International Carbon Action Partnership

EMISSIONS TRADING WORLDWIDE

Status Report 2019

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International Carbon Action Partnership (ICAP) – Status Report 2019

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FOREWORD

Messages from the ICAP Co-Chairs

Over the past few years, key emissions trading systems (ETSs) worldwide have considered and undergone sweeping policy reforms to get their systems ready for the post-2020 era. As these market reforms start to kick in, we have started to see significant price effects, which can now be tracked with the new ICAP Allowance Price Explorer, available on our website. From a climate perspective and as noted in the most recent IPCC Special Report, reinforced carbon price signals coupled with complementary policies can support increased ambition, cost-effectively.

Although robust carbon prices are important drivers for low-carbon investment, the key determinant of the mitigation impact of an ETS is its cap trajectory, and how it compares to a business-as-usual pathway. Through the recent reforms, the world's most experienced systems have legislated ambitious caps out to 2030 in line with their broader climate targets, providing a predictable planning horizon to covered businesses.

> *Although robust carbon prices are important drivers for low-carbon investment, the key determinant of the mitigation impact of an ETS is its cap trajectory, and how it compares to a business-as-usual pathway*

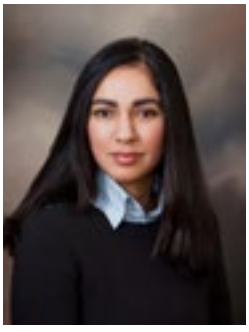
A key challenge when designing such ambitious climate policy and delivering on the targets, is to ensure that the competitiveness of the covered industries is maintained and that carbon leakage is avoided. Here, recent reforms have also produced real progress, striking a balance between steadily tightening caps and protecting those sectors genuinely at risk. Finally, to better arm markets against any unforeseen developments, systems are also putting market stability measures in place. Regardless of the approach adopted, these tools give businesses and investors more certainty for future planning and investment decisions.

Despite these achievements, the challenges of competitiveness and market stability are at the core of all ETSs and they will remain with us for years to come. Over the past decade, ICAP has become one of the key fora for front-runner jurisdictions to compare notes and share lessons learned on these and other challenges. In the coming year, we intend to step up our role as a platform where carbon market policymakers can meet each other and exchange views, making the most of the unique global mix of knowledge and experience our members and observers combine.

We are delighted that Mexico, which may start its own national carbon market as early as 2020, has joined ICAP last year as an observer, and we look forward to continuing stimulating discussions in an ever expanding circle of peers pioneering and fine-tuning carbon markets as a key tool on the path towards deep decarbonization.

BEATRIZ YORDI

Co-chair of the International Carbon Action Partnership and Director of European and International Carbon Markets, Directorate-General for Climate Action,
European Commission



RAJINDER SAHOTA

Co-chair of the International Carbon Action Partnership and Assistant Division Chief, Industrial Strategies Division
California Air Resources Board

From Local to Supranational 27 jurisdictions are implementing 20 ETSs across scales

"Reinforced carbon price signals coupled with complementary policies can support increased ambition, cost-effectively

1/8 *of the global population lives under an ETS in force.*

8% *of global GHG emissions are covered by an ETS*

Jurisdictions making up **37%** *of global GDP are using emissions trading*

PRACTITIONER INSIGHTS

Designing Cap-and-Trade

"With the scheduled start of China's national ETS, the share of emissions covered by carbon markets will jump to 14% in 2020

CALIFORNIA AND QUÉBEC

Climate collaboration in practice

An interview with California Air Resources Board
RAJINDER SAHOTA

Québec Ministry of the Environment and the Fight against Climate Change
JEAN-YVES BENOIT

INTRODUCTION

With just about 5,000 kilometers and a national boundary separating them, California and Québec operate the most geographically dispersed linkage between cap-and-trade programs. Under the joint heading of the Western Climate Initiative (WCI), these two climate-ambitious sub-nationals have been collaborating for more than a decade. Their quest to collectively lower the costs of climate change mitigation has resulted in a stable yet flexible carbon market and an example of what the future of climate collaboration can look like.

The ICAP secretariat sat down with ICAP Co-Chair Rajinder Sahota of the California Air Resources Board, and former ICAP Co-Chair, Jean-Yves Benoit of the Ministry of the Environment and the Fight Against Climate Change in Québec, to discuss shared history, challenges, opportunities, and prospects for the future.

> *"There is an evolution, going from a standalone regulatory agency to the mindset of a partnership*

HISTORY

Founded in 2007 by a group of five western U.S. states, the WCI was formed with the mandate of taking a regional approach through market-based mechanisms to address climate change. Four Canadian provinces, Québec being one of them, were quick to join in 2008. Québec and California adopted cap-and-trade regulations in their legislatures and established individual programs by late 2012. As of January 1, 2014, they were officially linked and held their first joint auction later that year in November.

At the start of 2018, Québec and California welcomed a third member to their linked market with the addition of Ontario. Despite a successful link, it was soon clear that political changes could undo their work. Several months after the tripartite linked market had begun, newly elected Ontario Premier Doug Ford, almost immediately upon inauguration, made the first definitive move of his incumbency the effective withdrawal of Ontario from the WCI linked market. The unilateral withdrawal forced Québec and California to react swiftly. They undertook coordinated measures to mitigate any potential market uncertainties, with the challenge resulting in a public display of their unity, and a joint market that remained robust throughout. This ability to transform challenges into opportunities is a recurrent theme in their collective work.

CHALLENGES AND BENEFITS OF COLLABORATION

California and Québec have diverging economic profiles with different abatement options across their jurisdictions. Electricity production might be the most notable difference, as Québec has basically no GHG emissions in this sector with its electricity production originating almost entirely from hydropower (approximately 99% of renewable electricity generation). Yet, it is a principle of cap-and-trade that a broad market with differing abatement opportunities leads to the greatest cost effectiveness. "We adopted an ambitious mitigation goal of 20% below 1990 levels by 2020. Linking with California allows us to achieve this with a smaller impact on our economy. In fact, between 1990 and 2016, our GHG emissions were reduced by 9% below 1990 levels while our economy grew by 62%", Jean-Yves Benoit states. In this light, he sees their different economic profiles "more as an opportunity than as a challenge".

One might also imagine that the different cultures, time zones, currencies and languages have made the collaboration difficult. Rajinder Sahota, however, "can't think of any" major challenges. Both agree that it takes some time to learn and adjust. "There is an evolution, going from a standalone regulatory agency to the mindset of a partnership." Looking back, Rajinder Sahota notes "with WCI we got a taste of what collaboration needs to look like. But it wasn't until we started writing regulations in advance of the linked market with Québec that we began to realize what collaboration really meant". Jean-Yves Benoit explains "It was a new way of thinking and doing things - something we had to learn." Rajinder Sahota concludes "I'm happy to say that, over time, it becomes second nature to consider your partner in the other jurisdiction and to have that level of trust, openness and direct dialogue with folks in the other program."

The experience has even brought benefits beyond managing the linked market. "I realized early on that the skills we learned in collaborating with Québec paid dividends in working with other state agencies within California. It actually helps us in finding solutions in other discussions and settings", notes Rajinder Sahota.

WHAT TO EXPECT IN THE COMING YEARS

In 2017, California enacted legislation providing direction and a clear role for their cap-and-trade program for the period extending through until 2030. Québec did the same by amending its cap-and-trade regulation for the post-2020 period and by setting its annually declining cap through 2030. Not only is this a testament to the policy's success, it reflects the wider success of the partnership between the WCI jurisdictions, a success that continues to inspire others to join the partnership.

However, welcoming new jurisdictions doesn't come without its challenges, as was seen in this past year, where Ontario first joined and several months later dropped out. The experience nevertheless proved valuable. The onboarding process was highly successful, and has demonstrated that the joint market is ready for new partners to opt-in. The rapid withdrawal of Ontario became a real-world test of market resilience, and also provided useful lessons. Two factors were important here: the regulatory design of the market proved itself able to cope with such unanticipated events, and good communication networks enabled market participants to stay informed and reassured during the process. Jean-Yves Benoit reflects "the end result was that our market stayed extremely stable throughout the delinking process with Ontario."

The experience has in no way deterred Québec and California from undertaking linking in the future. In fact, they are hoping to soon see another member join: Oregon, California's neighbor to the north and long-time member of the WCI. The state is currently working out the details in their "Clean Energy Jobs Bill", which makes clear mentions of the WCI design. While there are several potential linking partners on the horizon, both Jean-Yves Benoit and Rajinder Sahota see Oregon as being "the next jurisdiction ready to link with our program."

Their cooperation is not limited to the prospects of linking – it extends to broader continental and international forums such as the Carbon Pricing in the Americas (CPA) initiative, a framework committed to regional cooperation on carbon pricing across the American continents. Jean-Yves Benoit considers "collaboration amongst governments the key to fighting climate change."

> *The end result was that our market stayed extremely stable throughout the delinking process with Ontario*

Does the WCI collaboration provide a model for other jurisdictions to follow? Both Rajinder Sahota and Jean-Yves Benoit "certainly hope so". The WCI approach leaves jurisdictions ample room for individuality in their respective ETS regulations, despite the harmonization resulting from the linking process. Jean-Yves Benoit recalls that when the WCI framework was originally designed, the eleven partners at the table were hugely different in terms of their economic and emissions profiles. "We were making all our decisions by consensus. This really forced us to come up with a design that was flexible and could accommodate specific needs and circumstances". This room for diversity in implementation expands the scope for potential partners, can provide better abatement opportunities and also provides a realistic approach to climate change cooperation in the current 'bottom-up' paradigm.

The climate challenge is political, in that it cannot be successfully overcome by isolated actions. If we are to have a chance to transition to a low-carbon world, we must learn to collaborate, cooperate and coordinate our efforts. In times when policies on the national level may appear to be lacking, the tried and tested partnership between California and Québec serves not only as a beacon of hope, but also perhaps provides a glimpse into the future of climate policy, where differences are seen as opportunities and the only defining factor is how we can most efficiently and effectively fight climate change.

> *The relationship we build over time and that the team builds over time, really makes our joint program a success*

CHINA

Learning by doing: China's dynamic approach to ETS

SinoCarbon
QIAN GUOQIANG,
CHEN ZHIBIN,
LAI HAN

In 2018, China undertook a major governmental restructuring program, which has seen climate policy become part of a comprehensive national environmental strategy. Adopted in March 2018, the 'Plan on Deepening the Reform of Party and State Institutions' established a new Ministry of Ecology and Environment (MEE), which integrates, unifies, and strengthens all environmental protection functions of the Chinese national government. The climate change department of the National Development and Reform Commission (NDRC) and the previous Ministry of Environment Protection have been integrated under the MEE. This restructuring sends a strong message: climate policy is further consolidated with China's domestic environmental protection strategy, and is a key element in China's political vision to build an ecological civilization. According to Li Gao, head of the Climate Change Department, the new MEE combines stronger policy supervision capacity with enforcement authority, giving even greater weight to China's climate change policy goals.

THE DEVELOPMENT OF THE NATIONAL ETS CONTINUES UNDER MEE

After the restructuring, responsibility for the development of the Chinese national ETS now falls to MEE. On a number of occasions, MEE has reconfirmed the validity of the roadmap for establishing a national carbon market[1] that was approved in late 2017 by the State Council, the highest executive branch of the Chinese government. Soon after the restructuring, MEE picked up the ongoing work on the national ETS, including historical data reporting and verification for 2016-2017; the design, construction, and roll-out of the trading and registry platforms; and the establishment of an expert working group to prepare the allowance allocation plan for simulation trading. Improving the regulatory and administrative framework of the national ETS is another priority; in particular, developing the "Interim Regulation on Carbon Emissions Trading," which will constitute the primary legal basis of the national carbon market. Although the NDRC has previously prepared the draft regulation, it now needs to be endorsed by the newly restructured Ministry of Justice and finally approved by the State Council.

It is encouraging that the development of the national carbon market is continuing as planned under MEE. However, the restructuring is not without challenges. With eight years of studying, planning, and experimenting with carbon market design and implementation, the NDRC and its provincial affiliates have established an experienced personnel pool. While all officials have been transferred to MEE from NDRC at the national level, local level restructuring is still underway. As provincial and city level environment agencies will also play a critical role in the operation of the national carbon market, capacity gaps at these levels need to be properly addressed in a timely manner.

ETS PILOTS CONTINUE TO GENERATE VALUABLE LESSONS

Since June 2013, seven Chinese ETS pilots, as well as the Fujian regional ETS, have entered operation. During this period, the regional ETS pilots already have demonstrated their great value in providing lessons and experiences for the national ETS. In managing the regional pilot markets, the regulating authorities have continuously sought to improve their policies and maintain active markets.

(1) HIGH LEVEL OF COMPLIANCE ACHIEVED IN THE PILOT SYSTEMS

Back in 2013, compliance was not ideal. Most pilots experienced delays in compliance and levels were not as high as they could be. This was mainly because covered entities were either unprepared or unaware of their compliance obligations. The relatively weak penalty resulting from the pilots' low-level regional authority was another factor. However, the situation improved under the active supervision and support of the pilot authorities and exchanges. By 2016, most pilots completed their compliance obligations on time and since have continued to achieve high compliance rates.

1 - The "Work Plan for Construction of the National Emissions Trading System (Power Sector)" mandates three phases of implementation: (1) the infrastructure completion phase, (2) the simulation trading phase, and (3) the deepening and expanding phase.

(2) TRADING MARKETS FUNCTION SMOOTHLY

As of 31 December 2018, the accumulated trading volume of the allowance spot market (see Figure 1) in all the pilots reached 282 million tonnes, with a total value of CNY 6.2 billion (USD 937 million). Guangdong made up the largest share of the trading volume (94.3 million tonnes) as well as the trading value (CNY 1.87 billion [USD 283 million]).

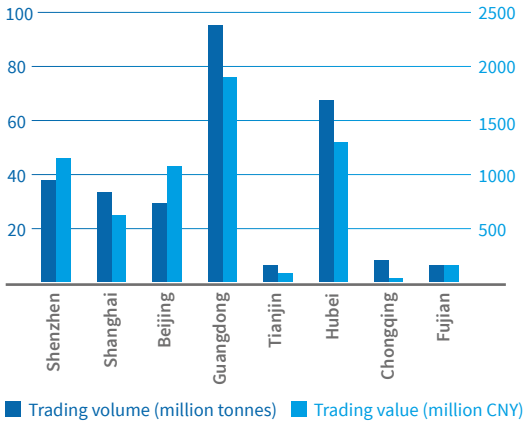


Figure 1. Accumulated trading volume and value of the pilots through 31 December 2018

Trading in most pilots has generally entered a "steady state" during the past two years: The price stays stable and the yearly trading volume no longer varies greatly. Nevertheless, there are several exceptions. In terms of allowance price (shown in Figure 2), Beijing shows more short-term fluctuations, while long-term fluctuations feature in Chongqing. Furthermore, the allowance price in Hubei rose from 16 CNY/tonne to 30 CNY/tonne (USD 2.42 to 4.53) from the middle of 2018. Regarding trading volume, Chongqing was impressively active in 2017, with 7.4 million allowances traded, but faced a sharp decline in 2018.

(3) POLICY IMPROVEMENT CONTINUES

Expanding coverage

In an attempt to strengthen the impact of their ETSs, several of the pilots have expanded their market coverage by adding new sectors, lowering the inclusion thresholds, or a combination of the two. Shanghai and Beijing have undertaken both sectoral and threshold approaches. In contrast, Guangdong has expanded sectoral coverage, while Hubei has progressively lowered the inclusion thresholds for existing sectors (measured in annual tonnes of coal equivalent–tce [2]). More specifically:

- Shanghai (2016): added waterway transportation; lowered thresholds for industrial sectors 20,000 tce to 10,000 tce; all other sectors: 10,000 tce to 5,000 tce
- Beijing (2015): added transportation; lowered thresholds for all sectors 10,000 tce to 5,000 tce
- Guangdong (2016): added civil aviation and paper making
- Hubei (2016): lowered thresholds for seven sectors 60,000 tce to 10,000 tce (petrochemical, chemical, building materials, iron and steel, nonferrous metal, paper making, and power); (2017): lowered thresholds for all sectors to 10,000 tce

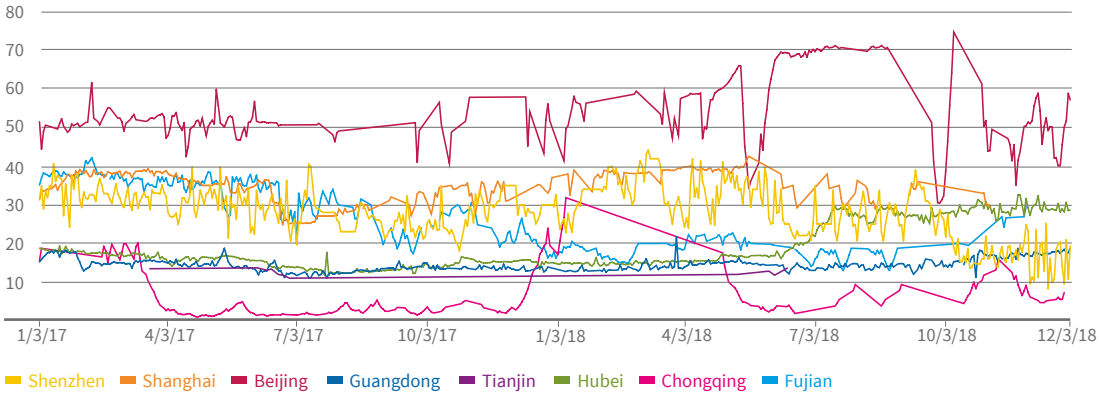


Figure 2. Daily average allowance price of online trading (CNY/tonne)

2 - Tonnes of coal equivalent—10,000 tce is approximately equal to 26,000 tCO_2

Greater use of benchmarking for allocation

Through years of trying and testing ETS at the regional level, benchmarking has been found to be most favorable for its ability to recognize and reward early mitigation action. For enterprises, it is considered a more transparent and fair approach. Thus, most pilots have endeavored to extend the sectoral coverage of benchmarking during the past years.

In Beijing, benchmarking was applied to the power generation sector from 2016, to both existing and new-entry facilities, thereby replacing the historical intensity-based method. A similar trend has been observed in Guangdong, a forerunner in this area, where between 2013 and 2016 they have succeeded in setting benchmarks for sectors with complex products and procedures, such as paper making, iron and steel, and aviation.

Increasing restrictions on offset use

All pilots accept domestically generated Chinese Certified Emission Reduction credits (CCERs). However, oversupply of CCERs has been recognized as a major factor putting downward pressure on allowance prices in many pilots. From 2016, Hubei tightened its rules for CCER use, allowing only CCER credits generated from rural biogas and forest-based projects. Furthermore, the projects have to be located in contiguous poor areas of Hubei and are subject to a stricter crediting period. Similarly, in 2016, Shanghai lowered the quantitative limit on CCERs from 5% to 1% of allocated allowances. While other factors also helped to improve market confidence, immediately after the new 1% limit was announced the allowance price rapidly increased from around CNY 10 (USD 1.51) in November 2016 to nearly CYN 40 (USD 6.04) in March 2017.

The new Ministry of Ecology and Environment combines stronger policy supervision capacity with enforcement authority, giving even greater weight to China's climate change policy goals

Developing local offset mechanisms

In addition to CCERs, regulated by the national authority, some pilots have also developed their own offset mechanisms. For example, Fujian has implemented Fujian Forestry Certified Emission Reductions, a local offset mechanism aiming to make full use of the province's rich forest resources. Guangdong, on the other hand, has chosen to develop the Pu Hui Certified Emission Reduction (PHCER) mechanism, focusing on forestry, renewable energy, and energy conservation. Up to 31 December 2018, 1.58 million PHCER credits had been traded.

In this way, ETS development in China can maintain a balance between innovation and risk control

OUTLOOK

Currently, the MEE and regional authorities are evaluating different approaches to integrate the regional pilots with the national ETS. Generally speaking, the regional and national markets will coexist in the foreseeable future, as some sectors gradually merge into the national market when conditions are ready. However, the pilots will continue the learning-by-doing process, improving technical standards for additional sectors, applying more benchmarks, and introducing innovative carbon finance instruments, continually generating experiences for the national market. In this way, ETS development in China can maintain a balance between innovation and risk control, which may be the best way to successfully establish the largest carbon market in the world.

3 - Allocation based on historical emissions intensity, updated ex-post using reported activity data and then modified by an emission control factor (a factor usually smaller than 1, which can be considered as a reduction target compared to the base year for one sector).

MEXICO

Lessons from the ETS development process

Mexico's Ministry of Environment and Natural Resources (SEMARNAT)
VICTOR ESCALONA

For over three years, Mexico has been working on developing a national ETS as a tool to help stakeholders reduce emissions, and for the country to reach its mitigation targets. By the end of 2018, the Ministry of Environment and Natural Resources (SEMARNAT) had finalized the draft regulation for the pilot phase of Mexico's national ETS. This article outlines the tasks accomplished and lessons learned at each step, while reflecting on the political, legal, and technical challenges.

BACKGROUND

The first and most important step towards developing a carbon pricing policy in Mexico was the publication of the 'General Law on Climate Change' (LGCC) in 2012. It established the basis for climate policy in Mexico, including the guidelines for developing planning instruments and provisions for mitigation and adaptation strategies and activities.

Also fundamental to the development of Mexico's ETS was the creation of the National Emissions Register (RENE), a greenhouse gas reporting system for facilities and companies. The regulation for RENE was published in October 2014, with provisions for monitoring, reporting, and verification (MRV). So far, facilities have submitted individual reports for four years (2014-2017).

> *The dialogue with private sector stakeholders represented a major innovation in how public policies are decided in Mexico and it soon proved to be of enormous value*

Despite the milestone achieved by having the LGCC legislation in place, the 2012 legal framework did not go as far as requiring that an ETS be implemented in the country: Article 94 of the 2012 LGCC stated that SEMARNAT could establish a voluntary ETS. Nevertheless, in 2015 SEMARNAT started an initial assessment of the feasibility of a mandatory system, alongside the identification of legal and technical requirements.

PLANNING: PAVING THE WAY FOR AN ETS

In the lead-up to the design of Mexico's ETS regulation, several steps were taken to prepare the way. Guidelines for verifying MRV data were developed, the regulatory landscape was formally assessed, and a process for engaging key stakeholders was initiated.

For the RENE verification process, SEMARNAT had to develop guidelines for the reporting entities and accredited verifiers. As a result, the Verification Standard for RENE reporting was drafted. It is based on ISO 14064 and ISO 14065 with program-specific requirements. This standard will be published in 2019, after many months of consultation, but it was in 2016 when the first draft was commissioned and completed.

In 2016, the planning for the ETS was initiated with a formal legal analysis of the regulatory framework. A Clean Energy Certificates program for power consumers had been legislated already in 2013. Moreover, a carbon tax on some fossil fuels had been implemented in 2014. It was therefore essential to evaluate the compatibility of these policies and develop options for an effective carbon pricing policy mix in Mexico that could deliver positive results while avoiding overregulation.

Early on in the planning process, a dialogue was started with private sector stakeholders, to listen to their concerns and questions firsthand. This effort represented a major innovation in how public policies are decided in Mexico and it soon proved to be of enormous value, not only for the planning process, but also for the next stage, which included legislative amendments and the formal consultation process.

In parallel, with the support of the Partnership for Market Readiness (PMR), SEMARNAT announced the implementation of an ETS Simulation Exercise, which took place in 2017-2018. The simulation exercise was the first of its kind in Latin America, bringing together more than 100 companies from a wide variety of energy and industry sectors.

Both of these stakeholder engagement activities opened the door for more direct and technically focused exchanges with private sector representatives—an opportunity that eventually led to the establishment of a formal Working Group.

LEGAL AMENDMENTS: PROVIDING CERTAINTY

In 2017, proposed amendments to the LGCC were introduced in Congress. The amendments addressed issues regarding harmonization with the Paris Agreement and Mexico's Nationally Determined Contribution, but importantly they also strengthened Article 94, thus providing the regulatory framework for a mandatory ETS. Finally, in April 2018, the amendments gained Senate approval. Congress thereby gave SEMARNAT the mandate to launch an ETS, under two conditions: (i) there should be a three-year pilot phase prior to full implementation; and (ii), the pilot phase should not lead to any negative economic impacts for the participating sectors[1].

DESIGNING THE NATIONAL ETS

With the legal basis in place, SEMARNAT and private sector stakeholders launched a Working Group with the objective of conducting a formal consultation process on the design of the national ETS pilot program. To aid the progression of the work plan, the group decided to use the ETS Handbook (published by ICAP and PMR[2]) as its main guideline.

Through this engagement, the government and private sector were able to constructively discuss their interests during the drafting process. The Working Group helped considerably in finding common ground on what are usually divergent positions, and the process placed the ETS as a politically feasible option for GHG mitigation in Mexico. The Working Group proved to be such an important format that it was integrated into the draft regulation through the creation of a Consultative Committee. We have learned an important lesson from the process, something we can recommend to any authority that is planning an ETS – this kind of stakeholder dialogue is fundamentally helpful in securing the adoption of climate policies.

To support the design of the pilot program and to provide an analytical basis for drafting the regulation, several studies were commissioned with the help of the German Agency for International Cooperation. The four key studies are:

- Achieving the Mexican Mitigation Targets: Options for an Effective Carbon Pricing Policy Mix[3]
- Emissions Trading in Mexico: Analysis of Carbon Leakage Risks[4]
- Designing an Emissions Trading System in Mexico: Options for Setting an Emissions Cap[5]
- Clean Energy Certificates and Emissions Trading in Mexico: Reciprocal Effects and Interactions[6]

The analyses enabled us to work constructively with stakeholders to develop the system design. As an input for these studies, SEMARNAT provided a comprehensive analysis of GHG emissions data for Mexican facilities, obtained from the RENE database. For example, to help with the scope assessment, we compiled data on facilities in the power and industry subsectors according to different emissions thresholds (see Figure 1).

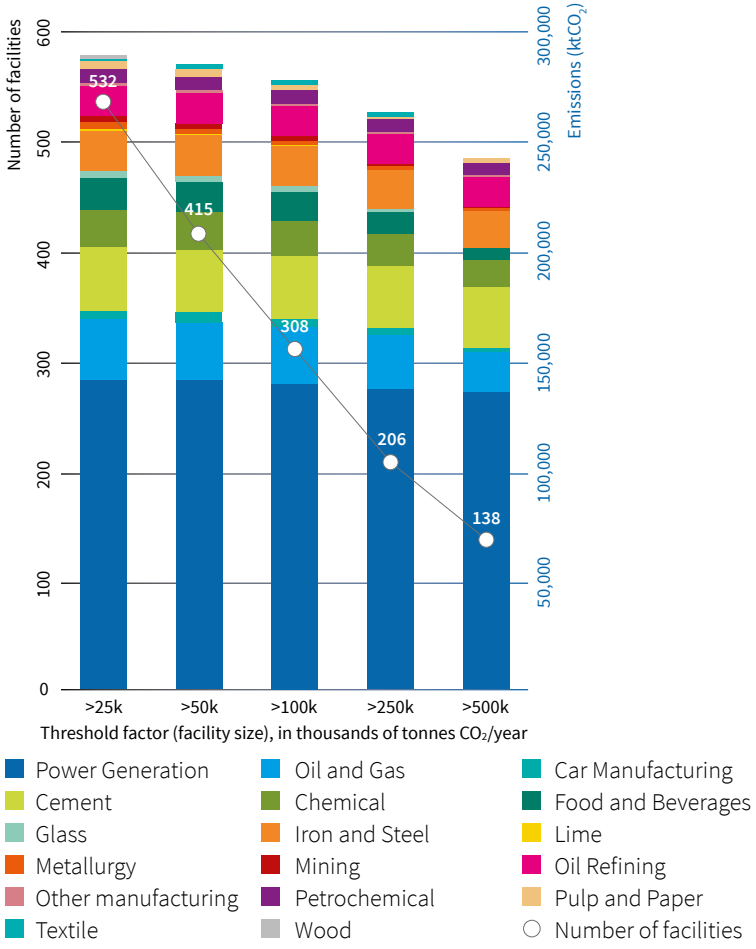


Figure 1. Analysis of GHG emissions of Mexican facilities using different thresholds

Source: RENE average annual emissions data from 2014 to 2016.

1 – In the LGCC Art. 2 transitory, it is stated that the pilot program shall not have economic impacts.

2 – ICAP/World Bank. Emissions Trading in Practice: A handbook on design and implementation. 2016.

3 – https://www.gob.mx/cms/uploads/attachment/file/401981/Options_for_Setting_an_Emissions_Cap.pdf

4 – https://www.gob.mx/cms/uploads/attachment/file/415521/Analysis_of_Carbon_Leakage_Risks.pdf

5 – https://www.gob.mx/cms/uploads/attachment/file/415523/Clean_Energy_Certificates_and_Emissions_Trading.pdf

6 – https://www.gob.mx/cms/uploads/attachment/file/415520/Achieving_the_Mexican_Mitigation_Targets.pdf

Mexico

Based on this analysis, the participation threshold of >100,000 tCO_2/year was chosen for the pilot phase, as it results in an optimal number of participants compared to the overall emissions coverage. At this threshold, the pilot will cover the 308 entities responsible for more than 96% of sectoral emissions and approximately 45% of national emissions.

Grandparenting was the logical choice for allocation, first because the historical GHG emissions data from RENE is currently the most reliable, and second, because 100% free allocation allows us to comply with the LGCC provisions mandating that the pilot program should not have economic impacts.

The draft regulation with all the provisions needed for the pilot program awaits public consultation before the government can adopt it and officially initiate the monitoring period. Consultation is scheduled for early this year, and according to the LGCC, the regulation must be published by April 2019 at the latest.

CHALLENGES AHEAD

The government will encounter several challenges before and during the pilot program implementation. The first is the renewed public consultation on pilot program regulation, a time-consuming but necessary step to comply with national transparency regulations. Key infrastructure also needs to be finished. In particular, a registry should be operational before or soon after the monitoring period starts for the participants to be able to receive their allowances. Discussions on cap-setting and allocation are also underway, and need to be completed before the pilot phase can begin.

During the pilot phase, SEMARNAT will begin developing the offset program, which will assist participants in lowering compliance costs and could also promote further emissions reductions outside of the scope of the ETS. Auctions are also mentioned in the draft regulation, though demand is not expected during the pilot phase due to the high level of free allocation. As with the offset program, developing an auctioning mechanism will be undertaken during the pilot phase, to be ready at the start of the next phase.

Improving data collection is also a challenge, particularly if allocation benchmarks are to be established in the future. Planned adjustments to the RENE regulation should result in more complete and accurate data, and lessons from the pilot phase will also be incorporated.

The regulation should also be accompanied by strong enforcement mechanisms and sanctions. Mexico's legal framework mandates that sanctions should be specified in law, rather than secondary regulation. Therefore, the transition to a fully functional ETS in Mexico will require further amendments to the LGCC outlining the enforcement provisions.

Despite these challenges, the hard work and progress made during the past years proves Mexico is taking solid and convincing steps to enhance carbon pricing policy implementation, joining China in a new generation of countries implementing a national ETS. This effort is part of Mexico's commitment to reach the Paris Agreement goals, while also providing an important basis for the adoption of more ambitious national mitigation targets in the future.

The hard work and progress made during the past years proves Mexico is taking solid and convincing steps to enhance carbon pricing policy implementation

REPUBLIC OF KOREA

The evolution of Korea's carbon market: Phase II and beyond

Ministry of Environment of the Republic of Korea
KIM JUNG-HWAN

The IPCC Special Report released in October 2018 outlines the difference in impact that limiting global warming to 1.5°C as opposed to 2°C would have on marine biodiversity, fisheries, and ecosystems. Based on current projections, the report predicts that global warming is likely to reach 1.5°C between 2030 and 2052 and if we are to have any chance of limiting warming to 1.5°C we would need emissions to be net zero by 2050. In order to deal with climate change while simultaneously minimizing negative impacts on economic growth, many countries have turned to carbon pricing mechanisms to deliver efficient and effective emissions reductions. Korea launched its Emissions Trading Scheme (the KETS) in 2015, and in 2018 Phase II started alongside a revision of Korea's 2030 GHG reduction roadmap.

This article outlines the key features of the KETS and provides an overview and operational performance review of Phase I. The major changes in Phase II are then discussed as well as plans for the future of the system.

DESIGN FEATURES OF THE KETS

The KETS is characterized by broad sectoral coverage of multiple greenhouse gases. Furthermore, the scope of the system includes both direct and indirect emissions, so that emissions related to electricity consumption are also covered. With the focus on large emitting companies, the KETS covers more than 70% of the country's emissions, and is therefore one of the most important climate change policy measures in Korea.

> *The KETS covers more than 70% of the country's emissions, and is therefore one of the most important climate change policy measures in Korea*

Flexibility and stability are built into the design of the KETS. Banking and borrowing provisions, an offset mechanism and market stability provisions allow covered entities to find cost-effective mitigation options, while also giving regulators the tools to ensure a stable and liquid market.[1]

The standard unit used for compliance and trading in the KETS is the Korean Allowance Unit (KAU). Offsets are also allowed[2], but are limited to 10% of each entity's compliance obligation. Domestic offset projects must comply with one or more of the government approved Clean Development Mechanism (CDM) or domestically-created methodologies. However, if not already on this list, new methodologies can also be registered. Additionally, from Phase II onwards, credits from international CDM projects are allowed, as long as they are developed by domestic companies.

The KETS also has market stability measures, namely the market stability reserve (MSR). The basic design of the Korean MSR is similar to that of the EU ETS; however, the reason why it was introduced differs. In the case of the EU ETS, the MSR was introduced to deal with oversupply. In the KETS, the MSR has been used to deal with a lack of liquidity. The Korean MSR is managed by a central agency, the Allocation Committee. Auctions for market stabilization were held in 2016 and 2018, with about 4.9 million KAUs sold for this purpose during Phase I.

OPERATIONAL RESULTS FROM PHASE I

Phase I of the KETS lasted three years from 2015 to 2017. The number of covered entities steadily increased over the period, from 524 in 2015 to 592 in 2017. In this phase, 1,608 million KAUs were initially allocated, and total allocation came to 1,685 million. In comparison, the total emissions of KETS entities in Phase I were 1,669MtCO_2e (99.2% of total allowances).

The difference between the initial and final allocation amount was the result of several factors: there were 51.4 million KAUs in additional allocation (including from the new entrants reserve), 51.3 million KAUs awarded from the early action reserve, an additional 18.6 million KAUs resulting from a change in the allocation plans, minus 44.5 million cancellations. Part of the extra allocation came from allowance reserves, put aside for market stabilization, early action and new entrants. During Phase I, around 85% of the 89.4 million reserve allowances were used.

1 – For a full and detailed list of design specifications, see the KETS factsheet later in this report.
2 – The credits generated by offsets projects are registered as KOC (Korean Offset Credits). In order to prevent double counting at the national level, credits from CDM projects (CERs) must also be converted to KOCs. These can be traded, but as they have no vintage, they must first be converted into KCUs (Korean Credit Units) before they can be used for compliance.

The offset mechanism was successfully established in Phase I. A total of 252 methodologies are registered, including 211 CDM methodologies, and 139 projects were approved. Of these projects, 90 were developed with CDM methodologies and 49 with domestic methodologies. The largest numbers of projects were in renewable energy (47) followed by N_2O reduction (24), fuel conversion (22), waste heat recovery (17), landfill gas utilization (10), SF_6 reduction (10) and other projects (9). A total of 22.4 $MtCO_2e$[3] were accredited from 82 projects, with N_2O reduction, landfill gas and SF_6 reduction projects producing the majority of credits. Of these accredited units, 15.3 $MtCO_2e$ (or 68.5%) were converted into KCUs and used for compliance.

Despite some early challenges, the first phase of the KETS saw the emergence of an ever more robust and stable trading market. In total, the volume of allowances traded in Phase I was 86.2$MtCO_2e$, representing a total value of KRW 1,748 billion (USD 1.59 billion). The annual traded volume and value both increased consistently across the three year period, from 5.7$MtCO_2e$ / KRW 63.1 billion (USD 60 million) in 2015 to 29.3$MtCO_2e$ / KRW 612.3 billion (USD 560 million) in 2017. The average allowance price in Phase I was KRW 20,279 (USD 18.42), and the market shows an upward trend with few major fluctuations. As can be seen from Figure 1, trading was generally concentrated around June and July (end of the second quarter), when compliance is due. Where major price fluctuations occurred, and based on the decision of the Allocation Committee, the MSR was used for market stabilization.

DEVELOPMENTS IN PHASE II

Phase II of the KETS is currently underway and will also last 3 years, from 2018–2020[4]. In a major development, auctioning as a means of allocation has been introduced in January this year. Entities thereby have to purchase 3% of their allowances at auction, with the exception of sub-sectors that have high trade intensity or high additional cost increases, considering international competitiveness and carbon leakage. Decisions on which sub-sectors are to face auctioning obligations are based on objective metrics: sub-sectors with >30% of trade intensity, >30% of additional cost rate[5], or a combination of >10% of trade intensity and >5% of additional cost rate are granted auctioning exceptions.

In order to promote low-carbon investments and innovation, benchmark-based methodologies will be applied to four more sub-sectors in Phase II. Already in Phase I, benchmarking applied to refinery, cement, and aviation. Benchmarking will now apply also to the power, cogeneration for district heating systems, cogeneration for industrial complexes and waste sectors.

There are also changes to the flexibility mechanisms in Phase II. The introduction of a 'market maker' mechanism is one of them. To reduce the risk of low market liquidity, designated market makers will play the role of activating the market and providing liquidity by offering allowances for sale. One or more public financial institution will be designated as a market maker, with 5 million reserve allowances set aside for this purpose. Another change is the approval of international offset projects that have the direct participation of domestic (Korean) companies.

Despite some early challenges, the first phase of the KETS saw the emergence of an ever more robust and stable trading market

THE FUTURE OF THE KETS

Looking ahead, from Phase III onwards the compliance periods will be extended to five years. This means that based on the lessons learned from Phase I and II, the KETS will then enter a phase of regular operation. In Phase III, the proportion of auctioning will be increased to 10% or more of an entity's obligation. Additionally, participation of 3rd parties (such as finance companies and other traders) is planned to be allowed starting from Phase III. As there have been several discussions about linking with other markets, the question of linkage will be one of the matters considered in Phase III. To implement these changes as planned and deal with other challenges successfully, Korea already has to prepare for Phase III and beyond, and will do so based on the experiences of Phases I and II. Though it seems like Phase II has just begun, the vision of the policy makers and participants extends to the future far beyond.

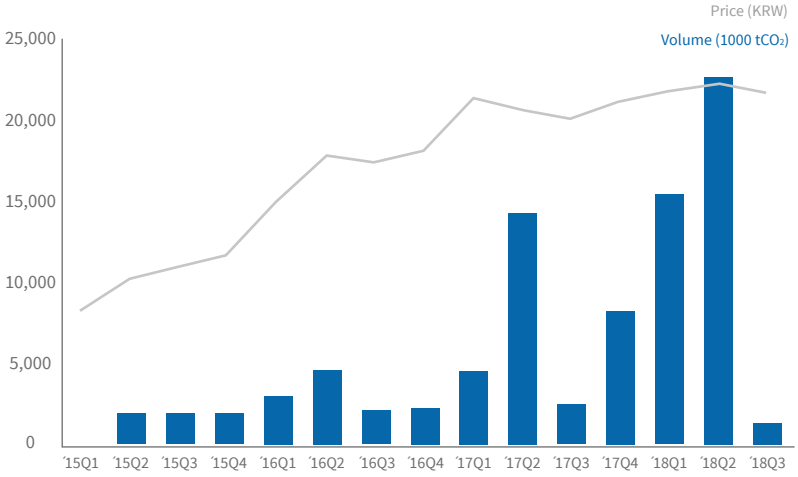


Figure 1. Quarterly trading volume (1000 tCO_2e) and average allowance price (KRW) in the KETS from 01/2015 to 08/2018

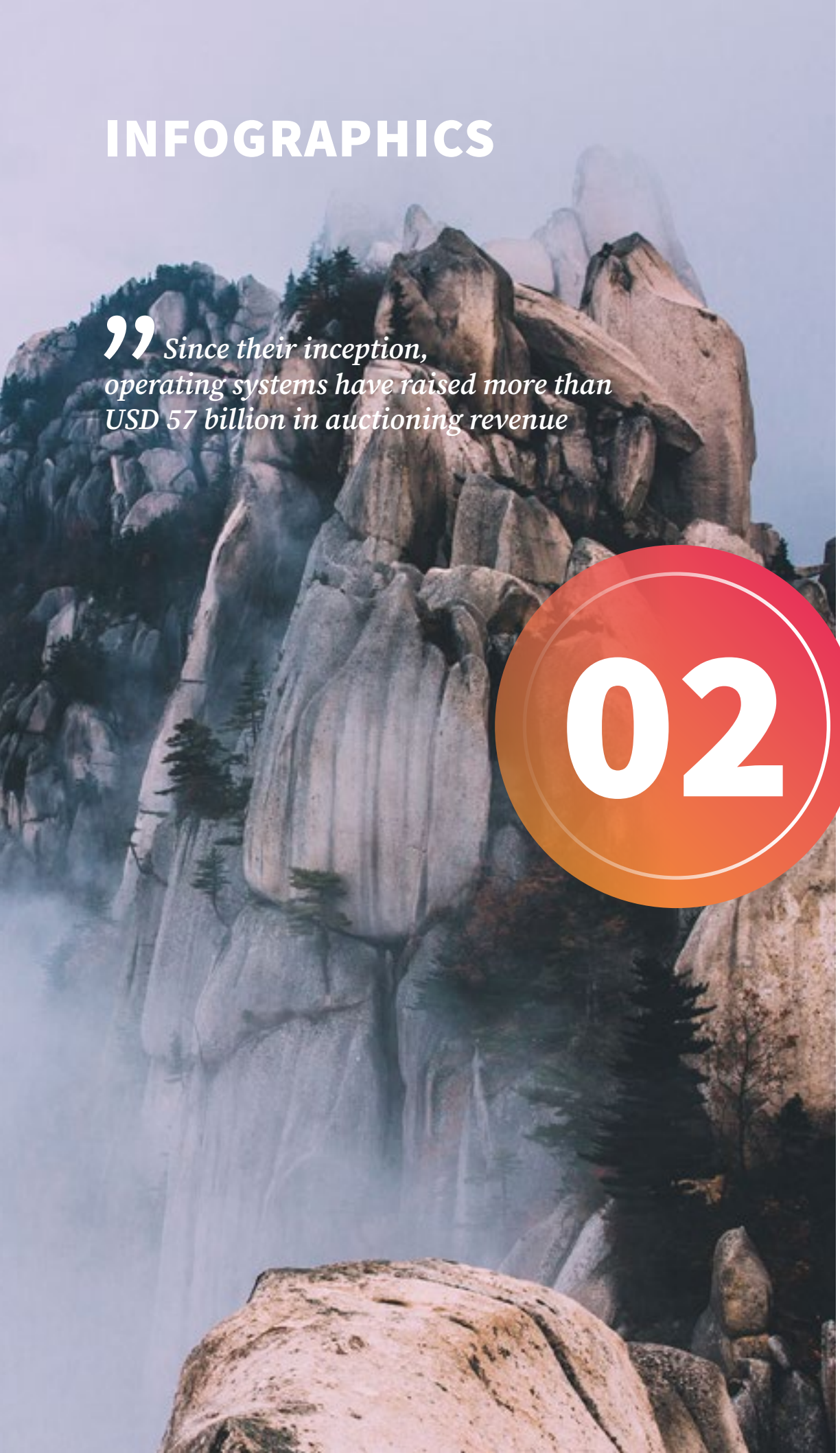
3 – 9.6 $MtCO_2e$ from N_2O reduction, 5.8 $MtCO_2e$ from landfill gas utilization, 4.5 $MtCO_2e$ from SF_6 reduction, 2.1 $MtCO_2e$ from renewable energy and 0.2 $MtCO_2e$ from fuel conversion

4 – The total amount of allowances (the cap) in Phase II is 1,796 million KAUs, including 153 million reserve allowances.

5 – The 'additional cost rate' is calculated as: (annual average emissions of the sub-sector x average price of allowances in the base period) /annual average value-added in the base period

INFOGRAPHICS

"Since their inception, operating systems have raised more than USD 57 billion in auctioning revenue



02

EMISSIONS TRADING WORLDWIDE

The state of play of cap-and-trade in 2019

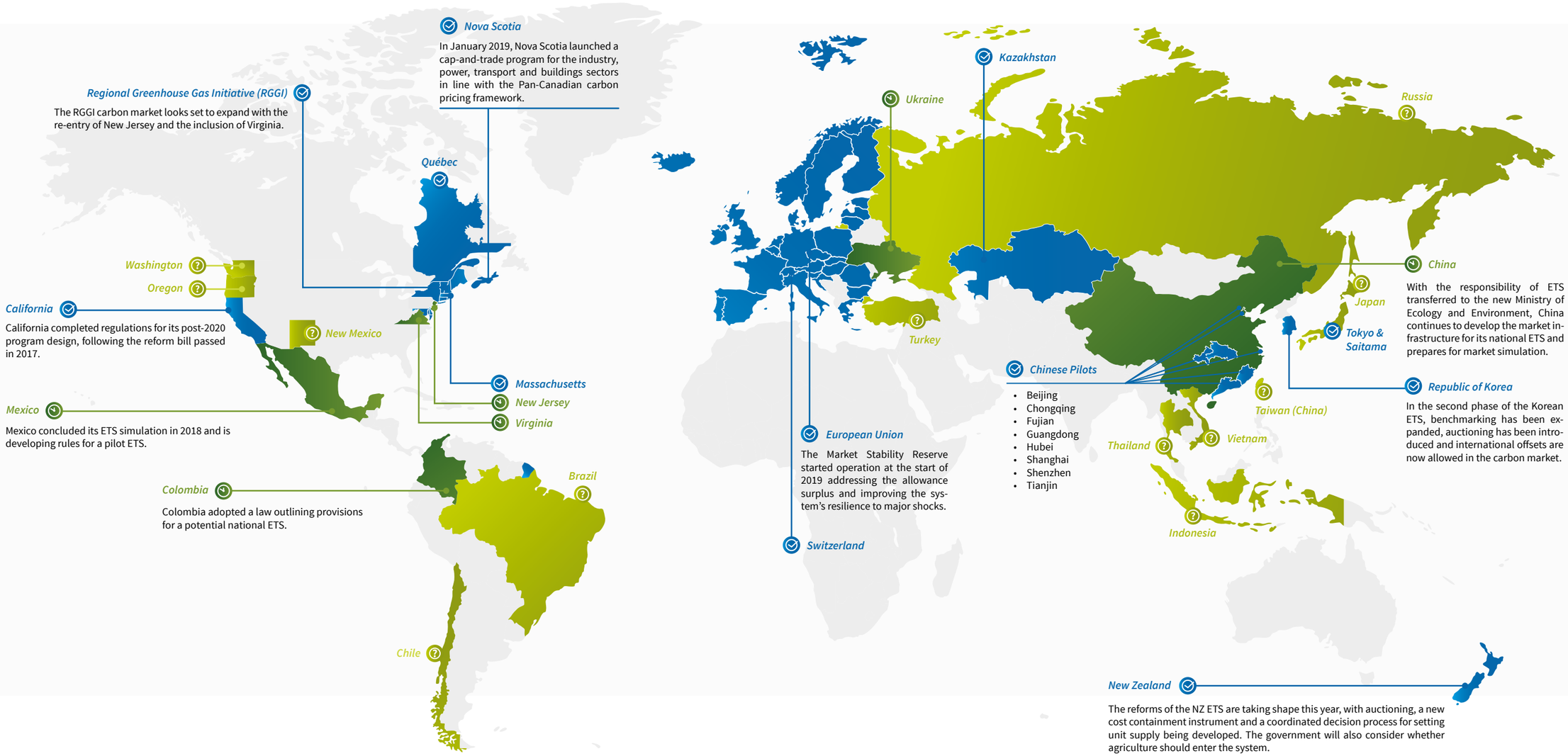
The ICAP ETS world map depicts emissions trading systems currently in force, scheduled or under consideration. There are now 20 systems covering 27 jurisdictions with an ETS in force. Another six jurisdictions are putting in place their systems that could be operating in the next few years, including China and Mexico. 12 jurisdictions are also considering the role an ETS can play in their climate change policy mix, including Chile, Thailand and Vietnam.

A regularly updated, interactive version of the ICAP ETS map with detailed information on all systems is available at: **www.icapcarbonaction.com/ets-map**

ETS in force

ETS scheduled

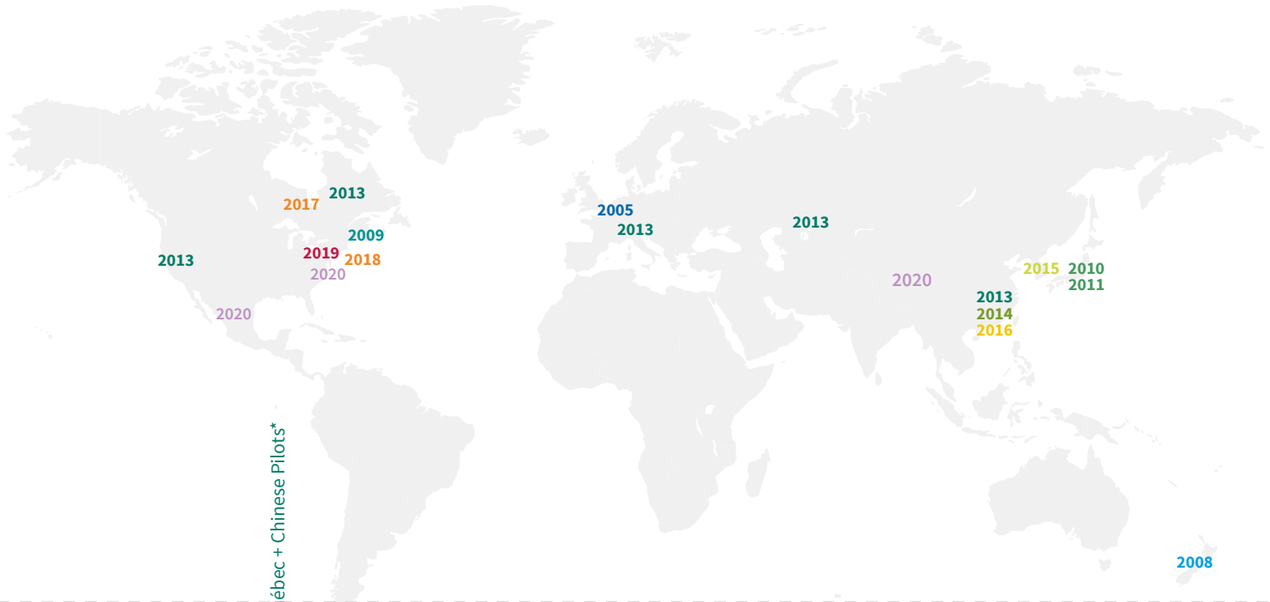
ETS considered



GLOBAL EXPANSION OF EMISSIONS TRADING

GHG emissions under ETSs

The graphic depicts the worldwide growth of emissions trading over time. Systems are spreading around the world and new additions have more than doubled the share of global emissions covered by emissions trading since the launch of the EU ETS in 2005. With more systems expected in the next few years, we estimate the number of global emissions under emissions trading to increase by almost 70% in 2020 compared to 2019. Changes over time are driven by the addition of new sectors and systems, as well as by the counteracting trend of declining caps in many systems.



*of global GHG emissions

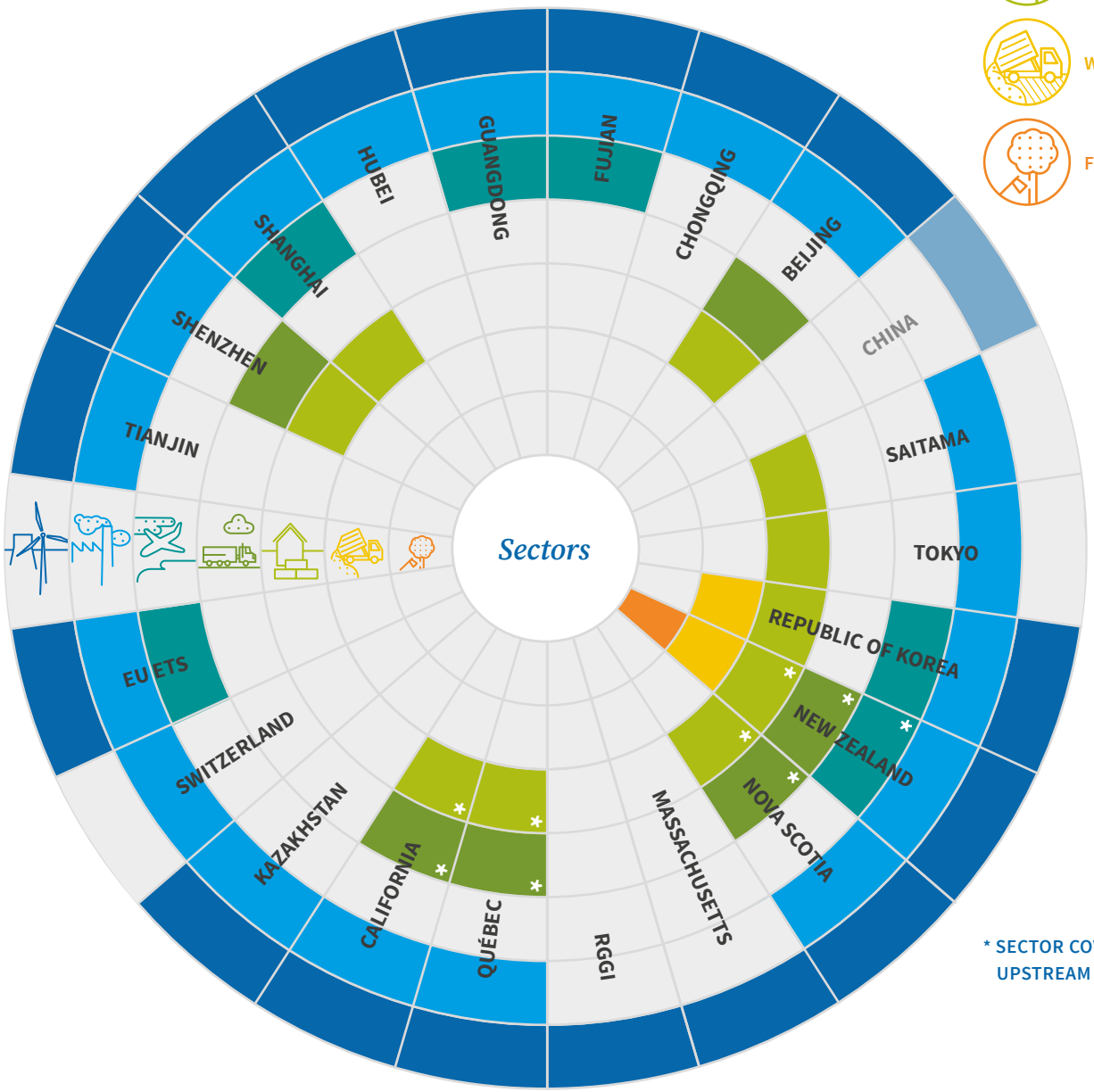
* Beijing,Guangdong, Shanghai, Shenzhen, Tianjin

*Virginia and New Jersey aim to join RGGI by 2020

SECTOR COVERAGE

Sectors included in emissions trading across systems

The graphic shows sectors (types of economic activity) included in emissions trading across all systems in force, as well as the point at which those emissions are regulated. Only sectors covered by at least one ETS are included.[1,2]



1 – Sectors are marked as covered by a system when at least some of this sector's emissions face explicit compliance obligations. Not all of the sector's facilities or GHG emissions must be regulated; in fact, this is rarely the case due to limits like inclusion thresholds. In addition, not all sub-sectors, gasses, or processes of a given sector may be covered. The respective factsheets provide more information on system coverage.
2 – Detailed definitions of each sector are provided in the notes on methods and sources.

DIFFERENT SHAPES OF CAP-AND-TRADE

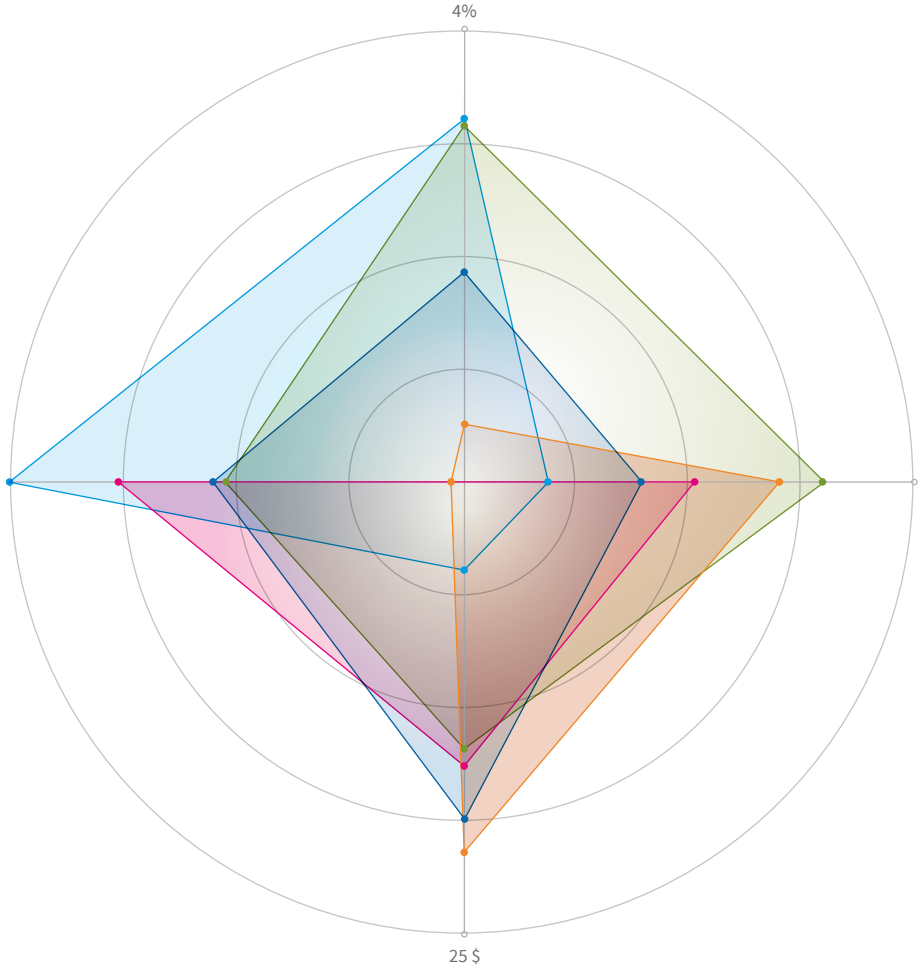
A comparative look at key metrics from carbon markets

EU ETS	European Emissions Trading System
KETS	Korean Emissions Trading System
NZ ETS	New Zealand Emissions Trading Scheme
RGGI	Regional Greenhouse Gas Initiative
WCI	Western Climate Initiative

This graphic shows five well-established systems along four key metrics. The cap reduction pathway indicates the average yearly decline between 2016 and 2020 in the number of allowances. The coverage shows the share of the jurisdiction's economy that falls under the ETS. The carbon price is the average allowance price per metric ton of CO_2 across 2018 in each of the systems. The share of allowances designates allowances that are not allocated for free, e.g. those that must be acquired in auctions.

CAP TRAJECTORY
Average annual rate of decline in newly available allowances between 2016 and 2020 (in %)

RGGI	3.22
WCI	3.18
EU ETS	1.86
KETS	0.54
NZ ETS	N.A.



SHARE OF ALLOWANCES NOT ALLOCATED FOR FREE
Proportion of allowances that is not allocated for free, but must be acquired either at auction or otherwise (in %)

RGGI	100
NZ ETS	76
EU ETS	57
WCI	53
KETS	< 3

COVERAGE
Percentage of jurisdiction's emissions covered under the system (in %)

WCI	80
KETS	70
NZ ETS	51
EU ETS	40
RGGI	18

CARBON PRICE
The average price for allowances across 2018, for one metric ton of CO_2e emissions (in USD)

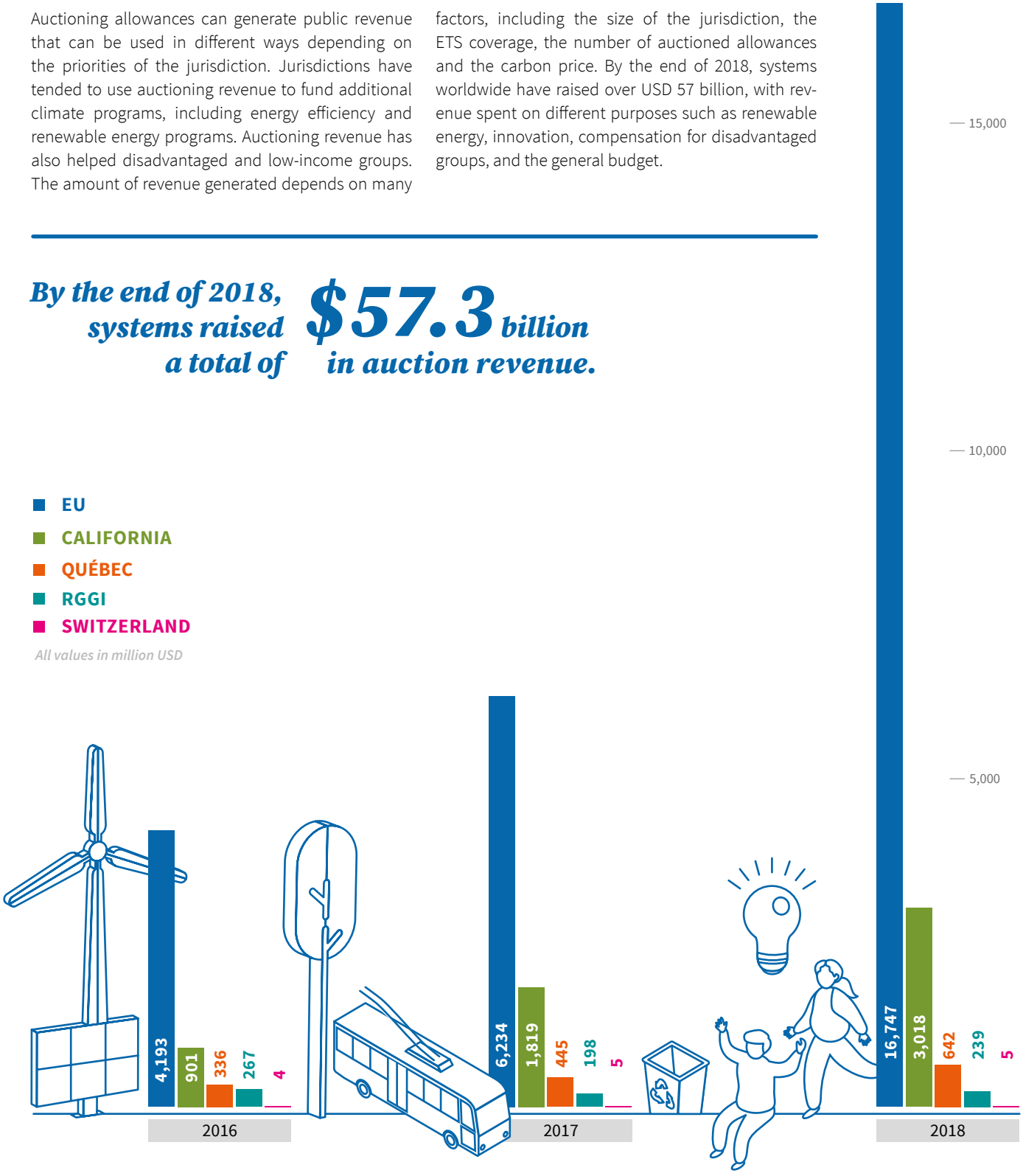
KETS	20.62
EU ETS	18.76
NZ ETS	15.71
WCI	14.91
RGGI	4.87

AUCTIONING REVENUE

Funds raised by emissions trading systems

Auctioning allowances can generate public revenue that can be used in different ways depending on the priorities of the jurisdiction. Jurisdictions have tended to use auctioning revenue to fund additional climate programs, including energy efficiency and renewable energy programs. Auctioning revenue has also helped disadvantaged and low-income groups. The amount of revenue generated depends on many factors, including the size of the jurisdiction, the ETS coverage, the number of auctioned allowances and the carbon price. By the end of 2018, systems worldwide have raised over USD 57 billion, with revenue spent on different purposes such as renewable energy, innovation, compensation for disadvantaged groups, and the general budget.

By the end of 2018, systems raised a total of $57.3 billion in auction revenue.

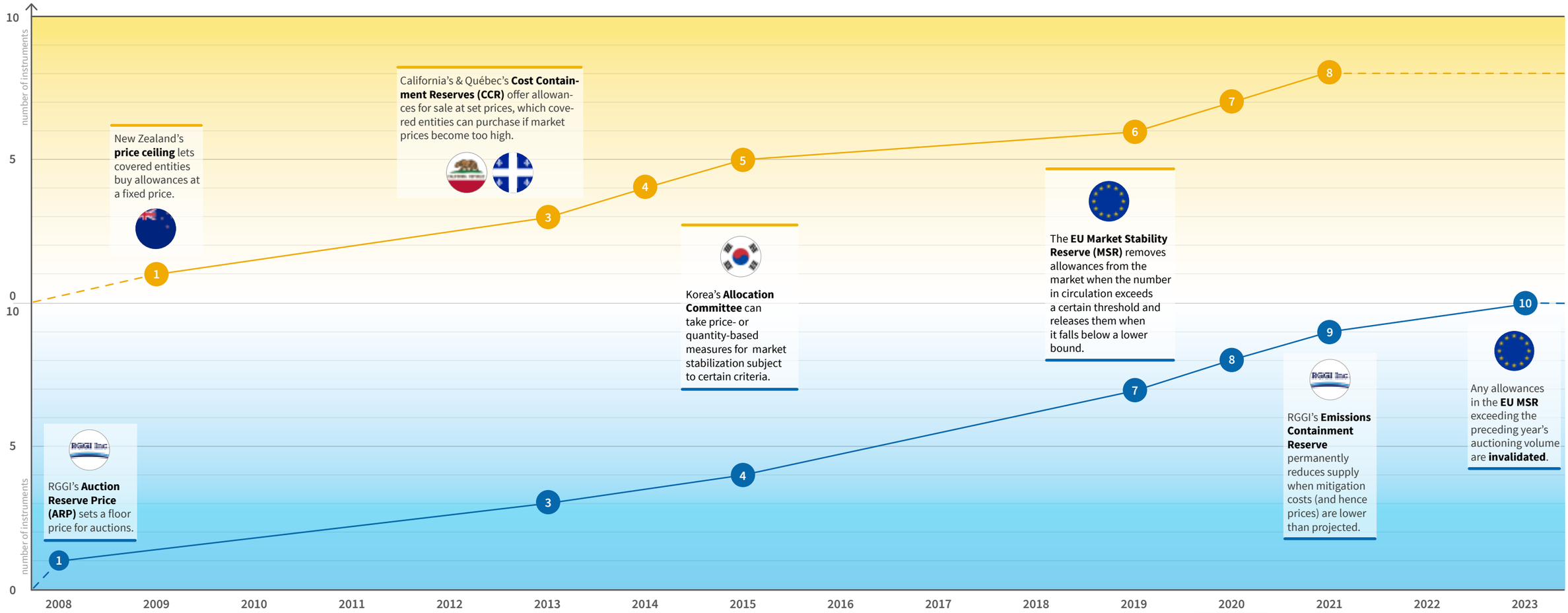


GROWING STABILITY

The spread and diversification of market stability instruments

This graphic shows the different types of market stability instruments operating in emissions trading systems around the world. These come into play when allowance prices or the number of allowances in circulation go below or above a certain level.

MARKET STABILIZATION AT THE UPPER BOUND:
Measures that ensure that the costs of the program remain manageable by intervening in case of high prices or scarcity of allowances.



MARKET STABILIZATION AT THE LOWER BOUND:
Measures that seek to ensure the environmental integrity and stringency of the ETS by intervening in case of low prices or a surplus of allowances.

DIVING INTO THE DETAILS

Planned and Operating Emissions Trading Systems Around the World

EUROPE AND CENTRAL ASIA

European Union 28
Switzerland 33
Kazakhstan 36
Turkey 39
Russia 40
Ukraine 41

NORTH AMERICA

Western Climate Initiative 42
California 43
Québec 47
Canada 51
Nova Scotia 53
Regional Greenhouse Gas Initiative 57
New Jersey 61
Massachusetts 62
Virginia 65
New Mexico 66
Oregon 67
Transportation and Climate Initiative 68
Washington 69

LATIN AMERICA AND THE CARIBBEAN

Brazil 70
Chile 71
Mexico 72
Colombia 74

ASIA-PACIFIC

China 75
Beijing 79
Chongqing 82
Fujian 85
Guangdong 88
Hubei 91
Shanghai 94
Shenzhen 97
Tianjin 100
Taiwan, China 102
New Zealand 103
Republic of Korea 107
Tokyo 112
Saitama 116
Indonesia 119
Japan 120
Thailand 121
Vietnam 122

EUROPEAN UNION

European Union Emissions Trading System

GASES	ALLOCATION	AVERAGE 2018 PRICE
Several gases	Auctioning Free Allocation	EUR 15.82 (USD 18.76) (average price on secondary market [EEX])
TOTAL REVENUE	**OFFSETS AND CREDITS**	**CAP**
Since beginning of program: EUR 35.9 billion (USD 42.4 billion) Collected in 2018: EUR 14.2 billion (USD 16.8 billion)	International Offsets	1,855 $MtCO_2e$ (2019)

ETS in force

ETS scheduled

ETS considered

SECTORS:

POWER

INDUSTRY

DOMESTIC AVIATION

MEMBERS (2018):
28 EU Member States, Iceland, Liechtenstein, and Norway

Oldest and largest ETS for GHGs

Post-2020 ETS design finalized. Market Stability Reserve started in 2019

Could link with Switzerland by 2020

ETS DESCRIPTION

The European Union Emissions Trading System (EU ETS) represents the central pillar of the EU climate change policy and is the oldest and still largest ETS for GHGs operating worldwide. Introduced in 2005 and now in its third phase, the system has gone through several reforms and will change again with the start of phase 4 in January 2021. The system covers emissions from the power, industrial, and aviation sectors, with the aviation sector being limited to flights within the European Economic Area (EEA). In 2017, the EU and Switzerland signed an agreement linking the Swiss ETS to the EU ETS—the first such agreement for the EU.

YEAR IN REVIEW

After more than two years of negotiations, in February 2018, the EU Council of Ministers formally approved the reform of the EU ETS for phase 4 (2021-2030). The revised EU ETS Directive entered into force in April 2018.

Phase 4 will see a steeper pace of annual emissions cuts required from the covered sectors, from 1.74% to 2.2%.

In addition, the Market Stability Reserve (MSR) – a mechanism to reduce the surplus of allowances in the carbon market and to improve the EU ETS's resilience to future shocks – has been strengthened: between 2019 and 2023, 24% of the surplus will be placed in the MSR instead of the regular rate of 12%, while from 2023 onwards the allowances held in the MSR exceeding the previous year's auction volume will be invalidated. Member States may also invalidate a portion of allowances to reflect additional policies in the energy sector, e.g., a coal phase out. Other changes for phase 4 include provisions to better target free allocation to address carbon leakage, as well as new financial support mechanisms to promote low-carbon innovation and to support modernization efforts in the industry and the power sectors of lower-income Member States.

Steps will be taken in 2019 to ratify the Linking Agreement between Switzerland and the EU, which could see the markets linked from 1 January 2020.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF)	4,353.0 $MtCO_2e$ (2016)

OVERALL GHG EMISSIONS BY SECTOR

Energy 3,391.0 (78%)
Industrial Processes 386.0 (9%)
Agriculture 436.0 (10%)
Waste 140.0 (3%)

GHG REDUCTION TARGETS

BY 2020: 20% below 1990 GHG levels
BY 2030: At least 40% below 1990 GHG levels
BY 2050: EU leaders have committed to reducing emissions by 80-95% below 1990 GHG levels

ETS Size

GHGs COVERED
CO_2, N_2O, PFCs

CAPPED EMISSIONS
1,855 $MtCO_2e$

SECTORS AND THRESHOLDS
PHASE 1 (2005-2007): Power stations and other combustion installations with >20MW thermal rated input (except hazardous or municipal waste installations), industry (various thresholds) including oil refineries, coke ovens, iron and steel plants, as well as production of cement, glass, lime, bricks, ceramics, pulp, paper, and board.

PHASE 2 (2008-2012): Aviation was introduced in 2012 (>10,000 tCO_2/year for commercial aviation; >1,000 tCO_2/year for non-commercial aviation since 2013) (see below). Nitrous oxide emissions from the production of nitric acid were included by a number of countries. The EU ETS also expanded to include Iceland, Liechtenstein, and Norway.

PHASE 3 (2013-2020): Carbon Capture and Storage installations, production of petrochemicals, ammonia, nonferrous and ferrous metals, gypsum, aluminum, as well as nitric, adipic, and glyoxylic acid (various thresholds) were introduced.

PHASE 4 (2021-2030): No changes to the scope are envisaged for phase 4.

International Aviation: Emissions from international aviation were included in the EU ETS in 2012. In November 2012, the EU temporarily suspended enforcement of the EU ETS requirements for flights operating from or to non-EEA countries ("stop the clock") while continuing to apply the legislation to flights within and between countries in the EEA. Exemptions for operators with low emissions have also been introduced.

In light of the progress made under the International Civil Aviation Organization towards a global measure to reduce emissions from the aviation sector (the Carbon Offsetting and Reduction Scheme [CORSIA]), the EU will maintain the intra-EEA scope for the ETS Aviation until 31 December 2023. A further review and assessment will be carried out once there is clarity surrounding the content and nature of CORSIA, as well as the extent of participation by Europe's international partners.

POINT OF REGULATION
Downstream

NUMBER OF ENTITIES
More than 11,000 power plants and manufacturing installations. Aircraft operators are covered for all flights. However, a temporary exemption applies to flights between the EEA and a third country.

CAP
PHASE 1 (2005-2008) and PHASE 2 (2009-2012): Decentralized cap-setting – the EU cap resulted from the aggregation of the National Allocation Plans of each Member State. Phase 1 started with a cap of 2,096 $MtCO_2e$ in 2005, phase 2 with a cap of 2,049 $MtCO_2e$ in 2009.

PHASE 3 (2013-2020): Single EU-wide cap for stationary sources: 2,084 $MtCO_2e$ in 2013, which is annually reduced by a constant linear reduction factor (currently 1.74% or ~38.3 million allowances). This amounts to 1,855 $MtCO_2e$ in 2019.

Aviation Sector Cap: The aviation sector cap was originally set at 210 $MtCO_2e$/year. This cap was meant to reflect the initial inclusion of all flights from, to, and within the EEA in the EU ETS. However, following the "stop the clock" temporary suspension until the end of 2016, the number of aviation allowances put into circulation in 2013-2016 was significantly lower than the original cap. In 2017, the intra-EEA scope for aviation was prolonged until 2023. The adjusted approach for determining the annual aviation cap still applies.

PHASE 4 (2021-2030): A linear cap reduction factor of 2.2% (48.4 million allowances) annually for both stationary sources and the aviation sector. The linear reduction factor does not have a sunset clause and the cap will continue to decline beyond 2030.

Phases & Allocation

TRADING PERIODS

PHASE 1: 3 years (2005-2007)
PHASE 2: 5 years (2008-2012)
PHASE 3: 8 years (2013-2020)
PHASE 4: 10 years (2021-2030)

ALLOCATION

PHASE 1 (2005-2007): Allocation established through the Member State National Allocation Plans. Nearly 100% free allocation through grandfathering. Some Member States used auctioning and some used benchmarking.

PHASE 2 (2008-2012): Similar to Phase 1 with ~90% of allowances allocated for free. Some benchmarking for free allocation and some auctioning in eight Member States (Germany, United Kingdom, The Netherlands, Austria, Ireland, Hungary, Czech Republic and Lithuania), constituting ~3% of total allowances.

PHASE 3 (2013-2020): Over the entire trading period, 57% of allowances will be auctioned, while the remaining allowances are available for free allocation.

Electricity Sector: 100% auctioning with optional derogation for the modernization of the electricity sector in certain Member States. Those Member States whose GDP per capita was below 60% of the EU average in 2013 may continue to make use of this optional free allocation in phase 4.

Manufacturing Sector: Free allocation is based on product-based benchmarks. Benchmarks are based on activity levels in 2007-2008 and are set at the average of the 10% most efficient installations in the (sub) sector.

Subsectors deemed at risk of carbon leakage receive free allocation at 100% of the predetermined benchmarks. Subsectors deemed not at risk of carbon leakage have free allocation phased out gradually from 80% of the benchmarks in 2013 to 30% by 2020. In the event that free allocation exceeds the amount reserved for free allocation, a cross-sectoral correction factor is applied.

Carbon leakage risk is assessed against criteria of emissions intensity and trade exposure.

Aviation Sector: In 2012, 85% of allowances were allocated for free, based on benchmarks. In phase 3, 15% of allowances are auctioned and 82% allocated for free, based on benchmarks. The remaining 3% constitute a special reserve for new entrants and fast-growing airlines. As a consequence of the temporary derogation applying to flights with third countries, the allocation is adjusted to the intra-EEA scope.

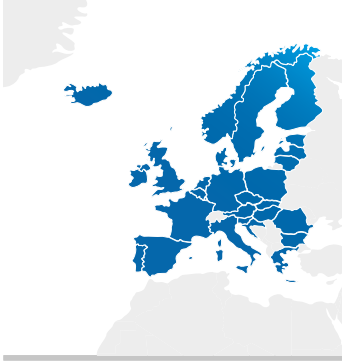
Backloading: Taken as a short-term measure to address a growing surplus in the EU ETS, it was agreed to postpone the auctioning of 900 million allowances from 2014-2016 to 2019-2020. Auction volumes were reduced by 400 million allowances in 2014, 300 million in 2015, and by 200 million in 2016. In line with the decision to create an MSR, the back-loaded allowances will be placed in the MSR.

New Entrants Reserve: 5% of the total allowances are set aside to assist new installations coming into the EU ETS or covered installations whose capacity has significantly increased since their free allocation was determined.

PHASE 4 (2021-2030): One of the central components of the phase 4 revision package is to ensure that the declining number of free allowances is distributed in the most effective and efficient way. To this end, in phase 4:

- Benchmark values will be updated twice during the phase to reflect technological progress in the different sectors.
- Free allocation may be updated annually to mirror sustained changes in production (if the change is more than 15% compared to the initial level, on the basis of a two-year rolling average).
- Carbon leakage rules will be more robust, as the number of sectors classified at risk of carbon leakage will be reduced, and the free allocation for other sectors will be discontinued by 2030 (except district heating).
- Carbon leakage will be assessed against a composite indicator of trade intensity and emissions intensity.
- As an additional safeguard for industry, the agreement foresees a “free allocation buffer” of over 450 million allowances initially earmarked for auctioning, to be made available if the initial free allocation is fully absorbed (thereby avoiding or reducing a correction factor).

In addition, two new multi-billion Euro funds will be established to help the industry and the power sectors meet the innovation and investment challenges of the transition to a low-carbon economy (for more, see Use of Revenue).



EUROPEAN UNION

European Union Emissions Trading System

Flexibility

BANKING AND BORROWING

Unlimited banking has been allowed since 2008. Borrowing is not allowed.

OFFSETS AND CREDITS

PHASE 1 (2005-2007):

Unlimited use of Clean Development Mechanism (CDM) credits and Joint Implementation credits (JI) was provided for in the Directive. In practice, no credits were used in phase 1.

PHASE 2 (2008-2012):

Qualitative Limits: Most categories of CDM/JI credits were allowed, no credits from LULUCF and nuclear power sectors. Strict requirements for large hydro projects exceeding 20 MW.

Quantitative Limits: In phase 2 (2008-2012), operators were allowed to use JI and CDM credits up to a certain percentage limit determined in the respective country's National Allocation Plans. Unused entitlements were transferred to phase 3 (2013-2020).

PHASE 3 (2013-2020):

Qualitative Limits: Newly generated (post-2012) international credits may only come from projects in Least Developed Countries. Credits from CDM and JI projects from other countries are eligible only if registered and implemented before 31 December 2012. Projects from industrial gas credits (projects involving the destruction of HFC-23 and N_2O) are excluded regardless of the host country. Credits issued for emission reductions that occurred in the first commitment period of the Kyoto Protocol were no longer accepted after 31 March 2015.

Quantitative Limits: The total use of credits for phase 2 and phase 3 may amount up to 50% of the overall reduction under the EU ETS in that period (~1.6 Gt CO_2e).

PHASE 4 (2021-2030):

The use of offsets is not envisaged.

MARKET STABILITY PROVISIONS

Market Stability Reserve (MSR): The MSR started operating in January 2019. It aims to neutralize the negative impacts of the existing allowance surplus and to improve the system's resilience to future shocks. Thresholds: Allowances will be added to the reserve if the total number of allowances in circulation (TNAC) is higher than 833 million allowances and reinjected to the market if the number of allowances in circulation falls below 400 million.

- When the TNAC is above 833 million, 12% (24% up to 2023) of the surplus is withdrawn from future auctions and placed into the reserve over a period of 12 months.
- When the TNAC is less than 400 million allowances, 100 million allowances are taken from the reserve and injected into the market.

From 2023 onwards, the number of allowances held in the reserve will be limited to the auction volume of the previous year. Holdings above that amount will lose their validity.

Cancellations: As of phase 4, a Member State may also cancel allowances from their auction share in the event that they take additional measures that result in closure of electricity generation capacity. The quantity of allowances invalidated shall not exceed the average verified emissions of the installation from five years preceding the closure.

Compliance

COMPLIANCE PERIOD

From 1 January until 30 April the following year (16 months)

MRV

REPORTING FREQUENCY: Annual self-reporting based on harmonized electronic templates prepared by the European Commission.

VERIFICATION: Verification by independent accredited verifiers is required before 31 March each year.

MRV FRAMEWORK: Since phase 3, the MRV framework for the EU ETS has been further harmonized. European Commission regulations now apply for emissions monitoring and reporting, as well as verification and accreditation of verifiers. A monitoring plan is required for every installation and aircraft operator (approved by competent authority).

ENFORCEMENT

Entities must pay an "excess emissions penalty" of EUR 100/tCO_2 (USD 118/tCO_2) for each tCO_2 emitted for which no allowance has been surrendered. The name of the noncompliant operator is also published. Different penalties exist at the national level for other forms of noncompliance.

Linking

LINKS WITH OTHER SYSTEMS

The European Commission has concluded negotiations with Switzerland on linking the EU ETS with the Swiss ETS. In November 2017, the EU and Switzerland signed the Agreement to link their ETS.[1] The Agreement will enter into force on 1 January of the year following the exchange of the instruments of ratification by the Parties.

Other Information

INSTITUTIONS INVOLVED

The European Commission and the relevant authorities of the 28 Member States, Iceland, Liechtenstein, and Norway.

EVALUATION/ETS REVIEW

The European Commission publishes annual reports on the functioning of the European carbon market (the 2018 report is available *here*[2]).

Two major EU ETS reviews – before phase 3 and before phase 4 – have been conducted to date, resulting in changes in system design. The directive establishing the EU ETS stipulates that the system be kept under review in light of the implementation of the Paris Agreement and the development of carbon markets in other major economies.

USE OF REVENUES

EU ETS revenues from auctioning accrue to EU Member States. At least 50% of revenues should be used for climate- and energy-related purposes. Member States are obliged to inform the Commission about how they use the revenues. According to information submitted, they spend ~80% for domestic and international climate-related purposes.

PHASE 3 (2013-2020):

300 million allowances were reserved for auction to fund the demonstration of environmentally safe carbon capture and storage and innovative renewable energy technologies through the NER300.

PHASE 4 (2021-2030):

Two EU-level funds fed from the sale of allowances funds will replace the NER300:

The Innovation Fund: For the demonstration of innovative technologies to breakthrough innovation in industry, as well as carbon capture and storage/use and renewable energy.

The Modernization Fund: Facilitating investments in modernizing the energy systems and supporting energy efficiency in 10 lower-income Member States, including investments to support a socially just transition to a low-carbon economy (such as retraining for affected workers).

IMPLEMENTING LEGISLATION

Consolidated version of Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for GHG emission allowance trading within the Community and amending Council Directive 96/61/EC (8 April 2018)

Decision concerning the establishment and operation of a market stability reserve for the Union GHG emission trading scheme and amending Directive 2003/87/EU (6 October 2015)

Consolidated Auctioning Regulation (25 February 2014): *Commission Regulation EU No 176/2014 amending Regulation (EU) No 1031/2010 in particular to determine the volumes of GHG emission allowances to be auctioned in 2013-2020* (25 February 2014).

All other legislation and documentation can be found *here*.[3]

1 – Agreement between the European Union and the Swiss Confederation on the linking of their greenhouse gas emissions trading systems, OJ L 322, 12 December 2017, p. 3
2 – https://ec.europa.eu/clima/sites/clima/files/ets/docs/com_2018_842_final_en.pdf
3 – https://ec.europa.eu/clima/policies/ets_en#tab-0-1

SWITZERLAND

Switzerland Emissions Trading System

GASES	ALLOCATION	AVERAGE 2018 PRICE
Several gases	Free allocation Auctioning	CHF 6.58/tCO_2e (USD 6.73) (average auction price)
TOTAL REVENUE	**OFFSETS AND CREDITS**	**CAP**
Since beginning of program: CHF 26.20 million (USD 26.79 million) Collected in 2018: CHF 4.41 million (USD 4.51 million)	International	5.01 $MtCO_2e$ (2019)

ETS DESCRIPTION

The Switzerland (Swiss) ETS started in 2008 with a five-year voluntary phase as an alternative option to the CO_2 levy on fossil fuels. Revised regulations entered into force in January 2013. The system subsequently became mandatory for large, energy-intensive entities, while medium-sized entities may join voluntarily. The ETS applies to industrial entities, largely comprising companies from the cement, chemicals, pharmaceuticals, paper, refinery, or steel sectors. It now covers about 11% of the country's total GHG emissions. In the 2013-2020 mandatory phase, participants in the ETS are exempt from the CO_2 levy.

YEAR IN REVIEW

In October 2018, the Swiss parliamentary Environment Commission of the National Council voted in favor of the agreement between the EU and Switzerland signed on November 2017 to link their ETSs. In December 2018 the National Council of the Swiss Parliament voted in favor of linking both systems. Following approval by the Swiss Council of States (expected early 2019) and, when all criteria within the agreement are met (for this, amendments to Swiss legislation are necessary), following ratification of the agreement by both the EU and Switzerland the link could become operational as of 1 January 2020. An optional referendum in Switzerland on the linking of the Swiss and EU ETS might delay the ratification process.

ETS in force

ETS scheduled

ETS considered

SECTORS:

INDUSTRY

Covers industrial entities

Link with EU ETS could be operational by 2020

After Link with EU ETS will also cover domestic aviation

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) — **48.3 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Energy (excluding transport) 22.3 (46%)
Transport 15.2 (31%)
Industrial Processes 4.1 (9%)
Agriculture 6.0 (12%)
Others (including waste and solvents) 0.8 (2%)

GHG REDUCTION TARGETS

BY 2020: At least 20% reduction from 1990 GHG levels (unconditional, domestic target)
By 2025: 35% reduction from 1990 GHG levels (NDC)
BY 2030: 50% reduction from 1990 GHG levels (NDC)
BY 2050: 70-85% reduction from 1990 GHG levels (aspirational)

ETS Size

GHGs COVERED

CO_2, NO_2, CH_4, HFCs, NF_3, SF_6, and theoretically PFCs.[1]

CAPPED EMISSIONS

5.01 $MtCO_2e$

11%
(2016)

1 - In principle, all these gases are covered in accordance with the CO_2 Ordinance. In practice, monitoring is only required for CO_2, NO_2, and PFCs, since there are no adequate approaches to monitor the other gases and since their share is negligible.

SECTORS AND THRESHOLDS

MANDATORY PARTICIPATION: Industries listed under Annex 6 of the revised CO_2 Ordinance (25 subsectors) must participate in the Swiss ETS. This includes companies from the cement, chemicals and pharmaceuticals, refineries, paper, district heating, steel, and other sectors.

INCLUSION THRESHOLDS: Facilities pertaining to the sectors included in Annex 6 that have a total rated thermal input of >20MW.

POSSIBLE VOLUNTARY OPT-IN: Industries a) listed under Annex 7 of the revised CO_2 Ordinance (21 sub-sectors) and b) with a total rated thermal input of >10MW. A company that newly fulfils the participation conditions must submit the application no later than six months from the date of fulfilment.

POSSIBLE OPT-OUT: Industries with a total rated thermal input of >20MW, but yearly emissions <25,000 tCO_2e/year in each of the past three years. Should their future emissions rise above the threshold during at least one year, they must start participating in the ETS the following year and cannot opt out anymore for the remainder of the compliance period.

DOMESTIC AVIATION: Coverage of domestic aviation (domestic flights within Switzerland or flights from Switzerland to member states of the European Economic Area) is a requirement of the linking agreement between Switzerland and the EU. In July 2017, to prepare for the inclusion of aviation in the Swiss ETS, Switzerland introduced the legislation for mandatory reporting of tonne-kilometer data for aircraft operators that are likely to fall within the scope of the Swiss ETS, when linked with the EU ETS. Aircraft operators submitted their monitoring plans and mandatory reporting began in January 2018. Verified monitoring reports containing tonne-kilometer data must be submitted by 31 March 2019.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

54 (2017)

CAP

The absolute cap is set at the installation level.

VOLUNTARY PHASE (2008-2012): Each participant received its own entity-specific reduction target.

MANDATORY PHASE (2013-2020): Overall cap of 5.63 $MtCO_2e$ (2013), to be reduced annually by a constant linear reduction factor (currently 1.74% of 2010 emissions), to 4.9 $MtCO_2e$ in 2020. The 2019 cap amounts to 5.01 $MtCO_2e$.

Phases & Allocation

TRADING PERIODS

VOLUNTARY PHASE: 2008-2012
MANDATORY PHASE: 2013-2020

ALLOCATION

VOLUNTARY PHASE (2008-2012):
Free Allocation: Each participant was granted free allocation of allowances covering emissions up to their own entity-specific emissions target.

MANDATORY PHASE (2013-2020):
Free allocation: Free allocation is based on industry benchmarks using a similar methodology to the EU ETS. Free allocation for sectors not exposed to the risk of carbon leakage will be phased out gradually: in 2013, such entities received 80% free allocation whereas in 2020 the share of free allocation will be reduced to 30%.

An overarching correction factor is applied given the benchmarked allocation exceeds the overall emissions cap.

Auctioning: Allowances that are not allocated for free are auctioned. Auctions take place two or three times a year, depending on available auction volumes.

5% of the allowances are set aside in a reserve for new entrants and significantly growing operators.

Flexibility

BANKING AND BORROWING

Banking within and across phases is allowed without limits. Valid certificates (CERs, ERUs) from the 2008-2012 phase could be banked into the mandatory phase and surrendered until April 2015. Certificates from the 2008-2012 phase that were not requested

SWITZERLAND

Switzerland Emissions Trading System

to be carried over within the deadline have been canceled.
Borrowing is not allowed.

OFFSETS AND CREDITS

QUALITATIVE LIMIT: Only international offsets are allowed. Exclusion criteria are listed in Annex 2 of the revised CO_2 Ordinance. Most categories of credits from CDM projects in least developed countries are allowed. Credits from CDM and JI projects from other countries are eligible only if registered and implemented before 31 December 2012.

QUANTITATIVE LIMIT: Industries that already participated in the voluntary phase (2008-2012): for 2013-2020, the maximum amount of offsets allowed into the scheme equals 11% of five times the average emissions allowances allocated in the voluntary phase (2008-2012) minus offset credits used in that same time period.

Industries entering the Swiss ETS in the mandatory phase and newly covered emission sources (2013-2020): 4.5% of their actual emissions in 2013-2020.

Compliance

COMPLIANCE PERIOD

One year (1 January to 31 December). Covered entities have until April 30 of the following year to surrender allowances.

MRV

Monitoring plans are required for every installation (approved by a competent authority) no later than three months after the registration deadline.

REPORTING FREQUENCY: Annual monitoring report, based on self-reported information (by 31 March).

VERIFICATION: The Federal Office for the Environment may order third-party verification of the monitoring reports.

ENFORCEMENT

The penalty for failing to surrender sufficient allowances is set at CHF 125/tCO_2 (USD 127.82/tCO_2). In addition to the fine, entities must surrender the missing allowances and/or international credits in the following year.

Linking

LINKS WITH OTHER SYSTEMS

Switzerland has concluded negotiations with the EU on linking the Swiss ETS to the EU ETS and is waiting for approval of the agreement by the Swiss Parliament in 2019. The link will become operational on 1 January the year following ratification of the linking agreement.

Other Information

INSTITUTIONS INVOLVED

The Federal Office of the Environment

EVALUATION/ETS REVIEW

The Federal Act on the Reduction of CO_2 Emissions, which contains the main legislation on the Swiss ETS, is in the process of being reviewed and revised for the period of 2021-2030. Implications for the design of the ETS are possible.

USE OF REVENUES

Revenues from auctioning allowances are fed into the federal government budget.

IMPLEMENTING LEGISLATION

Federal Act on the Reduction of CO2 Emissions (CO2 Act)[1]

Ordinance on the Reduction of CO2 Emissions (CO2 Ordinance)[2]

1 – https://www.admin.ch/opc/en/classified-compilation/20091310/index.html
2 – https://www.admin.ch/opc/en/classified-compilation/20120090/index.html#a5

KAZAKHSTAN

Kazakhstan Emissions Trading Scheme

GASES	ALLOCATION	OFFSETS AND CREDITS
CO_2 only	Free allocation	Domestic

CAP
162 $MtCO_2e$ (2019)

ETS in force
ETS scheduled
ETS considered

SECTORS:

POWER

INDUSTRY

Introduced benchmarking

Restarted operation in 2018

ETS DESCRIPTION

Kazakhstan launched an ETS in January 2013. The groundwork for the ETS development was laid out in 2011 through amendments and additions to Kazakhstan's environmental legislation. The system was temporarily suspended in 2016-2017 to tackle operational issues and reform allocation rules. MRV obligations applied during the suspension time. Amendments to the Environmental Code were passed in 2016 to improve the MRV system, as well as the overall GHG emissions regulation and KAZ ETS operation. Amendments to the Environmental Code in 2017 lay the groundwork for the introduction of benchmarking.

The National Allocation Plan runs through 2018-2020 with a cap of 485.9 $MtCO_2$ (162 $MtCO_2$ on annual average), with 225 participating installations belonging to 129 operators.

YEAR IN REVIEW

The KAZ ETS restarted operation on 1 January 2018 with new trading procedures and allocation methods. Participants were given a choice between allocation based on historical emissions (chosen by 76 installations) or product-based benchmarks with the possibility of updating when capacity changes (chosen by 149 installations).

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **337.9 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Energy (excluding Transport) 251.5 (74%)
Industrial processes 25.1 (7%)
Transport 22.7 (7%)
Agriculture 33.2 (10%)
Waste 5.5 (2%)

GHG REDUCTION TARGETS

BY 2020: 5% reduction from 1990 GHG levels
BY 2030: 15% (unconditional) – 25% (conditional) reduction from 1990 GHG levels (NDC)

BY 2050: 40% CO_2 emission reduction in power sector from 2012 levels (Concept of Transition to Green Economy, 2013)

ETS Size

GHGs COVERED

CO_2

CAPPED EMISSIONS

162 $MtCO_2e$

SECTORS AND THRESHOLDS

Power sector and centralized heating. Extractive industries and manufacturing: oil and gas mining, metallurgy, chemical and processing industry (production of building materials: cement, lime, gypsum, and brick).

INCLUSION THRESHOLDS: Facilities emitting more than 20,000 tCO_2e/year. For Phase III (2018-2020), 2013-2015 emission levels are used.

For Phase I (2013) and Phase II (2014-2015), thresholds were based on 2010 and 2012 emission levels.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

PHASE III (2018-2020): 129 companies (225 installations)

CAP

PHASE I (2013): 147 $MtCO_2$. This equals a stabilization of the capped entities' emissions at 2010 levels.

PHASE II (2014-2015): 2014: 154.9 $MtCO_2$; 2015: 152.8 $MtCO_2$. This represents reduction targets of 0% and 1.5% respectively, compared to the average CO_2 emissions of capped entities in 2011-2012.

PHASE III (2018-2020): 485.9 $MtCO_2$. The cap is set at a 5% reduction by 2020 from 1990 levels. The cap is allocated for the overall compliance period of 2018-2020; there is no yearly cap.

Phases & Allocation

TRADING PERIODS

PHASE I (PILOT PHASE): 2013

PHASE II: 2014-2015

PHASE III: 2018-2020

In 2016 and 2017, the system was temporarily suspended.

ALLOCATION

FREE ALLOCATION:

Phase I (2013): 100% free allocation based on emissions data from 2010, with a reserve of 20.6 $MtCO_2$.

Phase II (2014-2015): Free allocation (0% and 1.5% below 2011/2012 average emissions), with a reserve of 18 $MtCO_2$ in 2014 and 20.5 in 2015.

Phase III (2018-2020): Free allocation based on grandfathering or product-based benchmarking (by each company's own choice). A reserve contains 35.27 million allowances to accommodate for new entrants, new stationary emission sources, and for changes in capacity in case of the choice of benchmarking.

Flexibility

BANKING AND BORROWING

Banking is allowed within one trading period (i.e., within 2018-2020).
Banking between trading periods is not possible.
.

OFFSETS AND CREDITS

QUALITATIVE LIMIT:

The system allows domestic offsets. International credits may be allowed in the future.

Compliance

COMPLIANCE PERIOD
One year

MRV
REPORTING FREQUENCY: Reporting is required annually for businesses or financial facilities above the 20,000 tCO_2/year threshold.

Annual reporting is required for operators of installations with emissions between 10,000 tCO_2/year and 20,000 tCO_2/year (so-called "subjects to administration"), even though these operators are not required to participate in the ETS or to verify annual emission reports.

Aside from CO_2, reporting is also required for CH_4, N_2O, and PFCs emissions.

VERIFICATION: Emissions data reports and their underlying data require accredited third-party verification.

ENFORCEMENT
The non-compliance penalty equals five monthly standard units for each tonne (approximately KZT 10,605/tCO_2 [USD 31/tCO_2]). In 2013 and in 2014, penalties for non-compliance were waived.

Other Information

INSTITUTIONS INVOLVED
Ministry of Energy;
JSC Zhasyl Damu, a state-owned joint stock company

IMPLEMENTING LEGISLATION
Environmental Code of the Republic of Kazakhstan[1]

National GHG Emission Quota Allocation Plan for 2018-2020[2]

Rules for the allocation of quotas for GHG emissions and formation of reserves of the established number and volume of quotas[3]

Rules of trading greenhouse gas emission quota and carbon units[4]

1 – http://zan.gov.kz/client/#!/doc/31308/rus
2 – http://zan.gov.kz/client/#!/doc/117046/rus
3 – http://zan.gov.kz/client/#!/doc/112765/rus
4 – http://adilet.zan.kz/rus/docs/V1200007711

TURKEY

ETS in force

ETS scheduled

ETS considered

Mandatory MRV started in 2015

Developing draft ETS legislation

ETS DESCRIPTION

In April 2012, Turkey adopted a new regulatory framework for a comprehensive, mandatory MRV system. Monitoring started in 2015 and reporting (of 2015 emissions) began in 2016.

Since 2013, Turkey has also been working with the PMR to enhance the MRV regulation through pilot studies in the energy, cement, and refinery sectors. A series of workshops and analytical studies have also been conducted, to explore options for using emissions trading and other market-based instruments in the MRV sectors.

A synthesis report outlining carbon market policy options for Turkey was submitted to the Climate Change and Air Management Coordination Board in November 2018. With additional funding from the PMR through 2018, Turkey has been developing draft legislation and improving technical and institutional capacity, to prepare the groundwork for piloting a suitable carbon pricing policy.

Turkey is also a candidate to EU accession and thereby aims to complete the environmental obligations of the EU accession (including the EU ETS directive).

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **496.1 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Energy (excluding transport) 279.2 (56%)
Transport 81.8 (17%)
Industry 62.4 (13%)
Agriculture 56.5 (11%)
Waste 16.2 (3.%)

GHG REDUCTION TARGETS

BY 2030: Up to 21% reduction from the BAU scenario (INDC)

Compliance

MRV

The Turkish MRV legislation establishes an installation-level system for CO_2 emissions for roughly 900 entities. Sector coverage includes the energy sector (combustion fuels >20MW) and industry sectors (coke production, metals, cement, glass, ceramic products, insulation materials, paper and pulp, chemicals over specified threshold sizes/production levels).

MONITORING AND REPORTING: Entities had until October 2014 to submit their first monitoring plans.

VERIFICATION: Entities subsequently submitted verified emissions reports for 2015, 2016, and 2017 to the Ministry of Environment and Urbanization Verifiers were accredited by the Turkish Accreditation Organization in 2018. During 2016-2018, the Ministry of Environment and Urbanization provided training, examination, and licensing services.

OTHER: Entities that fail to comply with the Turkish MRV regulation are subject to sanctions under the Turkish Environmental Law No. 2872.

Other Information

INSTITUTIONS INVOLVED

Ministry of Environment and Urbanization

RUSSIA

ETS in force

ETS scheduled

ETS considered

Large industrial and energy companies target group for MRV

Draft 2018 law on emissions regulation, including markets

Building legal basis for state GHG regulation

ETS DESCRIPTION

Russia is currently exploring policy options, including carbon pricing, to meet its GHG emissions reduction target of at least 25% below 1990 levels by 2020 and 25-30% below 1990 levels by 2030. In 2014, the Russian government adopted a plan for the development and implementation of emissions reductions activities. The plan includes the development and introduction of an MRV system at the company level, assessment of emissions reduction potentials, and the development of a mitigation concept and action plan which could potentially include emissions trading. Furthermore, a 2016 governmental order (N 2344-r) establishes a plan of measures to improve GHG regulation and prepare the ratification of the Paris Agreement.

The Russian government has put in place legal elements to enable GHG monitoring at the company level. An MRV "Concept" was adopted in 2015, and methodological guidelines for corporate- and regional-level MRV were also adopted by the Ministry of Natural Resources and Ecology. At the end of 2018, a draft law – 'On state regulation of GHG and on amendments to certain legislative acts of the Russian Federation'– was presented by the Ministry of the Economy. According to the timeline in the aforementioned order N 2344-r, the law is to be adopted by June 2019.

According to the Concept on MRV, at the initial stage the target group for monitoring and reporting is "large industrial and energy organizations and companies with direct GHG emissions of more than 150,000 tCO_2e/year, including organizations of aviation and railway transport, carrying out passenger and cargo transportation".

The draft law includes provisions for economic instruments, around three main pillars: stimulating activities to reduce GHG emissions; developing market-based mechanisms for handling GHG reduction credits, e.g., from mitigation projects; and paying fees for GHG emissions that exceed established permits. The regulation of GHG emissions through emission permits could start from 2025, whereas the issuance of GHG reduction credits could begin in 2022. The draft law also establishes the legal terms and governmental competences for GHG regulation. An explanatory document that accompanies the proposed law explains that the MRV system, after four to five years, would provide the basis for further specification of system design features. Although not definite on precise instrument choice, the proposed instruments for consideration include elements typical of an emissions trading system.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **2,644.0 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Energy (excluding transport) 1919.0 (73%)
Transport 256.1 (10%)
Industrial Processes, Solvent, and Other Product Use 218.5 (8%)
Agriculture 134.2 (5%)
Waste 115.8 (4%)

GHG REDUCTION TARGETS

BY 2020: at least 25% reduction from 1990 GHG levels
BY 2030: 70-75% reduction from 1990 GHG levels (INDC)

UKRAINE

ETS in force

ETS scheduled

ETS considered

Introduced MRV law to parliament

Plans to develop ETS legislation based on 3 years of functioning MRV system

ETS DESCRIPTION

Ukraine plans to establish a national ETS in line with its obligations under the Ukraine-EU Association Agreement, which entered into force on 1 September 2017. Climate change related issues are addressed in Article 365 (c) Title V and Annex XXX to the agreement, which outlines steps for national ETS implementation, including:

- Adopting national legislation and designating competent authority/ies;
- Establishing a system for identifying relevant installations and identifying GHGs;
- Developing a national allocation plan to distribute allowances;
- Establishing a system for issuing GHG emissions permits and issue allowances to be traded domestically among installations in Ukraine; and
- Establishing MRV and enforcement systems, as well as public consultations procedures.

The country is developing the main elements of the national MRV system to provide a solid basis for the upcoming ETS. In autumn 2018, the Cabinet of Ministers approved a framework law on MRV, which is now under consideration in Parliament. Secondary legislation has also been drafted to establish the MRV system. To transpose other relevant EU directives and establish the ETS, the country plans to develop separate legislation based on at least three years of data from the MRV system. Ukraine is working on its MRV and ETS plans under the Ukraine-EU Association Agreement with the assistance of the PMR and the Deutsche Gesellschaft für Internationale Zusammenarbeit.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF)	338.60 $MtCO_2e$ (2016)

OVERALL GHG EMISSIONS BY SECTOR

Energy (excluding transport) 193.6 (57%)
Transport 32.2 (10%)
Industrial processes, solvent, and other product use 58.0 (17%)
Agriculture 42.4 (12%)
Waste 12.4 (4%)

GHG REDUCTION TARGETS

BY 2020: 20% voluntary reduction from 1990 GHG levels (Copenhagen Accord)
BY 2030: GHG emissions will not exceed 60% of 1990 GHG levels, including LULUCF (NDC)
BY 2035: 20% GHG emissions reduction from final energy consumption from 2010 levels (Energy Strategy 2035)

BY 2050: GHG emissions from energy and industrial processes will not exceed 31-34% of 1990 GHG levels (aspirational target of the Low Emission Development Strategy 2050)

Other Information

INSTITUTIONS INVOLVED

Ministry of Ecology and Natural Resources;
Cabinet of Ministers of Ukraine

WESTERN CLIMATE INITIATIVE

Aim develop joint regional strategy to reduce emissions through cap and trade

WCI, Inc. provides administrative and technical support

The Western Climate Initiative (WCI) is originally an initiative of American state and Canadian provincial governments that aimed at developing a joint regional strategy to reduce GHG emissions via a cap-and-trade program. Eventually, California and Québec independently established cap-and-trade systems using the framework developed through the WCI approach; their first compliance periods started on 1 January 2013. One year later California and Québec linked their systems, creating the first international cap-and-trade system consisting of sub-national jurisdictions. Ontario later developed a program using the WCI framework and launched its cap-and-trade system in 2017, which was linked to the California-Québec regional carbon market on 1 January 2018 until its termination in mid-2018.

WCI, Inc., created in 2011, is a non-profit organization that provides administrative and technical services to member jurisdictions to implement their respective systems. It provides such services to California and Québec, and did so for Ontario until the termination of its ETS. In 2018, WCI, Inc. began supporting Nova Scotia for the establishment of the province's own cap-and-trade system, which began operating in 2019.

CALIFORNIA

California Cap-and-Trade Program

GASES	ALLOCATION	AVERAGE 2018 PRICE
Several gases	Free allocation Auctioning	USD 14.91 (unweighted average auction price)
TOTAL REVENUE	**OFFSETS AND CREDITS**	**CAP**
Since beginning of program: USD 9.47 billion Collected in 2018: USD 3.02 billion	Domestic[1]	346.3 $MtCO_2e$ (2019)

ETS DESCRIPTION

Initiated in 2012, the California Cap-and-Trade Program began its compliance obligation in January 2013. California has been part of the Western Climate Initiative since 2007 and formally linked its system with Québec's in January 2014 and with Ontario's in January 2018 (until the latter's termination in mid-2018).

The California program covers sources responsible for approximately 80% of the state's GHG emissions.In 2017, legislation (Assembly Bill [AB] 398) was passed to provide direction on the cap-and-trade system post-2020 to help achieve California's climate goals.

YEAR IN REVIEW

In 2018, two major developments took place:

(1) A set of reforms for the post-2020 period was approved by the California Air Resources Board (CARB) in December 2018, and is scheduled to come into force in April 2019.

(2) Ontario's cap-and-trade program, to which California and Québec had been linked since January 2018, was terminated. The termination was addressed through measures that shielded the California and Québec programs from negative effects.

ETS in force

ETS scheduled

ETS considered

SECTORS:

POWER

INDUSTRY

TRANSPORT*

BUILDINGS*

** Sector covered upstream*

Covers 80% emissions

Broadest carbon pricing system in US

Post-2020 reforms approved

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) — **429.4 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Electricity Generation (In State) 42.7 (10%)
Electricity Generation (Imports) 26.3 (6%)
Transportation 174.0 (41%)
Industrial 100.4 (23%)
Commercial 23.0 (5%)
Residential 28.3 (5%)
Agriculture & Forestry 33.8 (8%)
Not Specified 0.8 (0.2%)

GHG REDUCTION TARGETS

BY 2020: Return to 1990 GHG levels
BY 2030: 40% reduction from 1990 GHG levels
BY 2050: 80% reduction from 1990 GHG levels

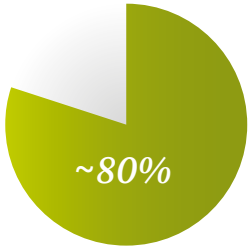
ETS SIZE

GHGs COVERED

CO_2, CH_4, N_2O, SF_6, HFCs, PFCs, NF_3 and other fluorinated GHGs

CAPPED EMISSIONS

346.3 $MtCO_2e$



1 - Includes offsets from linked jurisdictions (i.e., Québec) and can also include offsets from projects in the United States outside California.

SECTORS & THRESHOLDS

FIRST COMPLIANCE PERIOD (2013-2014):

Covered sectors include those which have one or more of the following processes or operations:
large industrial facilities (including cement, glass, hydrogen, iron and steel, lead, lime manufacturing, nitric acid, petroleum and natural gas systems, petroleum refining, pulp and paper manufacturing, including cogeneration facilities co-owned/operated at any of these facilities), electricity generation, electricity imports, other stationary combustion, and CO_2 suppliers.

SECOND COMPLIANCE PERIOD (2015-2017) AND BEYOND:

In addition to the sectors listed above, suppliers of natural gas, suppliers of reformulated blendstock for oxygenate blending and distillate fuel oil, suppliers of liquid petroleum gas in California, and suppliers of liquefied natural gas.

INCLUSION THRESHOLDS:

Facilities ≥25,000 tCO_2e/data year.

POINT OF REGULATION

Mixed

NUMBER OF ENTITIES

~500 entities (2015-2017)

CAP

The caps listed below are in $MtCO_2e$.
The cap decline factor is about 3.3% between 2018 and 2019 and is rising to an average of over 4.1% in the 2021-2030 period.

FIRST COMPLIANCE PERIOD (2013-2014):

2013: 162.8; **2014:** 159.7

SECOND COMPLIANCE PERIOD (2015-2017):

2015: 394.5; **2016:** 382.4; **2017:** 370.4

THIRD COMPLIANCE PERIOD (2018-2020):

2018: 358.3; **2019:** 346.3; **2020:** 334.2

FROM 2021 TO 2031, every compliance period will be three years. The annual caps are:
2021: 320.8; **2022:** 307.5; **2023:** 294.1; **2024:** 280.7; **2025:** 267.4; **2026:** 254.0; **2027:** 240.6; **2028:** 227.3; **2029:** 213.9; **2030:** 200.5; **2031:** 193.8

Phases & Allocation

TRADING PERIODS

The California Cap-and-Trade Program is structured around compliance periods (see "Compliance" below). A cap trajectory until 2030 has been set (see "Cap" above).

Allowances are allocated and auctioned with calendar year vintages. Some allowances from future vintages are offered at each auction and may be traded but not used for compliance until the compliance date for the vintage year.

ALLOCATION

Allowances are distributed via auction and/or free allocation.

FREE ALLOCATION:

Industrial facilities: Facilities receive free allowances for transition assistance and to prevent leakage. The amount is determined by specific benchmarks, production volumes, general cap adjustment factor, and an assistance factor based on assessment of leakage risk.

Leakage risk is measured through emissions intensity and trade exposure and used to define assistance factors until 2018. From 2018, assistance factors are set at 100% for all sectors receiving free allocation.

For the post-2020 period, AB 398 specifies an assistance factor of 100%, meaning there will be no differentiation based on leakage risk for sectors receiving free allocation. Recent regulatory changes also set third compliance period assistance factors to 100% for all sectors. There is no cap on the total amount of industrial allocation.

Free allocation is provided for transition assistance to public wholesale water entities, legacy contract generators, universities, and public service facilities.

Consignment: Electrical distribution utilities and natural gas suppliers: Utilities receive allowances on behalf of their ratepayers. All natural gas and electrical utilities must use the allowance value for ratepayer benefit and for emissions reductions.

AUCTIONING: In 2018, about 50% of allowances were available through auction, including both allowances owned by CARB and allowances consigned to auction by utilities. The remainder of allowances was allocated for free.

Flexibility

BANKING AND BORROWING

Banking is allowed, but the emitter is subject to a general holding limit.
Borrowing of future vintage allowances is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT:
Up to 8% of each entity's compliance obligation.

QUALITATIVE LIMIT:
Currently, six domestic offset types are accepted as compliance units originating from projects carried out according to six "protocols":
(1) US forest projects;
(2) Urban forest projects;
(3) Livestock projects (methane management);
(4) Ozone depleting substances projects;
(5) Mine methane capture (MMC) projects; and
(6) Rice cultivation projects.

FROM 2021:
AB 398 lays out two significant changes to the offset program from 2021 onwards:

(1) The share of offsets that can be used to fulfill the compliance obligation will reduce to 4% between 2021-2025 and will remain at 6% thereafter.

(2) At least half of the offset usage limits post-2020 would need to result in direct environmental benefits (DEBS) in the State of California. The DEBS requirement is operationalized through a performance standard, which defines DEBS eligibility by offset activity type. Offset projects implemented outside of California may still result in DEBS based on scientific evidence and project data provided. For example, afforestation projects outside California could also provide benefits within California by improving the quality of waters flowing through the state. Recent regulatory amendments specify the exact criteria that will be used for determining DEBS.

MARKET STABILITY PROVISIONS

Auction Reserve Price: USD 15.62 per allowance in 2019. The auction reserve price increases annually by 5% plus inflation, as measured by the Consumer Price Index.

Reserve: An Allowance Price Containment Reserve allocates allowances from various budgets (1% from budget years 2013-2014; 4% from budget years 2015-2017; and 7% from budget years 2018-2020). AB 398 requires two-thirds of the reserve allowances that remain on 31 December 2017 to be used to populate the two price containment points starting in 2021.

The reserve sale administrator can sell accumulated allowances on a regular basis in three equal price tiers. For 2019, these prices are USD 58.34, 65.65, and 72.93. Tier prices increase by 5% plus inflation (as measured by the Consumer Price Index).

Through 2020, if all the allowances in the reserve are sold, allowances from future years are transferred to the reserve and made available for sale.

Price Containment Points: AB 398 reforms the price management provisions starting in 2021: two price containment points triggered at increasing price levels will be filled with remaining APCR allowances. A third price level will be a price ceiling.

At this level, allowances (or if no allowances remain, price ceiling units) can be bought in unlimited quantities, with the revenues having to be invested in real, permanent, quantifiable, verifiable, enforceable, and additional emissions reductions on at least a metric tonne for metric tonne basis.

In 2021, the two cost containment reserve trigger points and the price ceiling will be set at USD 41.40, 53.20, and 65.00, respectively.

Compliance

COMPLIANCE PERIOD

Between two and three years. All allowances for emissions from the whole compliance period must be surrendered by 1 November (or the first business day thereafter) of the year following the last year of a compliance period. A share of allowances (usually about 30% of last year's emissions) must be surrendered annually.

FIRST COMPLIANCE PERIOD: 2013-2014
SECOND COMPLIANCE PERIOD: 2015-2017
THIRD COMPLIANCE PERIOD: 2018-2020
FOURTH COMPLIANCE PERIOD starts on 1 January 2021 and ends on 31 December 2023, and each subsequent compliance period will be three years long.

MRV

REPORTING FREQUENCY: One year

VERIFICATION: Emission data reports and their underlying data require independent third-party verification annually for all entities covered by the program (generally defined as entities with emissions that equal to or exceed 25,000 tCO_2e per year).

OTHER: Reporting is required for most operators at or above 10,000 tCO_2e per year. Operators must implement internal audits, quality assurance, and control systems for the reporting program and the data reported.

ENFORCEMENT

Penalties may be assessed pursuant to 'Health and Safety Code Section 38580' (misdemeanor, fines, and possibly imprisonment).

There are separate and substantial penalties for mis- or non-reporting under the 'Mandatory Greenhouse Gas Reporting Regulation.'

Linking

LINKS WITH OTHER SYSTEMS

California linked with Québec's ETS on 1 January 2014. The two extended their joint market by linking with Ontario on 1 January 2018 until the termination of Ontario's system in mid-2018.

Other Information

INSTITUTIONS INVOLVED

California Air Resources Board (CARB)

EVALUATION/ETS REVIEW

Pursuant to requirements in existing legislation (AB 32, AB 197, and AB 398), CARB must update the California Climate Change Scoping Plan at least every five years and must provide annual reports to various committees of the legislature and the board. These updates and reports provide opportunities for future review of the cap-and-trade program's progress in meeting the 2030 target.

USE OF REVENUES

Revenue from Auction of California-owned Allowances: Most of California's revenue goes to the Greenhouse Gas Reduction Fund, of which at least 35% must benefit disadvantaged and low-income communities. The fund also invests the proceeds in projects that reduce GHG emissions.

Revenue from Auction of Utility-owned Allowances: Electric and natural gas utilities are allocated allowances, a portion of which must be consigned to auction. Auction proceeds must be used for ratepayer benefit and for emissions reductions.

IMPLEMENTING LEGISLATION

Global Warming Solutions Act of 2006 (AB 32)[1]

AB 398[2]

Current regulation can be found on the CARB website.[3]

1 – https://www.arb.ca.gov/cc/docs/ab32text.pdf ;
2 – http://leginfo.legislature.ca.gov/faces/billStatusClient.xhtml?bill_id=201720180AB398 ;
3 – https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm;

QUÉBEC

Québec Cap-and-Trade System

GASES	ALLOCATION	AVERAGE 2018 PRICE
Several gases	Free allocation Auctioning	CAD 19.30 (USD 14.91) (unweighted average auction price)
TOTAL REVENUE	**OFFSETS AND CREDITS**	**CAP**
Since beginning of program: CAD 2.88 billion (USD 2.23 billion) Collected in 2018: CAD 831.44 million (USD 641.84 million)	Domestic[1]	56.85 $MtCO_2e$ (2019)

ETS in force

ETS scheduled

ETS considered

ETS DESCRIPTION

Québec's cap-and-trade system for GHG emissions was introduced in 2012. The program's enforceable compliance obligation began on 1 January 2013. Compliance periods are three years long (two years for the initial period). Québec has been a member of the Western Climate Initiative since 2008 and formally linked its system with California on 1 January 2014 and with Ontario on 1 January 2018 (until this system's termination in mid-2018). The system covers fossil fuel combustion and industrial emissions in power, buildings, transport, and industry.

YEAR IN REVIEW

Québec's cap-and-trade system has met the carbon pricing requirement of Canada's national 'Pan-Canadian Framework on Clean Growth and Climate Change' (scheduled to be implemented in 2019).

Québec's system linked with Ontario in January 2018 but the link was terminated six months later. Soon after, Ontario's system regulation and legislation were canceled completely.

SECTORS:

- POWER
- INDUSTRY
- TRANSPORT*
- BUILDINGS*

* Sector covered upstream

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) — **78.6 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Power 0.2 (0.3%)
Transportation 33.8 (43%)
Industry 23.6 (30%)
Buildings 8.5 (11%)
Agriculture 7.6 (10%)
Waste 4.9 (6%)

GHG REDUCTION TARGETS

BY 2020: 20% reduction from 1990 GHG levels
BY 2030: 37.5% reduction from 1990 GHG levels

Linked with California since 2014

ETS covers 80% of emissions

Fulfills Québec's responsibility under Pan-Canadian carbon pricing framework

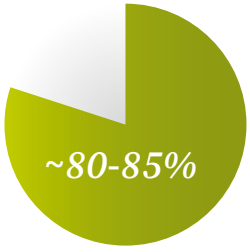
ETS Size

GHGs COVERED

CO_2, CH_4, N_2O, SF_6, HFCs, PFCs, NO_3, and other fluorinated GHGs

CAPPED EMISSIONS

56.85 $MtCO_2e$



1 - Also includes offsets from linked jurisdictions (i.e., California).

SECTORS & THRESHOLDS

FIRST COMPLIANCE PERIOD (2013-2014): Electricity, Industry.

SECOND COMPLIANCE PERIOD (2015-2017) AND THIRD COMPLIANCE PERIOD (2018-2020): Sectors of first compliance period as well as distribution and importation of fuels used for consumption in the transport and building sectors, and in small- and medium-sized businesses.

INCLUSION THRESHOLDS: >25,000 tCO_2e/year. As of 2016, fuel distributors that have distributed 200L or more of fuel (in 2015) are also subject to inclusion even if the combustion of their fuel resulted in the emission of less than 25,000 tCO_2e.

VOLUNTARY EMITTERS (OPT-IN COVERED ENTITIES): Starting in 2019, emitters from capped sectors that reported emissions between 10,000 tCO_2e/year and 25,000 tCO_2e/year may voluntarily register to the cap-and-trade system as a covered entity. If their production activity is eligible, they could receive free allocation.

POINT OF REGULATION

Mixed

NUMBER OF ENTITIES

149 (74 industrial entities, 75 fuel distributors) (2017)

CAP

The following caps are given in millions of allowances:

FIRST COMPLIANCE PERIOD (2013-2014): 23.20 each year
SECOND COMPLIANCE PERIOD (2015-2017):
2015: 65.30; **2016:** 63.19; **2017:** 61.08
THIRD COMPLIANCE PERIOD (2018-2020):
2018: 58.96; **2019:** 56.85; **2020:** 54.74
FOURTH COMPLIANCE PERIOD (2021-2023):
2021: 55.26; **2022:** 54.02; **2023:** 52.79
FIFTH COMPLIANCE PERIOD (2024-2026):
2024: 51.55; **2025:** 50.31; **2026:** 49.08;
SIXTH COMPLIANCE PERIOD (2027-2029):
2027: 47.84; **2028:** 46.61; **2029:** 45.37

After a slight increase in the cap in 2021 (due to an adjustment of the global warming potential of different GHGs), the cap will reduce by about 1.24 million allowances per year. This will result in a cap of 44.14 million allowances in 2030.

Phases & Allocation

TRADING PERIODS

The Québec cap-and-trade system is structured around three-year compliance periods, except for the first period (see "Compliance" below). A cap trajectory until 2030 has been set (see "Cap"). Allowances are allocated and auctioned with calendar vintage years.

ALLOCATION

FREE ALLOCATION: Emission-intensive sectors subject to international competition receive a portion of free allowances. Eligible sectors include: aluminum, lime, cement, chemical and petrochemicals, metallurgy, mining and pelletizing, pulp and paper, petroleum refining, and others (manufacturers of glass food containers, electrodes, gypsum products, and some agro-food products). Free allocation is generally based on benchmarks either for inputs of raw materials or for product-based benchmarks (output-based allocation).

First compliance period (2013-2014): Historical emission intensity adjusted for production level and by type of emission, with 100% allocation for process emissions, 80% for combustion emissions and 100% for emissions from other sources.

Second (2015-2017) and subsequent periods: Free allocation is based on increasingly strict intensity targets (declining emissions intensity per activity) and production levels. Since production volumes can vary, increasing intensity targets does not guarantee an absolute reduction in free allocation but incentive reductions of emissions intensity.

As of 2019, allocation of free allowances is made available to voluntary emitters (also known as opt-in covered entities) in alignment with what has been established for regulated entities.

Assistance factors: Assistance factors (AFs) for the 2021-2023 period vary between 1 (100%) and 0.6 (60%), with the lowest AFs for electricity and steam production and most industrial production having AFs of 1 (see Table 7 in the Appendix of the Regulation for details).

AUCTIONING: Generally, electricity and fuel distributors have to buy 100% of their allowances. Allowances are auctioned quarterly.

QUÉBEC

Québec Cap-and-Trade System

As of 1 January 2019, Québec had held a total of 21 auctions, 17 held jointly with California, of which two were also held jointly with Ontario.
Unsold allowances in past auctions are removed and will gradually be released for sale at auction after two consecutive auctions are held in which the sale price is higher than the minimum price.

In 2017, the latest year for which complete data are available, a little less than 70% of allowances were allocated by auction or destined to reserves. About 30% of allowances were allocated for free. Some allowances from future vintages are offered at each auction and may be traded but not used for compliance until the compliance date for the vintage year.

Flexibility

BANKING AND BORROWING

Banking is allowed but the emitter is subject to a general holding limit.
Borrowing is not allowed.

OFFSETS CREDITS

QUANTITATIVE LIMIT:
Up to 8% of each entity´s compliance obligation.

QUALITATIVE LIMIT:
Offset credits may be generated from projects carried out according to five protocols in Québec:
(1) CH_4 destruction from covered manure storage facilities;
(2) CH_4 destruction from landfill sites;
(3) Destruction of ozone-depleting substances contained in insulating foam or used as refrigerant gases removed from domestic appliances in Canada;
(4) CH_4 destruction from drainage systems at active coal mines; and
(5) CH_4 destruction from ventilation systems of active underground coal mines.

Québec is currently developing an offset protocol for afforestation and reforestation projects in private lands in Québec, which will be open to public consultation at a later point. A number of new offset protocols, co-commissioned with Ontario, were also under development. With the termination of Ontario's cap-and-trade program this work was discontinued and Québec is currently assessing its priorities in terms of which protocols to keep developing.

Offsets credits issued by jurisdictions linked with Québec are recognized as compliance instruments.

Québec offset credits are 100% guaranteed. In cases where offset credits issued for a project were deemed illegitimate, the Minister may require the offset promoter (developer) to replace them.

If credit recovery is not possible, an equivalent number of credits will be retired from the Minister's environmental integrity account. That account is filled up through a contingency reserve of 3% of issued offset credits from all offset projects.

MARKET STABILITY PROVISIONS

Auction Reserve Price: Annual auction reserve prices are determined per jurisdiction, once a year, and increase annually by 5% plus inflation until 2030. For 2019, this annual minimum price is CAD 15.31 (USD 11.82) for Québec and USD 15.62 for California. For joint auction with California in 2019, the highest between Québec's or California's annual price, based on the exchange rate of the Bank of Canada the day prior to the auction, will be the auction reserve price for that particular auction.

Allowance Price Containment Reserve: Reserve emission units held in the allowance price containment reserve account may be sold as "sales by mutual agreement" by the Minister in three tiers at CAD 56.96, CAD 64.07, and CAD 71.19 in 2019 (USD 43.96, USD 49.45, and USD 54.94) respectively. Only covered entities in Québec are eligible to purchase allowances from the reserve, as long as they do not have valid compliance instruments for the current period in their general account. Reserve prices increase annually by 5% plus inflation.

Compliance

COMPLIANCE PERIOD

FIRST COMPLIANCE PERIOD:
1 January 2013 - 31 December 2014.

SUBSEQUENT COMPLIANCE PERIODS: Three calendar years as of 1 January 2015 (2015-2017, 2018-2020, and so forth)

Allowances must be surrendered by 1 November following the end of the compliance period

MRV

REPORTING FREQUENCY: One year. Report to be submitted by 1 June of each year.

VERIFICATION: Emitters (and voluntary emitters) participating in ETS (higher threshold than those with regulatory reporting requirement) must send a verification report carried out by an organization accredited to ISO 14065.

FRAMEWORK: Regulation on the mandatory reporting of certain emissions of contaminants into the atmosphere is outlined in the 'Environment Quality Act.'

ENFORCEMENT

For noncompliance, entities can be fined CAD 3,000-500,000 (USD 2,315-385,875) and spend up to 18 months in jail in the case of a natural person, and CAD 10,000-3,000,000 (USD 7,718-2,315,252) in the case of a legal person.

Fines are doubled in the case of a second offence. In addition, the Minister of the Environment and the Fight against Climate Change may suspend the allocation to any emitter in case of noncompliance.

A covered entity that fails to cover its real and verified GHG emissions with enough allowances on 1 November following the end of a compliance period must remit each missing allowance and will have to remit three additional allowances for each allowance it failed to remit to the minister.

The person with legal responsibility for that entity would also be committing an infraction, subject to financial penalties, for each compliance instrument not surrendered as part of the compliance obligation.

Linking

LINKS WITH OTHER SYSTEMS

On 1 January 2014, Québec linked with California. On 1 January 2018, Québec and California linked with Ontario. The latter link was effectively abolished in mid-2018 when Ontario revoked and later fully canceled its system.

Other Information

INSTITUTIONS INVOLVED

Ministère de l'Environnement et de la Lutte contre les changements climatiques (Ministry of the Environment and the Fight Against Climate Change);
Direction générale de la Réglementation carbone et des données d'émission (Carbon Market Directorate)

EVALUATION/ETS REVIEW

The regulation has been adjusted almost annually to implement changes and adjustments and, when necessary, maintain harmonization with linked jurisdictions.

USE OF REVENUES

All auction revenues go to the Québec Green Fund, which is dedicated to the fight against climate change through Québec's 2013-2020 Climate Action Plan. Examples for spending include energy efficiency measures as well as public transport initiatives.

IMPLEMENTING LEGISLATION

Regulation respecting a cap-and-trade system for greenhouse gas emission allowances[1]

Amendments are listed and linked on the site of the Québec ministry.[2]

Environment Quality Act[3]

1 – http://legisquebec.gouv.qc.ca/en/ShowDoc/cr/Q-2,%20r.%2046.1
2 – http://www.environnement.gouv.qc.ca/changements/carbone/documentation-en.htm#regulations
3 – http://legisquebec.gouv.qc.ca/en/ShowDoc/cs/Q-2/

CANADA

Committed to pricing carbon across Canada by 2019

Federal backstop measure for provinces and territories available

Three main options are a carbon tax, ETS or hybrid approach

In December 2016, Canada's First Ministers adopted the Pan-Canadian Framework on Clean Growth and Climate Change (PCF)[1]. The PCF is Canada's plan to fight climate change, build resilience to the changing climate, and drive clean economic growth. It puts Canada on the path to meet its GHG reduction target of 30% below 2005 levels by 2030.

The PCF includes joint and individual commitments by federal, provincial, and territorial governments, and has been developed with input from the public, businesses, civil society, and Indigenous Peoples. A central part of the Framework is a commitment to price carbon pollution across Canada by 2019.

The Pan-Canadian Framework sets a federal benchmark, requiring all provinces and territories to implement carbon pollution pricing systems with a certain minimum level of stringency by 2019. To operationalize this level of stringency, the PCF defines a federal benchmark as follows: if the federal government determines that the benchmark is not met in a province or territory, a federal backstop measure is implemented.

Multiple options are available to comply with the federal benchmark. The "Pan-Canadian approach to pricing carbon pollution" and associated guidance outlines three main options:

(1) A carbon tax covering a scope comparable to that of British Columbia's carbon tax, i.e., covering fuels combusted for electricity, heating, transport, and industry. For this option, the carbon price has to increase by CAD 10 (USD 7.72) per year to reach CAD 50 (USD 38.59)/tCO_2e by 2022 in order to meet the benchmark stringency.

(2) A combination ("hybrid") of a carbon tax for fuels delivered to consumers and an intensity-based baseline-and-credit system for industrial emitters, with the same price trajectory as above. For the baseline-and-credit systems, benchmarks can be set based on provincial/territorial circumstances but should also reflect best-in-class performance.

(3) A broad cap-and-trade system, with coverage comparable to British Columbia's carbon tax – including large industry. For these systems, modeling has to demonstrate that expected emissions reductions are at least equal to those that would have resulted in a carbon tax with the above-described price trajectory. In addition, the provincial/territorial emission reduction target must be set equal to or greater than the federal reduction target (30% below 2005 levels by 2030).

DETERMINATION:

Provinces and territories were required to present plans for a carbon pollution pricing instrument by September 2018. Systems were already in place in the Canadian provinces of Alberta, British Columbia, and Québec (operating a cap-and-trade system linked with California). In January 2019, two additional systems were launched: Nova Scotia's cap-and-trade program, as well as Newfoundland and Labrador's carbon tax and output-based pricing system for industrial emitters. All these provinces were found to meet the federally-set benchmark entirely with their own carbon pricing instruments.

Saskatchewan's system for large emitters started in January 2019. It is complemented by the federal backstop, as it does not cover all sectors laid out by the benchmark. The federal output-based pricing system is being applied to electricity generation and to natural gas transmission pipelines. The federal fuel charge will also apply in the province starting in April 2019.

Prince Edward Island plans to establish a carbon levy to some sectors in April 2019, and the federal output-based pricing system (see below) will apply in the province.

Ontario, Manitoba, and New Brunswick do not currently have their own carbon pricing systems and the federal backstop will be fully applied.

The Northwest Territories plan a territorial carbon tax in July 2019. In the Yukon and Nunavut, the federal backstop will be applied starting in July 2019, with some exemptions for aviation fuels and electricity for remote communities, reflecting their unique circumstances.

From 2019 onwards, there will be an annual verification process to ensure provincial/territorial carbon pollution pricing systems continue to meet the benchmark. The federal government will also monitor major changes to provincial/territorial systems on an ongoing basis.

1 - Saskatchewan and Manitoba did not adopt the PCF at that time. Manitoba has since joined.

BACKSTOP MEASURE:

The federal backstop system is applying in provinces and territories that requested it or in those that do not have a carbon pollution pricing system that met the federal benchmark.

Under the 'Greenhouse Gas Pollution Pricing Act' the federal "backstop" system has two parts:

- A regulatory charge on fuel – that will apply starting April 2019 in Ontario, New Brunswick, Saskatchewan, and Manitoba; and in July 2019 in the Yukon and Nunavut, and
- A regulatory system for large industrial facilities – the federal Output-Based Pricing System (OBPS)– applied starting January 1, 2019 in Ontario, New Brunswick, Manitoba, Prince Edward Island, and partially in Saskatchewan; and will apply in July 2019 in the Yukon and Nunavut.

Both parts of the Act have an initial carbon price of CAD 20 (USD 15.44) increasing by CAD 10 (USD 7.72) per year until reaching CAD 50 (USD 38.59) in 2022. The OBPS will have intensity benchmarks so that the carbon price will only have to be paid for emissions above the benchmark for the given product.

Direct proceeds from the federal carbon pollution pricing measures will be returned to the jurisdiction of origin.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **704.0 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Oil and Gas 183.0 (26%)
Transportation 173.0 (25%)
Electricity 79.0 (11%)
Buildings 81.0 (12%)
Heavy industry 75.0 (11%)
Agriculture 72.0 (10%)
Waste and Others 41.0 (6%)

GHG REDUCTION TARGETS

BY 2020: 17% below 2005 levels
BY 2030: 30% below 2005 levels (NDC)

Other Information

INSTITUTIONS INVOLVED

Environment and Climate Change Canada;
Finance Canada;
Canadian provinces and territories

NOVA SCOTIA

Nova Scotia Cap-and-Trade Program

GASES	ALLOCATION	OFFSETS AND CREDITS
Several gases	Free allocation Auctioning	Offset framework to be developed in 2019.

CAP
13.68 $MtCO_2e$ (2019)

ETS DESCRIPTION

Nova Scotia's cap-and-trade program sets a cap on the total amount of GHG emissions allowed in covered sectors in the province for the years 2019-2022 (compliance period). Final cap-and-trade program regulations were passed in November 2018 and the program launched in January 2019. The program regulates the industrial, power, heat (buildings), and transport sectors and covers approximately 80% of GHG emissions in Nova Scotia.

YEAR IN REVIEW

The Nova Scotia program was found to meet the federally set benchmark introduced in the Pan-Canadian Framework on Clean Growth and Climate Change (see Canada factsheet). This means that the province will not be subject to the federal carbon pricing "backstop" measure.

In May 2018, Nova Scotia also became a member of the Western Climate Initiative, a collaboration of US and Canadian subnationals advancing emissions trading.

ETS in force
ETS scheduled
ETS considered

SECTORS:

POWER
INDUSTRY
TRANSPORT*
BUILDINGS*

** Sector covered upstream*

Started operating this year

Covers ~80% emissions

In compliance with the Pan-Canadian carbon pricing framework

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) — **16.1 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Electricity and heat generation 7.1 (44%)
Transportation 5.0 (31%)
Heat (residential) 1.2 (7%)
Industry 1.0 (6%)
Agriculture and waste 0.9 (5%)
Heat (commercial) 0.5 (3%)
Oil and gas sector 0.5 (3%)

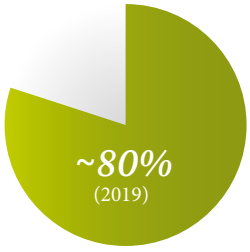
GHG REDUCTION TARGETS

BY 2020: at least 10% reduction from 1990 GHG levels
BY 2030: 45-50% below 2005 levels
BY 2050: 80% overall reduction in GHG emissions

ETS Size

GHGs COVERED
CO_2, CH_4, N_2O, SF_6, NF_3, HFCs, PFCs

CAPPED EMISSIONS
13.68 $MtCO_2e$



SECTORS AND THRESHOLDS

The program covers the industrial and electricity sectors, as well as fuel suppliers (upstream coverage of transport and heating).

INCLUSION THRESHOLDS: For the industrial and electricity sectors, facilities generating ≥ 50,000 tCO_2e/year. Electricity importers responsible for >10,000 tCO_2e/year are also included. For fuel suppliers, the following thresholds apply: petroleum product suppliers selling ≥ 200 liters of fuel into the Nova Scotia market and natural gas distributors producing ≥ 10,000 tCO_2e/year.

No provisions for voluntary ("opt-in") participation.

POINT OF REGULATION

Mixed

NUMBER OF ENTITIES

~21 entities

CAP

FIRST COMPLIANCE PERIOD (2019-2022):
2019: 13.68 $MtCO_2e$; **2020:** 12.72 $MtCO_2e$
2021: 12.26 $MtCO_2e$; **2022:** 12.14 $MtCO_2e$

Phases & Allocation

TRADING PERIODS

Nova Scotia's cap-and-trade program is structured around compliance periods; trading periods are not defined separately. The first compliance period is 2019-2022.

ALLOCATION

Allowances are distributed via free allocation and auction. Initially, most of the allowances will be distributed for free, as outlined in the regulation (and below).

FREE ALLOCATION:
Industrial Facilities: Facilities will receive allowances based on production intensity benchmarks based on data from the period 2014-2016. At the beginning of the year, 75% of the eligible emissions allowances will be distributed to the entities; the remaining 25% will be provided in the following year together with production-level adjustments after the submission of a verified emissions report.

The benchmark is based on historical facility emissions intensity, an assistant factor that varies between 1 (100%) for cement and 0.9 (90%) for pulp and paper and natural gas processing (the only defined industries).

A cap adjustment factor is also applied, declining from 1 in 2019 to about 0.88 in 2022. This means that an entity would receive about 12% less allowances based on the output from year 1.

Fuel Suppliers and Electricity Importers: Receive 80% of free allocation based on verified GHG reports for previous year's emissions.

Nova Scotia Power Inc.: The utility will be allocated allowances based on a reduction from BAU projections; ~6.3 million allowances will be freely allocated to Nova Scotia Power Inc. in 2019, declining to just over five million in 2022.

AUCTIONING: The province will hold auctions two to four times per calendar year, starting in 2020. Minimum price: 5% plus inflation per year.

Auctioning in Nova Scotia has two particularities:

(1) The option for regulated entities to consign allowances to auction: minimize transaction costs for participants, regulated entities can consign their allowances to the government auctions. Allowances offered for sale through consignment are included in the government auctions and sold first, followed by emission allowances offered for sale by the province. 100% of the revenue from allowances sold on consignment is returned to the participants.

(2) The purchase of limits to secure market functioning: secure market functioning, bidders will be subject to purchasing limits that restrict how many allowances each participant can buy at any one auction. Purchasing limits are intended to mitigate the risk that one participant can manipulate the market by causing shortages and price spikes.

Purchasing Limits (for the 2019-2022 compliance period):

- Fuel suppliers: 15% of the previous year's verified GHG emissions per auction and 25% for the calendar year;

- Industrial facilities: 3% of their previous year's verified GHG emissions per auction and 5% for the calendar year; and
- Nova Scotia Power Inc.: 5% of the allowances available for sale at each auction.

NOVA SCOTIA

Nova Scotia Cap-and-Trade Program

Flexibility

BANKING AND BORROWING

Not yet defined.

OFFSETS AND CREDITS

Nova Scotia's cap-and-trade legislation includes the possibility for an offset system. Further consultations will be undertaken in 2019 to consider this option.

MARKET STABILITY PROVISIONS

RESERVE: In the first year of the compliance period (2019), the government will place 3% of allowances available under the yearly caps into a reserve. These emission allowances may be used for:

(1) Cost containment: Offer for sale at set prices to participants at predetermined times throughout the year to cover their compliance obligations. Up to four reserve sales can occur in a calendar year. The initial price will be CAD 50 (USD 39) in 2020, rising annually by 5% plus inflation.

(2) New entrants: Accommodate new participants in the cap-and-trade program whose GHG emissions are not currently accounted for and that qualify for free allocation.

(3) Reserve for adjustments in output-based free allocation: Adjust to variability in year-to-year commitments to free allowances (allowances from reserve can be used as a buffer for allocation-amount uncertainty: if projections are not accurate, commitments for free allowances according to allocation rules can be fulfilled by using allowances from the reserve).

Compliance

COMPLIANCE PERIOD

Four years (2019-2022) (see "Phases and Allocation" above)

MRV

In Nova Scotia, MRV is referred to as "Quantification, Reporting, and Verification."

REPORTING FREQUENCY: Annually. Report for 2018 to be submitted by 1 June 2019; verification by 1 September 2019. Starting in 2020, report and verification must be submitted by 1 May of each year for the previous calendar year (1 May 2020 for 2019, 1 May 2021 for 2020, 1 May 2022 for 2021, 1 May 2023 for 2022).

VERIFICATION: Reports must be verified by an accredited third-party organization. Lists of eligible verification bodies are available at:
Standards Council of Canada and the American National Standards Institute.

FRAMEWORK: The rules for reporting GHG emissions are outlined in Nova Scotia's 'Quantification, Reporting, and Verification of Greenhouse Gas Emissions Regulations' and 'Standards for Quantification, Reporting, and Verification of Greenhouse Gas Emissions.'

ENFORCEMENT

Participants who do not surrender enough allowances at the end of the compliance period will pay three times the latest auction settlement price per allowance they are short.

Administrative penalties for violations of other cap-and-trade regulations will be determined in further regulations.

Other Information

INSTITUTIONS INVOLVED

Nova Scotia Environment, Climate Change Unit

EVALUATION/ETS REVIEW

Annual reports on the program will be published. Nova Scotia will also have to report annually to Environment and Climate Change Canada as part of the Pan-Canadian Framework on Clean Growth and Climate Change.

USE OF REVENUES

A Green Fund will be set up in 2019 to receive and distribute revenues. The Green Fund will support measures that mitigate GHG emissions, promote adaptation, encourage innovative technology, and reduce negative economic and social effects of mitigation action.

IMPLEMENTING LEGISLATION/REGULATION

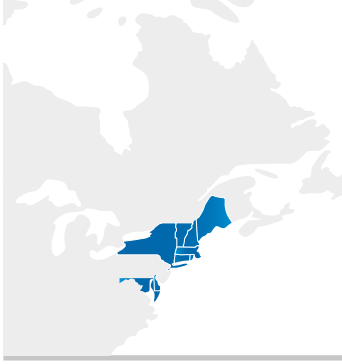
Nova Scotia's Cap and Trade Program Regulatory Framework[1]

Cap-and-Trade Program Regulations, Section 112Q of the Environment Act[2]

Environment Act[3]

1 – https://climatechange.novascotia.ca/sites/default/files/Nova-Scotia-Cap-and-Trade-Regulatory-Framework.pdf
2 – https://www.novascotia.ca/just/regulations/regs/envcapandtrade.htm
3 – https://nslegislature.ca/sites/default/files/legc/PDFs/annual%20statutes/2017%20Fall/c010.pdf

REGIONAL GREENHOUSE GAS INITIATIVE



GASES	ALLOCATION	AVERAGE 2018 PRICE
CO_2 only	Auctioning	USD 4.87 per tCO_2e / USD 4.42 per short ton CO_2e (average auctioning price)
TOTAL REVENUE	**OFFSETS AND CREDITS**	**CAP**
Since beginning of program: USD 3.08 billion Collected in 2018: USD 239.36 million	Domestic	58.3 million short tons CO_2e / 52.9 $MtCO_2e$ (2019)

ETS in force

ETS scheduled

ETS considered

SECTORS:

POWER

MEMBERS:

Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, Vermont

First mandatory GHG ETS in the US

Since 2012 two program reviews tightened cap

New Jersey and Virginia in process of joining RGGI by 2020

ETS DESCRIPTION

The Regional Greenhouse Gas Initiative (RGGI) is the first mandatory GHG ETS in the United States, based on a 2005 agreement by the governors of the original signatory states (Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont) and originally outlined in the RGGI Memorandum of Understanding (MoU). In August 2006, RGGI states published a model rule, which provided a regulatory framework for the development of individual state regulatory/statutory proposals. The system started operating in 2009 with 10 states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont), each having promulgated its own regulations covering CO_2 emissions from the power sector. New Jersey withdrew from the program at the end of the first control period, December 2011.

As foreseen by the MoU, a RGGI program review was conducted in 2012. According to the program review, each of the states updated their regulations so that a tighter cap and other program changes went into force on 1 January 2014. RGGI concluded its second program review in 2017 and a new model rule has been prepared. According to the rule, between 2021 and 2030 the cap will reduce by 30% compared to 2020. Furthermore, an emissions containment reserve (ECR) will be established to achieve greater emission reductions if the cost is lower than anticipated.

YEAR IN REVIEW

After the finalization of the 2017 Model Rule, the proposed post-2020 cap-and-trade regulations must be adopted by each RGGI state according to its own regulatory processes. The majority of the RGGI states have adopted the 2017 Model Rule, while the remaining states are on track to do so within early 2019.

New Jersey is in the process of rejoining RGGI and is expected to have final legislation in place to officially reenter the RGGI program by the beginning of 2020 (see factsheet on New Jersey).

Also, Virginia is in the process of establishing an ETS and linking it to the RGGI program (see factsheet on Virginia). The state started regulatory processes in 2018 and will presumably start entering the RGGI allowance market by 2020.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF)	462.9 $MtCO_2e$ (2014)

OVERALL GHG EMISSIONS BY SECTOR

Energy 397.5 (86%)
Industrial Processes 25.6 (6%)
Agriculture 9.8 (2%)
Waste 30.0 (6%)
Bunker Fuels 0.1 (0%)

GHG REDUCTION TARGETS

BY 2020: RGGI states have committed to a regional cap of more than 50% reduction of CO_2 emissions from electricity generation from 2005 CO_2 emissions

BY 2030: States propose to implement a reduction of 30% compared to the 2020 CO_2 emissions cap, with a constant reduction of 2.275 million short tons/year between 2021 and 2030

Note: The participating states have their own emission targets; economy-wide targets are not defined at the level of RGGI.

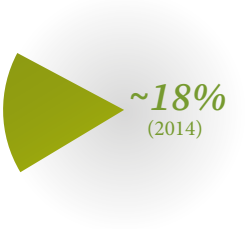
ETS Size

GHGs COVERED

CO_2

CAPPED EMISSIONS

52.9 $MtCO_2e$



SECTORS AND THRESHOLDS

Fossil Fuel Electric Generating Units

INCLUSION THRESHOLDS: Capacity equal to or greater than 25 MW.

POINT OF REGULATION

Downstream (at installation level)

NUMBER OF ENTITIES

165 entities (January 2019)

CAP

The cap was initially set at 165 million short tons CO_2 per year in the 2009-2014 period, with a 2.5% annual reduction factor from 2015 through 2018, totaling a 10% reduction between 2015 and 2018. However, by 2012, emissions under RGGI were more than 40% below the cap. The states thus tightened the cap to 91 million short tons in 2014. The revised regulations extended the 2.5% annual reduction factor through 2020, with a 2020 cap of approximately 78 million short tons.

Following the most recent program review, the proposed reduction factor between 2021 and 2030 is about 3% of the 2020 cap, resulting in a 2030 regional cap of about 55 million short tons.

Phases & Allocation

TRADING PERIODS

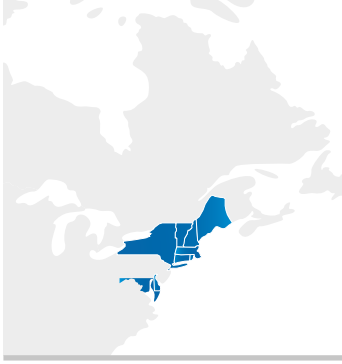
RGGI is structured around "control" (or compliance) periods. A cap trajectory until 2030 has been set (see "Cap" above).

FIRST CONTROL PERIOD: 2009-2011
SECOND CONTROL PERIOD: 2012-2014
THIRD CONTROL PERIOD: 2015-2017*
FOURTH CONTROL PERIOD: 2018-2020*

**RGGI introduced an interim control period with the 2014 revisions. An affected source must cover 50% of its emissions with allowances in each of the first two years of a control period. The affected source must cover 100% of the remaining emissions at the end of the three-year control period.*

ALLOCATION

AUCTIONING: CO_2 allowances issued by each RGGI state are distributed through quarterly, regional CO_2 allowance auctions using a "single-round, sealed-bid uniform-price" format. Auctions are open to all parties with financial security, with a maximum bid of 25% of auctioned allowances per quarterly auction.



REGIONAL GREENHOUSE GAS INITIATIVE

Flexibility

BANKING AND BORROWING

Banking of allowances is allowed without restrictions, but regulations include adjustments to the cap to address the aggregate bank by reducing the amount of allowances available for auctions in future years by the amount of allowances not used for compliance in previous control periods.
Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: 3.3% of an entity's liability may be covered with offsets. This percentage share will remain equal between 2021 and 2030 according to the Model Rule.

QUALITATIVE LIMIT: Currently the program allows offset allowances from five offset types located in RGGI states:

(1) Landfill methane capture and destruction;
(2) Sequestration of carbon due to reforestation, improved forest management, or avoided conversion;
(3) Avoidance of methane emissions from agricultural manure management operations;
(4) Reduction or avoidance of CO_2 emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency; and
(5) Reduction in SF_6 emissions.

According to the model rule, offset Protocols 4 and 5 will be discontinued from 2021. Some states have discontinued other protocols, but all states accept offset allowances issued by any participating state. To date, only one offset project has been approved under RGGI.

MARKET STABILITY PROVISIONS

Auction Price Floor: USD 2.20 per short ton in 2018, increasing by 2.5% per year (to reflect inflation).

Reserves: As of 2014, RGGI states created a cost containment reserve (CCR), where allowances are released to the market when certain trigger prices are reached. Trigger prices: USD 10 in 2017. Between 2018 and 2020, the CCR trigger price will increase annually by 2.5%.

In 2021, under the model rule, the trigger price will be set at USD 13 and will increase by 7% compared to the previous year thereafter.

In addition, the model rule envisages the establishment of an ECR by 2021: Allowances would be withheld from circulation (from auction) to secure emissions reductions if the emission reduction costs are lower than projected. In 2021, this trigger price will be set at USD 6, increasing by 7% compared to the previous year thereafter.

Compliance

COMPLIANCE PERIOD

Three years (see “Phases and Allocation” above)

MRV

REPORTING FREQUENCY: Compliance is evaluated at the end of each three-year control period. The RGGI program is currently in its fourth three-year control period (2018-2020).

FRAMEWORK: Emissions data for emitters are recorded in the United States Environmental Protection Agency's (US EPA) Clean Air Markets Division database in accordance with state CO_2 Budget Trading Program regulations and US EPA regulations. Provisions are based on the US EPA monitoring provisions. Data are then automatically transferred to the electronic platform of the RGGI CO_2 Allowance Tracking System, which is publicly available.

ENFORCEMENT

Penalties for non-compliance are set by each state; in case of excess emissions, compliance allowances for three times the amount of excess emissions have to be surrendered in future periods.

Linking

LINKS WITH OTHER SYSTEMS

Virginia and New Jersey plan to join the RGGI allowance market by 2020.

Other Information

INSTITUTIONS INVOLVED

Each RGGI state has its own statutory and/or regulatory authority;
RGGI Inc. (non-profit cooperative supporting RGGI's development and implementation)

EVALUATION/ETS REVIEW

The RGGI participating states periodically review the ETS program in order to consider program successes, impacts, and design elements. The first program review process (known as the 2012 Program Review) was completed in early 2013. A second review process was completed in 2017, resulting in the 2017 Model Rule. Program reviews were accompanied by stakeholder meetings to facilitate stakeholder engagement and the submission of comments from interested parties.

USE OF REVENUES

Revenues are collected from the quarterly auctions. They are returned to the RGGI states and have been primarily invested in consumer benefit programs: energy efficiency, renewable energy, direct energy bill assistance, and other greenhouse gas reduction programs.

IMPLEMENTING LEGISLATION/REGULATION

2017 RGGI Model Rule[1]

2017 RGGI Model Rule Updates (Summary)[2]

RGGI States' Statutes & Regulations[3]

RGGI Program design[4]

1 – https://www.rggi.org/sites/default/files/Uploads/Program-Review/12-19-2017/Model_Rule_2017_12_19.pdf ;
2 – https://www.rggi.org/sites/default/files/Uploads/Program-Review/12-19-2017/Summary_Model_Rule_Updates.pdf ;
3 – https://www.rggi.org/program-overview-and-design/state-regulations ;
4 – https://www.rggi.org/program-overview-and-design/elements

NEW JERSEY

ETS in force

ETS scheduled

ETS considered

Proposed rules consistent with RGGI

2020 cap of 18 million short tons

Plan to join RGGI by 2020

ETS DESCRIPTION

In January 2018, New Jersey's Governor directed the Department of Environmental Protection (DEP) and Board of Public Utilities (BPU) to take all necessary regulatory and administrative measures to ensure New Jersey's timely return to full participation in RGGI.

After working with the other RGGI states to determine how best to re-engage in the program, New Jersey's CO_2 Budget Trading Program rules were made consistent with the 2017 RGGI Model Rule.

That proposal establishes New Jersey's initial emissions cap at 18 million short tons CO_2e (16.3 $MtCO_2e$) in 2020. The cap will decline by a set amount annually (2.5% in 2020 and then by 30% over the next 10 years through to 2030). The proposal also establishes the applicability of the RGGI program to those power plants providing 25 MW or more to the grid and commits the state to participation in RGGI's Emissions Containment Reserve (ECR) beginning in 2021 and in the Cost Containment Reserve (CCR).

Simultaneously, New Jersey proposed the 'Global Warming Solutions Fund Rule' which would establish a framework, guidelines, and priority ranking system that the DEP, Economic Development Authority, and BPU will use to select eligible programs and projects to receive RGGI auction proceeds. To maximize coordination and avoid overlap between the uses of the auction proceeds, the proposal requires the three agencies to develop a multi-year strategic funding plan demonstrating that funds will advance one or more of six key objectives.

Both proposals required a 60-day public comment period, which ended in 2019. After reviewing and responding to comments, New Jersey expects to adopt both proposals by May 2019. The state anticipates participating in the first RGGI auction of 2020.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) — **109.0 $MtCO_2e$ (2015)**

OVERALL GHG EMISSIONS BY SECTOR

Electricity Generation 17.7 (16%)
Transportation 45.8 (42%)
Industrial 5.1 (5%)
Residential 15.5 (14%)
Commercial 10.8 (10%)
Highly Warming Gases (including Agriculture) 7.9 (7%)
Waste Management 5.2 (5%)

GHG REDUCTION TARGETS

BY 2020: GHG emissions equal to or below 1990 emissions

BY 2050: GHG emissions equal to 80% below 2006 emissions

Linking

LINKS WITH OTHER SYSTEMS

New Jersey is planning to join the RGGI cap-and-trade program (see above).

Other Information

INSTITUTIONS INVOLVED

New Jersey Department of Environmental Protection;
Board of Public Utilities;
Economic Development Authority

MASSACHUSETTS

Massachusetts Limits on Emissions from Electricity Generators

GASES	ALLOCATION	CAP
CO_2 only	Free allocation Auctioning	8.74 $MtCO_2e$ (2019)

ETS in force

ETS scheduled

ETS considered

SECTORS:

POWER

Launched in 2018 for power sector

Complements RGGI to achieve targets locally

Started auctioning in 2019

ETS DESCRIPTION

The Massachusetts system started operation in 2018 and covers the power sector. It complements RGGI to help ensure that Massachusetts achieves its mandatory mitigation targets.

In 2016, a ruling by the Massachusetts Supreme Court established that the government would need to take additional action to guarantee it meets the state's climate targets – a 25% reduction in 2020 and an 80% reduction by 2050 (compared to 1990). The regulation establishing this system is in response to this ruling.

The Massachusetts Limits on Emissions from Electricity Generators system exists in parallel to, but does not directly interact with, RGGI.

YEAR IN REVIEW

2018 saw the preparation of the auctioning of allowances. 25% of the allowances are to be distributed via auctions in 2019, increasing to full auctioning by 2021. The first auction of vintage 2019 allowances occurred in December 2018. Auction results are included in market monitoring reports posted on the program web page.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) — **76.3 $MtCO_2e$ (2015)**

OVERALL GHG EMISSIONS BY SECTOR

Electricity 15.6 (20%)
Transport 29.7 (39%)
Residential 13.7 (18%)
Commercial 7.6 (10%)
Industry 7.9 (10%)
Other 1.9 (2%)

GHG REDUCTION TARGETS

BY 2020: 25% reduction compared to 1990
BY 2050: 80% reduction compared to 1990

ETS Size

GHGs COVERED:
CO_2

CAPPED EMISSIONS
8.74 $MtCO_2e$ (2019)

SECTORS AND THRESHOLDS
Large electricity generators subject to RGGI (>= 25 MWe).

POINT OF REGULATION
Downstream

NUMBER OF ENTITIES
21 (2018)

CAP
8.74 $MtCO_2e$ (2019)
The cap declines annually by 223,876 tCO_2e per year until it reaches a cap of 1.8 $MtCO_2e$ by 2050.

Phases & Allocation

TRADING PERIODS
The system has an annual compliance deadline of 1 March for the prior year's emissions. A linear cap trajectory until 2050 has already been set (see 'Cap').

ALLOCATION
FREE ALLOCATION: Until 2021, remaining allowances will be freely allocated proportionally based on historical (2013-2015) generation.

AUCTIONING: From 2019 onwards, allowances are partially auctioned, with 25% auctioned in 2019, 50% in 2020, and 100% from 2021 onwards.
One to four auctions will be held each year.
The first auction took place in December 2018.

Flexibility

BANKING AND BORROWING
Banking is allowed, but restrictions apply to guarantee that emissions in any year cannot exceed the emission limit of the prior year. This is done by adjusting the number of auctioned allowances downward to compensate for banked allowances. Borrowing is not allowed, but the possibility of emergency deferred compliance exists.

MARKET STABILITY PROVISIONS
Auction reserve price: The first auction of 2019 allowances had a reserve price of USD 0.50 per allowance. Future reserve prices are not yet known.

Compliance

COMPLIANCE PERIOD
One year

MRV
REPORTING FREQUENCY: Regulated entities are required to submit emission reports (by 1 February) and compliance certification reports (by 1 March) indicating emissions and the holding of sufficient allowances, respectively.

VERIFICATION: Emissions must match reports to RGGI and US EPA. Documents (i.e., emissions reports and compliance certification reports) must be certified by a designated representative identified by the facility, and MassDEP may choose to conduct audits.

ENFORCEMENT
If the MassDEP establishes that an entity is in violation of compliance, this will be presumed to constitute "a significant impact to public health, welfare, safety or the environment." In addition to penalties, the regulated entity has to submit three allowances for each tonne of noncompliance.

Other Information

INSTITUTIONS INVOLVED

The Executive Office of Energy and Environmental Affairs;
Massachusetts Department of Environmental Protection (MassDEP)

EVALUATION/ETS REVIEW

The first program review will be in 2021, with a review every 10 years thereafter.

USE OF REVENUES

Auction proceeds will be paid to a segregated account and shall be used to further reduce GHG emissions.

IMPLEMENTING LEGISLATION/REGULATION

Electricity Generator Emissions Limits (310 CMR 7.74)[1]

1 – https://www.mass.gov/guides/electricity-generator-emissions-limits-310-cmr-774

VIRGINIA

ETS in force

ETS scheduled

ETS considered

Aims to link to RGGI by 2020

Proposed ETS in line with RGGI Model Rule

Proposal includes 2020 cap of 28 million short tons

ETS DESCRIPTION

Virginia has been working on setting up an ETS since 2017. The 2017 Proposed 'Regulation for Emissions Trading' prepared by the state's Department of Environmental Quality (DEQ) and approved by the Virginia State Air Pollution Control Board proposed a system that would be in line with many of RGGI's major design features, with the aim to link with RGGI by 2020.

A public comment period for the proposed carbon trading rule took place in 2018. US states participating in RGGI submitted comments to Virginia concerning the consistency of its proposed regulation with the RGGI states' 2017 Model Rule. According to the Model Rule, key design elements of the Virginia regulation would have to be harmonized with RGGI for a link to be established.

In September 2018, the DEQ released a revised draft regulation taking into account the comments of the RGGI states. The updated proposal sets a cap of 28 million short tons CO_2e (25.4 $MtCO_2e$) in 2020, which would decline 3% per year to 19.6 million short tons CO_2e (17.6 $MtCO_2e$) in 2030. The revised regulation is consistent with RGGI on the issues of covering mixed fuels and retiring unsold conditional allowances. Entities will be allowed to surrender offsets issued from other jurisdictions. This revised proposal has been approved by the Virginia Air Pollution Control Board. A public comment period is due to take place in early 2019. If there are no further delays, Virginia's cap-and-trade regulation will be operational and linked to RGGI by 2020.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) — **104.2 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Electric Power 33.6 (32%)
Transportation 47.5 (46%)
Industrial 11.7 (11%)
Residential 5.7 (5%)
Commercial 5.8 (6%)

GHG REDUCTION TARGETS

BY 2025: 30% reduction below BAU projection of GHG emissions

Linking

LINKS WITH OTHER SYSTEMS

Virginia is planning to join the RGGI cap-and-trade program (see above).

Other Information

INSTITUTIONS INVOLVED

Virginia Department of Environmental Quality

NEW MEXICO

ETS in force

ETS scheduled

ETS considered

Climate Change Task Force to evaluate adoption of market program

State-wide GHG reporting in place

ETS DESCRIPTION

New Mexico established a Climate Change Task Force to evaluate strategies and policies to reduce GHG emissions in the state. This includes the adoption of a comprehensive market-based program that sets emissions limits to reduce CO_2 and other GHG pollutants in New Mexico. Initial recommendations and a status update for the 'New Mexico Climate Strategy' are due in September 2019.

Requirements on GHG emission reporting–stemming from Title V of the Clean Air Act, Prevention of Significant Deterioration, and from U.S. Environmental Protection Agency rules–apply to stationary combustion, new major stationary sources, all power plants, fuel and industrial gas suppliers, CO_2 injection sites, and other large GHG emission sources, among others.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **80.9 $MtCO_2e$ (2013)**

OVERALL GHG EMISSIONS BY SECTOR

Electricity generation 28.5 (35%)
Residential / Commercial / Non-fossil industrial 7.9 (10%)
Transportation 13.6 (17%)
Fossil fuel industry 21.1 (26%)
Industrial processes 1.4 (2%)
Waste management 1.8 (2%)
Agriculture 6.6 (8%)

GHG REDUCTION TARGETS

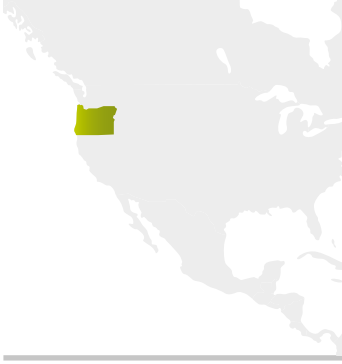
BY 2030: At least 45% from 2005 GHG levels (Executive Order 2019-003)

Other Information

INSTITUTIONS INVOLVED

New Mexico Climate Change Task Force;
New Mexico Energy, Minerals and Natural Resources Department;
New Mexico Environment Department

OREGON



ETS in force

ETS scheduled

ETS considered

House Bill proposes statewide cap-and-trade program starting in 2021

Proposed design closely modeled on California and Québec

ETS DESCRIPTION

In January 2019, House Bill 2020 was introduced, proposing the establishment of a statewide cap-and-trade program ('Oregon Climate Action Program'). The program would start in 2021 and the allowance budget would decline in line with a proposed target of a 45% reduction in GHG emissions below 1990 levels by 2035. From 2036, allowances would decline in line with Oregon's proposed 2050 target of at least 80% reduction from the same baseline.

Electricity companies would receive allowances equal to a forecast of emissions associated with serving their retail customers until 2030, and decline from that point at the rate of the overall cap. Natural gas utilities would be eligible for allowances based on the share of emissions that goes towards serving low-income residential customers. Covered entities with emissions-intensive, trade-exposed processes would initially receive an allocation based on 100% of sectoral or facility-specific production benchmarks in 2021. These shares would decline in subsequent years. Auctioning would be held at least annually with a slowly rising auction price floor and price ceiling.

The program's design is closely modeled on the California and Québec programs, including similar sectoral coverage and US domestic offset programs. In addition to auction price floors and ceilings, cost containment reserves are also envisaged. The possibility of linking with other market-based compliance mechanisms in other jurisdictions is mentioned in the proposed legislation.

Public hearings were held on the bill throughout February 2019. Oregon's legislature convenes until 30 June 2019.

An annual GHG emissions reporting program has been in place since 2010 covering industry and waste, as well as fuel distributors and electricity suppliers.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **65.0 $MtCO_2e$ (2017, preliminary)**

OVERALL GHG EMISSIONS BY SECTOR

Transport 25.7 (40%)
Residential and commercial 20.8 (32%)
Industrial 12.4 (19%)
Agricultural 5.7 (9%)

GHG REDUCTION TARGETS

BY 2020: 10% reduction from 1990 GHG levels
BY 2035: 45% reduction from 1990 GHG levels (proposed target)

BY 2050: At least 80% reduction from 1990 GHG levels (proposed target)

Other Information

INSTITUTIONS INVOLVED

Joint Interim Committee on Carbon Reduction;
Oregon Carbon Policy Office;
Oregon Department of Environmental Quality

TRANSPORTATION AND CLIMATE INITIATIVE

MEMBERS:
Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, Washington D.C.

The Transportation and Climate Initiative (TCI) is a regional collaboration of 13 northeastern and mid-Atlantic US jurisdictions that pursues the goal to reduce GHG emissions from the transportation sector and minimize the transportation system's reliance on high-carbon fuels. In December 2018, a coalition of 10 of the participating TCI jurisdictions (all but Maine, New Hampshire, and New York) announced the future design of a regional low-carbon transportation policy proposal, which aims to establish a carbon pricing mechanism. The goal to introduce such a mechanism is an outcome of several years of consultations and negotiations among the members of the TCI.

Regional collaboration to reduce transport GHG emissions

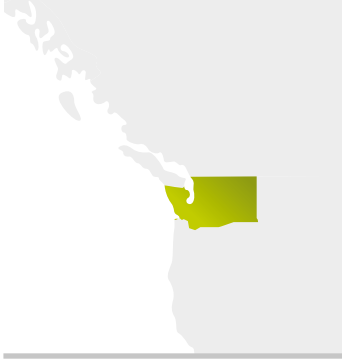
Coalition of majority of TCI members considers cap and invest or other carbon pricing mechanism

Ongoing stakeholder outreach and exploring design options

The proposal is supposed to cap carbon emissions from the combustion of transportation fuels by introducing a "cap-and-invest" program or another carbon pricing mechanism, emphasizing the possibility for TCI jurisdictions to raise revenue through the program and invest it into low-carbon and resilient transportation infrastructure projects. A first draft policy proposal is expected to be prepared in 2019. Once the policy proposal is completed, participating states will be able to decide whether to adopt and implement it. Other states would also be able to join the effort at any time.

In 2019, the participating TCI jurisdictions plan to engage in expert consultations; conduct further public stakeholder engagements; and undertake technical, environmental, and economic analyses of the benefits and costs of a regional transportation policy. During the process, TCI jurisdictions also aim to explore the design and potential implementation of complementary policies – including the determination of a cap level, establishing MRV guidelines, the identification of covered entities and fuels, the development of cost containment mechanisms, compliance flexibility, and the specific revenue usage.

WASHINGTON



ETS in force

ETS scheduled

ETS considered

Began implementing baseline and credit system

Other carbon pricing policies being considered

ETS DESCRIPTION

In 2008, the State of Washington adopted GHG reduction targets for 2020, 2035, and 2050.

In 2017 the Washington Department of Ecology began implementing the 'Clean Air Rule' – a baseline and credit system that reduces emissions from industrial sources, petroleum fuel producers and importers, and natural gas distributors. Those responsible for at least 100,000 metric tonnes of GHG per year are affected. Under this system, covered facilities must reduce a cumulative 1.7% of their baseline emissions annually. They can comply by reducing their own emissions, buying credits from other regulated parties or from projects that reduce emissions, or by acquiring allowances from approved ETS programs.

Other carbon pricing policies, including a possible ETS, are also being considered. Recent changes to the legislature have renewed interest in putting a carbon pricing policy into law. In addition, environmental NGOs have announced their intent to put a carbon pricing policy to a vote of the people if the state legislature does not act.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **95.3 $MtCO_2e$ (2014)**

OVERALL GHG EMISSIONS BY SECTOR

Electricity 18.3 (19%)
Residential, Commercial, Industrial 20.4 (21%)
Transport 41.2 (43%)
Fossil Fuel Industry 0.9 (1%)
Industrial Process 4.9 (5%)
Waste Management 3.5 (4%)
Agriculture 6.1 (6%)

GHG REDUCTION TARGETS

BY 2020: Reduce emissions to 1990 GHG levels
BY 2035: 25% reduction from 1990 GHG levels
BY 2050: 50% reduction from 1990 GHG levels or 70% reduction from the state's expected emissions for that year

Other Information

INSTITUTIONS INVOLVED

Washington Department of Ecology

BRAZIL

ETS in force

ETS scheduled

ETS considered

Considering the impact of carbon pricing instruments

RenovaBio provides for trading in emission reductions

Voluntary ETS simulation for some companies

ETS DESCRIPTION

Brazil's National Climate Change Policy, enacted in December 2009, aims to promote the development of a Brazilian market for emissions reductions.

As part of its activities under the PMR, the Brazilian government is considering the implementation of market instruments to meet Brazil's mitigation targets and reduce overall mitigation costs. Brazil is currently assessing different carbon pricing instruments, including an ETS and a carbon tax. The Ministry of Economy is developing design options and conducting comprehensive economic and regulatory impact assessments for both instruments. This includes, among others, an analysis on potential interactions between carbon pricing instruments and existing policies. In addition, the Ministry of Economy has launched a strategy to strengthen the understanding of carbon pricing instruments among stakeholders through engagement, communication, and consultation.

Currently, the Brazilian government is also working on the regulatory impact assessment of a national mandatory GHG emissions/removals registry with support from the German Development Agency, thus developing the fundamentals of a central building block for carbon pricing.

RenovaBio, the National Policy for Biofuels, was approved in 2017 (Federal Law 13576), establishing mandatory goals for the reduction of GHG emissions by avoiding the use of fossil fuels. The policy provides for a trading mechanism for emissions reduction units generated from switching from fossil fuels to biofuels, relative to a 100% fossil fuel use scenario.

Since 2013, a group of leading companies has been participating in a voluntary ETS simulation to gain experience and develop proposals for an emissions trading system in Brazil that can reduce national GHG emissions at the lowest possible cost. In 2018, 29 companies from diverse sectors of the Brazilian economy participated in this exercise. The ETS simulation is coordinated by the Centro de Estudos em Sustentabilidade da Fundação Getulio Vargas (FGVces). Trading takes place through the Rio de Janeiro Green Stock Exchange (BVRio).

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **1,036.0 $MtCO_2e$ (2015)**

OVERALL GHG EMISSIONS BY SECTOR

GHG REDUCTION TARGETS

BY 2020: Voluntary commitment to reduce GHG emissions by 36.1-38.9% compared to BAU projections

BY 2025: 37% reduction from 2005 GHG levels (NDC)

BY 2030: Indicative contribution of 43% reduction from 2005 GHG levels (NDC)

Other Information

INSTITUTIONS INVOLVED

Ministry of Environment;
Ministry of Economy (previously Ministry of Finance);
Ministry of Mines and Energy

CHILE

ETS in force

ETS scheduled

ETS considered

Considering an ETS in the energy sector

USD 5 carbon tax

ETS DESCRIPTION

Since 2013, Chile has been conducting a series of studies on the design and implementation of carbon pricing instruments in the country. As a result, stationary emission sources over 50MW are now subject to a carbon tax – set at USD 5 per tCO_2e – as well as to a tax on local pollutants (SO_2, NO_X, and particulate matter).

Current regulatory activities have focused on: **(1)** the further improvement of the carbon tax (a modification of the carbon tax was sent to Congress in August 2018 to change to an emissions-based threshold and include the use of offsets); and **(2)** the accompanying MRV system. However, Chile is also considering the possibility of establishing an ETS in the energy sector. An initial ETS design outline has already been developed under the PMR, and the country's MRV system has been designed to be ETS compatible. Technical work on a possible ETS continues within the government, with next steps yet to be determined.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **111.7 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Energy 87.1 (78%)
Industrial processes 6.9 (6%)
Agriculture 11.8 (11%)
Waste 5.8 (5%)

GHG REDUCTION TARGETS

BY 2020: Under the UNFCCC and conditional to external support, Chile has pledged to reduce projected BAU emissions by 20% (as projected from 2007)

BY 2030: 30% reduction of emissions intensity compared to 2007, in terms of CO_2/unit of GDP. Conditional to international funding, 35-45% reduction of emissions intensity compared to 2007, in terms of CO_2/unit of GDP (NDC)

Other Information

INSTITUTIONS INVOLVED

Ministry of Energy;
Ministry of Environment;
Ministry of Finance;
Inter-Ministerial Committee on Climate Change;
PMR Chile (Precio al carbono Chile)

MRV

The current MRV system serves primarily the implementation of the carbon tax. Operators of boilers and turbines of 50 MW or more of thermal capacity are required to monitor and report emissions through government-approved methodologies.

VERIFICATION: Verification procedures are administered by the Superintendence of the Environment under the Ministry of Environment (no third-party verification is currently used).

In the context of the Paris Agreement, the Ministry of Energy is working on the design and implementation of an MRV platform of mitigation actions in the energy sector, as a starting point to build a robust accounting framework under the agreement. This activity is being supported by the PMR, and it is in line with the national MRV platform that is being carried out by the Ministry of Environment.

MEXICO

ETS in force

ETS scheduled

ETS considered

Developing pilot phase regulations

Should cover energy and industry

Mandatory GHG reporting in place since 2014

ETS DESCRIPTION

Mexico's General Law on Climate Change Law (Ley General de Cambio Climatico–LGCC), as amended in July 2018, provides the framework for the establishment of an ETS in Mexico. The mandatory ETS is to be preceded by a pilot phase, which will run for three years.

The Mexican government is currently working on the development of regulations for the pilot phase. A first draft regulation was released in late 2018. A final draft is under consideration within the government and should be published during the first half of 2019. It is expected that the pilot cover direct CO_2 emissions from energy and industry. The latter could include, among others, the automotive, cement, chemicals, glass, steel, metallurgical, mining, and petrochemicals subsectors, as well as the pulp and paper subsector. Participation could be limited to entities with annual emissions greater than 100,000 tCO_2, amounting to ~300 entities. In this configuration, the pilot would cover approximately 45% of national emissions.

Allowances during the pilot phase are likely to be primarily distributed through grandparenting, based on historical emissions, sectorial goals, and the country's NDC. Auctions – which may be subject to price collars – may also apply to a small percentage of allowances. This could be complemented by reserves, e.g., for new entrants and to respond to price spikes.

Offsets may be eligible for compliance under the pilot ETS, subject to quantitative limits. Offsets would likely be generated under a domestic program that is yet to be established. Participation in the pilot phase is likely mandatory, but without penalties for noncompliance.

In October 2014, a mandatory reporting system (the National Emissions Register – RENE) was established for both direct and indirect GHG emissions for facilities with annual emissions above 25,000 tCO_2e. Emitters in the energy, industrial, transport, agricultural, waste, commercial, and services sectors are required to report the six GHGs identified by UNFCCC, as well as black carbon. Fossil fuel sales and imports (with the exemption of natural gas) have been subject to a USD 3.50 carbon tax since 2014.

ETS regulations have also built on extensive consultation with and participation by the private sector and civil society. In addition to numerous public consultation fora, a national carbon market simulation took place between 2017 and 2018 to strengthen capacity and the readiness of Mexican businesses to participate in a future ETS. The simulation brought together more than 100 Mexican companies from numerous economic sectors, such as electric power, hydrocarbons, aviation, mining, forestry, consumer goods, and financial institutions, among many others. The companies represented two-thirds of Mexico's GHG emissions. The exercise had the objective of strengthening the capacity and readiness of Mexican businesses to participate in a future ETS.

Mexico is also actively seeking to link its future ETS to markets in North America. To this end, in October 2015, Mexico signed a Memorandum of Understanding with Québec that includes cooperation on ETS. In August 2016, Mexico, Québec, and Ontario issued a joint declaration on carbon markets collaboration. Additionally, in December 2017, Mexico – together with four countries and seven subnational governments – issued the Paris Declaration on Carbon Pricing in the Americas for carbon pricing implementation, which creates a platform for cooperation among countries in the region.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **683.0 $MtCO_2E$ (2015)**

OVERALL GHG EMISSIONS BY SECTOR

Energy 480.9 (70%)
Industry 54.1 (8%)
Agriculture 102.1 (15%)
Waste 45.9 (7%)

GHG REDUCTION TARGETS

BY 2030: 22% reduction compared to BAU scenario and 36% conditional reduction, subject to a global mitigation agreement (NDC)
BY 2050: 50% reduction from 2000 GHG levels (Climate Change Law aspirational goal)

Other Information

INSTITUTIONS INVOLVED

Ministry of Environment and Natural Resources;
Ministry of Energy;
Ministry of Finance

COLOMBIA

ETS in force

ETS scheduled

ETS considered

Adopted a law outlining provisions for a potential national ETS

Expected focus on auctions

Possible connection with the carbon tax

ETS DESCRIPTION

In 2018, Colombia adopted a law for climate change management, which outlines provisions for the establishment of a National Program of Greenhouse Gas Tradable Emission Quotas (Programa Nacional de Cupos Transables de Emisión de Gases de Efecto Invernadero–PNCTE). Although there is no explicit reference to carbon markets or emissions trading, such a program is interpreted as providing for the establishment of a national ETS.

The law outlines the basic provisions for the PNCTE. The number of quotas will be determined by the Ministry of Environment and Sustainable Development (Minambiente), in line with Colombia's national mitigation targets. Minambiente is also in charge of allocation, which will primarily take place via auctions. The PNCTE will complement other mitigation instruments, such as the country's existing USD 5 carbon tax that was adopted in 2016 and its offsetting program adopted in 2017. The law for the PNCTE states that the government may also recognize carbon tax payments as part of the compliance obligation of regulated entities. Noncompliance is to be punishable by a fine up to two times the auction price. Auction revenues will be directed to the National Environmental Fund. The bill also includes crediting provisions: voluntary actions of non-regulated entities that generate GHG emissions reductions or removals could be issued quotas if they are verified, certified, registered in the National Registry, and eligible for the program.

Further regulations are yet to be developed in order to operationalize the PNCTE. The timeline for this is not yet specified.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **214.3 $MtCO_2e$ (2014)**

OVERALL GHG EMISSIONS BY SECTOR

Energy 82.5 (39%)
Industry 10.5 (5%)
Agriculture, Forestry, and Other Land Use (net) 106.9 (50%)
Waste 14.4 (7%)

GHG REDUCTION TARGETS

BY 2030: Reduce GHG emissions by 20% compared to BAU emissions by 2030, or by 30% if international support is provided (NDC)

Other Information

INSTITUTIONS INVOLVED

Ministry of Environment and Sustainable Development;
Department of National Planning;
Ministry of Mines and Energy;
Ministry of Finance;
National Climate Change System

CHINA

China National Emissions Trading System

GASES	ALLOCATION	OFFSETS AND CREDITS
CO_2 only	Free allocation	Domestic

EXPECTED COVERAGE
~3,300 $MtCO_2e$ (2020)

ETS in force

ETS scheduled

ETS considered

SECTORS:

POWER

Launched ETS politically in 2017 with a three-step roadmap to construct a fully operational market

Expected to initially cover power sector (three billion tonnes GHG)

Currently developing national market infrastructure and preparing power market simulation trading

ETS DESCRIPTION

Building on its experience of successfully piloting carbon markets in seven regions, China launched its national ETS politically in December 2017. This launch has been a goal set in 2015 at China's highest political level, which was reaffirmed by its Nationally Determined Contribution under the Paris Agreement, and the "13th Five-Year Work Plan for Greenhouse Gas Emission Control".

The provisions for the launch and incremental development of the ETS are laid out in the 'Work Plan for Construction of the National Emissions Trading System (Power Sector)' (the "Work Plan"), approved by the State Council in late 2017.

The ETS' objective is to contribute to the effective control and gradual reduction of carbon emissions in China and the achievement of green and low carbon development. The ETS is expected to regulate ~1,700 companies from the power sector (including combined heat and power, as well as captive power plants of other sectors), which emit more than 26,000 tonnes GHG or consume more than 10,000 tce per year. The Chinese system would cover more than three billion tonnes of CO_2e in its initial phase, accounting for about 30% of national emissions. The scope is to be further expanded in the future.

The Work Plan foresees a three-phase roadmap for the development of the ETS:

- **First Phase:** will focus on the development of market infrastructures (roughly one year);
- **Second Phase:** foresees simulation trading (roughly another year); and
- **Third Phase:** will be the deepening and expanding phase with allowances spot trading for compliance purposes (roughly starting from 2020).

A gradual transition of the Chinese pilots is foreseen by the Work Plan. In the short term, the existing ETS pilots are expected to operate in parallel to the national market, covering the non-power sectors. Over the medium to long term, they are expected to be integrated into the national market once it is fully operational.

YEAR IN REVIEW

In March 2018, the National People's Congress of China approved the plan to restructure the State Council, including the establishment of a new Ministry of Ecology and Environment (MEE) to replace the Ministry of Environmental Protection. In addition to environmental governance, the new ministry absorbs the climate change responsibilities previously under the National Development and Reform Commission (NDRC) and takes charge of the development of the national ETS.

In 2018, the government continued to advance the work on reporting and verification of the 2016-2017 emissions data from eight emission-intensive sectors of the economy. In terms of infrastructure, 2018 also saw the establishment of plans for a national registry and a trading system, as well as the development of a national enterprise GHG direct reporting system. Progress was also achieved in the technical preparation of the power sector with the establishment of a working group to: conduct research on the power industry participation in the national ETS, draft the refined allocation plan for the power sector and carbon market operation test plan, and compile training materials and technical guides on emissions trading. Work was also conducted on ETS design, including through consultation meetings and workshops, as well as through studies on the design of ETS elements such as allowance allocation and risk management.

Looking to the future, the main tasks of national ETS development are: establishing and improving national ETS regulations, accelerating the development of market infrastructure, promoting reporting, carrying out verification and carbon management for key enterprises, and strengthening capacity-building activities. The simulation trading in the power sector is expected to start in the first half of 2019.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **10,976.0 $MtCO_2e$ (2012)**

OVERALL GHG EMISSIONS BY SECTOR

Energy (excluding Transport) 7,946.9 (72%)
Transportation 702.9 (6%)
Industrial Processes 1,296.6 (12%)
Agriculture 831.6 (8%)
Waste 197.6 (2%)

GHG REDUCTION TARGETS

2016-2020: Reduction in carbon emissions per unit GDP by 18% compared to 2015 level (13th FYP)

BY 2020: 40-45% reductions in carbon intensity compared to 2005 levels (voluntary commitment under the Copenhagen Accord of 2009)

BY 2030: Peak CO_2 emissions around 2030, with best efforts to peak earlier; China also has committed to lowering CO_2 emissions per unit of GDP by 60-65% from 2005 levels (NDC)

ETS Size

GHGs COVERED
CO_2

CAPPED EMISSIONS
~3,300 $MtCO_2e$

SECTORS AND THRESHOLDS
Power sector (including combined heat and power, as well as captive power plants of other sectors).

The scope is expected to be gradually expanded to finally cover a total of eight sectors including: petrochemical, chemical, building materials, steel, nonferrous metals, paper, and domestic aviation. There is no specific timeline for this expansion.

INCLUSION THRESHOLDS: Entities with annual emissions of ~26,000 t/CO_2 (energy consumption of more than 10,000 tce) in any year over the period 2013-2015.

POINT OF REGULATION
Downstream

In the long run, both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are expected to be included.

NUMBER OF ENTITIES
~1,700

CAP
~3,300 $MtCO_2e$/year

Phases & Allocation

TRADING PERIODS

PHASE 1 (~A YEAR AS OF 2018): Development of market infrastructures

PHASE 2 (~ANOTHER YEAR AS OF 2019): Simulation trading

PHASE 3 (~FROM 2020 ON): Expanding sectoral coverage and deepening and expanding

CHINA

China National Emissions Trading System

ALLOCATION

The ETS competent authority will develop detailed allocation rules in cooperation with energy sector authorities.

FREE ALLOCATION: Free allocation is expected to be based on subsector benchmarks with ex-post adjustments for changes in actual production.

In 2017, draft allocation plans for power, cement, and electrolytic aluminum were developed and trial allocation work was carried out in two provinces. Further sector-based trial allocation is expected to be carried out in the first half of 2019 in order to refine and finalize the benchmarks.

Flexibility

BANKING AND BORROWING

Expected to allow banking across compliance phases, but not to allow borrowing.

OFFSETS AND CREDITS

The use of China Certified Emissions Reduction (CCER) credits is expected to be allowed during the third phase.

In 2012, the NDRC issued the 'Interim Measures for the Management of Voluntary GHG Emission Reduction Transactions' (the "Interim Measures"). These measures include guidelines for the issuance of CCERs.

The acceptance of CCERs is expected to be regulated through a revision of the Interim Measures and through the development of an 'Administration Measure of Offset Scheme for National ETS' (upcoming) focusing on the quality and limits on the use of CCERs in the ETS. Specific timelines and detailed rules are yet to be published.

MARKET STABILITY PROVISIONS

Adjustment mechanisms to prevent abnormal price fluctuations, as well as risk prevention and control mechanism to prevent market manipulations are to be developed.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of emissions to be submitted within a given timeline.

VERIFICATION: Emissions must be verified by a third-party verifier.

FRAMEWORK: MRV guidelines, supplementary data sheets, verification guidelines, and other guidance are available for the eight sectors expected to be covered by the ETS.

From 2013 to 2015, the NDRC released a series of MRV guidelines covering a total of 24 sectors. Supplementary MRV data sheets for the eight sectors expected to be covered under the national ETS, as well as 'Reference Guidance on Third-party Verification of China ETS' and 'Reference Qualification on Third-party Verification Body and Verifiers of China ETS,' were all released in 2016. In 2017, new requirements on data collection, categorization, and verification were added.

OTHER: The MEE is taking efforts to develop the management measure for corporate emissions reports as well as improve the existing guidelines and technical specifications for the national ETS.

ENFORCEMENT

Noncompliance would result in punishment, which may include recording the noncompliance information in the national credibility information sharing platform[1], although details are yet to be developed.

1 – The national credibility information sharing platform, developed in 2015, integrates credibility information provided by various departments and regions across the country. As of 2018, it has achieved interconnection with 44 ministries, 31 provinces and autonomous regions, and 65 market institutions.

Linking

LINKS WITH OTHER SYSTEMS

At the initial phases of the ETS, the focus is on the domestic ETS construction (rather than linking with other systems). Once the national ETS is fully operational, China and other jurisdictions such as EU and Korea may be interested in exploring linking opportunities.

Other Information

INSTITUTIONS INVOLVED

The MEE, in cooperation with other relevant ministries, is responsible for policy design and rule-making for the national ETS.

Local DRCs implement the policies and rules set up by the central level in their respective regions, but this is expected to be moved to local Ecology and Environment Bureaus, which are the corresponding government institutions of the MEE at the regional level, in the course of 2019.

IMPLEMENTING LEGISLATION

Work Plan for Construction of the National Emissions Trading System (Power Sector)[1]

Notice on Key Works in Preparation for the Launch of the National ETS[2]

24 Guidelines for GHG Monitoring and Reporting for various sectors *(2013*[3]*, 2014*[4] and *2015*[5]*)*

Interim Administrative Measures on Emissions Trading[6]

1 – http://www.ndrc.gov.cn/zcfb/gfxwj/201712/W020171220566893899825.pdf
2 – http://www.ndrc.gov.cn/gzdt/201601/t20160122_772150.html
3 – http://www.ndrc.gov.cn/zcfb/zcfbtz/201311/t20131101_565313.html
4 – http://www.waizi.org.cn/doc/27835.html
5 – http://www.ndrc.gov.cn/zcfb/zcfbtz/201511/t20151111_758275.html
6 – http://en.pkulaw.cn/display.aspx?cgid=3bd82d2e15823813bdfb&lib=law

BEIJING

Beijing Pilot Emissions Trading System

GASES	ALLOCATION	AVERAGE 2018 PRICE
CO_2 only	Free allocation	37.97 CNY (USD 5.74) (weighted average trading price)
OFFSETS AND CREDITS:	**CAP**	
Domestic	~50 $MtCO_2e$ (2017)[1]	

ETS DESCRIPTION

The Beijing Pilot ETS was launched in November 2013; to date, it has concluded five compliance years. Beijing is one of the few Chinese pilots with ETS regulation passed by their regional congress. The ETS covers about 45% of the city's total emissions, including both direct and indirect emissions from electricity providers, heat, cement, petrochemicals, other industrial enterprises, manufacturers, the service sector, and public transport. In cases of consecutively high or low average prices, the government can also auction or buy back extra allowances.

Beijing also has pioneered cross-regional trading with its neighboring provinces. A Framework Agreement for Cooperation on the Study of Cross-regional Carbon Emissions Trading with Tianjin, Hebei, Inner Mongolia, Shaanxi, and Shandong signed in 2013 provided a basis for cooperation. As a consequence of this, several cement companies from the Hebei province and companies from both the cement and power generation sectors voluntarily participated in the Beijing ETS in 2014 and 2015. Several companies from the same sectors in Inner Mongolia also voluntarily participated in 2015.

YEAR IN REVIEW

The 2017 allocation plan was released by the Beijing Development and Reform Commission (DRC) in February 2018. Compared to the previous year, the plan has two important changes: the power sector will be allocated allowances using benchmarking (instead of historical emissions intensity); and the emissions reduction factor has increased for most sectors, thus requiring further abatement action. In addition, an adjustment mechanism was created to avoid overallocation as a result of plant shutdowns or reductions in production.[2]

Much like the governance transition at the national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Beijing will be moved from the DRC to the Ecology and Environment Bureau. The process is ongoing and is expected to conclude by early 2019.

ETS in force

ETS scheduled

ETS considered

SECTORS:

POWER

INDUSTRY

TRANSPORT

BUILDINGS

One of two Chinese pilots with ETS regulation passed by regional congress

Using price floor and ceiling as price stability mechanism

Pioneered cross-regional trading

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF)	188.1 $MtCO_2e$ (2012)

GHG REDUCTION TARGETS

BY 2020: 20.5% reduction in carbon intensity compared to 2015 levels (13th Five Year Plan)

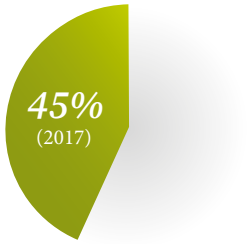
1 – It is estimated to be around this value also in 2018, but exact number is not available.

2 – Depending on which sector they are, a threshold was set for reducing the allowance by the same ratio of the emission reduction, i.e., 20% for cement and petrochemical and 50% for manufacturing, other industrial sectors, and tertiary.

ETS Size

GHGs COVERED
CO_2

CAPPED EMISSIONS
~50 $MtCO_2e$ (2017)



SECTORS AND THRESHOLDS
Industrial and non-industrial companies and entities, including electricity providers, heating sector, cement, petrochemicals, other industrial enterprises, manufacturers, service sector, and public transport.

INCLUSION THRESHOLDS: 5,000 tCO_2/year, considering both direct and indirect emissions.

MANDATORY REPORTING: 2,000 tonnes of standard coal equivalent (tce) energy consumption/year.

POINT OF REGULATION
Downstream.
Both direct and indirect emissions are covered.

NUMBER OF ENTITIES
943 (2017)

In addition, 621 entities have mandatory reporting obligation but no surrender obligations.

CAP
~50 $MtCO_2e$ (2017)

Phases & Allocation

TRADING PERIODS
2013-2018[3]

ALLOCATION
FREE ALLOCATION: Mainly free allocation through grandparenting based on emissions or emissions intensity in the baseline years (for 2017 allowances, the baseline years are 2009-2012 for stationary sources and 2013-2016 for mobile sources). Benchmarking is used for new entrants and entities with expanded capacity as well for the power sector.

AUCTIONING: Beijing could set aside up to 5% of allowances for regular and irregular auctions (see Market Stability Mechanisms). To date, the trigger price for auction has never been met.

Flexibility

BANKING AND BORROWING
Banking is allowed.
Borrowing is not allowed.

OFFSETS AND CREDITS
QUANTITATIVE LIMIT:
Domestic project-based carbon offset credits—China Certified Emission Reduction (CCER) credits—are allowed. The use of CCERs is limited to 5% of the annual allocation.

QUALITATIVE LIMIT:
CCERs from energy conservation projects and forestry carbon sink projects are allowed, whereas credits from hydropower, HFC, PFC, N_2O, and SF_6 projects are not eligible. CCERs must come from projects that began operation after the beginning of 2013 (with exceptions for carbon sink projects, for which the date is February 2005).

Out of the 5% limit, at least 50% must come from projects within the jurisdiction of the city of Beijing. Among the non-Beijing CCERs, priority is given to those with regional climate or pollution control cooperation agreements (e.g., Hebei and Tianjin).

3 – In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.

MARKET STABILITY PROVISIONS

The competent authority can auction extra allowances if the weighted average price exceeds CNY 150 (USD 22.67) for 10 consecutive days, and buy back allowances from the market using a special funding source from the municipal budget if the price is below CNY 20 (USD 3.02).

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions.

VERIFICATION: Third-party verification is required. In addition, further validation is carried out by government-assigned experts and random checks are conducted by fourth-party verifiers. Also, special attention is given to those only with mandatory reporting obligation while its reported emissions are close to 5,000 tCO_2.

FRAMEWORK: The Beijing DRC has released guidelines for monitoring and reporting for the following seven sectors: heat production and supply, thermal power generation, cement, petrochemicals, transport, other industrial enterprises, and the service sector.

OTHER: In addition to the ETS participants, all legal entities with energy consumption of more than 2,000 tce have to report their emissions. Verification is not required.

ENFORCEMENT

Penalties for failing to submit emissions or verification reports on time can result in fines up to 50,000 CNY (USD 7,558). Furthermore, companies failing to surrender enough allowances to match their emissions are fined up to five times the average market price over the past six months for each missing allowance. Other nonfinancial penalties include negative impacts on access to bank loans and subsidy programs.

Other Information

INSTITUTIONS INVOLVED

Beijing DRC (Competent authority) – the responsibility is expected to be moved to the Beijing Ecology and Environment Bureau in the course of 2019;
China Beijing Environment Exchange (trading platform and registry)

IMPLEMENTING LEGISLATION

Beijing Pilot ETS Implementation Plan[1]

Interim Measures for the Management Emissions Trading in Beijing[2]

Beijing DRC – Allocation Plan for Vintage 2017[3]

1 – http://www.bjrd.gov.cn/zdgz/zyfb/jyjd/201312/t20131230_124249.html
2 – http://news.bjx.com.cn/html/20140702/523941.shtml
3 – http://www.bjpc.gov.cn/zwxx/tztg/201802/t12508458.htm

CHONGQING

Chongqing Pilot Emissions Trading System

GASES	ALLOCATION	AVERAGE 2018 PRICE
Several gases	Free allocation	4.36 CNY (USD 0.66) (weighted average trading price)
OFFSETS AND CREDITS	**CAP**	
Domestic	~100 $MtCO_2e$ (2018)	

ETS in force

ETS scheduled

ETS considered

SECTORS:

POWER

INDUSTRY

Only Chinese pilot to cover non-CO_2 gases

Has annual cap reduction rate

Allocation based on entities' self-reported demand

ETS DESCRIPTION

Chongqing launched its pilot ETS in June 2014 and to date has concluded five compliance years. The system covers enterprises from seven sectors: power, electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel. The 195 enterprises covered by the system in 2017 accounted for ~40% of the city's total emissions. Among the eight Chinese pilots, the Chongqing ETS is the only one that covers non-CO_2 gases.

One unique feature of the Chongqing Pilot ETS is that it has a clear path for cap setting, in which an annual reduction rate is set and applied to the base year emission (i.e., the sum of the covered entities' highest emission amount of the year from 2008 to 2012). From 2013 to 2015, the annual reduction rate was 4.13% and afterwards 4.85%. The Chongqing Pilot ETS had suffered from low liquidity in past years due to a relatively loose cap in its early years.

YEAR IN REVIEW

The 2017 allocation plan was released by the Chongqing Development and Reform Commission (DRC) in March 2018. The plan differs from other pilots in that the Chongqing ETS allowances are allocated based on entities' self-reported demand. 2017 was the first year since the launch of the pilot where the initial cap (100.5 $MtCO_2e$) was lower than the self-declared demanded amount (103.2 $MtCO_2e$) – indicating a potential allowance shortage for some companies in the market.

ETS-related responsibilities in Chongqing were moved from the DRC to the Ecology and Environment Bureau in 2018.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF)	~300 $MtCO_2e$ (2018)

GHG REDUCTION TARGETS

BY 2020: 19.5% reduction in carbon intensity compared to 2015 levels (13th Five Year Plan)

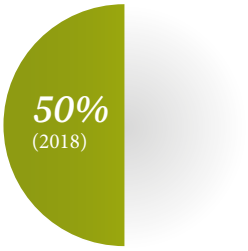
ETS Size

GHGs COVERED

CO_2, CH_4, N_2O, HFCs, PFCs, SF_6

CAPPED EMISSIONS

~100 $MtCO_2e$



SECTORS AND THRESHOLDS

Power, electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel.

INCLUSION THRESHOLDS:

20,000 tCO_2/year or energy consumption 10,000 tonnes coal equivalent (tce)/year.

POINT OF REGULATION

Downstream.
Both direct and indirect emissions are covered.

NUMBER OF ENTITIES

195 (2018)

CAP

~100 $MtCO_2e$ (2018)
From 2013 to 2015, the annual reduction rate of the cap was 4.13% and afterwards 4.85%.

Phases & Allocation

TRADING PERIODS

2013-2018[1]

ALLOCATION

FREE ALLOCATION: Free allocation through grandparenting based on historic emissions (highest number in period 2008-2012). If the sum of allocation for all enterprises exceeds the cap, a reduction factor is applied. Regulated companies submit their allocation quotas on a yearly basis, forming the basis of their free allocation. Ex-post adjustments based on output data are possible.

Flexibility

BANKING AND BORROWING

Banking is allowed.
Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Domestic project-based carbon offset credits – CCERs – are allowed up to 8% of the compliance obligation.

QUALITATIVE LIMIT: Reductions have to be achieved after 2010 with the exception of carbon sink projects. Credits from hydro projects are not allowed.

MARKET STABILITY PROVISIONS

Exchange Intervention: In case of market fluctuations, the Chongqing Carbon Emissions Exchange can take price stabilization measures.

Sale and Trade Limits: Compliance entities must not sell more than 50% of their annual free allocation. In addition, the price of trading is subject to increase and decrease limits of 10% or 30% depending on types of trading.

1 – In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.

Compliance

COMPLIANCE PERIOD
One year

MRV
REPORTING FREQUENCY: Annual reporting of GHG emissions.

VERIFICATION: Third-party verification is required.

FRAMEWORK: The Chongqing DRC released a guiding document for monitoring and reporting that includes methods for different emissions sources, including: combustion, industrial processes, and electricity consumption.

ENFORCEMENT
There are no financial penalties for non-compliance. Non-financial penalties may include public reporting, disqualification from the energy saving and climate subsidies and associated awards for three years, and a record entered in the State Owned Enterprise performance assessment system.

Other Information

INSTITUTIONS INVOLVED
Chongqing Ecology and Environment Bureau (Competent authority);
Chongqing Carbon Emissions Trading Center (Trading platform and registry)

IMPLEMENTING LEGISLATION
Interim Measures for Management of Emissions Trading In Chongqing[1]

Chongqing DRC – Allowance Allocation Management Rules[2]

Chongqing DRC – Notice about Allowances Allocation for Vintage 2017

1 – http://www.tanpaifang.com/tanjiaoyisuo/2014/0504/31858.html
2 – http://www.tanjiaoyi.com/article-2786-1.html

FUJIAN

Fujian Pilot Emissions Trading System

GASES	ALLOCATION	AVERAGE 2018 PRICE
CO_2 only	Free allocation	18.02 CNY (USD 2.72) (weighted average trading price)
OFFSETS AND CREDITS:	**CAP**	
Domestic	~200 $MtCO_2e$ (2017)	

ETS in force

ETS scheduled

ETS considered

ETS DESCRIPTION

Fujian launched its ETS in September 2016 and is the eighth regional pilot ETS in China. Unlike other pilots, which were mandated jointly by the National Development and Reform Commission (NDRC), the mandate for the Fujian ETS came from the State Council with the endorsement of the National Ecological Civilization Pilot Area (Fujian) Implementation Plan. The Haixia Equity Exchange in Fujian was approved by the NDRC as one of nine trading platforms for trading Chinese Certified Emission Reductions (CCERs), demonstrating the recognition by NDRC of the regional market.

The system covers nine sectors: electricity, petrochemical, chemical, building materials, iron and steel, nonferrous metals, paper, aviation, and ceramics. Given the prominence of the forestry sector in Fujian, its ETS pilot has a special focus on carbon sinks. In 2017, the Fujian government outlined a plan to promote forestry offsets projects in the province. By 2020, the selected counties in the province are required to develop forestry projects covering two million acres of forests, achieving an expected one million tonnes of emission reductions annually.

YEAR IN REVIEW

The 2017 allocation plan was released by the Fujian Development and Reform Commission (DRC) in July 2018. With the same coverage threshold as the previous year, the number of covered entities fell slightly from 277 (2016) to 255. Almost 50% of the regulated entities (109) are architectural ceramics companies.

Much like the governance transition at the national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Fujian will be moved from the DRC to the Ecology and Environment Bureau. The process is ongoing and is expected to conclude by early 2019.

SECTORS:

POWER

INDUSTRY

DOMESTIC AVIATION

Only regional Chinese ETS not belonging to seven pilots originally assigned by NDRC

Focus on carbon sinks and forestry in ETS, developed own provincial offsets

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF)	240 $MtCO_2e$ (2014)

GHG REDUCTION TARGETS

BY 2020: 19.5% reduction in carbon intensity compared to 2015 levels

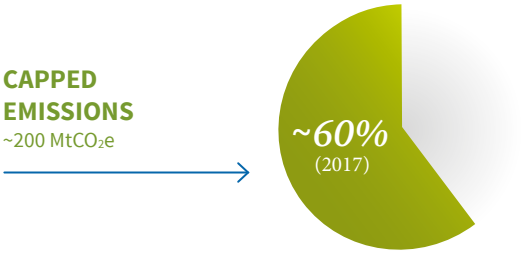
ETS Size

GHGs COVERED

CO_2

CAPPED EMISSIONS

~200 $MtCO_2e$



SECTORS AND THRESHOLDS

Electricity, petrochemical, chemical, building materials, iron and steel, nonferrous metals, paper, aviation, and ceramics.

INCLUSION THRESHOLDS: Energy consumption 10,000 tonnes of coal equivalent (tce)/year for any year between 2013-2016.

In the future, the Fujian system may extend its coverage to smaller emitters, i.e., with energy consumption of 5,000 tce or more.

POINT OF REGULATION

Downstream.
Both direct and indirect emissions are covered.

NUMBER OF ENTITIES

255 (2017)

CAP

~200 $MtCO_2e$ (2017)

Phases & Allocation

TRADING PERIODS

2016-2018[1]

ALLOCATION

FREE ALLOCATION: Benchmarking is applied to electricity, cement, aluminum, and plate glass sectors.

The other sectors are allocated allowances based on historical intensity. These entities can also apply for more allowances for early mitigation actions.

Free allowances are also to be allocated to new entrants while they are only covered after 12 or 24 months of operation (depending on type of allocation methods).

AUCTIONING: Auctioning may take place where considered appropriate by the ETS authorities (see Market Stability Provisions below) and may be introduced as a method for allowance allocation over time; up to 10% of the total cap is reserved for market intervention.

In order to increase market liquidity and price discovery, the Fujian DRC organized an auction in 2016 of discriminatory (non-uniform price) allowances. 50,000 allowances from the government reserve were auctioned, with the settlement prices ranging from CNY 26.50 (USD 4.01) to around CNY 30 (USD 4.53). To date, this is the only auction held in the province.

Flexibility

BANKING AND BORROWING

Banking is allowed.
Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Domestic project-based carbon offset credits (CCERs) and Fujian Forestry Certified Emission Reduction (FFCER) are allowed. The use of CCER credits is limited to 5% of the annual compliance obligation, which is increased to 10% for companies that use both FFCER and CCER credits.

QUALITATIVE LIMIT: Eligible offsets will be restricted to those generated in Fujian province, from CO_2 or CH_4 projects. Hydropower-related credits are not eligible. FFCER projects, with three project types (afforestation, forest management, and bamboo management), need to start implementation after 16 February 2005 and the project developers need to have independent legal personality.

1 – In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.

FUJIAN

Fujian Pilot ETS

MARKET STABILITY PROVISIONS

DRC Intervention, Reserves: According to the (trial) "Implementation Rules of Emissions Trading Market Management in Fujian Province," in case of market fluctuations (i.e., if the cumulative increase or decrease of allowance prices for 10 consecutive trading days reach a certain percentage), severe imbalances between supply and demand, or liquidity issues, the Fujian Economic and Information Center under the guidance of the Fujian DRC – in consultation with an advisory committee – can buy or sell allowances in order to stabilize the market. More specifically, high prices may trigger allowance auctions from government reserves through the Haixia Equity Exchange. Low prices may trigger authorities to buy allowances from the market through governmental funds.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions.

VERIFICATION: Third-party verification is required. In addition, further validation is carried out by government-assigned experts and random checks are conducted by fourth-party verifiers. Special attention is also given to those only with mandatory reporting obligation while its reported emissions are close to 5,000 tCO_2.

FRAMEWORK: The Fujian DRC and the Fujian Statistical Bureau have jointly released a guiding document on monitoring and reporting that includes a monitoring plan template, using national measuring and reporting guidelines. In addition, the Fujian DRC and the Fujian Quality and Technical Supervision Bureau also jointly released a measure for the administration of third-party verifiers, which specifies criteria for the verifiers and their staff.

ENFORCEMENT

Penalties for failing to submit an emissions or verification report on time, providing false information, or disturbing the verification process range from CNY 10,000 (USD 1,512) to CNY 30,000 (USD 4,535). Companies failing to surrender enough allowances to match their emissions are fined between one to three times the average market price of the past 12 months, with the maximum limit of CNY 30,000 (USD 4,535). Twice the amount of the missing allowances can be withdrawn from the account of the company or deducted from next year's allocation. Penalties for the misconduct of trading entities and their staff, such as not publishing relevant trading information or leaking commercial secrets, could range from CNY 10,000 (USD 1,512) to CNY 30,000 (USD 4,535).

Other Information

INSTITUTIONS INVOLVED

Fujian DRC (Competent authority) – the responsibility is expected to be moved to the Fujian Ecology and Environment Bureau in the course of 2019;
Fujian Huaxia Equity Exchange (Trading platform);
Fujian Economic and Information Center (Registry, market management, MRV administration)

IMPLEMENTING LEGISLATION

Implementation Plan of Emissions Trading Market Construction in Fujian Province[1]

Interim Measures for the Management of Emissions Trading in Fujian Province[2]

Fujian DRC – Allocation Plan for Vintage 2017[3]

1 – http://fgw.fujian.gov.cn/ztzl/stwmzt/qwsy/201609/t20160930_823497.htm
2 – http://www.fujian.gov.cn/m/#!/detail/1135886
3 – http://fgw.fujian.gov.cn/zfxxgkzl/zfxxgkml/yzdgkdqtxx/201807/t20180730_3595897.htm

GUANGDONG

Guangdong Pilot Emissions Trading System

GASES	ALLOCATION	AVERAGE 2018 PRICE
CO_2 only	Free allocation Auctioning	CNY 15.10 (USD 2.28) (weighted average trading price)
TOTAL REVENUE	**OFFSETS AND CREDITS**	**CAP**
Since beginning of program: CNY 804 million (USD 122 million) No revenue in 2018 (no auctions took place)	Domestic	422 $MtCO_2e$ (2018)

ETS in force

ETS scheduled

ETS considered

SECTORS:

POWER

INDUSTRY

DOMESTIC AVIATION

Largest Chinese pilot

One of most active Chinese pilots with largest market share for the spot trading

Only Chinese pilot regularly auctioning

ETS DESCRIPTION

The Guangdong Pilot ETS was launched in December 2013 and is the largest of the Chinese ETS pilots. It currently covers the power, cement, steel, petrochemical, papermaking, and aviation sectors, accounting for more than 60% of the province's emissions. This is the result of an expansion of its scope back in 2016, which introduced two new sectors (domestic aviation and paper) and adjusted allocation methods. In 2017, the Guangdong Pilot ETS had 50 new entrants.

The Guangdong Pilot ETS has one of the most active markets among Chinese pilots with the largest market share. Unlike other pilots, Guangdong auctions a small share of allowances[1]. The auctioning has been moved from mandatory (2013) to voluntary participation (since 2014) and has been held ad hoc (rather than quarterly) since 2017. Guangdong and Shenzhen are the only two Chinese pilots open to foreign investors.

In November 2016, Guangdong increased the maximum position of institutional and individual investors from three to eight million allowances. Guangdong also allows unincorporated organizations, such as funds and trusts, to trade in its carbon market. As of 2018, it had 72 institutional investors.

YEAR IN REVIEW

The 2018 allocation plan was released by the Guangdong Development and Reform Commission (DRC) in July 2018. No significant changes were implemented compared to the allocation plan of the previous year.

Much like the governance transition at the national level (see China National ETS factsheet), the ETS-related responsibilities in Guangdong provincial level moved from the DRC to the Ecology and Environment Bureau in October 2018.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) — **610.5 $MtCO_2e$ (2012)**

GHG REDUCTION TARGETS

BY 2020: 20.5% reduction in carbon intensity compared to 2015 levels

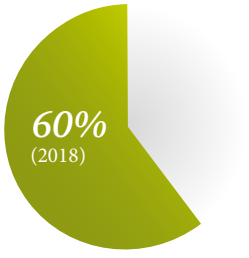
ETS Size

GHGs COVERED

CO_2

CAPPED EMISSIONS

422 $MtCO_2e$



1 - It was mandatory for enterprises to purchase 3% of their allowances from auctions in 2013 before receiving the remainder for free. Since 2014, the non-free allocation rate has been raised to 5% for the power sector and 3% for the remaining sectors.

SECTORS AND THRESHOLDS

Power, iron and steel, cement, papermaking, aviation, and petrochemicals.

INCLUSION THRESHOLDS: 20,000 tCO_2/year or energy consumption 10,000 tonnes coal equivalent (tce)/year.

POINT OF REGULATION

Downstream.
Both direct and indirect emissions are covered[2].

NUMBER OF ENTITIES

249 (2018), existing entities
39 (2018), new entrant entities

CAP

422 $MtCO_2e$ (2018), among which 23 $MtCO_2e$ are kept as government reserves for new entrants and market stability.

Phases & Allocation

TRADING PERIODS

2013-2018[3]

ALLOCATION

FREE ALLOCATION: Mainly free allocation based on grandparenting, historical intensity, or benchmarking. Benchmarking is applied to coal and gas-fired electricity generators (including heating, as well as combined heat and power), as well as to some industrial processes in the aviation, cement, paper, and steel sectors. Ex-post adjustments based on real production data of the respective compliance year are also applied.

AUCTIONING: Guangdong auctions a small share of allowances as a way of allowance allocation. During the first compliance year (2013), entities were required to purchase allowances in auctions in order to become eligible to receive their freely allocated allowances. This requirement was terminated in 2014. Since 2014, free allocation percentages remain the same, i.e., 95% for the power sector and 97% for the remaining sectors. A total of two million allowances are available for auction annually. Quarterly auctions were held until the 2016 vintage while for 2017 and 2018, auctions were ad hoc. No auction took place in 2018.

Flexibility

BANKING AND BORROWING

Banking is allowed.
Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Carbon offset credits (CCERs) are allowed. As a mechanism that encourages the public to reduce carbon emissions, Pu Hui Certified Emission Reductions (PHCER) are also allowed during 2017 and 2018. In 2018, entities are allowed to make use of 1.5 million offsets (CCER and PHCER) towards compliance obligations.

QUALITATIVE LIMIT: Of the annual compliance obligation met by offsets, at least half must be from CO_2 or CH_4 reduction projects. At least 70% of offsets need to come from within the Guangdong province. Pre-CDM credits are not eligible. Credits from hydro and from most fossil fuel projects are also not eligible.

MARKET STABILITY PROVISIONS

Reserves: The Guangdong province set aside 5% of all allowances for government reserves for new entrants and market stability. The specific rules for market stability are provided by its Trial Measures for ETS.

Auction Floor Price: Auctions under the Guangdong Pilot ETS are subject to an auction floor price. Initially in 2013, it was set at CNY 60 (USD 9.07), and then it was lowered to CNY 25 (USD 3.78) and increased to CNY 40 (USD 6.05) in steps of CNY 5 (USD 0.76) with each quarterly auction. In 2015, the floor price was set at 80% of the weighted average price for allowances over the previous three months. In 2016, there was no

2 - The electricity market in Guangdong has undergone some changes following the national power sector reform process. In 2019, about a third of the total electricity consumption in Guangdong will be included in the electricity trading market. Guangdong also plans to launch an electricity spot market.
3 - In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market once it is fully operational.

restriction on the declared price, but a so-called policy reserve price was set as an effective price floor. In 2017, the policy reserve price was set at 100% of the weighted average price for allowances over the previous three months. The policy reserve prices for the four auctions for the 2016 compliance period are as follows: (21 June 2016–20 June 2017) were CNY 9.37 (USD 1.42), CNY 11.27 (USD 1.70), CNY 16.09 (USD 2.43), and CNY 15.15 (USD 2.29).

OFFSET AUCTIONS: Guangdong also introduced auctioning for PHCERs with an auction price floor set by the Emissions Exchange Guangzhou on behalf of the project developers. In the latest auction (19 November 2018), the floor price was set as CNY 12.32/tonne (USD 1.86) (which is set at 80% of the weighted average price for allowances over the previous three months).

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions.

VERIFICATION: Third-party verification is required. In addition, further assessment of all validation reports was carried out by the government. On-site cross re-verifications were also conducted by third parties for all compliance entities with questionable verification reports as well for randomly selected entities. These have been shifted to fourth-party assessment and verification since the 2016 compliance period.

FRAMEWORK: The Guangdong DRC has released guidelines for monitoring and reporting for the compliance and reporting sectors.

OTHER: In addition to the ETS participants, all legal entities with energy consumption of more than 2,000 tce have to report their emissions. Verification is not required.

ENFORCEMENT

Penalties for failing to submit emissions or verification reports on time range from CNY 10,000 (USD 1,512) to CNY 50,000 (USD 7,558). Furthermore, companies failing to surrender enough allowances to match their emissions will be deducted twice the amount of allowances from the following year's allocation and are fined CNY 50,000 (USD 7,558). Other non-financial penalties include negative impacts on access to bank loans and subsidy programs.

Other Information

INSTITUTIONS INVOLVED

Guangdong Ecology and Environment Bureau (Competent authority);
Emissions Exchange Guangzhou (Trading platform)

USE OF REVENUES

Guangdong has been exploring the establishment of a Low Carbon Development Fund that would use auctioning revenues to promote further mitigation actions, carbon finance, and low-carbon industry development. The set-up and function of this fund is still under discussion between Guangdong DRC and Guangdong Finance Department. Currently, the revenue flows into the general provincial budget.

IMPLEMENTING LEGISLATION

Guangdong Pilot ETS Implementation Plan[1]

Trial Measures for Emissions Trading in Guangdong[2]

Guangdong DRC – Allocation Plan for Vintage 2018[3]

1 – http://zwgk.gd.gov.cn/006939748/201209/t20120914_343489.html
2 – http://zwgk.gd.gov.cn/006939748/201401/t20140117_462131.html ;
3 – http://www.gddrc.gov.cn/zwgk/jywtz/201807/t20180725_476705.shtml

HUBEI

Hubei Pilot Emissions Trading System

GASES	ALLOCATION	AVERAGE 2018 PRICE
CO_2 only	Free allocation	CNY 21.23 (USD 3.21) (weighted average trading price)
TOTAL REVENUE	**OFFSETS AND CREDITS**	**CAP**
Revenue information for the 2014 auction not available[1]. No auctions took place in 2018	Domestic	257 $MtCO_2e$ (2017)

ETS in force

ETS scheduled

ETS considered

ETS DESCRIPTION

The Hubei Pilot ETS was launched in April 2014; to date, it has concluded five compliance years. Hubei has been one of the most active regional markets in China in terms of trading and has the second-largest market size when considering spot trading only, after Guangdong. When spot forward trading is also considered, Hubei has the largest market share as of end 2018, with its total secondary market transaction volume and value both accounting for over 60% of the sum of all pilots together. The system initially covered 138 of the most carbon-intensive companies in the province, accounting for approximately 35% of the province's total carbon emissions.

Hubei has also expanded its scope several times. In 2016, it lowered the thresholds of seven sectors from 60,000 to 10,000 tonnes coal equivalent (tce) and in 2017 further lowered the thresholds of all the other sectors to 10,000 tce. A government reserve with 8% of the total cap is available for market stabilization, and the government can also intervene in cases of market fluctuations, severe supply-demand imbalances or for liquidity reasons.

According to the compliance notice by the Hubei Development and Reform Commission (DRC) in July 2017, the Hubei Pilot ETS will continue to run after the National ETS commences. However, only allowances that were traded can be banked into later years. The transition of Hubei allowances into the National ETS will be based on rules to be defined by the national competent authority. In December 2017, Hubei was selected to lead the development of the registry for the national ETS.

YEAR IN REVIEW

The 2017 allocation plan was released by the Hubei DRC in January 2018. The key change compared to the previous year's plan is a tighter allocation rule. By lowering thresholds for some sectors, it also increased the total number of covered entities from 126 (in 2016) to 344 (in 2017).

Much like the governance transition at the national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Hubei will be moved from the DRC to the Ecology and Environment Bureau. The process is ongoing and is expected to conclude by early 2019.

SECTORS:

POWER

INDUSTRY

Active trading pilot, largest market share (spot and spot forward)

Has market stability reserve, government can intervene in cases of low or high prices

Leading development of national ETS registry

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF)	463.1 $MtCO_2e$ (2012)

GHG REDUCTION TARGETS

BY 2020: 19.5% reduction in carbon intensity compared to 2015 levels

1 – To date, only one auction has been held in Hubei, with four million tonnes of allowances auctioned in 2014. The objective of the auction was to discover the market price and enhance market liquidity, rather than as a way of allowance allocation.

ETS Size

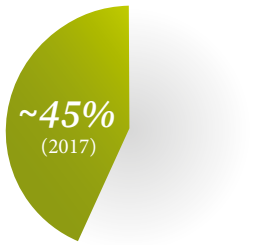
GHGs COVERED
CO_2

SECTORS AND THRESHOLDS
Power and heat supply, iron and steel, nonferrous metals, petrochemicals, chemicals, textile, cement, glass and other building materials, pulp and paper, ceramics, automobile and equipment manufacturing, and food, beverage, and medicine producers.

INCLUSION THRESHOLDS: Annual energy consumption more than 10,000 tce in any year between 2014 and 2016.

UNTIL 2015: Annual energy consumption more than 60,000 tce in any year between 2010 and 2011.

CAPPED EMISSIONS
257 $MtCO_2e$



POINT OF REGULATION
Downstream
Both direct and indirect emissions are covered.

NUMBER OF ENTITIES
344 (2017)

CAP
257$MtCO_2e$ (2017)

Phases & Allocation

TRADING PERIODS
2014-2018[2]

ALLOCATION
FREE ALLOCATION: Free allocation of 2017 vintage allowances through benchmarks for power, heat, co-generation, and cement (except the entities using outsourced clinker).

Historical emissions intensity for glass and other building materials, pulp and paper, and ceramics sectors; grandparenting based on previous three years' historic emissions for all other sectors.

Ex-post allocation adjustments are possible, especially for those sectors that use benchmarks and emissions intensity[3].

The total cap also includes a New Entrants Reserve, as well as a government reserve for potential market stability measures.

Flexibility

BANKING AND BORROWING
Banking is allowed, but only for allowances that were traded at least once. Borrowing is not allowed.

OFFSETS AND CREDITS
QUANTITATIVE LIMIT:
The use of domestic project-based carbon offset credits (CCERs) is limited to 10% of the annual initial allocation for each entity.

QUALITATIVE LIMIT:
CCERs must come from rural biogas or forestry projects in the key counties under the national or provincial poverty alleviation plan in urban agglomeration areas of the middle reaches of the Yangtze River (within Hubei). CCERs must have been generated between 1 January 2013 and 31 December 2015.

2 – In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.
3 – In this case, entities first receive half of the total allowance based on the previous year's actual emission data or historical emission baseline; the actual production data is then used to update allocation ex-post.

HUBEI

Hubei Pilot ETS

MARKET STABILITY PROVISIONS

Reserve: 8% of the total cap is kept as a government reserve for market stabilization.

DRC Intervention: In case of market fluctuations, severe imbalances between supply and demand or liquidity issues, the Hubei DRC – in consultation with an advisory committee consisting of government institutions and other stakeholders – can buy or sell allowances in order to stabilize the market. Specifically, if the allowance price reaches a low or high point six times during a 20-day time span, the Hubei DRC takes action.

Exchange: The exchange limits day-to-day price fluctuations to between -10% and +10% respectively; between 15 July and 25 December 2016, the limit was temporarily adjusted to between -1% and +10% as a response to the decreasing carbon price at that time.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions.

VERIFICATION: Third-party verification is required. In addition, further validation is carried by government-assigned experts and random checks are conducted by fourth-party verifiers. Special attention is also given to those only with mandatory reporting obligation while its reported emissions are close to 26,000 tCO_2.

FRAMEWORK: The Hubei DRC has released a guiding document on monitoring and reporting that includes sector-specific guidance for the following sectors: power, glass, aluminum, calcium carbide, pulp and paper, automobile manufacturing, iron and steel, ferroalloys, ammonia, cement, and petroleum processing.

ENFORCEMENT

Penalties for failing to submit an emissions or verification report on time range from CNY 10,000 (USD 1,512) to CNY 30,000 (USD 4,535). Trade participants that manipulate the market face up to CNY 150,000 (USD 22,673) in fines. Furthermore, companies that fail to surrender enough allowances to match their emissions will be deducted twice the amount of allowances from next year's allocation and are fined one to three times the average market price for every allowance, with a maximum limit of CNY 150,000 (USD 22,673).

Other Information

INSTITUTIONS INVOLVED

Hubei DRC (Competent authority)—the responsibility is expected to be moved to the Hubei Ecology and Environment Bureau in the course of 2019;
China Hubei Emission Exchange (Trading platform and registry)

IMPLEMENTING LEGISLATION

Hubei Pilot ETS Implementation Plan[1]

Interim Measures for Management of Emissions Trading in Hubei Province[2]

Hubei DRC – Allocation Plan for Vintage 2017[3]

1 – http://gkml.hubei.gov.cn/auto5472/auto5473/201302/t20130227_435678.html
2 – http://gkml.hubei.gov.cn/auto5472/auto5473/201404/t20140422_497476.html
3 – http://fgw.hubei.gov.cn/xw/tzgg_3465/gg/wbwj/201801/t20180115_134615.shtml

SHANGHAI

Shanghai Pilot Emissions Trading System

GASES	ALLOCATION	AVERAGE 2018 PRICE
CO_2 only	Free allocation Auctioning	CNY 37.99 (USD 5.74) (weighted average trading price)
TOTAL REVENUE	**OFFSETS AND CREDITS**	**CAP**
Since beginning of program: CNY 14.65 million (USD 2.21 million) Collected in 2018: CNY 12.68 (USD 1.92 million)	Domestic	158 $MtCO_2e$ (2018)

ETS in force

ETS scheduled

ETS considered

SECTORS:

- POWER
- INDUSTRY
- DOMESTIC AVIATION
- TRANSPORT*
- BUILDINGS*

** Sector covered upstream*

Broad sector coverage with 100% compliance rate since launch

Active offset trading market, pioneered spot forward trading

Leading development of national trading platform

ETS DESCRIPTION

Shanghai was the second Chinese region, after Shenzhen, to start its pilot ETS in November 2013 and has concluded five compliance years so far. The pilot covers more than half of the city's emissions, including power, industry, and non-industrial sectors such as building, aviation, and shipping. It is the only pilot that has achieved almost 100% compliance rate continuously since its launch. In 2016 Shanghai expanded its ETS coverage by adding the shipping sector, as well as lowering the threshold of exiting power and industries (which were included in the 2013-2015 phase) to 10,000 tCO_2/year.

Shanghai is the most active among the Chinese pilots in terms of offset credits trading. It also pioneered allowance spot forward trading in China. In January 2017, the Shanghai Environmental and Energy Exchange and Shanghai Clearing House jointly launched the over-the-counter Shanghai Emission Allowance Forward contract, with central counterparty clearing, as an innovative financial product that serves a purpose similar to carbon financial derivatives. Shanghai has also carried out various other carbon finance innovations such as repurchases, green bonds, carbon funds, carbon trusts, CCER mortgages, and allowance borrowing.

In December 2017, Shanghai was selected to lead the development of the trading platform for the national ETS.

YEAR IN REVIEW

The 2018 allocation plan was released by the Shanghai Development and Reform Commission (DRC) in December 2018. No significant changes were implemented compared to the allocation plan of the previous year.

Much like the governance transition at national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Shanghai will be moved from the DRC to the Ecology and Environment Bureau. The process is ongoing and is expected to conclude by early 2019.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF)	297.7 $MtCO_2e$ (2012)

GHG REDUCTION TARGETS

BY 2020: 20.5% reduction in carbon intensity compared to 2015 levels. The total CO_2 emissions to be limited within 250 million tonnes.

1 – In the short term, the existing Chinese regional carbon markets are expected to operate parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.

ETS Size

GHGs COVERED
CO_2

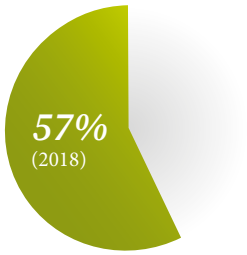
SECTORS AND THRESHOLDS
Airports, aviation, chemical fibers, chemicals, commercial, power and heat, water suppliers, hotels, financial, iron and steel, petrochemicals, ports, shipping, nonferrous metals, building materials, paper, railways, rubber, and textiles.

INCLUSION THRESHOLDS:
For power and industry: 20,000t CO_2/year or 10,000 tonnes coal equivalent (tce)/year; and those that already participated in the 2013-2015 phase with 10,000 tCO_2/year or 5,000 tce/year.

For Transport: 10,000t CO_2/year or 5,000 tce/year (aviation and ports), 100,000t CO_2/year or 50,000 tce/year (shipping), considering both direct and indirect emissions.

For Buildings: 10,000t CO_2/year or 5,000 tce/year.

CAPPED EMISSIONS
158 MtCO_2e



POINT OF REGULATION
Downstream.
Both direct and indirect emissions are covered.

NUMBER OF ENTITIES
298 (2018)

CAP
158 MtCO_2e (2018, including both free allocation and reserve)

Phases & Allocation

TRADING PERIODS
Two trading periods: first period 2013-2015, second period 2016; no specific ending year. [1]

ALLOCATION
FREE ALLOCATION: Free allocation based on sector-specific benchmarks (power, heat, manufacturers), historic emissions intensity (industry, aviation, car glass, ports, shipping, and water suppliers, generally based on 2014-2016 data), or historic emissions (buildings, commercial sector, industry with complex products or considerable change in emission boundary, and airports, generally based on 2014-2016 data).

Ex-post allocation adjustments, e.g., on the basis of production data, are applied for those with historic intensity or benchmarking allocations.

AUCTIONING: A small share of the annual cap could be auctioned. The purpose of auctions is not to allocate allowance but to provide compliance entities with additional supply to meet their compliance demand. Shanghai auctioned two million tonnes from the government reserve in July 2018, with a floor price set at two times the weighted on-exchange allowance price from 18 November 2016 to 30 July 2018—CNY 41.54 (USD 6.28). The auction cleared at the floor price and a total of 305,237 tonnes (15% of total auction volume). An auction of two million allowances was held in June 2017. 2% of allowances were sold, at the floor price of CNY 38.77 (USD 5.86).

Flexibility

BANKING AND BORROWING
Banking is allowed both within and across compliance periods, with some restrictions for the latter.

For banked allowances from the first trading period (2013-2015), only one-third can be used per year between 2016 and 2018 by compliance entities;

allowances are fully bankable for institutional investors, with some restrictions for OTC deals.
Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Domestic project-based carbon offset credits—CCERs—are allowed. Since 2016 the use of CCER credits is limited to 1% of the annual allocation. Between 2013 and 2015 the limit was 5%.

QUALITATIVE LIMIT: Credits for reductions that were realized before January 2013 cannot be used for compliance. Credits from hydro projects are not allowed.

MARKET STABILITY PROVISIONS

Exchange: Depending on transaction types, if prices vary more than 10% or 30% in one day, the Shanghai Environment and Energy Exchange can take price stabilization measures such as temporarily suspending trading or imposing holding limits.

Reserve: In addition, a small share of annual cap could be kept in a reserve for auctioning before the end of the annual compliance cycle as a market stability measure (see Auctions section).

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions.

VERIFICATION: Third-party verification is required. Besides this, the government also conducts quality checks.

FRAMEWORK: The Shanghai DRC has released monitoring and reporting guidelines for the following 10 sectors: iron and steel, electricity and heat, chemicals, nonferrous metals, non-metallic mineral products, textiles and paper, aviation, shipping, large buildings (hotels, commercial, and financial), and transport stations.

ENFORCEMENT

Penalties for failing to submit an emissions report or verification report on time or providing fraudulent information range from CNY 10,000 (USD 1,512) to CNY 50,000 (USD 7,558).
Between CNY 50,000 (USD 7,558) and CNY 100,000 (USD 15,115) can be imposed for non-compliance, besides surrendering the adequate amount of allowances. Further sanctions may also be imposed, such as entry into the credit record of the company, publication on the internet, cancelation of ability to access special funds for energy conservation, and emissions reduction measures.

Other Information

INSTITUTIONS INVOLVED

Shanghai DRC (competent authority; the responsibility is expected to be moved to the Shanghai Ecology and Environment Bureau in the course of 2019);
Shanghai Environment and Energy Exchange (trading platform);
Shanghai Information Center (registry)

USE OF REVENUES

The revenues are submitted to the general municipality budget.

IMPLEMENTING LEGISLATION

Shanghai Pilot ETS Implementation Plan[1]

Trial Measures for Management of Emissions Trading in Shanghai[2]

Shanghai DRC - Allocation Plan for Vintage 2018[3]

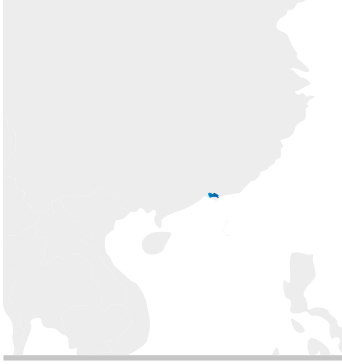
Shanghai DRC - Allocation Plan for Vintage 2017[4]

1 – http://www.cneeex.com/c/2014-05-13/487439.shtml
2 – http://www.cneeex.com/c/2014-05-16/487443.shtml
3 – http://www.shdrc.gov.cn/xxgk/cxxxgk/35152.htm
4 – http://www.cneeex.com/c/2017-12-30/487810.shtml

SHENZHEN

Shenzhen Pilot Emissions Trading System

GASES	ALLOCATION	AVERAGE 2018 PRICE
CO_2 only	Free allocation	CNY 24.47 (USD 3.70) (weighted average trading price)
TOTAL REVENUE	**OFFSETS AND CREDITS**	**CAP**
Since beginning of program: CNY 2.6 million in 2014[1] (USD 390,000) No revenue in 2018 (no auctions took place)	Domestic	31.45 $MtCO_2e$ (excluding buildings, 2015)[2]



ETS in force

ETS scheduled

ETS considered

SECTORS:

POWER

INDUSTRY

TRANSPORT

BUILDINGS

ETS DESCRIPTION

The Shenzhen Pilot ETS, which began in June 2013, was the first of the Chinese pilot ETSs to start operation. To date, it has concluded five compliance years. It is the only Chinese pilot at the sub-province-level, and it covers a broad scope across the energy, industry, building, and transport sectors. The Shenzhen Pilot ETS covers a total of 794 entities (2017). A unique feature of the Shenzhen Pilot ETS is its legal basis. While the majority of pilots are regulated by subnational government orders by the executive body of the government, the Shenzhen Pilot ETS is regulated by a dedicated ETS bill passed by its municipal legislator, the Shenzhen People's Congress. This provides more legal stability.

Shenzhen also has pioneered cross-regional cooperation. In 2014, Shenzhen and Baotou signed the 'Memorandum of Strategic Cooperation on the Construction of Carbon Trading Systems.' As a consequence of this, six companies in Baotou city of the Inner Mongolia Autonomous Region were covered in Shenzhen market on a voluntary basis as of June 2016.[3]

YEAR IN REVIEW

Shenzhen is one of the most active regional markets in China, despite its relatively smaller size compared to other pilots. As of 25 July 2018, its accumulated transaction amount reached CNY 1.091 billion (USD 0.165 billion), with total volume of 35.7 million tonnes, which makes it the first pilot in China to reach CNY 1 billion (USD 0.151 billion). Shenzhen's allocation plans for 2017 and 2018 have not been made publically available. Much like the governance transition at the national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Shenzhen will be moved from the Development and Reform Commission (DRC) to the Human Settlements and Environment Commission of Shenzhen Municipality. The process is ongoing and is expected to conclude by early 2019.

First Chinese pilot to launch

One of two Chinese pilots with ETS bill passed by regional congress

Total trading volume more than CNY 1 billion

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF)	83.5 $MtCO_2e$ (2010)

GHG REDUCTION TARGETS

BY 2020: 45% reduction in carbon intensity compared to 2005, to reach 0.6 tCO_2/CNY 10,000 (USD 1,512)

BY 2022: Shenzhen has pledged to peak its GHG emissions by 2022, as one of the first group of cities in China to endorse such a peak year target

1 – The objective of the auction was to increase market supply, and not as a means of allowance allocation.
2 – No more recent data has been made public by the competent authority.
3 – In June 2017, the companies from Baotou completed the first compliance. No further information is available on the subsequent compliance years.

ETS Size

GHGs COVERED
CO_2

CAPPED EMISSIONS
31.45 $MtCO_2e$

SECTORS AND THRESHOLDS
Power, water, gas, manufacturing sectors, buildings, port and subway sectors, public buses, and other non-transport sectors.

INCLUSION THRESHOLDS: Annual emissions of 3,000 tCO_2e/year for enterprises; large public buildings and 10,000m^2 for government buildings.

POINT OF REGULATION
Downstream
Both direct and indirect emissions are covered.

NUMBER OF ENTITIES
794 (2017)

CAP
31.45 $MtCO_2e$ (excluding buildings, 2015)

Phases & Allocation

TRADING PERIODS
2013-2018[4]

ALLOCATION
FREE ALLOCATION: Allowances are largely distributed for free. Benchmarking is applied to the water, power, and gas sectors based on sectoral historical emissions intensity.

Grandparenting is applied to port and subway sectors, public buses, and other nontransport sectors based on the entity's historical emissions intensity. Allowance allocation is adjusted ex-post based on output data.

Although the Interim Measure for the Administration of Carbon Emission Trading of Shenzhen states that at least 3% of allowances should be auctioned, this has not been implemented. So far, only one auction took place (in June 2014) in order to increase market supply.

Flexibility

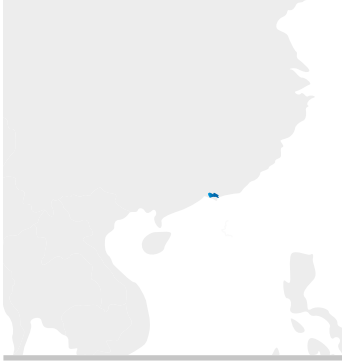
BANKING AND BORROWING
Banking is allowed.
Borrowing is not allowed.
Unlike other pilots, Shenzhen releases its annual allowances before the compliance date of the previous vintage but does not allow them to be used for the purpose for previous vintage compliance.

OFFSETS AND CREDITS
QUANTITATIVE LIMIT: Domestic project-based carbon offset credits (CCERs) are allowed. The use of CCER credits is limited to 10% of the annual compliance obligation.

QUALITATIVE LIMIT: Credits from hydro projects are not eligible and additional geographic restrictions apply to the use of certain CCERs.

MARKET STABILITY PROVISIONS
DRC Intervention: In case of market fluctuations, the Shenzhen DRC can sell extra allowances from a reserve at a fixed price. Such allowances can only be used for compliance and cannot be traded. The DRC can also buy back up to 10% of the total allocation.

4 – In the short term, the existing Chinese regional carbon markets are expected to operate parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.



SHENZHEN

Shenzhen Pilot ETS

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions with a tiered approach taking into account the size of the company. A quarterly emissions report is also submitted. In addition, covered industrial entities must annually submit a statistical indicator data report.

VERIFICATION: Third-party verification of the emissions report is required. Covered entities cannot use the same verifiers for three consecutive years. For the statistical indicator data report, the municipal statistical department may entrust the statistical indicator data verification agency to verify. In addition, further random checks of emission reports and verification reports are conducted by the government. The proportion of these checks shall not be less than 10% of the total number of covered entities. The competent authority may assign this inspection work to a specialized agency.

FRAMEWORK: The Shenzhen DRC has released a guiding document on monitoring and reporting that includes sector-specific guidance for the covered sectors.

ENFORCEMENT

Institutes providing false information can be fined for the difference between reported and actual emissions at three times the average allowance price of the past six months. Penalties for disturbing the market order can cost up to CNY 100,000 (USD 15,115). Companies failing to surrender enough allowances to match their emissions are fined three times the average market price of the past six months. The missing allowances can be withdrawn from the account of the company or deducted from next year's allocation. Other nonfinancial penalties include public reporting, reporting to relevant credit information of public banks, disqualification from financial subsidies (for five years), and a record entered in the State Owned Enterprise performance assessment system.

Other Information

INSTITUTIONS INVOLVED

Shenzhen DRC (Competent authority) – the responsibility is expected to move to the Human Settlements and Environment Commission of Shenzhen Municipality in the course of 2019;
China Shenzhen Emissions Exchange (Trading Platform and Registry)

EVALUATION/ETS REVIEW

No formal evaluation has been conducted. Research on improving Shenzhen ETS has been undertaken every year, funded by Shenzhen DRC.

IMPLEMENTING LEGISLATION

Shenzhen Special Economic Zone ETS Bill[5]

Interim Measures for Management of Emissions Trading in Shenzhen[6]

Shenzhen DRC – Notice of Carrying Out Emissions Trading Work for Vintage 2016[7]

5 – http://www.sz.gov.cn/zfgb/2013/gb817/201301/t20130110_2099860.htm
6 – http://www.sz.gov.cn/zfgb/2014/gb876/201404/t20140402_2335498.htm
7 – http://www.szpb.gov.cn/xxgk/qt/tzgg/201609/t20160918_4938028.htm

TIANJIN

Tianjin Pilot Emissions Trading System

GASES	ALLOCATION	AVERAGE 2018 PRICE
CO_2 only	Free allocation	11.58 CNY (USD 1.75) (weighted average trading price)
OFFSETS AND CREDITS	**CAP**	
Domestic	160-170 $MtCO_2e$ (2017)	

ETS in force

ETS scheduled

ETS considered

SECTORS:

POWER

INDUSTRY

Despite small number of regulated entities, covers more than half city's emissions due to high concentration of GHG in industrial sectors

High rates of compliance despite no financial penalties in place

ETS DESCRIPTION

Tianjin launched its pilot ETS in December 2013 and has concluded five compliance years so far. The system covers enterprises including heat and electricity production, iron and steel, petrochemicals, and chemicals, as well as oil and gas exploration. Covered entities account for 50-60% of the city's total emissions. Despite not having any financial penalties in place, Tianjin has achieved full or close to full compliance since its launch.

YEAR IN REVIEW

The Tianjin Development and Reform Commission (DRC) released its new "Interim Measure for Management of Emissions Trading in Tianjin" in May 2018, which was the third one since 2013, as each of them provides the legal basis for the Tianjin Pilot ETS within a specific time period. The Tianjin system has not undergone significant changes since its launch.

Much like the governance transition at the national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Tianjin will be moved from the DRC to the Ecology and Environment Bureau. The process is ongoing and is expected to conclude by early 2019.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF)	215 $MtCO_2e$ (2012)

GHG REDUCTION TARGETS

BY 2020: 20.5% reduction in carbon intensity compared to 2015 levels (13th five-year plan)

ETS Size

GHGs COVERED

CO_2

SECTORS AND THRESHOLDS

Heat and electricity production, iron and steel, petrochemicals, chemicals, exploration for oil and gas.

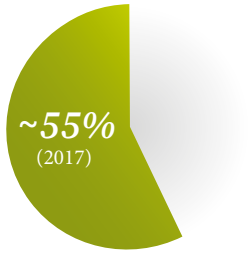
INCLUSION THRESHOLDS: 20,000t CO_2/year considering both direct and indirect emissions.

POINT OF REGULATION

Downstream.
Both direct and indirect emissions are covered.

CAPPED EMISSIONS

160-170 $MtCO_2e$



NUMBER OF ENTITIES

109 (2017)

CAP

160-170 $MtCO_2e$ (2017)

Phases & Allocation

TRADING PERIODS
2013-2018[1]

ALLOCATION
FREE ALLOCATION: Mainly free allocation through grandparenting based on 2009-2012 emissions or on emissions intensity. Benchmarking for new entrants and expanded capacity.

Flexibility

BANKING AND BORROWING
Banking is allowed.
Borrowing is not allowed.

OFFSETS AND CREDITS
QUANTITATIVE LIMIT: Domestic project-based carbon offset credits—CCERs—are allowed. The use of CCER credits is limited to 10% of the annual compliance obligation.

QUALITATIVE LIMIT: Credits must stem from CO_2 reduction projects, excluding hydro. They must be realized after 2013.

MARKET STABILITY PROVISIONS
DRC Intervention: In case of market fluctuations, the Tianjin DRC can buy or sell allowances in order to stabilize the market.

Compliance

COMPLIANCE PERIOD
One year

MRV
REPORTING FREQUENCY: Annual reporting of CO_2 emissions.

VERIFICATION: Third-party verification is required. Covered entities cannot use the same verifiers for three consecutive years.

FRAMEWORK: The Tianjin DRC has released a guiding document on monitoring and reporting that includes sector-specific guidance for the covered sectors.

ENFORCEMENT
In case of noncompliance, companies are disqualified for three years for preferential financial support and other national supporting policies, i.e., on recycling economy, energy-saving measures, and emission reductions. There are no financial penalties for noncompliance.

Other Information

INSTITUTIONS INVOLVED
Tianjin DRC (competent authority; the responsibility is expected to be moved to Tianjin Ecology and Environment Bureau in 2019);
Tianjin Climate Exchange (trading platform and registry)

IMPLEMENTING LEGISLATION
Tianjin Pilot ETS Implementation Plan[2]

Interim Measure for Management of Emissions Trading in Tianjin[3]

1 - In the short term, the existing Chinese regional carbon markets are expected to operate parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.
2 – http://gk.tj.gov.cn/gkml/000125022/201303/t20130305_8506.shtml
3 – http://www.tanpaifang.com/zhengcefagui/2013/123027548.html

TAIWAN, CHINA

ETS in force

ETS scheduled

ETS considered

Climate Change Action Guideline calls for ETS implementation

2018 proposal to establish ETS but no precise timeline

Mandatory GHG reporting and offsets program in place

ETS DESCRIPTION

In July 2015, Taiwan, China enacted the 'Greenhouse Gas Reduction and Management Act,' which legislates a 50% emissions reduction target for 2050 compared to 2005 GHG levels. The act also implements carbon reduction by setting regulatory goals in stages on a five-year basis. It further charges the Taiwanese Environmental Protection Administration (TEPA) with the development of appropriate climate change policies to reach this target. The government approved and implemented the 'National Climate Change Action Guideline' in February 2017. The guideline lays out 10 general principles on how to achieve Taiwan's climate mitigation and adaptation targets. The third principle calls for the implementation of a cap-and-trade system. Accordingly, TEPA has been conducting research on the design options and the timetable for establishing a cap-and-trade system.

The act also mandated TEPA to develop the 'GHG Reduction Action Plan,' which outlines details on how to implement the mitigation policies contained in the act. It includes periodic regulatory goals for both national and sectoral net GHG emissions, as well as implementation strategies in the form of eight policy packages. The plan was approved and published in March 2018 and proposes to implement a cap-and-trade system, calculate baseline emissions, and set up regulations—albeit without a precise timeline. On this basis, the central industry competent authorities of the six major sectors (energy, manufacturing, transportation, residential and commercial, agriculture, and environment) approved the 'GHG Emissions Control Action Programs' later in 2018.

A series of subsidiary regulations has been formulated in preparation for rolling out the cap-and-trade system. This includes the '2018 Regulations Governing GHG Offset Program Management,' which provide an opportunity for enterprises to acquire carbon offsets credits. Mandatory emissions reporting for entities with annual emissions above 25,000 tCO_2e from certain sectors has been ongoing since 2013. A crediting program for intensity-based early action and offset projects, promulgated by TEPA in 2010, will evolve into a reward program based on performance standards, which is currently under design.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **284.6 $MtCO_2e$ (2015)**

OVERALL GHG EMISSIONS BY SECTOR

Energy (excluding Transport) 255.7 (90%)
Industrial Processes 22.2 (8%)
Agriculture 2.7 (1%)
Waste 4.1 (1%)

GHG REDUCTION TARGETS

BY 2020: 2% below 2005 GHG levels
BY 2025: 10% below 2005 GHG levels
BY 2030: 20% below 2005 GHG levels
BY 2050: 50% below 2005 GHG levels

Other Information

MRV

REPORTING FREQUENCY: Annual reporting of GHGs (CO_2, CH_4, N_2O, SF_6, NF_3, PFCs, HFCs, and NF_3) for entities from certain sectors with annual emissions greater than 25,000 tCO_2e.

VERIFICATION: Third-party verification is required.

FRAMEWORK: Back in 2004, a voluntary GHG reporting under the Air Pollution Control Act, which became mandatory in 2013. Since 2016, GHG reporting and inventory program is mandatory under the GHG Accounting and Registration Regulations, which are authorized by the Greenhouse Gas Reduction and Management Act.

INSTITUTIONS INVOLVED

Taiwanese Environmental Protection Administration

NEW ZEALAND

New Zealand Emissions Trading Scheme

GASES	ALLOCATION	AVERAGE 2018 PRICE
Several gases	Free allocation	NZD 22.71 (USD 15.71) (average secondary market price)

COVERAGE
40.1 $MtCO_2e$[1]

ETS DESCRIPTION

The New Zealand Emissions Trading Scheme (NZ ETS) was launched in 2008. Originally designed to cover the whole economy, it has the broadest sectoral coverage of any ETS, including forestry as a source of both emissions and units. Biological emissions from agriculture, however, currently have only reporting obligations and no surrender obligations. The 'Climate Change Response Act 2002' sets the legislative framework for the NZ ETS.

The NZ ETS was conceived as a nested system under the Kyoto Protocol, with full links to international carbon markets. However, as of 1 June 2015, the NZ ETS became a domestic-only system. As indicated by New Zealand's NDC, reestablishing a link to high-integrity international carbon markets will form part of New Zealand's strategy for meeting its 2030 target.

YEAR IN REVIEW

Based on the second review of the NZ ETS, decisions were taken in 2018 to introduce several integrated measures to cap and manage unit supply to align the supply of units in the NZ ETS with New Zealand's emission reduction targets. These decisions include introducing an auctioning mechanism, a cost containment reserve (CCR) to replace the fixed price option ceiling, limits on international units (if and when the NZ ETS reopens to international markets), and a coordinated decision-making process for setting unit supply over a rolling five-year period with annual updates. For the forestry sector, provisions for permanent forests are to be introduced, as well as other technical improvements.

Further policy reforms are to be decided in 2019. Reforms under consideration include: simplified forestry-sector accounting options, a potential price floor mechanism, as well as options for the phase-down of free allocation to emissions intensive and trade exposed (EITE) industries. Options for strengthening the NZ ETS market governance framework and improving the penalties and compliance regime are also expected.

Legislation amending the 'Climate Change Response Act 2002' is expected to be presented to Parliament in mid-2019, so that the reforms may be implemented in 2020.

The 'Zero Carbon Bill' proposes putting in place the core building blocks to give certainty to a long-term approach to climate change. The bill is expected to be introduced in the first half of 2019. An Interim Climate Change Committee was established in 2018 to lay the groundwork on key issues, including how surrender obligations could best be arranged if agricultural CH_4 and N_2O emissions enter the NZ ETS.

ETS in force

ETS scheduled

ETS considered

SECTORS:

- POWER
- INDUSTRY
- DOMESTIC AVIATION*
- TRANSPORT*
- BUILDINGS*
- WASTE
- FORESTRY

* Sector covered upstream

Broad ETS sectoral coverage, including forestry

Implementing measures to cap and manage unit supply

Considering how agriculture could enter ETS

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) — **78.7 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Energy (excluding road transport) 17.7 (22%)
Road transport 13.6 (17%)
Industry 4.8 (6%)
Agriculture 38.7 (50%)
Waste 3.8 (5%)

1 – 2019 sectoral coverage based on 2016 emissions

GHG REDUCTION TARGETS

BY 2020: 5% reduction from 1990 GHG levels (unconditional target)

BY 2030: 30% reduction from 2005 GHG levels (equivalent to 11% reduction from 1990 GHG levels) (NDC)
BY 2050: 50% reduction from 1990 GHG levels

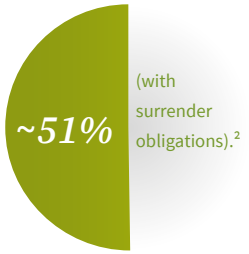
ETS Size

GHGs COVERED

CO_2, CH_4, N_2O, SF_6, HFCs, and PFCs

CAPPED EMISSIONS

40.1 $MtCO_2e$



SECTORS AND THRESHOLDS

Sectors were gradually phased in over time.

2008: Forestry (mandatory: deforesting pre-1990 forest land; voluntary: post-1989 forest land).

2010: Stationary energy (various thresholds), industrial processing (various thresholds), and liquid fossil fuels (various thresholds).

2013: Waste (except for small and remote landfills) and synthetic GHGs (various thresholds). Synthetic GHGs not in the NZ ETS are subject to an equivalent levy.

Currently, biological emissions from agriculture must be reported, but face no surrender obligations.

POINT OF REGULATION

The point of obligation is generally placed upstream.

Some large businesses that purchase fossil fuels directly from mandatory NZ ETS participants can choose to opt into the NZ ETS rather than have the costs passed down from their suppliers.

NUMBER OF ENTITIES

2,448 entities registered, of which 2,351 have surrender obligations (as of June 2018).
221 entities with mandatory reporting and surrender obligations.
2,156 entities with voluntary reporting and surrender obligations; most for post-1989 forestry activities.
71 entities with mandatory reporting without surrender obligations; all for agricultural activities.

CAP

The NZ ETS was originally designed to operate without a specific domestic cap as this accommodated carbon sequestration from forestry activities and a full link to the international Kyoto Protocol carbon markets. Allowance supply was restricted to New Zealand Units (NZUs) in 2015. Potential future access to international units will be subject to quantitative limits. The NZ ETS will have its own fixed cap in the future. This would restrict the number of units supplied into the scheme, in line with New Zealand's GHG reduction targets. It is expected that a process will be established for setting unit supply over a rolling five-year period with annual updates.

Phases & Allocation

TRADING PERIODS

For most sectors the NZ ETS has annual surrender obligations.

For post-1989 forestry participants, annual reporting of emissions and removals is optional, with five-year mandatory reporting periods. As a result, unit entitlement transfers and surrender obligations for these participants correspond to when they choose to report their emissions.

ALLOCATION

FREE ALLOCATION:

EITE Activities: Intensity-based allocation for 26 eligible activities. Highly EITE activities (over 1,600 tCO_2e/NZD 1 million of revenue [USD 0.69 million]) receive 90% free allocation. Moderately EITE activities (over 800 tCO_2e/NZD 1 million of revenue [USD 0.69 million]) receive 60% free allocation. 6.9 million NZUs were issued from June 2017 to June 2018.

2 - ~98% (with reporting obligations)

Post-1989 Forestry Sector and Other Removal Activities: NZUs are granted to participants that voluntarily register in the scheme for removal activities, as outlined below. There is no limit on the number of units that can be granted for removal activities.

Forestry Removal Activities: Participants are entitled to receive one NZU per tonne of CO_2 removed for registered post-1989 forest land. If the forest is harvested or deforested, units must be surrendered to account for the emissions, and if the participant chooses to deregister from the scheme, NZUs equivalent to the number received must be returned. 18.3 million NZUs were issued for forest removal activities from June 2017 to June 2018.

Other Removal Activities: Participants are entitled to receive one NZU per tonne of removal from recognized industrial processes, including export of products that embed carbon and export of HFCs and PFCs. 2.2 million NZUs were issued for other removal activities from June 2017 to June 2018.

Forestry and Fisheries Sectors: Owners of pre-1990 forest land, as well as owners of fishing quotas, received a one-off free allocation of NZUs when the NZ ETS was implemented to partially compensate for the impact of the ETS.

AUCTIONING: In 2018 the government decided to develop and introduce an auctioning mechanism, within an overall cap on non-forestry sectors. The first auctions are expected in 2020.

Flexibility

BANKING AND BORROWING

Banking is allowed except for those units that were purchased under the fixed price option (see Market Stability Provisions).
Borrowing is not allowed.

OFFSETS AND CREDITS

QUALITATIVE LIMIT: Units from Kyoto Protocol Flexible Mechanisms were eligible for use in the system with no restrictions until 2015. As of 1 June 2015, international units are not eligible for surrender in the NZ ETS.

MARKET STABILITY PROVISIONS

Transitional Measures: Two measures were implemented in 2009 to help firms adjust to the carbon cost: **(1)** One-for-two surrender obligation for non-forestry sectors (one allowance could be surrendered for every two tonnes of emissions); **(2)** A NZD 25 (USD 17.30) fixed price option, which acts as a price ceiling.

After the second NZ ETS review, the one-for-two measure was phased out and entities have faced full surrender obligations since 1 January 2019.

Reserve: The fixed price option will remain until it is replaced with a CCR incorporated into the auctioning mechanism. Allowances from the CCR will be auctioned if a predetermined trigger price is reached. The price trigger and reserve quantity are still to be determined. Any allowances released from the reserve will be backed by an equivalent tonne of removals.

Compliance

COMPLIANCE PERIOD

One year[3]

MRV

REPORTING FREQUENCY:
Most sectors are required to report annually.

VERIFICATION: Self-reporting supplemented by a program of second- and third-party audits run by the regulator. Participants must seek third party verification if they apply for the use of a unique emissions factor.

3 – Participants registered for post-1989 forestry have mandatory five-year compliance periods (with the option to report emissions annually).

ENFORCEMENT

An entity that fails to surrender emissions units when required to must surrender the units and pay a penalty of NZD 30 for each unit (USD 20.76) that was not surrendered by the due date. In certain circumstances the penalty may be reduced.

Entities can be fined up to NZD 24,000 (USD 16,607) on conviction for failure to collect emissions data or other required information, calculate emissions and/or removals, keep records, register as a participant, submit an emissions return when required, or notify the administering agency or provide information when required to do so.

Entities can also be fined up to NZD 50,000 (USD 34,598) on conviction for knowingly altering, falsifying, or providing incomplete or misleading information about any obligations under the scheme, including emissions return. This penalty and/or imprisonment of up to five years also apply to entities that deliberately lie about obligations under the NZ ETS to gain financial benefit or avoid financial loss.

A new "infringement offence regime" is expected to be established from 2020 for minor offences. Infringement offences will result in financial penalties for offenders but not convictions.

Linking

LINKS WITH OTHER SYSTEMS

Until 1 June 2015, the NZ ETS was indirectly linked to other systems (e.g., the EU ETS) via the international Kyoto Protocol Flexible Mechanisms. Since then, the NZ ETS has been a domestic-only system.

The current reforms will make the NZ ETS more similar to ETSs in other countries, which will make it more compatible for international linking in the future.

Other Information

INSTITUTIONS INVOLVED

Ministry for the Environment;
Environmental Protection Authority;
Ministry for Primary Industries;
New Zealand Customs Service;
New Zealand Transport Agency

EVALUATION/ETS REVIEW

The 'Climate Change Response Act 2002' includes provisions statutory independent reviews of the operation and effectiveness of the NZ ETS every five years. The first review took place in 2011-2012, and the second review took place in 2015-2017.

Public consultation on proposed amendments to the 'Climate Change Response Act' following the second review was undertaken in 2018 in order to support implementing proposed changes.

IMPLEMENTING LEGISLATION

Climate Change Response Act 2002 –Part 4 'New Zealand greenhouse gas emissions trading scheme[4]

4 – http://www.legislation.govt.nz/act/public/2002/0040/latest/DLM1662481.html

REPUBLIC OF KOREA

Korean Emissions Trading System

GASES	ALLOCATION	AVERAGE 2018 PRICE
Several gases	Free allocation Auctioning	KRW 22,692 (USD 20.62) (average secondary market price)
TOTAL REVENUE	**OFFSETS AND CREDITS**	**CAP**
Since beginning of program: KRW 109.4 billion (USD 99.4 million) from market stability auctions[1]. In addition, KRW 14.03 billion (USD 12.74 million) from regular allowance auction[2]. Collected in 2018: KRW 104.9 billion (USD 95.31 million)	Domestic International	548 $MtCO_2e$ (2019)

ETS DESCRIPTION

The Korean Emissions Trading System (KETS) was launched on 1 January 2015, becoming East Asia's first nationwide mandatory ETS and the second-largest carbon market after the EU ETS. The ETS covers 591 of the country's largest emitters, which account for ~68% of national GHG emissions. It covers direct emissions of six Kyoto gases, as well as indirect emissions from electricity consumption. The KETS was designed to play an essential role in meeting Korea's 2030 NDC target of 37% below BAU emissions.

The KETS is backed up by solid legal bases. The first and highest legal base for green growth and implementation of KETS is the 'Framework Act on Low Carbon, Green Growth' (2010). The 'Act on Allocation and Trading of Greenhouse Gas Emissions Allowances' (the 'Emissions Trading Act') and its Enforcement Decree were passed in 2012; it stipulates government actions, institutions, and timelines for KETS. Further details of the KETS were outlined in 2014 in a Master Plan (a ten-year plan for 2015-2024) and Allocation Plan.

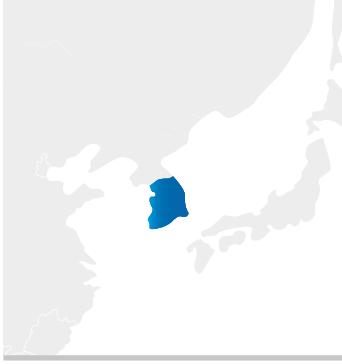
A mandatory GHG and Energy Target Management System (TMS) launched in 2012 (following a two-year pilot phase started in 2010), which enabled the collection of verified emissions data and training in the MRV process of TMS entities.

YEAR IN REVIEW

Key changes for the second phase in 2018 include: (i) an expansion of benchmark-based allocation; (ii) the introduction of 3% auctioning; (iii) new banking rules; and (iv) the permitted restricted use of international credits.

Although auctioning was originally set to begin in 2018, this was delayed to 2019. The first regular auction of allowances took place in January 2019. Auction rules were outlined in a guidance document released in March 2018. In addition, entities can now use international offset credits that have been developed by Korean companies to meet up to 5% of their compliance obligation.

Measures were taken to address liquidity concerns and increase trade activity. On 1 June 2018, 30 days before the 2017 compliance deadline, the Korean government auctioned an additional 5.5 million allowances from the market stability reserve. The Export-Import Bank, the Korea Development Bank, and the Industrial Bank of Korea are also now in consultation to participate as market makers in the KETS.



ETS in force

ETS scheduled

ETS considered

SECTORS:

- POWER
- INDUSTRY
- DOMESTIC AVIATION
- BUILDINGS
- WASTE

East Asia's first national ETS

Benchmarks expanded and international credits allowed in second phase

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) — **694.1 $MtCO_2e$ (2016)**

OVERALL GHG EMISSIONS BY SECTOR

Fuel Combustion (excl. Transport) 502.2 (72%)
Transport 98.7 (14%)
Fugitive Emissions 3.9 (1%)
Industrial Processes 51.5 (7%)
Agriculture 21.2 (3%)
Waste 16.5 (2%)

1 – Auctions were held in 2016 and 2018 for reasons of market stability, rather than allocation.

2 – The first auction held for the purpose of allocating allowances took place in January 2019.

GHG REDUCTION TARGETS

BY 2020: 30% below BAU (Copenhagen Accord target)
BY 2030: 37% below BAU (536 $MtCO_2e$), which represents a 22% reduction below 2012 GHG levels (NDC); 38 million international credits[3] may be used towards achieving this goal (2030 GHG mitigation roadmap)

ETS Size

GHGs COVERED

CO_2, CH_4, N_2O, PFCs, HFCs, SF_6

SECTORS AND THRESHOLDS

PHASE ONE (2015-2017): 23 subsectors from the following six sectors: power, industry (e.g., iron and steel, petrochemical, cement, oil refinery, nonferrous metals, paper, textile, machinery, mining, glass and ceramics, etc.), building, public, waste, and transportation (i.e., aviation).

PHASE TWO (2018-2020): According to the Allocation Plan, the public and waste sectors are disaggregated such that the KETS covers the following six sectors: heat and power, industry, building, transportation, waste sector, and public. These sectors are disaggregated into 64 sub-sectors.

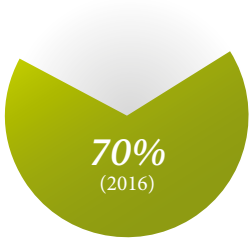
INCLUSION THRESHOLDS: Company >125,000 tCO_2/year, facility>25,000 tCO_2/year

POINT OF REGULATION

Downstream.
Both direct and indirect emissions are covered under KETS.

CAPPED EMISSIONS

548 $MtCO_2e$



NUMBER OF ENTITIES

610 (2019)

CAP

PHASE ONE (2015-2017): 1,686 $MtCO_2e$, including a reserve of 89 $MtCO_2e$ for market stabilization measures, early action and new entrants. 84.5% of reserve (76$MtCO_2e$) are used.
2015: 540 $MtCO_2e$, **2016:** 560 $MtCO_2e$, **2017:** 567 (including early reduction and additional allowances) $MtCO_2e$.

PHASE TWO (2018-2020): 1,796 $MtCO_2e$, including 14 million allowances for the market stabilization, five million for the market markers, and 134 million for new entrants and other purposes[4].
2018: 548 $MtCO_2e$; **2019:** 548 $MtCO_2e$; **2020:** 548 $MtCO_2e$.

Phases & Allocation

TRADING PERIODS

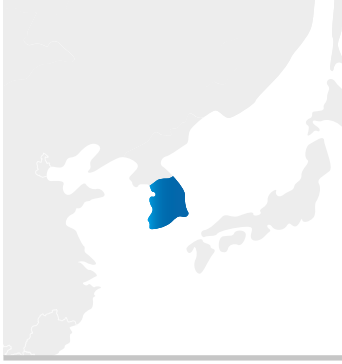
PHASE ONE: 3 years (2015-2017)
PHASE TWO: 3 years (2018-2020)
PHASE THREE: 5 years (2021-2026)

ALLOCATION

PHASE ONE (2015-2017):
Free allocation: 100% free allocation. Most sectors received free allowances based on the average GHG emissions of the base year (2011-2013). Three sectors (grey clinker, oil refinery, aviation) were allocated free allowances following benchmarks based on previous activity data from the base year (2011-2013).

During Phase One, about 5% of total allowances were retained in a reserve for market stabilization measures (14 $MtCO_2e$), early action (41 $MtCO_2e$), and other purposes including new entrants (33 $MtCO_2e$). In addition, unallocated allowances and withdrawn allowances were transferred to the reserve.

3 – This includes international credits through the KETS, as well as alternative options, including LULUCF and other international credits (i.e. Article 6 under the Paris Agreement).
4 – The competent authority expects the actual cap to be 1,777 $MtCO_2e$, considering that not all the reserves would be used.



REPUBLIC OF KOREA

Korean Emissions Trading System

PHASE TWO (2018-2020):

Free allocation: > 97% free allowances; in some sub-sectors entities have an obligation to get 3% of their compliance obligation from auctions.

Auctioning: <3% auctioned. Auctioning is determined on the sub-sector level, with an obligation to acquire 3% of allowances at auctions, with the exception of sub-sectors that have high trade intensity or high additional cost increases, considering international competitiveness and carbon leakage. Sectors that participate in auctions include, among others, entities from the electricity, domestic aviation, wooden product and metal foundry sectors. While auctioning was scheduled to start in 2018, it has been delayed to the beginning of 2019. Participation in auctions is subject to some limitations. Only companies that do not receive all their allowances for free will be eligible to bid, with a list of eligible bidders published by the Ministry of Environment. No one bidder can purchase more than 30% of the allowances of one auction. The auctions will be subject to a minimum price.

KETS held its first auction in January 2019. Seven companies participated with the bidding price ranging from KRW 23,100 (USD 20.99) to KRW 27,500 (USD 24.98). Four companies successfully bid for all available allowances (550,000 KAUs) for a settlement price of KRW 25,500 (USD 23.17). A total of 7.95 million tonnes are set to be auctioned on monthly basis this year, with 550,000 offered in the first, third and fourth quarters; a million tonnes per auction will be offered in the second quarter.

PHASE THREE (2021-2025):

Free allocation: less than 90% free allowances.

Auctioning: more than 10%.

Energy-intensive and trade-exposed (EITE) sectors will receive 100% of their allowances for free in all phases. EITE sectors are defined along the following criteria:

(1) Additional production cost of > 5% and trade intensity of > 10%; or

(2) Additional production cost of > 30%; or

(3) Trade intensity of > 30%.

Flexibility

BANKING AND BORROWING

Banking is allowed with some restrictions across phases. From Phase One to Phase Two, banking is limited for each installation to 10% of the annual average allocation and 20,000 Korean Allowance Units (KAUs). The amount that exceeds the threshold is deducted from Phase Two allocation. From Phase Two to Phase Three, banking is limited to the higher of two limits:

(1) The net annual amount of allowances sold in Phase Two; and

(2) Company- and facility-specific limits, of 250,000 KAUs and 5,000 KAUs respectively.

Borrowing is allowed only within a single trading phase. In 2015, this was limited to 10% of an entity's obligation. This limit increased to 20% in 2016 and 2017. In the first compliance year of Phase Two (2018), borrowing was limited to 15% of an entity's obligation. From 2019, the borrowing limit will be affected by how much an entity has borrowed in the past via the following formula: [Borrowing limit of previous year-("borrowing ratio" in previous year x 50%)]/entity's emission volume.

OFFSETS AND CREDITS

PHASE ONE (2015-2017):

Qualitative limit: Only domestic credits from external reduction activities implemented by non-ETS entities – and that meet international standards – could be used for compliance in this phase. Domestic CDM credits (CERs), and credits from domestically certified projects (Korean Offset Credits) were allowed. These credits had to be converted to Korean Credit Units (KCUs) of a specified vintage before being used for compliance. Eligible activities included those eligible under the CDM and Carbon Capture and Storage. However, only activities implemented after 14 April 2010 were eligible. As of December 2017, 35 domestic and 211 CDM methodologies had been approved for use under the KETS.

Quantitative limit: Up to 10% of each entity's compliance obligation.

PHASE TWO (2018-2020):

Qualitative limit: In Phase Two, trades of CERs generated after 1 June 2016 from international CDM projects developed by domestic companies are allowed. CDM projects operated by Korean companies will be allowed when:

(1) At least 20% of the ownership rights, operating rights or the voting stocks are owned by a Korean company;

(2) A Korean company sells or distributes more than 20% of the total project cost; or

(3) The projects are funded by a Korean company with a national or regional government operating in a

UN-designated Least Developed Country or a low-income economy as classified by the World Bank.

Regulated entities must convert CDM credits (CERs) to KCUs in order to be used for compliance.

Quantitative limit: Up to 10% of each entity's compliance obligation (of which up to 5% for international offset credit).

PHASE THREE (2021-2025):
Rules are not yet clear.

MARKET STABILITY PROVISIONS

Auction Reserve Price: Auctions for market stability will be subject to an auction reserve price that will be set by the following formula:
"the average price over the previous three months + the average price of last month + the average price over the previous three days/3."

Allocation Committee: An Allocation Committee is in place to implement market stabilization measures in particular cases:
(1) The market allowance price of six consecutive months is at least three times higher than the average price of the two previous years.
(2) The market allowance price of the last month is at least twice the average price of two previous years and the average trading volume of the last month is at least twice the volume of the same month of the two previous years.
(3) The average market allowance price of a given month is smaller than 40% of the average price of the two previous years. In 2015 and 2016, the price threshold is KRW 10,000 (USD 9.09).
(4) When it is difficult to trade allowances due to the imbalance of supply or demand.
The stabilization measures may include:
(1) Additional allocation from the reserve (up to 25%);
(2) Establishment of an allowance retention limit: minimum (70%) or maximum (150%) of the allowance of the compliance year;
(3) An increase or decrease of the borrowing limit;
(4) An increase or decrease of the offsets limit; and
(5) Temporary set-up of a price ceiling or price floor.

In 2016, the Allocation Committee doubled the borrowing limit to 20% and an additional nine million allowances were auctioned at a reserve price of KRW 16,200 (USD 14.72) of which less than a third of allowances were sold. In 2018, the Committee made an additional 5.5 million allowances available from the stability reserve in an attempt to ease the market in the lead-up to the 2017 compliance deadline.

The Export-Import Bank, the Korea Development Bank, and the Industrial Bank of Korea are also currently in consultation talks to participate as market makers in the KETS.

Compliance

COMPLIANCE PERIOD

One year

MRV

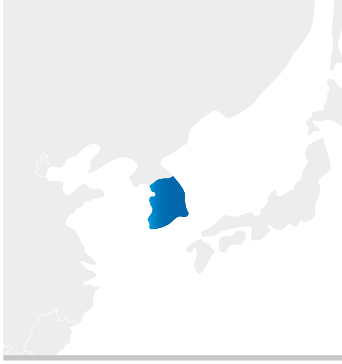
REPORTING FREQUENCY: Annual reporting of emissions must be submitted within three months from the end of a given compliance year (by the end of March).

VERIFICATION: Emissions must be verified by a third-party verifier.

OTHER: Emissions reports are reviewed and certified by the Certification Committee of the Ministry of Environment (MOE) within five months from the end of a given compliance year (by the end of May).
If the liable entity fails to report emissions correctly, the report will be disqualified.

ENFORCEMENT

The penalty shall not exceed three times the average market price of allowances of the given compliance year or KRW 100,000 (USD 90.85)/tonne.



REPUBLIC OF KOREA

Korean Emissions Trading System

Linking

LINKS WITH OTHER SYSTEMS

Linkage is planned to be considered in Phase Three.

Other Information

INSTITUTIONS INVOLVED

In 2016, overall responsibility for the KETS moved from the MOE to the Ministry of Strategy and Finance (MOST). On 1 January 2018, responsibility was transferred back to the MOE, while the MOST still chairs the Allocation Committee;
Korea Exchange (Trading Platform);
Greenhouse Gas Inventory and Research Center (Registry and technical support)

EVALUATION / ETS REVIEW

No standardized evaluation process has been developed to date, but an analysis of the economic impact of the KETS is ongoing for the current phase[5].

USE OF REVENUES

The government has put forward possible options for the use of the revenues – such as supporting mitigation equipment projects, innovation, and technology development of ETS-covered entities. Specific rules on the use of revenues are yet to be decided.

IMPLEMENTING LEGISLATION/REGULATION

Framework Act on Low Carbon, Green Growth[6]

Enforcement Decree of the Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances[7]

Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances[8]

First Master Plan for 2015-2024[9]

Second Allocation Plan[10]

5 – The method/modelling of the ongoing study is not yet open to the public.
6 – https://www.iea.org/policiesandmeasures/pams/korea/name-38971-en.php
7 – https://elaw.klri.re.kr/eng_mobile/viewer.do?hseq=46598&type=sogan&key=60
8 – http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/laws/1647.pdf
9 – http://www.moef.go.kr/nw/nes/detailNesDtaView.do?menuNo=4010100&searchNttId1=OLD_4020294&searchBsId1=MOSFBBS_000000000028
10 – http://www.me.go.kr/home/web/board/read.do?pagerOffset=10&maxPageItems=10&maxIndexPages=10&searchKey=&searchValue=&menuId=286&orgCd=&boardId=883200&boardMasterId=1&boardCategoryId=&decorator=

TOKYO

Tokyo Cap-and-Trade Program

GASES	ALLOCATION	AVERAGE 2018 PRICE
CO_2 only	Free allocation	~JPY 650 (USD 5.89) (estimated standard transaction price)
OFFSETS AND CREDITS	**COVERAGE**	
Domestic	13.2 $MtCO_2e$ (2019)	

ETS in force

ETS scheduled

ETS considered

SECTORS:

INDUSTRY

BUILDINGS

First citywide ETS

Energy efficiency improvements key to emissions reductions

ETS DESCRIPTION

Launched in April 2010, the Tokyo ETS – the cap-and-trade program of the Tokyo Metropolitan Government (TMG) – is Japan's first mandatory ETS and is linked to the Saitama ETS. Under the ETS, large offices and factories are required to reduce emissions by 15% or 17% in its second period (FY2015 – FY2019). The target in the third period (FY2020 – 2024) is expected to be 25% or 27%.

YEAR IN REVIEW

In FY2016, emissions were reduced by 26% compared to base-year emissions. The introduction of high-efficiency heat sources and light fittings have been key activities in reducing emissions in the building sector. Buildings have continued to decrease emissions despite an increase in gross floor space, indicating a decrease in emissions intensity in the sector.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **66.0 $MtCO_2e$ (2016)[1]**

OVERALL GHG EMISSIONS BY SECTOR

Industry 4.8 (8%)
Residential 16.8 (28%)
Transport 11.1 (18%)
Commercial 25.7 (43%)
Waste 1.7 (3%)

GHG REDUCTION TARGETS

BY 2020: 25% reduction from 2000 GHG levels
BY 2030: 30% reduction from 2000 GHG levels

ETS Size

GHGs COVERED

CO_2

SECTORS AND THRESHOLDS

Consumption of fuels, heat, and electricity in commercial and industrial buildings.

Building owners are subject to surrender obligations, but large tenants (floor space above 5000m2 or over six million kWh electricity usage per year) can assume obligations jointly or in place of building owners.

CAPPED EMISSIONS

13.2 $MtCO_2e$

INCLUSION THRESHOLDS: Facilities that consume energy more than 1,500kL of crude oil equivalent or more per year.

1 - The overall emissions figure for Tokyo is higher than the total of the emissions by sector because the former includes all GHGs in Tokyo, whereas the emissions by sector only measures CO_2 emissions.

POINT OF REGULATION
Downstream

NUMBER OF ENTITIES
1,200 facilities: office/commercial buildings: 1000; factories: 200

CAP
A Tokyo-wide cap is aggregated from emissions baselines set at the facility level. The baselines at the facility level are calculated according to the following formula: Sum of base year emissions of covered facilities x compliance factor x number of years of a compliance period (five years).

COMPLIANCE FACTOR:
First Period (FY2010–FY2014): 8% or 6% reduction below base-year emissions

Second Period (FY2015–FY2019): 17% or 15% reduction below base-year emissions

Third Period (FY2020–FY2024): 25% or 27% reduction below base-year emissions (expected compliance factors)

The higher compliance factor applies to office buildings, as well as to district heating and cooling (DHC) plant facilities (excluding facilities that use a large amount of DHC). The lower compliance factor applies, among others, to office buildings, facilities which are heavy users of DHC plants, and factories.

Facilities demonstrating outstanding performance in emissions reductions, as well as in the introduction, use, and management of energy equipment, are certified as top-level facilities that receive lower compliance factors according to their rate of progress. The certification standards represent the highest-level energy efficiency measures currently feasible, stipulating more than 200 different energy-saving measures.

Phases & Allocation

TRADING PERIODS
FIRST PERIOD: 1 April 2011 to 30 September 2016
SECOND PERIOD: 1 April 2015 to 30 September 2021
THIRD PERIOD: 1 April 2020 to 30 September 2026

Each of the above trading periods includes an 18-month adjustment period.

ALLOCATION
The baselines for facilities are based on historical emissions, calculated according to the following formula: Base-year emissions x (1 - compliance factor) x compliance period (5 years).

Base-year emissions for the first compliance period are based on the average emissions of three consecutive years between FY2002–2007, as chosen by each entity. Credits are issued to facilities whose emissions fall below the baseline.

Baselines for new entrants are based on past emissions or on emissions intensity standards.

Flexibility

BANKING AND BORROWING
Banking is only allowed between consecutive compliance periods. Borrowing is not allowed.

OFFSETS AND CREDITS
Credits from four offset types are allowed in the Tokyo ETS.

SMALL AND MID-SIZE FACILITY CREDITS:
Emissions reductions from non-covered small- and medium-sized facilities in Tokyo.

Quantitative Limits: None.

OUTSIDE TOKYO CREDITS:
Emission reductions achieved from large facilities outside of the Tokyo area. Large facilities are those with an energy consumption of 1,500kL of crude oil equivalent or more in a base-year, and with base-year emissions of 150,000t or less.

Quantitative Limits: Credits are only issued for the reduction amount that exceeds the compliance factor. These credits can be used for compliance for up to one-third of facilities' reduction obligations.

RENEWABLE ENERGY CREDITS:
Credits from solar (heat, electricity), wind, geothermal, or hydro (under 1,000kW) electricity production are counted at 1.5 times the value of regular credits. Credits from biomass (biomass rate of 95% or more, black liquor is excluded) are converted with the factor 1. These credits encompass the following types: Environmental Value Equivalent, Renewable Energy Certificates, and New Energy Electricity, generated under the Renewable Portfolio Standard Law.
Quantitative Limits: None.

SAITAMA CREDITS (VIA LINKING):
(1) Excess Credits: Emissions reductions from facilities in Saitama with base-year emissions of 150,000 tonnes or less. Issuance of credits from FY2015.
(2) Small- and Mid-size Facility Credits issued by Saitama Prefecture. Issuance of credits from FY2012.
Quantitative Limits: None.
All offsets have to be verified by verification agencies.

EMISSIONS REDUCTION METHODS:
(1) Low Carbon Electricity and Heat: In order to evaluate energy efficiency efforts of the covered facilities, CO_2 emission factors of supply side (electricity and others) are fixed during each compliance period. When covered facilities procure electricity or heating from TMG-certified suppliers with lower emission factors, they can reduce the difference between these emission factors from their emissions to be reported to TMG.
(2) Renewable Energy: When covered facilities generate electricity from renewable sources for their own use, they can deduct this amount of electricity from the total energy usage of the facility.

MARKET STABILITY PROVISIONS
In general, covered facilities trade over the counter and TMG does not control carbon prices. However, TMG offers offset credits for trading in case of excessive price development.

Compliance

COMPLIANCE PERIOD
Five years

FIRST PERIOD: FY2010-2014
SECOND PERIOD: FY2015-2019
THIRD PERIOD: FY2020-2024

MRV
REPORTING FREQUENCY: Annual emissions reporting, including emission reduction plans. All seven GHGs have to be monitored and reported: CO_2, CH_4, N_2O, PFCs, HFCs, SF_6, and NF_3. Large tenants, i.e., those with a floor space above 5000m^2 or over six million kWh electricity use per year, are required to submit their own emissions reduction plan to TMG in collaboration with building owners.

VERIFICATION: These annual reports require third-party verification.

FRAMEWORK: These are based on 'TMG Monitoring/Reporting Guidelines' and 'TMG Verification Guidelines.'

ENFORCEMENT
In the case of noncompliance, the following measures may be taken:

FIRST STAGE: The Governor orders the facility to reduce emissions by the amount of the reduction shortfall multiplied by 1.3.

SECOND STAGE: Any facility that fails to carry out the order will be publicly named and subject to penalties (up to JPY 500,000 [USD 4,528]) and surcharges (1.3 times the shortfall).

TOKYO

Tokyo Cap-and-Trade Program

Linking

LINKS WITH OTHER SYSTEMS

Linking with the Saitama Prefecture started in April 2011 when the Saitama ETS was launched. Tokyo and Saitama credits are officially eligible for trade between the two jurisdictions. During the first compliance period, 15 credit transfers took place between the Saitama Prefecture and Tokyo (nine cases from Tokyo to Saitama, six cases from Saitama to Tokyo).

Other Information

INSTITUTIONS INVOLVED

Tokyo Metropolitan Government

EVALUATION / ETS REVIEW

TMG has established a committee to analyze the structure of its system post-2020. From FY2020, the program will enter into a new stage to promote continued energy-savings and expanding the utilization of low-carbon (renewable) energy to achieve the 2030 target and transition to a zero-carbon society.

IMPLEMENTING LEGISLATION/REGULATION

The Tokyo Metropolitan Security Ordinance and Regulation for the Enforcement of the Tokyo Metropolitan Environmental Security Ordinance[1]

Detailed documents on the Tokyo ETS can be found on the TMG website.[2]

1 – http://www.kankyo.metro.tokyo.jp/basic/guide/security_ordinance/index.html ;
2 – http://www.kankyo.metro.tokyo.jp/en/climate/cap_and_trade/index.files/TokyoCaT_detailed_documents.pdf

SAITAMA

Target Setting Emissions Trading System in Saitama

GASES	ALLOCATION	OFFSETS AND CREDITS
CO_2 only	Free allocation	Domestic

COVERAGE
6.6 $MtCO_2e$ (2016)

ETS in force
ETS scheduled
ETS considered

SECTORS:

INDUSTRY

BUILDINGS

Covers large buildings and factories

Linked to Tokyo since launch

ETS DESCRIPTION

Saitama's ETS was established in April 2011 as part of the Saitama Prefecture Global Warming Strategy Promotion Ordinance. Under the ETS, large buildings and factories in Saitama are required to reduce emissions by 15% or 13% in its second compliance period (FY2015–2019). Saitama's ETS is linked to Tokyo's program.

YEAR IN REVIEW

In FY2016, the Saitama ETS achieved a 28% reduction in emissions below base-year emissions.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **36.6 $MtCO_2e$ (2016)[1]**

OVERALL GHG EMISSIONS BY SECTOR

Industry 11.2 (33%)
Residential 8.8 (26%)
Transport 9.4 (27%)
Commercial 4.8 (14%)

GHG REDUCTION TARGETS

BY 2020: 21% reduction from 2005 GHG levels (demand side)

ETS Size

GHGs COVERED

CO_2

SECTORS AND THRESHOLDS

Consumption of fuels, heat, and electricity in commercial and industrial buildings

INCLUSION THRESHOLDS: Facilities that consume energy more than 1,500kL of crude oil equivalent or more per year.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

~574 facilities (2016): office/commercial buildings: 166; factories: 408

CAPPED EMISSIONS

6.6 $MtCO_2e$

CAP

The Saitama-wide cap is aggregated based on emissions baselines set at the facility level. Baselines for the regulated facilities are calculated according to the following formula: Sum of base-year emissions of covered facilities x compliance factor x number of years of a compliance period (five years).

1 - The overall emissions figure for Saitama is higher than the total of the emissions by sector because the former includes all GHGs in Saitama, whereas the emissions by sector only measures CO_2 emissions.

COMPLIANCE FACTOR:
First Period (FY2010–FY2014): 8% or 6% reduction below base-year emissions

Second Period (FY2015–FY2019): 15% or 13% re- duction below base-year emissions

The higher compliance factor applies to commercial buildings, as well as to district heating and cooling (DHC) plant-facilities (excluding facilities that use a large amount of DHC). The lower compliance factor applies, among others, to commercial buildings, facilities which are heavy users of DHC plants, and factories.

Facilities demonstrating outstanding performance in emissions reduction, as well as in the introduction, use, and management of energy equipment, are certified as top-level facilities that receive lower compliance factors according to their rate of progress. The certification standards represent the highest-level energy-efficiency measures currently feasible, stipulating more than 200 different energy-saving measures.

Phases & Allocation

TRADING PERIODS
FIRST PERIOD: 1 April 2011 to 30 September 2016
SECOND PERIOD: 1 April 2015 to 30 September 2021

Each of the above trading periods includes an 18-month adjustment period.

ALLOCATION
The baselines for facilities are based on historical emissions, calculated according to the following formula: Base-year emissions x (1 – compliance factor) x compliance period (5 years).

Base-year emissions for the first compliance period are based on the average emissions of three consecutive years between FY 2002–2007, as chosen by each entity. Credits are issued to facilities whose emissions fall below the baseline.

Baselines for new entrants are based on past emissions or on emissions intensity standards.

Flexibility

BANKING AND BORROWING
Banking is only allowed between two consecutive compliance periods.
Borrowing is not allowed.

OFFSETS AND CREDITS
Credits from five offset types are allowed in the Saitama ETS.

SMALL- AND MID-SIZE FACILITY CREDITS:
Emissions reductions from non-covered small- and medium-sized facilities in Saitama.
Quantitative Limits: None.

OUTSIDE SAITAMA CREDITS:
Emission reductions achieved from large facilities outside of the Saitama prefecture. Large facilities are those with an energy consumption of 1,500kL of crude oil equivalent or more in a base-year, and with base-year emissions of 150,000t or less.

Quantitative Limits: Credits are only issued for the reduction amount that exceeds the compliance factor. These credits can be used for compliance for up to one-third of offices' reduction obligations. Factories can use up to 50%.

RENEWABLE ENERGY CREDITS: Credits from solar (heat, electricity), wind, geothermal, or hydro (under 1,000kW) electricity production are counted at 1.5 times the value of regular credits. Credits from biomass (biomass rate of 95% or more, black liquor is excluded) are converted with the factor 1. These credits encompass the following types: Environmental Value Equivalent, Renewable Energy Certificates, and New Energy Electricity, generated under the Renewable Portfolio Standard Law.
Quantitative Limits: None.

TOKYO CREDITS (VIA LINKING):
(1) Excess Credits: Emissions reductions from facilities with base-year emissions of 150,000 tonnes or less. Issuance of credits from FY2015.
(2) Small- and mid-size Facility Credits: Issued by Saitama Prefecture. Issuance of credits from FY2012.
Quantitative Limits: None.

FOREST ABSORPTION CREDITS: Credits from forests inside the Saitama Prefecture are counted at 1.5 times the value of regular credits. Others are converted with the factor 1.
Quantitative Limits: None.

EMISSIONS REDUCTION METHODS:
Renewable Energy: When covered facilities generate electricity from renewable sources for their own use, they can deduct this amount of electricity from the total energy usage of the facility.

MARKET STABILITY PROVISIONS
In general, Saitama does not control carbon prices.

Compliance

COMPLIANCE PERIOD
FIRST PERIOD: FY2011-2014
SECOND PERIOD: FY2015-2019

MRV
REPORTING FREQUENCY: Annual emissions reporting, including emission reduction plans. All seven GHGs must be monitored and reported: CO_2, CH_4, N_2O, PFCs, HFCs, SF_6, and NF_3.

VERIFICATION: These reports require third-party verification by the end of adjustment period.

FRAMEWORK: These are based on 'Saitama Monitoring/Reporting Guidelines' and 'Saitama Verification Guidelines.'

ENFORCEMENT
None

Linking

LINKS WITH OTHER SYSTEMS
Linking with Tokyo started in April 2011. Tokyo and Saitama credits are officially eligible for trade between the two jurisdictions. During the first compliance period, 15 credit transfers took place between the Saitama Prefecture and Tokyo (nine cases from Tokyo to Saitama, six cases from Saitama to Tokyo).

Other Information

INSTITUTIONS INVOLVED
Saitama Prefectural Government

IMPLEMENTING LEGISLATION/REGULATION
Saitama Prefecture Global Warming Strategy Promotion Ordinance[1]

Regulation on Saitama Prefecture Global Warming Strategy Promotion Ordinance[2]

1 – http://www3.e-reikinet.jp/saitama-pref/d1w_reiki/421901010009000000000/421901010009000000000/421901010009000000000.html ;
2 – http://www3.e-reikinet.jp/saitama-pref/d1w_reiki/421902100019000000000/421902100019000000000/421902100019000000000.html

INDONESIA

ETS in force

ETS scheduled

ETS considered

Legal basis for ETS by 2024

MRV system design near completion

ETS DESCRIPTION

Indonesia is considering market-based carbon pricing policy, including an ETS, for the power and industry sectors to help meet its NDC targets and foster low-carbon sustainable development.

'Act No. 32/2009 on Environmental Conservation and Management' provides a legal basis for environmental management and climate change policy in Indonesia. In 2017, Indonesia passed the 'Government Regulation on Environmental Economic Instruments' that provides a basis for ETS implementation; this regulation sets a mandate for an emissions and/or waste permit trading system to be implemented by 2024 (within seven years from its passage).

Since early 2017, Indonesia has been developing the building blocks for a carbon market with the PMR, including a study outlining the emissions profiles and marginal abatement cost curves of the power and industry sectors. Work on the design and governance framework of an MRV system is near completion, with capacity building and stakeholder consultation ongoing. The MRV guidelines for the power sector were released in mid-2018. Following this, an online GHG reporting platform for electricity generators and a pilot MRV program for electricity generators in the Java-Madura-Bali grid (covering ~70% of Indonesia's electricity demand) were launched in late 2018. The Ministry of Industry has developed an online GHG emissions reporting system for industries in Indonesia. Pilot MRV programs in the industry sector are being conducted in the cement and fertilizer subsectors.

Part of the ongoing PMR work is to develop a framework for market-based instruments (MBI) in Indonesia. A study completed in late 2018 examined and modeled four MBI options: an ETS for the power and industry sectors; energy efficiency certificates for industry; a cap-and-tax system; and a carbon offset mechanism. Based on the study, stakeholders are now being consulted about MBI implementation.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **865.0 $MtCO_2e$ (2014)**

OVERALL GHG EMISSIONS BY SECTOR

Energy (excluding transport) 461.0 (53%)
Transport 141.0 (16%)
Industrial processes 47.00 (5%)
Agriculture 113.0 (13%)
Waste 102.0 (12%)

GHG REDUCTION TARGETS

BY 2030: 29% below BAU by 2030 incl. LULUCF (unconditional NDC);
up to 41% below BAU by 2030 incl. LULUCF (NDC conditional on international support)

Other Information

INSTITUTIONS INVOLVED

Coordinating Ministry for Economic Affairs;
Ministry of Environment and Forestry;
Ministry of Energy and Mineral Resources;
Ministry of Industry;
Ministry of Finance;
National Development Planning Agency;
PMR Indonesia Secretariat;
UNDP Indonesia

JAPAN

ETS in force

ETS scheduled

ETS considered

Expert committee discussing carbon pricing options

Operating voluntary ETS

ETS DESCRIPTION

In March 2017, the Global Environment Committee of the Central Environment Council of Japan formulated the "Long-term Low-carbon Vision" of the country. The document refers to carbon pricing as essential to decarbonize the society. Based on that discussion, in March 2018 an expert committee on carbon pricing released a study assessing how carbon pricing could help Japan achieve long-term, substantial emissions reductions, as well as solve economic and social issues. In June 2018, a deliberative council – the "Subcommittee on Utilization of Carbon Pricing, Global Environmental Subcommittee, Central Environment Council" – was set up to consider how carbon pricing can encourage Japan to make the transition to a decarbonized society and to achieve economic growth. Both industry groups and academic experts participated in the council; discussions are still ongoing.

In parallel, Japan operates the Advanced Technologies Promotion Subsidy Scheme with Emission Reduction Targets program, which functions as a voluntary cap-and-trade program. Entities establish a reduction target based on historical emissions and propose new technologies to implement in order to reach these targets.

Japan is also implementing the Joint Crediting Mechanism, a bilateral offset crediting mechanism to incentivize low-carbon technologies in developing countries.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **1306.7 $MtCO_2e$ (FY2016)**

OVERALL GHG EMISSIONS BY SECTOR

Energy 1153.6 (88%)
Industrial processes and product use 95.9 (7%)
Agriculture 33.5 (3%)
Waste 21.6 (2%)
Indirect CO_2 2.1 (0%)

GHG REDUCTION TARGETS

BY 2020: 3.8% below 2005 levels by 2020
BY FY2030: 26% reduction from FY2013 GHG levels (NDC)
BY FY2050: 80% reduction (base year not stipulated)

Other Information

INSTITUTIONS INVOLVED

Ministry of the Environment

THAILAND

ETS in force

ETS scheduled

ETS considered

National Economic and Development Plan includes domestic ETS

Operating voluntary ETS to test registry and trading platform

Developing legal framework and roadmap for ETS

ETS DESCRIPTION

The '12th National Economic and Development Plan (2017-2021)' of Thailand calls for several mitigation measures, including the development of a domestic carbon market. The 'National Climate Change Master Plan (2015-2050)' also refers to carbon markets as a potential mechanism to reduce GHG emissions in the private sector. In addition, the importance of carbon markets has also been emphasized in Thailand's nationally determined contribution (NDC).

From 2013-2016, the Thailand Greenhouse Gas Management Organization (public organization) (TGO developed an MRV system for the 'Thailand Voluntary Emissions Trading Scheme' (Thailand V-ETS). In 2013-2014, MRV general guidelines for the Thailand V-ETS were developed. Between October 2014 and September 2017, the Thailand V-ETS ran its first pilot phase, aimed at testing the MRV system, developing sector-specific MRV guidelines, and setting a cap and allocating allowances for covered factories. The second pilot phase (2018-2020) tests the registry and trading platform.

Under the 'National Reform Plan,' the Thai government must set up an economic instrument, such as a cap-and-trade program, to incentivize the private sector to reduce emissions. The specific instrument will be outlined in the 'Climate Change Act,' which is expected to enter into force by 2020. The TGO is working on an ETS implementation roadmap and legal framework, which will be proposed as a policy recommendation for the government to consider.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **318.7 $MtCO_2e$ (2013)**

OVERALL GHG EMISSIONS BY SECTOR

Energy 236.9 (74%)
Industrial processes 19.0 (6%)
Agriculture and land-use change 50.9 (16%)
Waste 11.8 (4%)

GHG REDUCTION TARGETS

BY 2020: In its 'Nationally Appropriate Mitigation Action (2014),' Thailand committed to a voluntary 7% reduction compared to BAU in the energy and transport sectors. The reduction target can be up to 20% with international support.

BY 2030: 20% reduction compared to BAU with a 25% reduction contingent on adequate and enhanced access to technology development and transfer, financial resources, and capacity building support through a balanced and ambitious global agreement under the UNFCCC (NDC).

Other Information

INSTITUTIONS INVOLVED

Thailand Greenhouse Gas Management Organization (public organization)

VIETNAM

ETS in force

ETS scheduled

ETS considered

Considering an ETS for the steel sector in 2020

Considering market-based instrument for waste sector in 2020

ETS DESCRIPTION

Vietnam's 'Green Growth Strategy' (2012) pursues the objective of a low-carbon economy and invokes the introduction of market-based instruments. Several measures lay the groundwork for implementing 'National Appropriate Mitigation Actions' (NAMAs) in the waste, steel, cement, chemical fertilizer, wind power, and biogas sectors. As part of its activities under the PMR, Vietnam is focusing on the steel and waste sectors. The planned MRV system and crediting NAMA will provide the experience for the implementation of a sector-based cap-and-trade program in the steel sector, which could start in 2020. Vietnam is also considering the use of market-based instruments for the waste sector starting in 2020.

A decree on a roadmap for GHG emissions is going to be approved in 2019, which references the use of carbon credits and a carbon pricing policy system.

Background Information

OVERALL GHG EMISSIONS (EXCL. LULUCF) **293.3 $MtCO_2e$ (2013)**

OVERALL GHG EMISSIONS BY SECTOR

Energy 151.4 (52%)
Industrial Processes 31.8 (11%)
Agriculture 89.4 (31%)
Waste 20.7 (7%)

GHG REDUCTION TARGETS

BY 2030: 8% below BAU and 25% conditional on international support (NDC) including 20% reduction in 2010 GHG (intensity) levels and 30% conditional on international support

Other Information

INSTITUTIONS INVOLVED

Ministry of Natural Resources and Environment of Viet Nam

ABOUT ICAP

"ICAP is a unique platform for governments to discuss the latest research and practical experiences with emissions trading

ABOUT ICAP

Introducing the International Carbon Action Partnership

In 2007, ICAP was founded as an international government forum to bring together policymakers from all levels of government that have or are interested in introducing an ETS. It provides a unique platform for governments to discuss the latest research and practical experiences with emissions trading. Since its formation, ICAP has established itself as an ETS knowledge hub and its membership has grown to include 31 members and five observers.

OBJECTIVES:

- Share best practices and learn from each other's experience of ETS
- Help policymakers recognize ETS design compatibility issues and opportunities for the establishment of an ETS at an early stage
- Facilitate the future linking of trading programs
- Highlight the key role of emissions trading as an effective climate policy response
- Build and strengthen partnerships among governments

MEMBERS (AS OF MARCH 2019)

Arizona, Australia, British Columbia, California, Denmark, the European Commission, France, Germany, Greece, Ireland, Italy, Maine, Manitoba, Maryland, Massachusetts, Netherlands, New Jersey, New Mexico, New York, New Zealand, Norway, Ontario, Oregon, Portugal, Québec, Spain, Switzerland, the Tokyo Metropolitan Government, Vermont, the United Kingdom and the state of Washington.

OBSERVERS

Japan, Kazakhstan, the Republic of Korea, Mexico and Ukraine

ICAP PROVIDES A WIDE RANGE OF ONLINE TOOLS TO MEET YOUR EMISSIONS TRADING INFORMATION NEEDS

- The **ICAP ETS Map** lets you explore detailed up-to-date factsheets on all systems, ...

- ... while our **news** articles cover the latest milestones in emissions trading.

- The **ICAP Allowance Price Explorer** lets you display and compare allowance prices from across the world in customized charts.

- The soon-to-be launched **ICAP ETS Library** lets you dive into a range of government documents and academic papers on carbon markets. Continuously updated, the library is the reference point for all your emissions trading questions.

SHARING KNOWLEDGE AND EXPERIENCE ON EMISSIONS TRADING DESIGN AND IMPLEMENTATION GLOBALLY

- In our **publications**, available on our website, we consolidate lessons learned and highlight best practices from over a decade of experience with GHG emissions trading.

- Through our series **ETS briefs** we make the complex concepts underlying emissions trading accessible to a broader audience:

NOTES ON METHODS AND SOURCES

GENERAL NOTES

01. The report draws on a range of sources, including official ETS information and statements from governments and public authorities, data submitted to the UNFCCC, or where available, other official reporting and information provided by ICAP members and observers, contributing authors or in-country/native experts from our network. Information on emitting sectors is based on self-reporting by the respective jurisdictions; therefore categories are not necessarily consistent across jurisdictions.
02. Data in the report represents the current situation as of February 2019.
03. Where 2019 data is not yet available, we use the most recent available data.
04. For the purpose of this report, emissions trading systems (ETS) include mandatory cap-and-trade systems for GHGs. Systems that regulate other gases (e.g., other air pollutants) or trade other units (e.g., energy-efficiency certificates), other market-based instruments (e.g., carbon taxes, baseline-and-crediting systems) and voluntary programs do not fall under the scope of this report.
05. We use metric tonnes throughout the report, unless otherwise indicated.
06. Emissions coverage as reported in factsheets refers to the emissions cap data for systems with a cap. For systems without a cap it refers to estimates of the emissions covered under the particular emissions trading system.
07. Jurisdictions' shares of global GDP and world population are calculated based on the most recent annual data available at the time of writing. This data is for 2018, 2017 or 2016. The number of people living in jurisdictions that are running an ETS and the cumulative GDP of the respective economies are calculated as a percentage/share of world population and global GDP. The share of global GHG emissions covered by an ETS in force is calculated based on the latest available data of jurisdictions' official cap data or respective estimates. Figures have been retrieved from various sources (links available upon request, info@icapcarbonaction.com).
08. When WCI jurisdictions are represented as a single linked system, values are calculated as averages weighted by shares of the overall 2019 cap when no single uniform data point was available. For variables where the absolute total was of interest (e.g. market size), the cumulative total was used.
09. All prices are listed in USD unless otherwise specified. For the average 2018 price conversion to dollars, the exchange rate used constitutes a yearly average of the monthly averages as provided by the international financial statistics of the IMF. The exchange rates used for Québec carbon prices are the ones provided on day of auction by the WCI.
10. In the factsheets, overall GHG emissions by sector may not add up due to rounding.
11. The following criteria are used to determine the three categories of the status of an ETS:
    a. In force: ETS is in force with implementation established in the relevant regulation or legislation.
    b. Scheduled: A mandate for ETS is established, ETS rules are currently being drafted, an official launch date has been communicated.
    c. Under consideration: ETS is being considered as a potential mitigation instrument, the government or other relevant authorities have publicly sent signals regarding the development of an ETS.

NOTES ON INFOGRAPHICS

For the "Emissions Trading Worldwide Map", the "Sector Coverage" and the "Growing Stability" graphic, we draw on data contained in the factsheets, the online version of the ICAP ETS Map (https://icapcarbonaction.com/en/ets-map), as well as news articles from the ICAP secretariat. For infographics involving quantitative data the following sources were used and calculations performed:

GLOBAL EXPANSION OF EMISSIONS TRADING

01. Whenever available, we use the official and most recent cap data. When this data is unavailable or when systems operate without a cap, we use estimates of emissions from covered sectors.
02. In the case of the EU ETS, we exclude emissions covered under the aviation sector cap due to a lack of reliable data. In light of international developments of a global market-based regulation for aircraft emissions, the EU adjusted its treatment of the aviation sector, not applying the previously set cap to flights operating from or to non-EEA countries while continuing to apply the legislation to flights within and between countries in the EEA (see the EU ETS Factsheet for details). Excluding the aviation sector of the EU ETS thus leads to a more conservative estimate of the total global emissions covered by an ETS.

03. In the case of China, the year that its national ETS is expected to start to operate is based on the estimation according to the 'Work Plan for Construction of the National Emissions Trading System (Power Sector)' approved by the State Council in late 2017. There are still uncertainties and the start date may be subject to further change or delays.

04. There are two cases where an existing and a scheduled system regulate the same emissions. In those cases, we performed calculations to avoid double-counting:

    a. MA-RGGI: Massachusetts' system covers emissions from the electricity sector, just as RGGI does, thus it does not increase the total covered emissions.

    b. China-Chinese Pilots: Both the Chinese pilots and the China national ETS cover the power sector. In order to calculate the total emissions covered by the scheduled ETS in China, we have estimated the degree of power sector overlap between the national system and the pilots, and adjusted accordingly. For provincial power sector data we relied on: Qu, Shen, Sai Liang, and Ming Xu. "CO_2 Emissions Embodied in Interprovincial Electricity Transmissions in China" Environmental Science & Technology 51, no. 18 (2017): 10893-10902. The study aggregates official power generation statistics and combines them with emission intensities for 2013 data yielding province-level power sector emission estimates. It indicates that in 2013, ~1/6 of Chinese power sector emissions came from provinces that now have a pilot system covering the power sector. Assuming this share has remained constant since, we adjusted the estimated total coverage of the Chinese national ETS (3.3 Gt CO_2e – power sector only), meaning we assume that the Chinese national ETS has brought an additional 5/6 * 3.3Gt = 2.75 Gt CO_2e under ETS regulation in China.

05. Data on global emissions refers to CO_2e excluding LULUCF; 2018 data is calculated based on figures for 2017, assuming 2.7% growth. Data has been retrieved from: Olivier and Peters (2018): Trends in Global CO_2 and Total Greenhouse Gas Emissions, 2018 Report. PBL Netherlands Environmental Assessment Agency, The Hague.

06. The assumption of 2.7% growth in global emissions in 2018 is based on the best estimate of CO_2 emissions by the Global Carbon Budget Project.

07. Percentages of global emissions covered are rounded to the nearest full percentage. They are slightly above 5% in 2005 and slightly above 8% in 2018.

08. Forecasts for emissions coverages of jurisdictions for 2020 are calculated based on systems' future caps. This includes the projected caps for the scheduled systems of China, Mexico, Virginia and New Jersey. Mexican cap data were retrieved from Öko-Institut e.V.: Designing an Emissions Trading System in Mexico: Options for Setting an Emissions Cap. In those cases where no future caps are available the most recent cap is used.

DIFFERENT SHAPES OF CAP-AND-TRADE

01. Cap trajectory: The rate of decline in the cap is calculated for the period between 2016 and 2020. The cap trajectory for this period of time rather than for the latest available pair of successive years is calculated for reasons of robustness and validity of the results. The difference between the 2020 amount of allowances compared to the 2016 cap is expressed as the average percentage reduction in this time period. The data denotes annual caps and is thus not a direct measure of allowances released in this year, given that this can also be affected by vintage years, reserves and other instruments. The New Zealand ETS does not feature a system-specific cap, but is rather aligned to international targets under the UNFCCC, making it incomparable in this metric.

02. Coverage: The figures for coverage indicate the percentage of the respective economy's total emissions that is covered by the ETS. The data is retrieved from the factsheets published in this report and refers to the latest emissions coverage figures available for each system.

03. Carbon Price: For the EU ETS, the carbon price is the average of all 2018 spot prices (settlement prices) at the European Energy Exchange converted to USD. Prices for Switzerland represent an average of the "hammer price" from the biannual competitive auctions and are then converted to USD. For RGGI and WCI, the clearing prices of all auctions conducted in 2018 are averaged, with conversion to price per metric tonne in the case of RGGI (where short tons are the standard unit). For the Korean and New Zealand systems, prices are based on average end-of-day trading prices on secondary-market exchanges in 2018 and converted to USD.

04. Share of allowances not provided freely: This figure indicates the proportion of allowances that must be acquired at auction or elsewhere.

05. California presents a difficult boundary case as it simultaneously features characteristics of free allowances for utilities at the receiving side and characteristics of regularly auctioned allowances seen from the distributing side. Since our prime interest with this metric is illustrating the share of allowances for which a carbon price has to be paid (rather than existing as an opportunity cost), we treat consignment allowances as if they were not provided freely. We thereby take into consideration that most utilities cannot simply use the consignment allowances for their own compliance and revenue usage is mandated to benefit rate-payers.

06. The New Zealand ETS has so far not had an auctioning mechanism. However, this is not equivalent with a free provision of all allowances – most supply comes from sources such as domestic forestry removals or privately held banked units. For New Zealand this metric is calculated as the proportion of freely allocated allowances for Emissions Intensive and Trade Exposed (EITE) activities in 2017 compared to the total system-wide compliance obligation for that year.

SECTOR COVERAGE

01. Sectors referred to in this graphic are associated with the following definitions

SECTOR	DEFINITIONS
Power	Emissions from the combustion of fossil fuels for electricity generation, as well as large-scale centralized heat production.
Buildings	Emissions originating from buildings. With upstream coverage, distributors of heating fuels face compliance obligations and all consumers are exposed to the carbon price. With downstream coverage, emissions of large buildings are regulated. In this case, emissions originating from other sectors (e.g. power production) may also be attributed to buildings to incentivize demand reduction and shifting towards cleaner sources of supply.
Transport	Emissions from fossil fuel combustion for transport with the exception of aviation (domestic and international) and international maritime transport. Coverage usually is upstream with fuel distributors facing compliance obligations.
Domestic Aviation	Emissions from fossil fuel combustion for flights arriving and departing within the jurisdiction ('domestic') which are not regulated by the International Civil Aviation Organization (ICAO).
Forestry	Emissions and removals resulting from forest land use, including forest management/harvest, deforestation and re/afforestation activities.
Industry	Emissions from industrial activity, typically covering both energy emissions (e.g. from burning fossil fuels in furnaces), as well as process emissions (e.g. in the case of cement production).
Waste	Emissions from waste disposal and management (e.g. methane from anaerobic decomposition in landfills).

02. Even though China's national ETS is listed as scheduled in this Status Report, it is displayed in this graphic as the sector coverage for China's system is already set in an executive order approved by State Council; in all other cases of scheduled systems, the legal basis for the sector coverage is still to be decided upon.

AUCTIONING REVENUE

01. Auctioning revenues for the five systems displayed here were calculated from official figures from the European Commission, California Air Resources Board, Québec Ministry of Sustainable Development, Environment, and Fight Against Climate Change, Regional Greenhouse Gas Initiative, European Energy Exchange, the Intercontinental Exchange and Swiss Emissions Registry (links available upon request, info@icapcarbonaction.com).
02. Auctioning revenue figures for the EU ETS exclude revenue from the domestic aviation sector. For the California cap-and-trade system, the estimated percentage of auctioned permits and total auction revenue account for state-owned permits only.
03. For the Québec cap-and-trade system, joint auctions involve currency conversion for part of the proceeds. The rate and transaction fees on the date of conversion can affect the amount deposited to the Green Fund. As a result, the product of the number of permits sold and the settlement price may slightly differ from the actual amount deposited. The estimated percentage of auctioned allowances for the California and Québec cap-and-trade systems are calculated based on the vintage year, not by the year when allowances were or would actually be auctioned.

List of acronyms

AB	Assembly Bill
AFOLU	Agriculture, Forestry and other Land Use
AIC	Allowances in Circulation
ANSI	American National Standards Institute
APCR	Allowance Price Containment Reserve
BAU	Business as Usual
BPU	Board of Public Utilities
BVRio	Rio de Janeiro Green Stock Exchange
CAD	Canadian Dollar
CARB	California Air Resources Board
CCER	Chinese Certified Emission Reduction
CCR	Cost Containment Reserve
CCS	Carbon Capture and Storage
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CH_4	Methane
CHF	Swiss Franc
CMEA	Coordinating Ministry for Economic Affairs
CNY	Chinese Yuan Renminbi
CO_2	Carbon Dioxide
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CPA	Carbon Pricing in the Americas
DEB	Direct Environmental Benefits
DEP	Department of Environmental Protection
DEQ	Oregon Department of Environmental Quality
DHC	District Heat and Cooling
DRC	Development and Reform Commission
ECCC	Environment and Climate Change Canada
ECR	Emissions Containment Reserve
EEA	European Economic Area
EITE	Energy-Intensive and Trade-Exposed
ERU	Emissions Reduction Units
ETS	Emissions Trading System or Emissions Trading Scheme
EU	European Union
EUR	Euro
FFCER	Fujian Forestry Certified Emission Reduction
FGV	Fundação Getúlio Vargas
FY	Fiscal Year
FYP	Five Year Plan
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Society for International Cooperation)
GVCes	Centro de Estudos em Sustentabilidade da Fundação Getúlio Vargas (Center for Sustainability Studies)
HFCs	Hydrofluorocarbon
HFC-23	Fluoroform
ICAO	International Civil Aviation Organization
ICAP	International Carbon Action Partnership
INDC	Intended Nationally Determined Contribution
KCUs	Korean Credit Units
KETS	Korean Emissions Trading Scheme
KRW	South Korean Won
LDCs	Least Developed Countries
LGCC	Ley General de Cambio Climatico (Mexico's General Law on Climate Change)
LNG	Liquefied Natural Gas
LULUCF	Land Use, Land-Use Change and Forestry
JI	Joint Implementation
MassDEP	Massachusetts' Department of Environmental Protection
MBI	Market-based Instrument
MEE	Ministry of Ecology and Environment
MEP	Ministry of Environmental Protection
MMC	Mine Methane Capture
MOE	Ministry of Environment
MOU	Memorandum of Understanding
MOST	Ministry of Strategy and Finance
MRV	Monitoring, Reporting and Verification
MSR	Market Stability Reserve
$MtCO_2e$	Million Metric Tonnes of Carbon Dioxide Equivalent
MW	Megawatt
MWe	Megawatt Equivalent
N_2O	Nitrous Oxide
NOx	Nitrogen Oxide
NAMA	Nationally Appropriate Mitigation Actions
NDC	Nationally Determined Contribution
NDRC	National Development Reform Commission
NF_3	Nitrogen Trifluoride
NO_2	Nitrogen Dioxide
NZ	New Zealand
NZD	New Zealand Dollar
NZUs	New Zealand Units
OTC	Over the Counter
PFCs	Perfluorocarbon
PHCER	Pu Hui Certified Emission Reductions
PMR	Partnership for Market Readiness

PNCTE	Programa Nacional de Cupos Transables de Emisión de Gases de Efecto Invernadero (National Program of Greenhouse Gas Tradable Emission Quotas)
RBOB	Reformulated Blendstock for Oxygenate Blending
RENE	Registro Nacional de Emisiones (Mexico National Emissions Register)
RGGI	Regional Greenhouse Gas Initiative
SCC	Standards Council of Canada
SEMARNAT	Secretaría de Medio Ambiente y Recursos Naturales (Ministry of Environment and Natural Resources)
SF_6	Sulfur Fluoride
SHEAF	Shanghai Emission Allowance Forward
SO_2	Sulfur Dioxide
SOE	State Owned Enterprise
tce	Tonne of Coal Equivalent
TCI	Transportation and Climate Initiative
tCO_2	Tonne of Carbon Dioxide
tCO_2e	Tonne of Carbon Dioxide Equivalent
TEPA	Taiwanese Environmental Protection Administration
TGO	Thailand Greenhouse Gas Management Organization
TMG	Tokyo Metropolitan Government
TMS	Target Management Scheme
UNFCCC	United Nations Framework Convention on Climate Change
USD	US Dollar
US EPA	US Environment Protection Agency
V-ETS	Thailand Voluntary Emissions Trading Scheme
WCI	Western Climate Initiative

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