



International Carbon
Action Partnership

EMISSIONS TRADING WORLDWIDE

Status Report 2021

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International Carbon Action Partnership (ICAP) Status Report 2021

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FOREWORD

Short-term resilience and long-term ambition: ETS in the context of a net-zero consistent recovery

The COVID-19 pandemic and climate change are the global crises of our time. The virus has affected every corner of the world, but so too has the climate crisis, with year-on-year record temperatures driving a host of very visible, intensifying impacts, among these the extraordinary and tragic wildfires in Australia, California, and the Arctic Circle. Both crises threaten our public health, our environment, our economies, and our ways of life. They highlight the value of transparent, evidence-based information for decision-making and demonstrate the benefits of working together – in our communities, businesses, institutions, and governments. They also teach us that while facing challenges can pose risks and hardships, it also spurs creative and innovative solutions, and provides opportunities to create a safer, healthier, fairer, and more prosperous world.

In facing the economic shock of the pandemic, carbon markets have demonstrated remarkable resilience. Since spring 2020, the pandemic has impacted economic activity, reducing both emissions and demand for emissions allowances. Carbon markets reacted rationally as prices and auction volumes initially dropped. However, after a period of volatility, they stabilized, and allowance trading soon returned to pre-pandemic price and volume levels. This shows that the underlying structures of markets are sound and can foster resilience to external shocks, enabling market actors to react rationally, both to short-term signals and longer-term perspectives.

This is a different story compared to the global financial crisis, the last major external demand shock to hit carbon markets, which exacerbated structural surpluses, suppressed prices, and undermined confidence in emissions trading. ETS policymakers reflected on the lessons of the past decade and worked to improve the design of their systems by building increasingly sophisticated market stability elements into their regulations. These reforms have also been embedded in overarching policy frameworks, more ambitious 2030 targets, and long-term net-zero commitments, giving market actors confidence in the longevity of the policy.

Over the last years, a spectrum of innovative market stability mechanisms have been designed and implemented across major ETSs around the world, including auction floor prices, market stability reserves, and emissions containment reserves. They are transparent and predictable rule-based mechanisms, devised to ensure orderly market functioning by adjusting the supply of allowances and moderating undesirable price effects in response to external shocks or structural imbalances. These technical design features give market participants confidence in the carbon market by mitigating price volatility and supporting long-term trends in price development.

Anchoring an ETS within a robust framework with clear and ambitious policy targets further increases certainty, fostering resilience and longevity of the instrument. Having the role of ETS articulated in a policy mix and an overarching strategy to reach emissions targets offers a political and legal mandate for action. In particular, ambitious 2030 targets send a clear message that markets will need to provide a sufficiently strong and credible price signal to drive significant abatement and stimulate low-carbon investment.

Today, the number of jurisdictions announcing net-zero climate targets is on the rise, anchoring these commitments in high-level political pledges and/or legislation. National net-zero targets are catalyzed by the urgent need to align policy action with the goals of the Paris Agreement. Net-zero legislation has been passed or is currently under discussion in several key jurisdictions, including the European Union, France, Germany, Spain, Sweden, the UK, Republic of Korea, and New Zealand. Other key ETS jurisdictions such as California, Tokyo, and some RGGI states have explicitly set climate neutrality goals through executive orders or within policy documents. High-level political pledges have also been made by climate giants China, the US and Japan. This is truly encouraging, as achieving these net-zero targets will start to bring the Paris Agreement goals within reach.



Anchoring an ETS within a robust framework with clear and ambitious policy targets further increases certainty.

Achieving climate neutrality by mid-century will require a concerted, long-term policy approach. Enacting net-zero climate laws and strengthening existing policy frameworks can set the scene for proactive policy development, allowing policymakers to adopt regulations, calculate emissions budgets, and set ever more ambitious emissions caps. They also assure market actors that despite temporary market fluctuations, the overall policy direction is towards steady and inevitable emissions reductions.



The public response to the economic impacts of the pandemic also presents a historic opportunity to direct economic stimulus towards low-carbon development.

However, net-zero aspirations also raise a host of challenges for ETS policymakers, who need to think more concretely about pathways to net zero, the policies needed to achieve these pathways, and possible changes to carbon markets as we draw nearer to a state of deep decarbonization. ICAP is looking forward to diving deeper into these topics in the coming year through advancing the ICAP work-stream on ETS and net zero.

The public response to the economic impacts of the pandemic also presents a historic opportunity to direct economic stimulus towards low-carbon development, specifically by linking economic recovery packages to climate objectives. Under the European Green Deal, the EU is explicitly pursuing a recovery agenda oriented around a green and digital transition. The UK and Republic of Korea have also committed to greening their recovery packages. In the US, President Biden has articulated the strategic link between pandemic recovery and climate investment, proposing the USD 2 trillion 'Build Back Better' program. These green recovery plans foresee major investment in low-carbon infrastructure and human capital, while explicitly striving for a just transition. While a range of investments, subsidies and direct regulatory policies will be central to achieving green recovery goals around the world, well-designed ETSs are a key strategy to advancing these objectives. ETS auction revenue is also an important resource that policymakers can use to counter distributional effects and support the social and environmental objectives of green recovery packages.

In the past year, emissions trading systems have shown their mettle, withstanding a real-world test of resilience and demonstrating that well-designed carbon markets, while more complex than some other climate policies, are reliable and robust instruments that will play a fundamental role in achieving net-zero targets. Evidence from well-functioning and resilient markets is steadily building trust in the ability of ETSs to achieve cost-effective mitigation, while also maintaining economic competitiveness and fostering low-carbon investment. Policymakers can now look with more confidence to develop and expand their

systems as they work towards meeting increasing levels of ambition. Several jurisdictions are considering more ambitious economy-wide targets, while discussing options to increase the stringency of ETS caps, broaden the scope of existing systems and develop new systems in previously uncovered sectors. Examples include Germany's new national ETS for transport and heating fuels that will work alongside the energy and industrial coverage of the EU ETS, and New Zealand's efforts to put a carbon price on the agriculture sector. These innovations have run in parallel to key policy developments in China that have paved the way for the world's largest carbon market. ICAP continues to contribute to ETS developments by, for example, convening technical dialogue among our members, aimed at drawing together their rich experience in designing and operating an ETS across a range of sectors.

As we look ahead, we anticipate increasing momentum for the expansion of ETS policy, both in existing and newly emerging markets. ETS will become ever more relevant as a tried and trusted instrument with proven resilience. As we continue to adapt and improve our systems, we will strive to incorporate lessons and implement best practices to make our markets even more resilient. By engaging with each other through ICAP, we can actively support this process, with our diversity being our key strength. As policymakers implement robust ETS policies at home, we are also generating a world of practical knowledge from myriad perspectives. ICAP continues to provide an ideal forum to make the most of this wealth of ETS expertise, and our collaborations will ultimately create more robust and resilient carbon markets. And this starts when we reach out and engage with our peers around the world, share experiences and lessons learned, and cross-pollinate ideas to achieve our climate targets.



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EXECUTIVE SUMMARY

The economic impact of the COVID-19 pandemic had the potential to shock carbon markets around the world. However, markets demonstrated remarkable resilience, first reacting rationally to lower demand through price decreases, and then returning to near-normal functioning. Compared to after the global financial crisis, ETSs have weathered the shock without major effects. Market resilience can be attributed to two factors. First, market stability measures implemented in the last years have provided rule-based and predictable tools to support market function and adjust to structural imbalances. Secondly, ETS reforms have been embedded in overarching policy frameworks, more ambitious 2030 targets, and long-term net-zero commitments, fostering policy certainty and longevity.

Over the last year, jurisdictions worldwide have demonstrated their commitment to achieving net-zero emissions by announcing high-level pledges and/or embedding targets in law. Furthermore, as jurisdictions create pandemic economic recovery packages, some, such as the European Union, United Kingdom, the Republic of Korea, and the United States, are linking their plans to low-carbon development goals and greening their recovery spending. Meeting net-zero targets will require a concerted long-term approach that could bring the Paris Agreement goals within reach. Although a range of investments, subsidies and regulatory policies will be required, a well-designed ETS is a key strategy in advancing these objectives.

Thus, experience has now shown that well-designed ETSs are resilient to economic shocks and that policymakers can be more confident in developing and expanding their systems through more ambitious caps and broader scope coverage. In the last year, several jurisdictions have worked to expand ETSs into new sectors, policy developments in China have paved the way for the world's largest carbon market, and new systems have been announced around the world. Looking ahead, ETS will become even more relevant as a tried and trusted instrument that jurisdictions can rely on to achieve their climate targets. ICAP continues to be an ideal forum to collaborate on ETSs, by engaging with policymakers as they build ever more robust, resilient, and ambitious systems.

This edition of the International Carbon Action Partnership's (ICAPs) Emissions Trading Worldwide report outlines the key developments and trends over the past year. It presents infographics examining and comparing key ETS facts and figures and detailed factsheets on each system currently in force, under development, or under consideration. The Status Report also features articles from policymakers and experts in key ETS jurisdictions that provide insights into recent policy developments, responses to the economic impact of COVID-19, and efforts to instill greater climate ambitions.

The European Commission, for example, delves into recent developments and prospects for the EU ETS. Following a strong year in 2019, the EU carbon market passed a resilience test in 2020, as EU ETS market prices rebounded soon after the initial impact of the pandemic. The response is attributed to a robust carbon market

framework with an effective MSR, providing long-term policy certainty at the EU level. Looking ahead, the Green Deal recovery package and new 2030 targets encapsulated in the EU Climate Law are set to drive even greater climate ambition. Carbon pricing will be instrumental in delivering objectives, with the upcoming revision of the EU ETS further ensuring a long-term, credible price signal. Climate neutrality and green recovery were also key themes this year in the Republic of Korea. Experts at the Korean government research center GIR comment on the advances made in Korea's long-term climate policy, specifically the Korean commitment to achieve net-zero emissions by 2050 and the release of a Green New Deal framework. They further detail the recent developments in the K-ETS as it moves into Phase 3 and look ahead to aligning the system with steeper reductions projected under the new climate policy framework.

In separate articles, policymakers from the Regional Greenhouse Gas Initiative (RGGI), a collective of 12 US states, and from the New Zealand government, discuss how the impact of COVID-19 affected their systems. RGGI policymakers focus on the evolution of market stability design elements throughout the program, and how existing and pending stability measures have contributed to maintaining a functional and resilient carbon market. The New Zealand government recounts its experience with implementing major structural changes to the NZ ETS during the COVID-19 lockdown, including setting an emissions cap on the NZ ETS, introducing auctioning, and developing new price control mechanisms. They also outline the impacts of the pandemic on market price and functioning and look towards the full implementation of a newly reformed ETS.

The UK Government also looks ahead, outlining recent important developments in UK climate policy, including the world's first net-zero legislation and the decision to establish a UK ETS, which entered into force at the start of 2021. The UK's approach provides continuity for businesses after Brexit enables emissions trajectories to be aligned with net-zero targets and empowers policymakers to expand both the ambition and scope of the ETS. Policymakers in the UK are optimistic that despite the current challenges, there are opportunities to be realized in the transition to a green economy and the recovery from the COVID-19 pandemic.

Finally, experts from SinoCarbon, a key Chinese think tank, discuss how over the last year China has made progress with commitments and policy. At the highest political level, China has decided to pursue a green development strategy for high-quality growth, with President Xi Jinping pledging to peak CO₂ emissions before 2030 and achieve carbon neutrality by 2060. In early 2021, after releasing the final allocation plan for the power sector and the legal and administrative arrangements, the Ministry of Ecology and Environment officially announced that the national ETS had entered operation with the start of compliance obligations. SinoCarbon also discusses China's green development strategy and how the national ETS fits into the puzzle.

A YEAR OF ETS DEVELOPMENTS

Over the course of 2020, emissions trading systems underwent a range of developments, with some fine-tuning and enhancing system coverage and flexibility, and others launching into operation. New systems are also in the making, as jurisdictions work to design and implement anticipated ETSs. Here we summarize updates from the systems currently in force (i.e., those already in operation) and those under development (i.e., jurisdictions in which a mandate for an ETS is in place, and where system rules are currently being drafted), as well as other jurisdictions with major ETS developments in 2020.

Europe and Central Asia

- **European Union:** Started Phase 4 in 2021, with a steeper annual cap reduction factor of 2.2%, revised free allocation benchmarks, and launched the Modernization Fund and Innovation Fund. Revisions to align the ETS with the EU's 2030 Climate Plan are to be presented by mid-2021. These may include a possible expansion of the system's scope, revisions to the Market Stability Reserve, and a carbon border adjustment mechanism to protect against carbon leakage. The link with the Swiss ETS became operational in September 2020. As of January 2021, UK installations are no longer covered by the EU ETS.
- **Germany:** A national ETS was introduced in 2021, covering heating and transport fuels upstream. With the EU ETS covering Germany's energy, industry, and domestic aviation sectors, most major sectors in Germany are now covered by an ETS. The national system will be phased in gradually, with an annually increasing fixed price per tCO₂ from 2021 to 2025 and auctioning from 2026. A price corridor during auctions will apply in 2026 and, depending on decisions to be made in 2025, potentially also thereafter. The cap will be determined annually based on Germany's reduction targets for non-EU ETS sectors as defined by the 'European Effort Sharing Regulation'. A Carbon Leakage Regulation and a Cap Setting Regulation are expected in mid-2021.
- **Finland:** The government has appointed an intersectoral working group of public officials to assess and prepare for an emissions trading scheme in the transport sector.¹
- **Kazakhstan:** Completed the final year of the system's third phase, during which participating operators could choose between grandfathering and product-based benchmarking as the allocation method. Operators participating in the fourth phase must use benchmarking as the method of allocation. A new National Allocation Plan was also issued, setting the cap for 2021.
- **Montenegro:** ETS legislation was adopted in 2020, launching preparations for the development of a domestic system that would enable Montenegro to take part in the EU ETS should it become a member state of the European Union.
- **Sakhalin (Russia):** A mandate was created for a pilot carbon trading system in the Sakhalin region, in cooperation with the Russian government. The system could begin operating as early as 2022.
- **Switzerland:** Completed the second trading period (2013–2020). A provisional registry link between the EU ETS and the Swiss system launched in September 2020, allowing the transfer of allowances on specific dates. Changes to the Swiss system in line with the EU ETS include a revised linear reduction factor from 1.74% to 2.2%, updated benchmarks to be implemented by 2022, and an indefinite extension of the system.

- **Ukraine:** An MRV law entered into force in 2020 and applies to installations beginning in 2021. A recent statement by the Minister of Environmental Protection and Natural Resources suggests the ETS could launch in 2025.
- **United Kingdom:** Launched its own domestic ETS at the start of 2021, after 2020 was the last compliance year for UK installations under the EU ETS. The UK ETS design mostly mirrors the EU ETS Phase 4. The cap is initially set at 5% below the UK's notional share of the EU ETS cap, will be reduced annually, and is aligned with the country's legislated net-zero target. The UK is considering expanding the scope beyond power, industry, and domestic aviation and is open to linking with other systems.

North America

- **California:** Key amendments to the system took effect in January 2021. These include changes to allowance price containment provisions, reductions in the use of offset credits, and a sharper cap decline to 2030. The amendments stem from a regulatory overhaul in 2018 in response to state legislation clarifying the role of the program after 2020.
- **Massachusetts:** 2020 saw an increase in the share of allowances auctioned, with the system planning to increase to full auctioning in 2021. The system covers the power sector and complements RGGI.
- **Nova Scotia:** Held its first auction in June 2020 and sold all allowances on offer.
- **Oregon:** After several attempts to pass ETS legislation, an executive order was issued in 2020 mandating an emissions 'Cap and Reduce Program' for large emitters and transportation fuels. Program options and design elements were studied and workshopped during 2020.
- **Pennsylvania:** In its aim to join RGGI, Pennsylvania released a draft regulation in 2020 for a power sector ETS that aligns with the RGGI Model Rule. After public consultation and regulatory review, a final regulation is expected in 2021. Pennsylvania is expected to join RGGI and start participating in the ETS in 2022.
- **Québec:** Passed environmental legislation that also impacts the cap-and-trade program, including dedicating all revenue from the program to climate change measures as well as allowing regulators to enact reforms to industrial allocation aimed at better supporting decarbonization. Québec also updated its climate action plan for 2030, which includes the aim of achieving carbon neutrality by 2050.
- **Regional Greenhouse Gas Initiative:** Following the adoption of post-2020 regulations by each RGGI state, tighter annual cap reduction factors and an emissions containment reserve apply to all 12 participating states from 2021 onwards. Virginia joined RGGI in January 2021. Pennsylvania is also developing a power sector ETS and is expected to join the RGGI program in 2022.
- **Transport and Climate Initiative:** In December 2020, Massachusetts, Connecticut, Rhode Island, and Washington D.C. signed a memorandum of understanding to participate in the Transport and Climate Initiative Program (TCI-P). The program caps CO₂ emissions from road transport in participating states. Following the development of a Model Rule in 2021, mandatory reporting will begin in 2022, with the first compliance period starting in 2023. Other states also have the option to join the TCI-P.
- **Washington:** In early 2021, state legislators introduced a bill proposing a cap-and-trade program covering industry, energy, and fuel suppliers. The first compliance period would start in 2023.

¹ – The developments in Finland were announced after the editorial cut-off date for the 2021 ICAP Status Report and are therefore summarized only briefly here. For more information, please refer to the ICAP website.

Latin America and the Caribbean

- **Colombia:** Work on the design of a national ETS continues, with technical elements currently under internal revision. Development of system infrastructure is set to follow, with the pilot phase expected to start between 2023 and 2024.
- **Mexico:** Completed the first year of the Mexican Pilot ETS in 2020. The registry was developed, and the first allocations took place in early 2021.

Asia Pacific

- **China:** In late 2020, President Xi pledged to peak China's emissions before 2030 and achieve net zero by 2060. In this context, the Chinese national ETS became operational in 2021 as the world's largest system, covering more than four billion tCO₂ (approximately 40% of national carbon emissions). The system operates as an intensity-based ETS and covers the power sector, with other sectors expected to be introduced later. The national registry and trading platform are currently being developed, and details of key design elements, such as MRV, are being finalised.
- **Chinese Pilots:** Throughout 2020, the eight Chinese regional ETS pilots continued operating and further developed allocation, offsetting, and trading rules. While the Chinese pilots will initially operate in parallel to the national ETS, it is anticipated that overlapping entities will be gradually integrated into the national market.
- **Indonesia:** Currently developing a presidential regulation providing a framework for carbon pricing. A limited ETS pilot for the power sector is planned for implementation in 2021.
- **Japan:** Pledged to reduce emissions to net zero by 2050. Carbon pricing options are under discussion before an expert committee and a voluntary carbon market continues to operate.
- **New Zealand:** Completed comprehensive legislative reforms in 2020, laying the foundations for new regulatory settings for 2021–2025 in line with newly legislated net-zero targets to 2050. A cap on emissions was established for the first time under the NZ ETS, and auctioning was introduced in March 2021, incorporating new market stability measures. Other reforms include the phase down of free allocation for EITE activities, forestry sector accounting changes, and plans to put a price on agricultural emissions by 2025.
- **Philippines:** A bill with provisions for a domestic cap-and-trade system for the industrial and commercial sectors was submitted in 2020. The proposed bill is being reviewed by a technical working group.
- **Republic of Korea:** Phase 3 is set to start in 2021 with a stricter cap, updated allocation provisions, and financial intermediary and other third party participation in the secondary market. The share of auctioning for non-EITE sectors was increased to 10% in Phase 3, while the number of offsets allowed in the system was reduced. The system's scope will expand to include construction industries and large transport companies. Following Korea's announcement to reach net-zero emissions by 2050, updates across the climate policy framework are expected to be announced in the coming years.

- **Taiwan, China:** An act creating a mandate for an ETS is currently under revision.
- **Thailand:** Through 2020, MRV systems were developed for additional sectors under the voluntary ETS. An ETS pilot is currently being planned for the Eastern Economic Corridor region, and work is beginning on developing national ETS legislation.
- **Tokyo and Saitama:** Linked since 2011, these two systems continue to drive emissions reductions in large buildings and factories. They both entered their third compliance period in April 2020.
- **Vietnam:** The legal mandate for a domestic ETS was adopted in 2020. A pilot system is expected to start by 2025 and become fully operational by 2027.

ICAP and the years ahead

The COVID-19 pandemic and climate change are the global crises of our time, as both of these great challenges have affected every corner of the world and threaten our public health, environment, economies, and ways of life. Well-designed emissions trading systems capable of responding to short-term shocks and supporting long-term, ambitious climate goals will be crucial to driving necessary deep decarbonization and low-carbon investment. ICAP is a forum for policymakers worldwide to share best practices and learn from experiences designing and implementing emissions trading systems. We look forward to continuing to stimulate discussions in an ever-expanding circle of peers dedicated to using carbon markets as a key tool on the path towards a net zero consistent recovery.

PRACTITIONER INSIGHTS

01

CHINA

World's largest ETS goes live

Chen Zhibin and Qian Guoqiang → SinoCarbon Innovation & Investment Co., Ltd

In response to the COVID-19 pandemic, China has chosen green development to achieve economic recovery and high-quality growth. After President Xi Jinping's pledge in September 2020 to peak China's CO₂ emissions before 2030 and achieve carbon neutrality by 2060, attention on climate policy has reached new highs and turned to domestic implementation. The Chinese government is formulating an action plan for peaking its CO₂ emissions, with targets and preparation at the provincial level. A low emission development path in line with the peaking target will be mainstreamed into the 14th Five-Year Plan for National Economic and Social Development this year. The national ETS, a key pillar of China's vision for low-carbon development, made a breakthrough at the end of 2020 and early 2021. After releasing the final allocation plan for the power sector and a document providing the legal and administrative arrangements for China's national ETS, the Ministry of Ecology and Environment (MEE) officially announced the start of the first compliance cycle in January 2021, ending in December 2021.

NATIONAL ETS STARTS FIRST COMPLIANCE CYCLE

Details on the implementation of surrender obligations are not yet clear, but MEE's announcement means this will certainly take place in 2021. Two outstanding issues remain. First, emissions of covered entities and their allowance levels need to be confirmed. Provincial authorities are required to calculate and pre-allocate allowances for 2019 and 2020 to covered entities. Secondly, MEE needs to launch the national registry and trading platform. According to the national allocation plan, entities will likely need to comply for both 2019 and 2020.

The implementation of the national ETS will follow the Work Plan for Construction of the national ETS (Power Sector), which was released in 2017 by the National Development and Reform Commission before responsibility was shifted to MEE. The national ETS was prepared based on experiences of the past years, in particular China's eight regional pilots.

DESIGN AND GOVERNANCE OF THE NATIONAL ETS

A three-tiered governance structure

MEE acts as the national competent authority setting the rules and overseeing the system, with joint oversight of trading activities with other regulators, while its subsidiaries at the provincial level oversee the implementation of these rules and the municipal-level authorities take on some management duties locally.

Monitoring, reporting, and verification (MRV)

The MRV framework of the national ETS builds on the experience of historical emissions data collection in past years, with some adjustments to integrate the carbon market into the existing environmental governance structure and mechanisms. Two draft technical documents on MRV were released in December 2020. The "Guidelines on Enterprise Greenhouse Gas Emissions Accounting and Reporting – Power Generation Facilities" build on two existing technical guidelines and aim to establish the MRV foundation for the national ETS. The "Guidelines for Enterprise Greenhouse Gas Verification (Trial)" build on a previous document from 2016 and provide further details on verification.

System coverage

The power sector is the first covered by China's national ETS, with others to be added gradually during the coming Five-Year Plan, such as steel, aluminum, and other industrial materials. The threshold for coverage under the ETS is 26,000 tons of CO₂ annually for one company (including indirect emissions), resulting in 2,245 covered entities (see Figure 1). The scope of compliance obligation is the direct and indirect CO₂ emissions from power generation, which amounts to 4 billion MtCO₂ and accounts for around 40% of national carbon emissions. For comparison, the eight regional pilots cover about 1.27 billion MtCO₂, around 30% of the national ETS.

Cap-setting

The national ETS adopts a bottom-up approach to cap-setting (see Figure 2). Based on the allocation plan, provincial Ecology and Environment Bureaus (EEBs) calculate the allowances of the covered entities within their jurisdiction and report them to MEE, which confirms the allowances of each province and sums them to get the cap of the national ETS.

Figure 1: Number of covered entities in each province

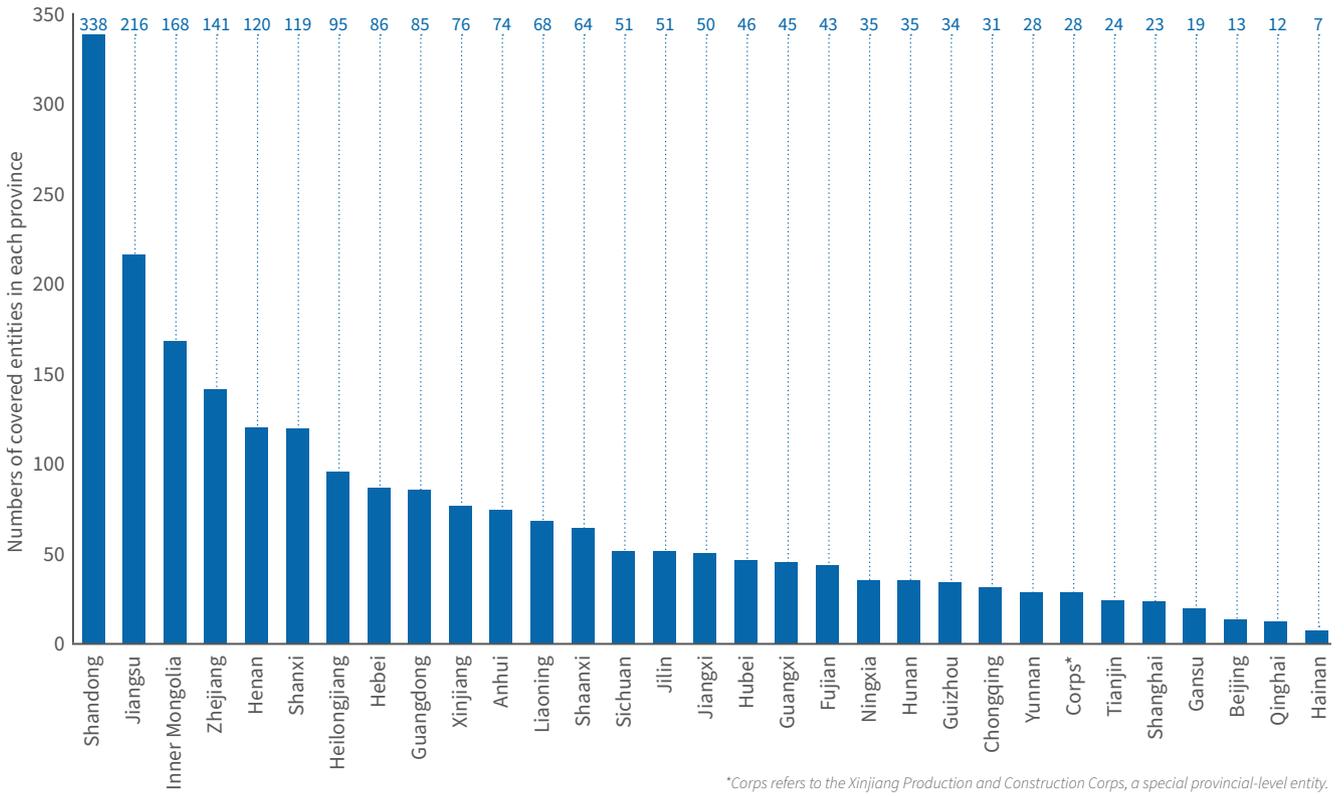
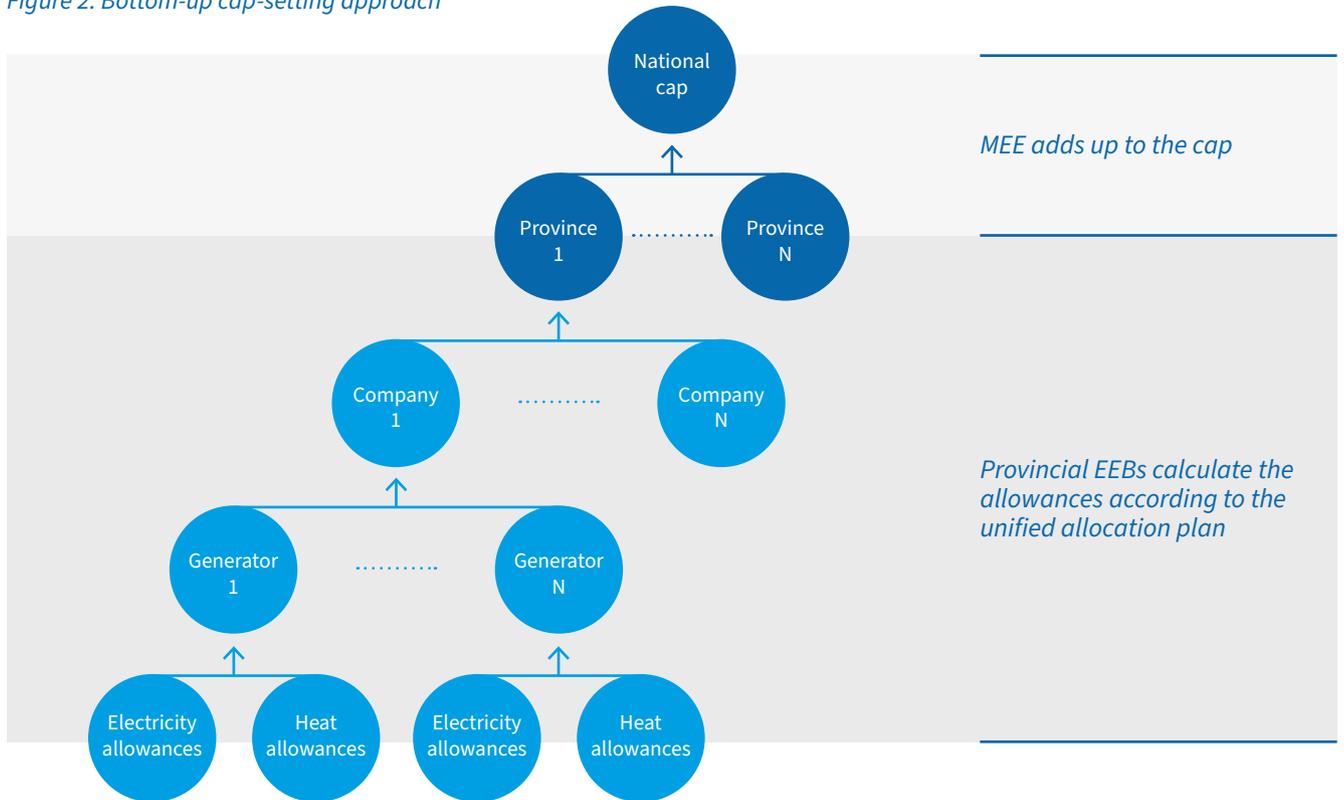


Figure 2: Bottom-up cap-setting approach



Allowance allocation for 2019 and 2020

The allocation plan provides 100% free allocation for 2019 and 2020 at benchmark levels with a correction factor. The allocation plan adopts benchmarking as the main allocation approach and includes processes for pre-allocation based on 2018 data and ex-post adjustments (final allocation) after the verification of 2019 and 2020 emission data. Auctioning will be introduced gradually, but there is not yet a timeline.

There are four distinct benchmarks based on type of power generation (see Table 1). In addition, an adjustment factor is used that allocates more allowances for entities operating at output below 85% (see Table 2). This is designed to help less efficient facilities transition to the ETS.

The allowance formula for one generator

$$A = A_e + A_h$$

A —Total CO₂ allowance of the generator (unit: tCO₂)

A_e —CO₂ allowance of the electricity supply (unit: tCO₂)

A_h —CO₂ allowance of the heating supply (unit: tCO₂)

The formula for electricity supply

$$A_e = Q_e \times B_e \times F_c \times F_r \times F_f$$

Q_e —Electricity supply (unit: MWh)

B_e —Benchmarks of electricity supply (Table 1)

F_c —The correction factor of the cooling mode: 1 for water cooling, 1.05 for air cooling.

F_r —The correction factor of heat supply: $1 - 0.25 \times \text{heat supply ratio}$.

F_f —The correction factor of the load factor. For general coal-fired generators, this factor follows Table 2. For other generators, this factor is 1.

The formula for heating supply

$$A_h = Q_h \times B_h$$

Q_h —Heating supply of the generator set (unit: GJ)

B_h —The CO₂ emission benchmarks for heating supply (Table 1)

Table 2: The correction factor of the load factor

Load factor (F)	F_f
$F \geq 85\%$	1.0
$80\% \leq F < 85\%$	$1 + 0.0014 \times (85 - 100F)$
$75\% \leq F < 80\%$	$1.007 + 0.0016 \times (80 - 100F)$
$F < 75\%$	$1.015(16 - 20F)$

Registry and exchange

Hubei and Shanghai are working on the readiness of the registry and exchange system, respectively. In December 2020, MEE released the draft “Administrative Measures for the Registration, Trading, and Settlement of the National Carbon Emission Rights (Trial)”. The Provincial Ecology and Environment Bureaus already collected the information of covered entities for opening accounts in the two systems and submitted it to MEE. The first trading of emission allowances is anticipated to take place by mid-year.

Compliance

For 2019 and 2020, compliance obligations are limited. For gas-fired plants they will be capped at the level of free allocation. Advanced gas-fired plants can sell surplus allowances. Other covered entities will need to surrender allowances of up to 20% of verified emissions above the level of free allocation. These measures aim to promote gas-fired units and reduce the overall compliance burden.

The fine for non-compliance is CNY 20,000 to 30,000 (~USD 1,500 to ~USD 4,500) in total. Any gap between compliance obligation and allowances submitted shall also be deducted from the following year’s allocation. In the future, the State Council national ETS regulation will impose a penalty of 2–5 times the average market price.

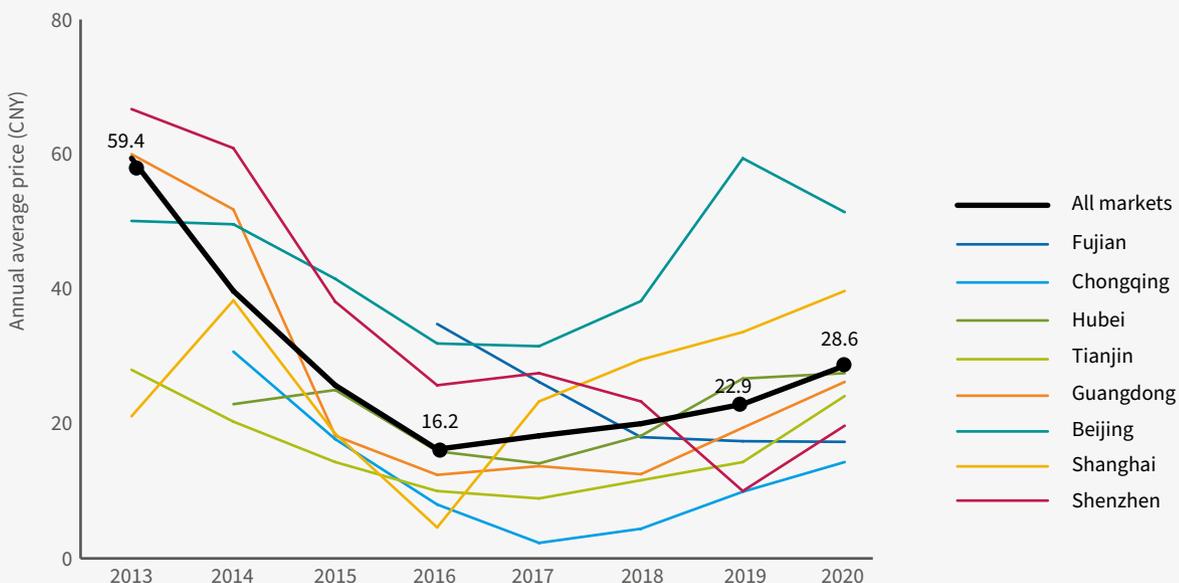
Table 1: Benchmarks for different generators for 2019–2020

Types of Generators	Benchmarks for Electricity Supply (tCO ₂ / MWh)	Benchmarks for Heating Supply (tCO ₂ / GJ)
Conventional coal-fired generators with installed capacity above 300 MW	0.877	0.126
Conventional coal-fired generators with installed capacity below 300 MW	0.979	0.126
Unconventional coal-fired generators	1.146	0.126
Gas-fired generators	0.392	0.059

CONTINUOUS RUNNING OF REGIONAL MARKETS

In the past year, eight Chinese regional ETS pilots have continued their operation and policy modifications. Due to the impact of the pandemic, 2019 compliance timelines across the regional systems were postponed. As the country recovered gradually in the middle of the year, most regional pilots finished their regular ETS management tasks with a few months of delay. With the announcement of a national carbon neutrality pledge, investor confidence grew in the last quarter. Prices in 2020 were largely unaffected overall (see Figure 3), with average prices in all regional markets increasing 25% over 2019, though trading volumes were down 17%.

Figure 3: Average trading price in regional markets



According to the national allocation plan, those markets that have already allocated 2019 and/or 2020 allowances will maintain authority over the power sector for the respective year(s). All regional markets have allocated 2019 allowances, while only Guangdong, Fujian, and Tianjin have already allocated 2020 allowances. For 2021, the power sector in all regional markets will be covered in the national ETS, while other sectors will continue to fall under the regional markets until they are brought into the national system.

Three years after the political launch of China's national ETS kickstarted planning and consultations, and in the midst of a worldwide pandemic, the world's largest carbon market is now online and ready to play its role in China's vision for low-carbon development.

EUROPEAN UNION

The resilience test of 2020 and the road ahead

Beatriz Yordi → European Commission

The year 2019 was important for the functioning of the EU ETS. The Market Stability Reserve (MSR) became operational and began gradually removing the structural surplus of allowances built up in the system. We saw the EU ETS deliver on its environmental objective again, showing strong promise for the next trading phase running from 2021 until 2030. Emissions from stationary installations decreased by 9.1% relative to 2018 emissions. The carbon price signal remained strong, levelling at an average of almost EUR 25 (USD 28.55) per tonne CO₂e. As a result, a total of EUR 14 billion (USD 16 billion) in auction revenues was distributed to Member States and largely directed to climate- and energy-related purposes.

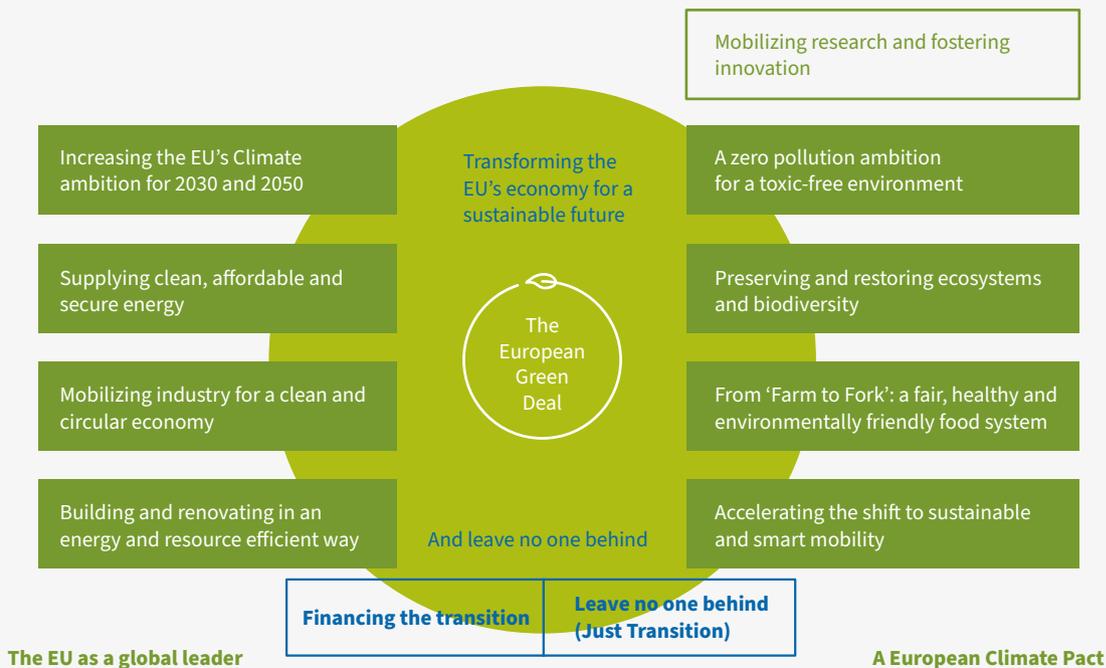
We also saw the carbon price reflected in investment decisions and strategic planning, which in turn translated into tangible results. Coal-to-gas switching and increased deployment of renewable energy capacity yielded an overall decrease of emissions in the power sector of 15%. While this largely drove 2019 emissions reductions under the EU ETS, industrial emissions experienced their biggest annual drop of the third trading phase, running from 2013 until 2020. Only emissions from the aviation sector within the European Economic Area continued to increase, albeit modestly, by 1% relative to 2018.

The year 2020, however, has painted a far more complicated picture. The COVID-19 pandemic spared no country, no sector, and no market, causing economic downturn and disrupting supply chains. Nevertheless, the EU ETS passed this resilience test. After a significant short-term dip in March/April 2020, the carbon price gradually bounced back to pre-pandemic levels and remains strong. This can be attributed to a robust carbon market framework and long-term policy certainty at the EU level.

Owing to the MSR and the 2018 ETS revisions for the fourth trading phase, the EU ETS is better equipped to deal with economic shocks than during the Great Recession just a decade ago. Should a significant imbalance of allowances arise threatening to undermine the orderly functioning of the market, the MSR adjusts the supply of allowances to be auctioned accordingly. The carbon market is also forward-looking, whereby the long-term outlook for market scarcity remains key for the carbon price development.

Here, the [European Green Deal](#)¹ provides an explicit long-term policy context – an action plan to becoming the first climate-neutral continent by mid-century, calling on all sectors of the economy to contribute. Presented

Figure 1: The European Green Deal – the EU’s growth and green recovery agenda



1 – <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0640&qid=1608201512919>

by the European Commission in late 2019 as the new growth strategy for the EU, the Green Deal has become the EU's recovery agenda (Figure 1). It aims to make the EU's economy sustainable, foster resilience, improve the health of our environment, and achieve this transition in a socially fair manner. This is reflected in the historic [Recovery and Resilience Facility](#)² put forward by the Commission, centered on the twin green and digital transitions, as well as announced policy initiatives.

The [Climate Law](#)³ proposes a legally binding target of climate neutrality by 2050 as well as addresses the steps necessary to deliver on this objective in a gradual and responsible manner. This includes increasing the EU's 2030 emissions reduction target from 40% to at least 55% relative to 1990 levels, including emissions and removals. The proposal garnered broad support, as all Member States endorsed the initiative at the European Council's summit in December 2020. This year the Commission will come forward with an enabling policy package necessary to deliver the additional emissions reductions for 2030, including revisions to existing policy instruments like the ETS.

Carbon pricing will be instrumental in delivering on this increased climate ambition and supporting a green economic recovery – by providing an incentive for emissions reductions and low-carbon investment as well as mobilizing resources that can be re-invested in the economy in support of these objectives. Investment choices made today will define our economy in 2050, and investment is needed across all sectors in support of the EU's economic recovery. We thus need to make sure that today's choices will not jeopardize our climate ambitions. As we work towards a revision of the ETS, it will be crucial to maintain a long-term, credible carbon price signal, as projects in the ETS sectors are characterized by high capital expenditure and long payback periods.

To further enable climate-proof investments, specific policy choices in the ETS revision will have to consider not only elements of its framework, but also their bearing on sectoral decarbonization i.e. alignment with companion policies deployed under the Green Deal. The European Commission sees important benefits in expanding the use of emissions trading in the EU to new sectors, to deliver the increased climate ambition in an economically efficient manner. In effect, the ETS should be complementary to relevant sectoral companion policies already in place or in development, providing a harmonized signal for emissions abatement. It needs to incentivize producers and consumers to change their behavior and

progressively adopt low-carbon alternatives. To this end, we need the carbon price to be reflected in the prices of goods and services in a transparent way. Furthermore, any expansion of emissions trading will need to effectively mitigate and address adverse distributional impacts of carbon pricing on the most vulnerable, low-income groups. Only by doing so can we advance a transition that is truly just.

The year 2020 concluded an intensive preparatory period for the implementation of the fourth trading phase of the ETS, yet prefaced another – of developing the carbon market framework in step with EU's increased climate target. While we have 15 years of ETS experience to build on, we need to ensure that it will continue to stand the test of time and turmoil, empowering far-reaching changes in some key sectors of the EU's economy.



Carbon pricing will be instrumental in delivering on this increased climate ambition and supporting a green economic recovery.

2 – https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en

3 – <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020PC0563>

THE REPUBLIC OF KOREA

Looking ahead from COVID-19 to a new trading phase and beyond

Sungwoo Lee, Kyeongah Ahn, and Younghyun Lee → Greenhouse Gas Inventory and Research Center of Korea (GIR)

AN INTERVIEW

1. The government approved the allocation plan for Phase 3 (2021–2025) in September 2020. What are the main regulatory changes?

Before coming to the ETS, it is important to highlight the broader context of climate policy development in the Republic of Korea over the past year. President Moon Jae-in pledged in October 2020 to embark on a carbon neutrality emissions pathway to be reached by 2050. The updated long-term target is paired with the Green New Deal framework aimed at boosting investment in low-carbon technologies and accelerating the decoupling of emissions from economic growth.

The Korea Emissions Trading System (K-ETS) is one of the Republic of Korea's main climate policy instruments and will hence play a major role in reducing emissions in line with steeper reductions projected under the new climate policy framework. It is anticipated that the targets of the ETS will be gradually expanded to achieve carbon neutrality in 2050. We may therefore expect further changes to the system in the coming years consistent with a net-zero emissions pathway. The Phase 3 Allocation Plan was approved in September 2020 and preceded by a revision to the ETS Act in August 2020, which enabled the implementation of several reforms that are key to the third trading phase, such as the broadening of market participation to non-compliance entities, which can trade allowances starting this year.

In Phase 2 (2018–2020) of the K-ETS, the liable entities were classified into six sectors and 62 sub-sectors. They were subject to free allocation (36 sub-sectors) and auctioning (26 sub-sectors) after analyzing international competitiveness, trade intensity, production cost, and other factors. More sub-sectors, 69 in total, are included in Phase 3, which means more industries will share responsibility in achieving the national emissions reduction target. With the inclusion of additional sectors in Phase 3, the K-ETS covers about 73% of national emissions. The cap was calculated in alignment with the national reduction target in 2030.

When auctioning was first introduced, 3% of the allocated amount was deducted from entities in sub-sectors subject to auctioning, those not considered at risk of carbon leakage. In Phase 3, the percentage has been increased to 10% of the allocated amount in accordance with practices in other ETSs, the “polluter pays” principle, and other K-ETS objectives.

Emission permits are allocated using either grandfathering or benchmarking. In Phase 1, three sub-sectors were subject to benchmarking, gradually increasing to 12 in Phase 3.

In Phase 3, market functions are going to be expanded by allowing additional participants and introducing derivatives. Currently, only liable entities and designated banks can trade emission permits in the exchange market, but other participants such as securities companies and individuals are expected to join the market and trade more products in Phase 3.



In Phase 3, market functions are going to be expanded by allowing additional participants and introducing derivatives.



2. Could you provide an overview of price developments in the past year, including the impact of COVID-19?

To begin with the broader picture, prices rose steadily during Phase 2. The average price of a Korea Allowance Unit (KAU) during Phase 1 (2015–2017) was KRW 16,661 (USD 14.12) and rose to KRW 27,926 (USD 23.66) in Phase 2's second compliance year (ending September 2020), an increase of 68%.

Overall, the introduction of market makers in 2019 has played a stabilizing role for prices in the latter half of Phase 2. They act as additional sellers and buyers of allowances to ensure liquidity in the market, taking part in the market when the price sharply increases or decreases. Their introduction helped moderate prices after a drastic change in price levels in June 2019, for instance. By introducing market makers, the share of competitive, real-time trading transactions dramatically improved, indicating that their intervention is revitalizing the market.

However, price development of KAUs was more turbulent in 2020. The market reached a peak in early April 2020, when the price rose to KRW 42,400 (USD 35.92), but fell sharply from May onwards as the effect of COVID-19 on emissions for the 2020 trading year factored in. At the same time, it became clear that emissions for 2019 had decreased more than initially projected, thereby exerting downward pressure on allowance demand ahead of the compliance deadline. KAU prices recovered to KRW 20,000 (USD 16.95) in August 2020 and climbed back to KRW 30,500 (USD 25.84) in December before closing the year at KRW 23,000 (USD 19.49).

3. What is the expected impact of Phase 3 changes on market dynamics and emissions?

Increased participants and products will bring more stability to trading conditions and flexibility to trading volumes. Those developments are expected to invigorate the market and further enhance its functioning as well as bringing about continued and greater reductions in GHG emissions.

Increased participants and products will bring more stability to trading conditions and flexibility to trading volumes.

As the introduction of market makers helped revitalize the K-ETS and improve market functioning in Phase 2, we expect similar effects from the introduction of derivative products and third-party transactions in Phase 3. The participation of securities companies and individuals in financial institutions other than the covered entities will be allowed. Within a certain limit, financial institutions will be able to trade themselves, while individuals will be allowed to trade on consignment. In addition, by introducing futures trading, the aim is to enhance price discovery and expand the predictability of the market.

NEW ZEALAND

Achieving major structural changes to the NZ ETS during a global pandemic

Vanessa Chalk → New Zealand Ministry for the Environment

NEW ZEALAND EMISSIONS TRADING SCHEME LEGISLATIVE REFORMS

Significant reforms to the New Zealand Emissions Trading Scheme (NZ ETS) were passed into law on 16 June 2020, culminating nearly five years of policy development and public consultation. The legislative reforms encompass major structural changes to the NZ ETS that are designed to support domestic emissions reduction targets by setting an emissions cap on the NZ ETS, introducing New Zealand emissions unit (NZU) auctioning, and developing new NZU price control mechanisms. The broad array of reforms also includes changes to accounting methods for calculating unit allocation to foresters and the removal of the fixed price option (FPO), a type of price ceiling that allowed participants to pay NZD 25 (USD 16.23) cash per tonne of carbon instead of surrendering units.

The reforms¹ were passed despite the major widespread challenges of COVID-19, which included the delay of the New Zealand election by a month and short-term restrictions to the capacity of Parliament to address non-urgent matters. The major opposition party called for implementation of the [Climate Change Response \(Emissions Trading Reform\) Amendment Act 2020](#)² to be delayed by 12 months to take the effects of COVID-19 into account, and there was pressure from some NZ ETS participants to relieve them of their 2019 ETS obligations. These requests were not acted on by the government.

COVID-19 IN NEW ZEALAND

The virus in New Zealand was predominantly contained by a full lockdown on 25 March 2020 that was phased out in stages after four weeks. While the New Zealand economy officially fell into recession and experienced a record fall in GDP of over 11%, it bounced back by 14% in the July–September 2020 quarter, the strongest quarterly growth in GDP on record in New Zealand. This is despite some industries still not returning to pre-lockdown levels, such as tourism, which previously directly contributed nearly 6% to New Zealand's total GDP.

Emissions from transport and industrial activities are expected to have dropped due to the lockdown, but this will not be confirmed until the 2020 national greenhouse gas inventory is published in 2022. Therefore, predicting the long-term impacts of COVID-19 and the swiftly fluctuating economy on future emissions and NZ ETS participants is particularly challenging.

IMPACTS ON THE NZ ETS

The reporting deadline for participants to submit emissions returns for the 2019 compliance period (for activities over the calendar year) was 31 March 2020, a week after the full lockdown period began. This meant some participants were physically unable to fulfill their obligations due to the COVID-19 restrictions, for example foresters who needed access to their land to verify activity. Those participants were encouraged to apply for an extension so they could undertake the reporting once restrictions were lifted. Extensions were sought for 49 emissions returns this year. This is a small increase from the previous year, when 30 extension applications were made.

The deadline for unit surrender for the 2019 emissions compliance period was 31 May 2020, soon after the full lockdown ended. Participants were encouraged to voluntarily disclose to the regulator if they anticipated being unable to meet their unit surrender obligation due to COVID-19 or the lockdown. If participants made this advanced voluntary disclosure, the NZ ETS compliance authority had the discretion to consider a reduction in the penalty fine they would ordinarily receive for their noncompliance by up to 100%. The potential reduction in the penalty fine is separate from the unit surrender obligation, which remained unchanged by this voluntary disclosure.

The rate of unit surrender noncompliance was expected to increase for the 2019 period as participants faced the financial strain of the COVID-19 lockdown immediately prior to the compliance date. However, this did not eventuate, as COVID-19 did not significantly impact participants' compliance.

An area that COVID-19 did appear to impact was use of the FPO. The proportion of emitters choosing to pay cash to the government for emission units (which are then immediately transferred back to the government and surrendered), dropped significantly. In 2019, 50% of emissions obligations were met using the NZD 25 (USD 16.23) per emission unit FPO. This dropped to just 21% in 2020, despite near identical prices of the NZU at the time surrenders were due (NZD 24.70 in 2019 vs. NZD 25.00 in 2020). This was presumably caused by a reluctance to spend cash in the uncertain economic times if participants already had NZUs available to use, and less confidence in the future rise of the NZU price. Another influence may have been the drop in

1 – <https://www.mfe.govt.nz/overview-reforming-new-zealand-emissions-trading-scheme>

2 – <https://www.legislation.govt.nz/bill/government/2019/0186/latest/whole.html>

NZU prices during the lockdown, and participants may have used that opportunity to purchase sufficient units for compliance below the FPO price.

IMPACTS ON THE NZU PRICE

At the end of 2019, a public consultation document was released that proposed the government's preferred options for the future NZU auction supply and prices controls. This included an NZD 50.00 (USD 32.47) price trigger for the cost containment reserve. This likely contributed to a rapid price jump from just below NZD 25.00 to NZD 29.00 (USD 18.83) by the end of January 2020 (see Figure 1).

During the COVID-19 lockdown, the NZU price dropped briefly to a low of NZD 22.10 (USD 14.35) at the end of March but recovered very quickly, climbing back to NZD 25.00 by mid-May, above NZD 30.00 (USD 19.48) at the start of June, and over NZD 35.00 (USD 22.73) in September. This is despite an NZD 35 FPO available for all 2020 emissions.

The significant and increasing trajectory of the NZU price indicates that, despite a swiftly fluctuating economy, participants and investors see the implementation of an emissions cap and removal of the FPO as factors that will significantly increase the competitive demand of accessing units.

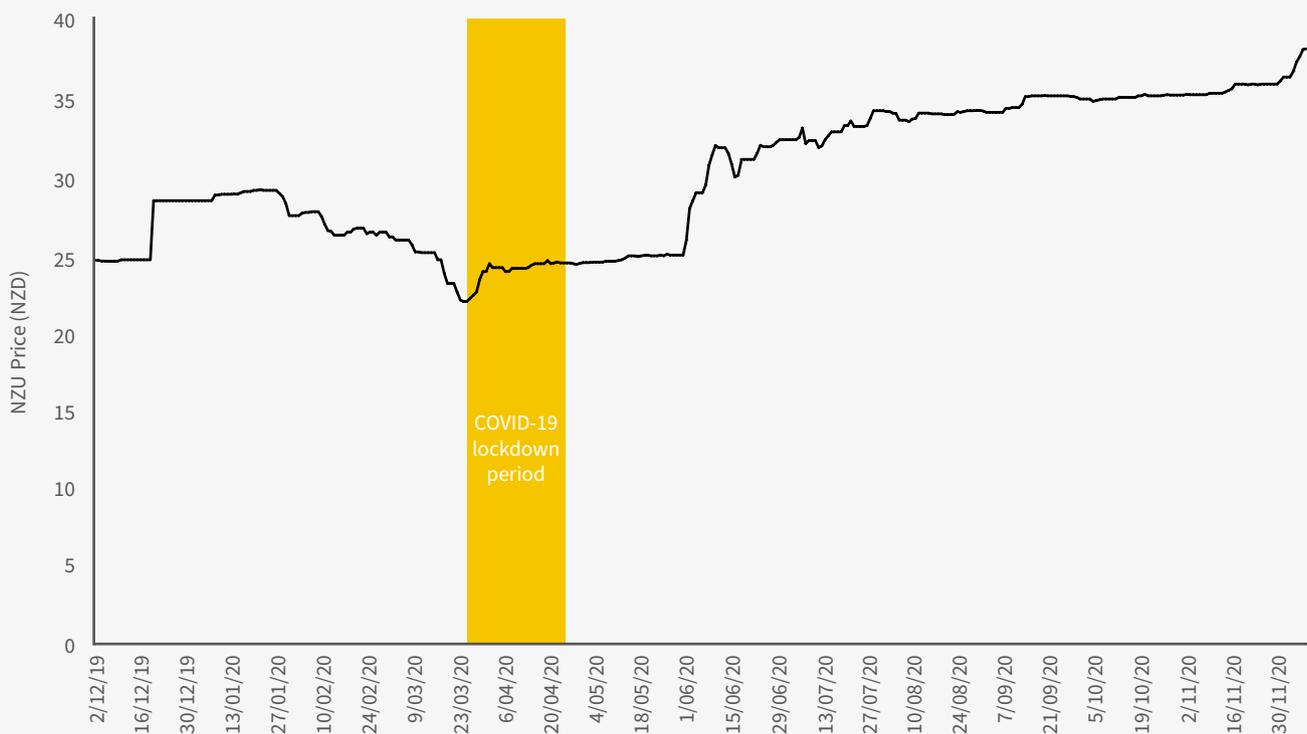
NEXT STEPS FOR THE NZ ETS

The NZ ETS operation and NZU price held up well throughout the uncertain times of COVID-19 in 2020. However, the impact that COVID-19 will have on the New Zealand economy and how this may flow through to emissions will play a role in the review and development of future NZ ETS settings regulations. This will occur through choices under the NZ ETS five-year rolling cycle framework.

Future unit supply and auction price control settings are always required to be announced five years in advance to maintain predictability and stability. However, the announced settings must also be reviewed every year and take into consideration any relevant circumstantial changes or adjustments for significant or adverse events, such as COVID-19. This will help to mitigate the risk of substantial oversupply of units. Review of future settings is also required to take place if either the cost containment reserve trigger price or auction reserve price is reached. Other improvements are being considered for future reviews, including changes to forestry accounting, market governance arrangements, and the current approach to free unit allocation to emissions-intensive, trade-exposed businesses.

The reformed scheme officially came into effect on 1 January 2021, and the first government NZU auction took place on 17 March, with 4.75 million units available. With those structural changes in place, New Zealand has laid the foundations for deeper climate ambition as it continues to recover from the impacts of the pandemic and in the critical decades ahead.

Figure 1: NZU prices from late 2019–2020



RGGI

Resilience and market stability through program design

William Space → Massachusetts Department of Environmental Protection / Brian Woods → Vermont Agency of Natural Resources

The COVID-19 pandemic has focused attention on how carbon markets respond to change. The Regional Greenhouse Gas Initiative (RGGI) includes design elements that adjust allowance supply when unexpected demand shocks occur. In most years since the program launched in 2009, these elements have influenced allowance prices, making the program more resilient to factors such as unanticipated changes in fuel prices and federal climate policy.

RGGI’s original design included several program elements intended to address the possibility that unanticipated or extraordinary events could increase demand for allowances, such as the loss of a nuclear power plant. To accomplish this, two stages of “trigger events” were defined in the regulation based on observed 12-month average allowance prices. At stage one limits on offset allowance supply and use for compliance were automatically relaxed. At stage two limits on offset allowances were further relaxed and the three-year compliance period was extended by one year. While it was important for the initial program design to acknowledge possible high demand for allowances under certain conditions, ultimately these mechanisms were never invoked. Consistent with the experience of many ETSS, the initial regional cap was conservatively established, and subsequent domestic economic conditions resulted in an allowance market that was oversupplied during the first two compliance periods (2009–2014).

In fact, this mismatch between supply and demand was so large that prices might have fallen to zero but for another design element: the minimum reserve price. This minimum bid price, which increases by 2.5% per year, was included in the first RGGI auctions based on advice from auction experts that it could deter buyer-side collusion. However, the mechanism ended up serving the equally important purpose of keeping allowance prices from dropping to zero. The minimum reserve price supported the allowance price over a period of several years, preserving the viability of the market and maintaining allowance revenue, and has remained in place through two program reviews.

Beginning in 2014, the trigger event design elements were replaced with a much simpler mechanism called a cost containment reserve (CCR). This mechanism immediately introduces a fixed quantity of additional allowances into each auction if there is sufficient demand above a set CCR trigger price. Market participants benefit from a more predictable price signal, and observed prices suggest that the CCR likely played a role in price formation and transparency over a period of several years. Based partly on the success of the CCR, a corresponding emission containment reserve (ECR) took effect this year. The ECR functions as a mirror image of the CCR, as it immediately removes allowances from an auction if there is not sufficient demand at prices above the ECR trigger price. The expectation that the ECR will support prices after 2020 appears to have already pushed allowance prices into

Figure 1: RGGI’s market stability design elements have been revised at each program review

- | | | | |
|---|---|--|---|
| <ul style="list-style-type: none"> • Extended Compliance Periods • International Credit Cancellations | <ul style="list-style-type: none"> • Five Offset Project Categories • Minimum Auction Reserve Price | <ul style="list-style-type: none"> • Five Offset Project Categories with state option to implement • Minimum Auction Reserve Price • Cost Containment Reserve | <ul style="list-style-type: none"> • Three Offset Project Categories with state option to implement • Minimum Auction Reserve Price • Cost Containment Reserve • Emission Containment Reserve |
|---|---|--|---|

2009–2014

2015–2020

2021–2030

the range established by the ECR-CCR trigger prices. The CCR and ECR trigger prices are informed by modeling and represent allowance prices that could be realized in scenarios beyond the high and low emissions cases that were examined during program design.

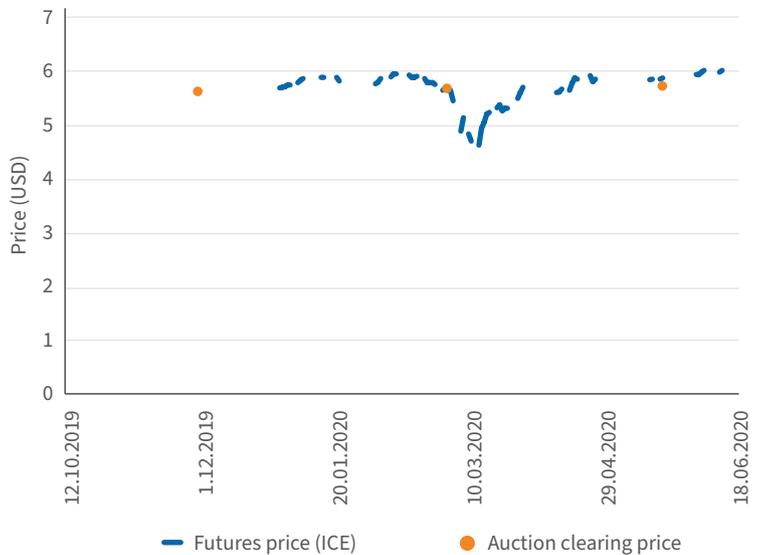
A market may be considered resilient if it responds to demand shocks without price spikes or crashes. Figure 2 shows that, in most years, RGGI allowance prices appear to have been influenced by at least one price-based design element. This history shows how these design elements have in fact made the program more resilient and enhanced market stability.

How the ECR and CCR support market stability

- In the near term, the ECR and CCR can automatically adjust allowance supply to compensate for demand shocks. For example, the pandemic may affect near-term allowance demand for compliance entities.
- In the longer term, the ECR and CCR reduce the likelihood of allowance prices below or above the corresponding trigger prices. This deters trading of allowances at prices outside this range and creates a more stable market for compliance.

The RGGI market response to economic conditions of the COVID-19 pandemic provides a recent example of the resiliency of the market (see Figure 3). Early 2020 pre-pandemic allowance prices in the futures and allowance markets were relatively stable, averaging USD 5.77. Imposition of coronavirus management measures in the US in early March resulted in a drop in futures prices to USD 4.69, followed by a rapid recovery by early April. By the June 2020 auction the futures market had stabilized and prices had returned to their pre-pandemic levels. This response reflected short-term uncertainty that was

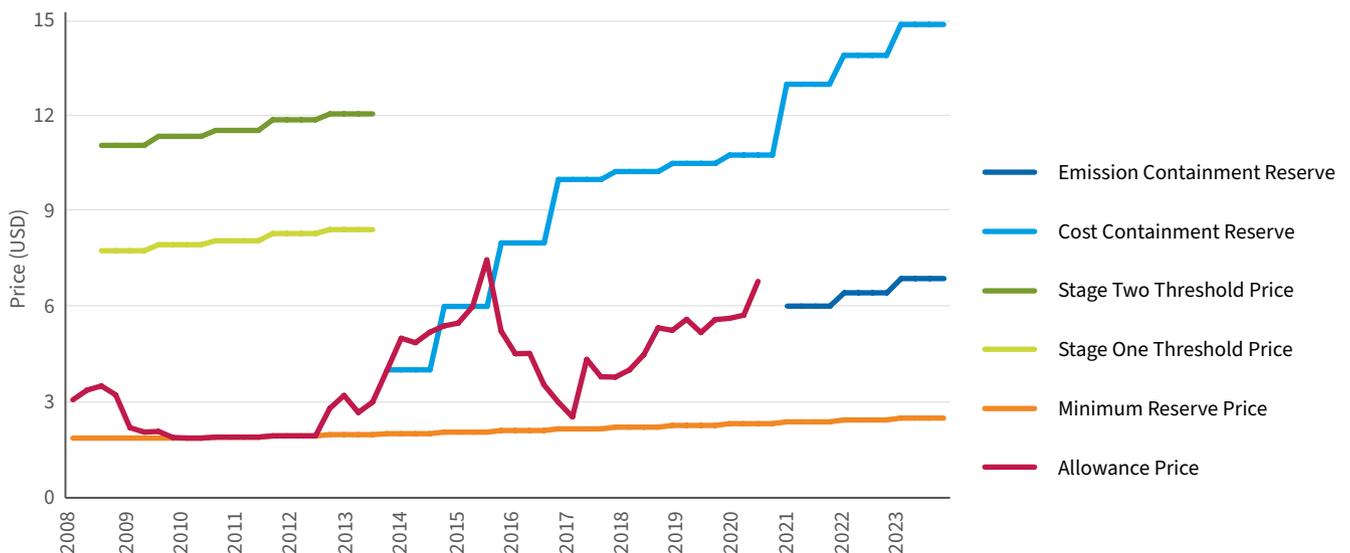
Figure 3: RGGI market prices January-June 2020



followed by data showing that demand for electricity was not going to be affected nearly as much as was the case for liquid transportation fuels. While it is not possible to know what the market response would have been absent the existing and pending stability measures, it is clear from this example that RGGI can and does exhibit the characteristics of a functional, resilient carbon market.

In developing RGGI's newest design element, the ECR, RGGI staff drew on the EU ETS Market Stability Reserve (MSR) mechanism. In particular, the CCR/ECR combination builds on the MSR experience in its use of similar design elements to address high and low allowance demand, which contrasts with the original RGGI program design. In a similar manner, the RGGI history presented here may offer lessons that can help other programs innovate to become more resilient.

Figure 2: RGGI's market stability design elements have strengthened market performance



UNITED KINGDOM

A net-zero cap-and-trade market

Charlie Lewis → UK Department for Business, Energy and Industrial Strategy

The new UK Emissions Trading Scheme came into force on 1 January 2021, increasing the climate ambition of the UK's carbon pricing policy. The UK was a pioneer of emissions trading when it set up the first cap-and-trade scheme in 2002 and will continue to be a world leader in carbon pricing as the government builds towards hosting the United Nations Climate Change Conference of the Parties (COP26) in Glasgow at the end of the year.

In 2019 the UK was the first major economy to legislate for net-zero emissions, with a target of 2050. The UK ETS will be among the first cap-and-trade markets aligned with net zero, and is a crucial step in achieving this goal. From day one, the cap on emissions was reduced by 5% compared to the UK's notional share of the European Union (EU) ETS cap.

The UK government and devolved administrations will consult on aligning the ETS cap with the net-zero target. The consultation follows the advice recently published by the UK's independent Climate Change Committee (CCC) on the UK's carbon budget for 2033–2037. The UK has already accepted the CCC's advice on its 2030 Nationally Determined Contribution (NDC), in December 2020 committing to a more ambitious target of at least 68% below 1990 emissions.

THE SCALE OF THE CHALLENGE

The UK government and devolved administrations are united in their determination to address climate change. The UK ETS was designed by the UK government jointly with the Scottish government, Welsh government, and Northern Ireland executive.

The scale of the challenge in the UK is clear, but so are the opportunities presented by the transition to a green economy and the recovery from the COVID-19 pandemic. Policy action has spurred rapid decarbonization in the power sector, with emissions from electricity generation in 2019 down by 72% from 1990 levels (see Figure 1).¹

Industrial emissions have also halved, but the remaining reduction required for industry to be consistent with net zero is equivalent to taking all the cars in the UK off the road.² Overall, the UK has in the last 30 years grown its GDP by 75% while cutting emissions by 43% (see Figure 2).³ Growth and decarbonization, now more than ever, can and must go hand in hand.

Figure 1: Emissions from power stations, UK, 1990–2019 (MtCO₂e)

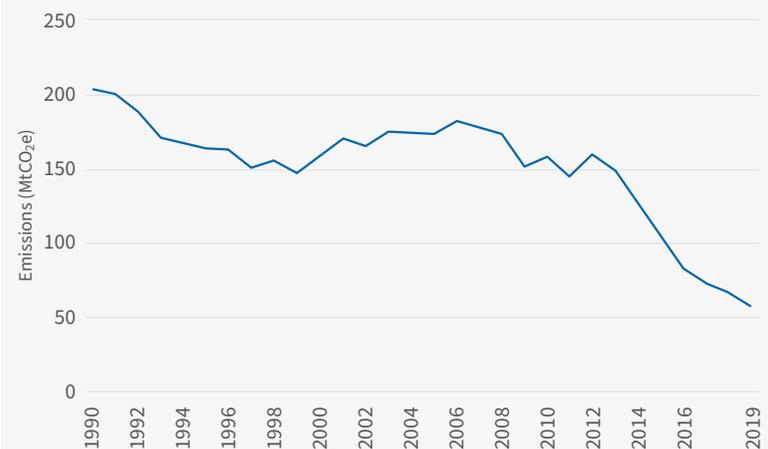
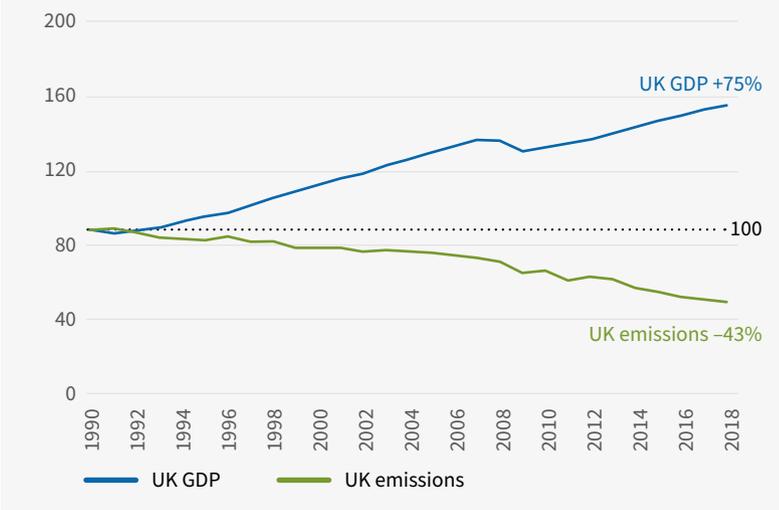


Figure 2: UK GDP and emissions, 1990–2018*



* Note: both GDP and emissions are indexed to 1990 values.

THE UK ETS

The UK government had also consulted on a carbon emissions tax but will not progress with this option. The government felt the UK ETS, with a cap on emissions aligned with a net-zero target, and the continuity it offers participants, provides a better basis for businesses to decarbonize.

The scope of the UK ETS is initially the same as the EU system. This provides continuity of emissions trading for affected businesses—especially important, as those same businesses will have to fulfil 2020 EU ETS compliance obli-

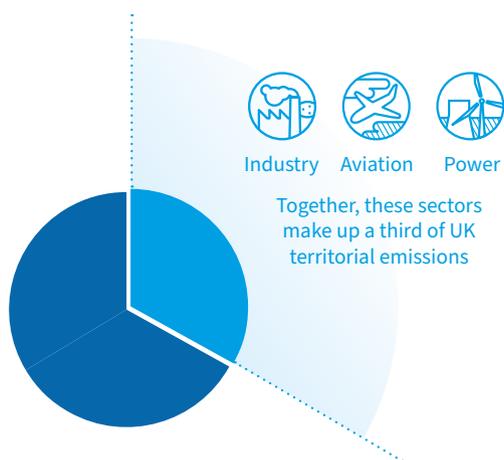
1 – The 2019 figures are provisional estimates. BEIS (2020), 'Provisional UK greenhouse gas emissions national statistics 2019': <https://www.gov.uk/government/statistics/provisional-uk-greenhouse-gas-emissions-national-statistics-2019>

2 – BEIS energy and emissions projections, based on committed policies. <https://www.gov.uk/government/collections/energy-and-emissions-projections>

3 – Office of National Statistics, BEIS Greenhouse Gas Inventory.

gations in the first quarter of 2021. A third of UK territorial emissions are covered by the new scheme (see Figure 3).

Figure 3: UK ETS sectors and emissions covered



However, with the new UK ETS the UK will be able to expand carbon pricing across the economy and encourage innovation in emerging decarbonization technologies. There is a case for expanding carbon pricing, especially in the context of a net-zero emissions target. We have committed to exploring expanding the UK ETS to other sectors that are currently not included. This will also include how the UK ETS could incentivize deploying greenhouse gas removal technologies.

The UK also recognizes the risk of carbon leakage and will seek to ensure that the UK ETS does not lead to offshoring of emissions. Initially, free allocation of emissions allowances under the UK ETS will be calculated using the same methodology as Phase IV of the EU ETS, which the UK has been involved in designing, to provide a smooth transition for participants. However, the UK will be reviewing free allocation to ensure the system is best suited to UK participants and is fair and equitable.

SUPPORTING DECARBONIZATION

The introduction of a UK ETS sends a strong signal to businesses. It will help mobilize the scale of capital investment necessary to deploy clean energy technologies and to capture new trade opportunities in the energy transition. As a trading system, it will promote cost-effective decarbonization, allowing businesses to cut carbon where it is cheapest to do so.

Alongside the UK ETS, the UK government is also supporting businesses in industry, power, and across the economy to decarbonize. In November 2020, the prime minister unveiled the UK's Ten Point Plan for a Green Industrial Revolution. The plan recognizes the support that will be needed across the economy if sectors are to reach the levels of decarbonization required to achieve net zero by 2050.

In total the plans set out will mobilize GBP 12 billion (USD 15.4 billion) of government investment, and potentially three times as much from the private sector, to create and support up to 250,000 green jobs.

The government is investing GBP 1 billion (USD 1.3 billion) up to 2025 to facilitate the deployment of Carbon Capture, Utilization, and Storage in two industrial clusters by the mid-2020s, with a further two by 2030, and consulting on how to incentivize greenhouse gas removals. The UK is also providing up to GBP 500 million (USD 641 million) for low-carbon hydrogen production across the decade, aiming for 5 gigawatts of capacity by 2030, and increasing the ambition of our Industrial Clusters Mission, a public-private initiative aimed at decarbonizing areas with heavy concentrations of emissions-intensive industries.

In December, the UK's Energy White Paper put in place a strategy for the wider energy system that will transform energy, support a green recovery, and provide a fair deal for consumers.

The UK government's Industrial Decarbonisation Strategy will be published in spring 2021, setting out how energy-intensive industries can thrive in the transition to net zero.

INTERNATIONAL COOPERATION

The UK government recognizes the importance of international cooperation on carbon pricing and the important role international carbon markets can play. While the UK ETS currently operates as a standalone scheme, the UK is open to linking the UK ETS internationally in principle.

The UK's free trade agreement with the EU demonstrates continued commitment to carbon pricing as an effective tool to fulfil climate change objectives. It confirms that both the UK and the EU shall have in place an effective system of carbon pricing, which covers emissions from electricity and heat generation, industry, and aviation. The UK and EU have agreed to cooperate on carbon pricing, including considering linking their respective carbon pricing systems, although neither side is under any obligation to do so.

LOOKING AHEAD

As part of its incoming COP presidency, the UK is urging all parties to come forward with ambitious, updated NDCs. Net-zero commitments by the EU, China, Japan, and Republic of Korea in 2020 are very welcome. As in the UK, delivering on these commitments will require radical change and decisive action.

The UK is already taking the necessary steps, including launching the UK ETS as a keystone of its climate policy. 2021 will be a critical year for climate action, and the UK's presidency of COP26 in Glasgow in November provides the opportunity to drive further ambitious action on climate change and unite the world on a path to achieving the goals of the Paris Agreement.

An aerial photograph of a beach. The top half of the image shows the ocean with waves breaking, creating white foam. The water transitions from a deep blue to a lighter, greenish-blue near the shore. The bottom half of the image shows a wide, sandy beach with some tracks or patterns in the sand.

INFOGRAPHICS

02

FROM SUPRANATIONAL TO LOCAL

Emissions trading operates at every level of government

1 Supranational ——— **8 Countries** ——— **18 Provinces & States** ——— **6 Cities**

EU Member States
+ Iceland
+ Liechtenstein
+ Norway

China
Germany
Kazakhstan
Mexico
New Zealand
Republic of Korea
Switzerland
United Kingdom

California
Connecticut
Delaware
Fujian
Guangdong
Hubei
Maine
Maryland
Massachusetts

New Hampshire
New Jersey
New York
Nova Scotia
Québec
Rhode Island
Saitama Prefecture
Vermont
Virginia

Beijing*
Chongqing*
Shanghai*
Shenzhen
Tianjin*
Tokyo

Jurisdictions making
up **54%**
of global GDP are using
emissions trading

16%
of global GHG emissions
are covered by an ETS

Almost
1/3 of the global
population lives
under an ETS in
force

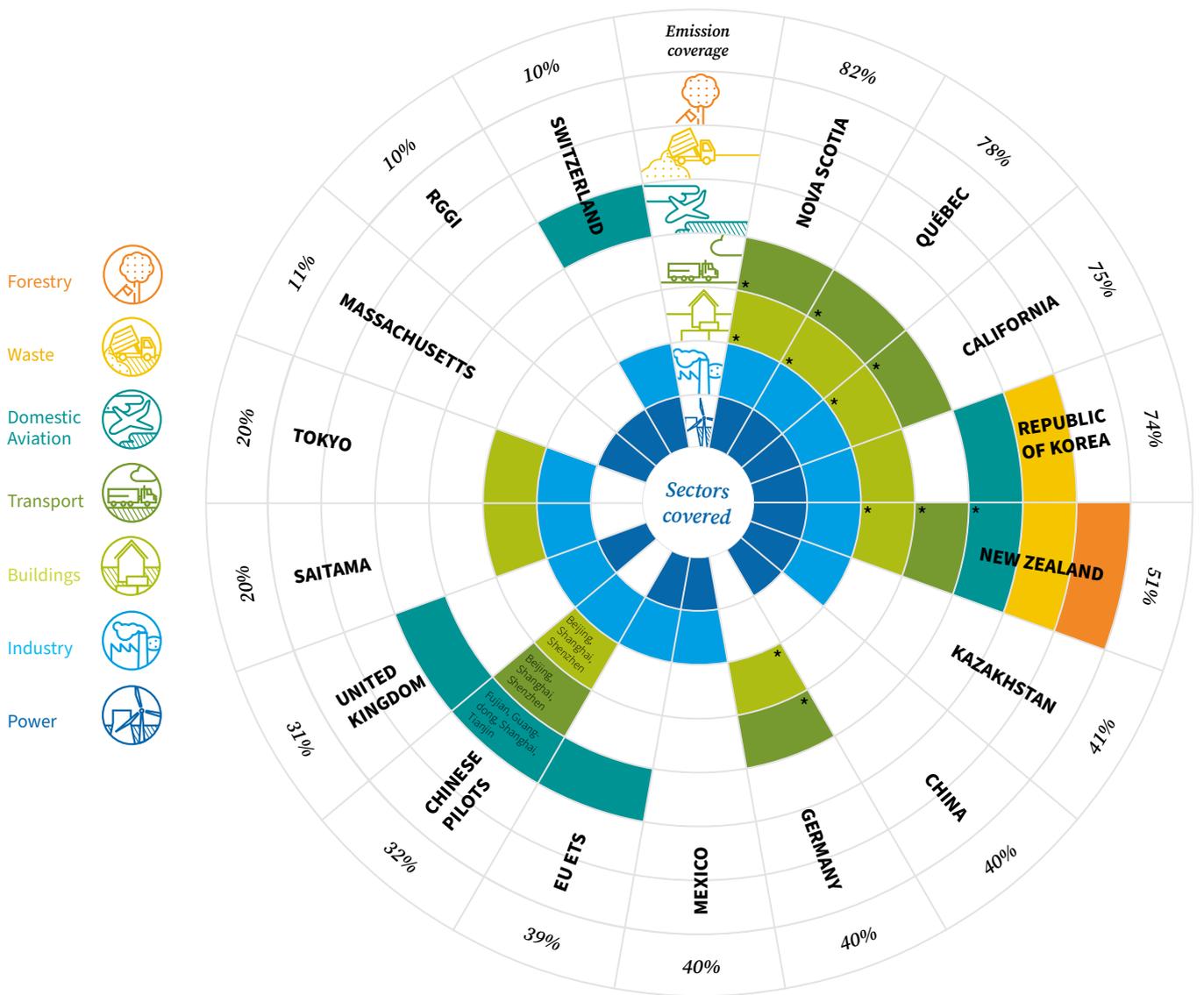


* In the Chinese administrative system, Beijing, Chongqing, Shanghai and Tianjin are provincial level municipalities.

SECTOR COVERAGE

Sectors covered by emissions trading across systems

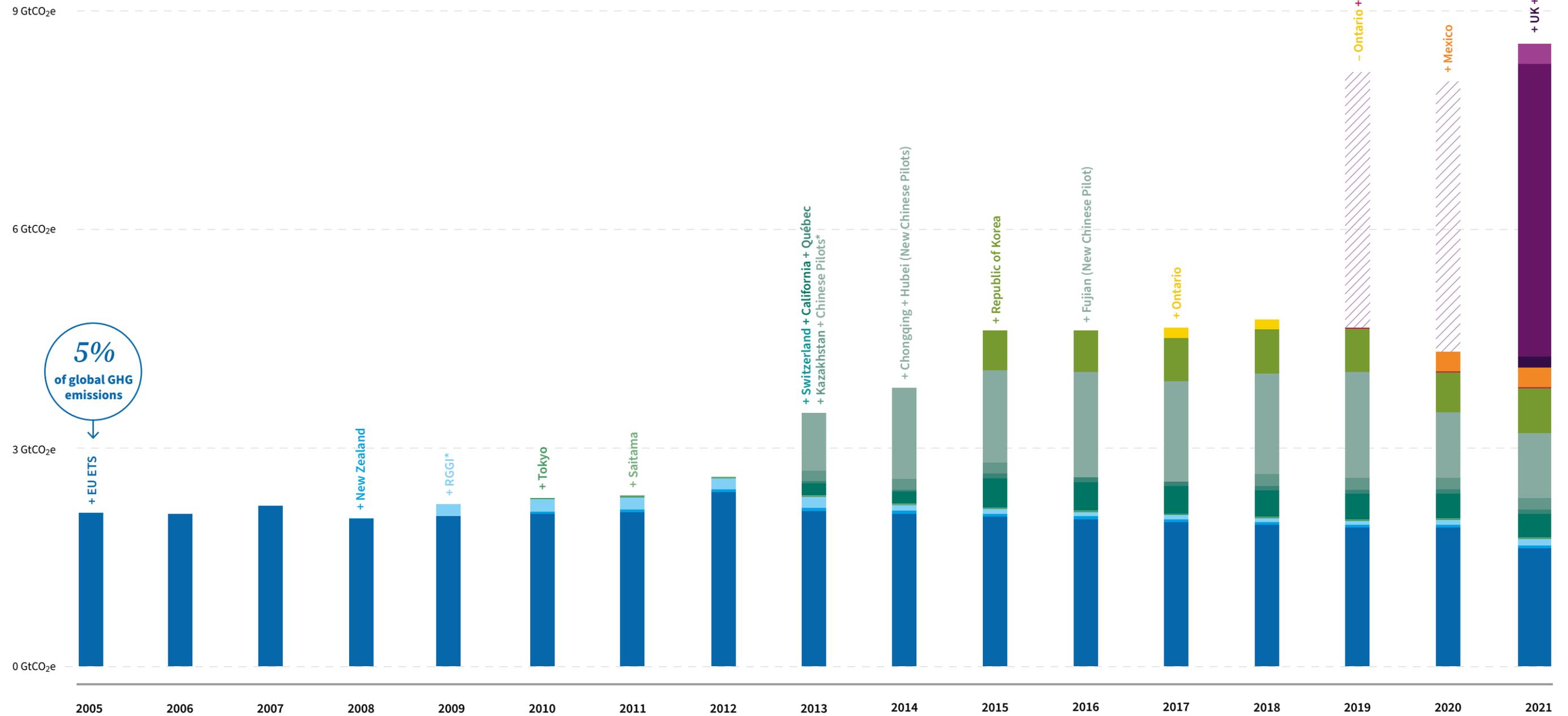
The graphic shows sectors (types of economic activity) covered by an ETS in force in 2021. Systems are listed clockwise in decreasing order of share of aggregate emissions covered, with the numbers in the outermost ring indicating the share of aggregate emissions covered by the system. Upstream coverage is indicated with an asterisk (*). Sectors are considered covered when at least some entities in the sector have explicit compliance obligations. Typically, not all facilities in the sector are regulated because of limits like inclusion thresholds. In addition, not all gases or processes of a given sector are covered. The jurisdictions' respective factsheets provide more information on system coverage. Only sectors covered by at least one ETS are included in the graphic. See "Notes on Methods and Sources" for further details.



GLOBAL EXPANSION OF ETS

The share of global GHG emissions under an ETS tripled since 2005

The graphic depicts the worldwide growth of emissions trading over time. Systems are spreading around the world. With new additions in China, Germany, the UK and Virginia, the share of GHG emissions covered by emissions trading has tripled since the launch of the EU ETS in 2005. Changes over time are driven by the addition of new sectors and systems, as well as by the counteracting trends of declining caps in many systems and growing global emissions. See "Notes on Methods and Sources" for further details.



* RGGI includes New Jersey (as of 2020) and Virginia (as of 2021).

* Beijing, Guangdong, Shanghai, Shenzhen, Tianjin

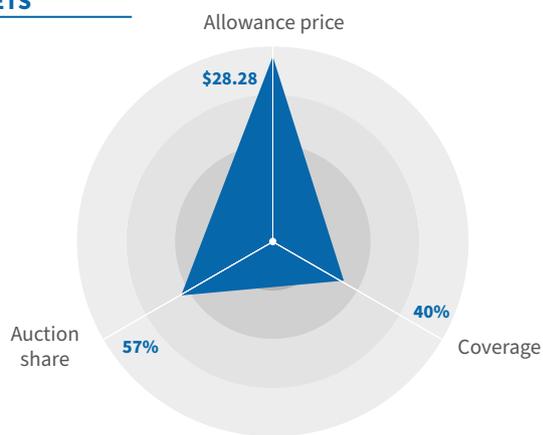
*The Chinese National ETS came into force in 2021 but has retroactive compliance obligations in 2019 and 2020, indicated above by the striped bars.

DIFFERENT SHAPES OF ETS

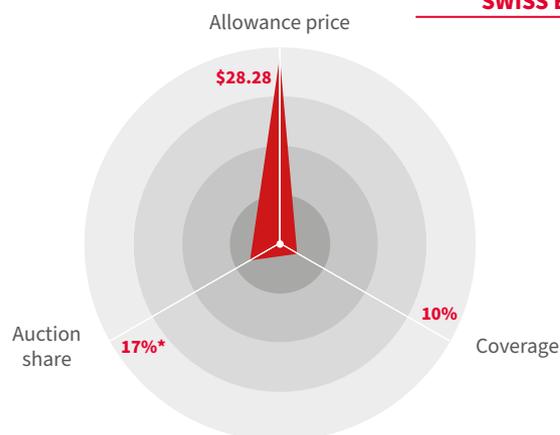
A comparative look at key metrics in six well-established systems

The axes on each graph correspond to a specific metric. Allowance price is measured in USD per metric tonne of CO₂e in each system and averaged over 2020. Coverage shows the share of the jurisdiction's emissions covered under the ETS. Auction share, expressed as a share of the 2020 cap, denotes the number of allowances that were auctioned and generated revenues for the jurisdiction's government. To aid comparison, the axes share the same scale across graphs. See "Notes on Methods and Sources" for further details.

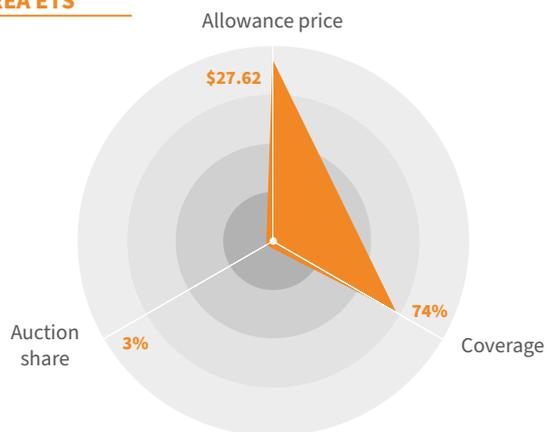
EU ETS



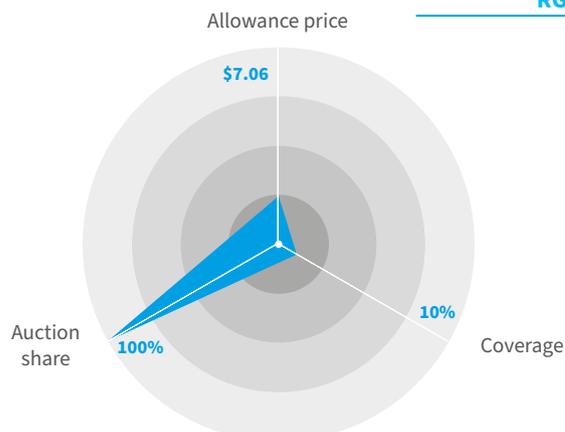
SWISS ETS



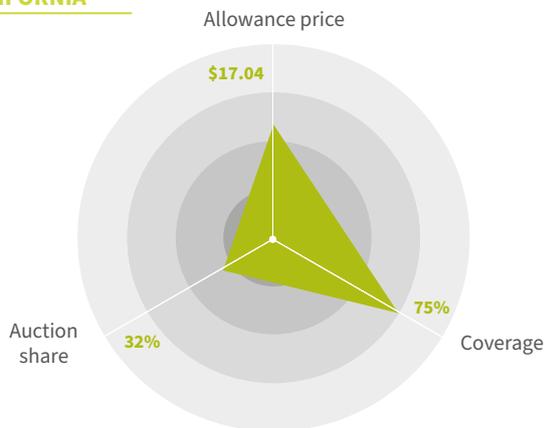
KOREA ETS



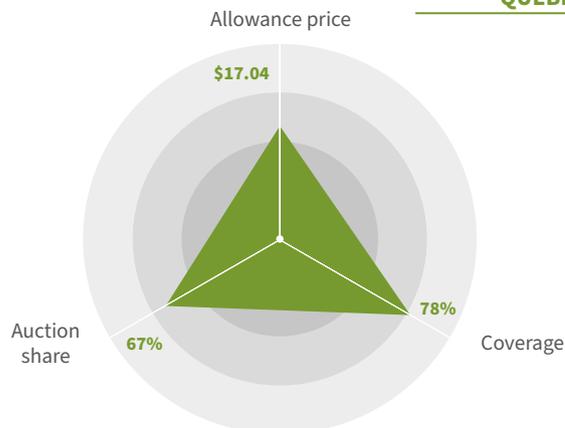
RGGI



CALIFORNIA



QUÉBEC



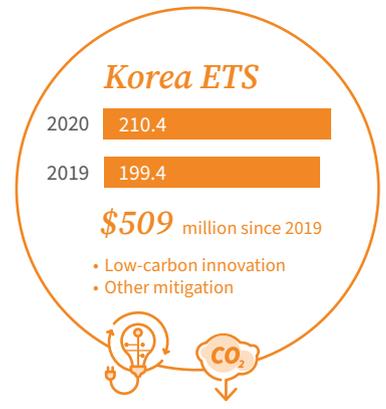
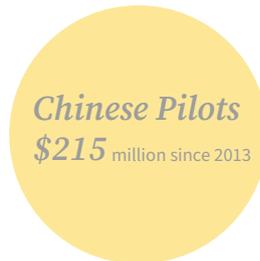
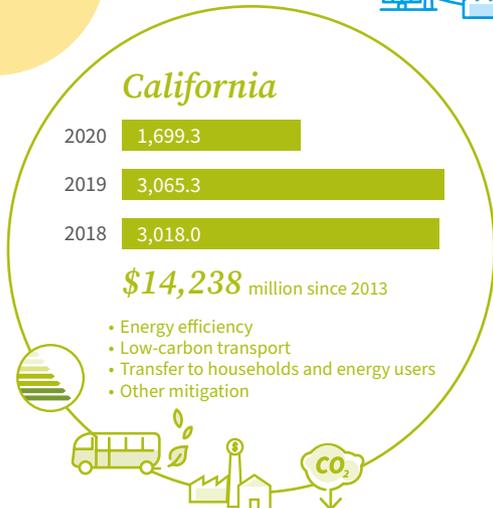
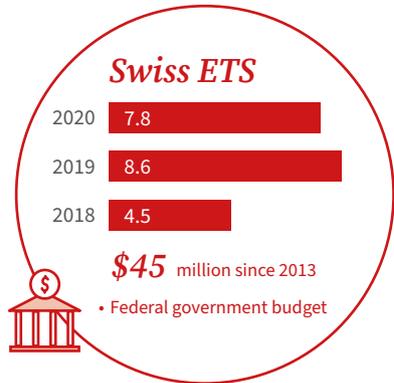
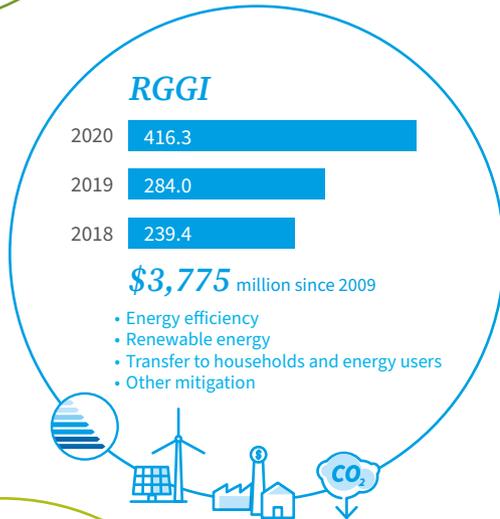
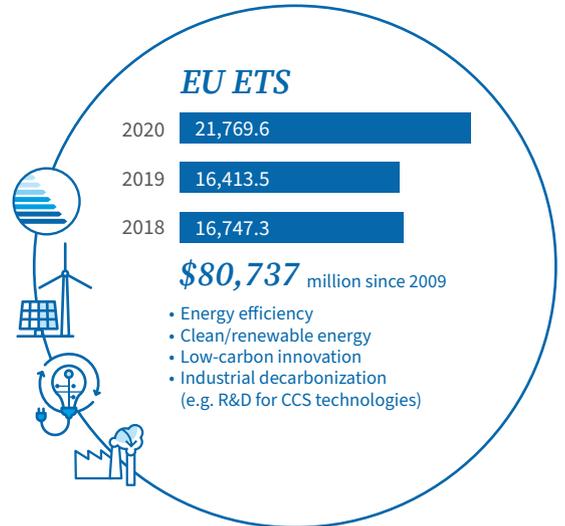
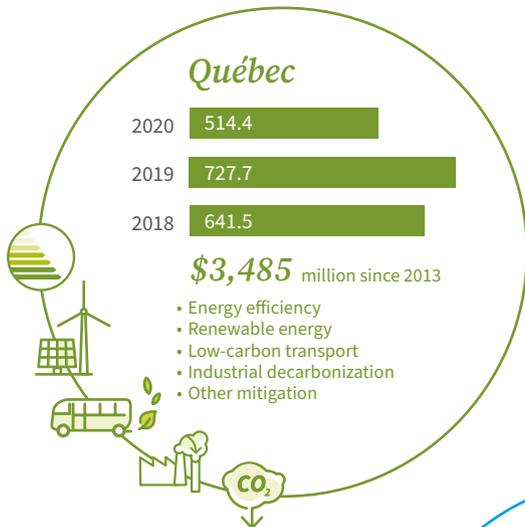
* Not considering cancelled auctions. See "Notes on Methods and Sources" for further details.

AUCTION REVENUE

Emissions trading as an additional source of government revenue

Allowance auctions generate revenue that can be used in areas reflecting jurisdictional priorities. Jurisdictions have tended to use auction revenues to fund climate programs, including on energy efficiency, low-carbon transport and renewable energy. Revenues have also been used to support energy intensive industries, as well as to assist disadvantaged and low-income groups. The amount of revenue collected depends on the jurisdiction's size, ETS coverage, share of auctioned allowances and their prices. By the end of 2020, systems worldwide raised over USD 103 billion cumulatively. See "Notes on Methods and Sources" for further details.

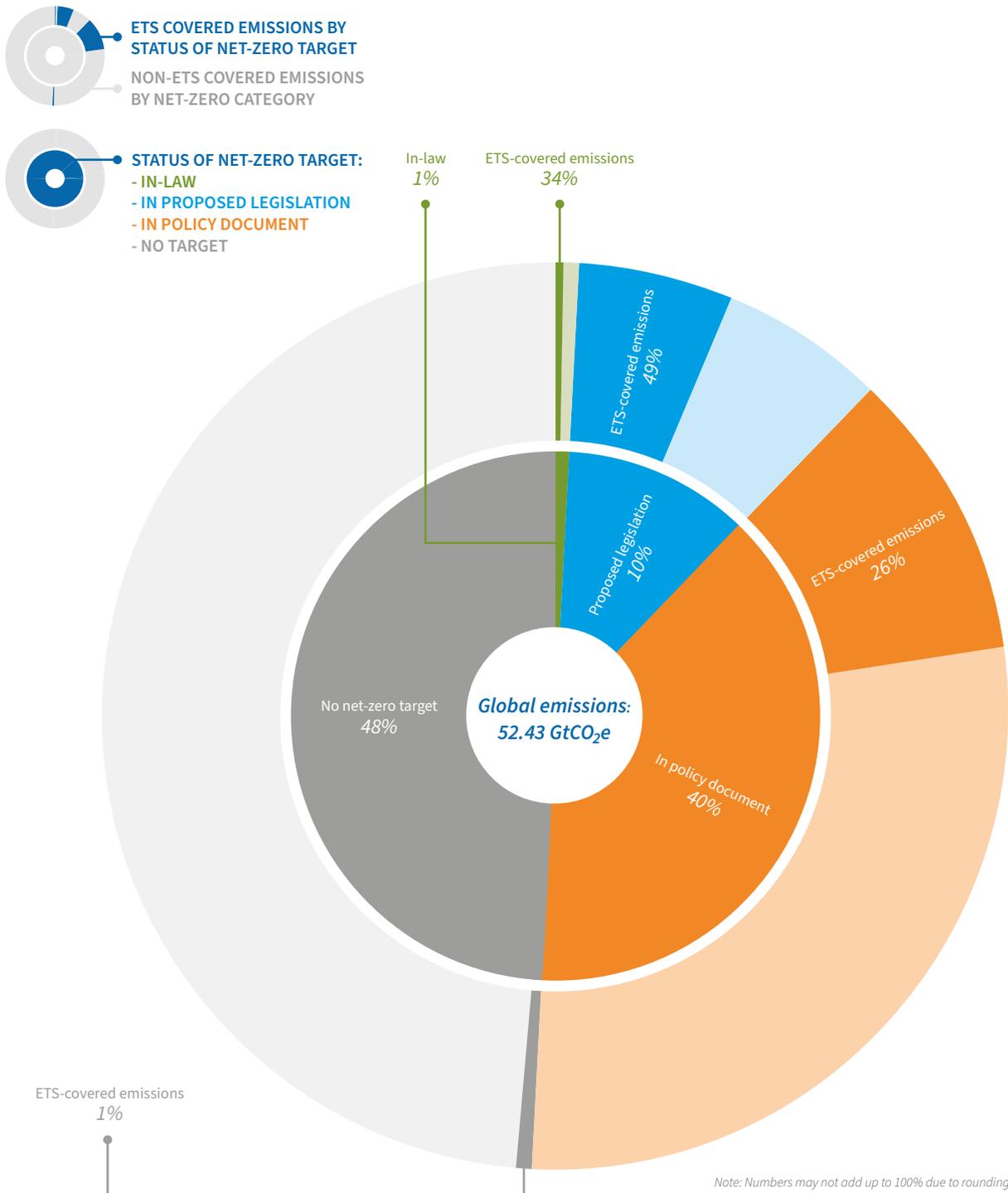
total
\$103
billion since 2009



DEEP DECARBONIZATION AND ETS

ETS as an important policy instrument for the net-zero transition

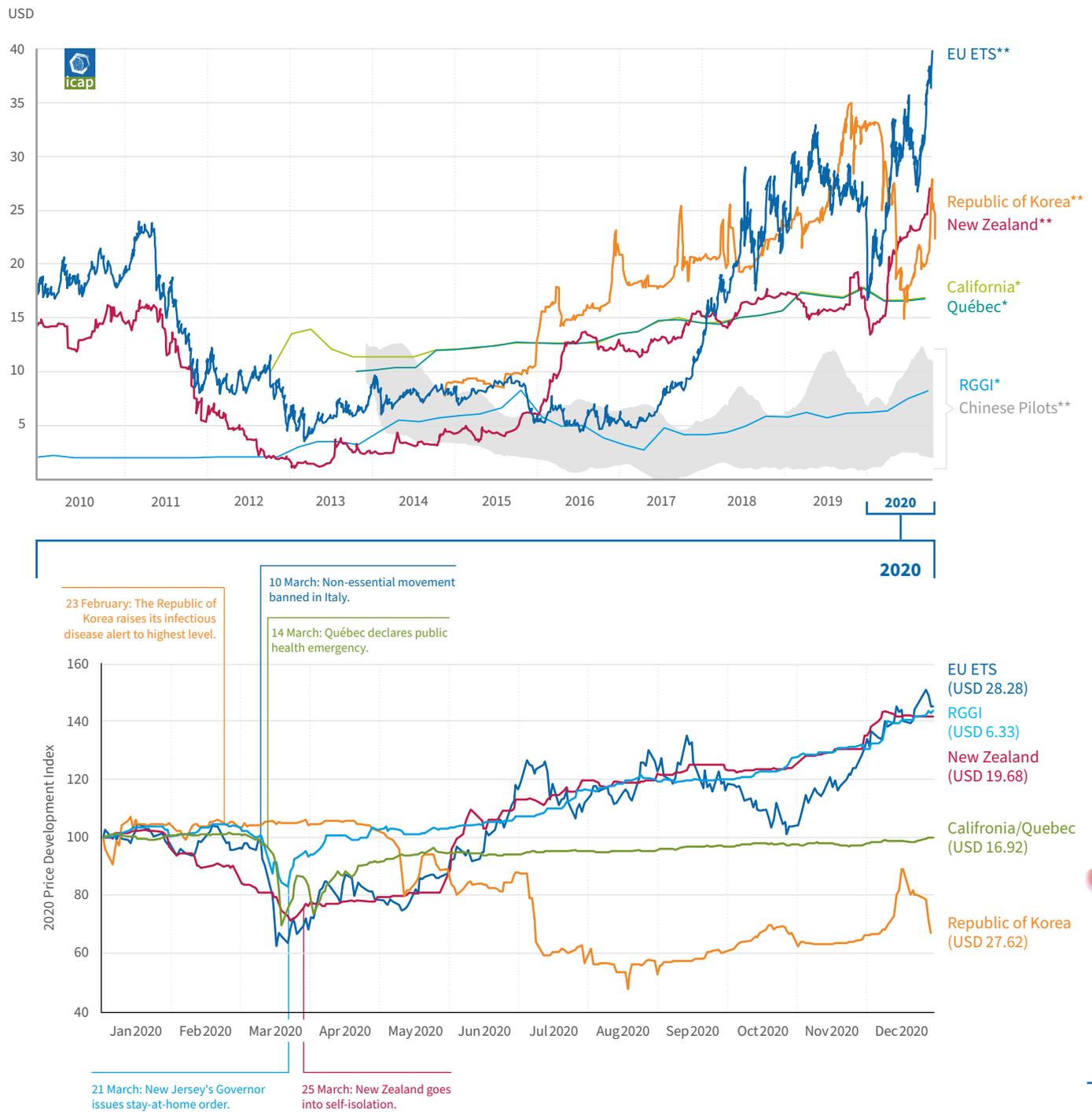
Around the world an increasing number of jurisdictions are formally adopting mid-century net-zero emissions targets to limit global warming to 1.5°C. Emissions trading is an important component of the policy portfolios aimed at achieving these targets. The inner ring of this infographic shows the share of global GHG emissions by status of net-zero target development at the national or, for EU member states, supranational level based on the categorization from the Energy & Climate Intelligence Unit's Net Zero Tracker. For each stage of net-zero target development, the outer ring indicates the share of emissions covered by an ETS currently in force at the subnational, national or supranational level. See "Notes on Methods and Sources" for further details.



ALLOWANCE PRICE DEVELOPMENTS

Allowance price developments since 2010

The top panel of the figure uses data from the ICAP Allowance Price Explorer to visualize price developments in primary (*) and secondary (**) markets between 2010 and 2020 in major ETs around the world. Sustained upward trends and short-term volatility were driven by changes in current and expected future scarcity of allowances, due to variations in general economic conditions, revisions to the rules of the systems (including those governing offsets and market stability mechanisms), and interactions with other climate and energy policies. The lower panel shows an index of allowance prices in selected ETs in 2020. The index value is set to 100 across all prices at the start of 2020 and values at other dates indicate price changes relative to this base period. Prices indicated to the right are the yearly average of the daily secondary market prices. Highlighted dates indicate the first major government announcements regarding restrictions to stop the spread of COVID-19. Although most of the displayed systems experienced a sharp price decrease early in the pandemic, prices recovered for most systems by the second half of 2020. See “Notes on Methods and Sources” for further details.



FACTSHEETS

03



EUROPE AND CENTRAL ASIA

European Union	37
Germany	43
Kazakhstan	47
Montenegro	50
Sakhalin	51
Switzerland	52
Turkey	56
Ukraine	58
United Kingdom	59

NORTH AMERICA

California	64
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Nova Scotia	78
Oregon	82
Pennsylvania	83
Québec	84
Regional Greenhouse Gas Initiative	88
Transportation and Climate Initiative	91
Washington	93
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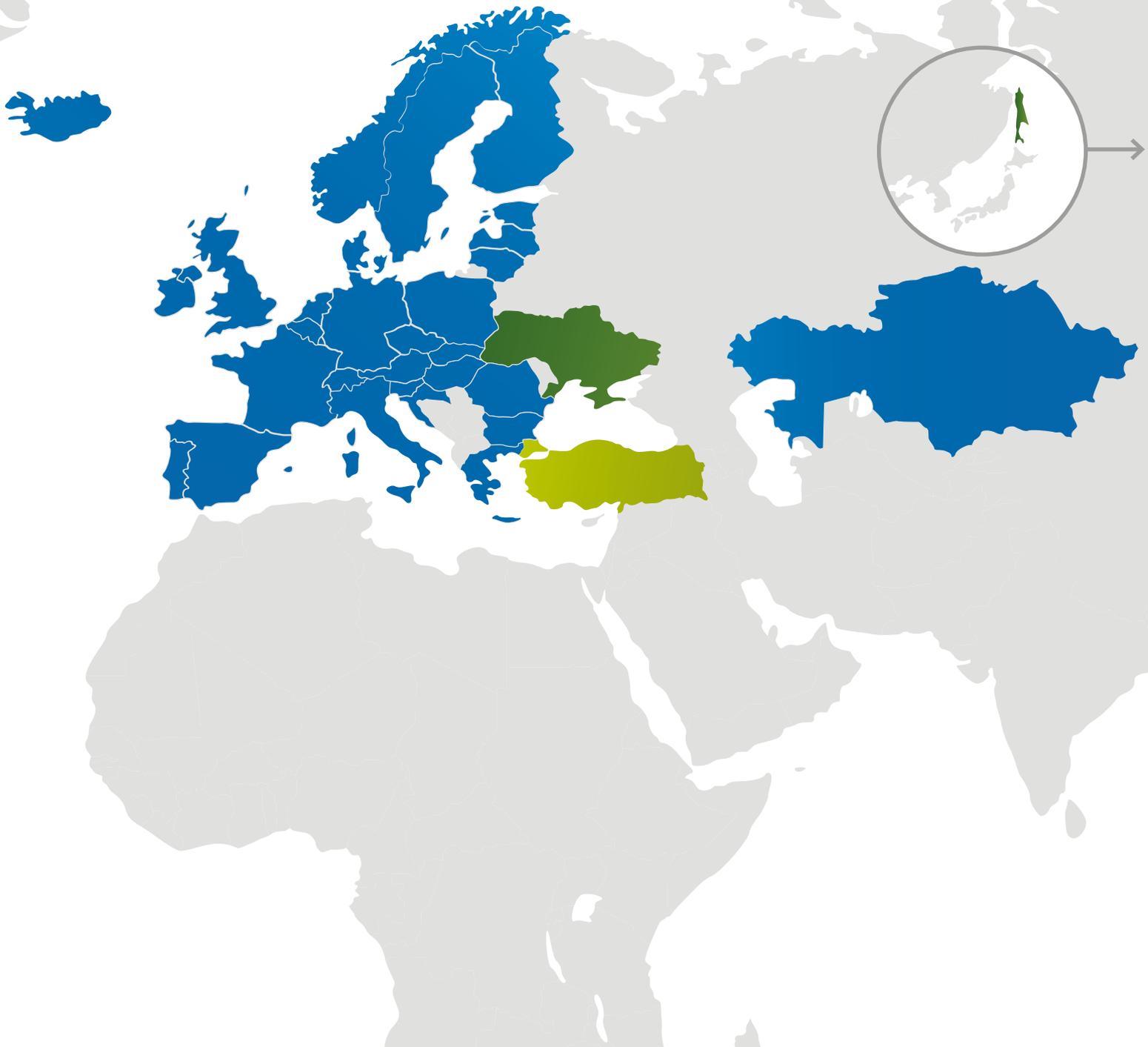
LATIN AMERICA AND THE CARIBBEAN

Brazil	97
Chile	98
Colombia	100
Mexico	101

ASIA-PACIFIC

Beijing	106
China	109
Chongqing	114
Fujian	117
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Shanghai	145
Shenzhen	148
Taiwan, China	151
Thailand	152
Tianjin	153
Tokyo	156
Vietnam	160

EUROPE AND CENTRAL ASIA





EUROPEAN UNION

European Union Emissions Trading System

In force

Under development

Under consideration

SECTORS:



POWER



INDUSTRY



AVIATION

MEMBER STATES (2021):

All EU Member States as well as Iceland, Liechtenstein, and Norway

←
Oldest ETS in force – now in its fourth trading phase

Link with the Swiss ETS operational since Q3 2020

Reduced ETS emissions from stationary sources by 9.1% in 2019

CAP 1,610 MtCO ₂ e (2021) 1,572 MtCO ₂ e for stationary installations 38 MtCO ₂ e for aviation operators	GASES Several gases	OFFSETS AND CREDITS Offsets and international credits can no longer be used for compliance since Phase 4 (2021–2030)
ALLOCATION Free allocation: Benchmarking Auctioning	AVERAGE 2020 PRICE¹ EUR 24.76/tCO ₂ (USD 28.28)	TOTAL REVENUE EUR 69.7 billion (USD 80.7 billion) since beginning of program, EUR 19.2 billion (USD 21.8 billion) collected in 2020

ETS DESCRIPTION

The European Union Emissions Trading System (EU ETS) is a cornerstone of the EU's policy to combat climate change and a key tool for reducing, on a cost-effective basis, GHG emissions from the regulated sectors. The system covers ~40% of the EU's emissions, from the power sector, manufacturing industry, and aviation within the European Economic Area. It is the oldest and now second largest ETS operating worldwide. Introduced in 2005 and now in its fourth trading phase, the EU ETS has gone through several reforms. The latest revision of the system's framework for Phase 4 was completed in 2018 and took effect in January 2021. The next reform of the ETS will be proposed later in 2021 as part of steeper emission reductions across the economy envisaged under the European Green Deal. As of January 2020, the EU ETS became linked to the Swiss ETS, the first linking of this kind for both parties.

YEAR IN REVIEW

2020 was an important year for the EU ETS with: the announcement of milestone climate policy initiatives under the European Green Deal; the finalization of the regulatory preparations ahead of Phase 4 (2021–2030); and a market that proved itself resilient amidst macroeconomic shocks prompted by the COVID-19 pandemic. The Market Stability Reserve (MSR), now in its third year of operation, absorbed a total of 773 million allowances through reduced auction volumes in 2019 and 2020. The proposed Climate Law and the 2030 Climate Target Plan pave the way for steeper emissions reductions and will see the EU ETS play a central role in Europe's deep decarbonization pathway.

Under the 2030 Climate Plan, the European Commission (the Commission) has launched the revision process for the EU ETS, with a proposal due by June 2021. The objectives are to: strengthen the system in line with the more ambitious 2030 emissions reductions target; adjust the MSR and provisions to protect against the risk of carbon leakage; extend the system's scope to emissions from the maritime sector and, possibly, the road transport and buildings sectors; and review existing support mechanisms for low-carbon investment. Alternative options, e.g., to address the risk of carbon leakage, are also considered—including a carbon border adjustment mechanism targeting specific industrial sectors. The impact assessment for the revision of the EU ETS is coordinated with the scheduled review of the MSR.

In addition to the developments outlined above, 2020 saw further operationalization of the EU ETS framework for Phase 4. This included implementing rules for the ETS' Modernisation Fund. The first open call for large-scale projects under the ETS' Innovation Fund was also launched. The Commission published the cap for 2021, which no longer covers the United Kingdom but does include emissions from electricity generation in Northern Ireland. Other building blocks for Phase 4 had been implemented through key legislation in 2019; these included free allocation, auctioning, MRV, and the Union Registry, as well as the operationalization of the Innovation Fund.

2020 also saw major developments on the international front. The linking agreement between the EU ETS and the Swiss ETS took effect in January 2020, and a provisional link was established in September allowing for allowance transfers between both registries on pre-announced dates. The UK formally withdrew from the EU on 31 January 2020, but continued to participate in the EU ETS until the end of the year as part of the transition period. Linkage with the UK ETS might be considered in the future.

¹ – Average secondary market spot price from EEX exchange.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) EU-28: 4,391.9 MtCO₂e (2018)
EU-27:² 3,893.1 MtCO₂e (2018)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy 2,907.1 (75%)
Industrial Processes 343.5 (9%)
International Aviation 129.2 (3%)
Agriculture 395.4 (10%)
Waste 117.2 (3%)

GHG REDUCTION TARGETS

BY 2030: At least 55% below 1990 GHG levels proposed (European Green Deal), to be set in the Climate Law

BY 2050: Climate neutrality target proposed (European Green Deal), to be set in the Climate Law³

ETS Size

COVERED EMISSIONS⁴

1,749.5 MtCO₂e
(Verified emissions 2018)



GHGs COVERED

CO₂, N₂O, PFCs

SECTORS AND THRESHOLDS

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

PHASE TWO (2008–2012): Aviation was introduced in 2012 (>10,000 tCO₂/year for commercial aviation; >1,000 tCO₂/year for non-commercial aviation since 2013) (see "Aviation" section). A number of countries included NO_x emissions from the production of nitric acid. The EU ETS also expanded to include Iceland, Liechtenstein, and Norway.

PHASE THREE (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 included.

PHASE FOUR (2021–2030): Based on the current legislation, no changes to the scope have been agreed on for Phase 4. Changes are being considered as part of the review of the ETS foreseen under the 2030 Climate Target Plan (see "Year in Review" section).

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 (ICAO) 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. In 2020, the Commission initiated a process to revise the ETS Directive to address the implementation of CORSIA in EU law in a way that is consistent with the EU's 2030 climate target, with a view of adoption in 2021.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

10,569 power plants and manufacturing installations.

CAP

PHASE ONE (2005–2008) and **PHASE TWO (2009–2012):** The cap was established bottom-up, based on the aggregation of the national allocation plans of each Member State. Phase 1 started with a cap of 2,096 MtCO₂e in 2005; Phase 2 started with a cap of 2,049 MtCO₂e in 2009.

PHASE THREE (2013–2020): A single EU-wide cap for stationary sources: 2,084 MtCO₂e in 2013, which is annually reduced by a linear reduction factor (currently 1.74% or ~38.3 million allowances). This amounts to a cap of 1,816 MtCO₂e in 2020.

2 – EU-27 comprises all European Member States, which as of 2021 no longer includes the United Kingdom.

3 – Both updated targets (2030 and 2050) recently have been endorsed by the European Parliament and European Council, and are currently in the process of being enshrined into the European Climate Law.

4 – Including emissions and verified emissions of the EU-28, Iceland, Liechtenstein and Norway

PHASE FOUR (2021–2030): A single EU-wide cap for stationary installations set for 2021 at 1,572 MtCO₂e. A linear cap reduction factor of 2.2% (of 2008–2012 baseline emissions) applies to both stationary sources and the aviation sector each year. This translates into a year-on-year reduction of the cap by 43 million allowances. The linear reduction factor does not have a sunset clause and the cap will continue to decline beyond 2030. Starting 2021, emissions from UK entities previously covered by the EU ETS are no longer considered in the cap. However, pursuant to Article 9 and Annex 4 of the Protocol on Ireland/Northern Ireland, the cap trajectory in Phase 4 does account for emissions from electricity generators in Northern Ireland.

Aviation Sector Cap: Emissions for intra-EEA aviation in 2021 are capped at 38 million allowances and will decrease each year by the linear reduction factor of 2.2%. The aviation sector cap was set in 2012 at 210 MtCO₂e/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 reduced to 38 million allowances annually and set considerably below verified intra-EEA aviation emissions. In 2017, the intra-EEA scope for aviation was prolonged until 2023. The adjusted annual aviation cap applies up to 2021 and decreases thereafter.

Phases & Allocation

TRADING PERIODS

PHASE ONE: 3 years (2005–2007)

PHASE TWO: 5 years (2008–2012)

PHASE THREE: 8 years (2013–2020)

PHASE FOUR: 10 years (2021–2030)

ALLOCATION

PHASE ONE (2005–2007): Allocation established through the Member State national allocation plans. Allocation through grandfathering. Some Member States used auctioning and some used benchmark-based allocation.

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

PHASE THREE (2013–2020): 57% of allowances auctioned over the entire trading period with the remaining allowances allocated through benchmarking.

88% of the auctioned allowances were distributed to EU Member States based on verified 2005 or average 2005–2007 emissions.

10% was allocated to lower-income EU Member States and the remaining 2% distributed among nine Member States that reduced 2005 emissions by 20% compared to the base year.

Power Sector: 100% auctioning with an optional derogation for the modernization of the electricity sector in certain Member States whose GDP per capita was below 60% of the EU average in 2013.

Manufacturing/Industry: Free allocation follows product-based benchmarks. Benchmarks were based on activity levels in 2007–2008 and were set at the average of the 10% most efficient installations in the (sub)sector.

Subsectors deemed at risk of carbon leakage received free allocation at 100% of the predetermined benchmarks. Subsectors deemed not at risk of carbon leakage had free allocation phased out gradually from 80% of the respective benchmarks in 2013 to 30% by 2020. Where free allocation exceeded the amount reserved for free allocation, a cross-sectoral correction factor applied.

Carbon leakage risk was assessed against the following criteria of emissions intensity and trade exposure:

- direct and indirect cost increase >30%; or
- non-EU trade intensity >30%; or
- direct and indirect cost increase >5% and trade intensity >10%.

Cost intensity was determined by the formula
[Carbon price × (direct emissions × auctioning factor + electricity consumption × electricity emission factor)] / GVA

Trade intensity was determined by the formula
(imports + exports)/(imports + production)

Aviation Sector: In 2012, 85% of allowances were allocated for free, based on benchmarks. In Phase 3 (2013–2020), 15% of allowances were auctioned and 82% allocated for free, based on benchmarks. The remaining 3% constituted a special reserve for new entrants and fast-growing airlines. Due to the temporary derogation that applied to flights with third countries, the allocation was adjusted to the intra-EEA scope.

Back-loading: As a short-term measure to address a growing surplus in the EU ETS, the auctioning of 900 million allowances from 2014–2016 was postponed to 2019–2020. In line with the decision to create the market stability reserve, the back-loaded allowances were placed in the MSR, which became operational in 2019.

New Entrants Reserve: 5% of the total allowances are set aside to assist new installations coming into the EU ETS or to cover installations whose capacity has significantly increased

since their free allocation was determined. Until June 2020, a total of 171.1 million allowances were reserved for 1,089 installations during Phase 3. At the end of Phase 3, any unallocated allowances (excluding 200 million reserved for the NER300⁴ in Phase 4) were placed into the MSR.

PHASE FOUR (2021–2030):

Manufacturing/Industry: Benchmark values are updated twice to reflect technological progress in different sectors. The first set of benchmark values applies to the period 2021–2025; the second set of values will cover the period from 2026 to 2030. Member States submitted lists of incumbent installations and updated emissions data by 30 September 2019 and are required to do so again by 30 September 2024. Based on this data, the European Commission will update Phase 3 benchmarks.

- Benchmark values in Phase 4 will be adjusted for technological progress year-on-year. An annual reduction rate (0.2% to 1.6%) will be determined for each benchmark. For the steel sector, which faces high abatement costs and leakage risks, the lower end of 0.2% annual benchmark reduction will apply. Further updates on the above may be released as part of the broader ETS review.
- Free allocation may be updated annually to mirror sustained changes in production (if the change is more than 15% compared to the initial level, based on a 2-year rolling average).

Carbon leakage rules:

- The third carbon leakage list adopted in February 2019 applies for the period 2021–2030. The revised list includes a reduced number of sectors classified at risk of carbon leakage. Free allocation for other sectors will be discontinued by 2030 (except district heating).
- Carbon leakage is assessed against a composite indicator of trade intensity and emissions intensity.
- As an additional safeguard for industry, the Phase 4 cap breakdown includes a free allocation buffer of more than 450 million allowances, initially earmarked for auctioning, which can be made available for free allocation if the initial free allocation volume is fully absorbed (thereby avoiding the need to apply the cross-sector correction factor).

- Carbon leakage risk is assessed according to the following criteria:
 - Trade Intensity x Emissions Intensity > 0.2
 - Trade intensity x Emissions Intensity > 0.15 < 0.2; qualitative assessment will follow based on abatement potential, market characteristics, and profit margins.

Emissions intensity is determined by: $[\text{direct emissions} + (\text{electricity consumption} \times \text{electricity emission factor})] / \text{GVA}$

Trade exposure is determined by: $(\text{imports} + \text{exports}) / (\text{imports} + \text{production})$

Power Sector: 100% auctioning with an 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 through benchmarking. Three out of ten eligible Member States make use of the derogation in Phase 4 (2021–2030). Some Member States chose to monetize the corresponding share of allowances or use them to boost their share of the Modernization Fund.

Aviation: Free allocation for the aviation sector will be reduced compared to the 82% in Phase 3. A proposal is expected in June 2021.

Auctioning: 57% of allowances in Phase 4 will be auctioned. Out of these, 90% will be distributed to Member States based on their share of verified emissions, with 10% distributed among the lower-income EU Member States. Authorities have the right to cancel auctions when the highest bidding price is significantly below the prevailing secondary market price to avoid market distortion. In such a situation, allowances are transferred to subsequent auctions scheduled at the same trading platform.

NER: The New Entrants Reserve in Phase 4 (2021–2030) has been supplied with 200 million from the unallocated NER allowances from Phase 3 (2013–2020).

Flexibility

BANKING AND BORROWING

Unlimited banking has been allowed since 2008.

Borrowing is not allowed. However, implicit borrowing within trading periods is allowed, i.e., the use of allowances allocated in the current year for compliance in the previous year.

OFFSETS AND CREDITS

PHASE ONE (2005–2007): Unlimited use of Clean Development Mechanism (CDM) credits and Joint Implementation (JI) credits was provided for in the directive. In practice, no credits were used in Phase 1.

PHASE TWO (2008–2012):

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

Quantitative Limits: In Phase 2, 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).

⁴ – The NER 300 is an EU low-carbon technology funding program of approximately EUR 2 billion (USD 2.3 billion) monetized through the sale of 300 million allowances that awarded proposals in 2012 and 2014, the latest of which will enter into operation by June 2021.

PHASE THREE (2013–2020):

Qualitative Limits: Newly generated (post-2012) international credits had to originate from projects in least developed countries. Credits from CDM and JI projects from other countries were eligible only if registered and implemented before 31 December 2012. Projects from industrial gas credits (projects involving the destruction of HFC-23 and N₂O) were 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 was capped at 50% of the overall reduction under the EU ETS in that period (~1.6 Gt CO₂e).

PHASE FOUR (2021–2030): Based on the current legislation, the use of offsets is not envisaged.

MARKET STABILITY PROVISIONS

MARKET STABILITY RESERVE: The MSR started operating in January 2019. Its purpose is to address any supply-demand imbalance of allowances prevailing in the EU carbon market and to improve the EU ETS's resilience to future shocks.

Thresholds: The European Commission publishes the total numbers of allowances in circulation (TNAC) by 15 May each year.

- When the TNAC is above 833 million, 24% (12% beyond 2023) of the surplus is withdrawn from future auctions and placed into the reserve over a period of 12 months.

- When the TNAC is fewer than 400 million allowances, 100 million allowances are taken from the reserve and injected into the market through auctions.

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 be invalidated. Thresholds, withdrawal rates, and cancellation provisions of the MSR will be reviewed in June 2021.

In 2019, a total of 397 million allowances were placed in the reserve. In 2020, the total number of allowances withdrawn amounted to more than 375 million, corresponding to a 35% reduction in auction volumes for that year.

Swiss allowance supply is not taken into account when the annual EU withdrawal amount is calculated, and Swiss auction quotas will not be reduced by the mechanism.

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

Compliance

COMPLIANCE PERIOD

One year (1 January to 31 December): every year, operators must submit an emissions report. Data for a given year must be verified by an accredited verifier by 31 March of the following year. Once verified, operators must surrender the equivalent number of allowances by 30 April of that year.

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 for verification and accreditation of verifiers. A monitoring plan is required for every installation and aircraft operator (approved by a competent authority). MRV procedures were updated in 2020 in preparation for Phase 4.

ENFORCEMENT

Regulated entities must pay an excess emissions penalty of EUR 100/tCO₂ (USD 114.22/tCO₂) for each tonne of CO₂ emitted for which no allowance has been surrendered, in addition to buying and surrendering the equivalent amount of allowances. The name of the non-compliant operator is also made public. Member States may enforce different penalties for other forms of noncompliance.

Linking

LINKS WITH OTHER SYSTEMS

Following final regulatory changes in the design of the Swiss ETS, a link between the Swiss ETS and the EU ETS took effect on 1 January 2020. The link allows covered entities in both systems to use allowances from either ETS for compliance. A provisional link was implemented in September the same year, enabling the transfer of allowances between registries on pre-announced dates. This system is set to be replaced with an electronic link that would facilitate transfers of emission allowances between both ETS registries on a continuous basis.

The link caps a ten-year process of reaching an agreement on regulatory alignment. Formal negotiations began in December 2010, culminating in the conclusion of a linking agreement in late 2017.⁶ Both sides announced on 12 December 2019 that the link would become operational in January 2020.

Other Information

INSTITUTIONS INVOLVED

The European Commission and the relevant authorities of all EU Member States as well as Iceland, Liechtenstein, and Norway.

EVALUATION/ETS REVIEW

The European Commission publishes annual reports on the functioning of the European carbon market (2020 report).⁷

Two major EU ETS reviews—before Phase 3 and before Phase 4—have been conducted to date, introducing changes to the system's operational framework. The ETS Directive 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

In the EU ETS, revenues from the auctioning of allowances accrue to Member States. At least 50% of revenues should be used for climate- and energy-related purposes. Member States are obliged to inform the European Commission about how they use the revenues. In 2019, on average, Member States spent ~77% of their revenues on domestic and international climate-related purposes.

PHASE FOUR (2021–2030): The latest revision of the EU ETS set up two new funds to support EU stakeholders in the low-carbon investment challenge.

- **Innovation Fund:** Supports demonstration of innovative breakthrough technologies in industry, as well as carbon capture and storage/use and renewable energy. The fund is monetized through the sale of at least 450 million allowances, and the remaining budget from the NER300. In 2020, the first batch of 50 million allowances was auctioned to capitalize the Fund.

- **Modernisation Fund:** Supports investments in modernizing energy systems and improving energy efficiency in ten lower-income Member States, including investments to support a socially just transition to a low-carbon economy (e.g., upskilling/reskilling of affected workers). The Modernisation Fund is capitalized with the auction revenues of 2% of total allowances for Phase 4. Subject to the allowance price, up to EUR 14 billion (USD 16 billion) may be injected into the Fund over 2021–2030.

IMPLEMENTING LEGISLATION

[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

[Decision concerning the establishment and operation of a market stability reserve for the Union GHG emission trading scheme and amending Directive 2003/87/EC \(6 October 2015\).](#)⁹

[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 \(26 February 2014\).](#)^{10, 11}

All other legislation and documentation can be found [here](#).¹²

6 – *Agreement between the European Union and the Swiss Confederation on the linking of their GHG emissions trading systems*, OJ L 322, 12 December 2017, p. 3.

7 – https://ec.europa.eu/clima/sites/clima/files/news/docs/com_2020_740_en.pdf

8 – <https://eur-lex.europa.eu/eli/dir/2003/87/2018-04-08>

9 – <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1576247155765&uri=CELEX:02003L0087-20180408>

10 – <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02010R1031-20140227>

11 – <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1547715054952&uri=CELEX:02010R1031-20171108>

12 – https://ec.europa.eu/clima/policies/ets_en#tab-0-1



GERMANY

German National Emissions Trading System

In force

Under development

Under consideration

SECTORS*:



TRANSPORT



BUILDINGS

**In general, all sectors not covered by the EU ETS are covered, mainly transport and heating for buildings.*

National ETS introduced in 2021 covering heating and transport fuels upstream

Fixed price per tCO₂ from 2021 to 2025

Auctioning starting in 2026 with minimum and maximum price; continuation of a price corridor after 2026 to be decided in 2025

CAP	GASES	ALLOCATION
TBD (Cap Setting Regulation expected by mid-2021)	CO ₂ only	Fixed price until 2025, auctioning thereafter; price corridor foreseen at least for 2026

ETS DESCRIPTION

Germany launched its National Emissions Trading System (in German: Nationales Emissionshandelssystem, or nEHS) for heating and transport fuels in 2021. This measure complements the EU ETS and forms part of the 'Climate Action Programme 2030,' a package of measures adopted by the German Federal Cabinet to reach Germany's 2030 climate targets and aim for climate neutrality by 2050. Because GHG emissions from the country's energy, industry, and domestic aviation sectors are already covered by the EU ETS, the introduction of the national ETS leads to most major sectors in Germany facing a CO₂ price from 2021 onwards.

After the release of the 'Cornerstones for the Design of a National ETS' in October 2019, the implementing legislation for the nEHS—the 'Fuel Emissions Trading Act'—was adopted in December 2019 and amended in November 2020.

The national ETS will be phased in gradually, with a fixed price per tCO₂ from 2021 to 2025. In 2026, auctions with minimum and maximum prices will be introduced. Whether a price corridor will be applied from 2027 onwards has to be decided in 2025. The coverage of fuels will also be gradually expanded.

YEAR IN REVIEW

Based on the key design features of the system laid out in the 'Fuel Emissions Trading Act,' regulatory efforts in 2020 focused on a first amendment and the further implementation of the law.

The amendments to the 'Fuel Emissions Trading Act' adopted by the German legislative bodies in November 2020 increased the initially set fixed-price levels of the nEHS. Prices were set at EUR 25/tCO₂ (USD 28.55) in 2021, which will then increase yearly to EUR 55/tCO₂ (USD 62.82) in 2025. In 2026, a price corridor between EUR 55/tCO₂ (USD 62.82) and EUR 65/tCO₂ (USD 74.24) will apply. Whether a price corridor should be applied from 2027 onwards will be decided in 2025.

Additional revenue raised through the increased prices is to be used to reduce electricity rates for consumers (renewable energy levy/surcharge) and additional income tax reliefs for commuters.

Together with the changed price levels, the German Parliament required the establishment of a system to prevent carbon leakage from 2021 onwards.

Further implementation steps of the law included the introduction of the 'Emissions Reporting Regulation 2022' which regulates monitoring, reporting and verification (MRV) obligations for 2021 and 2022 as well as the 'Fuel Emissions Trading Regulation' which regulates, among others, selling (or, later on, auctioning) of allowances and the set-up of the registry. Other regulations such as a Carbon Leakage Regulation and a Cap Setting Regulation are expected by mid-2021.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 859.0 MtCO₂e (2018)



GHG REDUCTION TARGETS

BY 2030: 55% below 1990 GHG levels (Climate Change Act)

BY 2050: GHG neutrality (Climate Change Act)

ETS Size

COVERED EMISSIONS



GHGs COVERED

CO₂ only



~40%

SECTORS AND THRESHOLDS

The nEHS will cover all fuel distributors and suppliers. It applies to all fuels used in the transport sector and for the production of heat, e.g., fuel oil, LPG, natural gas, coal, gasoline, and diesel.

Biomass used as fuel in the transport sector and for heating purposes generally also falls under the scope of the nEHS. However, emissions from biogenic fuels that meet the sustainability criteria as set out in national Regulations transposing the European Renewable Energy Directives 2029/28/EC and 2018/2001 do not face compliance obligations.

The system starts with a limited scope in 2021 and 2022, including fuel oil, LPG, natural gas, gasoline, and diesel. Other fuels such as coal will be covered from 2023 onwards.

Provisions have been put in place to avoid double compliance burdens for installations covered by the EU ETS. Emissions that arise from a fuel delivered to and used in an EU ETS installation have to be reported by the EU ETS installation in any case. These emissions may be deducted from the reported emissions of the fuel distributor under the nEHS if: (a) evidence can be provided that the emissions have been reported by the receiving EU ETS installation; and (b) no CO₂-price has been passed through. If such evidence cannot be provided and if CO₂-costs were passed through from

the supplier under the nEHS to the EU ETS installation, the supplier is obligated to report and to surrender allowances to cover the emissions. In that case, the EU installation receives a full compensation for the CO₂-price that has been passed through.

POINT OF REGULATION

Upstream

NUMBER OF ENTITIES

N/A

CAP

The cap will be determined annually based on a separate “Cap Regulation” which will be adopted in 2021. The cap will be set in line with Germany’s reduction targets for the non-EU ETS sectors as defined by the ‘European Effort Sharing Regulation’ (ESR), and will decline each year. However, if emissions (and therefore the demand for allowances) within the nEHS exceed the cap, additional allowances will be available for compliance entities. Such additional allowances will be covered by using the flexibility mechanisms provided for in the ESR, including transfer of additional emission reductions in sectors not covered by the EU ETS, and/or by acquiring annual emission allocations from other EU Member States.

The aforementioned flexibility leads to a flexible cap and will be applied during the fixed-price phase and as long as a price corridor is deemed necessary.

As soon as the price determination will be left to the market solely, the cap will be absolute without using the aforementioned flexibility provisions.

Phases & Allocation

TRADING PERIODS

PHASE ONE: 10 years (2021–2030)

ALLOCATION

PHASE ONE (2021–2030)

Fixed price phase (2021–2025): Allowances will be sold for an annually increasing fixed price:

- 2021: EUR 25 (USD 28.55)
- 2022: EUR 30 (USD 34.27)
- 2023: EUR 35 (USD 39.98)
- 2024: EUR 45 (USD 51.40)
- 2025: EUR 55 (USD 62.82)

Generally, the yearly fixed price only applies to allowances acquired in the respective calendar year. However, up to 10% of allowances needed for compliance obligations for a certain year X can be acquired until 30 September of year X+1 at the fixed price of year X.

Auctioning phase (from 2026): Auctioning of allowances starts in 2026, and a price corridor with a minimum price of EUR 55 (USD 62.82) and a maximum price of EUR 65 (USD 74.24) per tCO₂ will apply.

Based on a review of the system, it will be decided in 2025 whether a price corridor should also be applied from 2027 onwards.

CARBON LEAKAGE RULES: A compensation mechanism to avoid carbon leakage for emissions-intensive trade exposed sectors will come into effect as early as 1 January 2021. Respective regulations will be released by mid-2021 and will have retroactive effect. The carbon leakage rules will apply to

companies from emission-intensive sectors that are in international competition. Industries eligible for compensation are those on the carbon leakage list of the EU ETS Phase 4. Furthermore, it is foreseen that additional sectors/subsectors may qualify upon request.

Flexibility

BANKING AND BORROWING

Banking is not allowed during the fixed-price phase, but will be allowed in the auctioning Phase 1.

In 2026, auctions of allowances will contain a price corridor of a minimum price per tCO₂ of EUR 55 (USD 62.82) and a maximum price of EUR 65 (USD 74.24).

OFFSETS AND CREDITS

No offsets will be allowed in Phase 1.

A potential price corridor for the time after 2026 will be decided upon in 2025.

MARKET STABILITY PROVISIONS

Additional allowances exceeding the cap can be acquired by entities in the fixed-price phase.

Compliance

COMPLIANCE PERIOD

From 1 January until 31 December each year. Entities have to surrender allowances to cover the reported emissions of the previous year by 30 September every year.

the emissions reports also lead to penalty payments in the equivalent amount. Payment of the penalty doesn't release the entity from the obligation to surrender allowances to cover the emissions: entities remain obliged to purchase and surrender the outstanding allowances.

MRV

REPORTING FREQUENCY: Annual self-reporting in the form of an emissions report based on electronic templates to be submitted by 31 July.

During the second phase, entities must pay an "excess emissions penalty" of EUR 100/tCO₂ (USD 114.22) for each tCO₂ emitted for which no allowance was surrendered. This amount will increase annually by the European consumer price index.

From 2023 onwards, the emissions report must be based on a previously approved monitoring plan. Due to a high level of standardization of the permitted reporting methods during the first two years, the monitoring plan requirement has been waived for 2021 and 2022.

For other instances of noncompliance, e.g., misreporting, or late reporting, a fine can be imposed on an entity.

Emissions data are recorded in a national registry and will be publicly available.

VERIFICATION: Verification of the annual emissions by accredited independent third-party verifiers is mandatory from 2023 onwards. Similarly to the case of the monitoring plan requirement, the verification requirement has been waived for the years 2021 and 2022.

ENFORCEMENT

During the first phase, when allowances are allocated at a fixed price, entities must pay an excess emissions penalty for each tCO₂ emitted for which no allowance has been surrendered, which is two times the fixed price. Mistakes in

Linking

LINKS WITH OTHER SYSTEMS

The long-term goal is to establish emissions trading in the transport and heating sectors at the EU level.

Other Information

INSTITUTIONS INVOLVED

German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)

German Emissions Trading Authority (DEHSt) at the German Environment Agency (UBA)

EVALUATION/ETS REVIEW

The German government will publish evaluation reports on the functioning and implementation of the German national ETS every two years until 2024 (until end of November 2022 and 2024) and every four years from 2024 onwards.

USE OF REVENUES

Revenues will be partly used to support measures under the climate protection program such as incentivizing climate-friendly transport and energy-efficient buildings, and partly redistributed to consumers, e.g., in the form of rebates to compensate citizens for higher carbon costs.

IMPLEMENTING LEGISLATION/REGULATION

[Fuel Emissions Trading Act](#)¹

Further government regulations: [Emissions Reporting Regulation 2022](#)² and the

[Fuel Emissions Trading Regulation](#)³

1 – <http://www.gesetze-im-internet.de/behg/BJNR272800019.html>

2 – http://www.gesetze-im-internet.de/ebev_2022/index.html

3 – <http://www.gesetze-im-internet.de/behv/>



KAZAKHSTAN

Kazakhstan Emissions Trading Scheme

In force

Under development

Under consideration

CAP 159.9 MtCO ₂ (2021)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation: Benchmarking	AVERAGE 2020 PRICE KZT 456 (USD 1.10)	

SECTORS:



**POWER
OIL AND GAS**



INDUSTRY

ETS DESCRIPTION

Kazakhstan launched its ETS (KAZ 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 operation of the KAZ ETS. Further amendments to the Environmental Code in 2017 laid the groundwork for the introduction of benchmarking.

The current 'National Allocation Plan' for 2021 sets a cap of 159.9 MtCO₂ for the year, with 225 participating installations belonging to 130 operators. According to the new Environmental Code, which will come into force in July 2021, the next National Allocation Plan will be developed for five years.

YEAR IN REVIEW

2020 was the last year of the third phase of KAZ ETS operation, and the new National Allocation Plan was issued to set the cap for the year 2021. In the third phase, participating operators could choose the allocation method between grandparenting and product-based benchmarking. A full transition to benchmarking has been made for the current phase.

Kazakhstan ETS moved into Phase 4

Full transition to benchmarking in 2021

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 396.6 MtCO₂e (2018)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy (excluding transportation) 305.1 (77%)
Industrial Processes 22.4 (6%)
Transport 26.1 (7%)
Agriculture 36.2 (9%)
Waste 6.8 (2%)

GHG REDUCTION TARGETS

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

BY 2050: 40% CO₂ emission reduction in power sector from 2012 levels (2013 Concept of Transition to Green Economy)

ETS Size

COVERED EMISSIONS

162.0¹
(ETS cap 2018)

GHGs COVERED

CO₂ only

41%

SECTORS AND THRESHOLDS

PHASE ONE (2013): Power sector and centralized heating. Extractive industries and manufacturing: oil and gas mining, metallurgy, chemical industry.

PHASE TWO (2014–2015): Same as Phase 1

(2016–2017: System suspended)

¹ – The cap displayed here corresponds to the 2018–2020 cap divided by three (the cap was allocated for the overall period of 2018–2020; there was no yearly cap. See "Cap" section.)

PHASE THREE (2018–2020): 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).

PHASE FOUR (2021): Same as Phase 3

THRESHOLDS: Facilities emitting more than 20,000 tCO₂e/year.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

130 companies (225 installations)

CAP

PHASE ONE (2013): 147 MtCO₂ (plus new entrants' reserve of 20.6 MtCO₂). This equalled a stabilization of the capped entities' emissions at 2010 levels.

PHASE TWO (2014–2015): 2014: 154.9 MtCO₂ (plus a reserve of 18 MtCO₂); 2015: 152.8 MtCO₂ (plus a reserve of 20.5 MtCO₂). This represented reduction targets of 0% and 1.5% respectively, compared to the average CO₂ emissions of capped entities in 2011–2012.

(2016–2017: System suspended)

PHASE THREE (2018–2020): 485.9 MtCO₂ (plus a reserve of 35.3 MtCO₂). The cap was set at a 5% reduction by 2020 from 1990 levels. The cap was allocated for the overall compliance period of 2018–2020; there was no yearly cap.

PHASE FOUR (2021): 159.9 MtCO₂ (plus a reserve of 11.5 MtCO₂).

Phases & Allocation

TRADING PERIODS

PHASE ONE: 1 year (2013)

PHASE TWO: 2 years (2014–2015)

PHASE THREE: 3 years (2018–2020)

PHASE FOUR: 1 year (2021)

(2016–2017: System suspended)

According to the new Environmental Code, which will come into force in July 2021, the next National Allocation Plan will be developed for five years.

ALLOCATION

PHASE ONE (2013): Free allocation (grandparenting). Based on emissions data from 2010.

PHASE TWO (2014–2015): Grandparenting (0% and 1.5% below 2011–2012 average emissions), with a reserve of 18 MtCO₂ in 2014 and 20.5 MtCO₂ in 2015.

(2016–2017: System suspended)

PHASE THREE (2018–2020): Allocation based on grandparenting or product-based benchmarking, chosen by each company (149 installations chose benchmarking and 76 installations chose grandparenting). A reserve contained 35.3 million allowances to accommodate for new entrants, new stationary emission sources, and changes in output in case of the choice of benchmarking.

PHASE FOUR (2021): Benchmarking. A reserve contains 11.5 million allowances.

Flexibility

BANKING AND BORROWING

Banking is allowed within each trading period (one phase). Banking between trading periods is not possible.

OFFSETS AND CREDITS

Qualitative Limits: Domestic offsets in all economic sectors (GHG reduction or absorption activities), except for emissions reductions at the installations covered by the ETS. Project applicants can submit their projects for consideration to the Ministry of Ecology, Geology and Natural Resources in order to obtain approval and gain offset credits. The approval of

carbon offsets and the provision of offset credits are carried out in accordance with IPCC methodologies and the rules developed and approved by the Ministry of Ecology, Geology and Natural Resources.

Quantitative Limits: None

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Reporting is required annually for businesses or financial facilities above the 20,000 tCO₂/year threshold.

Annual reporting also is required for operators of installations with emissions between 10,000 tCO₂/year and 20,000 tCO₂/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 CO₂, reporting also is required for CH₄, N₂O, and PFCs emissions.

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

FRAMEWORK: Environmental Code of the Republic of Kazakhstan.

ENFORCEMENT

The non-compliance penalty equals five monthly standard units for each tonne (approximately KZT 14,585/tCO₂ (USD 35.32) in 2021). In 2013 and 2014, penalties for non-compliance were waived.

Other Information

INSTITUTIONS INVOLVED

Ministry of Ecology, Geology and Natural Resources
Ministry of Energy
JSC Zhasyl Damu, a state-owned joint stock company

IMPLEMENTING LEGISLATION/REGULATION

Environmental Code of the Republic of Kazakhstan (2007)²
Environmental Code of the Republic of Kazakhstan (2021)³
National GHG Emission Quota Allocation Plan for 2021⁴
Rules for the allocation of quotas for GHG emissions and formation of reserves of the established number and volume of quotas⁵
Rules of trading greenhouse gas emission quota and carbon units⁶

2 – <http://zan.gov.kz/client/#!/doc/31308/rus>

3 – <http://adilet.zan.kz/rus/docs/K2100000400>

4 – <https://legalacts.egov.kz/npa/view?id=5331191>

5 – <http://zan.gov.kz/client/#!/doc/112765/rus>

6 – <http://adilet.zan.kz/rus/docs/V1200007711>

MONTENEGRO



In force

Under development

Under consideration

← Designing an ETS as part of EU accession process

Announced several ETS design provisions in 2020, including a minimum price of EUR 24/tonne (USD 27.41/tonne)

In December 2019, Montenegro adopted the 'Law on Protection from the Negative Impacts of Climate Change,' which entered into force in January 2020. The law mandates the development of a comprehensive set of climate policies including a GHG inventory, a low-carbon development strategy, and a national MRV system. It further sets the legal basis for a national ETS for the industry and power sectors.

A bylaw specific to the ETS, the 'Decree on activities for which a GHG permit is issued,' was adopted in February 2020. The regulation determines sectoral coverage and inclusion thresholds, rules governing trade of permits, allocation rules for auctions, benchmarking and grandfathering, and a market stabilization reserve. It further includes provisions

for banking allowances, a minimum reserve price of EUR 24/tonne (USD 27.41/tonne), and a linear reduction factor that would reduce the emissions cap by 1.5% year-on-year between 2020–2030. Revenue from auction proceeds would go to the Environmental Protection Fund to finance climate innovation, renewable energy, and environmental protection.

Montenegro has been an EU candidate country since 2010 and is required to bring its environmental and climate change policy in line with the EU as part of accession talks under Chapter 27 that began in late 2018. The national ETS would ensure that Montenegro has the climate policy infrastructure in place to take part in the EU ETS should it become a member country of the European Union.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 3.5 MtCO₂e (2015)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy 2.5 (71%)
Industrial Processes 0.4 (11%)
Agriculture 0.4 (11%)
Waste 0.2 (6%)

GHG REDUCTION TARGETS

BY 2030: 30% GHG emissions reduction below 1990 levels (NDC)

Other Information

INSTITUTIONS INVOLVED

Ministry of Sustainable Development and Tourism

IMPLEMENTING LEGISLATION

Decree on activities for which a GHG permit is issued (2020)¹

Law on Protection from the Negative Impacts of Climate Change (2019)²

1 – <https://epa.org.me/regulativa/>

2 – <http://www.gov.me/ResourceManager/FileDownload.aspx?rid=384341&rType=2>



SAKHALIN

In force

Under development

Under consideration

Mandate for pilot carbon trading system for the Sakhalin region in Russia in place

Developed through a cooperation between local authorities and the Russian government

First transfers of carbon units could take place as soon as 2022

In January 2021, the Russian Ministry of Economic Development in cooperation with the government of the Russian region of Sakhalin approved the ‘Roadmap for the implementation of an experiment to establish special regulation of greenhouse gas emissions in the Sakhalin Region’ to regulate GHG emissions in the region. Among other measures, the roadmap foresees a pilot carbon trading system. The overall aim of the roadmap is to ensure that Sakhalin achieves carbon neutrality by 2025.

The roadmap foresees the creation of a regional inventory of GHG emissions and removals by August 2021, which will clarify the economic activities primarily responsible for emissions in the region. By April 2022, an information system—including a carbon registry—is planned to start operating in test mode. The first transfers of carbon units between the participants of the pilot could take place as early as July 2022.

Sakhalin is regarded as a testing ground for identifying GHG regulation measures that can be extended to other Russian regions. Measures proposed by the roadmap still need formal legal approval from the State Duma, Russia’s lower house of parliament, which is expected in June-July 2021.

During the past decade, the Russian government has put in place legal elements for the development of an MRV system in the country. An MRV ‘Concept’ was approved by order of the Government No. 716-r in 2015, and methodological guidelines for corporate- and regional-level MRV were adopted by the Ministry of Natural Resources and Ecology. According to the Concept on MRV, the target group for monitoring and reporting is “large industrial and energy organizations and companies with direct GHG emissions of more than 150,000 tCO₂e/year, including organizations of aviation and railway transport, carrying out passenger and cargo transportation.” Currently, Russian regions are urged to voluntarily develop regional inventories of GHG emissions and removals.

Background Information

OVERALL GHG EMISSIONS (Russia, excluding LULUCF) 2,220.1 MtCO₂e (2018)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy (excluding transport) 1,498.5 (68%)
Industrial Processes 243.1 (11%)
Transport 254.1 (11%)
Agriculture 126.7 (6%)
Waste 97.7 (4%)

GHG REDUCTION TARGETS

BY 2030: GHG emissions will not exceed 70% of 1990 GHG levels, including LULUCF (updated Russian NDC)

Other Information

INSTITUTIONS INVOLVED

Ministry of Economic Development
Government of Sakhalin Region
Other interested federal ministries

IMPLEMENTING LEGISLATION/REGULATION

Roadmap for the implementation of an experiment to establish special regulation of greenhouse gas emissions in the Sakhalin Region¹

1 – https://economy.gov.ru/material/file/faf1ab0ae1e3f2be140971c9e934d0ab/dorozhnaya_karta.pdf

SWITZERLAND

Switzerland Emissions Trading System



CAP 4.9 MtCO ₂ e (2020, industry), 1.3 MtCO ₂ e (2020, aviation) ¹	GASES Several gases	OFFSETS AND CREDITS No offsets or international credits can be used for compliance since 2021
ALLOCATION Free allocation: Benchmarking Auctioning	AVERAGE 2020 PRICE² EUR 24.9/tCO ₂ e (USD 28.45)	TOTAL REVENUE EUR 39.8 million (USD 45.3 million) since beginning of program, EUR 7.3 million (USD 8.3 million) collected in 2020

In force

Under development

Under consideration

SECTORS:



POWER



INDUSTRY



AVIATION*

← Entered a new 10-year trading phase in 2021 with updated provisions in line with the EU ETS Phase 4

Linked with the EU ETS since January 2020; registry link operational since September 2020

ETS DESCRIPTION

The Switzerland (Swiss) ETS started in 2008 with a five-year voluntary Phase as an alternative option to the CO₂ 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 Swiss ETS linked with the EU ETS in January 2020 and expanded sector coverage to Swiss domestic aviation (including flights to the European Economic Area) and fossil-thermal power plants. The ETS furthermore applies to industrial entities, largely comprising companies from the cement, chemicals, pharmaceuticals, paper, refinery, and steel sectors. It covered about 10% of the country's total GHG emissions in 2019. Participants in the ETS are exempt from the CO₂ levy.

YEAR IN REVIEW

In January 2020, the Swiss ETS officially linked with the EU ETS, thereby sealing a ten-year process of negotiations and regulatory alignment. A provisional registry link became operational in September 2020, allowing for transfers between both registries and enabling covered entities to use European Union Allowances (EUAs) for compliance. Under the provisional link, transfers between the EU and Swiss registries were executed on eight pre-announced dates in 2020. Considered

the first phase of the agreement's implementation, the provisional link is set to be replaced with a permanent registry link that will enable transfers of emission allowances between both ETS registries on a continuous basis.

2020 also marked the final year of the system's second trading period (2013–2020). The revised 'Ordinance on the Reduction of CO₂ Emissions (CO₂ Ordinance),' the implementing legislation of Switzerland's key climate instruments, was adopted in November 2020 to update provisions in line with Phase 4 of the EU ETS. Notable changes to the system include: a revised linear reduction factor from 1.74% to 2.2%; the implementation of updated EU ETS benchmarks by 2022 at the latest; and an indefinite extension of the system. The new legal base for the Swiss ETS has been embedded in the partially revised 'CO₂ Act'—the core framework of Switzerland's climate legislation—that entered into force in January 2021.

Alongside new revisions to the ETS, the Swiss Parliament adopted in September 2020 the legal framework for Swiss Climate Policy 2030, which sets out a 50% emissions reduction target and has reinforced measures for the transport, buildings, and industry sectors. The updates will be enshrined in a fully revised 'CO₂ Act' that is planned to enter into force by 2022, subject to a referendum in Q3 2021.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 46.4 MtCO₂e (2018)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy (excluding transport) 20.3 (44%)
Industrial Processes 4.4 (9%)
Transport 14.9 (32%)
Agriculture 6.0 (13%)
Others (including waste) 0.7 (2%)

¹ – New caps are calculated in accordance with the revised CO₂ Ordinance (Annex 8 and 15), and will be released in Q1 2021.

² – Average auction price

* domestic and outbound flights to the EEA

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: Net-zero GHG emissions (aspirational)

ETS Size

COVERED EMISSIONS

4.6 MtCO₂e

(Verified emissions 2018)

GHGs COVERED

CO₂, NO₂, CH₄, HFCs, NF₃, SF₆, and theoretically PFCs³

SECTORS AND THRESHOLDS

MANDATORY PARTICIPATION: Industries listed under Annex 6 of the 'CO₂ Ordinance' must participate in the Swiss ETS. These include 25 categories, including companies from the cement, chemicals and pharmaceuticals, refineries, paper, district heating, steel, and other sectors. Since 2020, the ETS covers aviation (domestic and outbound flights to the EEA) and fossil-thermal power plants.

INCLUSION THRESHOLDS: Facilities pertaining to the sectors included in Annex 6 of the 'CO₂ Ordinance' that have a total rated thermal input of >20 MW. For aircraft operators, the same thresholds apply as in the EU ETS (see "Aviation" section).

POSSIBLE VOLUNTARY OPT-IN: Industries—listed under Annex 7 of the 'CO₂ Ordinance' (21 activities)—with a total rated thermal input of ≥10 MW. A company that 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 >20 MW, but yearly emissions of <25,000 tCO₂e/year in each of the past three years. If an entity's future emissions rise above the threshold in a given year, it must participate in the ETS starting the following year and cannot opt out for



the remainder of the compliance period. New entrants can apply for an opt-out with immediate effect if they can credibly report their emissions to be below 25,000 tCO₂e/year.

AVIATION: Commercial aircraft operators emitting more than 10,000 tCO₂/year or operating more than 243 flights in a four-month period in the preceding year. Non-commercial operators are included when emitting more than 1,000 t/CO₂ per year. The thresholds do not apply if the operator has obligations under the EU ETS.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

51 stationary installations, 6 aircraft operators (2020)

CAP

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

SECOND TRADING PERIOD (2013–2020): Overall cap of 5.63 MtCO₂e (2013) that was reduced annually by a constant linear reduction factor of 1.74% (of baseline emissions set by entities' historical data of the years 2008–2012) to 4.9 MtCO₂e in 2020.

Aviation Sector Cap: 1.3 MtCO₂ (2020)

THIRD TRADING PERIOD 2021–2030: An annual linear reduction factor of 2.2% (2010 base year) applies to the cap for stationary installations (4.9 MtCO₂ in 2020). The cap for airline operators is reduced annually by 2.2% with 2020 as the base year (1.3MtCO₂ in 2020).

Phases & Allocation

TRADING PERIODS

VOLUNTARY PHASE: 2008–2012

SECOND TRADING PERIOD: 2013–2020

THIRD TRADING PERIOD: 2021–2030

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.

SECOND TRADING PERIOD (2013–2020):

Free allocation: Free allocation was based on industry benchmarks using a similar methodology to the EU ETS. Free allocation for sectors not exposed to the risk of carbon leakage was phased out gradually. In 2013, such entities received 80% free allocation, reduced to 30% in 2020.

An overarching correction factor was applied, given that the benchmarked allocation exceeded the overall emissions cap. Free allocation for aircraft operators was based on tonne-

3 – In principle, all these gases are covered in accordance with the 'CO₂ Ordinance.' In practice, only CO₂, N₂O, and PFCs require monitoring, as the share of the other gases is negligible.

kilometer data for 2018 reported by individual aircraft operators, multiplied by the benchmark of 0.642 emissions allowances per 1,000 tonne-kilometers (same benchmark as in the EU ETS).

Auctioning: Allowances that were not allocated for free were auctioned. Auctions took place two or three times a year, depending on available auction volumes. As of January 2020, auctions were opened to entities covered by the Swiss ETS and the EU ETS, as well as to non-compliance entities allowed to place bids in the EU ETS. In line with EU ETS legislation, the Federal Office of the Environment has the authority to cancel the auction results if the clearing price is significantly below the prevailing secondary market price of the EU ETS. In such a situation, allowances are transferred to subsequent auctions.

5% of the allowances were set aside in a reserve for new entrants and fast-growing operators.

Aviation Sector: In line with EU ETS regulations, starting in 2020, 15% of aviation sector allowances were auctioned. 3% were placed in the reserve dedicated to new and fast-growing operators. The remaining 82% was allocated according to sector-specific benchmarks in line with the EU ETS.

THIRD TRADING PERIOD (2021–2030):

Free allocation: Updated EU ETS benchmarks will apply starting 2022 at the latest. Free allocation levels may be updated annually if production levels deviate at least 15 percentage points from the 2014–2018 base years.

Auctioning: The same provisions apply as in the second trading period.

Flexibility

BANKING AND BORROWING

Banking within and across phases is allowed without limits. Banked allowances from the EU ETS Phase 3 can equally be used for compliance in the 2021–2030 trading phase.

Valid certificates (CERs, ERUs) from the 2008–2012 phase could be banked into the second trading period and surrendered until April 2015. Certificates from the 2008–2012 phase that were not requested to be carried over within the deadline have been canceled.

Borrowing is not allowed. Implicit borrowing is allowed within trading periods, i.e., using allocated allowances from the current trading year for surrender obligations of the prior year.

OFFSETS AND CREDITS

QUALITATIVE LIMIT: International offsets were allowed up to 2020, subject to certain criteria. Most categories of credits from CDM projects in least-developed countries were allowed. Credits from CDM and JI projects from other countries were eligible only if registered and implemented before

31 December 2012. Since 2021, offsets can no longer be used to meet compliance obligations.

QUANTITATIVE LIMIT: During 2013–2020, the maximum amount of offsets allowed into the scheme equaled 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 that entered the Swiss ETS in the second trading period (2013–2020) could surrender offsets to cover up to 4.5% of their emissions. For aircraft operators, the quantitative limit was set at 1.5% of verified CO₂ emissions.

MARKET STABILITY PROVISIONS

As of January 2020, the Swiss legislation foresees the possibility of reducing auction volumes where there is a significant increase of allowances on the market for economic reasons. In this case, unauctioned allowances will lose their validity. The Swiss ETS is not subject to the EU ETS Market Stability Reserve.

Compliance

COMPLIANCE PERIOD

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

MRV

Monitoring plans are required for every installation and for every aircraft operator (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 from installations and can take random samples to ensure consistency.

Aircraft operators must have their monitoring reports verified by an accredited third-party verifier.

ENFORCEMENT

The penalty for failing to surrender sufficient allowances is set at CHF 125/tCO₂ (USD 133.14/tCO₂). In addition to the fine, entities must surrender the missing allowances in the following year.

Linking

LINKS WITH OTHER SYSTEMS

Switzerland concluded negotiations with the EU on linking the Swiss ETS to the EU ETS in 2015 and signed the concluded agreement in 2017. Following legislative approval and ratification in 2019, the link entered into force on 1 January 2020. Prior to that, revisions were made to align with the EU ETS legislative framework.

In March 2019, the Swiss Parliament approved legal changes to the 'CO₂ Act,' the core framework of Swiss climate legis-

lation. In November 2019, the Federal Council made the necessary amendments to the 'CO₂ Ordinance' which specifies regulations and implementation; these amendments expanded ETS coverage to civil aviation and fossil-thermal power plants. Under the link, covered entities in the Swiss ETS can use allowances from the EU ETS for compliance, and vice versa. The two systems run separate auctions. Market participants from the EEA need an account at the Swiss Emissions Trading Register in order to participate.

Other Information

INSTITUTIONS INVOLVED

Federal Office for the Environment (FOEN)

EVALUATION/ETS REVIEW

The 'CO₂ Act' (main ETS legislation) and 'CO₂ Ordinance' (secondary ETS legislation) have been revised to align with the new 2030 climate policy framework and are to be implemented by 2022.

Transitional revisions to both documents came into effect on 1 January 2021 in order to ensure continuity on Swiss climate policy and extend the ETS (for an unlimited period).

Next steps towards the implementation of the new legislative framework by 2022 are:

- Public consultation for the "full" revision of the 'CO₂ Ordinance' in spring 2021; and
- A referendum in Q3 2021 on the "full" revision of the 'Federal Act on the Reduction of CO₂ Emissions,' ('CO₂ Act') (adopted by Parliament in 2020).

USE OF REVENUES

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

IMPLEMENTING LEGISLATION

[Federal Act on the Reduction of CO₂ Emissions \(CO₂ Act\)](#)⁴

[Ordinance on the Reduction of CO₂ Emissions \(CO₂ Ordinance\)](#)⁵

[CO₂ Ordinance – Explanatory report](#)⁶

4 – <https://www.admin.ch/opc/en/classified-compilation/20091310/index.html>

5 – <https://www.admin.ch/opc/en/classified-compilation/20120090/index.html#a5>

6 – <https://www.news.admin.ch/newsd/message/attachments/63988.pdf>

TURKEY



 *In force*

 *Under development*

 *Under consideration*

← *Second Phase of the PMR completed*

Draft framework for a pilot ETS developed

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 2012, Turkey has:

- been studying the possible use of carbon pricing instruments to help achieve its mitigation targets; and
- worked with the PMR to enhance the MRV regulation through pilot studies in the energy, cement, and refinery 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. The PMR First Phase Closure Meeting was held at the end of 2018 and the PMR Second Phase officially began in February 2019.

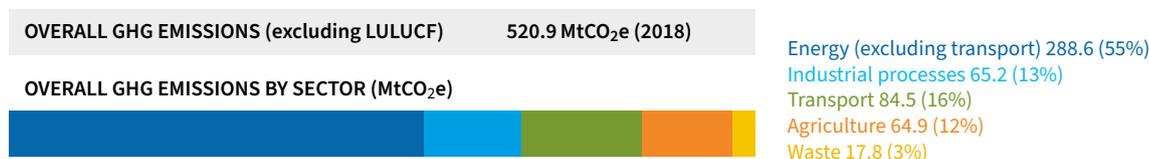
With additional funding under the PMR Second Phase, Turkey has developed draft legislation as well as improved technical and institutional capacity to prepare the groundwork for piloting a suitable carbon pricing policy. By the end of 2020,

the country had held a series of workshops, conducted technical analyses, and organized stakeholder meetings which culminated in:¹

- (1) the final draft legal and institutional framework for a pilot ETS, published in December 2020;
- (2) the identification of the emission cap and development of the national allocation plan;
- (3) the development of Turk-SIM, an ETS simulation with gamification features;
- (4) the development of a transaction registry for the pilot ETS; and
- (5) the assessment of Article 6 and options for Turkey.

Following the formal end of the PMR Second Phase in February 2020, Turkey is currently considering its participation in the Partnership for Market Implementation (PMI), the successor to PMR. 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



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 CO₂ emissions for ~800 entities. Sector coverage includes the energy sector (total rated thermal input >20MW) and industry sectors (coke production, metals, cement, glass, ceramic products, insulation materials, pulp and paper, and chemicals over specified threshold sizes/production levels).

MONITORING AND REPORTING: Entities had until October 2014 to submit their first monitoring plans. Since then, entities have also submitted monitoring plans and verified emissions reports for 2015–2019 to the Ministry of Environment and Urbanization.

1 – See <https://pmturkiye.csb.gov.tr/raporlar/> for the associated documents, some of which are only available in Turkish.

VERIFICATION: Monitoring plans, emission data reports, and their underlying data require independent third-party verification annually for all entities. Verifiers were accredited by the Turkish Accreditation Organization by 2018.

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

Other Information

INSTITUTIONS INVOLVED

Ministry of Environment and Urbanization
Climate Change and Air Management Coordination Board

UKRAINE



In force

Under development

Under consideration

← MRV law applies to installations from 1 January 2021 onwards

Data from the operation of the MRV system will provide the basis for an ETS

ETS legislation to be based on at least three years of MRV data

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

- adopting national legislation and designating competent authority(ies);
- establishing a system for identifying relevant installations and GHGs;
- developing a national allocation plan to distribute allowances;
- establishing a system for issuing allowances to be traded domestically among installations in Ukraine; and
- establishing MRV and enforcement systems, as well as public consultations procedures.

The country has developed the main elements of the national MRV system to provide a solid basis for the upcoming ETS. In 2019, Ukraine adopted a framework law on MRV. The MRV law entered into force in 2020 and applies to installations from the start of 2021. By 31 March 2022, covered installations must submit the first monitoring reports for 2021. To establish its ETS, Ukraine plans to develop separate legislation based on at least three years of data from the MRV system. According to a statement made by the Minister of Environmental Protection and Natural Resources in January 2021, the ETS launch could take place as early as in 2025. Ukraine is working on its ETS plans with the assistance of the PMR and the German Corporation for International Cooperation (GLZ).

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 339.2 MtCO₂e (2018)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy 191.3 (56%)
Industrial Processes 56.5 (17%)
Transport 35.0 (10%)
Agriculture 44.2 (13%)
Waste 12.2 (4%)

GHG REDUCTION TARGETS

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 (Low Emission Development Strategy 2050)

Compliance

MRV

REPORTING FREQUENCY: Reporting is required annually for: fuel combustion in installations over 20 MW; oil refining; and the production of: coke, metal ores, pig iron, steel, ferrous alloys including ferroalloys (if the total nominal thermal capacity of combustion units exceeds 20 MW), cement clinker, lime or the calcination of dolomite or magnesite (with a production capacity exceeding 50 tonnes per day),

nitric acid, and ammonia. Aside from CO₂, reporting is also required for N₂O emissions from nitric acid production.

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

FRAMEWORK: Law on the principles of monitoring, reporting, and verification of GHG emissions.

Other Information

INSTITUTIONS INVOLVED

Ministry of Environmental Protection and Natural Resources of Ukraine
Cabinet of Ministers of Ukraine

IMPLEMENTING LEGISLATION/REGULATION

Law on the principles of monitoring, reporting and verification of greenhouse gas emissions¹

1 – <https://zakon.rada.gov.ua/laws/show/377-20>



UNITED KINGDOM

UK Emissions Trading Scheme

In force

Under development

Under consideration

SECTORS:



POWER



INDUSTRY



AVIATION

Launched on 1 January 2021, following the end of the UK's participation in the EU ETS

Broadly similar in design to the EU ETS

Looking to align the cap with an appropriate net-zero trajectory

Possible expansion beyond power, industry, and aviation in the future; open to linking with other systems

CAP	GASES	ALLOCATION
155.7 MtCO ₂ e (2021)	Several gases	Free allocation: Benchmarking Auctioning

ETS DESCRIPTION

In December 2020, the United Kingdom (UK) government confirmed that a UK Emissions Trading Scheme (UK ETS) would be in place from January 2021. Many design elements of the new system mirror those in Phase 4 of the EU ETS, in which the UK had participated since 2005. The UK ETS covers energy-intensive industries, the power sector, and aviation within the UK and European Economic Area (EEA), together making up about one third of the UK's GHG emissions. The scheme's cap is 5% below the UK's notional share of the EU ETS cap (i.e., the EUAs that would have been available to the UK government for allocation) and will decline by 4.2 Mt per year initially. Provisions to ensure market stability include a Supply Adjustment Mechanism (SAM), a Cost Containment Mechanism (CCM), and – quite distinct from the EU ETS – a transitional Allowance Reserve Price of GBP 22 (USD 28.21). Moreover, in the first years, triggers for the UK ETS CCM will be lower than those of the equivalent EU ETS provisions, so as to allow for a smooth transition. To safeguard competitiveness and minimize the risk of carbon leakage, a share of allowances will be freely allocated to Emissions Intensive Trade Exposed (EITE) sectors using an approach similar to Phase 4 of the EU ETS. The UK government remains open to the possibility of linking the UK ETS to other systems, but no decision has been made on the preferred linking partners.

The first trading phase of the UK ETS will run until 2030. The entire scheme is due to be reviewed in 2023 and 2028, with ongoing reforms and developments of specific elements in the meantime.

YEAR IN REVIEW

The UK formally exited the EU on 1 January 2020, and the transition period ended on 31 December 2020. The UK no longer participates in the EU ETS, but the covered entities in the country have to surrender allowances under the EU ETS by 30 April 2021 for their 2020 compliance obligations. On 1 January 2021, the UK ETS was launched to ensure the continued contribution of a carbon price to the UK's decarbonization efforts. These efforts, described in more detail in the country's recently announced NDC, include a GHG emission reduction goal of 68% below 1990 levels by 2030 as well as a legislated net-zero emissions target by 2050.

In June 2020, the UK government completed a consultation process on "The Future of UK Carbon Pricing" and published an accompanying impact assessment.¹ In November 2020, draft legislation was introduced for the UK ETS; however, the official decision to establish an ETS rather than a carbon tax was not taken until December 2020, after which the draft legislation was made into a statutory instrument.²

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 461.7 MtCO₂e (2018)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy 104.9 (23%)
Industrial Processes 10.2 (2%)
Transport 124.4 (27%)
Public Sector Buildings 8.0 (2%)
Business 79.0 (17%)
Residential 69.1 (15%)
Agriculture 45.4 (10%)
Waste 20.7 (4%)

GHG REDUCTION TARGETS

BY 2030: 68% reduction from 1990 GHG levels (updated NDC)

BY 2050: Net-zero GHG emissions (2019 amendment to the Climate Change Act 2008)

1 – <https://www.gov.uk/government/consultations/the-future-of-uk-carbon-pricing>; https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/889038/The_future_of_UK_carbon_pricing_impact_assessment.pdf

2 – <https://www.londonstockexchange.com/news-article/market-news/statement-from-hmg-nuclear-emissions-trading/14790837>

ETS Size

COVERED EMISSIONS

141.9 MtCO₂e
(Verified emissions³ 2018)



GHGs COVERED

CO₂, N₂O, PFCs

SECTORS AND THRESHOLDS

POWER SECTOR & INDUSTRY: The ETS applies to a specified list of activities of installations in the power and industry sector. This includes activities involving combustion of fuels in installations with a total rated thermal input exceeding 20 MW, as well as activities in refining, heavy industry, and manufacturing. Power generators in Northern Ireland still fall under the EU ETS, as they are part of the Isle of Ireland's Single Electricity Market.

In addition to the power sector's participation in the UK ETS, the UK's Carbon Price Support (CPS) policy imposes a minimum carbon price of GBP 18/tCO₂ (USD 23.08) for power generators using fossil fuels. The CPS will continue to support the decarbonization of the power sector and will stay in place at least until unabated coal-fired power generation is phased out. The government has committed to end the use of unabated coal by 2024.

Small Emitter and Hospital Opt-Out Scheme: Hospitals and small emitters with emissions lower than 25,000 tCO₂e per year and a net-rated thermal input lower than 35 MW can opt out of the ETS and instead monitor and report their emissions and meet annual emission reduction targets. This approach is similar to the UK's opt-out scheme in Phase 3 of the EU ETS.

Ultra-Small Emitter Exemption: For stationary installations emitting less than 2,500 tCO₂e per year, an ultra-small emitter exemption is in place. These installations are exempt from participation in the ETS, except for a requirement to monitor emissions and notify the regulator if emissions exceed the threshold.

AVIATION: Emissions are included from flights within the UK and flights from the UK to and from Gibraltar or to a country within the EEA. Exemptions are made for aircraft operators with less than 243 flights per calendar year for three consecutive four-month periods or total annual emissions of less than 10,000 tonnes of CO₂.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

~1,000 installations in the UK were subject to the EU ETS in Phase 3 and are now covered under the UK ETS.

CAP

FIRST ALLOCATION PERIOD (2021–2025): 736.0 MtCO₂e, to be adjusted to reflect the hospital and small emitter opt-outs.

SECOND ALLOCATION PERIOD (2026–2030): 630.1 MtCO₂e, to be adjusted to reflect the hospital and small emitter opt-outs.

The cap was set at 5% below the UK's notional share of the EU ETS cap for Phase 4 of the EU ETS. The annual cap for 2021 is 155.7 MtCO₂e and will decline by 4.2 MtCO₂e each year, which is equivalent to a reduction of 2.7% in the first year. Allowances for the New Entrants Reserve are part of the overall cap.

The government indicated that it will consult on the cap's trajectory within 9 months of the national Climate Change Committee's advice on a cost-effective pathway to net-zero emissions. This advice, published in December 2020, included a recommended level of emissions from covered sectors of 106 MtCO₂e in 2023, decreasing to 61 MtCO₂e in 2030.

Phases & Allocation

TRADING PERIODS

FIRST TRADING PERIOD: 2021–2030

ALLOCATION

AUCTIONING: Auctioning is the primary means of allowance allocation under the UK ETS. Auctions have a GBP 22 (USD 28.21) transitional Auction Reserve Price, which will be in place until a SAM (if implemented – see "Market Stability Provisions" section) becomes operational. Auctions clear even when not all allowances are sold. Unsold allowances

are carried over to the next four auctions, up to 125% of those originally intended for sale at that auction. If all four subsequent auctions have reached the 125% limit, the remaining unsold allowances are transferred into a reserve in the Market Stability Mechanism Account.

FREE ALLOCATION: A limited number of allowances are allocated for free to industrial participants at risk of carbon leakage. The number of free allowances that an installation is entitled to is determined using the historical activity level,

3 – The verified emissions of the regulated entities under the EU ETS are provided as an approximation.

an industry benchmark, and a carbon leakage exposure factor (CLEF). The benchmarks and CLEFs to be used initially are those of the EU ETS during Phase 4. Historical activity levels are also based on data collected under the EU ETS. These parallels will likely result in comparable levels of free allocations for an installation in the UK ETS as it would have received had the UK participated in Phase 4 of the EU ETS.

The maximum number of allowances allocated for free (industry cap) is initially set at the UK's notional share of the EU ETS industry cap for Phase 4, which is ~58 million allowances for 2021 (~37% of the UK ETS cap) and will decline by

1.6 million allowances per year. A review of the free allocation rules is planned to be carried out in 2021.

New Entrants Reserve: A reserve of free allowances is set aside for installations that become eligible for participation within the first trading period and for covered installations that significantly increase their activity level. In line with the EU ETS Phase 4 approach, free allowance amounts are adjusted when activity levels of an installation increase or decrease by more than 15%. The number of free allowances for new entrants is determined based on their activity in the first year of operation, industry benchmark, and CLEF.

Flexibility

BANKING AND BORROWING

Banking of allowances is permitted, and allowances remain valid indefinitely.

Limited and implicit borrowing is allowed, i.e., using allowances allocated for free in the current year for compliance in the previous year. Covered entities are not allowed to use allowances left over from their participation in the EU ETS for compliance with the UK ETS.

OFFSETS AND CREDITS

The use of offsets for compliance is not permitted at this time, although the UK government has indicated it is open to reviewing this as the scheme evolves, especially in deciding on how to implement obligations under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) alongside the ETS for aviation.

MARKET STABILITY PROVISIONS

SUPPLY ADJUSTMENT MECHANISM (SAM): A Supply Adjustment Mechanism based on the EU ETS Market Stability Reserve (MSR) may be implemented after the launch of the UK ETS. If the UK government decides to implement a SAM along these lines, it will hold a separate consultation on the design of the mechanism. Given that a SAM similar to the MSR would require a measure of the allowance surplus in the UK ETS (analogous to the Total Number of Allowances in Circulation in the EU ETS), a SAM cannot be operational until mid-2022 at the earliest. To reduce the risks at the early stages of the UK ETS and ensure minimum price continuity, the UK government has put in place a transitional Auction Reserve Price (see "Allocation" section).

COST CONTAINMENT MECHANISM (CCM): The UK ETS has a Cost Containment Mechanism to avoid spikes in allowance prices by auctioning additional allowances. If the CCM is triggered, regulators can decide on whether and how to intervene. Additional allowances from within the cap can be introduced from three possible sources: the reserve in the Market Stability Mechanism Account; future auctions; or the auctioning of up to 25% of remaining allowances in the New Entrants Reserve (NER). The CCM is similar to the measures described in paragraph 29a of the EU ETS Directive.

Triggers: In the first two years of the UK ETS, the CCM has lower price and time triggers than the equivalent EU ETS provisions, to ensure its reactivity. In the first year, the CCM is triggered if, for three consecutive months, the ETS carbon price is two times the average allowance price in effect in the UK in the two preceding years. In the second year, the trigger is increased to two and a half times the carbon price for three months. The CCM will revert to the EU ETS price triggers in the third year. This means it would be triggered if, for six consecutive months, the allowance price is more than three times the average market price of allowances during the two preceding years.

TRANSITIONAL AUCTION RESERVE PRICE (ARP): To ensure a minimum level of ambition in the transition from the EU ETS to the UK ETS, a transitional Auction Reserve Price of GBP 22 (USD 28.21) is in place. The transitional ARP will be kept under review and the government will consult on withdrawing it as the system matures or if a SAM becomes operational. An ARP would not be implemented in a UK ETS fully linked to the EU ETS, as price convergence would be expected between the two markets.

Compliance

COMPLIANCE PERIOD

One year (1 January to 31 December). Covered entities have until 30 April of the following year to surrender allowances. These provisions are the same as under the EU ETS.

MRV

The UK ETS has adopted the EU ETS approach to MRV, with some changes.

REPORTING FREQUENCY: Annual self-reporting

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

FRAMEWORK: The UK ETS has adopted the MRV framework of Phase 4 of the EU ETS, including discretionary changes regarding reduced frequency of improvement reporting and the simplification of monitoring plans.

ENFORCEMENT

Regulated entities must pay an excess emissions penalty for each tonne of CO₂ emitted without surrendering a permit. This penalty is equal to GBP 100/tCO₂e (USD 128.21) initially, but is adjusted for inflation over time. The names of non-compliant operators are published.

Linking

LINKS WITH OTHER SYSTEMS

No link with another system is currently in place. The UK government has indicated it is open to the possibility of internationally linking the scheme in the future, but has not made any decision on preferred linking partners. The post-Brexit

Trade and Cooperation Agreement between the EU and UK stipulates that the jurisdictions “shall give serious consideration to linking their respective carbon pricing systems in a way that preserves the integrity of these systems and provides for the possibility to increase their effectiveness.”

Other Information

INSTITUTIONS INVOLVED

United Kingdom Department for Business, Energy & Industrial Strategy

HM Treasury

United Kingdom Department for Transport

Scottish Government

Welsh Government

Northern Ireland Executive

Environment Agency UK

Scottish Environment Protection Agency

Natural Resources Body for Wales

Northern Ireland Environment Agency

Offshore Petroleum Regulator for Environment and Decommissioning

USE OF REVENUES

The UK government is exploring the possibility of establishing a Fund for Industrial Decarbonisation, to which UK ETS auction revenues would contribute.

IMPLEMENTING LEGISLATION/REGULATION

[The Greenhouse Gas Emissions Trading Scheme Order 2020⁴](#)
[The Climate Change Act 2008 \(2050 Target Amendment\) Order 2019⁵](#)

EVALUATION/ETS REVIEW

The first trading period (2021–2030) includes two mandatory whole-system reviews. The first review must be carried out by the end of 2023 and the second by the end of 2028. A report will be published on the conclusions of each review round. Changes to the ETS design following the reviews should be implemented by 2026 and 2031, respectively.

In addition to the whole-system reviews, the government will conduct targeted reviews of inter alia free allocation for stationary installations and aviation and changes required to align with CORSIA.

4 – <https://www.legislation.gov.uk/uksi/2020/1265/contents/made>

5 – <https://www.legislation.gov.uk/uksi/2019/1056/contents/made>

NORTH AMERICA





CALIFORNIA

California Cap-and-Trade Program

- In force
- Under development
- Under consideration

CAP 320.8 MtCO ₂ e (2021)	GASES Several gases	OFFSETS AND CREDITS Domestic ¹
ALLOCATION Free allocation: Benchmarking Free allocation with consignment Auctioning	AVERAGE 2020 PRICE USD 17.04 / tCO ₂ ²	TOTAL REVENUE USD 14.24 billion since beginning of program, USD 1.7 billion ³ collected in 2020

SECTORS:

- POWER
- INDUSTRY
- TRANSPORT*
- BUILDINGS*

* Sectors represent upstream coverage

Broadest carbon pricing system in the US

Continued linkage with Québec

Series of major changes start in 2021, including to cost-containment provisions, offset usage limits, and a steeper cap decline

ETS DESCRIPTION

California's Cap-and-Trade Program began operation in 2012, with the opening of its tracking system for allocation, auction distribution, and trading of compliance instruments. The first compliance obligations started 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.

The California program, which is implemented by the California Air Resources Board (CARB), covers sources responsible for approximately 80% of the state's GHG emissions. Key amendments to the system took effect in 2021, following the passage of legislation clarifying the role of the program after 2020 (Assembly Bill [AB] 398) and regulatory amendments adopted by CARB. Among the major changes to the system that started in 2021 are the addition of a price ceiling, the inclusion of two allowance price containment reserve tiers below the price ceiling, reductions in the use of offset credits (especially for credits generated from projects which do not provide direct environmental benefits in the state), and a steeper allowance cap decline to 2030.

YEAR IN REVIEW

In January 2020, CARB approved the membership of the Compliance Offsets Protocol Task Force, which is required by AB 398 to advise CARB on approving new protocols for the purpose of increasing offset projects with direct environmental benefits in the state of California while prioritizing disadvantaged communities, Native American or tribal lands, and rural and agricultural regions. AB 398 defines direct environmental benefits in the state as offsets that reduce or avoid emissions in California or pollutants that adversely affect the state's waterways.

In 2020, CARB released an application form that project sponsors may submit if they wish to seek a determination that these projects provide direct environmental benefits in the state. CARB also began making determinations about the direct environmental benefits of offsets. Starting in 2021, no more than half of the offset credits that an entity surrenders for compliance can come from projects that do not provide direct environmental benefits in the state (see "Offsets and Credits" section for more details).

Background Information



GHG REDUCTION TARGETS

- BY 2020:** Return to 1990 GHG levels (AB 32)
- BY 2030:** 40% reduction from 1990 GHG levels (AB 398)
- BY 2045:** Achieve carbon neutrality (Executive Order B-55-18)

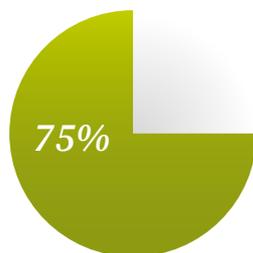
- Electricity Generation (in state) 38.6 (9%)
- (imports) 24.6 (6%)
- Industrial Processes 101.3 (24%)
- Transport 173.8 (41%)
- Commercial 23.9 (6%)
- Residential 30.5 (7%)
- Agriculture and Forestry 32.6 (8%)

1 – California's Cap-and-Trade Program allows the use of offsets issued by linked jurisdictions (e.g., Québec).
 2 – Average 2020 auction settlement price.
 3 – Does not include revenue from auctioning of consigned allowances.

ETS Size

COVERED EMISSIONS

319.9 MtCO₂e
(Verified emissions³ 2018)



GHGs COVERED

CO₂, CH₄, N₂O, SF₆, HFCs, PFCs, NF₃, and other fluorinated GHGs.

SECTORS AND THRESHOLDS

FIRST COMPLIANCE PERIOD (2013–2014): Covered sectors include those that 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, and pulp and paper manufacturing, including cogeneration facilities co-owned/operated at any of these facilities); electricity generation; electricity imports; other stationary combustion; and CO₂ suppliers.

SINCE THE SECOND COMPLIANCE PERIOD: In addition to the sectors listed above, suppliers of natural gas, suppliers of reformulated blendstock for oxygenate blending (i.e., gasoline blendstock) and distillate fuel oil (i.e., diesel fuel), suppliers of liquid petroleum gas in California, and suppliers of liquefied natural gas.

INCLUSION THRESHOLDS: Facilities $\geq 25,000$ tCO₂e/data year. Electricity providers that import 25,000 tCO₂e per year or more from specified sources of electricity (those with known emissions factors) are considered to be above the threshold. All imported electricity from unspecified sources

(those without known emissions factors) is considered to be above the threshold, and a default value is applied as an emissions factor.

POINT OF REGULATION

Mixed

NUMBER OF ENTITIES

~500 facilities⁴

CAP

FIRST COMPLIANCE PERIOD (2013–2014): The system started in 2013 with a cap of 162.8 MtCO₂e, declining to 159.7 MtCO₂e in 2014.

SECOND COMPLIANCE PERIOD (2015–2017): With the program expanding to include fuel distribution, the cap rose to 394.5 MtCO₂e in 2015. The cap decline factor averaged 3.1% per year in the second compliance period (2015–2017), reaching 370.4 MtCO₂e.

THIRD COMPLIANCE PERIOD (2018–2020): The cap in the third compliance period started at 358.3 MtCO₂e and declined at an average annual rate of 3.3% to 334.2 MtCO₂e in 2020.

FOURTH COMPLIANCE PERIOD (2021–2023) AND BEYOND: During the period 2021–2030, the cap declines by about 13.4 MtCO₂e each year, averaging about 4% per year and reaching 200.5 MtCO₂e in 2030.

The Cap-and-Trade Regulation sets a formula for declining caps after 2030 through 2050.

Phases & Allocation

TRADING PERIODS

The California Cap-and-Trade Program is structured around compliance periods (see “Compliance” section). A cap trajectory has been set through 2030, with a formula for the declining annual caps through 2050 (see “Cap” section).

Allowances are both allocated and auctioned, with each allowance associated with a specific calendar year vintage. Some allowances with a vintage three years in the future are offered at each auction and may be traded, but these future vintage allowances may not be used for compliance until the compliance date for the vintage year.

ALLOCATION

Allowances are distributed via free allocation, free allocation with consignment, and auction.

FREE ALLOCATION:

Industrial facilities: Facilities receive free allowances to minimize carbon leakage. For nearly all industrial facilities, the amount is determined by product-specific benchmarks, recent production volumes, a cap adjustment factor, and an assistance factor based on assessment of leakage risk.

Leakage risk is divided into tiers of “low”, “medium”, and “high” based on levels of emissions intensity and trade exposure. The Cap-and-Trade Regulation as adopted in 2011 set assistance factors of 100% for the first compliance period regardless of leakage risk. For facilities with medium leakage risk, the original regulation included an assistance factor decline to 75% for the second compliance period and to 50% for the third compliance period. For facilities with low leakage risk, it included an assistance factor decline to 50% for the second compliance period and to 30% for the third compliance period. Amendments to the Cap-and-Trade Regulation in 2013 delayed these assistance factor declines

⁴ – Approximately 330 registered covered/opt-in entities. These entities represent approximately 500 registered emitting sources/facilities.

by one compliance period, and AB 398 (adopted in 2017) set all assistance factors to 100% for 2021–2030, citing continued vulnerability to carbon leakage. In adjusting these factors pursuant to AB 398, CARB also set all assistance factors in the same manner for the 2018–2020 period.

There is no cap on the total amount of industrial allocation, but the formula for allocation includes a declining cap adjustment factor to gradually reduce allocation in line with the overall cap trajectory.

Free allocation is also provided for transition assistance to public wholesale water entities, legacy contract generators, universities, public service facilities, and, beginning in 2018, waste-to-energy facilities.

CONSIGNMENT:

Electrical distribution utilities and natural gas suppliers: Receive free allocation on behalf of their ratepayers. All natural gas and electrical utilities must use the allowance value for ratepayer benefit and for emissions reductions.

All allowances allocated to investor-owned electric utilities and an annually increasing percentage of allowances allocated to natural gas suppliers must be consigned for sale at the state’s regular quarterly auctions. Publicly owned electrical utilities can choose to consign freely allocated allowances to auction or use them for their own compliance needs.

AUCTIONING: In 2020, about 58% of total California-issued vintage 2020 allowances were made available through auction, which included allowances owned by CARB (~ 32%) and allowances consigned to auction by utilities (~ 26%).

Unsold allowances in past auctions are removed from circulation 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. However, if any of these allowances remain unsold after 24 months, they will be placed into CARB’s price ceiling reserve or into the two lower reserve tiers (see “Market Stability Provisions” section). To date, 37 million allowances originally designated for auction have been placed in reserves through those provisions.

Flexibility

BANKING AND BORROWING

Banking is allowed but is subject to the general holding limit on allowances to which all entities in the system are held. The holding limit varies based on the year’s cap. Emitting entities may also be eligible for a limited exemption from the holding limit based on their emissions levels to meet annual compliance obligations or obligations at the end of a three-year compliance period.

Borrowing from future vintage allowances is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: For compliance obligations related to 2013–2020 emissions, entities are held to a limit of meeting up to 8% of their obligations for a compliance period through offsets. Starting with their 2021 emissions, entities are subject to new limits that were established by AB 398. The share of offsets that can be used to fulfil the compliance obligation will decrease to 4% per year for 2021–2025 emissions and will increase to 6% starting with 2026 emissions.

QUALITATIVE LIMIT: Currently, six domestic offset types are accepted as compliance units originating from projects carried out according to six compliance offset protocols:

- US Forest Projects
- Urban Forest Projects
- Livestock Projects (methane management)
- Ozone-Depleting Substances Projects
- Mine Methane Capture Projects
- Rice Cultivation Projects

In addition to setting new quantitative limits on the use of offsets, AB 398 set new limits on the types of units that can fulfil compliance obligations. Starting with 2021 compliance obligations, no more than one half of any entity’s offset usage limit can come from offsets that do not provide direct environmental benefits in the state of California (DEBS). Projects located within California are considered to provide DEBS. Offset projects implemented outside of California may still result in DEBS, based on scientific evidence and project data provided. For example, a forest project outside California has been determined to provide benefits within California by improving the quality of waters flowing through California. Recent regulatory amendments specify the criteria that will be used for determining DEBS.

Offset credits issued by jurisdictions linked with California (e.g., Québec) are eligible to be used to satisfy a California entity’s compliance obligation, subject to the quantitative usage limit.

To ensure environmental integrity, California’s offset program has incorporated the principle of buyer liability. The state may invalidate an offset credit that is later determined to have not met the requirements of an offset protocol because of double counting, over-issuance, or regulatory non-conformance. The entity that surrendered that offset credit for compliance must then substitute a valid compliance instrument for the invalidated offset credit.

MARKET STABILITY PROVISIONS

AUCTION RESERVE PRICE: USD 17.71 per allowance in 2021. The auction reserve price, the minimum price at which allowances are available at auction, increases annually by 5% plus inflation, as measured by the Consumer Price Index.

RESERVE: Allowances from each annual cap were placed in an Allowance Price Containment Reserve (APCR) (1% from the 2013–2014 compliance period; 4% from the 2015–2017 compliance period; and 7% from the 2018–2020 compliance period). Until the end of 2020, these allowances populated three price tiers in equal quantities. AB 398 replaced the three tiers with a new structure of two tiers and a price ceiling starting in 2021. AB 398 also directed where remaining allowances from the earlier APCR would be distributed. Specifically, two-thirds of those allowances are spread evenly across the two new price tiers. The remaining one-third (which had been spread evenly across the original three price tiers), plus unsold allowances that have been transferred into the APCR (about 37 million to date), are placed in the price ceiling reserve. In addition, the Cap-and-Trade Regulation also sets aside portions of annual allowance caps for the two lower price tiers from 2021–2030.

Although no reserve sale has been held to date, CARB will offer a reserve sale when auction settlement prices from the preceding quarter are at least 60% of the lowest price tier. CARB will also offer a reserve sale just before the compliance obligation deadline, if requested by at least one covered entity.

At the price ceiling, a covered entity can purchase allowances (or if no allowances remain, “price ceiling units”) up to the amount of its current unfulfilled emissions obligation. The revenues from the sale of price ceiling units will be used to purchase real, permanent, quantifiable, verifiable, enforceable, and additional emissions reductions on at least a metric tonne for metric tonne basis. Sales at the price ceiling will only be conducted if no allowances remain at the two lower tiers.

In 2021, the two cost containment reserve tiers and the price ceiling are set at USD 41.40, USD 53.20, and USD 65.00, respectively. Tier prices increase by 5% plus inflation (as measured by the Consumer Price Index).

Compliance

COMPLIANCE PERIOD

Except for the year following the last year of a compliance period, compliance instruments equal to 30% of the previous year’s verified emissions must be surrendered annually, by 1 November (or the first business day thereafter). Compliance instruments equal to all remaining emissions must be surrendered by 1 November (or the first business day thereafter) of the year following the last year of a compliance period.

FIRST COMPLIANCE PERIOD: 2013–2014

SUBSEQUENT COMPLIANCE PERIODS: Three calendar years (2015–2017, 2018–2020, and so forth)

MRV

REPORTING FREQUENCY: Annually

VERIFICATION: Emission data reports and their underlying data require independent third-party verification annually for all entities covered by the program.

FRAMEWORK: Reporting is required for most emitters at or above 10,000 tCO_{2e} per year. They must implement internal audits, quality assurance, and control systems for the reporting program and the data reported.

ENFORCEMENT

A covered entity that fails to surrender sufficient compliance instruments to cover its verified GHG emissions on either an annual surrender deadline or at the end of a compliance period is automatically assessed as an untimely surrender obligation, requiring it to surrender each missing compliance instrument as well as three additional compliance instruments for each compliance instrument it failed to surrender.

Failure to meet the untimely surrender obligation as described above would subject the entity to substantial financial penalties for its noncompliance pursuant to California Health and Safety Code Section 38580.

Separate and substantial penalties apply to mis- or non-reporting under the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions.

Linking

LINKS WITH OTHER SYSTEMS

California linked with Québec's ETS on 1 January 2014. The two expanded 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

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. The Scoping Plan provides updates on progress toward climate targets and lays out strategies to achieve them, including the role and level of effort accorded different programs in the state's portfolio approach to climate mitigation.

USE OF REVENUES

SINCE BEGINNING OF PROGRAM: USD 14.24 billion

COLLECTED IN 2020: USD 1.70 billion

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: Investor-owned electric utilities and natural gas suppliers 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 \(AB 32\)](#)⁵

[AB 398](#)⁶

[2018 amendments to the 2021–2030 period](#)⁷

[Current regulation can be found on the CARB website](#)⁸

5 – https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200520060AB32

6 – http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB398

7 – https://ww3.arb.ca.gov/regact/2018/capandtrade18/ct18fro.pdf?_ga=2.68405201.1545648372.1576533466-747824352.1574948884

8 – <https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program>

CANADA



In December 2016, Canada's Prime Minister and Premiers adopted the 'Pan-Canadian Framework on Clean Growth and Climate Change' (PCF). The PCF was Canada's first ever federal-provincial-territorial plan to fight climate change, build resilience to the changing climate, and drive clean economic growth. The PCF includes pricing carbon pollution across Canada as a foundational pillar.

The 'Pan-Canadian Approach to Pricing Carbon Pollution,' released in October 2016, gives provinces and territories the flexibility to implement their own pricing systems, as long as they meet minimum federal stringency criteria (known as the federal "benchmark").

To meet the federal benchmark, provinces and territories can choose from several options, including:

- (1) An explicit price-based system (e.g., a carbon tax like that in British Columbia);
- (2) A combination ("hybrid") of a charge on fossil fuels and an intensity-based baseline-and-credit system for industrial emitters. For the baseline-and-credit systems, standards can be set based on provincial/territorial circumstances. These standards should be at levels that drive improved performance in carbon intensity and should account for best-in-class performance;
- (3) A cap-and-trade system.

For price-based or hybrid systems, the Pan-Canadian Approach set the minimum price stringency at CAD 10 (USD 7.46) in 2018, rising CAD 10 (USD 7.46) per year to reach CAD 50 (USD 37.28) in 2022. For cap-and-trade systems, modeling has to demonstrate that expected emissions reductions are at least equal to those that would have resulted from a carbon tax with the above-described price trajectory.

All systems are required to have common scope by applying pricing to substantively the same sources as British Columbia's carbon tax, i.e., covering fuels combusted for electricity, heating, transport, and industry.

In addition, provincial/territorial emission reduction targets must be set equal to or greater than the federal reduction target (30% below 2005 levels by 2030).

The federal carbon pollution pricing "backstop" system applies in jurisdictions that request it or do not implement systems that meet the federal benchmark.

In December 2020, the federal government announced 'A Healthy Environment and a Healthy Economy'—Canada's

strengthened climate plan of federal policies, programs, and CAD 15 billion (USD 11.2 billion) in investments to build a stronger, cleaner, more resilient, and inclusive economy. Once fully implemented, 'A Healthy Environment and a Healthy Economy' is expected to enable Canada to exceed its current 2030 GHG reduction target. The plan proposes to continue to put a price on carbon pollution through to 2030, rising at CAD 15 (USD 11.18) per year from 2022–2030 until it reaches CAD 170 (USD 126.76) in 2030. The plan also proposes to review the federal benchmark in order to strengthen the standards against which provincial/territorial systems are assessed.

FEDERAL CARBON POLLUTION PRICING "BACKSTOP"

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

- A regulatory charge on fossil fuels such as gasoline and natural gas, known as the fuel charge. Generally, the fuel charge applies early in the supply chain and is payable by a registered producer or distributor. The fuel charge started at CAD 20 per tCO₂e (USD 14.91) in 2019 and has been increasing annually by CAD 10 (USD 7.46), until it reaches CAD 50 per tCO₂e (USD 37.28) in 2022.
- A performance-based system for industries, known as the federal Output-Based Pricing System (OBPS). The federal OBPS is designed to ensure that there is a price incentive available for industrial emitters to reduce their GHG emissions and spur innovation, while maintaining competitiveness and protecting against carbon leakage. The OBPS applies to companies in the industrial and electricity sectors that emit equal to 50,000 tCO₂e or more annually. Smaller installations with annual emissions that equal 10,000 tCO₂e or more per year are able to apply to voluntarily participate.

The OBPS sets a performance standard (i.e., GHG emissions per unit of output) for different industrial activities. Facilities that produce more emissions than the standard have to compensate for the excess. Facilities whose emissions are below the standard get surplus credits they can sell or save to use later. Facilities can comply by: (1) remitting surplus credits purchased from other facilities or retained from previous periods; (2) paying the carbon price; or (3) remitting eligible offset credits. Final regulations for the OBPS were released in June 2019 and a review of the OBPS Regulations is scheduled for 2022. An updated discussion paper was published in July 2020¹ to seek input on a national carbon offset program. The development of this program is still in progress.

Direct proceeds from the federal carbon pricing system are returned to the jurisdiction of origin.

← Carbon pricing in place across Canada

Provinces and territories have the flexibility to choose carbon pricing mechanisms that best suit their respective contexts

The Pan-Canadian Approach to Pricing Carbon Pollution has begun a program review, targeting completion by early 2022

1 – <https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/pricing-pollution/pricing-pollutionProtocol-Development-GHG-Offset-System-v6.pdf>

An annual verification process is carried out to ensure provincial/territorial carbon pollution pricing systems continue to meet the federal backstop criteria. The federal government also monitors major changes to provincial/territorial systems on an ongoing basis.

PRICING SYSTEMS ACROSS CANADA: The Government of Canada has confirmed that the carbon pollution pricing systems in the following provinces/territories continue to fully meet federal benchmark stringency requirements:

- **British Columbia** (carbon tax);
- **Nova Scotia** (cap-and-trade system);
- **Northwest Territories** (territorial carbon tax); and
- **Québec** (cap-and-trade system, which is linked to California).

In the following provinces, the federal backstop applies in part:

- **Alberta:** The federal fuel charge took effect in Alberta in January 2020. The charge will increase every 1 April thereafter, beginning in April 2020. Alberta's TIER (Technology Innovation and Emissions Reductions Regulation) system for large emitters, which also took effect in January 2020, replaced Alberta's previous approach to pricing carbon pollution for industry. TIER aligns with the federal benchmark for the emission sources it covers.
- **New Brunswick:** The federal OBPS has been in place since January 2019. In September 2020, the federal government informed the Government of New Brunswick that its carbon pollution pricing system for industrial facilities meets the federal government's minimum stringency benchmark requirements for pricing carbon pollution for the sources that it covers. As a result, the Government of Canada intends to stand down the OBPS in New Brunswick (the date is still to be determined). The province's fuel charge, approved by the federal government in December

2019, meets the federal stringency requirements for the emission sources that it covers. The fuel charge took effect in April 2020, starting at a rate of CAD 30 per tonne (USD 22.37).

- **Prince Edward Island:** The federal OBPS applies in the province. The province's carbon levy on fuels meets the federal benchmark stringency requirements.
- **Saskatchewan:** Saskatchewan has a provincial OBPS for large industrial emitters, with the exception of the electricity-generating and -transmission pipeline sectors; as a result, these sectors are covered by the federal OBPS. The Saskatchewan OBPS sets a compliance price of CAD 40 per tonne (USD 29.83) in 2021 on emissions from regulated facilities such as oil and gas, mining, manufacturing, and others. The federal fuel charge has been applied in the province since April 2019.

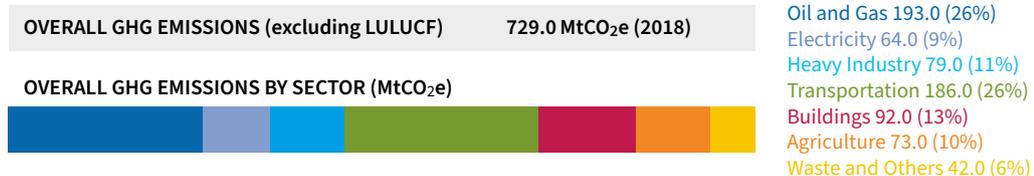
The federal backstop is fully in place in:

- **Manitoba**
- **Ontario:** In September 2020, the federal government informed the Government of Ontario that its carbon pollution pricing system for industrial facilities meets the federal government's minimum stringency benchmark requirements for pricing carbon pollution for the sources that it covers. As a result, the Government of Canada intends to stand down the OBPS in Ontario as of a future date.
- **Yukon and Nunavut:** In these territories, some exemptions apply to fuels for aviation and electricity for remote communities, reflecting their unique circumstance.

Some of the provincial legal challenges to the federal carbon pricing backstop (Alberta, Ontario, and Saskatchewan) were heard by the Supreme Court of Canada in September 2020. The court is expected to issue a decision regarding the constitutionality of the federal carbon pricing backstop in 2021.

Background Information

GHG REDUCTION TARGETS



BY 2030: 30% below 2005 levels (NDC)

BY 2050: Proposed net-zero target by 2050 (Canadian Net-Zero Accountability Act presented by the Canadian government in the Canadian Parliament in late 2020²)

2 – <https://www.parl.ca/LegisInfo/BillDetails.aspx?Mode=1&billId=10959361&Language=E>

Other Information

INSTITUTIONS INVOLVED

Environment and Climate Change Canada
Finance Canada
Canadian provinces and territories

IMPLEMENTING LEGISLATION

Pan-Canadian Framework on Clean Growth and Climate Change³
Output-Based Pricing System Regulations⁴
Greenhouse Gas Pollution Pricing Act⁵

3 – http://publications.gc.ca/collections/collection_2017/eccc/En4-294-2016-eng.pdf

4 – <https://laws-lois.justice.gc.ca/PDF/SOR-2019-266.pdf>

5 – <https://laws-lois.justice.gc.ca/PDF/G-11.55.pdf>



MASSACHUSETTS

Massachusetts Limits on Emissions from Electricity Generators

In force

Under development

Under consideration

SECTORS:



Exists in parallel to, but does not directly interact with, RGGI

Two years of full compliance from all regulated entities

Program review to be conducted in 2021

CAP 8.3 MtCO ₂ (2021)	GASES CO ₂ only	
ALLOCATION Free allocation: Grandparenting Auctioning	AVERAGE 2020 PRICE¹ USD 7.00	TOTAL REVENUE USD 27.17 since beginning of program, USD 15.78 collected in 2020

ETS DESCRIPTION

The Massachusetts Limits on Emissions from Electricity Generators began operating in 2018 and covers CO₂ emissions from 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 Massachusetts government would need to take additional action to guarantee it meets the state's climate targets—a 45% reduction by 2030 and an 80% reduction by 2050 (compared to 1990). The regulation establishing this system, '310 CMR 7.74,' is one of the responses to this ruling. The regulation is intended to ensure that emission reductions associated with other clean energy programs occur in Massachusetts. In 2020, the Massachusetts Executive Office of Energy and Environmental Affairs signed a determination of statewide emissions limits for 2050, establishing a 2050 statewide net-zero GHG emissions limit.

The 'Massachusetts Limits on Emissions from Electricity Generators' system exists in parallel to, but does not directly interact with, RGGI. The electricity generators in Massachusetts have to comply with both RGGI and the Massachusetts program. A 2016 court decision required Massachusetts to establish a statewide cap-and-trade program to control emissions located specifically in Massachusetts. Massachusetts electricity generators must hold and surrender allowances for both programs.

YEAR IN REVIEW

2020 saw a reduction of the share of allowances distributed through free allocation from 75% to 50%. The remainder, after an adjustment to account for banked allowances, were distributed via auctions. The system will increase to full auctioning by 2021.

During the course of 2021, Massachusetts will finalize a new climate program establishing climate targets for 2030. The Massachusetts ETS will be revised to align with these targets.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 72.9 MtCO₂e (2017)



Oil and Gas 0.8 (1%)
Electricity 13.6 (19%)
Industrial Processes 3.8 (5%)
Transportation 30.5 (42%)
Buildings 23.3 (32%)
Agriculture 0.2 (0%)
Waste 0.7 (1%)

GHG REDUCTION TARGETS

BY 2050: Net-zero GHG emissions. Positive emissions will be compensated with removals, and positive emissions in 2050 are not to be greater than 85% below the 1990 level (Letter of Determination of Statewide Emissions Limit for 2050)

¹ – Prices from the December 2020 auction are not included, as allowances from the auction will be used to satisfy 2021 and 2022 compliance obligations.

ETS Size

COVERED EMISSIONS

5.7 MtCO₂e
(Verified emissions 2019)

GHGs COVERED

CO₂ only

SECTORS AND THRESHOLDS

Large electricity generators subject to RGGI (≥25 MWe)

POINT OF REGULATION

Downstream



NUMBER OF ENTITIES

23 (2020)

CAP

The cap declines annually by 223,876 tCO₂e until it reaches a cap of 1.8 MtCO₂e by 2050.

ANNUAL CAPS:

2019: 8.7 MtCO₂e

2020: 8.5 MtCO₂e

2021: 8.3 MtCO₂e

Phases & Allocation

TRADING PERIODS

The system has an annual compliance deadline of 1 March for the prior year's emissions.

ALLOCATION

AUCTIONING: From 2019 onwards, allowances were partially auctioned, with 25% auctioned in 2019, 50% in 2020, and 100% from 2021 onwards. At least one auction is held each year. The first auction took place in December 2018, the

second one in December 2019, the third one in September 2020, and the fourth auction in December 2020. Auction results are included in market monitoring reports posted on the program web page.

FREE ALLOCATION: Before 2021, non-auctioned allowances were freely allocated through grandparenting based on historical (2013–2015) generation.

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 auctions have a reserve price of USD 0.50 per allowance.

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 the US Environmental Protection Agency. Documents (i.e., emissions reports and compliance certification reports) must be certified by a designated representative identified by the facility, and the Massachusetts Department of Environmental Protection (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 must submit three allowances for each metric tonne of noncompliance.

Other Information

INSTITUTIONS INVOLVED

The Executive Office of Energy and Environmental Affairs
Massachusetts Department of Environmental Protection

EVALUATION/ETS REVIEW

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

USE OF REVENUES

Auction proceeds are paid to a segregated account and are used to further reduce GHG emissions (e.g., clean energy and vehicle electrification projects) as well as for adaption programs and for projects targeting communities adversely impacted by air pollution.

IMPLEMENTING LEGISLATION/REGULATION

[Electricity Generator Emissions Limits \(310 CMR 7.74\)](https://www.mass.gov/guides/electricity-generator-emissions-limits-310-cmr-774)²

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

NEW MEXICO



New Mexico established an interagency Climate Change Task Force in January 2019 to evaluate strategies and policies to reduce GHG emissions in the state. Potential strategies include adopting a market-based program that would set emissions limits to reduce CO₂ and other GHG pollutants in New Mexico. Over the course of 2020, state agencies continued to evaluate options for a future market-based program that would result in the most cost-effective approach, including through cooperating with other states that already operate cap-and-trade programs.

The second annual report of the Climate Change Task Force, released in October 2020, found that although the state made progress on curbing emissions, additional action is

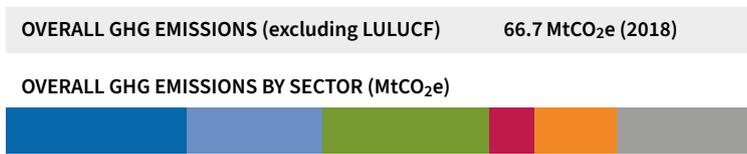
needed to reach New Mexico's GHG reduction targets. Future recommended objectives include adopting rules for low- and zero-emission technologies, cutting HFC emissions, and further reducing GHGs and other pollution from the oil and gas industry. The report emphasizes the importance of embedding existing emissions targets into legislative statute, rather than establishing them only through executive orders. The report also highlights that the New Mexico Environment Department and the New Mexico Department of Energy, Minerals, and Natural Resources continue to evaluate options for a comprehensive market-based program. Both departments will make coordinating with other states already implementing such programs a priority area for stakeholder engagement in 2021.

-  *In force*
-  *Under development*
-  *Under consideration*

New Mexico state agencies are evaluating options for a market-based program

Interagency Climate Change Task Force released second annual report in late 2020

Background Information



GHG REDUCTION TARGETS

BY 2030: At least 45% reduction 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



NEW YORK CITY

In force

Under development

Under consideration

Potential trading program for large buildings being studied by the New York City Mayor's Office of Sustainability

Study results are expected to include an implementation plan

Impacts to environmental justice communities are a critical component of the study

As part of a local law that sets emissions-intensity limits for most large buildings starting in 2024, the New York City (NYC) Mayor's Office of Sustainability (MOS) is required to study the feasibility of a citywide trading program and release its findings in early 2021.

Local Law 97, one part of the 'Climate Mobilization Act of 2019,' requires most buildings over 25,000 square feet (2,323 square meters) to meet annual emissions-intensity limits based on occupancy type. If the owner of a covered building exceeds their specified limit, they will be liable for a civil penalty equal to USD 268 per tonne of emissions exceeding their cap. Buildings in which more than 35% of the dwelling units are rent regulated have an alternate compliance pathway under the law, which includes implementing a list of prescriptive energy conservation measures.

Local Law 97 also requires the study of a potential citywide trading program. The law specifies that this feasibility study

"include methods to ensure equitable investment in environmental justice communities that preserve a minimum level of benefits for all covered buildings." The study requires that any recommended market design demonstrate that it will not increase local air pollution and will drive additional investment towards environmental justice communities.

In addition to assessments of carbon trading scenarios and methods to ensure equitable investment in environmental justice communities, the study will outline an implementation plan for a marketplace approach to carbon trading that consists of pricing mechanisms, carbon credit verification, and monitoring and evaluation processes.

The trading system being studied could serve as a compliance mechanism under the existing law (LL97 of 2019). This would require adoption through legislation by City Council.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 55.1 MtCO₂e (2019)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Stationary Energy 37.3 (68%)
Transportation 15.6 (28%)
Waste 2.2 (4%)

GHG REDUCTION TARGETS

BY 2050: Net-zero emissions citywide (OneNYC 2050 Strategy)

Other Information

INSTITUTIONS INVOLVED

NYC Mayor's Office of Sustainability
NYC Department of Buildings

IMPLEMENTING LEGISLATION

Local Law 97¹
Climate Mobilization Act²

1 - https://www1.nyc.gov/assets/buildings/local_laws/ll97of2019.pdf
2 - <https://www1.nyc.gov/site/sustainability/our-programs/carbon-trading-study.page>

NORTH CAROLINA



In October 2018, North Carolina’s Governor Roy Cooper issued an executive order (EO No. 80) demanding stronger commitment within the state to address climate change and towards a transition to a clean energy economy. The underlying goal is to reduce statewide GHG emissions to 40% below 2005 levels. As directed by the EO, in September 2019, North Carolina’s Department of Environmental Quality (DEQ) released the “Clean Energy Plan” (CEP) to outline policy and action recommendations to reach the announced GHG reduction target. A core component of the CEP is to reduce electric power sector GHG emissions by 70% below 2005 levels by 2030 and attain carbon neutrality by 2050. The list of policy options to reach the GHG reduction targets has not yet been finalized.

To assess the most cost-effective options to achieve CO₂ emissions reductions in the power sector, the DEQ has commissioned an academic report that will evaluate policy designs for a market-based carbon reduction program, a coal phase-out, clean energy policies, and hybrid approaches. The report is scheduled to be delivered in early 2021.

According to the CEP, key policy design elements for a market-based carbon reduction program that should be analyzed in the report include levels of emission limits, the scope of covered sources, the distribution of emission allowances, investment of revenue generated from the program, linking the program with similar programs in other states, technical platforms for administering the program, and mechanisms for protecting ratepayers.

- In force
- Under development
- Under consideration

← *Executive order to develop policy options for reducing emissions in the power sector*

Evaluation report on a potential market-based carbon reduction program expected by early 2021

Background Information



Electricity (direct combustion and imported) 52.6 (35%)
 Industrial Processes 18.5 (12%)
 Transportation 48.7 (32%)
 Commercial 5.7 (4%)
 Residential 5.3 (4%)
 Agriculture 10.5 (7%)
 Waste 8.8 (6%)

GHG REDUCTION TARGETS

BY 2025: 40% reduction compared to 2005 levels (Executive Order No. 80)

Other Information

INSTITUTIONS INVOLVED

North Carolina Department of Environmental Quality

IMPLEMENTING LEGISLATION/REGULATION

Executive Order No. 80¹
 Clean Energy Plan²

1 – [https://files.nc.gov/governor/documents/files/EO80-NC%27s Commitment to Address Climate Change %26 Transition to a Clean Energy Economy.pdf](https://files.nc.gov/governor/documents/files/EO80-NC%27s%20Commitment%20to%20Address%20Climate%20Change%26%20Transition%20to%20a%20Clean%20Energy%20Economy.pdf)
 2 – <https://deq.nc.gov/energy-climate/climate-change/nc-climate-change-interagency-council/climate-change-clean-energy-16>



NOVA SCOTIA

Nova Scotia Cap-and-Trade Program

- In force
- Under development
- Under consideration

CAP 12.3 MtCO ₂ e (2021)	GASES Several gases	
ALLOCATION Free allocation: Benchmarking Free allocation: Grandparenting Auctioning	AVERAGE 2020 PRICE CAD 24.35 (USD 18.16) / tCO ₂ ²	TOTAL REVENUE CAD 28.7 million (USD 21.4 million) since beginning of program in 2020

SECTORS:

- POWER
- INDUSTRY
- TRANSPORT*
- BUILDINGS*

* Sectors represent upstream coverage

Auctioning started in 2020 with two auctions

In compliance with the Pan-Canadian carbon pricing framework

Has a 2050 net-zero GHG target

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. The program regulates the industry, power, heat (buildings), and transportation sectors and covers more than 80% of GHG emissions in Nova Scotia.

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 is not subject to the federal carbon pricing "backstop" measure.

Since May 2018, Nova Scotia has been a member of the Western Climate Initiative, which provides technical services and support for Nova Scotia's cap-and-trade program.

Nova Scotia is not linked to any jurisdictions.

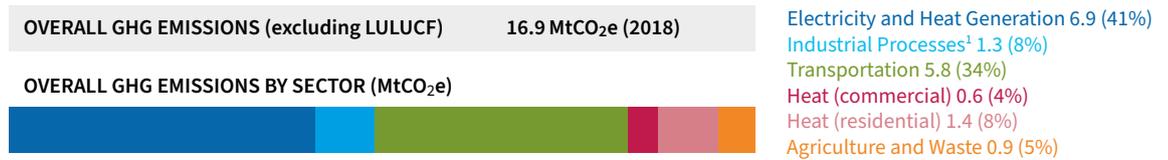
In October 2019, Nova Scotia introduced the 'Sustainable Development Goals Act,' which sets new targets to fight climate change, including a target of reaching 53% below 2005 levels by 2030, as well as net-zero emissions by 2050. The cap-and-trade program, along with other policies and programs, will help Nova Scotia achieve its 2030 and 2050 GHG targets.

YEAR IN REVIEW

In June 2020, the Nova Scotia cap-and-trade program held its first auction, selling all allowances on offer. The minimum price for auctions held in 2020 was set at CAD 20 (USD 14.91), and in each subsequent year the minimum price will increase by 5% plus inflation. Regulated entities have the option to consign allowances to auction. In addition, purchase limits apply in order to secure market functioning.

The most recent auction was held in December 2020, when 542,000 allowances were on offer, 15.3% less than in the program's first sale in June. The auction settled at CAD 24.70 (USD 18.42).

Background Information



GHG REDUCTION TARGETS

BY 2030: 53% below 2005 levels (Sustainable Development Goals Act)

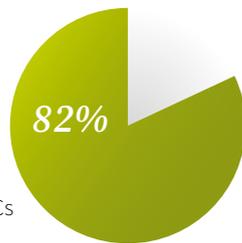
BY 2050: Net-zero emissions (Sustainable Development Goals Act)

1 – Includes the oil and gas sector

ETS Size

COVERED EMISSIONS

13.8 MtCO₂e
(Verified emissions 2018)



GHGS COVERED

CO₂, CH₄, N₂O, SF₆, NF₃, HFCs, PFCs

SECTORS AND THRESHOLDS

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

INCLUSION THRESHOLDS: For the industrial and electricity sectors, facilities generating $\geq 50,000$ tCO₂e/year. Electricity importers responsible for $>10,000$ tCO₂e/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 $\geq 10,000$ tCO₂e/year.

There are no provisions for voluntary (“opt-in”) participation.

POINT OF REGULATION

Mixed

NUMBER OF ENTITIES

27 entities (December 2020)

CAP

FIRST COMPLIANCE PERIOD (2019–2022):

2019: 13.7 MtCO₂e

2020: 12.7 MtCO₂e

2021: 12.3 MtCO₂e

2022: 12.1 MtCO₂e

Phases & Allocation

TRADING PERIODS

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

ALLOCATION

FREE ALLOCATION: Each year within the compliance period, free allowances are transferred to the program participants’ accounts. The amount of free allowances for the participating entities is calculated as follows:

Industrial Facilities (output-based allocation): Facilities receive allowances based on production intensity benchmarks. 75% of eligible emissions allowances are distributed to participating entities on 14 January of each year. The remaining eligible 25% are provided in the following year with production-level adjustments after the submission of a verified emissions report.

The benchmark is based on historical facility emissions intensity, an assistance factor that varies between 1 (100%) for cement and 0.9 (90%) for pulp and paper as well as natural gas processing (these are the only three GHG activities, or components of a GHG activity explicitly specified in the regulatory framework).

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% fewer allowances based on the output in 2022 compared to in 2019.

Fuel Suppliers and Electricity Importers (grandparenting):

Facilities receive 80% of free allocation based on verified GHG reports for the previous year’s emissions on 14 April of each year.

Nova Scotia Power Inc. (free allocation based on a reduction of BAU projections):

Allowances for the utility are allocated equivalent to the amount of approximately 90% of the business-as-usual projections for GHG emissions from the electricity sector for the compliance period. The BAU projections are established by the regulator. ~5.5 million allowances were freely allocated in 2020, and in 2021, ~5.1 million allowances will be allocated, declining to just over five million in 2022. Allowances are allocated on 14 January of each year.

AUCTIONING: The province holds two to four auctions per calendar year. Two auctions were held in 2020: the first in June and the second in December. Minimum price: CAD 20 (USD 14.91) for auctions held in 2020; the minimum price increases by 5% plus inflation in each subsequent year.

Purchasing Limits at Auctions (for the 2019–2022 compliance period):

In order to minimize the risk of one participant manipulating the market by causing shortages and price spikes, purchasing limits restrict how many emission allowances each participant can buy at any one auction. The limits for the three types of participants are as follows:

- Industrial facilities: 3% of their previous year’s verified GHG emissions per auction and 5% for the calendar year.
- Fuel suppliers: 15% of the previous year’s verified GHG emissions per auction and 25% for the calendar year.
- Nova Scotia Power Inc.: 5% of the allowances available for sale at each auction.

Auctioning in Nova Scotia has two particularities:

(1) Option for regulated entities to consign allowances to auction: To 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 allowances offered for sale by the province. 100% of the revenue from allowances sold on consignment is returned to the participants.

(2) Purchase limits to secure market functioning: To secure market functioning, bidders are 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.

Flexibility

BANKING AND BORROWING

Nova Scotia's cap-and-trade program does not allow for banking or borrowing across compliance periods.

OFFSETS AND CREDITS

Nova Scotia's cap-and-trade legislation includes the possibility for an offset system. Further consultations will be undertaken, and a study was completed in 2020 to explore offset potential in the province's carbon market.

MARKET STABILITY PROVISIONS

RESERVE: In the first year of each compliance period, the government places 3% of allowances available under the cap of each year into a reserve. These allowances may be used for:

(1) Cost containment: Offering them 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 one calendar year. The initial price was set at CAD 50 (USD 37.28) in 2020, and this will rise annually by 5% plus inflation.

(2) New entrants: Accommodating 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: Allowances from the reserve can be used as a buffer for uncertainty in output-based allocation for industrial facilities. If initial projections by the regulator on the yearly allocation levels fall short of necessary allocation based on real production levels, then output-based allocation according to allocation rules can be fulfilled by using allowances from the reserve.

Compliance

COMPLIANCE PERIOD

Four years (2019–2022) to provide year-to-year flexibility (see “Phases and Allocation” section).

By December 2023, entities must true up and surrender one allowance for each tonne of GHG emissions that they emitted over the course of the compliance period.

MRV

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

REPORTING FREQUENCY: Annually. Reporting and verification must be submitted by 1 May each year for the previous calendar year.

VERIFICATION: Reports must be verified by an accredited third-party organization.

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 that do not surrender sufficient allowances at the end of the compliance period will be subject to enforcement under the ‘Environment Act.’

All revenue from fines issued for not surrendering sufficient allowances will go into the Nova Scotia Green Fund.

Linking

LINKS WITH OTHER SYSTEMS

Nova Scotia does not plan to link at this time.

Other Information

INSTITUTIONS INVOLVED

Nova Scotia Environment, Climate Change Unit

EVALUATION/ETS REVIEW

Annual reports on the program are published by the regulator. Nova Scotia must also report annually to Environment and Climate Change Canada as a part of the 'Pan-Canadian Framework on Clean Growth and Climate Change.'

USE OF REVENUES

A Green Fund was established in 2019 to receive and distribute revenues from allowance auctions, sales of reserve emission allowances, and administrative penalties. The Green Fund must be used to support measures that mitigate GHG emissions, promote adaptation, encourage innovative technology, and reduce negative economic and social effects of mitigation action.

Revenue for 2020: CAD 28.7 million (USD 21.4 million).

IMPLEMENTING LEGISLATION/REGULATION

Nova Scotia's Cap and Trade Program Regulatory Framework²

Cap-and-Trade Program Regulations, Section 112Q of the Environment Act³

Quantification, Reporting, and Verification of Greenhouse Gas Emissions Regulations⁴

Standards for Quantification, Reporting, and Verification of Greenhouse Gas Emissions⁵

Sustainable Development Goals Act⁶

Environment Act⁷

2 – <https://climatechange.novascotia.ca/sites/default/files/Nova-Scotia-Cap-and-Trade-Regulatory-Framework.pdf>

3 – <https://www.novascotia.ca/just/regulations/regs/envcapandtrade.htm>

4 – <https://www.novascotia.ca/just/regulations/regs/envqrv.htm>

5 – https://climatechange.novascotia.ca/sites/default/files/uploads/QRV_Standards.pdf

6 – <https://nslslegislature.ca/sites/default/files/legc/PDFs/annual%20statutes/2019%20Fall/c026.pdf>

7 – <https://nslslegislature.ca/sites/default/files/legc/PDFs/annual%20statutes/2017%20Fall/c010.pdf>



OREGON

In force

Under development

Under consideration

Issued an executive order establishing a sector-specific 'cap and reduce program'

Program options and design elements have been studied and workshopped during 2020

Oregon has pursued a statewide cap-and-trade program through its legislature since 2019 and issued an executive order on cap-based emission reductions in 2020.

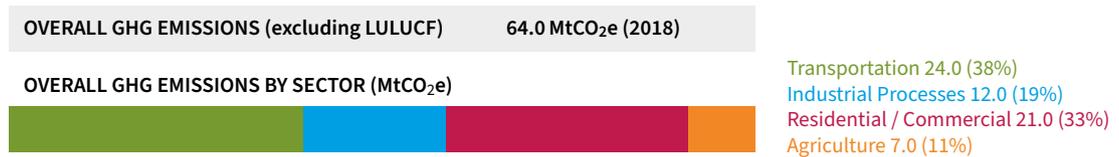
The most recent legislative attempt, Senate Bill 1530 (SB1530), was filed during the 2020 legislative session, and built on 2019 draft legislation (House Bill 2020 [HB2020]), but with some notable changes for the industry and transport sectors.

Both SB1530 and HB2020 failed to pass during regular legislative sessions, which prompted the state's governor to issue an executive order mandating an emissions cap and reductions for large emitters and transportation fuels, in line with the state's proposed reduction targets for 2035 and 2050. Executive Order 20-04 directs the state Environmental Quality Commission (EQC) and the Department of Environmental Quality (DEQ) to establish a sector-specific 'cap and reduce

program' for large stationary sources of emissions, transportation fuels, and other fossil fuels, including natural gas. The executive order provides little detail on the potential design of the program. It would require a cap as well as emissions reductions for the covered sources that are consistent with the targets set out in previous legislation (45% below 1990 levels by 2035 and 80% by 2050). The executive order makes no reference to trading and does not distinguish whether the program would resemble a baseline-and-credit system, or an ETS.

The DEQ submitted a preliminary report in May 2020 and a final report in June 2020, both of which focused on program options to cap and reduce emissions. The DEQ hosted a series of online technical workshops during August and September of 2020 to discuss specific program design elements, options, and implications to inform program scoping prior to the formal rulemaking process, which will occur over the course of 2021. The intended start date of the program is in 2022.

Background Information



GHG REDUCTION TARGETS

BY 2035: 45% reduction from 1990 GHG levels (Executive Order 20-04 covering Oregon state agencies)

BY 2050: At least 80% reduction from 1990 GHG levels (Executive Order 20-04 covering Oregon state agencies)

Other Information

INSTITUTIONS INVOLVED

Oregon Environmental Quality Commission
Oregon Department of Environmental Quality

IMPLEMENTING LEGISLATION/REGULATION

Oregon Greenhouse Gas Initiative (SB1530)¹
House Bill 2020 (HB2020)²
Executive Order 20-04³

1 - <https://olis.oregonlegislature.gov/liz/2020R1/Measures/Overview/SB1530>
2 - <https://olis.leg.state.or.us/liz/2019R1/Measures/Overview/HB2020>
3 - https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf

PENNSYLVANIA



In October 2019, Pennsylvania’s Governor Tom Wolf signed an executive order directing the Pennsylvania Department of Environmental Protection (DEP) to develop and present to the Environmental Quality Board (EQB) a proposal for an ETS covering CO₂ emissions from the electric power sector and its linkage to the Regional Greenhouse Gas Initiative (RGGI).

According to the executive order, the legal basis for developing an ETS is the state’s ‘Air Pollution Control Act,’ which regulates air resources necessary for the protection of public health.

In January 2020, the DEP released a first draft proposal for a power sector ETS covering CO₂ emissions. An update to the proposal in April 2020 proposed an emissions cap of 78 MtCO₂ for 2022 that would decrease annually by 3% to 58.1 MtCO₂ in 2030. In September 2020, the DEP released and presented to the EQB a draft ETS regulation based on the draft proposal. As Pennsylvania aims to join RGGI, for which one precondition is to align ETS program design accordingly, the DEP-proposed regulation is largely consistent with the system design features of the RGGI Model Rule. This includes the implementation of an emissions containment reserve and a cost containment reserve, as well as quarterly auctions to allocate allowances. It includes additional features such as a waste-coal set-aside account, a set-aside provision for cogen-

eration units (including combined heat and power systems), and a limited exemption for cogeneration units that supply less than 15% of their total energy to the electricity grid.

The draft regulation went through public consultation between November 2020 and January 2021 and will undergo the state’s regulatory review process, before a final proposal is presented during the course of 2021. The earliest start date for Pennsylvania’s ETS and for it to join RGGI would be 2022.

Joining RGGI would require negotiations between Pennsylvania and the current RGGI member states to adjust the program’s emissions cap. With Pennsylvania joining RGGI, the initiative’s carbon market would increase significantly, as Pennsylvania’s share of emissions in the 2022 RGGI cap would amount to 40.2%.

Other major emission reduction efforts currently under development in Pennsylvania include:

- a memorandum of understanding (MOU) between Pennsylvania and six other states to develop an action plan for the buildout of regional CO₂ transport infrastructure to enable large-scale carbon management; and
- a rulemaking which would establish a requirement for automobile manufacturers to offer zero emissions vehicles (ZEVs) as a percentage of their fleet.

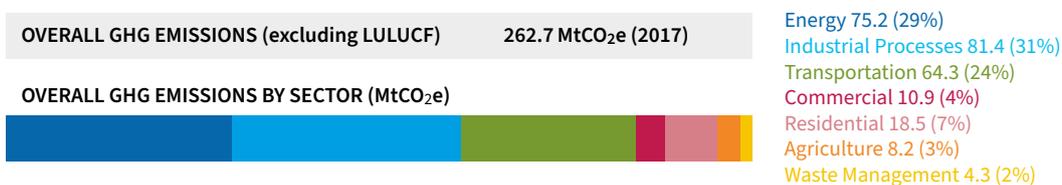
- In force
- Under development
- Under consideration

← Executive order for a power sector ETS and joining RGGI

Draft ETS regulation consistent with RGGI Model Rule released in October 2020

Plan to join RGGI by earliest 2022

Background Information



GHG REDUCTION TARGETS

- BY 2025:** 26% below 2005 levels (Executive Order 2019-1)
- BY 2050:** 80% below 2005 levels (Executive Order 2019-1)

Other Information

INSTITUTIONS INVOLVED

Pennsylvania Department of Environmental Protection (DEP)

IMPLEMENTING LEGISLATION/REGULATION

- Executive Order 2019-07¹
- Draft CO₂ Budget Trading Program²

1 – <https://www.governor.pa.gov/newsroom/executive-order-2019-07-commonwealth-leadership-in-addressing-climate-change-through-electric-sector-emissions-reductions/>
 2 – <http://www.pacodeandbulletin.gov/Display/pabull?file=/secure/pabulletin/data/vol50/50-45/1541.html>



QUÉBEC

Québec Cap-and-Trade System

In force

Under development

Under consideration

SECTORS:



* Sectors represent upstream coverage

Covers ~80% of Québec's overall emissions

Reforms to free allocation beginning 2021, with more expected after 2023

Chair of the Carbon Pricing in the Americas, alongside Chile

Linked with California since 2014

CAP	GASES	OFFSETS AND CREDITS
55.3 MtCO ₂ e (2021)	Several gases	Domestic ¹
ALLOCATION	AVERAGE 2020 PRICE ²	TOTAL REVENUE
Free allocation: Benchmarking Auctioning	CAD 22.76 /tCO ₂ (USD 16.97)	CAD 4.54 billion (USD 3.39 billion) since beginning of program, CAD 689.9 million (USD 514.4 million collected in 2020)

ETS DESCRIPTION

Québec's Cap-and-Trade System for GHG emissions became operational in 2013. Québec has been a member of the Western Climate Initiative since 2008 and formally linked its system with California's in January 2014 and with Ontario's in January 2018 (until the termination of Ontario's ETS in mid-2018). The system covers fossil fuel combustion and industrial emissions in power, buildings, transport, and industry.

YEAR IN REVIEW

In October 2020, the National Assembly of Québec passed Bill 44, which amends numerous pieces of environmental legislation and impacts the cap-and-trade program. The bill maintains all funding generated by the cap-and-trade program to climate change measures and strengthens the authority of the Ministry of Environment and the Fight against Climate Change over this revenue. It also allows the ministry to implement a major part of its post-2023 allocation plan: a portion of allowances that were previously given to industrial emitters free of charge would be sold at auction, with

the revenue reserved for those entities on the condition that they use it to finance mitigation. Regulations on this change and other facets of post-2023 allocation, including updated benchmarks (intensity targets), are expected to be finalized in 2021.

Also in October 2020, Québec accepted to chair the 'Carbon Pricing in the Americas' platform, alongside Chile. The platform brings governments from all parts of the Americas together to identify and foster opportunities to increase alignment of carbon pricing systems and promote carbon markets in the Americas to maximize climate action.

In November 2020, Québec published its latest climate change action plan (2030 Plan for a Green Economy), in which the government aims to achieve carbon neutrality by 2050.

In December 2020, Québec amended its price tiers for sales of allowances from its reserves to more closely align with those of California (see "Market Stability Provisions" for more).

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 80.6 MtCO₂e (2018)



Power 0.3 (0%)
Industrial Processes 24.2 (31%)
Transportation 36.1 (46%)
Buildings 8.2 (10%)
Agriculture 7.8 (10%)
Waste 4.1 (5%)

GHG REDUCTION TARGETS

BY 2020: 20% reduction from 1990 GHG levels (Order in Council 1187–2009)

BY 2030: 37.5% reduction from 1990 GHG levels (Decree 1018–2015)

BY 2050: Carbon neutrality (2030 Plan for a Green Economy)

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

2 – Average 2020 auction settlement price

ETS Size

COVERED EMISSIONS

60.3 MtCO₂e

(Verified emissions 2018)

GHGs COVERED

CO₂, CH₄, N₂O, SF₆, HFCs, PFCs, NO₃, and other fluorinated GHGs

SECTORS AND THRESHOLDS

FIRST COMPLIANCE PERIOD (2013–2014): electricity, industry

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

INCLUSION THRESHOLDS: >25,000 tCO₂e/year. As of 2016, fuel distributors that distributed 200L or more of fuel (in 2015) are also subject to inclusion, even if the combustion of their fuel resulted in emissions of less than 25,000 tCO₂e.

VOLUNTARY EMITTERS (OPT-IN COVERED ENTITIES): Since 2019, emitters from capped sectors that have reported emissions between 10,000 tCO₂e/year and 25,000 tCO₂e/year may voluntarily register with the cap-and-trade system as a covered entity. If their production activity is eligible, they may receive free allocation.



POINT OF REGULATION

Mixed

NUMBER OF ENTITIES

150 facilities (104 industrial facilities and 46 fuel distributors)⁴ (2019)

CAP

FIRST COMPLIANCE PERIOD (2013–2014): The system started in 2013 with a cap of 23.2 MtCO₂e.

SECOND COMPLIANCE PERIOD (2015–2017): With the program expanding to include fuel distribution, the cap rose to 65.3 MtCO₂e in 2015. The cap declined to 61 MtCO₂e in 2017, an average of 3.2% per year.

THIRD COMPLIANCE PERIOD (2018–2020): The cap in the third compliance period started at 59 MtCO₂e and declined at an average annual rate of 3.5% to 54.7 MtCO₂e in 2020.

FOURTH COMPLIANCE PERIOD (2021–2023) AND BEYOND:

After a slight nominal increase in the cap in 2021 due to an adjustment of the global warming potential of different GHGs, the cap will be reduced annually by about 2.2% on average until 2030. This will result in a cap of 44.14 million tCO₂e 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” section). A cap trajectory until 2030 has been set (see “Cap” section). Allowances are allocated and auctioned with calendar vintage years.

ALLOCATION

Allowances—referred to as “emission units” in Québec’s cap-and-trade regulations—are distributed via auction and free allocation.

FREE ALLOCATION: Emission-intensive, trade-exposed (EITE) sectors receive a portion of free allowances because they are considered vulnerable to carbon leakage. Eligible sectors include aluminum, lime, cement, chemical and petrochemicals, metallurgy, mining and pelletizing, pulp and paper, petroleum refining, and others (manufacturers of glass containers, gypsum products, and some agro-food products). Electricity producers with a fixed-price sales contract signed before 2008 that does not allow price adjustments to take into account a carbon cost are also eligible to receive

free allowances. The amount of free allocation issued is generally determined by: recent levels of production or consumption of raw materials (depending on the reference unit for the sector); a declining intensity target based on historic averages, depending on the type of emissions (e.g., fixed process, combustion, and other, mainly fugitive emissions); and an assistance factor.

Until 2020, the assistance factors for all EITE sectors were set at 100%. For the 2021–2023 period, assistance factors for industrial activities have been determined based on trade exposure and emissions intensity. These metrics were used to group the industrial sector’s carbon leakage risk into three categories (low, medium, and high), with assistance factors of 90%, 95%, and 100% respectively. An assistance factor of 60% applies for off-site electricity and steam production for producers with fixed-price sales contracts signed before 2008 that were referenced above.

³ – Includes an adjustment to account for differences between verified ETS emissions and the GHG inventory methodology.

⁴ – 115 registered entities, but some entities operate more than one facility. These entities represent 150 emitting facilities.

The rules on free allocation for entities that voluntarily opt into the cap-and-trade system are the same as those for regulated entities.

AUCTIONING: Electricity and fuel distributors must buy 100% of their allowances, with some narrow exceptions (e.g., on contracts prior to 2008 that have not been renewed or extended). Allowances are auctioned quarterly.

Allowances that remain unsold after an auction may be offered for sale again later when the price at two consecutive auctions settles above the minimum price.

In 2019, about 67% of allowances were allocated by auction or directed to reserves. About 33% of allowances were allocated for free.

Flexibility

BANKING AND BORROWING

Banking is allowed, but the emitter is subject to the general holding limit on allowances to which all entities in the system are held. The holding limit declines based on the year's annual allowance budget.

While borrowing is not allowed, 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.

OFFSETS AND CREDITS

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

QUALITATIVE LIMIT: Currently, Québec's offset program has five offset protocols:

- CH₄ destruction from covered manure storage facilities;
- CH₄ destruction from landfill sites;
- Destruction of ozone-depleting substances contained in insulating foam or used as refrigerant gases removed from domestic appliances in Canada;
- CH₄ destruction from drainage systems at active coal mines; and
- CH₄ destruction from ventilation systems of active underground coal mines.

Québec has developed an offset protocol for afforestation and reforestation projects in private lands in the province, which is expected to be finalized and adopted in 2021. In addition, Québec is working to assess or develop other new protocols in order to increase offset supply, some of which may also be adopted in 2021, including biomethanation, fuel switching in the marine transport sector, conversion of refrigeration systems, and improvements in the application of agricultural fertilizers.

Québec offset credits are recognized as compliance instruments by jurisdictions linked with Québec, and similarly for offset credits issued by linked jurisdictions.

Québec offset credits are 100% guaranteed. This means that in cases where offset credits issued for a project are later

deemed illegitimate by the regulator, the offset promoter is required 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 funded by the automatic withholding of 3% of issued offset credits from all offset projects.

MARKET STABILITY PROVISIONS

AUCTION RESERVE PRICE: The auction reserve price sets the minimum price at which allowances are available at auction and increases annually by 5% plus inflation. It is set at CAD 17.36 (USD 12.94) for Québec and USD 17.71 for California in 2021. For joint auctions with California in 2021, the highest value in USD between Québec's or California's auction reserve prices, 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.

RESERVE ACCOUNT: Québec maintains an allowance reserve to adjust levels of free allocation and sell to entities that do not have enough allowances to cover their obligations ("sales by mutual agreement"). The reserve is filled with set portions of the annual cap (4% for 2021 and beyond).

Sales by mutual agreement are held a maximum of four times per year at three price categories that contain an equal share of allowances on offer. Only covered entities in Québec are eligible to purchase allowances from the reserve, and only if they do not have valid compliance instruments for the current period in their general account.

In December 2020, Québec amended the prices of its three tiers to more closely align with California. For 2021, the prices of the three tiers are CAD 41.40 (USD 30.87), CAD 53.20 (USD 39.67), and CAD 65 (USD 48.47). However, if California has set higher prices per allowance for a corresponding category, Québec allowances would be sold at the highest of the prices of both jurisdictions according to the daily average exchange rate of the Bank of Canada published on its website on the day preceding the sale. Unlike California, the highest tier will not act as a price ceiling for Québec. Reserve prices increase annually by 5% plus inflation.

Compliance

COMPLIANCE PERIOD

FIRST COMPLIANCE PERIOD: 2013–2014

SUBSEQUENT COMPLIANCE PERIODS: Three calendar years (2015–2017, 2018–2020, 2021–2023, and so forth)

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

MRV

REPORTING FREQUENCY: Annually

VERIFICATION: All covered entities in the program require independent third-party verification of emissions reports.

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

ENFORCEMENT

A covered entity that fails to cover its 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 of the Environment and the Fight against Climate Change.

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.

For noncompliance, entities can be fined CAD 3,000–500,000 (USD 2,237–372,814) and spend up to 18 months in jail in the case of a natural person, and CAD 10,000–3,000,000 (USD 7,456–2,236,882) 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 allowance allocation to any noncompliant emitter.

Linking

LINKS WITH OTHER SYSTEMS

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

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), Carbon Market Division

EVALUATION/ETS REVIEW

The regulation is adjusted almost annually to implement changes and, when necessary, maintain harmonization with linked jurisdiction.

USE OF REVENUES

Since the beginning of the program: CAD 4.54 billion (USD 3.39 billion).

Collected in 2020: CAD 689.9 million (USD 514.4 million).

All auction revenues go to the Electrification and Climate Change Fund (formerly the Québec Green Fund), which funds mitigation measures that include energy efficiency, electrification (Québec's electricity is 99.7% renewable), and public transport. Bill 44, passed by the National Assembly of Québec in 2020, renamed the Green Fund the Electrification and Climate Change Fund, devotes it entirely to climate action, and brings it fully under the direction of the Ministry of the Environment and the Fight against Climate Change.

IMPLEMENTING LEGISLATION

[Regulation respecting a cap-and-trade system for greenhouse gas emission allowances](#)⁵
[Amendments are listed and linked on the site of the Ministry of the Environment and the Fight Against Climate Change](#)⁶
[Environment Quality Act](#)⁷

5 – <http://legisquebec.gouv.qc.ca/en/ShowDoc/cr/Q-2,%20r:%2046.1>

6 – <http://www.environnement.gouv.qc.ca/changements/carbone/documentation-en.htm#regulations>

7 – <http://legisquebec.gouv.qc.ca/en/ShowDoc/cs/Q-2/>



REGIONAL GREENHOUSE GAS INITIATIVE

In force

Under development

Under consideration

SECTORS:



POWER

MEMBER STATES:

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

→
First mandatory GHG ETS in the US

Since 2012, two program reviews tightened cap

A third program review will commence in 2021

New Jersey began participation in RGGI again in 2020; Virginia began participation in 2021; Pennsylvania expected to begin participation in 2022

CAP 119.8 million short tons CO ₂ / 108.9 MtCO ₂ (2021) ¹	GASES CO ₂ only	OFFSETS AND CREDITS Domestic (within RGGI states only)
ALLOCATION Auctioning	AVERAGE 2020 PRICE USD 7.06	TOTAL REVENUE USD 3.8 billion since beginning of program, USD 416.3 million collected in 2020

ETS DESCRIPTION

The Regional Greenhouse Gas Initiative (RGGI) is the first mandatory GHG ETS in the United States and covers emissions from the power sector. The system started operating in 2009 with 10 states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont). Its development was based on the '2005 RGGI Memorandum of Understanding' (MOU) and on the '2006 RGGI Model Rule.' Through statutes or regulations based on the Model Rule, each state then established individual CO₂ budget trading programs. New Jersey began participation in RGGI again in 2020 and Virginia began participation in 2021. Currently, Pennsylvania is looking into RGGI participation in 2022.

RGGI has gone through two review processes to date, which resulted in updating of the Model Rule and enshrined tighter caps and adjustments to system design. Between 2021 and 2030, the RGGI cap will reduce by 30% compared to 2020. Furthermore, an emissions containment reserve (ECR) started operating in 2021. The ECR is an automatic adjustment mechanism that will adjust the cap downward in the face of lower-than-expected costs.

YEAR IN REVIEW

Upon finalization of the '2017 Model Rule,' the proposed post-2020 cap-and-trade regulations were adopted by each RGGI state according to its own regulatory processes over the course of 2019 and 2020.

Virginia began participation in RGGI as of January 2021 after final legislation for establishing an ETS and participating in RGGI was adopted in February 2020. The state had started regulatory processes to participate in RGGI in 2018 and adopted final regulations in April 2019. However, provisions added to the 2019 Budget Act by the Republican legislative majority prevented Virginia from joining RGGI in 2020. After legislative majorities shifted following the November 2019 elections, cap-and-trade legislation was introduced by the new Democratic majority in 2020.

Pennsylvania is also in the process of establishing a power sector ETS and possibly participating in the RGGI program. In January 2020, Pennsylvania released a first draft proposal followed by a final ETS proposal in September 2020. A final proposal could be presented later in 2021, while the earliest start date for Pennsylvania's ETS and its linkage to RGGI would be 2022 (see Pennsylvania factsheet).

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 564.3 MtCO₂e (2017)²

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Electric Power 104.1 (18%)
Industrial Processes 39.8 (7%)
Transportation 275.9 (49%)
Commercial 59.7 (11%)
Residential 84.7 (15%)

GHG REDUCTION TARGETS

BY 2030: By adopting the '2017 Model Rule,' RGGI states have committed to implement a reduction of 30% of power sector emissions compared to the 2020 CO₂ emissions cap (2017 Model Rule)

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

¹ - The RGGI states will adjust the 2021 through 2025 caps based upon the quantity of privately held allowances (the bank) as of March 15, 2021.

² - GHG emissions reported here are based on energy-related emissions data only and retrieved from the International Energy Agency (IEA). Energy-related CO₂ emissions refer to emissions released at the location where fossil fuels are consumed.

ETS Size

COVERED EMISSIONS

58.5 MtCO₂e

(Verified emissions 2017)



GHGs COVERED

CO₂ only

SECTORS AND THRESHOLDS

Fossil Fuel Electric Generating Units

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

POINT OF REGULATION

Downstream (at installation level)

NUMBER OF ENTITIES

203 sources (November 2020)

CAP

The RGGI cap was 188 million short tons CO₂ per year in the 2009–2011 period. It was 165 million short tons CO₂ per year for the 2012–2014 period (nine states participating), with

a 2.5% annual reduction factor from 2015 through 2018, totaling a 10% reduction between 2015 and 2018. However, by 2012, verified 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. Also, the RGGI states had adjusted the caps between 2014 and 2020 to account for banked CO₂ allowances accumulated in the first and second control periods.

The resulting 2020 cap was 74.3 million short tons/67.4 MtCO₂ including the 18 million short tons/16.3 MtCO₂ cap of 2020 RGGI entrant New Jersey.

The 2021 unadjusted cap is 119.8 million short tons/108.9 MtCO₂ including the 27.2 million short tons/24.7 MtCO₂ cap of new RGGI entrant Virginia. Following 2017 Model Rule amendments, a third adjustment of banked allowances will be made over a five-year period (2021–2025) based on the size of the bank as of 15 March 2021. The reduction factor between 2021 and 2030 as set out in the ‘2017 Model Rule’ is about 3% of the 2020 cap (2.275 million short tons), resulting in a 2030 regional cap of 86.9 million short tons/70.0 MtCO₂.

Phases & Allocation

TRADING PERIODS

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

FIRST CONTROL PERIOD: 2009–2011

SECOND CONTROL PERIOD: 2012–2014

THIRD CONTROL PERIOD: 2015–2017

FOURTH CONTROL PERIOD: 2018–2020

FIFTH CONTROL PERIOD: 2021–2023

Since the third control period, RGGI operates with interim control periods (see “Compliance Period” section).

ALLOCATION

CO₂ allowances issued by each RGGI state are distributed through quarterly regional CO₂ allowance auctions. Auctions are open to all parties with financial security, with a maximum bid of 25% of auctioned allowances per quarterly auction.

Flexibility

BANKING AND BORROWING

Banking of allowances is allowed without restrictions, but regulations include adjustments to the cap to address the aggregate bank. This means that the amount of allowances available for auctions in future years is reduced by the amount of allowances not used for compliance in previous control periods (see also “Cap” section).

Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: 3.3% of an entity’s liability may be covered with offsets. This share will remain the same between 2021 and 2030.

QUALITATIVE LIMIT: Currently, the program allows offset allowances from three 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.

Some states have discontinued specific offset protocols, but all states accept offset allowances issued by any participating state. To date, only one offset project (on landfill methane capture and destruction) has been approved under RGGI.

MARKET STABILITY PROVISIONS

AUCTION PRICE FLOOR: USD 2.38 per short ton in 2021, increasing by 2.5% per year (to reflect inflation).

RESERVES: Since 2014, RGGI has operated with a cost containment reserve (CCR), consisting of a quantity of allowances in addition to the cap which are held in reserve and only released to the market when certain trigger prices are reached. Beginning in 2021, allowances provided within the CCR will be equal to 10% of the regional cap.

Trigger price: USD 13.00 in 2021 (increasing by 7% annually compared to the previous year thereafter; having increased at 2.5% annually starting from USD 10 between 2017 and 2020).

In 2021, RGGI started implementing an emissions containment reserve (ECR). Under the ECR, allowances are withheld from auction if certain trigger prices are reached, up to an annual withholding limit of 10% of the emission budgets (i.e., the share of each state in the regional cap) of participating states. Allowances withheld will not be re-offered for sale, effectively adjusting the cap downward. In 2021, the trigger price is set at USD6, increasing by 7% compared to the previous year thereafter. Maine and New Hampshire are not participating in the ECR.

Compliance

COMPLIANCE PERIOD

Three years

Compliance is evaluated at the end of each three-year control period. From the third control period, regulated entities must surrender allowances corresponding to 50% of their verified emissions in each of the first two years of a control period. They must cover 100% of the remaining allowances at the end of the three-year control period.

MRV

REPORTING FREQUENCY: Quarterly

VERIFICATION: Emission data reports and their underlying data are required to undergo periodic quality assurance and quality control procedures in accordance with US EPA regulations.

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 CO₂ 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 CO₂ Allowance Tracking System (RGGI COATS), which is publicly available.

ENFORCEMENT

In case of excess emissions (i.e., if entities are found to not surrender all required allowances), allowances for three times the amount of excess emissions must be surrendered. Furthermore, covered entities may also be subject to specific penalties imposed by the RGGI state where the entity is located.

Other Information

INSTITUTIONS INVOLVED

Statutory and/or regulatory authority of each RGGI state. Environmental and energy agencies for each state participate. 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. The next program review is scheduled to begin in 2021.

USE OF REVENUES

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

IMPLEMENTING LEGISLATION/REGULATION

[2017 RGGI Model Rule](#)³
[2017 RGGI Model Rule Updates \(Summary\)](#)⁴
[RGGI States' Statutes & Regulations](#)⁵
[RGGI Program Design](#)⁶

3 - https://www.rggi.org/sites/default/files/Uploads/Program-Review/12-19-2017/Model_Rule_2017_12_19.pdf

4 - https://www.rggi.org/sites/default/files/Uploads/Program-Review/12-19-2017/Summary_Model_Rule_Updates.pdf

5 - <https://www.rggi.org/program-overview-and-design/state-regulations>

6 - <https://www.rggi.org/program-overview-and-design/elements>

TRANSPORTATION AND CLIMATE INITIATIVE

Transportation and Climate Initiative Program (TCI-P)



The Transportation and Climate Initiative (TCI) is a regional collaboration of northeastern and mid-Atlantic US jurisdictions pursuing a goal of reducing GHG emissions from the transportation sector and minimizing the transportation system's reliance on high-carbon fuels. In December 2018, a subset of the participating TCI jurisdictions announced the future design of a regional low-carbon transportation policy proposal, which aims to establish a carbon pricing mechanism in the form of a cap-and-invest program. The announcement of such a program is the result of several years of consultations and negotiations amongst TCI members.

Over the course of 2019, TCI jurisdictions engaged in expert and public stakeholder consultations, as well as technical, environmental, and economic analyses of the benefits and costs of a regional transportation carbon pricing mechanism. As a result of this design process, in October 2019 the jurisdictions released a draft framework outlining basic design features of the regional transportation sector cap-and-invest program. In December 2019, the jurisdictions released a draft memorandum of understanding (MOU) consistent with the design features from the draft framework and announced modeling results for different cap reduction factors.

The final MOU, along with an 'Elements of Program Design' document, was released in December 2020 and is largely based on the draft MOU. As of February 2021, Massachusetts, Connecticut, Rhode Island, and Washington D.C. have signed the final MOU and will participate in the established cap-and-invest program, the Transportation and Climate Initiative Program (TCI-P). The TCI-P will consist of individual programs adopted and implemented under the independent legal authority of each signatory jurisdiction. The program implementation schedule of the final MOU foresees that the first three-year compliance period will begin in January 2023, with emissions reporting beginning in 2022.

According to the MOU, the program will cap CO₂ emissions from the combustion of gasoline and on-road diesel fuel in the participating states. Compliance obligations fall upstream, to firms that supply the covered fuels within these states. The four signatory jurisdictions of the TCI-P MOU will start with a cap of 42.1 MtCO₂ in 2023 that would decline by 30% by 2032. The cap will be equal to the sum of the four TCI-P jurisdictions' CO₂ emissions budgets (Connecticut: 13.5 MtCO₂; Massachusetts: 24.5 MtCO₂; Rhode Island: 3.3 MtCO₂; Washington D.C.: 0.9 MtCO₂).

The program intends to auction nearly 100% of its allowances, with revenues being returned to TCI-P jurisdictions. Each state can invest the revenue as determined appropriate to achieve TCI program goals; however, at least 35% of revenues generated are to be invested in equitable, less-polluting, and more resilient transportation. Each signatory jurisdiction will establish a representative Equity Advisory Body, specifically designated to ensure that the program impacts are effective and just, and that both the policies and flow of investment are transparent.

The program will also implement a minimum reserve price and include a Cost Containment Reserve (CCR) with a trigger price of USD 12 in 2023 and an Emissions Containment Reserve (ECR) with a trigger price of USD 6.50 in 2023. Banking of allowances will be allowed without restrictions and a limited use of offsets will be permitted.

In addition, the MOU introduced three-year compliance periods and interim compliance obligations, as well as a program evaluation three years after program launch (and regularly thereafter). An administrative organization to provide administrative support and technical assistance will be established. Further program design features such as specifications on eligible offset projects and the price level for the minimum reserve price are yet to be decided upon.

As next steps, the TCI-P jurisdictions will: provide for public review and input; develop a model rule; and conduct rulemaking processes over the course of 2021 to adopt regulations on the state level and start implementing the program by the 2022 reporting year.

A joint statement released by 12 jurisdictions (Delaware, Maryland, New Jersey, New York, North Carolina, Pennsylvania, Vermont, Virginia, and the four MOU jurisdictions) reiterates their commitment to collaborating with one another on the further development of the program. Other states will also have the opportunity to join the TCI-P in the future.

In force

Under development

Under consideration

MEMBER STATES:

Massachusetts; Connecticut; Rhode Island; Washington, D.C.

Regional collaboration to reduce transportation sector GHG emissions

Final MOU on design elements for ETS finalized in December 2020

ETS compliance obligation starting as early as 2023

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 110.0 MtCO₂e (2017)¹

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Electric Power 19.3 (18%)
Industrial Processes 5.5 (5%)
Transportation 50.9 (46%)
Commercial 13.1 (12%)
Residential 21.3 (19%)

IMPLEMENTING LEGISLATION/REGULATION

Final Memorandum of Understanding²

Elements of Program Design³

1 – GHG emissions reported here are based on energy related emissions data only and retrieved from the IEA. Energy-related CO₂ emissions refer to emissions released at the location where fossil fuels are consumed.

2 – <https://www.transportationandclimate.org/sites/default/files/TCI%20MOU%2012.2020.pdf>

3 – https://www.transportationandclimate.org/sites/default/files/TCI-P_EPD_12-21-2020.pdf

WASHINGTON



 *In force*

 *Under development*

 *Under consideration*

← *Governor introduced a climate policy proposal that includes a cap-and-trade program for industry*

Legislator introduced bill aligned with proposal for cap-and-trade program covering industry, energy, and fuel suppliers

Auction proceeds would be invested in mitigation, environmental justice, and climate resilience

The State of Washington continues to pursue carbon pricing policies through its legislature and executive agencies.

In December 2020, Governor Jay Inslee introduced the ‘Climate Commitment Act,’ a bill proposing to create a comprehensive climate program across Washington. Amongst other measures, the bill would establish an economy-wide limit on GHG emissions. It would also authorize the Department of Ecology to administer a cap-and-trade program that ensures industries comply through the sale, tracking, and accounting of emissions allowances.

In January of 2021, Washington state legislators sponsored ‘the Climate Commitment Act’ bill, building on Governor Inslee’s climate program. Titled SB-5126, the bill is modeled on the Western Climate Initiative (WCI) and directs the Department of Ecology to administer an economy-wide cap-and-trade program by January 2023. The bill aligns with Washington’s statutory emissions limits of 50 million tonnes of CO₂e in 2030, 27 million tonnes of CO₂e in 2040, and 5 million tonnes of CO₂e in 2050.

The program would cover transportation fuel suppliers, in-state power generators, and stationary facilities that emit equal to or more than 25,000 tCO₂e per year as well as electricity importers and natural gas suppliers whose electricity consumption corresponds to more than 25,000 tCO₂e per year. Uncovered entities that wish to participate in the program could do so by registering as an opt-in entity or as a general participant.

The Department of Ecology would adopt annual allowance budgets for the program on a calendar year basis. Allowances would be distributed through a combination of auctions and free allocation. A maximum of four auctions would take place annually in addition to any necessary reserve auctions. In the program’s first compliance period, emissions-intensive trade-exposed (EITE) entities would receive 90% of their allowances for free in 2023, declining by five percentage points annually to 75% in 2026. The Department of Ecology would have to adopt EITE allocation rules for the second compliance period by July 2024. Some power generators will receive free allocation during the first compliance period; however, these allowances must be consigned to auction for the benefit of ratepayers. Natural gas utilities would receive full free allocation during the course of the cap-and-trade program; however, these allowances must also be consigned to auction.

The bill also outlines market stability measures, specifically an emissions containment reserve (ECR), an auction floor price with a schedule for the floor price to increase

by a predetermined amount each year, and an allowance containment reserve. Only covered and opt-in entities will be able to participate in the auction of allowances from the allowance containment reserve.

The bill also includes provisions for offset protocols. Offset projects must be located in the US or in a jurisdiction with which the Department of Ecology has entered into a linking agreement; result in GHG reductions or removals; and be certified by a recognized registry. The bill also enables the Department of Ecology to pursue links with other jurisdictions that have established an allowance-based GHG reduction programs.

Additionally, SB 5126 states that the Department of Ecology would have to:

- complete an evaluation of the program’s performance by December 2035 to ensure the program is on track to achieve 2040 emissions reductions; and
- complete another evaluation by December 2045 to ensure the program is on track to achieve 2050 emission reductions.

Finally, the bill asserts that proceeds from the sale of emissions allowances would be directed to a new climate investment account. The funds from the account would be put towards clean transportation, natural climate resilience solutions, clean energy transition, and assistance and emissions reduction projects. An environmental justice and equity advisory panel would recommend plans and funding proposals for programs to be funded by the climate investment account. Funding proposals would need to undergo an environmental justice analysis to ensure they are being directed towards eliminating environmental harm as well as economic and health disparities for vulnerable populations.

The bill is being deliberated in the Washington Senate Committee on Environment, Energy, and Technology. The legislative session for 2021 ends on 25 April.

Carbon pricing policies, including a proposed cap-and-trade program, have repeatedly come before the legislature, and failed in two state referenda. Laws establishing steep emissions reduction targets successfully passed in the 2019 session, but no carbon pricing measures were approved. The most recent cap-and-trade program proposal, Senate Bill 5981, would have established a cap-and-trade program modeled after WCI. The Senate bill and other carbon pricing measures were debated in the 2020 legislative session but did not pass the legislature.

The 'Clean Air Rule' (CAR)—a baseline-and-credit system that reduces emissions from industrial sources, petroleum fuel producers and importers, and natural gas distributors—was

suspended by legal challenges before it could be implemented in 2020.

Background Information

GHG REDUCTION TARGETS

OVERALL GHG EMISSIONS (excluding LULUCF) 99.6 MtCO₂e (2018)



Electricity 16.2 (16%)
Residential/Commercial/Industrial (RCI) Fuels 23.3 (23%)
Fossil Fuel Industry 0.8 (1%)
Industrial Processes 5.4 (5%)
Transportation 44.7 (45%)
Agriculture 6.7 (7%)
Waste Management 2.4 (2%)

BY 2030: 45% reduction from 1990 GHG levels (RCW 70A.45.020)

BY 2040: 70% reduction from 1990 GHG levels (RCW 70A.45.020)

BY 2050: Reduction of total GHG emissions to 95% below 1990 levels and achievement of net-zero emissions (RCW 70A.45.020)

Other Information

INSTITUTIONS INVOLVED

Washington Department of Ecology
Office of Governor Jay Inslee

IMPLEMENTING LEGISLATION/REGULATION

Governor Inslee's Climate Commitment Act¹
Senate Bill 5126 (SB 5126)²
Senate Bill 5981 (SB 5981)³
Clean Air Rule⁴

1 - <https://www.governor.wa.gov/sites/default/files/ClimateBrief-Dec2020.pdf>

2 - [http://lawfilesexternal.leg.wa.gov/biennium/2021-22/Pdf/Bills/Senate Bills/5126.pdf?q=20210202081928](http://lawfilesexternal.leg.wa.gov/biennium/2021-22/Pdf/Bills/Senate%20Bills/5126.pdf?q=20210202081928)

3 - [http://lawfilesexternal.leg.wa.gov/biennium/2017-18/Pdf/Bills/Senate Bills/5981.pdf?q=20210203015011](http://lawfilesexternal.leg.wa.gov/biennium/2017-18/Pdf/Bills/Senate%20Bills/5981.pdf?q=20210203015011)

4 - <https://apps.leg.wa.gov/WAC/default.aspx?cite=173-442&full=true&pdf=true>

WESTERN CLIMATE INITIATIVE

The Western Climate Initiative (WCI) was originally an initiative of American state and Canadian provincial governments, 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 in 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 in 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 support the member jurisdictions in implementing 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. Current participating jurisdictions are California, Québec, and Nova Scotia.

LATIN AMERICA AND THE CARIBBEAN





BRAZIL

In force

Under development

Under consideration

→
Considering the design of an ETS

Trades in RenovaBio credits began in June 2020

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

As part of its activities under the PMR, the Brazilian government carried out studies on the possible implementation of market instruments to meet Brazil's mitigation targets and reduce overall mitigation costs. This included the development of design options, economic and regulatory impact assessments, as well as an analysis of potential interactions between carbon pricing instruments and existing policies. The country is currently considering adhering to the Partnership for Market Implementation.

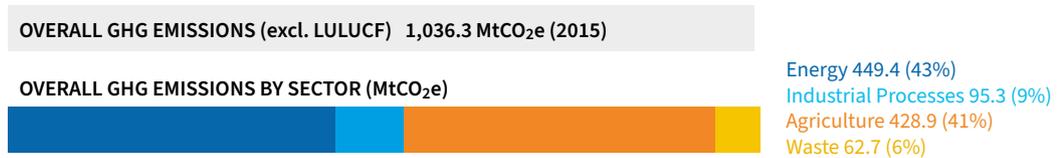
In addition, the Ministry of Economy is strengthening the understanding of carbon pricing instruments among stakeholders through engagement, communication, and consultation. The Market Readiness Project team in Brazil, for example, engaged in talks with representatives of the private sector that support the carbon pricing agenda in Brazil, as well as representatives from civil society organizations.

Work in this area also continues through other international cooperation activities, such as through the Climate Change Policies Program (PoMuC) with the German Corporation for International Cooperation (GIZ).

Since 2013, a group of leading companies has been participating in a voluntary ETS simulation to gain experience and develop proposals for an ETS in Brazil. The ETS simulation is coordinated by the Centro de Estudos em Sustentabilidade da Fundação Getulio Vargas. In 2020, trading was undertaken using the CarbonSim simulation platform.

RenovaBio, the National Policy for Biofuels, was approved in 2017 (Federal Law 13.576), establishing mandatory goals for the purchase of biofuels by fuel distributors. To achieve the targets, distributors must purchase specified volumes of certificates (CBIO), which represent emissions reductions related to the substitution of fossil fuels by biofuels. Trades in CBIOs began in June 2020, and public consultations are ongoing both on annual GHG reduction goals under the program as well as other design features.

Background Information



GHG REDUCTION TARGETS

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

BY 2030: 43% reduction from 2005 GHG levels (updated NDC)

Other Information

INSTITUTIONS INVOLVED

- Ministry of Environment
- Ministry of Economy (previously Ministry of Finance)
- Ministry of Mines and Energy
- Ministry of Science, Technology and Innovation

CHILE



- In force
- Under development
- Under consideration

Since 2013, Chile has been conducting a series of studies and discussions on the design and implementation of carbon pricing instruments in the country.

The tax reform of 2014 introduced green taxes for some mobile and stationary emission sources. In this context, a carbon tax has been in place in Chile since 2017; the tax was reformed in February 2020. In its updated form, the rate of USD 5 per tCO₂ applies to stationary emission sources that emit more than 25,000 tCO₂ and/or 100 tonnes of particulate matter due to combustion processes per year. The same reform contemplates the possibility for the regulated entities to offset part or all of their emissions subject to the tax with mitigation projects that reduce the same emissions, subject to that mitigation being additional, measurable, verifiable, and permanent. The Chilean government is currently working on developing the offset regulation, which is to be presented to the Council of Ministers of Sustainable Development in 2021. Offsets, their threshold limits, and their transactions are expected to be operational in 2023.

The Chilean Ministry of Environment is leading the development of a 'Framework Law on Climate Change.' The draft underwent a public consultation process and high-level approval by the Council of Ministers for Sustainability in 2019 and was sent for Congress approval in January of 2020. In August 2020, it was unanimously approved in general terms by the Senate and is currently being discussed in particular terms by the same chamber. The draft bill sets a carbon neutrality goal by 2050, alongside a detailed governance framework to reach it.

Also, the draft Framework Law defines a system in which the Ministry of Environment would establish GHG emis-

sions limits to individual or groups of emitting sources (in tCO₂e/year). The surplus in the fulfilment of the emission limits would be certified as an emission reduction by the Ministry of the Environment, and regulated entities would in turn be able to sell this surplus. The specific design of the system of GHG emissions limits is not yet defined, and could be implemented either as an ETS or as a tradable performance standard. The law also would allow regulated entities to implement mitigation projects and use the certified reductions to either achieve the standard or transfer those reductions to third parties. A dedicated registry would track the projects and the transfers.

In 2020, an Interministerial Task Force on Article 6 was created. This Task Force is composed of the Ministry of Environment, Ministry of Foreign Affairs, Ministry of Finance, Ministry of Energy, and Ministry of Agriculture. It aims to coordinate the work related to the development of a national policy on the use of Article 6 and international collaboration on this subject.

Chile is set to continue its cooperation with the World Bank. In the context of the transition period from the Partnership for Market Readiness (PMR) to the Partnership for Market Implementation (PMI), work is expected to focus on a roadmap for implementing the changes to the carbon tax, as well as on deepening the understanding of the role of carbon pricing in carbon neutrality, including the development of the system contained in the draft climate change law. Chile also joined the Warehouse Initiative of the World Bank with the aim of developing a GHG mitigation portfolio of energy projects, and is engaging in activities as part of the Climate Market Club, an initiative which supports countries in the development of Article 6 pilots to share lessons from a practical experience.

← Provisions for a system of GHG emissions limits contained in the draft Framework Law on Climate Change

Updated NDC submitted in April 2020

Offset regulations currently under development

National policy on the use of Article 6 currently under development

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 112.31 MtCO₂e (2018)



Energy 87.0 (77%)
 Industrial Processes 6.6 (6%)
 Agriculture 11.8 (11%)
 Waste 7.0 (6%)

GHG REDUCTION TARGETS

BY 2025: Peak GHG emissions (updated NDC)
BY 2030: GHG emissions level of 95 MtCO₂e. Reduction of at least 25% of total emissions of black carbon, as compared to 2016. Carbon budget 1.100 MtCO₂e between 2020 and 2030 (updated NDC)

Compliance

MRV

The current GHG MRV system serves primarily the implementation of the carbon tax. Current regulations determine that operators of boilers and turbines of 50 MW or more of thermal capacity are required to monitor and report emissions through government-approved methodologies. Participation thresholds have been changed by the approved tax reform. With these changes, the carbon tax will apply to entities that emit more than 25,000 tCO₂ and/or 100 tonnes of particulate matter due to combustion processes per year from 2023 onwards. Current methodologies are expected to be updated in the future to incorporate all possible regulated fixed sources.

The Chilean government has developed a Unified Atmospheric Emissions Report (Reporte Único de Emisiones Atmosféricas) under the Pollutant Release and Transfer Register for entities regulated under the tax and other norms. This has unified various reporting needs and aims to improve the quality of

the information provided. This new system, developed with support from the PMR, is considered as a basis for Chile to advance to the development of a Unified GHG Report, which will help evaluate Chile's National Climate Policy.

Also, a National Mitigation Actions Registry (Registro Nacional de Acciones de Mitigación–RENAMI) is being developed. This registry will allow the implementation of the offset scheme approved in the carbon tax reform and would constitute a key element for other instruments under consideration, such as the scheme proposed in Framework Law on Climate Change or Article 6 of the Paris Agreement.

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

Other Information

INSTITUTIONS INVOLVED

Ministry of Energy
Ministry of Environment
Ministry of Finance
Ministry of Foreign Affairs
Ministry of Agriculture
Inter-Ministerial Committee on Climate Change
PMR Chile (Precio al Carbono Chile)

COLOMBIA



In force

Under development

Under consideration

← Initial work on ETS design conducted in 2020

ETS pilot phase expected to start in 2023–2024

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]).

The law outlines the basic provisions for the PNCTE. The Ministry of Environment and Sustainable Development (Minambiente) will determine the number of allowances, in line with Colombia's national mitigation targets. Minambiente is also in charge of allocation, which will take place primarily via auctions. 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 and will be used for GHG reductions and mitigation projects, as well as to manage the information needed for the implementation of the law. The bill also includes crediting provisions: voluntary actions of non-regulated entities that generate GHG emissions reductions or removals could be issued allowances if they are verified, certified, registered in the National Emission Reductions

Registry (Registro nacional de reducción de emisiones de GEI–Renare), and deemed eligible for the program.

Further regulations required to operationalize the PNCTE are yet to be finalized. With support from the Partnership for Market Readiness, Colombia now has the main inputs to inform the technical design of the ETS. These inputs are currently under internal revision. Public discussions on the policy will then follow, as well as the development of the system infrastructure, such as an emissions reporting program. The final regulations for the ETS are expected to be concluded, and a pilot phase expected to start between 2023 and 2024.

The PNCTE will complement other mitigation instruments, such as the country's existing USD 5 carbon tax and its offsetting program, both of which have been in place since 2017. The 2018 Climate Change Law states that the government may recognize carbon tax payments as part of the compliance obligation of regulated entities under the PNCTE.

Background Information

OVERALL GHG EMISSIONS (excluding category "3B Land") 150.6 MtCO₂e (2014)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



GHG REDUCTION TARGETS

BY 2022: Accumulated reduction of GHG emissions of 36 MtCO₂e, with respect to the national reference scenario, between 2018 and 2022 (aspirational, National Development Plan 2018–2022)

BY 2023: Determine a carbon budget for the 2020–2030 period (updated NDC)

BY 2030: Reduce GHG emissions by 51% compared to BAU emissions by 2030. Reduce black carbon emissions by 40% compared to 2014 (updated 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

IMPLEMENTING LEGISLATION/REGULATION

Ley 1931 de 2018²

1 – Colombia uses the sectors defined in the latest IPCC guidelines (2006 IPCC Guidelines for National Greenhouse Gas Inventories) for the preparation of its inventory, in which the Agriculture and the LULUCF sectors are integrated into "Agriculture, Forestry and Other Land Use." In an effort to make the display of overall GHG emissions comparable with other jurisdictions, the figure shown here excludes the category "3B Land," but includes the categories "3A Livestock" and "3C Aggregate sources and non-CO₂ emissions sources on land."

2 – <https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=87765>



MEXICO

Mexican Emissions Trading System Pilot Program

In force

Under development

Under consideration

CAP 273.1 MtCO ₂ (2021)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic ¹
ALLOCATION Free allocation: Grandparenting		

SECTORS:



POWER



INDUSTRY

→
First ETS in operation
in Latin America

Pilot phase
implemented in 2020

Covers energy and
industry sectors,
which constitute 40%
of national emissions

ETS DESCRIPTION

The Mexican Pilot ETS started operating in January 2020. It was mandated by Transitional Article 2 of the ‘General Law on Climate Change’ (as amended in July 2018) and is regulated by implementing regulation finalized in 2019. The Pilot ETS will help test system design and will run for two years, plus one year of transition to the full operational ETS. It aims to enhance the quality of emissions data and build capacity in emissions trading for covered entities, ultimately improving the design of the operational phase from 2023 onwards. The rules for the 2022 transitional phase are yet to be announced. Together, the Pilot phase (2020–2021) and the transition phase (2022) constitute the “test program” of the Mexican ETS.

The Pilot covers direct CO₂ emissions from entities in the energy and industry sectors generating at least 100,000 tCO₂ per year. Approximately 300 entities are covered by the Pilot, corresponding to ~40% of national emissions.

The Mexican Pilot ETS is designed to pose no economic impact on regulated entities; however, in case of noncompliance, entities lose the opportunity to bank unused allowances into the next compliance periods within the Pilot. Moreover, noncompliant entities will receive fewer allowances during the operational period of the national ETS (two fewer allowances for each nondelivered allowance during the Pilot).

YEAR IN REVIEW

In 2020, Mexico developed its ETS Registry (Sistema de Seguimiento de Derechos de Emisión). As of early 2021, the first allowance allocation into accounts in the Registry is underway, after a small delay to the original deadline due to the impact of the COVID-19 pandemic.

In 2020, the country continued the development of offset provisions in priority sectors (forestry, agriculture, livestock, transport). Moreover, the Ministry of Environment and Natural Resources (SEMARNAT) is preparing a registry for

mitigation outcomes from voluntary and regulated sources (such as offsets, early action offsets, Internationally Transferred Mitigation Outcomes (ITMOs), or voluntary projects, among others), referred to as the “second branch” of the National Emissions Registry (RENE). The eligibility rules for the use of offsets within the ETS are being developed based on a mapping of activities and projects that could be used for this purpose.

In terms of stakeholder engagement, the Consultative Committee of the Pilot ETS has had three sessions as of January 2021 and its rules of operation are being developed. The Consultative Committee is the formal technical forum for consultation, orientation, social participation, and advice for the Pilot ETS. Its members are: representatives from the ministries of Finance, Environment and Natural Resources, Energy and Economy; a representative from the National Institute of Ecology and Climate Change; a representative from the Confederation of Industrial Chambers; a representative from the Coordinating Business Council; five representatives of the regulated sectors; a representative from financial institutions or exchanges; and two representatives from civil society and two from universities, with voice but no vote in the Committee. As well, several capacity-building activities also took place during 2020, such as advanced training courses and a number of smaller courses aimed at regulated entities.

Different studies and analyses are also being developed, such as:

- an analysis of the interaction of the ETS with other carbon pricing instruments in the country (at both national and subnational levels);
- an evaluation framework that reviews different methods, criteria, metrics, and international experiences on the evaluation of ETSs; and
- an analysis of the Mexican climate policy framework and its suitability to engage in international cooperation through Article 6 of the Paris Agreement.

¹ – The Ministry of Environment and Natural Resources is in the process of establishing a domestic offsetting program.

Background Information

OVERALL GHG EMISSIONS (excluding category "3B Land") 733.8 MtCO₂e (2017)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy 522.4 (71%)
Industrial Processes 58.0 (8%)
Agriculture, Forestry,
and Other Land Use² 106.7 (15%)
Waste 46.7 (6%)

GHG REDUCTION TARGETS

BY 2030: 22% below BAU GHG emissions baseline (NDC, included in the 'General Law of Climate Change')

BY 2050: 50% below 2000 GHG levels (aspirational, included in the 'General Law of Climate Change')

ETS Size

COVERED EMISSIONS

273.1 MtCO₂
(ETS cap 2021)



GHGs COVERED

CO₂ only

CAP

PILOT (2020–2021):

Year 2020: 271.3 MtCO₂

Year 2021: 273.1 MtCO₂⁴

Three reserves will be filled each year with allowances additional to the cap:

- auctions reserve (equivalent to 5% of the cap);
- new entrants reserve (equivalent to 10% of the cap, for new entrants as well as increases in production among existing regulated entities); and
- general reserve (equivalent to 5% of the cap, for ex-post adjustment allocation for entities with higher emissions relative to their baselines).

SECTORS AND THRESHOLDS

The Pilot ETS covers the energy and industrial sectors. The energy sector encompasses electricity generation, transmission, and distribution, as well as fossil fuel extraction, production, transport, and distribution.

The industry sector includes automobiles, cement, lime, chemical industry, food and beverages, glass, iron and steel, metallurgical, mining, petrochemicals, and pulp and paper, as well as other industrial subsectors generating direct CO₂ emissions from stationary sources at or above the threshold.

The reserves serve as safeguards to avoid economic impacts on regulated entities during the Pilot phase, as required by the '2018 General Law on Climate Change.'

The Pilot ETS covers installations whose annual direct emissions from stationary sources amount to at least 100,000 tCO₂.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

~300

The broader mandatory National Emissions Register (RENE) requires mandatory reporting of direct and indirect GHG emissions for facilities with annual emissions at or above 25,000 tCO₂e (see "MRV" section).

2 – Mexico uses the sectors defined in the latest IPCC guidelines (2006 IPCC Guidelines for National Greenhouse Gas Inventories) for the preparation of its inventory, in which the Agriculture and the LULUCF sectors are integrated into "Agriculture, Forestry and Other Land Use." In an effort to make the display of overall GHG emissions comparable with other jurisdictions, the figure shown here excludes the category "3B Land," but includes the categories "3A Livestock" and "3C Aggregate sources and non-CO₂ emissions sources on land".

3 – As per information published by SEMARNAT

4 – The increase in the cap between 2020 and 2021 is due to an increase in the sectoral allocation for regulated entities categorized as "others."

Phases & Allocation

TRADING PERIODS

Pilot phase (2020–2021); and
Transition phase (2022) to the operational period of the ETS, which is scheduled to start in 2023.

The schedule of implementation as contained in Annex I to the ETS Pilot regulation (Acuerdo por el que se establecen las bases preliminares del Programa de Prueba del Sistema de Comercio de Emisiones) contains compliance and allocation dates for the compliance cycle of 2020 and 2021. Emissions for 2022 will be covered by the operational period of the ETS.

SEMARNAT is expected to publish the regulation of the operational period of the ETS in 2022.

ALLOCATION

The Pilot will use free allocation with the following specifications.

INITIAL ALLOCATION: Entities will receive free allowances based on the most recent verified emissions. New entrants will receive free allowances based on their verified emissions in the year in which they first crossed the 100,000 tCO₂ threshold.

EX-POST ADJUSTMENT: An adjustment allocation will be carried out from the general reserve for those participants whose verified emissions in that year are higher than the free allocation received. Also, as per the ‘Notice on the rules and criteria for allowance allocation,’ participants may request additional allowances when an expansion in their production results in additional direct CO₂ emissions from stationary sources. As per the same Notice, in the event that demand for additional allowances exceeds reserves, SEMARNAT will make a distribution of additional allowances proportional to the requested amounts.

PLANT CLOSURES: When an installation closes permanently, the installation may have to surrender the allowances that it has for the compliance period of the year before its closure. As well, it may need to return the free allowances received for the compliance period in which it closes. Whether the installation has to only surrender allowances, only return allowances, or both, depends on the date of the year in which it closes. These allowances are then cancelled by SEMARNAT.

AUCTIONS: Starting from the second year of the Pilot and depending on market behavior, SEMARNAT may auction allowances from the auction reserve.

Flexibility

BANKING AND BORROWING

If participants are in compliance with their surrender obligations, then their remaining allowances may be banked for use in subsequent compliance periods within the Pilot. Allowances issued in the Pilot will be valid only for the Pilot, although SEMARNAT is tasked to also assess the viability of allowing a share of Pilot allowances to be banked into the national ETS.

Although the possibility of borrowing is not explicitly stated, surrender of allowances for a given compliance period is done after allocation of allowances for the subsequent compliance period takes place.

OFFSETS AND CREDITS

QUALITATIVE LIMIT: Two types of flexibility instruments are foreseen, both of which will generate “offset credits” eligible for use under the Pilot: offsets and early action.

Offsets: SEMARNAT will establish a domestic program for the generation of credits that can be surrendered for compli-

ance in the national ETS. Eligible mitigation projects or activities are domestic projects that have been validated and verified under internationally or domestically recognized protocols (as yet unspecified). Emission reductions related to all GHGs will be eligible, except for those related to direct CO₂ emissions.

Early action: For those projects or mitigation activities operating under recognized protocols that receive offsets before the Pilot comes into force, SEMARNAT may issue offset credits if a certificate of cancellation is presented. These projects will be allowed to continue generating offsets during the Pilot.

QUANTITATIVE LIMITS: Participants will be able to meet up to 10% of their compliance obligations with offset or early action credits.

SEMARNAT is currently working on the regulations to operationalize the offset and early action provisions in the Pilot ETS.

Compliance

COMPLIANCE PERIOD

From 1 January to 31 December. Regulated entities have until 1 November of the subsequent year to surrender allowances of a compliance period.

MRV

REPORTING FREQUENCY: Annual self-reporting based on electronic templates prepared by SEMARNAT.

VERIFICATION: Verification by independent accredited verifiers is required by 30 June each year.

FRAMEWORK: A monitoring plan is required from all regulated entities, but noncompliance has no effects on free allocation or ex-post adjustments. Verified annual CO₂ emissions are reported both to the RENE (in addition to other obligations that regulated entities have to report to the RENE) and to the ETS registry.

Under RENE, emitters with annual emissions at or above 25,000 tCO₂e 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, chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halogenated ethers, halocarbons, and their mixes.

ENFORCEMENT

The system is designed to pose no economic impact on regulated entities; however, in case of noncompliance, entities lose the opportunity to bank unused allowances for the next compliance periods within the Pilot. Moreover, noncompliant entities will receive fewer allowances during the operational period of the national ETS (two fewer allowances for each nondelivered allowance during the Pilot).

Linking

LINKS WITH OTHER SYSTEMS

The 'General Law on Climate Change' foresees possible linkages between the Mexican ETS and ETSs in other countries. Various cooperation activities have taken place in recent years. Mexico signed a Memorandum of Understanding with California in 2014 and with Québec in 2015 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.

Other Information

INSTITUTIONS INVOLVED

SEMARNAT
National Institute for Ecology and Climate Change (INECC)

A preliminary study on different methods, criteria, metrics, and international experiences on the evaluation of ETSs is being developed, as an input for the evaluation process of the Pilot.

EVALUATION/ETS REVIEW

Article 10 of the Agreement on the establishment of the preliminary basis of the Pilot Program provides that SEMARNAT will annually review the Pilot, publishing reports on topics such as price behavior and emissions reductions achieved. As well, an evaluation of the Pilot, supported by the INECC and by the Consultative Committee, will be conducted to determine if adjustments to the ETS design are necessary before the start of the operational period of the program. This evaluation process may involve consultations with civil society and academia.

Regulations for the operational period of the Mexican ETS are to be published in 2022.

IMPLEMENTING LEGISLATION

[General Law of Climate Change](#)⁵
[Agreement on the establishment of the preliminary basis of the Pilot Program of the Emissions Trading System \(implementing regulation of the pilot\)](#)⁶
[Regulation of the General Law on Climate Change on the National Emissions Register](#)⁷
[Notice on the cap for the years 2020 and 2021](#)⁸
[Notice on the reserve and sectoral allocation of allowances for the years 2020 and 2021](#)⁹
[Notice on the rules and criteria for allowance allocation](#)¹⁰

5 – http://www.diputados.gob.mx/LeyesBiblio/pdf/LGCC_061120.pdf

6 – https://www.dof.gob.mx/nota_detalle.php?codigo=5573934&fecha=01/10/2019

7 – <https://biblioteca.semarnat.gob.mx/janium/Documentos/Ciga/agenda/DOFsr/DO3452.pdf>

8 – https://www.gob.mx/cms/uploads/attachment/file/513702/Aviso_Tope.pdf

9 – https://www.gob.mx/cms/uploads/attachment/file/513701/Aviso_Asignacion_Sectorial.pdf

10 – <https://www.gob.mx/cms/uploads/attachment/file/600718/Aviso-Reglas-Criterios-de-Asignacion-SCE.pdf>

ASIA-PACIFIC





BEIJING

Beijing Pilot Emissions Trading System

In force

Under development

Under consideration

CAP ~50 MtCO ₂ (2018)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic Provincial
ALLOCATION Free allocation: Grandparenting Free allocation: Benchmarking	AVERAGE 2020 PRICE CNY 87.06 (USD 12.62)	TOTAL REVENUE No auctions have been held

SECTORS:



POWER



INDUSTRY



TRANSPORT



BUILDINGS

ETS DESCRIPTION

The Beijing Pilot ETS was launched in November 2013; to date, it has completed seven compliance years. Beijing is one of the two Chinese pilots with ETS regulation passed by its regional congress. The ETS covers ~45% of the city's total emissions, including: both direct and indirect emissions from electricity providers; heat, cement, petrochemicals, and other industrial enterprises; manufacturers; the service sector; and public transport. In 2016, it lowered the inclusion thresholds from the original 10,000 to 5,000 tCO₂/year while adding the public transport sector. In 2020, Beijing also included the aviation sector in its mandatory reporting scheme, preparing the sector to be included in the carbon market.

Beijing is the only regional pilot in China that uses a price floor (CNY 20.00 (USD 2.90)) and ceiling (CNY 150.00 (USD 21.74)) as a price stability mechanism. In cases of consecutively high or low average prices, the government can auction or buy back extra allowances. The Beijing pilot has seen a relatively high carbon price level, as compared to other pilots (average price in 2020 was above CNY 80.00 (USD 11.59)). The Beijing pilot is also open to diversified market participants including compliance entities, institutional investors, and individuals.

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 as well as 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.

The Beijing Pilot ETS is managed by the Beijing Municipal Ecology and Environment Bureau (EEB), which became the competent authority for the Beijing ETS in 2019. Updated implementing legislation is contained in the '2018 Carbon Emission Management and Trading Plan.'

YEAR IN REVIEW

In April 2020, the Beijing EEB released a notice on the 'Management of Key Carbon Emission Units and the Pilot Work of Carbon Emissions Trading in 2020'; the notice had several documents on MRV, allowance allocation, and offsets as attachments. Most noticeably, the notice included the domestic aviation sector in the mandatory emissions reporting scheme, laying the foundation for covering this sector in its carbon market later. In this context, the Beijing EEB introduced monitoring and reporting guidelines for the aviation sector and updated its existing MRV guidelines for the other sectors.

As part of the revisions to 'the carbon allowance approval methods of enterprises (units) in Beijing' which specifies the pilot's allocation methods, the Beijing EEB adjusted the benchmark values of different unit types of power generation enterprises (combined heat and power), increasing their stringency. It also officially indicated that some sectors currently using grandparenting, such as cement as well as heat production and heat supply, will move to benchmarking soon. It further set the emission reduction factors for all the covered sectors for 2019 and 2020.

In addition, the Beijing EEB published a new voluntary offset methodology for low-carbon transportation attached to the April notice, by modifying and improving the 2017 methodology focused on motor vehicles.

The Beijing EEB moved the compliance deadline for 2019 emissions from 15 June to 15 November 2020 as a result of the COVID-19 pandemic. The government announced a 100% compliance rate at the end of 2020.

According to the Chinese national ETS rules, regional markets that have already allocated allowances for 2019 and/or 2020 for the power sector will remain under the regional system for those years. As Beijing already announced the emission reduction factors for 2020, this implies that the power sector entities that are overlapping between Beijing and the national ETS will be covered under the regional carbon market in 2020 and moved to the national one from 2021 onwards.

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

Price floor and ceiling are used as price stability mechanism

Expanded sector coverage and lowered inclusion threshold

Cross-regional trading pioneered

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF)

188.1 MtCO₂e (2012)

GHG REDUCTION TARGETS

BY 2020: 20.5% reduction in carbon intensity compared to 2015 levels. Pledge to peak Beijing CO₂ emissions by 2020 (Beijing 13th Five-Year Plan on Energy Saving and Climate Change)

ETS Size

COVERED EMISSIONS



GHGs COVERED

CO₂ only



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

POINT OF REGULATION

Downstream

Both direct and indirect emissions from electricity consumption are covered.

SECTORS AND THRESHOLDS

Industrial and non-industrial companies and entities, including electricity providers, heating sector, cement, petrochemicals, other industrial enterprises, manufacturers, service sector, public transport, and domestic aviation.¹

NUMBER OF ENTITIES

831 (2019). In addition, 14 aviation entities and 634 other entities have mandatory reporting but no surrender obligations.

CAP

~50 MtCO₂e (2018)

INCLUSION THRESHOLDS:

Until 2015: 10,000 tCO₂/year, considering both direct and indirect emissions.

From 2016 onwards: 5,000 tCO₂/year, considering both direct and indirect emissions.

Phases & Allocation

TRADING PERIODS

2013 and ongoing²

Benchmarking is used for new entrants and entities with expanded capacity, as well for the power sector. Benchmarking will be expanded to sectors such as heat production and cement.

ALLOCATION

FREE ALLOCATION: Free allocation through grandfathering based on historical emissions or emissions intensity in the baseline years, which are the previous three years.

AUCTIONING: Beijing could set aside up to 5% of allowances for regular and irregular auctions (see “Market Stability Provisions” section). To date, no auctions have been held.

Flexibility

BANKING AND BORROWING

Banking is allowed.

Borrowing is not allowed.

¹ – Currently, the domestic aviation sector is only subject to mandatory reporting.

² – In the short term, the existing Chinese regional carbon markets are expected to operate in parallel with 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.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Domestic project-based carbon offset credits—Chinese Certified Emission Reduction (CCER) credits—are allowed. In addition, Beijing also has introduced its local offset programs focusing on carbon sinks, low-carbon transport, and energy saving. Offset use is limited to 5% of the annual allocation. The limit has been increased to 20% since 2019 only for the local low-carbon transport offsets.

QUALITATIVE LIMIT: CCERs from energy conservation projects and forestry carbon sink projects are allowed, whereas credits from hydropower, HFC, PFC, N₂O, and SF₆ 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 non-Beijing CCERs, priority is given to those with regional climate or pollution control cooperation agreements (e.g., Hebei and Tianjin).

MARKET STABILITY PROVISIONS

PRICE FLOOR AND CEILING: The competent authority can auction extra allowances if the weighted average price exceeds CNY 150 (USD 21.74) 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 2.90).

EXCHANGE: The China Beijing Environment Exchange implements a system of limits on price increases and decreases for trading over the exchange³ which is $\pm 20\%$ of the reference price (the weighted average price of all transactions on the previous trading day) to prevent large price fluctuations. It also sets the maximum position limit for the different market participants: the sum of their annual allocated allowances plus one million tonnes for the compliance entities, one million tonnes for institutional investors, and 50,000 tonnes for natural persons.

RESERVE: The competent authority could set aside up to 5% of allowances for regular and irregular auctions. To date, no auctions have been held.

Compliance

COMPLIANCE PERIOD

One year (1 January to 31 December): covered entities have until 15 June of the following year to surrender allowances.

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions.

VERIFICATION: Third-party verification is required. In addition, the government organizes expert review of all the verification reports; 30% of them are subject to further fourth-party verification.

FRAMEWORK: The Beijing EEB has updated the general rules for monitoring and reporting, as well as for sector-specific guidelines for the following sectors: heat production and supply, thermal power generation, cement, petrochemicals,

public transport, aviation, 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 must 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 CNY 50,000 (USD 7,245.57). Furthermore, companies failing to surrender enough allowances to match their emissions are fined up to five times the average market price over the previous 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 Ecology and Environment Bureau (competent authority)

China Beijing Environment Exchange (trading platform)

Beijing Research Center for Climate Change (registry)

IMPLEMENTING LEGISLATION

Beijing Municipal People's Congress ETS Pilot Bill⁴

Interim Measures for the Management of Emissions Trading in Beijing⁵

List of Covered Entities (2019 compliance year)⁶

Beijing EEB Notice on the Management of Key Carbon Emission Units and the Pilot Work of Carbon Emission Rights Trading in 2020⁷

3 – Besides this type of trading, the Beijing pilot also allows over-the-counter (OTC) trading.

4 – <http://www.tanpaifang.com/zhengcefagui/2013/122927524.html>

5 – <http://www.tanpiaoyi.com/article-1562-1.html>

6 – <http://sthjj.beijing.gov.cn/bjhrb/index/xxgk69/zfxgk43/fdzdgknr2/hbjfw/1745093/index.html>

7 – <http://sthjj.beijing.gov.cn/bjhrb/index/xxgk69/zfxgk43/fdzdgknr2/hbjfw/1758471/index.html>

CHINA

China National Emissions Trading System



ESTIMATED COVERAGE	GASES	OFFSETS AND CREDITS
Over 3,500 MtCO ₂ (2019) Over 3,700 MtCO ₂ (2020) Over 4,000 MtCO ₂ (2021)	CO ₂ only	Domestic
ALLOCATION		
Free allocation: Benchmarking		

In force

Under development

Under consideration

SECTORS:



**captive power plants of other sectors are also covered*

← *Became operational in 2021, as the world's largest ETS, covering more than four billion tCO₂ (about 40% of national emissions)*

Operates as an intensity-based ETS

Covers the power sector initially and will roll out to other sectors over time

ETS DESCRIPTION

China's national ETS started operating in 2021, bringing the world's largest ETS online after three years of preparation since the political launch. In early January 2021, the Chinese Ministry of Ecology and Environment (MEE) published key ETS policy documents, along with an announcement that regulated entities will need to surrender allowances pertaining to their 2019–2020 emissions in 2021.

Building on its experience of successfully piloting carbon markets in eight regions, China launched its national ETS politically in December 2017. A step-by-step development roadmap was then outlined in a work plan, which was endorsed by the country's highest administrative body, the State Council. The launch of the ETS was a goal set in 2015 by China's highest political level, and the goal was reaffirmed by the country's Nationally Determined Contribution (NDC) under the Paris Agreement and the '13th Five-Year Work Plan (FYP) for Greenhouse Gas Emission Control.'

The objective of the China national ETS is to contribute to the effective control and gradual reduction of carbon emissions in China and to the achievement of green and low-carbon development. The ETS regulates more than 2,200 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 tCO₂ per year. The Chinese national ETS is estimated to cover more than four billion tCO₂, accounting for ~40% of national carbon emissions. The system's scope is to be further expanded in the future. Currently, it is an intensity-based ETS with the cap being adjusted ex-post based on actual production levels. The compliance obligations are also limited.

From the institutional perspective, the National Development and Reform Commission (NDRC) was responsible for national ETS development until 2018. That year, as part of a broader government restructuring, the climate change policy portfolio (including the development of the ETS) was shifted to the newly established MEE.

Key pillars of the development of the national ETS include: reporting and verification of historical emissions data from eight emission-intensive sectors; development of the national registry, trading system, and national enterprise GHG reporting system; set-up of the legislative and regulatory framework; and capacity building.

The existing Chinese regional ETS pilots are gradually transitioning into the national ETS. In the short term, the pilots continue to operate in parallel to the national market, covering the sectors and entities not included in the national market. Over the medium to long term, as more sectors are included in the national ETS, overlapping entities are expected to be integrated into the national market.

China's national ETS is expected to be one of the key policy instruments to realize the country's climate ambition in both the short and long term. The country's key mitigation targets include peaking carbon emissions before 2030 and achieving carbon neutrality by 2060.

YEAR IN REVIEW

Many technical and political processes for the launch of the national ETS were concluded in 2020. The turning point was President Xi Jinping's announcement in September 2020, committing China to achieve peak carbon emissions before 2030 and carbon neutrality by 2060. This generated great momentum for the development of the national ETS, leading to the system's operationalization at the beginning of 2021.

A key milestone for the national ETS was achieved with the finalization and publication of two important policy documents:

- 'The National Measures for the Administration of Carbon Emission Trading (Trial)' (short form: the National Measures); and
- the '2019–2020 National Carbon Emission Trading Cap Setting and Allowance Allocation Implementation Plan (Power Generation Industry)' (short form: the Allocation Plan).

The National Measures, which took effect in February 2021, provide the legal basis for the national ETS and supersede the interim measures published in 2014.¹ It is issued in the form of a departmental regulation, which is subject to future review and revision.² The document includes: general rules and provisions related to allowance allocation and registration; emissions trading; MRV; compliance; offsets; supervision and management; and penalties.

The Allocation Plan adopts benchmarking as the main allowance allocation approach and includes processes for pre-allocation and ex-post adjustments. It further clarifies the relationship between regional ETS pilots and the national ETS: the overlapping entities between them that are already covered by regional allocation plans in 2019 and/or 2020 are excluded from the national ETS for those years and remain in the regional systems. However, after the release of the Allocation Plan for the national ETS, the regional pilots will no longer issue allowances to them. Together with the Allocation Plan, the MEE also released the list of covered entities, according to which the national ETS covers 2,225 companies. The confirmation of the covered entities builds on an extensive historical data collection process that started in 2013 and continued until 2020.

The MEE is also working on the policy documents outlining other key areas of the national ETS design, with some already released for public consultation even though they have not yet been finalized:

- ‘The Administrative Measures for the Registration, Trading, and Settlement of the National Carbon Emission Rights (Trial)’ was released in November 2020. It clarifies the basic elements and oversight system of allowance registration, trading, and settlement, as well as the functions of the agencies responsible for the registry and trading system’s operation.

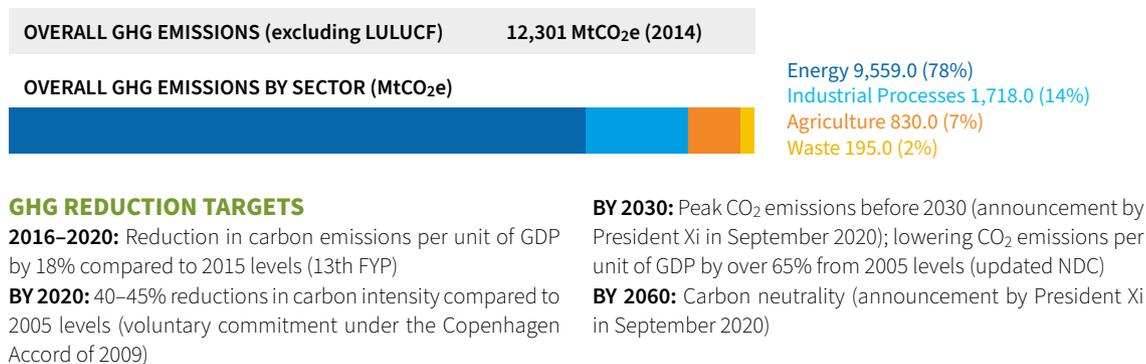
- Two documents on MRV were released in December 2020. The ‘Guidelines on Enterprise Greenhouse Gas Emissions Accounting and Reporting – Power Generation Facilities’ build on two existing technical guidelines and aim to establish the MRV foundation for the national ETS. The ‘Guidelines for Enterprise Greenhouse Gas Verification (Trial)’ build on a previous document from 2016 and provide further details on verification.

These documents are expected to be finalized after the public consultation process to support the implementation of the national ETS.

A key ongoing technical task is the development of the registry and of the trading platform, which are led by the local governments of Hubei and Shanghai respectively. In May 2020, the MEE organized an expert review meeting on the construction plan of these two systems. They have been further developed and improved, with several rounds of inspections by experts since then.

Following the announcement of the country’s 2030 and 2060 targets, China put forward its enhanced NDC in December 2020, committing to reduce its carbon intensity by more than 65% by 2030 compared to 2005 levels. China is in the process of developing its 14th Five-Year Plan (2021–2025) and 2030 carbon emissions peaking plan. Its national ETS will then be aligned with these targets and plans.

Background Information



1 – In December 2014, the NDRC—the former national competent authority for climate change—issued the Interim Measures for the Administration of Carbon Emissions Trading (NDRC Order No. 17) to regulate the construction of carbon markets in China.

2 – This level of regulation (in Chinese: Guanli Banfa) is lower in the legal hierarchy compared to the State Council regulation, with implications for the level of financial fines it could impose. The document itself also leaves space for the further development of higher-level legislation such as national regulation (in Chinese: Zhanxing Tiaoli) as the national ETS develops further.

ETS Size

COVERED EMISSIONS

GHGs COVERED
CO₂



SECTORS AND THRESHOLDS

Power sector (including combined heat and power, as well as captive power plants of other sectors). Compliance obligations are currently limited (see “Enforcement” section).

The scope is expected to be gradually expanded to cover seven other sectors in addition to power: 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 tCO₂ in any year over the period 2013–2019.

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

The Chinese regional ETS pilots covered power sector entities, which may also fall under the national ETS. These entities are transitioning into the national market. Below is an estimation, based on publicly available information, of the number of covered entities under the national ETS:

1,961 (2019)
2,070 (2020)
2,225 (2021)

CAP

The cap is set bottom-up, i.e., the sum of the total allowance allocation to all covered entities forms the cap. It is also an intensity-based cap, which changes according to the actual production levels. The national ETS is estimated to have a cap of over 4,000 MtCO₂/year for 2021.³

Phases & Allocation

TRADING PERIODS

The current regulation does not yet define specific trading periods for the Chinese national ETS.

ALLOCATION

FREE ALLOCATION: Benchmarking is used as the main allocation method, with four distinct benchmarks: conventional coal plants below 300 MW; conventional coal plants above 300 MW; unconventional coal; and natural gas.

At first, entities will receive allowances at 70% of their 2018 output multiplied by the corresponding benchmark factor. Allocation will be adjusted later to reflect

actual generation in 2019 and 2020. A unit load (output) adjustment factor distributes more allowances for entities operating at load rates lower than 85%. This may provide more allowances to less efficient power units. A regional adjustment factor that would give regional governments the opportunity to tighten allocation in line with regional climate targets had been proposed during the drafting phase of the Allocation Plan, but was not included in the final version.

AUCTIONING: Currently, allocation is to take place mainly through free allocation, but the National Measures clarify that auctioning may be introduced at a later point in time.

³ – Moreover, according to the National Measures, voluntary allowance cancellation is allowed: covered entities, other institutions and individuals can voluntarily purchase and cancel emission allowances.

Flexibility

BANKING AND BORROWING

Rules on banking and borrowing are not yet specified in the published policy documents. The system is expected to allow for banking but not for borrowing.

OFFSETS AND CREDITS

The National Measures allow for the use of China Certified Emissions Reduction (CCER) already from 2021 onwards: covered entities can use offsets for up to 5% of their verified emissions from CCER projects in renewable energy, carbon sinks, methane utilization, and others.

The CCER offset program was developed in China alongside the development of the regional ETS pilots. In 2012,

the NDRC issued the 'Interim Measures for the Management of Voluntary GHG Emission Reduction Transactions' (short form: Interim Measures), which provide guidelines for the issuance of CCERs. Further details on the development of CCER projects and the acceptance of CCERs in the national ETS are expected to be regulated through a revision of the Interim Measures and/or through the development of an 'Administration Measure of Offset Scheme for National ETS.'

MARKET STABILITY PROVISIONS

Adjustment mechanisms to prevent abnormal price fluctuations, as well as risk prevention and control mechanisms to prevent market manipulations, are under development.

Compliance

COMPLIANCE PERIOD

One year (1 January to 31 December). Nevertheless, entities are expected to surrender allowances in 2021 for the years 2019 and 2020.

MRV

REPORTING FREQUENCY: Under the national ETS, covered entities submit the previous year's emission reports by the end of March each year. Entities in the power sector have had MRV obligations since 2013.

VERIFICATION: Provincial-level ecological and environmental authorities will organize the verification of GHG reports. They may commission technical service agencies to provide verification services.

The draft verification guidelines outline a six-step verification process and indicate a strong reliance on document review such that on-site verification in many cases would be deemed unnecessary. The verification entities could be the ecological and environmental units at provincial and subprovincial levels, government-affiliated institutions, and other technical service institutions selected (and paid) by the government.

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

MRV framework has evolved continuously since 2013. In 2020, updated technical guidelines on emissions accounting, reporting, and verification were released for public consultation and are yet to be finalized.

OTHER: The MEE will further improve the existing MRV guidelines and technical specifications for the national ETS, based on the practice.

ENFORCEMENT

According to the current Allocation Plan, compliance obligations are limited. Gas-fired plants only need to surrender allowances up to their level of free allocation as per the benchmarks. The compliance obligation of other covered entities is limited to the level of free allocation as per benchmarks, plus 20% of their verified emissions. This means that no allowances must be surrendered for verified emissions above this threshold. These measures aim to promote gas-fired units and reduce the overall compliance burden.

The National Measures define that failures in reporting are subject to a fine of CNY 10,000 to 30,000 (USD 1,449 to 4,347), while failures in compliance obligations are subject to a fine of CNY 20,000 to 30,000 (USD 2,898 to 4,347). Any gap between the (limited) compliance obligation and allowances surrendered also will be deducted from the following year's allocation.

Other Information

INSTITUTIONS INVOLVED

The China national ETS has a multi-level governance structure involving three levels of government:

- the MEE acts as the national competent authority setting the rules and overseeing the system, with joint oversight of trading activities with other national regulators;
- the MEE subsidiaries at the provincial level oversee the implementation of these rules; and
- the municipal-level authorities take on some management duties locally.

IMPLEMENTING LEGISLATION

Work Plan for Construction of the National Emissions Trading System (Power Sector)⁴

Notice on Key Works in Preparation for the Launch of the National ETS⁵

Interim Administrative Measures on Emissions Trading (2014)⁶

24 Guidelines for GHG Monitoring and Reporting for various sectors (2013⁷, 2014⁸, and 2015⁹)

The National Measures for the Administration of Carbon Emission Trading (Trial), final¹⁰

The National Measures for the Administration of Carbon Emission Trading (Trial), draft for comments¹¹ (English translation)¹²

Allocation Plan for the Power Sector (2019–2020) and list of covered entities, final¹³ (English translation)¹⁴

Allocation Plan for the Power Sector (2019–2020), draft for comments released in November 2020¹⁵ (English translation)¹⁶

Guidelines on enterprises greenhouse gas emissions accounting and reporting – Power generation facilities, draft for comments¹⁷

Guidelines for Enterprises Greenhouse Gas Verification (Trial), draft for comments¹⁸

4 – <https://www.ndrc.gov.cn/xxgk/zcfb/ghxwj/201712/W020190905495689305648.pdf>

5 – http://www.gov.cn/xinwen/2016-01/22/content_5035432.htm

6 – <http://extwprlegs1.fao.org/docs/pdf/chn163081.pdf>

7 – http://www.gov.cn/zwgk/2013-11/04/content_2520743.htm

8 – http://www.ncsc.org.cn/SY/tpfjyj/202003/t20200319_769745.shtml

9 – http://www.ncsc.org.cn/SY/tpfjyj/202003/t20200319_769747.shtml

10 – http://www.mee.gov.cn/xxgk2018/xxgk/xxgk02/202101/t20210105_816131.html

11 – https://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202011/t20201102_805822.html

12 – <http://www.cet.net.cn/html/zl/bg/2020/1116/482.html>

13 – https://www.mee.gov.cn/xxgk2018/xxgk/xxgk03/202012/t20201230_815546.html

14 – <https://chinaenergyportal.org/en/implementation-plan-for-the-2019-2020-national-carbon-emission-trading-quota-setting-and-allocation-power-generation-industry/>

15 – http://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202011/t20201120_809087.html

16 – <http://www.cet.net.cn/html/zl/bg/2020/1125/483.html>

17 – http://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202012/t20201203_811443.html

18 – https://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202012/t20201216_813413.html



CHONGQING

Chongqing Pilot Emissions Trading System

In force

Under development

Under consideration

CAP 97 MtCO ₂ e (2018)	GASES Several gases	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation: Grandparenting	AVERAGE 2020 PRICE CNY 26.38 (USD 3.82)	

SECTORS:



ETS DESCRIPTION

Chongqing launched its pilot ETS in June 2014; to date, it has concluded five compliance years.¹ The system covers enterprises from seven sectors: power, electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel. The 180 enterprises covered by the system accounted for ~62% of the city's total emissions in 2018. Among the eight Chinese pilots, the Chongqing ETS is the only one that covers non-CO₂ gases.

One unique feature of the Chongqing Pilot ETS as compared to other Chinese pilot programs 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 level (i.e., the sum of each covered entity's highest annual emission 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 suffered from low liquidity in past years due to a relatively loose cap in its early years.

2019 saw the completion of the transition of ETS-related responsibilities in Chongqing from the Development and Reform Commission (DRC) to the Ecology and Environment Bureau (EEB).

YEAR IN REVIEW

In April 2020, the Chongqing EEB released a notice on its ETS work for compliance year 2019, with a list of covered entities attached. The latest publicly available allocation plan dates from 2019 and is for the compliance year 2018.

The Chongqing allocation plan differed from those of other Chinese pilots in that allowances were allocated based on entities' self-reported demand. Adjustment is made when an individual entity's self-reported demand level exceeds its highest historical annual emissions (2008–2012), by using the average of the two numbers. In addition, if the sum of the allocation for all the entities exceeds the top-down cap, a reduction factor is applied across the board.

Following 2017, 2018 was the second year since the launch of the pilot where the cap (97 MtCO₂e) was lower than the sum of the allocation based on self-declared demanded amount (106 MtCO₂e); hence, downward adjustment to entities' allocation was made, indicating a potential allowance shortage for some companies in the market. However, 2018 saw relatively low liquidity of the Chongqing carbon market because some market investors released their holdings and increased the market supply. Since then, no detailed allocation plan has been publicly released.

The only Chinese pilot to cover non-CO₂ gases

Annual cap reduction rate

Allocation based on entities' self-reported demand and historical highest emissions

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) ~156.0 MtCO₂e (2018)

GHG REDUCTION TARGETS

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

¹ – The 2018 compliance cycle is the latest to have been completed. 2019 compliance is expected to be completed in the first half of 2021.

ETS Size

COVERED EMISSIONS



GHGs COVERED

CO₂, CH₄, N₂O, HFCs, PFCs, SF₆



SECTORS AND THRESHOLDS

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

INCLUSION THRESHOLDS: 20,000 tCO₂/year or energy consumption of 10,000 tonnes of coal equivalent (tce)/year.

POINT OF REGULATION

Downstream

Both direct and indirect emissions from electricity and heat consumption are covered.

NUMBER OF ENTITIES

180 (2018 and 2019)

CAP

97 MtCO₂e (2018)

From 2013 to 2015, the annual reduction rate of the cap was 4.13%. From 2016 onwards, it was revised to 4.85%.

Phases & Allocation

TRADING PERIODS

2013 and ongoing²

ALLOCATION

FREE ALLOCATION: Free allocation through grandparenting based on historical emissions (highest number in period 2008–2012). Regulated entities submit their allowance allo-

cation demand on a yearly basis, forming the basis of their free allocation. This value is adjusted if it exceeds the highest historical annual emissions (2008–2012) of the respective entities, by using the average of the two numbers. In addition, if the sum of the allocation for all the entities exceeds the top-down cap (see “Cap” section), a reduction factor is applied to all the covered entities.

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 must be achieved after 2010 with the exception of carbon sink projects. Credits from hydro projects are not allowed.

MARKET STABILITY PROVISIONS

EXCHANGE INTERVENTION: Depending on transaction types, if prices vary more than 10% or 30% in one day, the Chongqing Carbon Emissions Exchange can institute price stabilization measures, such as temporarily suspending trading or imposing a holding limit.

SALE AND TRADE LIMITS: Compliance entities must not sell more than 50% of their annual free allocation.

Compliance

COMPLIANCE PERIOD

One year (1 January to 31 December): the exact date for the covered entities to surrender allowances is set by the government on an annual basis and varies across years.

MRV

REPORTING FREQUENCY: Annual reporting of GHG emissions.

VERIFICATION: Third-party verification is required.

² – In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the Chinese national carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.

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 noncompliance. Nonfinancial penalties may include public reporting, disqualification from 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 Chongqing³](#)

[Chongqing Allowance Allocation Management Rules⁴](#)

[Chongqing EEB Notice on Carrying out ETS Work for Compliance Year 2019⁵](#)

3 – <http://www.tanpaifang.com/tanjiaoyisuo/2014/0504/31858.html>

4 – <http://www.tanpaifang.com/tanjiaoyi/2014/0530/32965.html>

5 – http://sthjj.cq.gov.cn/zwgk_249/fdzdgknr/zdmsxx/hjgl/ydqhbh/202004/t20200414_7047139.html

FUJIAN

Fujian Pilot Emissions Trading System



CAP ~220 MtCO ₂ (2019)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic Provincial
ALLOCATION Free allocation: Grandparenting Free allocation: Benchmarking Auctioning	AVERAGE 2020 PRICE CNY 17.24 (USD 2.50)	TOTAL REVENUE CNY 1.25 million (USD 0.18 million) ¹ since beginning of program

In force

Under development

Under consideration

SECTORS:



POWER



INDUSTRY



DOMESTIC AVIATION

← Regional Chinese ETS not belonging to seven pilots originally assigned by NDRC

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

ETS DESCRIPTION

The province of Fujian launched its ETS in September 2016; it is the eighth regional pilot ETS in China. To date, it has completed four compliance years, achieving 100% compliance except in the first year. Unlike other Chinese 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 NDRC approved the Haixia Equity Exchange in Fujian as one of nine trading platforms for trading Chinese Certified Emission Reductions (CCERs), demonstrating NDRC’s recognition 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.

In early 2019, the ETS-related responsibilities in Fujian completed the transition from the Fujian DRC to the Fujian Provincial Department of Ecology and Environment (DEE), as a result of the governance restructuring across China.

YEAR IN REVIEW

In August 2020, the Fujian government amended the ‘Interim Measures for the Administration of Carbon Emissions Trading in Fujian Province,’ fine-tuning its reporting, verification, and market oversight system.

As a province dedicated to promoting its forestry-based offsets, by the end of October 2020 the Fujian ETS had traded 2.6 million tonnes of forestry offset credits, with a total turnover of over CNY 38 million (USD 5.5 million), overachieving the province’s target of forestry offsets set in 2017.

The Fujian ETS finished its compliance work for 2019 at the end of October 2020, reporting a 100% compliance rate for its 269 covered entities from nine sectors.

The latest publicly available detailed allocation plan, which dates from 2019, covers two years: 2018 and 2019. This plan was released by the Fujian DEE in June 2019. Almost 50% of the regulated entities are architectural ceramics companies. Since then, no detailed allocation plan has been released publicly.

In late November 2020, Fujian published a notice on the pre-allocation of carbon emission allowances for the 2020 compliance year. The notice specifies that 269 covered entities are covered under the Fujian ETS. Following the allocation rules (see ‘Allocation’ section), the entities receive 70% of the number of allowances based on their 2019 production data as pre-allocated allowances for 2020. The actual production data is then used to update allocation ex-post.

According to the Chinese national ETS rules, regional markets that have already allocated allowances for 2019 and/or 2020 for the power sector will remain under the regional system for those years. This implies that the power sector entities that are overlapping between Fujian and the national ETS will be covered under the regional carbon market in 2020 and moved to the national one from 2021 onwards.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 240.0 MtCO₂e (2014)

GHG REDUCTION TARGETS

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

¹ – Fujian pilot has held only one auction, in 2016, which provided 50,000 tonnes allowances, with a floor price of CNY 25 (USD 3.62) per tonne. Nevertheless, the exchange did not disclose the final volume and price. The calculation here assumes that all allowances were sold at the floor price.

ETS Size

COVERED EMISSIONS



GHGs COVERED

CO₂



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 and 2016.

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

POINT OF REGULATION

Downstream

Both direct and indirect emissions from electricity and heat consumption are covered.

NUMBER OF ENTITIES

255 (2018)

269 (2019)

269 (2020)

CAP

~220 MtCO₂ (2019)²

The cap includes three elements: existing entities' allowances, new entrants reserve, and market stability reserve.

Phases & Allocation

TRADING PERIODS

2016-ongoing³

ALLOCATION

FREE ALLOCATION: Benchmarking is applied to the 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.

A pre-allocation method is adopted for the annual allowance allocation. At first, entities receive 70% of the allowances in a given year, which are calculated based on their production levels in the previous year (for example, 2019 pre-allocation is based on 2018 production data). Allocation is then adjusted

ex-post to reflect the actual production in the respective compliance year.

AUCTIONING: Auctioning may take place where considered appropriate by the ETS authorities (see "Market Stability Provisions" section) 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 a discriminatory (nonuniform price) auction of 50,000 allowances in 2016 from the government reserve, with the settlement prices ranging from CNY 26.50 (USD 3.84) to ~CNY 30 (USD 4.35). No further auctions have taken place to date.

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 credits (FFCER) are allowed. The use of CCER credits is limited to 5% of the annual compliance obligation. The limit

is increased to 10% for companies that use both FFCER and CCER credits.

QUALITATIVE LIMIT: Eligible offsets are restricted to those generated in Fujian province, from CO₂ or CH₄ projects. Hydropower-related credits are not eligible. FFCER projects, with three project types (afforestation, forest management, and bamboo management) are eligible if implementation took place after 16 February 2005 and if the project developers have independent legal personality.

² - There is no public data on the total cap, or the number of its three elements. This number is based on an estimate developed by experts.

³ - In the short term, the existing Chinese regional carbon markets are expected to operate in parallel with the Chinese national 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

RESERVE: 10% of the total cap is kept as a government reserve for market stabilization.

INTERVENTION: According to the (trial) ‘Implementation Rules of Emissions Trading Market Management in Fujian Province,’ the Fujian Economic and Information Center under the guidance of the competent authority—in consultation with an advisory committee—can buy or sell allowances in

order to stabilize the market under certain conditions. These conditions include: market fluctuations (i.e., if the cumulative increase or decrease of allowance prices for ten consecutive trading days reaches a certain percentage); severe imbalances between supply and demand; or liquidity issues. 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 (1 January to 31 December): covered entities have until 30 June of the following year to surrender allowances.⁴

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions.

VERIFICATION: Third-party verification is required for all the annual emissions reports. In addition, further validation is carried out by government-assigned experts for ~30% of the reports to further enhance accuracy; this process is also called “fourth-party verification” in China.

FRAMEWORK: The Fujian DRC and the Fujian Statistical Bureau 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 jointly released a measure for the administration of third-party verifiers, which specifies criteria for the verifiers and their staff. Both documents are still valid.

ENFORCEMENT

Penalties for failing to submit an emission or verification report on time, providing false information, or disturbing the verification process range from CNY 10,000 (USD 1,449) to CNY 30,000 (USD 4,347). 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 per allowance, with a maximum limit of CNY 30,000 (USD 4,347). Additionally, 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 1,449) to CNY 30,000 (USD 4,347).

Other Information

INSTITUTIONS INVOLVED

Fujian Provincial Department of Ecology and Environment (competent authority)

Fujian Haixia Equity Exchange (trading platform)

Fujian Economic and Information Center (registry, market management, and MRV administration)

IMPLEMENTING LEGISLATION

Implementation Plan of Emissions Trading Market Construction in Fujian Province⁵

Interim Measures for the Management of Emissions Trading in Fujian Province⁶

2020 Amendments to the Interim Measures⁷

Fujian Provincial Department of Ecology and Environment—Allocation Plan for Vintage 2018 and 2019⁸

4 – This is according to the ‘Interim Measures of the Fujian ETS.’ In practice, the provincial government releases executive notices to guide the timeline of the annual compliance circle.

5 – http://fgw.fuzhou.gov.cn/zz/fgwzgwkg/fg/201901/t20190108_2735580.htm

6 – http://fjnews.fjsen.com/2020-09/15/content_30478231.htm

7 – <http://www.fj.msa.gov.cn/fjmsacms/cms/html/fjhsjwwwz/2020-10-21/1168696783.html>

8 – <http://www.tanjiayoi.com/article-27392-1.html>



GUANGDONG

Guangdong Pilot Emissions Trading System

In force

Under development

Under consideration

SECTORS:



POWER



INDUSTRY



DOMESTIC AVIATION

Largest Chinese pilot in terms of market size

Largest market share (spot trading) and diversified participants

A pioneer for auctioning of allowances among pilots

Sector expansion of aviation and papermaking

CAP 465 MtCO ₂ (2019 and 2020)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic Provincial
ALLOCATION Free allocation: Grandparenting Free allocation: Benchmarking Auctioning	AVERAGE 2020 PRICE CNY 28.21 (USD 4.09)	TOTAL REVENUE CNY 815.46 million (USD 118.17 million) since beginning of program, CNY 11.28 million (USD 1.63 million) collected in 2020

ETS DESCRIPTION

Launched in December 2013, the Guangdong Pilot ETS is the largest of the Chinese ETS pilots. Following a scope expansion in 2016 of two new sectors, the ETS now covers the power, cement, steel, petrochemical, papermaking, and domestic aviation sectors, accounting for about 70% of the province's emissions.

The Guangdong Pilot ETS has one of the most active markets among Chinese pilots with the largest market share for spot trading. Guangdong is the first pilot to introduce auction as one of the key allocation methods. It was mandatory for enterprises to purchase 3% of their allowances from auctions in 2013 before receiving the remainder for free. Since 2014, participation in auctions has been voluntary and the non-free allocation rate has been raised to 5% for the power sector and 3% for the remaining sectors.¹ Since 2017, auctions have been held on ad hoc dates (rather than quarterly). Guangdong is among the few pilots that are open to foreign investors. In November 2016, Guangdong increased the maximum position of institutional and individual investors from three million to eight million allowances. Guangdong also allows unincorporated organizations, such as funds and trusts, to trade in its carbon market. As of 2020, it had 96 institutional investors. Guangdong is the first and only province in China that both implements an ETS pilot and is also one of the pilots for green finance policy.

In late 2018, the ETS-related responsibilities in Guangdong completed the transition from its Development and Reform Commission to the Department of Ecology and Environment (DEE), as a result of the governance restructuring across China.

YEAR IN REVIEW

In order to further standardize the province's own offsetting program, Pu Hui Certified Emission Reductions (PHCER), the Guangdong Province PHCER Trading Rules were revised and re-issued in June 2020, setting new rules on the quantity and price of certain transaction types.

Guangdong also introduced a new method of allowance transaction for the secondary market in June 2020 to improve its market efficiency. Under this so-called "bidding transfer," covered entities entrust the Guangzhou Carbon Emission Trading Center to organize auctions of their allowances rather than pursue bilateral trading, determining the minimum price, timing of sale, and other transaction rules in conjunction with the Center.

The Guangdong DEE moved the compliance deadline for 2019 emissions from June to November 2020 as a result of the COVID-19 pandemic. In December 2020, the Guangdong government announced that its pilot completed its 2019 compliance period with a 100% compliance rate.

In December 2020, Guangdong released its 2020 allocation plan with the list of covered entities. Compared to previous years, the allocation plan introduced one major change, namely an increase of free allocation for the aviation sector from 97% to 100%. The total cap for the 268 covered entities for 2020 is 438 MtCO₂; in addition, 27 MtCO₂ are kept as government reserves for new entrants and market stability.

According to the Chinese national ETS rules, regional markets that have already allocated allowances for 2019 and/or 2020 for the power sector will remain under the regional system for those years. This implies that the power sector entities that are overlapping between Guangdong and the national ETS will be covered under the regional carbon market in 2020 and moved to the national one from 2021 onwards.

¹ - This has been slightly modified for the 2020 compliance year for the aviation sector which receives 100% free allocation.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) **610.5 MtCO₂e (2012)**

GHG REDUCTION TARGETS

BY 2020: 20.5% reduction in carbon intensity compared to 2015 levels (Guangdong Province Work Plan for Controlling Greenhouse Gas Emission During the 13th Five-Year Plan Period)

BY 2030: CO₂ peaking sometime before 2030 (Guangdong Province Work Plan for Controlling Greenhouse Gas Emission During the 13th Five-Year Plan Period). Some cities in the province, such as Guangzhou, have set the target of reaching or approaching the peak by as early as 2020 (Outline of Guangzhou Ecological Civilization Construction Plan 2016–2020)

ETS Size

COVERED EMISSIONS

GHGs COVERED
CO₂ only



SECTORS AND THRESHOLDS

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

INCLUSION THRESHOLDS: 20,000 tCO₂/year or energy consumption 10,000 tonnes of coal equivalent (tce)/year.

POINT OF REGULATION

Downstream

Both direct and indirect emissions from electricity and heat consumption are covered.²

NUMBER OF ENTITIES

242 existing entities, 37 new entrants (2019)

245 existing entities, 23 new entrants (2020)

CAP

465 MtCO₂, of which 27 MtCO₂ are kept as government reserves for new entrants and market stability (2019 and 2020)

Phases & Allocation

TRADING PERIODS

2013 and ongoing³

ALLOCATION

FREE ALLOCATION: Mainly free allocation through grandparenting based on historical emissions or emissions intensity, or benchmarking.

Benchmarking is applied to coal- and gas-fired electricity generators (including heating, and combined heat and power), as well as to some industrial processes in the aviation, cement, paper, and steel sectors.

Grandparenting on the basis of historical emissions is applied to some processes in the cement and steel industries and the whole petrochemical industry. Grandparenting on the basis of historical emissions intensity is applied to the power industry using special fuel generating units and heating boilers, other powder products in cement industry, captive power plants in the steel industry, special paper and paper product manufacturers, enterprises with pulp manufacturing, and other aviation enterprises.

Ex-post adjustments based on real production data of the respective compliance year are also applied for those sectors that use benchmarks and emissions intensity methods.

Compared to previous years, the 2020 allocation plan has one major change, namely an increase of free allocation for the aviation sector from 97% to 100%.

AUCTIONING: Guangdong auctions a small share of allowances as a form 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 (for 2020, the aviation sector received 100% free allocation). Quarterly auctions were held until 2016; since 2017, they have been held on an ad hoc basis. Auctions are also subject to a reserve price (see “Market Stability Provisions” section). No auctions took place in 2018 or 2019.

² - The electricity market in Guangdong has undergone some changes following the national power sector reform process. Guangdong's electricity spot market was officially launched at the end of 2018, and it was planned that in two years, the electricity trading volume in the market would account for no less than 60% of the power generation in Guangdong province. There is no publicly available data on this yet.

³ - In the short term, the existing Chinese regional carbon markets are expected to operate in parallel with 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.

The allowance volume available for auction was adjusted from two million allowances (as had been the case until year 2018) to five million allowances from 2019 onwards.

One auction took place in April 2020 with a floor price of CNY 25.84 per tCO₂e (USD 3.74), selling 400,000 allowances at the price of CNY 28.2 (USD 4.09).

Flexibility

BANKING AND BORROWING

Banking is allowed.

Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: The use of offsets is limited to 10% of covered entities' annual emissions. Chinese Certified Emissions Reductions (CCERs) are allowed. As a mechanism that encourages the public to reduce carbon emissions, Pu Hui Certified Emission Reductions (PHCER) are also allowed since compliance year 2017. In addition to the quantitative limit applied to individual entities, Guangdong sets an upper limit to the total volume of offsets allowed. In 2019, entities were allowed to use up to 1.5 million offsets (CCER and PHCER) towards compliance obligations, with the priority given to the province's CCERs and PHCERs first; then, other offsets will be allowed in accordance with the order of enterprises' written applications until this limit is reached. The number for 2020 has not yet been announced.

QUALITATIVE LIMIT: At least 70% of offsets used by each regulated entity must come from within Guangdong province. This rate is adjusted to 60% if offsets are generated in certain priority regions within Guangdong, as identified by the government (e.g., poor and ethnic minority group areas). Pre-CDM credits are not eligible. Credits from hydro and from most fossil fuel projects are also not eligible. Credits generated in other Chinese ETS pilot regions are not eligible. To be eligible, projects must relate primarily (i.e., more than 50%) to the reduction of CO₂ and CH₄ emissions.

MARKET STABILITY PROVISIONS

RESERVES: 5% of allowances are set aside for government reserves for new entrants and market stability. The specific rules for market stability are provided by its 'Trial Measures for ETS'.⁴

AUCTION RESERVE PRICE: Auctions under the Guangdong Pilot ETS are subject to an auction reserve price. Initially in 2013, the reserve price was set at CNY 60 (USD 8.69), and it was lowered to CNY 25 (USD 3.62) and increased to CNY 40 (USD 5.80) in steps of CNY 5 (USD 0.72) with each quarterly auction in 2014. In 2015, a so-called "policy reserve price" was set as an effective reserve price, which links the auction reserve price with the secondary market price. The reserve price was set at 80% of the weighted average price for allowances over the previous three months in 2015. In 2016, 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 were as follows: CNY 9.37 (USD 1.36), CNY 11.27 (USD 1.63), CNY 16.09 (USD 2.33), and CNY 15.15 (USD 2.20). When auctions were resumed in April 2020 for the compliance year 2019, the policy reserve price was set at 90% of the weighted average price for allowances over the previous three months considering the COVID impact.

OFFSET AUCTIONS: Guangdong introduced auctioning for PHCERs in addition to the existing secondary market trading modes, with an auction reserve price set by the Emissions Exchange Guangzhou and offset project developers. In the latest two auctions of PHCERs in 2020 (28 December 2020), the reserve price for one offset project was set at CNY 22.25/tonne (USD 3.22) (80% of the weighted average price for allowances over the previous three months). The offered 52,355 tonnes offsets were sold at the price of CNY 35.3/tonne (USD 5.12). For the other one, the reserve price was set as CNY 33/tonne (USD 4.78), with all the 9,789 tonnes offered being sold at the price of CNY 36.06/tonne (USD 5.23).

Compliance

COMPLIANCE PERIOD

One year (1 January to 31 December): covered entities have until 20 June of the following year to surrender allowances.⁵

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions.

VERIFICATION: Third-party verification is required. In addition, further validation was initially carried out by government-assigned expert groups in the first three compliance years. Onsite cross reverifications were conducted for the entities with questionable verification reports, as well as for

4 – The auctioning ratio might be adjusted in the future, but no concrete plan is available yet.

5 – The 2020 compliance deadline was postponed due to the COVID-19 pandemic.

randomly selected entities. A so-called “fourth-party independent evaluation system” has been in place since the 2016 compliance period. The “technical evaluation organizations” selected by the government carry out technical review and evaluation of the annual emissions reports and verification reports and undertake further onsite review and random inspection tasks. These technical evaluation agencies do not undertake regular third-party verification tasks.

FRAMEWORK: The Department of Ecology and Environment of Guangdong has released guidelines for monitoring and reporting for the compliance and reporting sectors.

OTHER: Industrial enterprises with annual carbon emissions of more than 5,000 tonnes and less than 10,000 tonnes are required 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 1,449) to CNY 50,000 (USD 7,246). 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 7,246). Other nonfinancial penalties include negative impacts on access to bank loans and subsidy programs.

Other Information

INSTITUTIONS INVOLVED

Guangdong Ecology and Environment Bureau (competent authority)

China Emissions Exchange (Guangzhou) (trading platform)

Guangdong Research Center for Climate Change (registry)

USE OF REVENUES

Guangdong has been exploring the establishment of a Low Carbon Development Fund that would use auction revenues to promote further mitigation actions, carbon finance, and low-carbon industrial development. However, due to the change of the pilot’s competent authority, further information regarding this measure has not yet been released.

IMPLEMENTING LEGISLATION

[Guangdong Pilot ETS Implementation Plan](#)⁶

[Trial Measures for Carbon Emissions Trading in Guangdong](#)⁷
[Department of Ecology and Environment of Guangdong—Allocation Plan for Vintage 2019](#)⁸ (including list of covered entities)

[Department of Ecology and Environment of Guangdong—Allocation Plan for Vintage 2020](#)⁹ (including list of covered entities)

6 – http://www.gd.gov.cn/gkmlpt/content/0/141/post_141049.html#7

7 – http://www.gd.gov.cn/zwggk/wjk/zcfgk/content/post_2524340.html

8 – <http://www.cnemission.cn/article/zcfg/201911/20191100001804.shtml>

9 – <http://www.cnemission.com/article/zcfg/202012/20201200002034.shtml>



HUBEI

Hubei Pilot Emissions Trading System

In force

Under development

Under consideration

SECTORS:



POWER



INDUSTRY

Largest market share (spot and spot forward) among pilots and diversified participants

Market stability reserve in place; government can intervene in cases of low or high prices

Lowered inclusion threshold

Leading in the development of a national ETS registry

CAP 270 MtCO ₂ (2019)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation: Grandparenting Free allocation: Benchmarking Auctioning	AVERAGE 2020 PRICE CNY 27.21 (USD 3.94)	TOTAL REVENUE CNY 212 million (USD 30.7 million) since beginning of program, CNY 49.32 million (USD 7.15 million) collected in 2020

ETS DESCRIPTION

Launched in April 2014, the Hubei Pilot ETS has since concluded six 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 in terms of spot trading volume, after Guangdong. It is also one of the regional pioneers for allowance spot forward trading in China.¹ When spot forward trading is also considered, Hubei has the largest market share as of end 2020, with its total secondary market transaction volume of 347 million tonnes and value of CNY 8.13 billion (USD 1.18 billion). The system initially covered 138 of the most carbon-intensive companies in the province, accounting for ~35% of the province's total carbon emissions.

Hubei has expanded its scope several times. In 2016, it lowered the thresholds of seven sectors from 60,000 to 10,000 tonnes of coal equivalent (tce). In 2017, it further lowered the thresholds of all the other sectors to 10,000 tce. In 2018, the water supply sector was added. As of 2020, the system covers more than 370 entities which accounts for ~42% of the province's carbon emissions.

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. The Hubei ETS pilot is open to diversified market participants, including covered entities as well as institutional and individual (domestic and foreign) investors.

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. 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.

In early 2019, the ETS-related responsibilities in Hubei completed the transition from DRC to the Department of Ecology and Environment (DEE) of Hubei, as a result of the governance restructuring across China.

YEAR IN REVIEW

The Hubei DEE released the 2019 allocation plan in August 2020. Key changes compared to the previous year's plan include: a cap increase of 14 million tonnes to reach 270 million tonnes; a decline in the market adjustment factor, which is a factor applied to all covered entities to reduce overall allocation; and updating of the base year from 2015–2017 to 2016–2018. In this plan, Hubei also clarifies how it plans to coordinate its ETS with the upcoming national ETS. According to the plan, if the national ETS had implemented 2019 compliance work, the overlapping companies would have no longer participated in Hubei's compliance and the regional government would have withdrawn the corresponding allowances issued. This cutoff date of September 2019 did not see the operationalization of the national ETS; hence, these entities were covered under the Hubei ETS for compliance year 2019.

The Hubei DEE moved the compliance deadline for 2019 emissions from May to December 2020 as a result of the COVID-19 pandemic. In December 2020, the Hubei pilot completed its 2019 compliance period with a 100% compliance rate.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 463.1 MtCO₂e (2012)

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

¹ - China is still in the exploratory and research stage of carbon futures trading, and according to the "Administrative Regulations on Futures Trading" document, futures can only be traded on approved professional futures exchanges. Therefore, regional ETS pilots cannot introduce futures trading; however, a few of them have developed carbon forward trading products with their own characteristics.

ETS Size

COVERED EMISSIONS



GHGs COVERED

CO₂ only



SECTORS AND THRESHOLDS

16 sectors:² power and heat supply, iron and steel, non-ferrous metals, petrochemicals, chemicals, textile, cement, glass and other building materials, pulp and paper, ceramics, automobile and equipment manufacturing, food, beverage, and medicine producers, and water supply.

INCLUSION THRESHOLDS:

Until 2015: Annual energy consumption more than 60,000 tce in any year between 2010 and 2011, applying to all energy and industrial sectors.

From 2016 onwards: Annual energy consumption more than 10,000 tce in any year between 2016 and 2018, applying to all energy and industrial sectors.

POINT OF REGULATION

Downstream

Both direct and indirect emissions from electricity and heat consumption are covered.

NUMBER OF ENTITIES

373 (2019)

CAP

270 MtCO₂ (2019), which includes reserves for new entrants and market stability.

Phases & Allocation

TRADING PERIODS

2014 and ongoing³

ALLOCATION

FREE ALLOCATION, BENCHMARKING: Free allocation of 2019 vintage allowances through benchmarks for power and cement (except for entities using outsourced clinker).

FREE ALLOCATION, GRANDPARENTING: Historical emissions intensity for heat, co-generation, glass and other building materials, some of the equipment manufacturing, and the pulp and papers sectors; grandparenting based on previous three years' historic emissions for all other sectors.

Ex-post allocation adjustments are applied, especially for those sectors that use benchmarks and emissions intensity.⁴

Hubei also introduces the so-called market adjustment factor, a factor that is applied to all covered entities to reduce overall allocation. It is determined based on the previous year's market stock of the Hubei carbon market, while taking the province's overall economic development and the achievement of its climate mitigation targets and strategies into consideration. For the 2019 compliance year, it was set at 0.9723.

AUCTIONING: A small share of the annual cap can be auctioned. The main purpose of auctions is to promote price discovery and provide regulated entities with additional

supply to meet their compliance demand. To date, auctions have been held on an ad hoc basis and happened only in 2014, 2019, and 2020. The first auction took place in 2014, with two million allowances sold at the floor price of CNY 20 (USD 2.90).

In November 2019, through two separate auctions, five million allowances were made available from the government reserve. The auctions operated with a reserve price set at the weighted spot market price from 30 October 2017 to 30 October 2019. The first auction was restricted to compliance entities. Two million allowances were offered with 1.49 million sold at an average price of CNY 24.65 (USD 3.57). Remaining allowances were made available to covered entities as well as other market participants for a second auction. The total auction volume was 3.51 million tonnes, including 0.51 million that was left from the first auction. The average price was CNY 24.49 (USD 3.55).

Following an identical structure of two separate rounds of auctions targeting different types of entities, in December 2020 three million allowances were made available from the government reserve, with two-thirds dedicated to compliance entities only. The auctions operated with a reserve price set at CNY 27.56 (USD 3.99). 1.1 million and 671,000 tonnes were successfully auctioned respectively, with the average price of CNY 27.57 (USD 4.00).

2 – Different from other Chinese pilots, Hubei does not pre-define which sectors are covered under its ETS; rather, it sets a threshold which applies to all power and industrial sectors. Those sectors with entities above the threshold then are covered.

3 – 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.

4 – 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 are then used to update allocation ex-post.

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.

MARKET STABILITY PROVISIONS

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

INTERVENTION: In case of market fluctuations, severe imbalances between supply and demand, or liquidity issues, the Hubei EEB—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 EEB takes action.

EXCHANGE: The exchange limits day-to-day price fluctuations to between -10% and +10% respectively.

Compliance

COMPLIANCE PERIOD

One year (1 January to 31 December): covered entities have until the last working day of May of the following year to surrender allowances.⁵

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions.

VERIFICATION: Third-party verification is required. Third-party verifiers may be involved in mutual evaluation of each other's verification reports. In addition, further validation is carried out by government-assigned experts to further enhance the accuracy; this process is also called "fourth-party verification" in China.

FRAMEWORK: The Hubei government has released general rules on monitoring and reporting guiding all the sectors as well as sector-specific guidance for the following 11 sectors: power, glass, aluminum, calcium carbide, pulp and paper, automobile manufacturing, iron and steel, ferroalloys, ammonia, cement, and petroleum processing. The nation-

al-level guidelines on MRV, especially for the sectors outside these 11 sectors, are also used as reference for Hubei.

ENFORCEMENT

Hubei has introduced a capped mechanism for the compliance obligations. If the difference between the annual verified emissions and the allocated allowances of an entity exceeds either 20% of the allocation or 200,000 tonnes, the allowances will be added or deducted to cap the surplus or deficit within the 20%/200,000 tonnes limit.⁶

Penalties for failing to submit an emissions or verification report on time range from CNY 10,000 (USD 1,449) to CNY 30,000 (USD 4,347). Trade participants that manipulate the market face up to CNY 150,000 (USD 21,737) 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 21,737).

Other Information

INSTITUTIONS INVOLVED

Department of Ecology Environment of Hubei Province (competent authority)

China Hubei Emission Exchange (trading platform and registry)

IMPLEMENTING LEGISLATION

[Hubei Pilot ETS Implementation Plan](#)⁷

[Interim Measures for Management of Emissions Trading in Hubei Province](#)⁸

[Department of Ecology Environment of Hubei Province- Allocation Plan for Vintage 2019 \(including list of covered entities\)](#)⁹

5 – For the compliance year 2019, the deadline was postponed in 2020 due to the COVID-19 pandemic.

6 – Two limits, as opposed to only one, are set based on the consideration that 20% may suit the smaller entities better while 200,000 tonnes may suit those that are larger.

7 – <http://www.hbets.cn/index.php/index-view-aid-1075.html>

8 – <http://www.hbets.cn/index.php/index-view-aid-1072.html>

9 – <http://www.yidianzixun.com/article/0QP8E8ng?s=&appid=>

INDONESIA



ETS DESCRIPTION

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).

In 2018, Indonesia completed a study outlining the emissions profiles and marginal abatement cost curves of the power and industry sectors, in addition to completing the design and governance framework of an MRV system. 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 also developed an online GHG emissions reporting system for industries in Indonesia. Pilot MRV programs are being conducted in the cement and fertilizer sectors.

A study completed in late 2018 examined four market-based instrument 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 and stakeholder consultations, an ETS scenario was selected for further development.

A presidential regulation that will provide a national framework for carbon pricing instruments, including an ETS, is reaching an advanced stage, to be decided in early 2021. In parallel, a limited ETS pilot in the power sector is planned for implementation in 2021.

In force

Under development

Under consideration

← MRV system in operation for industry and power sectors

Regulation to set a national framework for carbon pricing instruments being finalized

ETS pilot planned for power sector in 2021

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 1,457 MtCO₂e (2016)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy 538.0 (37%)
Industrial Processes 55.0 (4%)
AFOLU (including peat fire) 752.0 (52%)
Waste 112.0 (8%)

GHG REDUCTION TARGETS

BY 2030: 29% below BAU by 2030 including LULUCF (unconditional NDC); up to 41% below BAU by 2030 including LULUCF (NDC conditional on international support)

Other Information

INSTITUTIONS INVOLVED

Coordinating Ministry for Economic Affairs
Coordinating Ministry for Maritime and Investment Affairs
Ministry of Environment and Forestry
Ministry of Energy and Mineral Resources
Ministry of Industry
Ministry of Finance
Environment Fund Agency
National Development Planning Agency
PMR Indonesia Secretariat
UNDP Indonesia

IMPLEMENTING LEGISLATION/REGULATION

GR 46/2017 on Government Regulation on Environmental Economic Instruments¹
Act No. 32/2009 on Environmental Conservation and Management²

1 - <https://sipuu.setkab.go.id/PUUdoc/175354/PP%20Nomor%2046%20Tahun%202017.pdf>
2 - <http://extwprlegs1.fao.org/docs/pdf/ins97643.pdf>



JAPAN

In force

Under development

Under consideration

Expert committee discussing carbon pricing options

Operating voluntary ETS

In March 2017, the Global Environment Committee of the Central Environment Council of Japan formulated the country's 'Long-term Low-Carbon Vision.' The document refers to carbon pricing as essential to decarbonizing society. Based on this 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 address economic and social issues. In June 2018, a deliberative council—the Subcommittee on Utilization of Carbon Pricing, Global Environmental Subcommittee, Central Environment Council—was established 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. In August 2019, the subcommittee published an interim summary report of the discussion and is scheduled to resume activities beginning early 2021. Discussions on the shape of a future carbon pricing mechanism, in addition to the existing 2012 carbon tax levied on fossil fuels such as petroleum, natural gas, and coal, are still ongoing within the Ministry of Environment and with various stakeholders. In December 2020, Prime Minister Yoshihide Suga instructed the Minister of the Environment and the Minister of Economy, Trade, and Industry to consider a carbon pricing proposal.

In parallel, Japan operates the Advanced Technologies Promotion Subsidy Scheme with Emission Reduction Targets (ASSET) Program, which functions as a voluntary cap-and-trade program. To receive an ASSET subsidy, entities establish a reduction target based on historical emissions and propose new technologies to reach these targets. Entities that implement such technologies and achieve their target are granted the ASSET subsidy. Entities unable to meet their target on their own are permitted to purchase either credits from other participating entities, or so-called 'J-Credits.' The government administers the voluntary J-Credit Scheme, where energy saving, renewable energy, and domestic forest management mitigation activities are verified as tradable J-Credits.

Japan is also implementing the Joint Crediting Mechanism (JCM), a bilateral offset crediting mechanism to incentivize low-carbon technologies, in 17 JCM partner countries (Mongolia, Bangladesh, Kenya, Ethiopia, Indonesia, Vietnam, Lao PDR, Cambodia, Maldives, Palau, Costa Rica, Mexico, Chile, Saudi Arabia, Myanmar, Thailand, and the Philippines).

In October 2020, Prime Minister Suga pledged to reduce GHG emissions in Japan to net zero by 2050.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 1,240.4 MtCO₂e (2018)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy 1,085.7 (88%)
 Industrial Processes and Product Use 100.1 (8%)
 Agriculture 33.3 (3%)
 Waste 19.3 (2%)
 Indirect CO₂ 2.1 (0%)

GHG REDUCTION TARGETS

BY 2030: 26% reduction from FY2013 GHG levels (NDC)

BY 2050: Climate net neutrality (October 2020 pledge)

Other Information

INSTITUTIONS INVOLVED

Ministry of the Environment, which manages the Subcommittee on Utilization of Carbon Pricing
 Global Environmental Subcommittee
 Central Environment Council

NEW ZEALAND

The New Zealand Emissions Trading Scheme



COVERAGE	GASES	OFFSETS AND CREDITS
40.3 MtCO ₂ e ¹	Several gases	None ²
ALLOCATION	AVERAGE 2020 PRICE ³	REVENUE COLLECTED IN 2020
Free allocation for emissions-intensive and trade-exposed (EITE) activities: Benchmarking Auctioning Allowances granted for forestry and other removal activities	NZD 30.83 (USD 19.99)	NZD 215 million (USD 139 million) ⁴

- In force
- Under development
- Under consideration

SECTORS:

- POWER
- INDUSTRY
- DOMESTIC AVIATION*
- TRANSPORT*
- BUILDINGS*
- WASTE
- FORESTRY
- AGRICULTURE (reporting obligations only)

* Sectors covered through upstream coverage

ETS DESCRIPTION

The New Zealand Emissions Trading Scheme (NZ ETS) was launched in 2008 and is a central policy for climate change mitigation in New Zealand. It has broad sectoral coverage, including forestry having emissions surrender obligations and the opportunity to earn units for emissions removals. Currently, biological emissions from agriculture have reporting obligations without surrender obligations. The 'Climate Change Response Act 2002' sets the legislative framework for the NZ ETS and incorporates all of New Zealand's key climate legislation under one Act.

After an extensive process of review and public consultation, the government has recently enacted sweeping legislative reforms of the NZ ETS to improve its design and operation, and enable it to better support New Zealand's international and domestic emissions reduction obligations.

The NZ ETS originally operated as a nested system under the Kyoto Protocol, with full links to international carbon markets. Since 2015, however, it has been a domestic-only system. Accessing high-integrity international carbon markets could form part of New Zealand's strategy for meeting its NDC.

YEAR IN REVIEW

In June 2020, the New Zealand government completed comprehensive legislative reforms with the passing of the 'Climate Change Response (Emissions Trading Reform) Amendment Act 2020.' This legislation strengthens the NZ ETS and aligns it with the goals of the Paris Agreement and the new 2050 net-zero targets established under the 'Climate Change Response (Zero Carbon) Amendment Act 2019.'⁵

With the legislative framework in place, the government announced the regulatory settings for the 2021–2025 period, which establish a cap on emissions for the first time under the NZ ETS. The cap represents an annual limit on units to be supplied into the NZ ETS under the economy-wide five-yearly emissions budgets, set by the government with advice from the newly established Climate Change Commission.

Auctioning has been introduced to the NZ ETS beginning in March 2021 and price control regulations provide for release of additional units through a cost containment reserve to manage unacceptably high prices; and an auction reserve price as a price floor. In a joint bid, the New Zealand Exchange (NZX) and the European Exchange (EEX) were together selected by the New Zealand government to develop and operate the NZ ETS auctioning service.

The legislation specifies a schedule to phase down free allocation for the industrial sector at a rate of 1% per year between 2021 and 2030, increasing to 2% in 2031–2040, and 3% in 2041–2050. A further review of the free allocation methodology will take place over 2021.

The forestry sector is also undergoing a raft of reforms due to come into force in 2023, including simplified accounting measures for new entrants (e.g., a transition from "stock-change" to "averaging" accounting methodology).

Under the new legislation, agricultural GHG emissions will be subject to a carbon price from 2025 onwards. Agricultural emissions, particularly from livestock, are to be covered preferably at the farm level by a levy/rebate system – a separate, alternative pricing mechanism to the NZ ETS. A partnership between the government and the agricultural sector, called "He Waka Eke Noa," has been established to prepare for this pricing mechanism, including the development of on-farm accounting and reporting systems for GHG sources and sinks. However, if this partnership has not made enough progress by 2022 for implementation in 2025, agricultural emissions will be brought directly into the NZ ETS from 2022, with livestock emissions priced at the processor level (e.g., milk processors and abattoirs). GHG emissions from fertilizer would then likely be covered upstream under the NZ ETS at the importer/manufacturer level.

← Broad ETS sectoral coverage including forestry

Implementation of auctioning and market stability measures under a new ETS cap

Pricing mechanism for the agricultural sector scheduled

1 – Emissions reported in activity year 2019, excluding LULUCF and agriculture

2 – International (prior to 1 June 2015)

3 – Average secondary market price

4 – Money paid to meet surrender obligations under the "fixed price option" – 8.6 million fixed price option units were used at NZD 25 (USD 16.21) each

5 – Both of these Acts amend the "Climate Change Response Act 2002"

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 78.9 MtCO₂e (2018)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy (transport) 16.6 (21%)
 Energy (other) 15.3 (19%)
 Industrial Processes and Product Use 5.2 (7%)
 Agriculture 37.7 (48%)
 Waste 4.1 (5%)

GHG REDUCTION TARGETS

BY 2030: Reduce emissions 30% below 2005 levels (NDC)

BY 2050: Reduce net emissions of all greenhouse gases (except biogenic methane) to zero. Reduce biogenic methane emissions 10% below 2017 levels by 2030, and 24–47% by 2050 (Climate Change Response (Zero Carbon) Amendment Act 2019)

ETS Size

COVERED EMISSIONS

40.3 MtCO₂e
 (Verified emissions⁵ 2019)



GHGs COVERED

CO₂, CH₄, N₂O, SF₆, HFCs, and PFCs



SECTORS AND THRESHOLDS

Sectors were gradually phased in between 2008 and 2013. Thresholds for participation are typically low.

- Forestry (mandatory: deforesting pre-1990 forest land; voluntary: post-1989 forest land)
- Stationary energy (various thresholds)
- Industrial processing (various thresholds)
- Liquid fossil fuels (various thresholds)
- Waste (except for small and remote landfills)
- Synthetic GHGs (various thresholds); synthetic GHGs not in the NZ ETS are subject to an equivalent levy

Biological emissions from agriculture must be reported at the processor level but face no surrender obligations. By 2025, a carbon price will be levied on agricultural emissions either through the NZ ETS or a separate levy/rebate scheme.

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 ENTITIES⁶

2,398 entities registered, of which 2,321 have surrender obligations:

- 218 entities with mandatory reporting and surrender obligations.
- 2,103 entities with voluntary reporting and surrender obligations, most of which are for post-1989 forestry activities.
- 77 entities with mandatory reporting without surrender obligations, all of which are for agricultural processing 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 'Climate Change Response (Emissions Trading Reform) Amendment Act' requires the government to set a cap on emissions covered by the NZ ETS, based on the five-yearly emissions budgets mandated by the 'Zero Carbon Act' and announced over a rolling five-year period with annual updates. The Climate Change Commission will advise on further emissions budgets in 2021.

In the interim, the government has chosen a provisional emissions budget and associated cap for the period 2021–2025. The cap will limit the number of allowances that can be released to the market from auctioning, industrial allocation, and the new Cost Containment Reserve (CCR), as well as from any international units (not currently foreseen).

There will be no limit on NZUs generated from removal activities.

⁵ - With surrender obligations

⁶ - All figures as of June 2020

Phases & Allocation

TRADING PERIODS

The NZ ETS has no fixed trading periods or phases.

ALLOCATION

FREE ALLOCATION:

Leakage Protection/Industrial Free Allocation: Free allocation is provided, based on output and intensity-based benchmarks for 26 eligible industrial activities. Activities are deemed eligible if both emissions-intensive and trade-exposed (EITE) criteria are met. Highly emissions-intensive activities (over 1,600 tCO₂e per NZD 1 million of revenue [1,600 tCO₂e per USD 648 thousand of revenue]) receive 90% free allocation. Moderately emissions-intensive activities (over 800 tCO₂e per NZD 1 million of revenue [USD 648 thousand]) receive 60% free allocation. Trade exposure is deemed if there is transoceanic trade in the good produced. 8.4 million NZUs were allocated for industrial EITE activities in the 2019/2020 financial year (1 July 2019 to 30 June 2020).

As a part of the 'Climate Change Response (Emissions Trading Reform) Amendment Act,' the government plans to phase down industrial free allocation from 2021. A minimum annual phase-down rate of 1% across all industrial activities will apply from 2021–2030. That rate will increase to 2% for the years 2031–2040, and to 3% for 2041–2050. The minimum phase-down rate will be complemented by further phase-down rates for activities that are considered at lower risk of carbon leakage.

Forestry and Fisheries Sectors (one-off): 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: Auctioning was introduced in 2021, with the first auction taking place on 17 March.

ALLOWANCES GRANTED FOR REMOVALS

Post-1989 Forestry Sector and Other Removal Activities: NZUs are granted to participants that voluntarily register in the scheme for removal activities, as outlined under "Forestry Removal Activities" below.

Forestry Removal Activities: Participants are entitled to receive one NZU per tCO₂ removed for registered post-1989 forest land. If the forest is harvested⁷ 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. 9.1 million NZUs were issued for forest removal activities for the 2019/2020 financial year.

Other Removal Activities: Participants are entitled to receive one NZU per tonne of removal from the destruction or export of products that embed carbon as well as for the export of HFCs and PFCs.⁸ 3.1 million NZUs were issued for other removal activities for the 2019/2020 financial year.

Flexibility

BANKING AND BORROWING

Banking is allowed except for those units that were purchased under the fixed price option (see "Market Stability Provisions" section).

Borrowing is not allowed.

OFFSETS AND CREDITS

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. Access to high-integrity international carbon markets is likely to form part of New Zealand's strategy for meeting its 2030 target. The government can decide to allow international units as part of the annual unit supply-setting process. However, only units from government-approved sources and those meeting environmental integrity standards would be eligible and would be subject to quantitative limits.

MARKET STABILITY PROVISIONS

A Fixed Price Option of NZD 25 (USD 16.21), which acts as a form of price ceiling, was introduced in 2009 and raised to NZD 35 (USD 22.70) for emissions produced in 2020. It will be replaced with a CCR once the transition to auctioning has occurred.

NEW MARKET STABILITY MEASURES: The 'Climate Change Response (Emissions Trading Reform) Amendment Act' enables new measures to be implemented via the auctioning mechanism. These include a CCR and an auction reserve price, outlined below.

COST CONTAINMENT RESERVE: The CCR is implemented via auctioning. A specified number of allowances from the CCR will be released for auction if a predetermined trigger price is reached, currently set at NZD 50 (USD 32.42) in 2021 and rising by 2% per year in line with projected inflation.

7 – Under the new "averaging" method for post-1989 forests, allowances are granted only up to the long-term average carbon stock, but therefore do not need to be surrendered at harvest.

8 – In the case of export, GHGs are considered "removals" according to the accounting rules of the NZ ETS. They are not removed from the atmosphere.

The volume of the reserve, in the years 2021–2025, will be composed of two sources:

- (1) units under the ETS cap which are to be withheld from auctioning in order to reduce the stockpile of units in circulation (~5.5 million per year); and
- (2) an additional volume equal to 5% of the total volume of the NZ ETS (~1.6 million per year), which will come from outside the cap and therefore must be “backed” by equivalent removals procured by the government, e.g., from international markets or through government funding of other domestic mitigation activities.

PRICE FLOOR: Via auctioning, the government will introduce a price floor of NZD 20 (USD 13.00) for the period 2020–2025.

The price floor will operate through a reserve price below which NZUs will not be sold at auction. The minimum accepted bid at auction will rise by 2% for each subsequent year. In addition to the hard auction reserve price floor, the government plans to introduce a technical reserve price (TRP). The TRP will be set by referencing prices from the secondary market and will use a confidential methodology to determine a reserve price below which units cannot be sold. If the TRP is set higher than the hard auction reserve price, then it becomes the new reserve price floor for that auction. Any unsold units can be carried over to the following auction within the calendar year, but will be cancelled if it is the final auction of the year.

Compliance

COMPLIANCE PERIOD

One year

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 allocations and surrenders for these participants occur in the year they choose to report their emissions.

MRV

REPORTING FREQUENCY: Most sectors are required to report annually; deadline of 31 March to submit an Annual Emissions Return (emissions report).

VERIFICATION: Self-reporting supplemented by a program of official audits. Participants must seek third-party verification if they apply for the use of a unique emissions factor.

ENFORCEMENT

An entity that fails to surrender or repay emissions units when required must surrender the units and pay a cash penalty of three times the current market price for each unit that was not surrendered by the due date. Entities can be fined up to NZD 24,000 (USD 15,564) 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 32,424) on conviction for knowingly altering, falsifying, or providing incomplete or misleading information about any obligations under the scheme, including in the Annual Emissions Return report. 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.

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 recent reforms make the NZ ETS more similar to ETSs in other countries, making it more compatible for international linking in the future.

Other Information

INSTITUTIONS INVOLVED

Ministry for the Environment
Environmental Protection Authority
Ministry for Primary Industries

EVALUATION/ETS REVIEW

The 'Climate Change Response Act 2002' includes provisions for statutory independent reviews of the operation and effectiveness of the NZ ETS. These reviews were originally required every five years, but the timing is now discretionary. The first statutory 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' was undertaken in 2018 following the second review.

USE OF REVENUES

Currently, NZ ETS revenues are assigned to the general budget. There is no earmarking for specific purposes.

IMPLEMENTING LEGISLATION/REGULATION

['Climate Change Response Act 2002—Part 4 New Zealand greenhouse gas emissions trading scheme'](#)⁹

Note: in order to keep New Zealand's key climate change legislation under one act, the Act incorporates both the Climate Change Response (Emissions Trading Reform) Amendment Act 2020, and the Climate Change Response (Zero Carbon) Amendment Act 2019. The 'Zero Carbon Act' details domestic targets to 2050, establishes the Climate Change Commission, and mandates a process of setting and meeting five-year national emission budgets.

9 – <http://www.legislation.govt.nz/act/public/2002/0040/latest/DLM1662481.html>.



PAKISTAN

In force

Under development

Under consideration

→
Launched a national committee in 2019 to assess the role and scope of an ETS

Work is underway on preparing MRV regulations for an ETS

Pakistan is considering market-based climate policy instruments, including an ETS, to tap into low-cost abatement opportunities and leverage low-carbon investments.

The ‘Pakistan Climate Change Act, 2017’ provides the legal and institutional framework for climate policy in Pakistan. It establishes the cross-ministerial Pakistan Climate Change Council responsible for the country’s overall climate strategy as well as the Pakistan Climate Change Authority, which is tasked with coordinating climate policy development and implementation, in addition to designing and establishing a national registry and database on GHG emissions. In 2019, the Pakistani Ministry of Climate Change, in cooperation with the United Nations Framework Convention on Climate Change secretariat and the Institute for Global Environmental Strategies, published a study on carbon pricing underlining the potential for emissions trading in Pakistan in the power and industry sectors.

Following the outcomes of the study, Pakistan launched the National Committee on Establishment of Carbon Markets in December 2019. The committee is tasked with assessing the role and scope of carbon markets in delivering Pakistan’s NDC and identifying opportunities for and challenges to improving emissions data. Among other objectives, it will review existing carbon market designs, deliberate with national stakeholders, draft reports, and coordinate information-sharing and capacity-building activities.

The ongoing work is focused on developing recommendations for the government on the development of a domestic ETS and of credit-based trading mechanisms linked to international carbon markets, which would enable Pakistan to supply offsets to partner countries. Provisions are being drafted for domestic instruments under Article 6, and work is underway on preparing MRV regulations for an ETS. Moreover, Pakistan is developing a carbon pricing communication strategy.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 397.5 MtCO₂e (2015)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy 186.0 (47%)
Industrial Processes 22.0 (6%)
Agriculture 174.3 (44%)
Waste 15.5 (4%)

GHG REDUCTION TARGETS

BY 2030: 20% below BAU including LULUCF (NDC conditional on international support)

Other Information

INSTITUTIONS INVOLVED

Ministry of Climate Change
Pakistan Climate Change Council
Pakistan Climate Change Authority
National Committee on Establishment of Carbon Markets

IMPLEMENTING LEGISLATION/REGULATION

Pakistan Climate Change Act 2017¹

1 - www.na.gov.pk/uploads/documents/1485513841_966.pdf

PHILIPPINES



In early 2020, the Committee on Climate Change of the Philippine House of Representatives conditionally approved the 'Low Carbon Economy Act' House Bill (HB) No. 2184, which includes provisions for a domestic cap-and-trade system. A technical working group has since been established to review the bill, which will be reconsidered based on the group's input. The bill would establish a cap-and-trade system for the industrial and commercial sectors, administered by the Philippine Department of Environment and Natural Resources (DENR) and the Department of Trade and Industry.

Under the proposed legislation, the cap-and-trade system would cover a variety of GHGs, including carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, and any other gas determined by the DENR to contribute to global warming. The DENR would determine key details regarding setting annual emissions reduction targets, setting a cap, distributing allowances, monitoring, and enforcement. The bill would also establish a 'Climate Reinvestment Fund' to be used by the DENR to exclusively address global warming. The bill does not specify a timeline to have the system in place.

- In force
- Under development
- Under consideration

← Legal basis being developed for an ETS in the industrial and commercial sectors

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 229.0 MtCO₂e (2017)



Energy 133.0 (58%)
Industrial Processes 12.0 (5%)
Agriculture 63.0 (28%)
Waste 20.0 (9%)

GHG REDUCTION TARGETS

BY 2030: Conditional pledge to keep 2030 emissions 70% below BAU levels (INDC, NDC to be submitted in 2020/2021)

Other Information

INSTITUTIONS INVOLVED

Department of Environment and Natural Resources
Department of Trade and Industry
House of Representatives Committee on Climate Change



REPUBLIC OF KOREA

Korea Emissions Trading System

In force

Under development

Under consideration

SECTORS:



POWER



INDUSTRY



DOMESTIC AVIATION



BUILDINGS



WASTE

East Asia's first national ETS

Phase 3 commenced in 2021 with a stricter cap, updated allocation provisions, and third-party participation

2050 net-zero target currently in the legislative process

CAP	GASES	OFFSETS AND CREDITS
592 MtCO ₂ e (2020) 609 MtCO ₂ e (2021)	Several gases	Domestic International
ALLOCATION	AVERAGE 2020 PRICE ¹	TOTAL REVENUE
Free allocation: Benchmarking Free allocation: Grandparenting Auctioning	KRW 32,595.83 (USD 27.62)	KRW 480.7 billion (USD 407.3 million ²), KRW 248.3 billion (USD 199.4 million) collected in 2020

ETS DESCRIPTION

The Korea ETS (K-ETS) was launched on 1 January 2015, becoming East Asia's first nationwide mandatory ETS and, at the time, the second-largest carbon market after the EU ETS. The K-ETS covers 685 of the country's largest emitters, accounting for ~73.5% of national GHG emissions. It covers direct emissions of six GHGs, as well as indirect emissions from electricity consumption. The K-ETS is meant to play an essential role in meeting Korea's 2030 updated NDC target of a 24.4% reduction from 2017 emissions.

The first and highest legal base for green growth and implementation of the K-ETS is the 'Framework Act on Low Carbon, Green Growth' (2010). The 'Act on Allocation and Trading of Greenhouse Gas Emissions Allowances' ('Emissions Trading Act') and its Enforcement Decree, passed in 2012, stipulate government actions, institutions, and timelines for the K-ETS. Further details of the K-ETS were outlined in two Master Plans (January 2014 and February 2017). Detailed Allocation Plans are released for each trading phase (January 2014, July 2018, and September 2020).

The K-ETS was preceded by a mandatory GHG and Energy Target Management System (TMS) that was launched in 2012 (following a two-year pilot phase started in 2010). The TMS facilitated the collection of verified emissions data and training in the MRV process and still applies to smaller entities not covered by the K-ETS.

YEAR IN REVIEW

2020 was an important year for climate ambition in Korea with the government announcing a Green New Deal and a net-zero target for 2050, tied to a commitment to speed

up investment in clean technologies across the economy. 2020 also saw notable developments in the K-ETS with the adoption of key regulations for the third trading phase which commenced with the start of the new trading year in 2021. The updates include amendments to the 'Emissions Trading Act' and the adoption of the Phase 3 Allocation Plan in September 2020—the latter of which forms the main ETS document detailing updated design provisions ahead of the new trading phase.

Starting from Phase 3, financial intermediaries can participate in the secondary market and trade allowances as well as converted carbon offsets on the Korea Exchange (KRX)—complementing the "market maker system" that was introduced in Phase 2 to support market liquidity. Furthermore, the system's scope has been expanded to include construction companies and (large) transport companies. This corresponds to a rise in the number of compliance entities from ~610 to 685 and a 3.2% increase in the average annual cap, amounting to 609 million tCO₂e during 2021–2025. The inclusion of these sectors brings the system's coverage to 73.5% of national emissions, an increase of more than 2 percentage points. The allocation plan also foresees the introduction of a futures market at a yet-to-be-determined date.

In line with earlier announcements about allocation provisions in Phase 3, the share of auctioning increases from 3% to 10% in 2021 for a total of 41 out of 69 industries eligible to participate in auctions. The remaining 28 subsectors receive 100% free allocation as determined by a carbon leakage index. The share of benchmarking increases from 50% to 60% and expands to a total of 12 sectors. The share of offsets in Phase 3 is reduced from 10% to 5%.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 727.7 MtCO₂e (2018)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Fuel Combustion (including transport) 632.4 (87%)
Industrial Processes 57.0 (8%)
Agriculture 21.2 (3%)
Waste 17.1 (2%)

¹ – Average secondary market price from KRX.

² – The regular auction schedule began in 2019. Allowances were also auctioned in 2016 and 2018 by the Allocation Committee from the reserve for market stability measures. Revenues from these auctions totalled USD 99.6 million and are not included in the total auction revenue figure above.

GHG REDUCTION TARGETS

BY 2030: 24.4% below 2017 emissions (i.e., 536 MtCO₂e in 2030) (updated NDC); 38 million international credits³ may be used towards achieving this goal (2030 GHG mitigation roadmap)

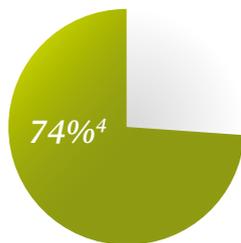
BY 2050: Net-zero emissions (proposed)

ETS Size

COVERED EMISSIONS

GHGs COVERED

CO₂, CH₄, N₂O, PFCs, HFCs, SF₆



SECTORS AND THRESHOLDS

PHASE ONE (2015–2017): 23 subsectors from the following five sectors: power, industry (e.g., iron and steel, petrochemical, cement, oil refinery, nonferrous metals, paper, textile, machinery, mining, glass, and ceramics), buildings, waste, and transportation (domestic aviation).

PHASE TWO (2018–2020): According to the Phase 2 Allocation Plan, the public and waste sectors are disaggregated such that the K-ETS covers the following six sectors: heat and power, industry, buildings, transportation, waste sector, and the public sector. These sectors are disaggregated into 62 subsectors.

PHASE THREE (2021–2025): The K-ETS covers the following six sectors: heat and power, industry, buildings, transportation, waste sector, and the public sector. The transport sector (freight, rail, passenger, and shipping) and construction industries have been brought into the system's scope, increasing the number of subsectors covered to 69.

INCLUSION THRESHOLDS: company >125,000 tCO₂/year, facility >25,000 tCO₂/year

Next to direct emissions coverage, the K-ETS covers indirect emissions from electricity consumption. The same inclusion thresholds apply.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

685 (2021)

CAP

PHASE ONE (2015–2017): 1,686.3 MtCO₂e, including a reserve of 88 MtCO₂e for early action and new entrants. 84.5% of the reserve was used within the phase. 14.3 million allowances were set aside in a reserve for market stabilization, bringing the total number of allowances in Phase 1 to 1,700.6 million.

Annual Caps in Phase One

2015: 540.1 MtCO₂e

2016: 560.7 MtCO₂e

2017: 585.5 MtCO₂e

(Yearly caps do not include allowances set aside for market stabilization.)

PHASE TWO (2018–2020): 1,777 MtCO₂e, including 134 million for new entrants and other purposes. 14 million allowances were set aside for market stabilization and five million for the market makers (see "Market Stability Provisions" section) bringing the total amount of allowances to 1,796.1 million in Phase 2.

Annual Caps in Phase Two

2018: 601 MtCO₂e

2019: 587.6 MtCO₂e

2020: 545.1 MtCO₂e

Unallocated and withdrawn allowances were transferred to the reserve.

PHASE THREE (2021–2025): 3,048.3 MtCO₂e. This corresponds to an average annual cap of 610 MtCO₂e, including reserves. Annual caps are higher in Phase 3 due to the expansion in scope, but reflect a 4.7% decrease in emissions compared to the 2017–2019 baseline. In addition, 14 million allowances are set aside for market stability purposes and 20 million for the market makers, bringing the total amount of allowances in Phase 3 to 3,082.3 million.

Annual Caps in Phase Three (excluding reserves)

2021: 589.3 MtCO₂e

2022: 589.3 MtCO₂e

2023: 589.3 MtCO₂e

2024: 567.1 MtCO₂e

2025: 567.1 MtCO₂e

Phases & Allocation

TRADING PERIODS

PHASE ONE: 3 years (2015–2017)

PHASE TWO: 3 years (2018–2020)

PHASE THREE: 5 years (2021–2025)

³ - This includes international credits through the K-ETS, as well as alternative options, including LULUCF and other international credits (i.e., Article 6 under the Paris Agreement).

⁴ - Phase 3 Allocation Plan factsheet: <http://www.me.go.kr/home/web/board/read.do?pagerOffset=0&maxPageItems=10&maxIndexPages=10&searchKey=&searchValue=&menuId=286&orgCd=&boardId=1401250&boardMasterId=1&boardCategoryId=&decorator=>

ALLOCATION

PHASE ONE (2015–2017)

Free Allocation: 100% of total allowance supply. Most sectors received free allowances based on the average GHG emissions of the base years (2011–2013). Three sectors (grey clinker, oil refinery, and aviation) were allocated free allowances following benchmarks based on previous activity data from the base years (2011–2013).

PHASE TWO (2018–2020)

Free Allocation: 97% of allocation to entities in sub-sectors subject to auctioning; 100% for EITE sectors. Toward the end of Phase 2, the share of sector-specific benchmarking reached 50% of total primary allocation and was expanded to a total of seven sectors: grey clinker, oil refinery, domestic aviation, with the addition of waste, industrial parks, electricity generation, and district heating/cooling.

EITE sectors received 100% of their allowances for free if they met one of the following three criteria:⁵

- Additional Production Cost of >5% and Trade Intensity of >10%; or
- Additional Production Cost of >30%; or
- Trade Intensity of >30%.⁶

Auctioning: 3% of allocation to entities in sub-sectors subject to auctioning. 26 subsectors were eligible to participate in auctions, including entities from the electricity, domestic aviation, wooden products, and metal foundry sectors. Regular auctions began in 2019. In 2019, authorities auctioned a total of 7.95 million allowances. 9.3 million allowances were auctioned in 2020.

Participation in auctions is subject to some limitations. Only companies that do not receive all their allowances for free are 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 are subject to a minimum price set by the following formula: (average price over the previous three months + average price of last month + average price over the previous three days)/3

PHASE THREE (2021–2025)

Free Allocation: Less than 90% of allocation to entities in sub-sectors subject to auctioning; 100% for EITE sectors. The share of sector-specific benchmarking is to reach 60% and has been expanded to a total of 12 sectors: grey clinker, oil refinery, domestic aviation, waste, industrial parks, electricity generation, and district heating/cooling, with the addition of steel, petrochemical, buildings, paper, and wood processing.

Fuel-specific benchmarks apply to electricity generators and will be updated again by the end of 2023. Industry benchmarks are currently undergoing revisions.

EITE sectors receive 100% free allocation when meeting the following criteria:

Cost Incidence * Trade Intensity \geq 0.002

Auctioning: At least 10% of allocation to entities in sub-sectors subject to auctioning. Entities from 41 subsectors, which excludes EITE sectors, can participate in auctions. The same auction provisions as for Phase 2 apply.

Financial intermediaries and other third parties can participate in exchange trading since 2021. A futures market will be introduced as a part of Phase 3 reforms at a yet-to-be-determined date.

Flexibility

BANKING AND BORROWING

Banking is allowed with restrictions across and within phases.

Borrowing is allowed within a single trading phase.

PHASE ONE (2015–2017) From Phase 1 to Phase 2, banking was limited for each installation to 10% of their annual average allocation at a maximum of 20,000 Korean Allowance Units (KAUs). The amount that exceeds the threshold was deducted from the Phase 2 allocation.

Borrowing in 2015 was limited to 10% of an entity's obligation and was increased to 20% in 2016 and 2017.

PHASE TWO (2018–2020) From Phase 2 to Phase 3, banking was initially limited to the higher of two limits: the net annual amount of allowances sold by the entity in Phase 2; or company- and facility-specific limits of 250,000 KAUs and 5,000 KAUs, respectively. Borrowing was limited to 15% of an entity's obligation in 2018.

Rules on banking and borrowing were adjusted in 2019. The borrowing limit was set by each entity's past borrowing activity: [Borrowing limit of previous year - ("borrowing ratio" in previous year x 50%)]/entity's emission volume.

The banking limit for the transition between Phase 2 and Phase 3 has been calculated as follows:

- For allowances from the 2018 vintage (KAU18), entities can bank either three times the net selling amount or 75,000 allowances for companies emitting >125k tCO₂e (or 15,000 allowances for companies emitting >25,000 tCO₂e) — whichever of the two is higher;
- For KAU19s, the amounts above are reduced by 1/3, i.e., two times the net selling amount or 50,000 for large entities (10,000 for smaller entities) allowances, again whichever is higher;
- For KAU20s, the amount represents a 2/3 reduction compared to the KAU18 rule.

⁵ - Additional Production Cost: annual average GHG emissions during base year x average market price of allowances during base year / annual average value-added production during base year

⁶ - Trade Intensity is calculated relative to the base year: (annual average exports + annual average imports) / (annual average sales + annual average imports)

PHASE THREE (2021–2025)

In the first trading year, entities can borrow up to 15% of their compliance obligation. From the second to fourth trading years, the same borrowing formula as for 2019 applies.

Banking in Phase 3:

- In the first and second compliance years (2021–2023), entities can bank up to two times their net amount of allowances (KAUs) and offsets (Korean Credit Units, KCUs) sold on the secondary market.
- In the third and fourth compliance years (2023–2024), entities' banking limit is equal to their net amount of allowances and offsets sold.
- Phase 3 allowances and offsets can only be carried over to the first compliance year of Phase 4 (2026–2030). The banking limit in the fifth compliance year (2025) is set by an entity's annual average net sold units (KAU21-KAU25; KCU21-KCU25) on the secondary market during Phase 3.

OFFSETS AND CREDITS

Domestic offsets, i.e., Korean Offset Credits (KOCs) were allowed in Phase 1. KOCs and international credits (subject to qualitative criteria) have been allowed since Phase 2. Both domestic and international credits need to be converted to KCUs in order to be used for compliance.

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. Eligible activities included those eligible under the CDM and Carbon Capture and Storage. However, only activities implemented after 14 April 2010 were eligible.⁷

Quantitative Limit: Up to 10% of each entity's compliance obligation.

PHASE TWO (2018–2020)

Qualitative Limit: In Phase 2, CERs generated after 1 June 2016 from international CDM projects developed by domestic companies are allowed. CDM projects operated by Korean companies were allowed when:

- at least 20% of the ownership rights, operating rights, or the voting stocks are owned by a Korean company;
- a Korean company supplies the low-carbon technology worth at least 20% of the total project cost; or
- 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.

Quantitative Limit: Up to 10% of each entity's compliance obligation (of which up to 5% can be international offset credits).

PHASE THREE (2021–2025): Offsets will continue to be allowed according to the qualitative criteria outlined for Phase 2.

Quantitative Limit: In Phase 3, the share of offsets has decreased to 5% of an entity's compliance obligation. No separate limit for international credits applies.

MARKET STABILITY PROVISIONS

AUCTION RESERVE PRICE: Regular auctions as well as auctions for market stability are subject to a reserve price determined by a formula (see "Allocation" section).

ALLOCATION COMMITTEE: An Allocation Committee is in place to implement market stabilization measures in particular cases:

- the market allowance price of six consecutive months is at least three times higher than the average price of the two previous years;
- the market allowance price of the last month is at least twice the average price of the 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;
- the average market allowance price of a given month is lower than 40% of the average price of the two previous years; or
- it is difficult to trade allowances due to an imbalance of supply or demand.

The stabilization measures may include:

- additional auctioning of allowances from the reserve (up to 25%);
- establishment of a limit to the number of allowances in an entity's account: minimum (70%) or maximum (150%) of the allowance of the compliance year;
- an increase or decrease of the borrowing limit;
- an increase or decrease of the offsets limit; and
- temporary setup of a price ceiling or price floor.

In 2016, the Allocation Committee doubled the borrowing limit to 20%; as well, an additional 0.9 million allowances were auctioned at a reserve price of KRW 16,200 (USD 13.73) of which almost one-third were sold. In 2018, the Allocation Committee auctioned an additional 5.5 million allowances from the stability reserve to ease the market in the lead-up to the 2017 compliance deadline; 4.7 million allowances were sold.

In June 2019, the Korea Development Bank and the Industrial Bank of Korea were officially designated as "market makers." These institutions can draw on a government-held reserve of five million allowances in a bid to increase liquidity in the market. Both banks, along with the Korean Export-Import Bank, engaged in market transactions on a daily basis. This has improved market liquidity and reduced bid-ask spreads.⁸

The reserve for market liquidity increased to 20 million allowances for the third trading phase.

⁷ – As of December 2017, a total of 35 domestic and 211 CDM methodologies had been approved for use under the K-ETS.

⁸ – The government lends allowances to the market makers that provide services for market stability. Market makers can return allowances in-kind or transfer the proceeds of allowances sold.

Compliance

COMPLIANCE PERIOD

One year. Entities need to surrender allowances for the previous emissions year by end of June.

MRV

REPORTING FREQUENCY: Annual reporting of emissions must be submitted within three months from the end of a given 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 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 84.73)/tonne.

Linking

LINKS WITH OTHER SYSTEMS

No linkage is currently considered.

Other Information

INSTITUTIONS INVOLVED

In 2016, overall responsibility for the K-ETS moved from the Ministry of Environment (MOE) to the Ministry of Economy and Finance (MOEF). In January 2018, responsibility was transferred back to the MOE, although the MOEF still chairs the Allocation Committee

Korea Exchange (Trading Platform)

Greenhouse Gas Inventory and Research Center (GIR; Registry and technical implementation)

EVALUATION/ETS REVIEW

The GIR regularly releases summary (evaluation) reports that include key emissions statistics, market performance indicators, and survey results from covered entities.

USE OF REVENUES

The government has put forward possible options for the use of the revenues. These options include support for mitigation equipment, low-carbon 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 Growth⁹

Enforcement Decree of the Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances¹⁰

Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances¹¹

First Basic Plan for 2015–2024¹²

Second Basic Plan for 2017–2026¹³

Third Basic Plan of the ETS¹⁴

First Allocation Plan¹⁵

Second Allocation Plan¹⁶

Greenhouse Gas Emissions Allocation and Trade Act (amended as of June 2020)¹⁷

Third Allocation Plan¹⁸

9 – <https://www.climate-laws.org/geographies/south-korea/laws/framework-act-on-low-carbon-green-growth-regulated-by-enforcement-decree-of-the-framework-act-on-low-carbon-green-growth>

10 – https://elaw.klri.re.kr/eng_mobile/viewer.do?hseq=46598&type=sogan&key=60

11 – <http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/laws/1647.pdf>

12 – http://www.moef.go.kr/nw/nes/detailNesDtaView.do?menuNo=4010100&searchNttId1=OLD_4020294&searchBbsId1=MOSFBBS_000000000028

13 – http://www.moef.go.kr/com/cmm/fms/FileDown.do?atchFileId=ATCH_00000000003839&fileSn=3

14 – <http://me.go.kr/home/file/readDownloadFile.do?sessionId=bC6XpwGMToJc4qEXWU7x7Pmt.mehome1?fileId=186504&fileSeq=1>

15 – <http://www.me.go.kr/home/web/index.do?menuId=10262>

16 – <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=>

17 – <https://www.law.go.kr/LSW/lsInfoP.do?efYd=20200601&lsSeq=215913&ancYd=20200324&nwJoYnInfo=N&ancYnChk=0&ancNo=17104&chrClsCd=010202&efGubun=Y#0000>

18 – <https://ors.gir.go.kr/home/board/read.do?menuId=2&boardMasterId=4&boardId=44>

SAITAMA

Target Setting Emissions Trading System in Saitama



COVERAGE 7.5 MtCO ₂ (2018)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation: Grandfathering		

- In force
- Under development
- Under consideration

ETS DESCRIPTION

Saitama Prefecture's ETS was established in April 2011 as part of the 'Saitama Prefecture Global Warming Strategy Promotion Ordinance.' Large buildings and factories in Saitama Prefecture covered under the program are required to reduce emissions below a facility-specific baseline. They are assigned a higher or lower target, depending on factors such as expected energy efficiency gains and the extent to which they consume energy supplied by other facilities.

Saitama's ETS is linked to Tokyo's Cap and Trade Program.

YEAR IN REVIEW

In fiscal year 2018, the Saitama ETS achieved a 29% reduction in emissions below base-year emissions.

In April 2020, the Saitama ETS entered its third compliance period (FY2020–2024), which requires facilities to reduce emissions by 20% or 22% below baseline emissions, depending on their category.

The 'Zero Carbon Saitama' initiative was announced in 2018 and includes cooperation with the Tokyo 2020 Organizing Committee to fully offset the GHG emissions from the (postponed) Tokyo 2020 Olympic and Paralympic Games. As part of this initiative, companies may donate excess credits from the ETS. Companies that do not possess credits but still wish to make donations may purchase credits from larger facilities within the ETS. Credit donations to the program closed in September 2020.

SECTORS:



Covers large buildings and factories

Linked to Tokyo Cap-and-Trade Program since 2011 launch

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 37.2 MtCO₂e (2017)*



Industrial Processes 11.2 (32%)
 Transport 9.4 (27%)
 Commercial 4.8 (14%)
 Residential 9.1 (26%)

GHG REDUCTION TARGETS

BY 2030: 26% reduction from 2013 levels (Saitama Prefecture Global Warming Countermeasures Action Plan Second Phase)

ETS Size

COVERED EMISSIONS

7.5 MtCO₂
(Verified emissions 2017)



GHGs COVERED

CO₂ only

SECTORS AND THRESHOLDS

Consumption of fuels, heat, and electricity in commercial and industrial buildings

INCLUSION THRESHOLDS: Facilities that consume the energy equivalent of at least 1,500kL of crude oil for three consecutive years.

* The overall emissions figure for Saitama Prefecture 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 CO₂ emissions.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

~608 facilities (first compliance period):

- Office/commercial buildings: ~180
- Factories: ~428

CAP

The cap is aggregated from the bottom up, based on facility-level “baselines” which are calculated using base-year emissions and a compliance factor (see “Allocation” section).

The bottom-up cap for the first compliance period (FY2011-FY2014) was 33.3 MtCO₂

Phases & Allocation

TRADING PERIODS

FIRST TRADING PERIOD: 1 April 2012 to 30 September 2016

SECOND TRADING PERIOD: 1 April 2015 to 30 September 2021

THIRD TRADING PERIOD: 1 April 2020 to 30 September 2026

The Saitama ETS has both trading periods and compliance periods (see “Compliance” section). The trading period is defined as the compliance period plus an additional 18-month adjustment period, during which time entities may continue to trade credits in order to reach their targets for the corresponding compliance period.

ALLOCATION

Under the Saitama ETS, each facility has its own cap, which serves as the “baseline” from which it must achieve its reduction target. Baselines for facilities are set according to the following formula: Base-year emissions x (1 – compliance factor) x compliance period (5 years). The compliance factor for each period is determined based on regulations established by the Governor of Saitama Prefecture.

Base-year emissions are the average emissions of any three consecutive years between FY2002 and FY2007, 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 (the average of any three consecutive years of emissions from four years prior to the start of the compliance period up until the year before the start of the compliance period) or on emissions intensity standards.

COMPLIANCE FACTOR:

First period (FY2011-FY2014): 8% or 6% reduction below base-year emissions

Second period (FY2015-FY2019): 15% or 13% reduction below base-year emissions

Third period (FY2020-FY2024): 22% or 20% reduction below base-year emissions

The higher compliance factor applies to commercial buildings, as well as to district heating and cooling (DHC) plant facilities. The lower compliance factor applies to other facilities, such as commercial buildings that use DHC for more than 20% of the entire energy consumption, and factories.

In the third compliance period, for large facilities owned by small and medium-sized enterprises, the compliance factor is reduced to three quarters of the 22% or 20%, depending on category. Similarly, in medical facilities where electricity is vital to preserve life and health, the compliance factor is two percentage points lower than the 22% or 20% category.

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 to be reported.
- Low carbon electricity: In order to evaluate energy efficiency efforts of the covered facilities, CO₂ emissions factors of electricity suppliers are fixed during each compliance period. When covered facilities procure electricity from suppliers with lower emissions factors, they can reduce the difference between these emission factors from their emissions to be reported to Saitama Prefecture from the third compliance period.

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, for a period of five years. The certification standards represent the highest-level energy-efficiency measures currently feasible, stipulating more than 200 different energy-saving measures.

Flexibility

BANKING AND BORROWING

Banking is allowed only 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 Prefecture.

Quantitative Limits: None

OUTSIDE SAITAMA CREDITS: Emission reductions achieved from large facilities outside of 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 issued only 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: Renewable energy credits generated under the Saitama ETS encompass the following types: Environmental Value Equivalent, Renewable Energy Certificates, and New Energy Electricity, generated under the Renewable Portfolio Standard Law. Credits from solar (heat,

electricity), wind, geothermal, or hydro (under 1,000 kW) electricity production for use under the Saitama ETS were converted to 1.5 times the value of regular credits until the end of the second compliance period. From the third compliance period, they are converted on a 1 to 1 basis. Credits from biomass (biomass rate of 95% or more, black liquor is excluded) are also converted with factor 1.

Quantitative Limits: None

TOKYO CREDITS (VIA LINK):

- Excess Credits: Emissions reductions from facilities with base-year emissions of 150,000 tonnes or less. Issuance of credits from FY2015.
- 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 Saitama Prefecture are counted at 1.5 times the value of regular credits. Others are converted with the factor 1.

Quantitative Limits: None

All offsets must be verified by verification agencies.

MARKET STABILITY PROVISIONS

In general, Saitama Prefecture does not use market stability provisions.

Compliance

COMPLIANCE PERIOD

FIRST COMPLIANCE PERIOD: FY2011–2014

SECOND COMPLIANCE PERIOD: FY2015–2019

THIRD COMPLIANCE PERIOD: FY2020–2024

Covered entities must submit a global warming countermeasures plan preparation report and implementation status report by 31 July of the first fiscal year of the compliance period. Every year thereafter, operators must submit a new global warming countermeasure plan and emissions report by 31 July.

Compliance instruments must be submitted and the predetermined target achieved by the end of the 18-month adjustment period, 30 September of the second fiscal year after the end of the compliance period.

The next compliance period coincides, then, with the adjustment period for 18 months and begins immediately after the preceding period.

MRV

REPORTING FREQUENCY: Annual emissions reporting, including emission reduction plans. All seven GHGs must be monitored and reported: CO₂, CH₄, N₂O, PFCs, HFCs, SF₆, and NF₃.

VERIFICATION: These reports require third-party verification by the end of the adjustment period.

FRAMEWORK: These are based on 'Saitama Monitoring/Reporting Guidelines' and 'Saitama Verification Guidelines.'

ENFORCEMENT

If the reduction target is not achieved, the name of the company is made public and the insufficient reduction amount added to the reduction amount of the following compliance period.

Regardless of whether the target is achieved, the global warming countermeasures plan and implementation status report of each facility are published on Saitama Prefecture's website every year.

Linking

LINKS WITH OTHER SYSTEMS

Linking with the Tokyo Cap and Trade Program 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

[Saitama Prefecture Global Warming Strategy Promotion Ordinance¹](#)

[Regulation on Saitama Prefecture Global Warming Strategy Promotion Ordinance²](#)

1 – http://www3.e-reikinet.jp/saitama-pref/d1w_reiki/42190101000900000000/42190101000900000000/42190101000900000000.html
2 – https://en3-jg.d1-law.com/saitama-pref/d1w_reiki/42190210001900000000/42190210001900000000/42190210001900000000.html

SHANGHAI

Shanghai Pilot Emissions Trading System



CAP 158 MtCO ₂ (2019)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation: Grandparenting Free allocation: Benchmarking Auctioning	AVERAGE 2020 PRICE CNY 40.11 (USD 5.81)	TOTAL REVENUE CNY 102.2 million (USD 14.8 million) since beginning of program, CNY 84.4 million (USD 12.2 million) collected in 2020

In force

Under development

Under consideration

SECTORS:



POWER



INDUSTRY



TRANSPORT



BUILDINGS



DOMESTIC AVIATION

← Broad sector coverage with 100% compliance rate since launch

Active offset trading market, pioneered allowance spot forward trading

Scope expansion through lowering the threshold (mainly)

Leading the development of a national trading platform

ETS DESCRIPTION

Shanghai was the second Chinese region to start its pilot ETS in November 2013 and has concluded seven compliance years to date. 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 100% compliance rate continuously since its launch. In 2016, Shanghai expanded its ETS coverage by adding the shipping sector, as well as lowering the participation threshold of power plants and industries (which were included in the 2013–2015 phase) to 10,000 tCO₂/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.¹ In January 2017, the Shanghai Environmental and Energy Exchange and the 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, carbon funds, carbon trusts, CCER pledge loans, green bonds, and carbon margin trading.

In December 2017, Shanghai was selected to lead the development of the trading platform for the national ETS.

In early 2019, the ETS-related responsibilities in Shanghai completed the transition from the Development and Reform Commission (DRC) to the Ecology and Environment Bureau (EEB), as a result of the governance restructuring across China.

YEAR IN REVIEW

The Shanghai EEB released the 2019 allocation plan in June 2020. No significant changes were implemented compared to the allocation plan of the previous year.

In 2020, the Shanghai pilot also opened its auctions to institutional investors for the first time. Before that, participation in the Shanghai auctions had been limited to the compliance entities. By diversifying the participants in the auctions, the Shanghai pilot further increases its liquidity and promotes price discovery.

The Shanghai ETS completed its compliance work for 2019 in October 2020, after some delay due to the COVID-19 pandemic, reporting its 7th consecutive 100% compliance rate.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 297.7 MtCO₂e (2012)

GHG REDUCTION TARGETS

BY 2020: 20.5% reduction in carbon intensity compared to 2015 levels. The total CO₂ emissions to be limited within 250 million tonnes (13th Five-Year Plan)

BY 2025: pledged to peak the total and per capita CO₂ emissions (Shanghai Urban Master Plan 2017–2035)

BY 2040: ~15% reduction in CO₂ emissions compared to the peak level (Shanghai Urban Master Plan 2017–2035)

¹ - China is still in the exploratory and research stage of carbon futures trading, and according to the "Administrative Regulations on Futures Trading" document, futures trading can only be traded on approved professional futures exchanges. Therefore, regional ETS pilots cannot introduce futures trading. However, a few of them have developed carbon forward trading products with their own characteristics.

ETS Size

COVERED EMISSIONS



GHGs COVERED

CO₂ only



SECTORS AND THRESHOLDS

Airports, domestic 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: Either 20,000 tCO₂/year or 10,000 tonnes of coal equivalent (tce)/year; and those that already participated in the 2013–2015 phase with 10,000 tCO₂/year or 5,000 tce/year.

For Transport: Either 10,000 tCO₂/year or 5,000 tce/year (aviation and ports), 100,000 tCO₂/year or 50,000 tce/year (shipping).

For Buildings: Either 10,000 tCO₂/year or 5,000 tce/year.

POINT OF REGULATION

Downstream

Both direct and indirect emissions from electricity and heat consumption are covered.

NUMBER OF ENTITIES

313 (2019), including 280 existing and 33 new entities

CAP

158 MtCO₂ (2019, including reserves)

Phases & Allocation

TRADING PERIODS

Two trading periods:

- the first period ran between 2013 and 2015;
- the second period started in 2016, with no specific ending year.²

ALLOCATION

FREE ALLOCATION: Free allocation based on sector-specific benchmarks (for the electricity and heat producers, and electricity grid sector).

Grandfathering based on historic emissions intensity for part of the industrial sectors, aviation, ports, shipping, and water suppliers, generally based on the previous three years' data.

Grandfathering based on historic emissions for airports, buildings, commercial sector, and part of the industrial sectors with complex products or considerable change in emission boundary, generally based on the previous three years' 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 main purpose of auctions is to provide compliance entities with additional supply to meet their compliance demand. To date, auctions have been held on an ad hoc basis. One auction was held in each of the following years: 2014, 2016, 2018, and 2019.

In 2020, Shanghai held two auctions: one in August and the other in October. The floor prices were set differently: for the first auction, which was open to institutional investors and compliance entities, the floor price was set at the market weighted average price of all trading days in the second quarter of 2020. For the second auction, which was open to the compliance entities only, the floor price was set at 1.1 times the market weighted average price of all trading days from December 1, 2019 to September 30, 2020. The auctions offered 2 million tonnes of allowances each, with 100% and 5.9% of them cleared at the floor price of CNY 39.61 (USD 5.74) and CNY 44.27 (USD 6.42) respectively.

² – 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.

Flexibility

BANKING AND BORROWING

Banking is allowed both within and across trading periods, with some restrictions for the latter. For banked allowances from the first trading period (2013–2015), only one-third could be used per year between 2016 and 2018 by compliance entities; allowances are fully bankable for institutional investors.

Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Domestic project-based carbon offset credits—CCERs—are allowed. For compliance year 2019, the use of CCER credits was limited to 3% of the verified emissions, of which up to 2% was for credits generated outside the Yangtze River Delta region.³ Between 2016 and 2018, the use of CCER credits was 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 institute price stabilization measures such as temporarily suspending trading or imposing holding limits.

RESERVE: A small share of the annual cap can be kept in a reserve for auctioning before the end of the annual compliance cycle as a market stability measure (see “Allocation” section).

Compliance

COMPLIANCE PERIOD

One year (1 January to 31 December): covered entities have until 30 June of the following year to surrender allowances.⁴

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions.

VERIFICATION: Third-party verification is required. In addition, the government also conducts quality checks.

FRAMEWORK: The Shanghai government has released general rules for monitoring and reporting as well as sector-specific guidelines for the following 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 1,449) to CNY 50,000 (USD 7,245).

Between CNY 50,000 (USD 7,245) and CNY 100,000 (USD 14,491) can be imposed for noncompliance, in addition to 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, cancellation of ability to access special funds for energy conservation, and emissions reduction measures.

Other Information

INSTITUTIONS INVOLVED

Shanghai Ecology and Environment Bureau (competent authority)
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 Trial⁵
Measures for Management of Emissions Trading in Shanghai⁶
Shanghai EEB- Allocation Plan for Vintage 2019 (including list of covered entities)⁷

3 – This region covers Shanghai, Jiangsu, Zhejiang, and Anhui.

4 – In some recent years, the compliance deadlines have been postponed to later dates, for reasons such as the COVID-19 pandemic and other factors.

5 – <http://www.tanpaifang.com/tanshui/2012/0307/155.html>

6 – <http://www.tanpaifang.com/tanjiaoyi/2013/0712/22185.html>

7 – <https://sthj.sh.gov.cn/hbzhwypt2025/20200630/20348b1adf354c9ab73b7a461c9ec0a9.html>



SHENZHEN

Shenzhen Pilot Emissions Trading System

In force

Under development

Under consideration

SECTORS:



POWER



INDUSTRY



TRANSPORT



BUILDINGS

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

Relatively active market despite small market size

Sectoral expansion to port, airport, subway, and public transportation sectors

Cross-regional trading pioneered

CAP 31.45 MtCO ₂ (excluding buildings, 2015) ¹	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation: Grandparenting Free allocation: Benchmarking	AVERAGE 2020 PRICE CNY 23.91 (USD 3.46)	TOTAL REVENUE Since beginning of program: CNY 2.6 million in 2014 ² (USD 380,000), no auctions were held in 2020

ETS DESCRIPTION

The Shenzhen Pilot ETS began in June 2013 and was the first of the Chinese pilot ETSs to start operation. 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 ~700 entities. A unique feature of this pilot ETS is its legal basis: although 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 is one of the most active regional markets in China, despite its relatively small size compared to other pilots. As of July 2018, its accumulated transaction amount had reached CNY 1.091 billion (USD 160 million), with total volume of 35.7 million tonnes, which made it one of the few pilots in China to reach CNY one billion (USD 145 million). By end of 2020, Shenzhen's cumulative trading volume and turnover amounted to 58.06 million tonnes and CNY 1.378 billion (USD 200 million) respectively. Shenzhen ETS pilot is open to diversified market participants, including covered entities and institutional as well as individual (domestic and foreign) investors.

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 by the Shenzhen Pilot ETS on a voluntary basis for one compliance year starting in June 2016.

In early 2019, the ETS-related responsibilities in Shenzhen completed the transition from the Development and Reform Commission to the Ecology and Environment Bureau (EEB)³, as a result of the governance restructuring across China.

YEAR IN REVIEW

In May 2020, Shenzhen EEB released the 'Notice on Carrying out ETS Work for Compliance Year 2019' which included an updated list of covered entities and adjusted the reporting, verification, and compliance schedule. However, Shenzhen's allocation plans since 2013 have not been made publicly available.

Due to the COVID-19 pandemic, the Shenzhen ETS postponed the 2019 compliance deadline for its system from the end of June to the end of September 2020. In October 2020, the Shenzhen EEB announced three companies had failed to comply, while announcing that the remaining 704 covered entities had successfully completed their 2019 compliance, achieving another high compliance rate of over 99%.

Background Information

OVERALL GHG EMISSIONS (excluding LULUCF) 83.45 MtCO₂e (2010)

GHG REDUCTION TARGETS

BY 2020: 45% reduction in carbon intensity compared to 2005 (13th Five-Year Plan)

BY 2022: Pledged to peak its CO₂ emissions by 2022 (political pledge made by a Shenzhen government leader in 2015)

¹ - No more recent data has been made public by the competent authority.

² - The auction's objective was to increase market supply and price stability, with the participation of covered entities being voluntary, and not as a means of allowance allocation in which covered entities have to purchase a certain percentage of their allocation via auction.

³ - EEB's predecessor was the Human Settlements and Environment Commission.

ETS Size

COVERED EMISSIONS



GHGs COVERED

CO₂ only



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 tCO₂/year for enterprises; 10,000m² for large public buildings and government buildings.

POINT OF REGULATION

Downstream

Both direct and indirect emissions from electricity, heat, cooling, and steam consumption are covered.

NUMBER OF ENTITIES

707 (2019)

706 (2020)

CAP

31.45 MtCO₂ (excluding buildings, 2015) for the existing entities.

In addition, the government sets aside reserves for the new entrants (2%) and market stability measures (2%).

Phases & Allocation

TRADING PERIODS

2013 and ongoing⁴

ALLOCATION

Allowances are largely distributed for free and allowance allocation is adjusted ex-post, based on output data.

FREE ALLOCATION, BENCHMARKING: Benchmarking is applied to the water, power, and gas sectors based on sectoral historical emissions intensity.

FREE ALLOCATION, GRANDPARENTING: Grandparenting is applied to port and subway sectors, public buses, and other non-transport sectors based on the entity's historical emissions intensity.

AUCTIONING: Although the 'Interim Measure for the Administration of Carbon Emission Trading of Shenzhen' document states that at least 3% of allowances should be auctioned, this has not yet been implemented. So far, only one auction has been held (in June 2014); its purpose was to increase market supply and price stability.

Flexibility

BANKING AND BORROWING

Banking is allowed.

Borrowing is not allowed.

Unlike some other pilots, Shenzhen releases its annual allowances before the compliance date of the previous vintage. Nevertheless, entities are not allowed to use allowances of the following year for the purpose of 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

RESERVE: 2% of the total cap is kept as a government reserve for market stabilization.

INTERVENTION: In case of market fluctuations, the Shenzhen EEB can sell extra allowances from the reserve at a fixed price. Such allowances can be used only for compliance and cannot be traded. The government can also buy back up to 10% of the total cap. Once they are bought back, allowances can be also used for the market stability auctions.

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.

Compliance

COMPLIANCE PERIOD

One year (1 January to 31 December): covered entities have until 30 June of the following year to surrender allowances.

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions to the ETS competent authority, using different tiers of emission factors depending on the size of the company. A quarterly emissions report is also submitted. In addition, covered industrial entities must annually submit a statistical indicator report covering their production data to the municipality's statistics department.

VERIFICATION: Third-party verification of the emissions report is required. Covered entities cannot use the same verifiers for three consecutive years. In addition, the government conducts further random checks of emission reports and verification reports. The proportion of these checks must 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: Shenzhen has released two documents:

- a general guiding document in the form of regional standards on monitoring and reporting; and
- a guiding document on monitoring and reporting of the building sector.

ENFORCEMENT

Covered entities 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 14,491). Covered entities 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 Environment and Ecology Bureau (competent authority; registry)

China Shenzhen Emissions Exchange (trading platform)

EVALUATION/ETS REVIEW

No formal evaluation has been conducted. Research on improving the Shenzhen ETS has been undertaken every year, funded by the Shenzhen government.

IMPLEMENTING LEGISLATION

Shenzhen Special Economic Zone ETS Bill⁵

Interim Measures for Management of Emissions Trading in Shenzhen⁶

Shenzhen DRC—Notice of Carrying Out Emissions Trading Work for Vintage 2016⁷

Shenzhen EEB—Notice on Carrying out ETS Work for Compliance Year 2019⁸

5 – <http://www.cerx.cn/szPolicy/377.htm>

6 – <http://www.cerx.cn/szPolicy/385.htm>

7 – <http://www.tanpaifang.com/zhengcefagui/2016/091856419.html>

8 – http://www.sz.gov.cn/cn/xxgk/zfxqj/tzgg/content/post_7650474.html

TAIWAN, CHINA



- In force
- Under development
- Under consideration

In July 2015, Taiwan, China enacted the ‘Greenhouse Gas Reduction and Management Act’ (the Act) which legislates a 50% emissions reduction target for 2050 compared to 2005 GHG levels. The Act also mandates the setting of regulatory mitigation goals in stages. In this context, the Act stipulates that the Taiwanese Environmental Protection Administration (TEPA) will implement a domestic cap-and-trade scheme by considering the UNFCCC and its agreements, or relevant decisions by international conventions. This is further referred to in the ‘Climate Change Action Guideline 2017.’ The Act also mandated TEPA to develop the ‘GHG Reduction Action Plan,’ which outlines details on how to implement the mitigation policies. It includes five-year regulatory goals for both national and sectoral GHG emissions, as well as implementation strategies in the form of eight policy packages. Published in March 2018, the plan 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’ in October 2018.

A series of subsidiary regulations have been formulated. Mandatory emissions reporting for entities with annual emissions above 25,000 tCO₂e from certain sectors has been ongoing since 2014. Subsidiary regulations also include the ‘2018 Regulations Governing GHG Offset Program Management,’ which provide an opportunity for enterprises to acquire carbon offset credits. TEPA is in the process of revising the Act. A carbon fee, carbon tax, and ETS are all under consideration. Regulatory discussions are pending on whether the carbon fee will be implemented first, as well as on how it could be transitioned to the ETS in the future and/or co-exist as a complementary mechanism.

←
The 2015 ‘GHG Reduction and Management Act’ calls for ETS implementation

The Act is currently being revised

Mandatory GHG reporting program in place

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 293.1 MtCO₂e (2016)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)

Energy 264.7 (90%)
Industrial Processes 21.7 (7%)
Agriculture 2.7 (1%)
Waste 4.0 (1%)

GHG REDUCTION TARGETS

BY 2020: 2% below 2005 GHG levels (TEPA)

BY 2025: 10% below 2005 GHG levels (TEPA)

BY 2030: 20% reduction from BAU levels (TEPA)

BY 2050: 50% below 2005 GHG levels (the Act)

Other Information

OFFSETS

The Act stipulates that the use of offset credits should give priority to domestic efforts.

MRV

REPORTING FREQUENCY: Annual reporting of GHGs (CO₂, CH₄, N₂O, SF₆, NF₃, PFCs, HFCs, and NF₃) for entities from certain sectors (power, steel, petrochemical, cement, and manufacturing of semiconductors and flat panel displays) with annual emissions greater than 25,000 tCO₂e. Currently, 293 entities are under the mandatory reporting scheme.

VERIFICATION: Third-party verification is required.

FRAMEWORK: GHG reporting under the ‘Air Pollution Control Act’ has been possible on a voluntary basis since 2004 and became mandatory in 2014. Since 2016, GHG reporting and the inventory program is mandatory under the ‘GHG Accounting and Registration Regulations,’ which are authorized by the Act.

INSTITUTIONS INVOLVED

Taiwanese Environmental Protection Administration (TEPA)

IMPLEMENTING LEGISLATION

Greenhouse Gas Reduction and Management Act (2015)¹

Climate Change Action Guidelines²

2015 GHG Inventory (Executive Summary)³

1 – <https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?pcode=00020098>

2 – https://adapt.epa.gov.tw/eng/TCCIP-1-D/TCCIP-1-D-6_en.html

3 – https://unfccc.saveoursky.org.tw/nir/2015nir/uploads/00_abstract_en.pdf



THAILAND

In force

Under development

Under consideration

National reform plan calls for the exploration of a domestic ETS

Voluntary ETS builds readiness on MRV system, registry, and trading platform

Planning ETS pilot implementation in the Eastern Economic Corridor region

The '12th National Economic and Social Development Plan (2017–2021)' of Thailand calls for several climate change 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. Most recently, the 'National Reform Plan (2018)' mandates the Thai government to develop an economic instrument, such as a cap-and-trade system, to incentivize the private sector to reduce emissions. The specific instrument will be considered as part of the policy and legislative process following the formulation of the framework 'Climate Change Act,' which is expected to be proposed for Cabinet consideration in 2021.

Since 2013, Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) has developed an MRV system and basic trading infrastructures under the Thailand Voluntary Emissions Trading Scheme (Thailand V-ETS). The first three-year pilot phase (2015–2017) of this voluntary pilot program aimed at: testing the MRV system for four GHG-intensive industrial sectors (cement, pulp and paper, iron and steel, and petrochemical); setting a cap for facilities' direct and energy-related indirect emissions; and testing allocation methods by granting allowances to covered facilities. The second pilot phase (2018–2020) further tested the MRV system, the registry and trading platform, with

five additional industrial sectors (petroleum refinery, glass, plastic, food and feed, and ceramics). Like in the previous phase, allocation was tested, with allowances granted to each sector according to their GHG reporting and target-setting results. Trading was also practiced on the demonstration-version of the trading platform.

In 2020, MRV was developed for another three sectors (beverage and sugar, textiles, and flat glass) and additional sector-specific guidelines were developed and improved. Furthermore, many capacity-building and outreach activities were held, to introduce the ETS concept to various stakeholders.

In 2021, TGO—in collaboration with its partner the Eastern Economic Corridor Initiative (Department of Industrial Promotion, Industrial Estate Authority of Thailand)—is developing a strategic plan for ETS implementation in Thailand's Eastern Economic Corridor region. Under this plan, a pilot ETS will be implemented, including key ETS features and a trading platform.

In addition, under the Thailand PMR Program, TGO has conducted a study on the appropriate formulation of legislation for a mandatory ETS. In 2020, TGO submitted a proposal for the draft 'greenhouse gas reporting law for designated factories and buildings' for consideration at the policy level.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 397.27 MtCO₂e (2016)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy (excluding transport) 197.8 (51%)
Transport 69.1 (18%)
Industrial Processes 45.6 (12%)
Agriculture 63.9 (16%)
Waste 12.6 (3%)

GHG REDUCTION TARGETS

BY 2030: 20% reduction compared to BAU (unconditional NDC); 25% reduction compared to BAU contingent on adequate and enhanced support (conditional NDC)

Other Information

INSTITUTIONS INVOLVED

Thailand Greenhouse Gas Management Organization (Public Organization)

IMPLEMENTING LEGISLATION / REGULATION

12th National Economic and Social Development Plan (2017–2021)¹
National Reform Plan²

1 - https://www.nesdc.go.th/ewt_w3c/ewt_dl_link.php?filename=EvaluationDriven&nid=9640
2 - https://plan.rmutr.ac.th/wp-content/uploads/2018/12/Plan_Reform.pdf

TIANJIN

Tianjin Pilot Emissions Trading System



CAP 160–170 MtCO ₂ (2014)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation: Grandparenting Free allocation: Benchmarking Auctioning	AVERAGE 2020 PRICE CNY 22.64 (USD 3.28)	TOTAL REVENUE Since beginning of program: CNY 349.67 million (USD 50.7 million) Revenue collected in 2020: CNY 240.88 million (USD 34.9 million)

In force

Under development

Under consideration

SECTORS:



POWER



INDUSTRY



DOMESTIC AVIATION

← *Despite small number of regulated entities, covers more than half of the city's emissions*

High rates of compliance despite no financial penalties in place

Sectoral expansion to building materials, papermaking, and aviation sectors

ETS DESCRIPTION

Tianjin launched its pilot ETS in December 2013 and has concluded seven compliance years so far. The system covers: heat and electricity production; iron and steel; petrochemicals; chemicals; oil and gas exploration; papermaking; aviation; and building materials. 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.

2019 saw changes to the governance of the Tianjin ETS as well as to the design of the system. With regards to governance, responsibility for the Tianjin ETS was moved from the Tianjin Development and Reform Commission (DRC) to the Ecology and Environment Bureau (EEB). With regards to design, the Tianjin ETS was expanded to also cover enterprises from the building materials, papermaking, and aviation sectors that previously only reported. Furthermore, allowance auctions were also held for the first time in 2019. These changes have indicated the regional EEB's commitment to further improve the effectiveness and robustness of its regional carbon market.

YEAR IN REVIEW

The Tianjin EEB released the 2019 allocation plan at the end of that year. The main allocation methods are historical intensity and total emission-based free allocation through grandparenting. Entities receive 50% of their pre-allocation based on 2018 emissions data and the remaining as ex-post adjustments on the basis of real production data. The plan also states that entities covered by the national Chinese ETS within the compliance period will be excluded from the compliance in the Tianjin Pilot ETS; in this case, the regional government will also withdraw the corresponding allowances issued for these entities.

In June 2020, the Tianjin municipal government released the latest version of the 'Tianjin Interim Measures for the Administration of Carbon Emissions Trading,' which is the regulative document released every few years providing the legal basis for its regional carbon market. The document extended the Tianjin Pilot ETS until 30 June 2025. As well, the document introduces the following main changes:

- relocating the responsibility of the regional ETS from the Municipal DRC to its EEB;
- adding air pollution control as one of the purposes;
- explicitly excluding covered entities under the operational national ETS from the Tianjin Pilot ETS; and
- strengthening enforcement measures: companies failing to surrender enough allowances to match their emissions will face deduction of double the amount of the gap in the next year's allocation, and third-party verifiers found to not comply with regulations will be banned for three years.

Following the first auction in 2019, the Tianjin pilot held two auctions in 2020. The first auction for the 2019 compliance year was held in June, with two million allowances sold at prices between CNY 17.31 (USD 2.51) and CNY 21.55 (USD 3.12). The second, held in August, sold 812,573 allowances at CNY 26.24 (USD 3.80).

In September 2020, the Tianjin pilot completed its 2019 compliance period with a 100% reported compliance rate, becoming the first Chinese pilot to conclude the 2019 compliance process.

In December 2020, Tianjin released its 2020 allocation plan.¹ According to the Chinese national ETS rules, regional markets that already have allocated allowances for 2019 and/or 2020 for the power sector will remain under the regional system for those years. This implies that the power sector entities that are overlapping between Tianjin and the national ETS will be covered under the regional carbon market in 2020 and moved to the national one from 2021 onwards.

1 – This document, however, is not publicly available.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 215 MtCO₂e (2012)

GHG REDUCTION TARGETS

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

BY 2025: Pledged to peak its CO₂ emissions by about 2025 (Tianjin Work Plan for Controlling Greenhouse Gas Emissions During the 13th Five-Year Plan Period)

ETS Size

COVERED EMISSIONS



GHGs COVERED

CO₂



SECTORS AND THRESHOLDS

Heat and electricity production, iron and steel, petrochemicals, chemicals, oil and gas exploration, papermaking, aviation, and building materials.²

INCLUSION THRESHOLDS: 20,000 tCO₂/year considering both direct and indirect emissions.

POINT OF REGULATION

Downstream

Both direct and indirect emissions from electricity and heat consumption are covered.

NUMBER OF ENTITIES

113 (2019)

CAP

160–170 MtCO₂ (2014)

Phases & Allocation

TRADING PERIODS

2013 and ongoing³

ALLOCATION

FREE ALLOCATION: Mainly free allocation through grandparenting based on either base year (for example, 2018 for the allocation of 2019 allowances) total emissions (for iron and steel, petrochemicals, chemicals, exploration for oil and gas, and aviation) or on emissions intensity (for heat and electricity production, papermaking, and building materials). Benchmarking for new entrants and expanded capacity.

Ex-post allocation adjustments are applied, especially for those sectors that use benchmarks and emissions intensity.

AUCTIONING: A small share of the annual cap could be auctioned. Participation is voluntary and the purpose of auctions is mainly to provide compliance entities with additional supply to meet their compliance demand. To date, auctions have been held on an ad hoc basis. The Tianjin EEB held its first allowance auction in June 2019. Two million tonnes were on offer with the auction clearing at CNY 14.63/tonne (USD 2.12). Following the first auction in 2019, the Tianjin pilot held two auctions in 2020. The first auction for the 2019 compliance year was held in June, with two million allowances sold at prices between CNY 17.31 (USD 2.51) and 21.55 (USD 3.12). The second, held in August, sold 812,573 allowances at CNY 26.24 (USD 3.80).

² – The last three sectors were added in 2019.

³ – 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.

Flexibility

BANKING AND BORROWING

Banking is allowed.

Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Domestic project-based China Carbon Offset Credits (CCERs) are allowed as well as Tianjin regional forestry offsets. The use of CCER credits is limited to 10% of the annual compliance obligation. For the 2019 compliance year, at least 50% of the credits must originate from Beijing, Tianjin, or Hubei.

QUALITATIVE LIMIT: Credits must stem from CO₂ reduction projects, excluding hydro. They must be realized after 2013.

MARKET STABILITY PROVISIONS

INTERVENTION: In case of market fluctuations, the Tianjin EEB can buy or sell allowances (on a fixed price or through auctioning) in order to stabilize the market.

Compliance

COMPLIANCE PERIOD

One year (1 January to 31 December): covered entities have until 30 June of the following year to surrender allowances.⁴

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ 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. The document includes sector-specific guidance for the covered sectors, which EEB – as the competent authority since 2019 – is continuing to improve.

ENFORCEMENT

There are no financial penalties for noncompliance. In case of noncompliance, companies are disqualified for three years for preferential financial support and other national supporting policies, e.g., on recycling economy, energy-saving measures, and emission reductions. In addition, since mid-2020, companies and third-party verifiers face further penalties. Companies failing to surrender enough allowances to match their emissions will face deduction of double the amount of the gap in the next year's allocation. Third-party verifiers found not to comply with regulations (e.g., in the case of false verification reports) will be banned from providing verification services for three years in Tianjin.

Other Information

INSTITUTIONS INVOLVED

Tianjin Ecology and Environment Bureau
(competent authority)

Tianjin Climate Exchange (trading platform and registry)

IMPLEMENTING LEGISLATION

[Tianjin Pilot ETS Implementation Plan](#)⁵

[Interim Measure for Management of Emissions](#)

[Trading in Tianjin](#)⁶

[Interim Measure for Management of Emissions Trading in Tianjin \(2020\)](#)⁷

[Interim Measure for Management of Emissions](#)

[Tianjin EEB – Allocation Plan for Vintage 2019](#)⁸

4 – The deadline was postponed in 2020 due to the COVID-19 pandemic.

5 – <http://www.cdmfund.org/10898.html>

6 – <http://www.carbonmanager.net/media/carbonbutler/images/tianjin05.pdf>

7 – <https://www.chinatcx.com.cn/view/4253.html>

8 – <https://www.chinatcx.com.cn/view/4127.html>



TOKYO

Tokyo Cap-and-Trade Program

In force

Under development

Under consideration

SECTORS:



INDUSTRY



BUILDINGS

First city-wide ETS

Commercial and industrial buildings covered

Energy efficiency improvements key to emissions reductions

COVERAGE 12.11 MtCO ₂ (2018)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation: Grandfathering	AVERAGE 2020 PRICE ~JPY 540 (USD 5.06) ¹	

ETS DESCRIPTION

Launched in April 2010, 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 Tokyo ETS, large buildings, factories, heat suppliers, and other facilities that consume large quantities of fossil fuels are required to reduce emissions below a facility-specific baseline.

Entities covered under the program are assigned a higher or lower target, depending on factors such as expected energy efficiency gains and the extent to which they consume energy supplied by other facilities.

YEAR IN REVIEW

In March 2020, the TMG released emission data for fiscal year 2018 indicating that, on aggregate, emissions were reduced by 27% overall among covered entities during the second compliance period (FY2015–FY2019) compared to base-year emissions, overachieving the 15–17% target set for the period. The introduction of high-efficiency heat sources,

light fittings, and other equipment has been key to reducing emissions in the buildings sector. Buildings have continued to decrease emissions despite an increase in gross floor space, indicating a decrease in emissions intensity in the sector.

In April 2020, the Tokyo ETS began its third compliance period (FY2020–FY2024), which requires facilities to reduce emissions by 25% or 27% below base-year emissions, depending on their category. The third compliance period also aims to expand the use and production of low-carbon and renewable energy through additional incentives for covered entities to reduce their compliance obligations by switching to cleaner electricity. Most facilities thus far have achieved their targets via their own energy efficiency measures.

Due to the COVID-19 pandemic, the Tokyo ETS postponed the deadline for the submission of annual reports by two months. MRV rules were also reformed via the establishment of an online verification process.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 63.9 MtCO₂e (2018)²

OVERALL CO₂ EMISSIONS BY SECTOR (MtCO₂e)



Industrial Processes 4.2 (7%)

Transport 9.6 (17%)

Residential 16.5 (29%)

Commercial 25.3 (44%)

Waste 1.8 (3%)

GHG REDUCTION TARGETS

BY 2030: 30% reduction from 2000 GHG levels (Zero Emission Tokyo Strategy)

BY 2050: Net-zero CO₂ emissions (Zero Emission Tokyo Strategy)

¹ – Estimated standard transaction price provided by TMG.

² – 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 CO₂ emissions.

ETS Size

COVERED EMISSIONS



GHGs COVERED

CO₂ only



POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

1,200 facilities:

- Office/commercial buildings: ~1,000
- Factories: ~200

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 5,000 m² or over six million kWh electricity usage per year) can assume obligations jointly or in place of building owners.

INCLUSION THRESHOLDS: Facilities that consume the energy equivalent to at least 1,500 kL of crude oil per year.

CAP

A Tokyo-wide cap is aggregated from the bottom up from facility-level “baselines,” which are calculated using base-year emissions and a compliance factor (see “Allocation” section).

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

The Tokyo ETS has trading periods as well as compliance periods (see “Compliance” section). The trading period is defined as the compliance period plus an additional 18-month adjustment period, during which time entities may continue to trade credits in order to reach their targets for the corresponding compliance period.

ALLOCATION

Under the Tokyo ETS, each facility has its own cap, which serves as the “baseline” from which it must achieve its reduction target. Baselines for facilities are set according to the following formula: Base-year emissions x (1 – compliance factor) x compliance period (5 years). The compliance factor for each period is determined based on regulations established by the Governor of Tokyo. Prior to the start of each new compliance period, TMG holds consultation meetings to garner experts’ opinions for determining the compliance factors.

Base-year emissions are based on the average emissions of any three consecutive years between FY2002 and FY2007, as chosen by each entity. Credits are issued to facilities whose emissions fall below their baselines. Additional emissions reductions may be issued through use of renewable electricity (see also “Offsets and Credits” section). Baselines for new entrants are based on past emissions or on emissions intensity standards.

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): 27% or 25% reduction below base-year emissions

The higher compliance factor applies to office buildings, as well as to district heating and cooling (DHC) plants (excluding facilities that use a large amount of DHC). The lower compliance factor applies to factories and office buildings that use DHC for more than 20% of their entire energy consumption.

For new entrant facilities from the third compliance period onward, the 17% and 15% compliance factors from the second period are applied (transitional measures are introduced).

In the third compliance period, in medical facilities where electricity is vital to preserve life and health, the compliance factor is two percentage points lower than the 27% or 25% category to which they would otherwise belong.

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 50% or 75% 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.

Flexibility

BANKING AND BORROWING

Banking is allowed only between consecutive compliance periods. Borrowing is not allowed.

OFFSETS AND CREDITS

Credits from four offset types are permitted, to complement emissions reduction credits issued to facilities covered by the Tokyo ETS whose emissions fall below their baseline.

SMALL AND MID-SIZE FACILITY CREDITS: Emissions reductions from non-covered small and medium-sized facilities in Tokyo.

Quantitative Limits: None

OUTSIDE TOKYO CREDITS: Emissions reductions achieved from large facilities outside of the Tokyo area. Large facilities are those with an energy consumption equivalent to at least 1,500kL of crude oil in a base year and with base-year emissions of 150,000 tonnes or less.

Quantitative Limits: Credits are issued only 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: Renewable energy credits generated under the Tokyo ETS encompass the following types: Environmental Value Equivalent, Renewable Energy Certificates, and New Energy Electricity, generated under the Renewable Portfolio Standard Law. Credits from solar (heat, electricity), wind, geothermal, or hydro (under 1,000 kW) electricity production for use under the Tokyo ETS were converted to 1.5 times the value of regular credits until the end of the second compliance period. From the third compliance period, they are converted on a 1 to 1 basis. Credits from biomass (biomass rate of 95% or more, black liquor excluded) are also converted with factor 1.

Quantitative Limits: None

SAITAMA CREDITS (VIA LINK):

- Excess Credits: Emissions reductions from facilities in Saitama with base-year emissions of 150,000 tonnes or less. Issuance of credits from FY2015.
- Small and Mid-Size Facility Credits issued by Saitama Prefecture. Issuance of credits from FY2012.

Quantitative Limits: None

All offsets must be verified by verification agencies.

QUALIFYING FOR ADDITIONAL EMISSIONS REDUCTIONS THROUGH USE OF RENEWABLE ELECTRICITY

- (1) Low Carbon Electricity: In order to evaluate the energy efficiency efforts of the covered facilities, CO₂ emission factors of the supply side (electricity and others) are fixed during each compliance period. If covered facilities procure electricity from TMG-certified suppliers with lower emission factors (0.37 [t-CO₂/1,000 kWh] or less), they can reduce the difference between these emission factors from their emissions to be reported to the TMG.
- (2) If 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 to be reported to the TMG.
- (3) During the third compliance period, covered facilities can deduct emissions to be reported to the TMG if electricity with a higher renewable energy source rate (30% or higher) is procured (additional grant).

MARKET STABILITY PROVISIONS

In general, covered facilities trade over the counter and the TMG does not control carbon prices. However, as a discretionary mechanism, the TMG sells its own offset credits for trading in case of excessive price development.

Compliance

COMPLIANCE PERIOD

Entities must submit a GHG Emissions Reduction Plan and implementation status report by 30 November every year.³

Compliance instruments must be submitted, and the predetermined target achieved by the end of the 18-month adjustment period, 30 September of the second fiscal year after the end of the compliance period.

The next compliance period coincides, then, with the adjustment period for 18 months and begins immediately after the preceding period.

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 must be monitored and reported: CO₂, CH₄, N₂O, PFC_s, HFC_s, SF₆, and NF₃. Large tenants, i.e., those with a floor space above 5,000 m² or over six million kWh electricity use per year, are required to submit their own emissions reduction plans to the TMG in collaboration with building owners.

3 – Due to the COVID-19 pandemic, the deadline for 2020 only was postponed to 1 February 2021.

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 4,683]) and surcharges (1.3 times the shortfall).

Linking

LINKS WITH OTHER SYSTEMS

Linking with the Saitama Prefecture ETS started in April 2011 when the Saitama program 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

The TMG established a committee of experts to analyze the structure of the Tokyo Cap-and-Trade Program post-2020. In FY2020, the program entered a new stage to achieve the 2030 target and transition to a net-zero carbon society, promoting continued energy savings and expanding the utilization of low-carbon (renewable) energy.

IMPLEMENTING LEGISLATION

The Tokyo Metropolitan Security Ordinance and Regulation for the Enforcement of the Tokyo Metropolitan Environmental Security Ordinance⁴

Detailed documents on the Tokyo ETS can be found on the TMG website.⁵

TMG Zero Emissions Strategy⁶

4 – https://www.kankyo.metro.tokyo.lg.jp/basic/guide/security_ordinance/index.html

5 – https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap_and_trade/index.files/TokyoCaT_detailed_documents.pdf

6 – http://www.kankyo.metro.tokyo.jp/en/about_us/zero_emission_tokyo/strategy.html



VIETNAM

In force

Under development

Under consideration

Established the legal mandate to design a domestic ETS and a crediting mechanism

Pilot system is expected to start by 2025 and to become fully operational by 2027

In November 2020, Vietnam’s National Assembly adopted the revised Law on Environmental Protection, which establishes a mandate for the Ministry of Natural Resources and Environment (MONRE) and for the Ministry of Finance (MOF) to design a domestic emissions trading scheme and a crediting mechanism. The framework legislation gives MONRE a legal mandate to establish an emissions trading scheme, set a cap, and determine the method of allowance allocation, and allows for the inclusion of domestic and international offsets. The Law on Environmental Protection will enter into force on 1 January 2022. MOF and MONRE are considering a timeline for ETS implementation; a pilot system is expected to start by 2025 and to become fully operational by 2027.

Policy developments have been guided by Vietnam’s ‘Green Growth Strategy’ (2012), which sets the objective of a low-carbon economy and cites the use of market-based instruments as an avenue to achieving the strategy. In line with the strategy, ‘National Appropriate Mitigation Actions’ (NAMAs) are being implemented in the agriculture, forestry, waste, industry (steel, cement, chemical), and power sectors. With the support of the PMR, Vietnam has also been developing policy proposals for carbon pricing and market-based instruments in the country, in addition to developing MRV and accreditation systems. These actions are intended to underpin the further development of the national ETS.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 321.5 MtCO₂e (2014)

OVERALL GHG EMISSIONS BY SECTOR (MtCO₂e)



Energy 171.6 (53%)
Industrial Processes 38.6 (12%)
Agriculture 89.8 (28%)
Waste 21.5 (7%)

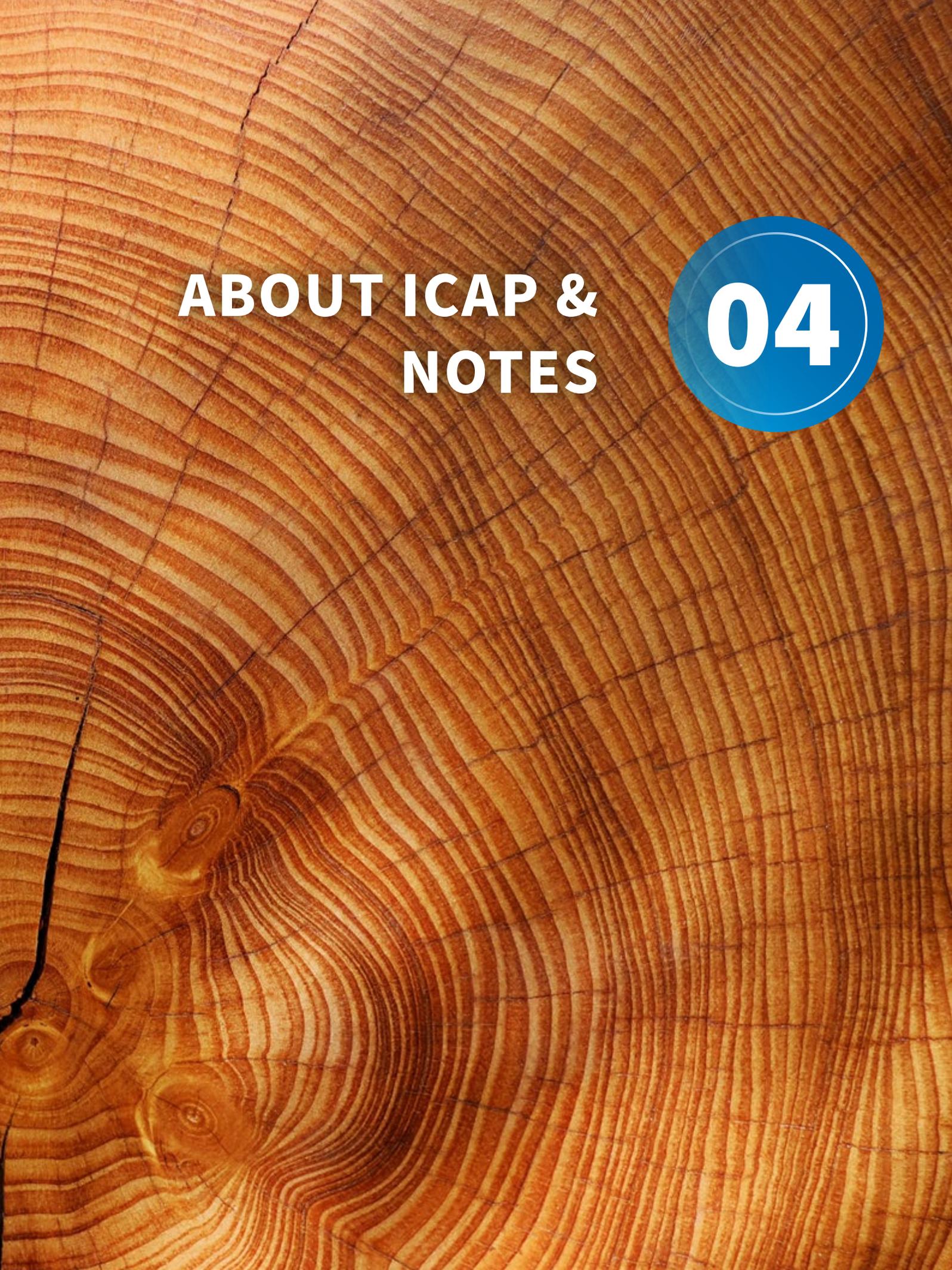
GHG REDUCTION TARGETS

BY 2030: 9% below BAU and 20% reduction in 2010 emission intensity levels (unconditional NDC). 17% below BAU and 30% reduction in 2010 emission intensity levels (conditional NDC).

Other Information

INSTITUTIONS INVOLVED

Ministry of Natural Resources and Environment
Ministry of Finance

The background of the entire page is a close-up photograph of a tree trunk's cross-section, showing concentric growth rings in shades of light to dark brown. The rings are slightly wavy and uneven, with some darker spots and a prominent vertical crack on the left side.

ABOUT ICAP & NOTES

A solid blue circle with a thin white border, containing the white number '04' in a bold, sans-serif font.

04

ABOUT THE INTERNATIONAL CARBON ACTION PARTNERSHIP

Founded in 2007, ICAP is an international government forum that brings 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 32 members and five observers.

Objectives

- Share best practices and learn from each other's ETS experiences
- Help policymakers recognize ETS design compatibility issues and opportunities for establishing an ETS at an early stage
- Facilitate future linking of trading programs
- Highlight emissions trading as a key aspect of an effective climate policy response
- Build and strengthen partnerships amongst governments

Members (as of February 2021)

Arizona, Australia, British Columbia, California, Denmark, the European Commission, France, Germany, Greece, Ireland, Italy, Maine, Manitoba, Maryland, Massachusetts, the Netherlands, New Jersey, New Mexico, New York, New Zealand, Norway, Nova Scotia, Ontario, Oregon, Portugal, Québec, Spain, Switzerland, the Tokyo Metropolitan Government, the United Kingdom, Vermont and the state of Washington.

Observers

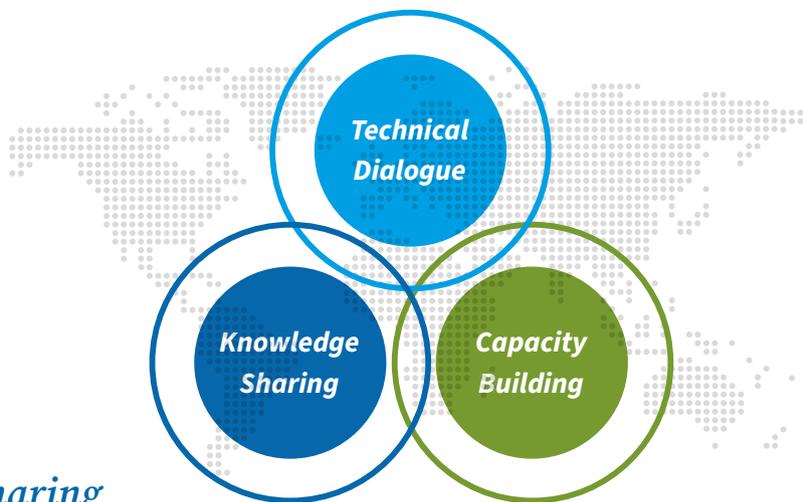
Japan, Kazakhstan, the Republic of Korea, Mexico, and Ukraine



The three pillars of ICAP's Work

KNOWLEDGE SHARING, TECHNICAL DIALOGUE, AND CAPACITY BUILDING

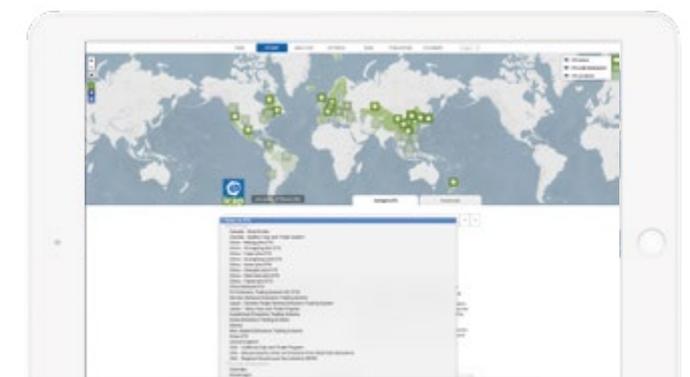
Through these three pillars, ICAP creates a holistic approach to delivering meaningful ETS support. This encompasses ICAP's role as a knowledge hub for ETS through our knowledge sharing tools and activities, ICAP's capacity building courses around the world, and the ongoing technical dialogues on pertinent design topics.



Knowledge Sharing

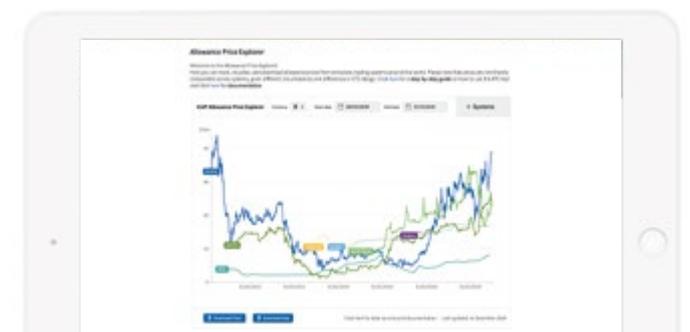
ETS MAP

The ICAP ETS Map provides up to date information on ETSs around the world - including systems that are in force, under development and under consideration. The interactive map features downloadable factsheets and provides detailed information on individual design elements.



ALLOWANCE PRICE EXPLORER

The regularly updated Allowance Price Explorer is an interactive tool which lets the user compare price developments across ETS markets. The tool features full data downloads and a deep dive into market stability mechanisms, allowing the user to create individualized charts.



Technical Dialogue

A WEALTH OF ETS RESEARCH

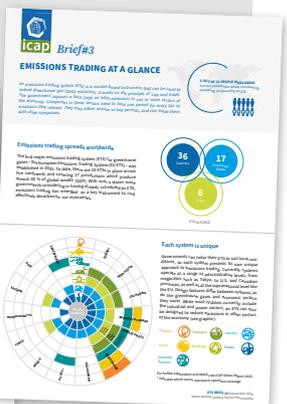
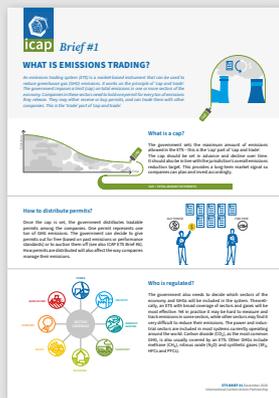
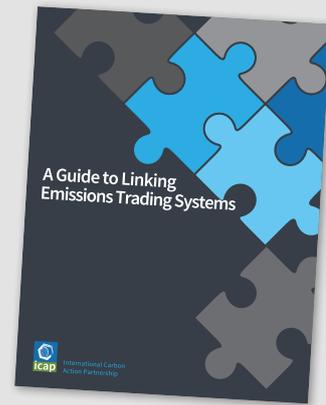
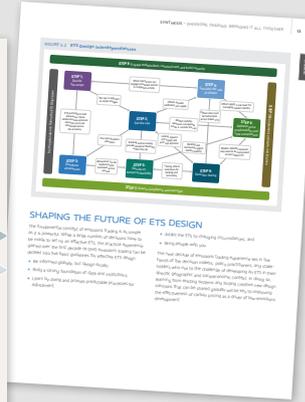
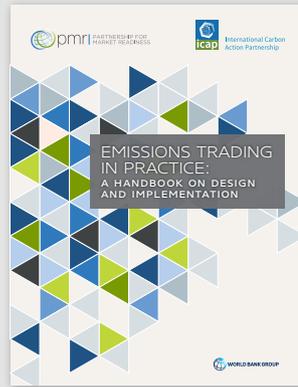
Through its technical dialogue activities, the ICAP Secretariat periodically publishes research on various topics of ETS design and implementation, drawing on the rich experience of all ICAP jurisdictions.

Among many others, examples include:

- The PMR-ICAP **ETS Handbook**, which provides a detailed step-by-step guide to ETS design and implementation and incorporates the latest in ETS thinking, good-practice design, and experiences from ETS jurisdictions around the world. A newly updated version will be published in 2021.
- The **ICAP report on Carbon Leakage and Deep Decarbonization**, an in-depth review of current efforts to address carbon leakage, assess the risk of carbon leakage, and policies to strengthen decarbonization efforts.
- The **ICAP-EU1** policy brief on policy options exploring how to keep carbon prices in check while achieving net-zero emissions.
- Additional **ICAP publications** including the ICAP Guide to Linking Emissions Trading Systems, a technical note with the CPLC on carbon market simulations, and a recent paper exploring different market stability mechanisms (MSMs) used in ETSs around the world.

The **ICAP Briefs on ETS basics** provide simple explainers on what an ETS is and how it operates in practice.

Stay tuned to the ICAP website for the latest publications!



Capacity Building

ICAP ETS COURSES

ICAP delivers ETS capacity building courses ranging from a few days to several weeks. Since 2009, ICAP has delivered 22 courses with almost 600 participants from 45 countries. The courses have drawn on the teachings of over 230 speakers from 32 countries. ICAP is consistently expanding its training scope, with an increasing focus on south-south cooperation. Thanks to support from the European Commission, more courses are funded and being planned for 2021.

IN-COUNTRY TRAININGS

In cooperation with various partners, ICAP has delivered training to relevant stakeholders in countries establishing an ETS or in the early stages of their ETS implementation. Past examples include Colombia, Ukraine, Turkey, Chile and China. The most recent in-country training brought together policymakers and private sector participants in Mexico in preparation for the pilot phase of their ETS, which launched in January of last year. ICAP will continue to deliver in-country trainings online until the effects of the COVID-19 pandemic have subsided.



NOTES ON METHODS AND SOURCES

GENERAL NOTES

1. 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 jurisdiction-specific data sources; therefore, categories are not necessarily consistent across jurisdictions.
2. Data in the report represents the current situation as of 31 January 2021.
3. Where 2021 data is not yet available, we use the most recent available data.
4. 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.
5. We use metric tonnes throughout the report, unless otherwise indicated.
6. Emissions coverage as reported in the factsheets refers to the verified emissions of entities under the ETS in a jurisdiction as a proportion of that jurisdiction's inventory. When this value is not available, an equivalent value provided by the jurisdiction, or the cap of the system, is used.
7. Average allowance prices are the mean of the allowance prices between 1 January 2020 and 31 December 2020. Values are taken from the infographic Allowance Price Developments (see below).
8. All monetary values in national currency units are converted to USD using the annual average exchange rates provided by the international financial statistics of the IMF. For monetary values that are fixed over multiple years the value reported in USD uses the most recent year's exchange rates.
9. Overall GHG emissions, the sum of the sectoral emissions, and the corresponding percentages reported in the factsheets may not add up exactly, due to rounding.
10. The following criteria are used to determine the three ETS status categories:
 - a. In force: ETS is in force with implementation established in the relevant regulation or legislation.
 - b. Under development: A mandate for ETS is established and ETS rules are currently being drafted.
 - c. Under consideration: ETS is being considered as a potential mitigation instrument, the government or other relevant authorities have publicly sent signals towards the development of an ETS.
11. The factsheets for Montenegro and New Mexico could not be reviewed by the respective jurisdictions but were reviewed internally within the ICAP Secretariat team.

NOTES ON INFOGRAPHICS

For the infographics “From Supranational to Local”, “Emissions Trading Worldwide” and “Sector Coverage”, 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 and methods were used:

FROM SUPRANATIONAL TO LOCAL

1. Jurisdictions' shares of global GDP and world population are calculated based on the latest annual data available before the Status Report's editorial cut-off date in February 2021. They cover 2018 or 2019 data. The population of jurisdictions with an ETS in force and the cumulative GDP of their respective economies are calculated as a share of world population and global GDP. The share of global GHG emissions covered by an ETS in force is calculated using the latest available data for the jurisdictions' official cap. In cases where the 2021 cap data were not available, estimates based on most recent data were used. Specific sources and figures are available upon request from info@icapcarbonaction.com.

SECTOR COVERAGE

1. For the purposes of this infographic, the following sector definitions are used:

SECTOR	DEFINITIONS
Power	 Emissions from the combustion of fossil fuels for electricity generation, as well as large-scale centralized heat production.
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). In the case of Kazakhstan, this also comprises extractive industries such as oil and gas mining.
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).
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.
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.
Forestry	 Emissions and removals resulting from forest land use, including forest management/harvest, deforestation and re/afforestation activities.
Waste	 Emissions from waste disposal and management (e.g. methane from anaerobic decomposition in landfills).

- Agriculture is a major source of biological emissions; however, the sector does not yet face direct compliance obligations under any existing ETS. Currently, in New Zealand, agricultural emissions must be monitored and reported under the ETS, and some offset programs (e.g. California) allow for offset projects in the sector.
- Emissions coverage of the different systems corresponds to the value that is reported in the corresponding factsheets. In the case of the Chinese pilots, the coverage was calculated by adding the most recent reported caps of all the pilots and dividing that number by the addition of the most recent reported GHG emissions of all the pilots. Note that sector coverage differs across Chinese pilots and this is indicated in the relevant slice of the infographic.

GLOBAL EXPANSION OF ETS

- Whenever available, we use the official and most recent cap data. When those data are unavailable or when systems operate without a cap, the estimates of covered emissions in the regulated sectors are used instead.
- EU ETS cap in 2021 has been revised down to reflect the UK leaving the system. It includes emissions covered under the aviation sector cap of the EU ETS, which in 2012 amounted to 210 MtCO₂e and from 2013 to 2021 has been around 38 MtCO₂e per year. For more details, see the EU ETS factsheet.
- Chinese National ETS started operating in 2021. In early January 2021, the Ministry of Ecology and Environment (MEE) published key ETS policy documents, along with an announcement that regulated entities will need to surrender allowances pertaining to their 2019–2020 emissions in 2021. The infographic reflects the start date of the Chinese National ETS in 2021, while also indicating the retroactive coverage of the system in 2019 and 2020. The caps for the Chinese National ETS and Pilots are estimated values provided by domestic ETS experts.
- There are two cases where an existing and a scheduled system regulate the same emissions. In those cases, we made the following assumptions:
 - Massachusetts ETS & RGGI: Massachusetts' system covers the same emissions as RGGI does, so it is excluded from the infographic to avoid double counting.
 - Chinese National ETS & Pilots: According to the Chinese National ETS rules, Pilots that have already allocated allowances for 2019 and/or 2020 for the power sector will remain under the pilots for those years. This implies the power sector entities that are subject to overlapping regulation will be covered under the pilots in 2020 and move to the national ETS starting 2021. Accordingly, the infographic reduces the Chinese Pilots' cap in 2020 and 2021 by 550 MtCO₂e based on estimates provided by domestic ETS experts.

- Global emissions data refer to GHG emissions in CO₂e excluding LULUCF. The values for 2020 and 2021 are calculated based on the observation in 2019 and assuming a constant 1.62% growth rate, which is the average growth rate of global GHG emissions between 2016 and 2019 and likely overestimates the actual growth rate of emissions considering the ongoing COVID-19 pandemic. Global GHG emissions data are from Olivier and Peters (2020): Trends in Global CO₂ and Total Greenhouse Gas Emissions; 2020 Report. PBL Netherlands Environmental Assessment Agency, The Hague. URL: https://www.pbl.nl/sites/default/files/downloads/pbl-2020-trends-in-global-co2-and_total-greenhouse-gas-emissions-2020-report_4331.pdf
- Percentages of global emissions covered are rounded to the nearest full percentage. They are slightly above 5% and 16% in 2005 and 2021, respectively.
- For the German National ETS, we assume that the cap will approximately equal the sum of emissions from transport, residential and commercial/institutional sectors in 2018 from Umweltbundesamt (2020): Nationale Trendtabellen für die deutsche Berichterstattung atmosphärischer Emissionen 1990–2018. URL: <https://www.umweltbundesamt.de/themen/klima-energie/treibhausgas-emissionen>.

DIFFERENT SHAPES OF ETS

- Coverage:** The figure indicates the percentage of the jurisdiction's total emissions that is covered by the ETS. The data is taken from the factsheets and refers to the latest emissions coverage figures available for each system.
- Allowance Price:** For the EU ETS, the price is the average of all 2020 spot prices (settlement prices) at the European Energy Exchange. The prices for EU and Swiss ETS are depicted as equal due to the link between the two systems becoming active in 2020. For RGGI, Québec and California, the clearing prices of all auctions conducted in 2020 are averaged. The prices for California and Québec systems are depicted as equal due to the link between them. In the case of RGGI where short tons are the standard unit, the price is converted to the price per metric tonne. For the Korean system, the price is based on end-of-day trading prices on the secondary-market exchange, averaged for 2020. Where necessary local currency prices were converted using the yearly exchange rate as published by the IMF Financial Statistics.
- Auction share:** This figure indicates the share of auctioned allowances in the cap. The consignment auctions in California are not included in calculating the auction share. In the case of the Swiss ETS, the figure shows the remainder of the allowances allocated for free as a proportion of the cap, as 2 out of the 4 scheduled auctions in 2020 were cancelled due to the COVID-19 pandemic.
- The previous editions of ICAP the Status Report featured a fourth metric/axis titled “Cap trajectory”. This aspect is not included in the current edition because geographical scope changes in the EU ETS and RGGI as well as sectoral scope changes in K-ETS make the calculation of this metric in 2021 assumption laden.

AUCTIONING REVENUE

- Auction revenues for the 15 systems (including the 8 Chinese pilots) were calculated using data 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; Massachusetts Department of Environmental Protection; the website of the Korea Exchange (KRX) as well as from the factsheets of the Chinese pilot systems (links available upon request, info@icapcarbonaction.com).
- Auction revenue for the EU ETS includes revenue from the domestic aviation sector.
- For the California cap-and-trade system, the proceeds from consignment auctions are excluded.
- 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.
- The Massachusetts quarterly reports are published by Potomac Economics, which is the official market monitor for the Massachusetts Department of Environmental Protection.

DEEP DECARBONIZATION AND ETS

- Information on the status of net-zero target development (i.e. “in law”, “in proposed legislation” and “in policy document”) is drawn from the Energy & Climate Intelligence Unit's Net Zero Tracker, accessible at <https://eciu.net/netzerotracker>. National jurisdictions which are not covered under one of these categories are grouped under the fourth category “no net-zero target”. The categorization is accurate as of 10 March 2021.
- For simplicity, the EU is treated as a single supranational jurisdiction and is categorized under “in proposed legislation”. It is important to note that there are individual EU Member States with national net-zero targets that are “in law” (e.g. France); “in proposed legislation” (e.g. Spain); “in policy document” (e.g. Finland); or “no net-zero target” (e.g. Bulgaria).
- Data on national GHG emissions are the most recent available and have been retrieved either from country reports incorporated into the Status Report factsheets, from the UNFCCC National Inventory Submissions 2020 (<https://unfccc.int/ghg-inventories-annex-i-parties/2020>) as well as the National Communication submissions from Non-Annex I Parties (<https://unfccc.int/non-annex-i-NCs>). Data on ETS-covered emissions are from the Status Report factsheets.

ALLOWANCE PRICE DEVELOPMENTS

1. The top panel of the infographic displays the allowance prices between 1 January 2010 and 31 December 2020.
2. An allowance represents the right to emit one tonne of CO₂e in the jurisdiction(s) that accept it for compliance. However, allowances from different systems cannot be treated as a single commodity because of differences in system design. Allowance prices are not directly comparable across systems.
3. In the top panel of the infographic, price series for California, Québec and RGGI are obtained from the primary market and are reported at the same frequency as the respective auctions in these systems. All other price series are obtained from the secondary market and are reported for each trading day for which data are available.
4. All data are in USD and are converted using the average exchange rate of the corresponding month as reported by the IMF.
5. For the infographic covering price developments in 2020, the data underlying the indices, including those for WCI (California/Québec) and RGGI, are obtained from the secondary market and are reported for each trading day for which data are available.
6. For the infographic covering price developments in 2020, the data for WCI (California/Québec) and RGGI allowance prices that underlie the graph were provided by the Independent Commodity Intelligence Services (ICIS), with data from the Intercontinental Exchange (ICE).
7. Where allowance prices reflect auction settlement prices, the observations from two successive auctions are connected linearly.
8. Secondary market prices reflect settlement prices and do not capture intra-day trade variation.
9. RGGI allowance prices are in short tons and have been converted to metric tonnes for the purposes of this infographic.
10. Where allowances have a limited vintage, the time series data compiles these vintages in a way that reflects the compliance cycle.
11. A 90-day moving average was used to smooth out the variability in calculating the price range for the Chinese pilots. Note that the variability may be driven by changes in market fundamentals as well as absence of price data from a given system on a given day.
12. For information on sources for allowance prices and exchange rates see <https://icapcarbonaction.com/en/documentation-allowance-price-explorer>.
13. Different jurisdictions took a variety of public health measures to address the spread of the SARS-CoV-2 virus during the first months of 2020. Measures obeyed to different domestic circumstances and their scope is not always immediately comparable. For the infographic covering price developments in 2020, the following sources were used for the public health measures taken by the jurisdictions:
 - a. European Union Members:**

Hirsch, C. (2020 March 31). Europe's coronavirus lockdown measures compared. Politico, <https://www.politico.eu/article/europes-coronavirus-lockdown-measures-compared/>
 - b. New Zealand:**

New Zealand COVID-19 Alert System. (2020). History of the COVID-19 Alert System. <https://covid19.govt.nz/alert-system/history-of-the-covid-19-alert-system/>
 - c. Republic of Korea:**

Ministry of Health and Welfare (2020 February 23). Briefing on the pan-governmental meeting for COVID-19. https://www.mohw.go.kr/eng/nw/nw0101vw.jsp?PAR_MENU_ID=1007&MENU_ID=100701&page=1&CONT_SEQ=353124
 - d. Québec:**

Rowe, D. J. (2020 April 12). COVID-19 in Quebec: A timeline of key dates and events. CTV News. <https://montreal.ctvnews.ca/covid-19-in-quebec-a-timeline-of-key-dates-and-events-1.4892912>
 - e. United States:**

Centers for Disease Control and Prevention. (2020 September 4). Timing of State and Territorial COVID-19 Stay-at-Home Orders and Changes in Population Movement — United States, March 1–May 31, 2020. <https://www.cdc.gov/mmwr/volumes/69/wr/mm6935a2.htm>
 - f. RGGI:**

Mendelson, L. (2020 May 20). Stay on Top of “Stay At Home” – A List of Statewide Orders. <https://www.littler.com/publication-press/publication/stay-top-stay-home-list-statewide>

LIST OF ACRONYMS

AB	Assembly Bill	EEB	Ecology and Environment Bureau
AFOLU	Agriculture, Forestry and other Land Use	EEX	European Exchange
AIC	Allowances in Circulation	EITE	Emission-Intensive and Trade-Exposed
ANSI	American National Standards Institute	EO	Executive Order
APCR	Allowance Price Containment Reserve	ERU	Emissions Reduction Units
ARP	Auction Reserve Price	EQB	Environmental Quality Board
ASSET	Advanced Technologies Promotion Subsidy Scheme with Emission Reduction Targets	EQC	Environmental Quality Commission
BAU	Business as Usual	ERU	Emissions Reduction Unit
BMU	Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit (German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety)	ESR	European Effort Sharing Regulation
BPU	Board of Public Utilities	ETS	Emissions Trading System or Emissions Trading Scheme
CAD	Canadian Dollar	EU	European Union
CAR	Clean Air Rule	EU ETS	European Union Emissions Trading System
CARB	California Air Resources Board	EUR	Euro
CBAM	Carbon Border Adjustment Mechanism	FFCER	Fujian Forestry Certified Emission Reduction
CBIO	Brazilian decarbonization credits	FPO	Fixed Price Option
CCC	Climate Change Committee	FY	Fiscal Year
CCER	Chinese Certified Emission Reduction	FYP	Five Year Plan
CCM	Cost Containment Mechanism	GBP	British Pound Sterling
CCR	Cost Containment Reserve	GDP	Gross Domestic Product
CCS	Carbon Capture and Storage	GHG	Greenhouse Gas
CDM	Clean Development Mechanism	GIR	Greenhouse Gas Inventory and Research Center of Korea
CEP	Clean Energy Plan	GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Corporation for International Cooperation)
CER	Certified Emission Reduction	GJ	Giga Joule
CFCs	Chlorofluorocarbons	GtCO₂e	Giga Tonnes of Carbon Dioxide equivalent
CH₄	Methane	GVA	Gross Value Added
CHF	Swiss Franc	HB	House Bill
CLEF	Carbon Leakage Exposure Factor	HCFCs	Hydrochlorofluorocarbons
CNY	Chinese Yuan Renminbi	HFCs	Hydrofluorocarbons
CO₂	Carbon Dioxide	HFC-23	Fluoroform
COP26	26th Conference of the Parties	ICAO	International Civil Aviation Organization
CORSIA	Carbon Offsetting and Reduction Scheme	ICAP	International Carbon Action Partnership
COVID-19	2019 novel coronavirus	IEA	International Energy Agency
CPA	Carbon Pricing in the Americas	IMF	International Monetary Fund
CPS	Carbon Price Support	INECC	National Institute for Ecology and Climate Change
DEBS	Direct Environmental Benefits	INDC	Intended Nationally Determined Contribution
DEE	Department of Ecology and Environment	IPCC	Intergovernmental Panel on Climate Change
DEMNR	Department of Energy, Minerals, and Natural Resources	ITMOs	Internationally Transferred Mitigation Outcomes
DENR	Department of Environment and Natural Resources	JCM	Joint Crediting Mechanism
DEP	Department of Environmental Protection	JI	Joint Implementation
DEQ	Department of Environmental Quality	JPY	Japanese Yen
DHC	District Heating and Cooling	KAZ ETS	Kazakhstan Emissions Trading Scheme
DRC	Development and Reform Commission	KAU	Korean Allowance Unit
EC	European Commission	KCU	Korean Credit Unit
ECCC	Environment and Climate Change Canada	K-ETS	Korea Emissions Trading System
ECR	Emissions Containment Reserve	KOC	Korean Offset Credit
EEA	European Economic Area	KRW	South Korean Won
		KRX	Korea Exchange
		kWh	Kilowatt hour

KZT	Kazakhstani Tenge	Q1/Q2/Q3/Q4	Quarter 1/Quarter 2/Quarter 3/Quarter 4
LDCs	Least Developed Countries	RBOB	Reformulated Blendstock for Oxygenate Blending
LNG	Liquefied Natural Gas	RCI	Residential/Commercial/Industrial emissions
LPG	Liquefied Petroleum Gas	RENAMI	Registro Nacional de Acciones de Mitigación (National Mitigation Actions Registry)
LULUCF	Land Use, Land-Use Change and Forestry	Renare	Registro nacional de reducción de emisiones de GEI (National Emission Reductions Registry)
MassDEP	Massachusetts Department of Environmental Protection	RENE	Registro Nacional de Emisiones (Mexico National Emissions Register)
MBI	Market-based Instrument	RGGI	Regional Greenhouse Gas Initiative
MEE	Ministry of Ecology and Environment	RGGI COATS	RGGI CO ₂ Allowance Tracking System
MEP	Ministry of Environmental Protection	R&D	Research and Development
MMC	Mine Methane Capture	SAM	Supply Adjustment Mechanism
MOE	Ministry of Environment	SB	Senate Bill
MOEF	Ministry of Economy and Finance	SCC	Standards Council of Canada
MOF	Ministry of Finance	SEMARNAT	Secretaría del Medio Ambiente y Recursos Naturales (Ministry of Environment and Natural Resources of Mexico)
MONRE	Ministry of Natural Resources and Environment	SF₆	Sulfur Fluoride
MOS	Mayor's Office of Sustainability	SO₂	Sulfur Dioxide
MOU	Memorandum of Understanding	SOE	State-owned Enterprise
MOST	Ministry of Strategy and Finance	tce	Tonne of Coal equivalent
MRV	Monitoring, Reporting and Verification	TCI	Transportation and Climate Initiative
MSR	Market Stability Reserve	TCI-P	Transportation and Climate Initiative Program
MtCO₂e	Million Tonnes of Carbon Dioxide equivalent	tCO₂	Tonne of Carbon Dioxide
MW	Megawatt	tCO₂e	Tonne of Carbon Dioxide equivalent
MWe	Megawatt equivalent	TEPA	Taiwanese Environmental Protection Administration
MWh	Megawatt hour	TGO	Thailand Greenhouse Gas Management Organization
N₂O	Nitrous Oxide	TIER	Technology Innovation and Emissions Reduction Regulation
NO_x	Nitrogen Oxide	TMG	Tokyo Metropolitan Government
NAMA	Nationally Appropriate Mitigation Actions	TMS	Target Management System
NDC	Nationally Determined Contribution	TNAC	Total Number of Allowances in Circulation
NDRC	National Development Reform Commission	TRP	Technical Reserve Price
nEHS	Nationales Emissionshandelssystem (German National ETS)	Turk-SIM	Turkish ETS simulation game
NER	New Entrants Reserve	UK	United Kingdom
NF₃	Nitrogen Trifluoride	UK ETS	UK Emissions Trading Scheme
NMED	New Mexico Environment Department	UNDP	United Nations Development Program
NO_x	Nitrogen Dioxide	UNFCCC	United Nations Framework Convention on Climate Change
NYC	New York City	US	United States
NZ	New Zealand	USD	US Dollar
NZ ETS	New Zealand Emissions Trading Scheme	US EPA	US Environment Protection Agency
NZD	New Zealand Dollar	V-ETS	Thailand Voluntary Emissions Trading Scheme
NZU	New Zealand Unit	WCI	Western Climate Initiative
NZX	New Zealand Exchange	ZEV	Zero Emissions Vehicle
OBPS	Output-Based Pricing System		
OTC	Over-the-Counter		
PCF	Pan-Canadian Framework on Green Growth and Climate Change		
PDR	People's Democratic Republic		
PFCs	Perfluorocarbons		
PHCER	Pu Hui Certified Emission Reductions		
PMI	Partnership for Market Implementation		
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)		
PoMuC	Climate Change Policy Program		

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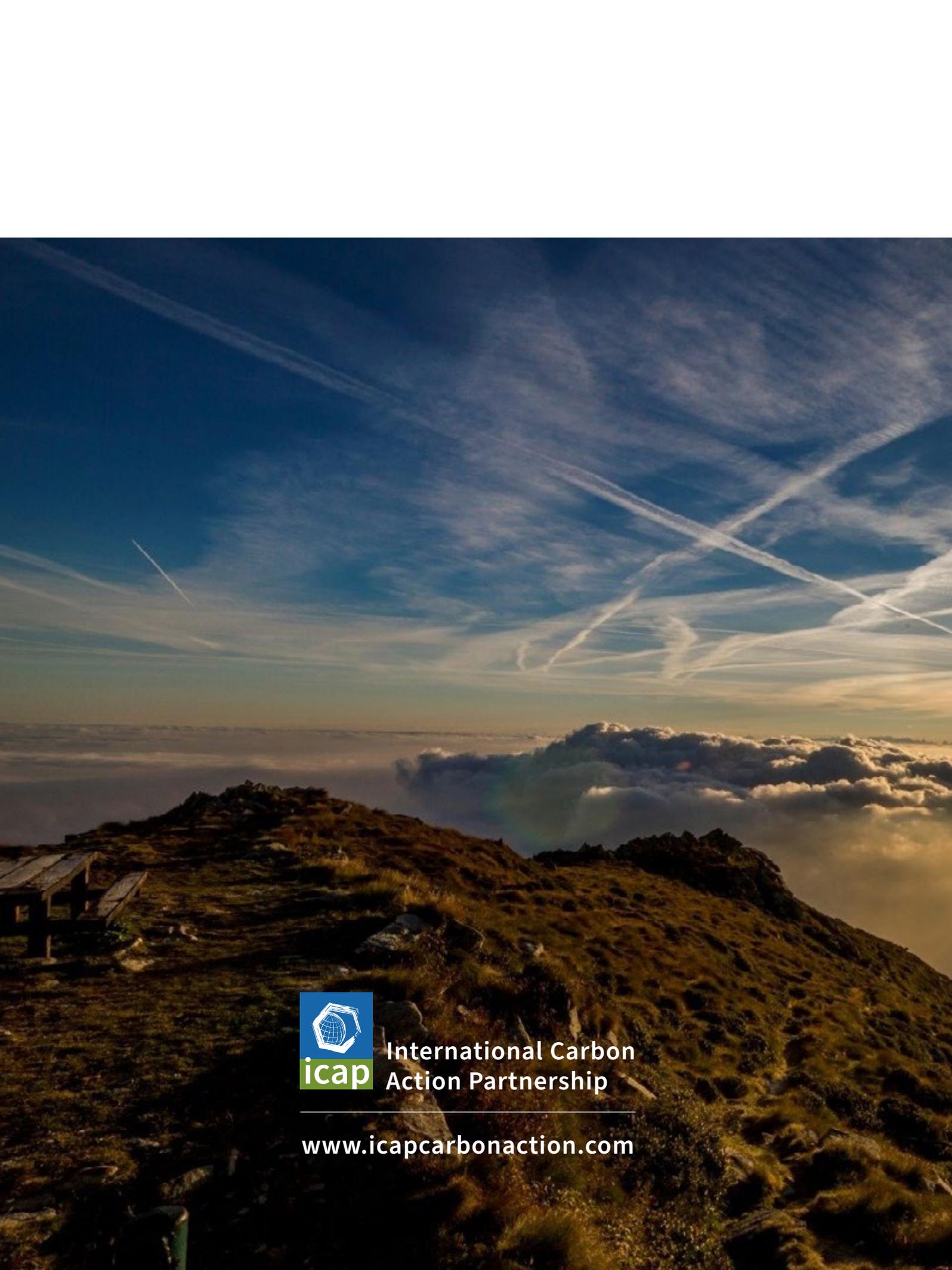
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