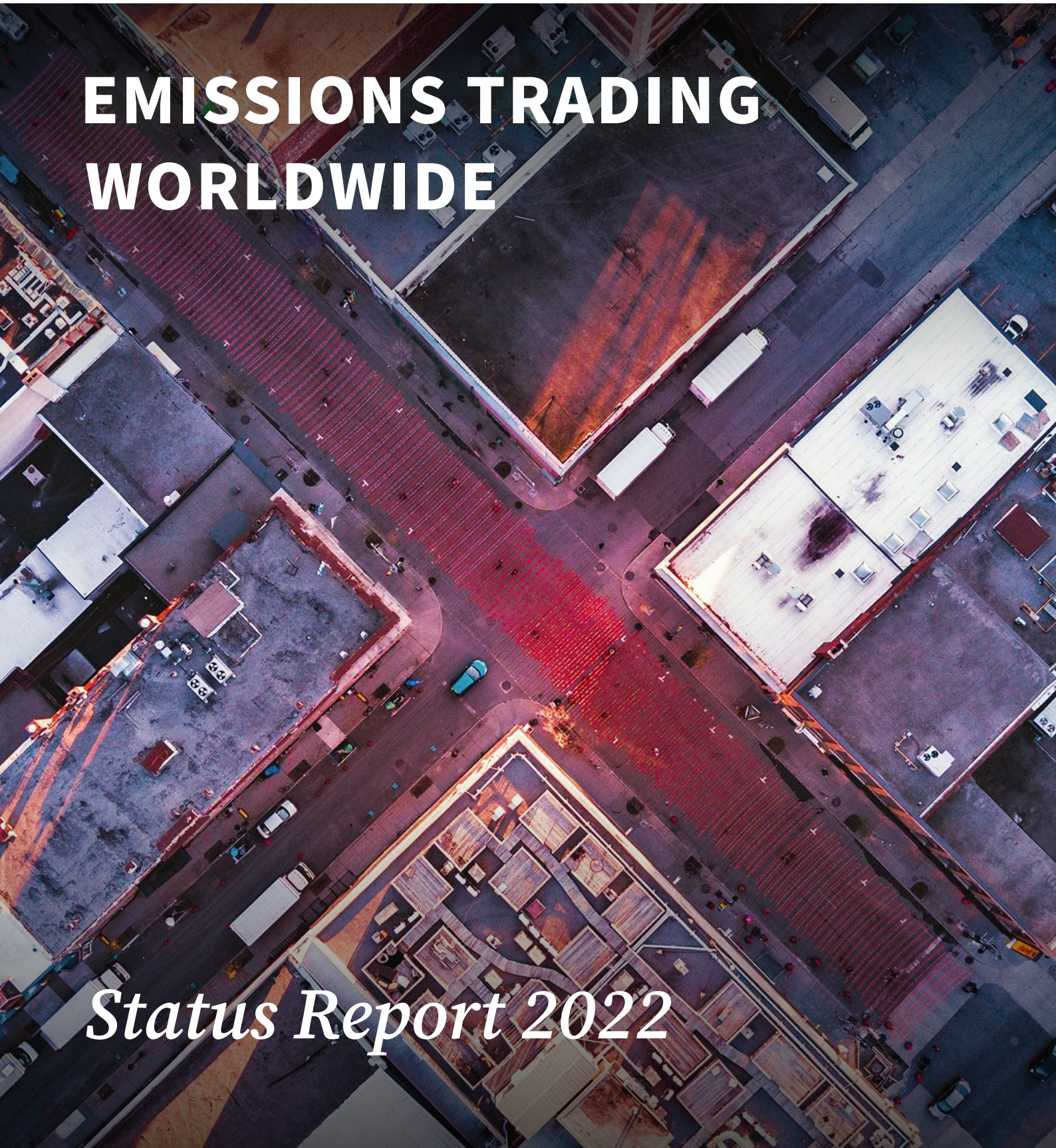
International Carbon Action Partnership

EMISSIONS TRADING WORLDWIDE



Status Report 2022

Emissions Trading Worldwide

International Carbon Action Partnership (ICAP) Status Report 2022

EDITORIAL TEAM:

Stefano De Clara, Baran Doda, Alexander Eden, Julia Groß, Maia Hall, Leon Heckmann, David Hynes, Daria Ivleva, Martina Kehrer, Ernst Kuneman, Stephanie La Hoz Theuer, Trevor Laroche-Theune, Lina Li, Victor Ortiz Rivera, Anastasia Steinlein, Theresa Wildgrube.

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Luiz Mauricio de Araujo Navarro (Brazil), Raquel Breda dos Santos (Brazil), Gustavo Saboia Fontenele e Silva (Brazil), Brian Covi (California), Rachel Gold (California), Jason Gray (California), Maureen Hand (California), Blayne Morgan (California), Jeremy Newman (California), Amy Ng (California), Rajinder Sahota (California), Mark Sippola (California), Camille Sultana (California), Simon Tudiver (Canada), Marijke Vermaak (Canada), Francisco Dall'Orso (Chile), Juan Pedro Searle (Chile), Qiang Li (Chongqing Carbon Emissions Trading Center), German David Romero Otálora (Colombia), Sangsun Ha (Ecoeye), Maureen Lee (Ecoeye), Hans Bergman (European Commission), Matthieu Moulonguet (European Commission), Timothee Noel (European Commission), Julia Ziemann (European Commission), Valtteri Härmälä (Finland), Niko-Matti Ronikonmäki (Finland), Matleena Kurki-Suutarinen (Finland), Alexander Handke (Germany), Uwe Neuser (Germany), Dirk Weinreich (Germany), Sirui Xiao (China Emissions Exchange (Guangdong)), Sara Budinis (IEA), Tom Howes (IEA), Luca Lo Re (IEA), Dida Gardera (Indonesia), Tetsuhisa Kato (Japan), Botagoz Akhmetova (Kazakhstan), Muhamad Ridzwan Bin Ali (Malaysia), William Space (Massachusetts), Diana Karin Guzmán Torres (Mexico), Suriel Islas Martínez (Mexico), Sandra López (Mexico), Jelena Ban (Montenegro), Claudia Borchert (New Mexico), Matthew Maez (New Mexico), Stephanie Stringer (New Mexico), Kate Gouin (New York City), Ross MacWhinney (New York City), Scott Gulliver (New Zealand), Ted Jamieson (New Zealand), Jacqueline Ruesga (New Zealand), Paula Hemmer (North Carolina), John Cooper (Nova Scotia), Michelle Miller (Nova Scotia), Andrew Webber (Nova Scotia), Brittany White (Nova Scotia), Colin McConnaha (Oregon), Nicole Singh (Oregon), Rachel Fernandez (Oregon), Mathew Espie (Oregon), Syeda Hadika Jamshaid (Pakistan), Glenda Daco (Philippines), Jean-Yves Benoit (Québec), Pierre Bouchard (Québec), Steve Doucet-Héon (Québec), Thomas Duchaine (Québec), Diane Gagnon (Québec), Vincent Girard (Québec), Jean-François Labrie (Québec), Stéphane Legros (Québec), Kim Ricard (Québec), Chang-hwan Lee (Republic of Korea), Rupa Deshmukh (RGGI), Lois New (RGGI), Yuji Jigata (Saitama), Marat Latypov (Sakhalin), Jia Liu (Shanghai Information Center), Can Jiang (China Shenzhen Emissions Exchange), Tian Xue (China Shenzhen Emissions Exchange), Lishen Lin (SinoCarbon), Guoqiang Qian (SinoCarbon), Shuai Yuan (SinoCarbon), Wang Zongyi (SinoCarbon), Thomas Kellerhals (Switzerland), Sophie Wenger (Switzerland), Anothai Sangthong (Thailand), Cheng Liu (Tianjin Climate Exchange), Takuya Ozawa (Tokyo Metropolitan Government), Naobumi Higashikawa (Tokyo Metropolitan Government), Ezgi Akgedik (Turkey), Kaan Moralı (Turkey), Arzu Önsal (Turkey), Orhan Solak (Turkey), Okan Uğurlu (Turkey), Olga Yukhymchuk (Ukraine), Joe Cooper (United Kingdom), Henry Dieudonné-Demaria (United Kingdom), Charlie Lewis (United Kingdom), Hannah Lewis (United Kingdom), Jacob Rose (United Kingdom), Chris Shipley (United Kingdom), Eleanor Stead (United Kingdom), Huy Luong Quang (Vietnam), Bill Drumheller (Washington), Luke Martland (Washington).

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Foreword

Advancing Emissions Trading Systems: Challenges and opportunities on the path to deep decarbonization

The critical decade of climate action is upon us. The latest assessment report of the Intergovernmental Panel on Climate Change makes clear that without rapid and large-scale emissions reductions, our collective goal of limiting warming to close to 1.5 °C, or even to 2 °C, will be beyond reach. Against a backdrop of extreme weather events and ever-increasing public concern about the climate emergency, many governments and companies have responded by raising their ambition. More than 150 countries have submitted new NDCs and around 90 % of global emissions are now covered by a net-zero target. In recent months, governments and businesses also have come together in a variety of initiatives to accelerate progress in specific sectors. With these developments we are headed in the right direction: the International Energy Agency has estimated that if all pledges, including those made at COP26 in Glasgow, are met in full and on time, the average global temperature increase could be limited to 1.8 °C by the end of the century.

> ***Many governments and companies have responded by raising their ambition.***

Translating these targets into policies to achieve the short-term emission reductions we need is now a priority. As countries increasingly turn to implementing their NDCs, carbon pricing will be a crucial policy tool to drive decarbonization. It can play a central role in both incentivizing short-term reductions as well as supporting the longer-term transition to net-zero emissions. As this year's ICAP Status Report shows, at the end of 2021 ETSs covered 37 % of emissions in jurisdictions that have enshrined their net-zero targets in law and 17 % of emissions in jurisdictions where net-zero targets are under development or discussion.

Having proved resilient to the economic shocks caused by the start of the COVID-19 pandemic in 2020, carbon markets performed strongly in 2021. Due to the anticipated impact on ETSs of greater climate ambition at the national and sub-national levels, several jurisdictions experienced increased market activity and rising allowance prices. The market stability provisions that many jurisdictions have implemented in recent years were able to respond to developments in the markets, whether by shoring up or containing prices, in a predictable and transparent manner.

Reaching net-zero emissions by or around mid-century is now a common goal covering the vast majority of the global economy. ETSs are well suited to achieving this ambition: they provide both assurance over emissions levels and longer-term market signals needed to stimulate the investment necessary to enable the low-carbon transition. The role an ETS will play in reaching net-zero emissions will vary among jurisdictions. For some it will be the main instrument, for others a key tool within a portfolio of GHG mitigation measures. Policymakers will need to grapple with issues such as expanding ETS coverage into new sectors, implementing new tools, and intensifying international cooperation. The process will be a dynamic one, with systems adjusting to new challenges and opportunities in the coming decades.

The road to net zero will pose challenges, some very familiar and others more novel. As ETS caps continue to fall towards zero, we will need to see significant reductions from sectors in which progress has so far been limited. This will involve further assessment of the level of free allocation provided to certain parts of the economy, while continuing to address the risk of carbon leakage through allocation and other mechanisms. For instance, in 2021 we saw the EU's proposal to introduce a carbon border adjustment mechanism (CBAM) on selected imports. The CBAM has been conceived of as an alternative approach, which would, at the same time, allow for a raised ambition of domestic industries and level the playing field to address the risk of carbon leakage. These challenges will only grow in the next decades and the appropriate response will differ between jurisdictions. But, everywhere, the transition will require a careful balance between the need to incentivize decarbonization while maintaining the competitiveness of local industries. In this respect, the idea of an open climate alliance with common ambitious goals and comparable measures, possibly leading to a common border protection, may be useful and should be discussed in more detail.

Climate action cannot come at the expense of live-lihoods. The net-zero transition will see the winding down of some carbon-intensive industries and the expansion of new, low-carbon ones. The potential for green growth is significant. Nevertheless, for this

transition to succeed it must be just and leave no one behind. Public acceptance of carbon pricing is essential to its political feasibility, effectiveness, and longevity. As jurisdictions look to introduce or expand ETSs, and prices rise in response to an ever-shrinking carbon budget, the most vulnerable must be protected from negative impacts. We already have examples of how to use revenues in innovative ways to achieve this. In the years ahead, we must continue to learn from each other's experiences on how best to design programs to support a just transition, communicate the benefits of carbon pricing, and how to mitigate its impacts where needed, to gain and maintain public support.

Looking to the future, reaching net zero and prospectively negative emissions will also require usage, storage and the removal of CO_2 from the atmosphere, especially in hard-to-decarbonize sectors. As ICAP explored in 2021, incentivizing removals in an appropriate manner poses questions for the long-term design and functioning of ETSs. Removals have already been included in some ETSs through offset credits from afforestation and reforestation projects. The coming decades will see the development and scaling up of a wider variety of negative emissions technologies (NETs), including direct air capture and storage (DACS). To protect the integrity of the ETS, any removal methodology will need to ensure that carbon will be permanently stored and negative impacts on biodiversity and land use have to be avoided. And finally, NETs must not jeopardize the decarbonization of the global economy, especially through ETSs. We will therefore carefully have to consider how to address removals in ETSs. ICAP will continue to explore these and other questions as part of its ongoing work on ETSs in the context of net-zero goals.

The sheer scale of the task of reaching net zero reminds us that the climate crisis is a common challenge and will require international collaboration. ICAP was founded with the aim of fostering this spirit of cooperation through the linking of ETSs. It was therefore good news to see the adoption of Article 6 rules at COP 26 in Glasgow. These rules should pave the way for a new wave of international cooperation on climate action through market mechanisms. Article 6 is a broad framework which enables countries to pursue various forms of market-based approaches under the Paris Agreement, from ETS linking and international crediting

The years of preparation are coming to fruition as more countries move towards implementing emissions trading.

to other forms of country-to-country agreements. With the COP 26 outcome, governments now have the long-awaited clarity on the Article 6 rules that will enable them to consider the role of international collaboration in their NDCs as well as in the context of their domestic ETS. We also know the climate emergency requires all hands on deck, and the recent decisions at COP 26 cleared the way for the investment of billions of private capital alongside government measures to spur climate action.

While the task ahead is daunting, we look back at 2021 with a renewed sense of optimism that there is international will to move forward. We see this reflected in this year's Status Report, through the start of China's ETS, the Glasgow Declaration on Carbon Pricing in the Americas, ambitious reforms proposed in several jurisdictions, and the number of net zero commitments supported by ambitious ETSs. The years of preparation are coming to fruition as more countries move from the planning stage towards implementing emissions trading. For many of these countries, ICAP has already been part of the journey. For all of us, ICAP will continue to be at the forefront of developments in 2022 – through its capacity-building programs, technical dialogues, and unique forums for peer-to-peer learning and knowledge sharing – as we work together to make progress in this critical decade.

RAJINDER SAHOTA
Co-chair of the International Carbon Action Partnership and Deputy Executive Officer – Climate Change and Research,
California Air Resources Board

DIRK WEINREICH
Co-chair of the International Carbon Action Partnership and Head of Division 'Climate Legislation, Emissions Trading',
Federal Ministry for Economic Affairs and Climate Action, Germany

Executive Summary

ALMOST 1/3 OF THE GLOBAL POPULATION LIVES UNDER AN ETS IN FORCE

Climate change is the defining challenge of this decade. Without concerted efforts to decarbonize economies around the world and reduce emissions, our collective goal of limiting global warming to 1.5 °C, or even to 2 °C, will be out of reach. Governments and companies are responding to the climate emergency by ramping up their ambition: setting new climate targets and committing to net zero by mid-century.

Achieving net zero in time will be challenging. Governments' net-zero commitments cover roughly 90 % of global GHG emissions, but many are not yet supported by near-term policies. To reach these long-term goals, countries must rapidly implement adequate policy frameworks and those already in place must be bolstered. In this context, emissions trading will be critical, and will increasingly play a key role as the policy tool of choice to drive decarbonization. At the end of 2021 ETSs covered 37 % of emissions in jurisdictions that have enshrined their net-zero targets in law and 17 % of emissions in jurisdictions where net-zero targets are under development or discussion.

The 2022 International Carbon Action Partnership (ICAP) Status Report demonstrates how ETS developments are proliferating and picking up pace across the globe, with an increasing number of systems. There are now 25 such systems in force, covering 17 % of global GHG emissions. 22 ETSs are currently under development or under consideration, mainly in South America and South-East Asia. Today, almost 1/3 of the global population lives under an active ETS.

Existing systems are maturing, becoming increasingly resilient to external shocks, and several governments around the world are undertaking reforms to align their ETS with net-zero targets. This increase in global ambition has resulted in an increase in carbon prices across almost all systems, reflecting the expectations of more ambitious emissions caps in the future. Allowance prices in the EU ETS reached a record high of more than USD 100 at the end of 2021, and the market's auctions generated a revenue of USD 36,7 billion in 2021, representing a growth of almost 63 %. The rise in allowance prices and revenues can be observed in nearly all systems, from North America across to the Asia Pacific. In North America, the allowance price in California and Quebec grew from USD 18 to USD 28, and from USD 8 to USD 14 in the Regional Greenhouse Gas Initiative (RGGI). Across the Asia-Pacific region, significant price rises were recorded in Korea, from USD21 to USD 30, and in New Zealand, from USD 27 to USD 46.

While carbon prices are rising against a backdrop of high energy prices in several regions around the world, public acceptance of carbon pricing is essential to its political feasibility, effectiveness, and longevity. Emissions trading offers tools to ensure that the most vulnerable are protected from negative impacts, such as California's ring-fencing of ETS revenues to support disadvantaged and low-income communities and household rebates via utility bills. By the end of 2021, global ETSs had raised a record USD 161 billion in auctioning revenues, growing by over 50 % since the end of 2020.

In the years ahead, we must continue to learn from each other's experiences on how best to design programs to support a just transition, communicate the benefits of carbon pricing, and how to mitigate its impacts where needed, to gain and maintain public support.

New systems are gaining momentum in their design and implementation. China's national ETS commenced trading, becoming the largest carbon market in the world in terms of covered emissions. It covers over 4 billion tCO_2 representing over 40 % of its emissions. 2021 also witnessed the launch of national carbon markets in the UK and Germany.

This newest edition of the ICAP Emissions Trading Worldwide report lays out the latest developments and salient ETS trends from the past year. A series of infographics examine and compare ETS facts and figures, and detailed factsheets have been compiled on each system currently in force, under development, or under consideration. The report also features in-depth articles from policymakers and experts from key jurisdictions around the world.

To ensure that the maritime sector contributes to the EU's climate ambitions, the European Commission made the proposal to extend the scope of the EU ETS to cover CO_2 emissions from large ships. In its article, the Commission presents the key stages of this sectoral expansion, the main opportunities and challenges, as well as the need for further action in the framework of the International Maritime Organization. The article provides important insights for moving forward on maritime decarbonization.

Meanwhile, the UK ETS has now been up and running for one year. An article from the UK government provides reflections on the progress the UK has made and how it has aligned the system with its national net-zero framework. As a frontrunner on net-zero climate legislation, the UK's experience yields valuable lessons on how to balance ambition with competitiveness and preserving stability for participants.

California has seen firsthand the destructive force of climate change, with wildfires ripping through the state this past year and exacerbating existing disparities in the community. Its article lays out the jurisdiction's innovative approaches to ensuring a sustainable and fair transition to net zero. The California ETS provides policymakers around the world with an important real-world example of how distributional impacts of carbon pricing instruments like ETS can be addressed and environmental justice advanced. This issue will continue to grow in relevance as jurisdictions hotly debate how to strengthen and expand their own ETSs.

The world's largest carbon market, the Chinese national ETS, is discussed by experts from SinoCarbon, a prominent Chinese think-tank. Having now completed its first compliance cycle, China is looking ahead at strengthening the system's legal foundations, expanding the scope of the ETS to different industrial sectors, improving data quality, and making decisions on offset use and how to allocate allowances.

The Carbon Pricing in the Americas Platform (CPA) sheds light on the increasing interest in carbon pricing across the Americas. With its article, the CPA reflects on the role and prospects for carbon markets in the region, and how it will continue to support these discussions by fostering dialogue, sharing best practice, and facilitating the convergence of carbon pricing policies.

Finally, the International Energy Agency (IEA) details what it means to translate net-zero targets into policy measures that can deliver the necessary level of emission reductions and removals. The article assesses the role of emission removals and the use of both domestic and international carbon markets to drive them. This is an emerging debate as we strive for net zero, and understanding the implications of these technologies will increasingly gain relevance.

JURISDICTIONS MAKING UP 55 % OF GLOBAL GDP ARE USING EMISSIONS TRADING

55%

A Year of ETS Developments

During the course of 2021, global ETSs have undergone a series of developments, including changes to make them compatible with the net-zero targets many jurisdictions have committed to. New systems are also being introduced as jurisdictions work to design and implement ETSs. Below, 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 2021.

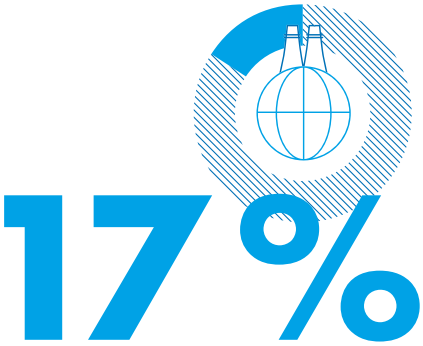
EUROPE AND CENTRAL ASIA

European Union: Following the release of the "Fit for 55" package in July 2021, a comprehensive reform package is underway to align the EU ETS with the new EU-wide 2030 climate target. The proposed reforms include adjustments to the cap, the MSR, benchmarks, the inclusion of the maritime sector, a border carbon mechanism, and a separate fuel ETS for buildings and road transport. The widely-awaited proposal was one of the key drivers pushing EU carbon prices to record levels in 2021.

Germany: Germany successfully launched its national ETS in 2021. It covers fuels from the transport and building sectors upstream and complements the EU ETS. In 2021, regulated entities opened registry compliance accounts, started monitoring their emissions and bought the first allowances from the exchange or authorized intermediaries.

Finland: In March 2021, the Ministry of Transport and Communications in Finland set up a cross-sectoral working group tasked with assessing and preparing for a national ETS to cover the road transport sector.

Kazakhstan: The system made a full transition to benchmarking as the only allocation method. The cap for 2021 had been established at 159.9 $MtCO_2$, for one year only, as opposed to the three-year cap of the previous 2018–2020 phase.



OF GLOBAL GHG EMISSIONS ARE COVERED BY AN ETS

Montenegro: The EU and Western Balkan states, including Montenegro, agreed on a roadmap for climate policy implementation in October 2021. Under the "Green Agenda Action Plan", the EU will support Montenegro's efforts to align its national legislation with the bloc's by 2024.

Sakhalin: In 2021, the results of the regional GHG inventory in Sakhalin were published, showing that 95 % of emissions are energy related. The Russian Ministry of Economic Development in cooperation with the government of Sakhalin prepared a draft law to introduce mandatory requirements for carbon reporting and compliance with the allocated emissions allowances for entities emitting 50,000 tCO_2e and more. The draft passed the first State Duma reading in December 2021 and is expected to become law in early 2022. Four other regions in Russia have expressed an interest in joining the experiment.

Switzerland: The Swiss ETS started its third trading period in 2021. The ministry updated allocation benchmarks in line with the EU ETS and introduced a market stability mechanism to counter future demand shocks.

Turkey: In the lead up to COP 26, Turkey became the latest country to ratify the Paris Agreement and redoubled its efforts to introduce an ETS.

Ukraine: 2021 was the first year MRV procedures, as adopted in the framework law, were applied. The first monitoring reports for 2021 are expected by the end of March 2022. Based on at least three years of data from the MRV system, Ukraine plans to develop legislation to establish an ETS, which the Minister of Environmental Protection and Natural Resources announced in January 2021 could launch in 2025.

United Kingdom: The UK ETS successfully completed its first year of operation. High allowance prices triggered the cost containment mechanism in both December 2021 and January 2022, with the authorities deciding on both occasions not to redistribute or release additional supply into the market.

NORTH AMERICA

California: California implemented program changes, including the introduction of a price ceiling and two price containment reserve tiers below it, reductions in the use of offset credits and a steeper allowance cap decline to 2030. By May, prices of California Carbon Allowances had reached record highs.

Massachusetts: In March 2021, Massachusetts passed a new climate law with binding emission reduction targets of 50 % by 2030 and 75 % by 2040, compared with 1990 levels, as well as net-zero emissions by 2050. The state's ETS changed to full auctioning in 2021.

Nova Scotia: The current federal approval for the province's carbon pricing system expires at the end of this year and Nova Scotia is reviewing options for post-2022. Nova Scotia held a public consultation in 2021, which included questions on carbon pricing as well as broader environmental goals and climate change policies.

North Carolina: In July 2021, North Carolina's Environmental Management Commission (EMC) instructed the DEQ to initiate a rulemaking process to establish an ETS that is consistent with the design features of the RGGI Model Rule, which would enable the state to join the regional partnership.

Oregon: Oregon adopted rules that establish a new Climate Protection Program that includes an ETS for fuel suppliers. The first compliance period is 2022–2024, with free distribution of compliance instruments under the cap.

Québec: The cap-and-trade system began its fourth compliance period with new rules, including amended price tiers for reserve allowances and reformed eligibility for offset projects. The second half of the year saw increased allowance prices.

Regional Greenhouse Gas Initiative: In May 2021, the final regulation to establish an ETS in Pennsylvania covering CO_2 emissions from the power sector and to join RGGI was released, alongside updated modeling results of the effects of the ETS. An emissions containment reserve started operating in 2021. The RGGI states initiated the Third Program Review in

1 Supranational *8 Countries* *19 Provinces & States* *6 Cities*

summer 2021 to analyze program successes, impacts, potential additional reductions to the cap post-2030, and other design elements.

Transport and Climate Initiative: In the second half of 2021, most of the participating states halted their participation in TCI-P. As a result, it is currently unlikely that the implementation of TCI-P in its current form will continue.

Washington: The "Climate Commitment Act" was signed into law, establishing an economy-wide cap-and-invest program to start operation in January 2023. It will cover entities emitting more than 25,000 tCO_2e per year. The Washington State Department of Ecology is currently developing the rules to implement the system.

LATIN AMERICA AND THE CARIBBEAN

Colombia: The "Climate Action Law", which entered into force in December 2021, consolidates the commitments presented in Colombia's NDC and sets a goal to fully implement the ETS by 2030.

Mexico: In 2021, the first and second allowance allocations took place. The Ministry of Environment and Natural Resources concluded the analysis and revision of the information for the first compliance period and participants surrendered allowances corresponding to this period, achieving a 97 % compliance rate.

ASIA PACIFIC

China: China's national ETS – the world's largest in terms of covered emissions (4.5 billion tCO_2) – started operating in 2021. As confirmed as part of the "1+N policy" framework in October 2021, it will be an important measure to achieve China's targets to peak emissions by 2030 and reach carbon neutrality by 2060. Throughout 2021, a series of ETS policy documents on key design elements such as MRV and market operation were finalized, and trading of carbon emissions allowances (CEAs) commenced in July. At the end of 2021, the government announced the successful conclusion of the first compliance period covering 2019 and 2020, with high compliance rate.

Chinese Pilots: 2021 saw the transition of the electricity generation sector from Chinese regional ETSs to the national system. Meanwhile all eight regional carbon markets continued operating and further developed allocation, offsetting, MRV and trading rules. Several of them (such as Beijing, Chongqing, Guangdong, Fujian, and Tianjin) also expanded their scope or are in preparation to do so.

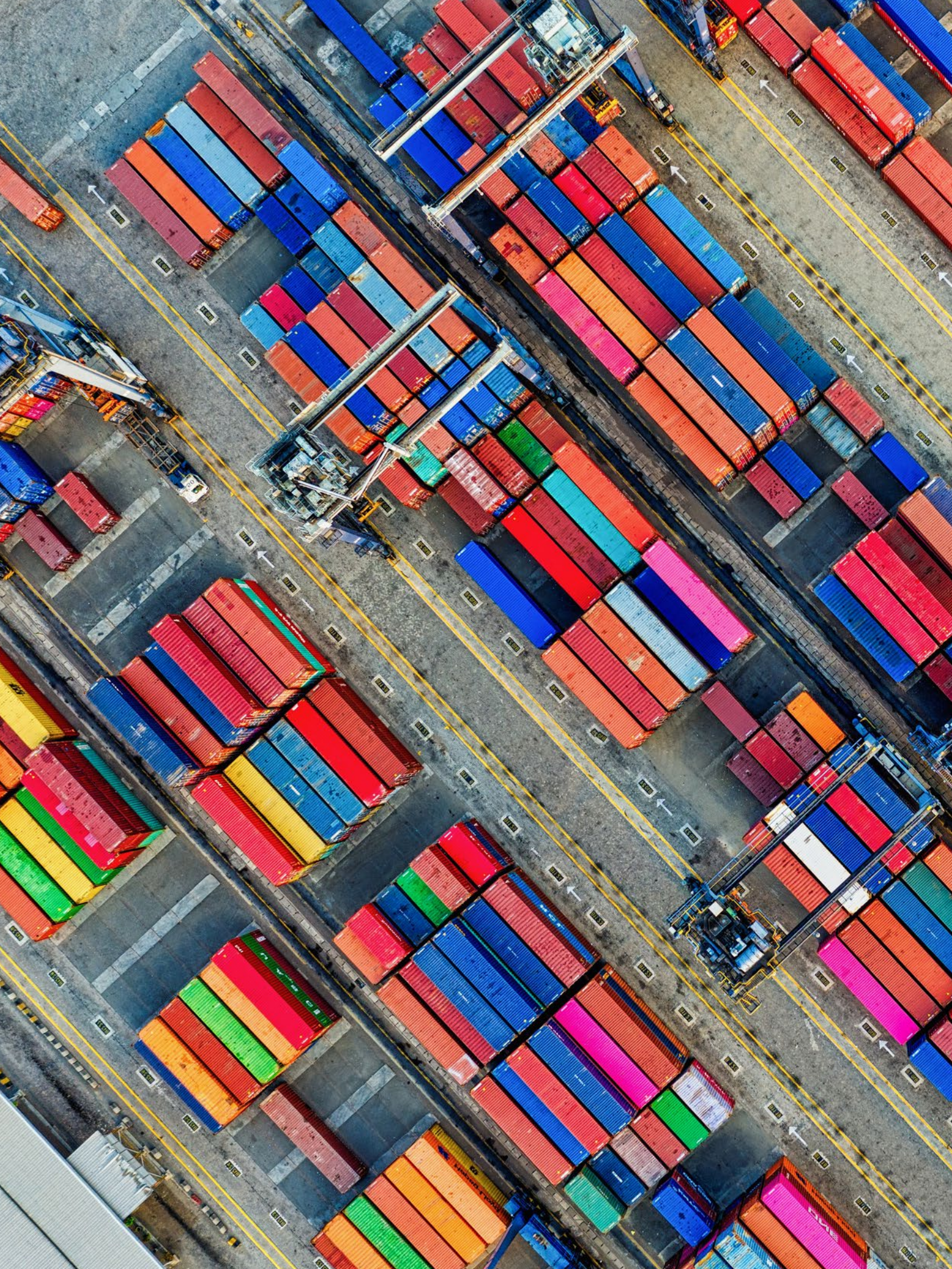
Indonesia: After a voluntary intensity-based ETS pilot for the power sector took place between April and August 2021, the much-anticipated "Presidential Regulation on the Economic Value of Carbon" was signed in October, which will serve as the framework for Indonesia's carbon pricing instruments. A hybrid "cap-trade-and-tax" system was also announced, to start April 2022.

Malaysia: The Malaysian government published a policy document with plans for a domestic ETS. In 2022, a trading platform for voluntary carbon market credits is planned to start, which will serve as preceding infrastructure for the ETS.

New Zealand: 2021 was a year of major reforms for the NZ ETS, following on from the passing of the "Climate Change Response (Emissions Trading Reform) Amendment Act 2020". The reforms include a cap on unit supply and the introduction of an auctioning mechanism. Auctioning began in March 2021. The fixed price option, which previously acted as a price ceiling, was withdrawn after 2020, and was replaced with a cost containment reserve.

Republic of Korea: The Korean government decided to suspend the monthly allowance auctions from February to May 2021, following assessments of low allowance prices and oversupply for the 2020 compliance year, in part due to lower emission in covered entities from the impacts of the COVID-19 pandemic. In the second half of the year, both prices and trading volumes increased.

Vietnam: In January 2022, the Government of Vietnam issued a comprehensive set of regulations under the "Law on Environmental Protection", including provisions for the development of a national ETS with a declining cap corresponding to Vietnam's NDC, and the establishment of a carbon crediting program.



Practitioner Insights

China's national ETS

Underway with a smooth start, yet enhancements are needed to achieve dual climate goals

Qian Guoqiang, Lin Lishen and Wang Zongyi
SinoCarbon Innovation & Investment Co., Ltd

On 16 July, 2021, in the first nation-wide action to directly limit carbon emissions from enterprises, China's national ETS officially commenced trading. After almost a decade of continuous efforts to establish a national carbon pricing mechanism, growing from pilots to a national scheme, China's national ETS has set off to a smooth start. The market began with an initial allowance price of CNY 48.00 (USD 7.44)/tonne, which then rose modestly throughout the year. In the first compliance period, only the power sector was covered, with some limits on compliance. Even so, more than 2,160 power companies faced obligations under the national ETS, in total covering about 4.5 billion tonnes of CO_2 emissions per year. Eventually, China's national ETS is expected to grow into the world's largest carbon market in terms of value, with a potential transaction value of over CNY 100 billion [1](USD 15.5 billion), providing a nation-wide price signal and channeling financial resources to sectors that are crucial for the realization of China's dual goals: peaking emissions before 2030 and ultimately reaching long-term carbon neutrality before 2060.

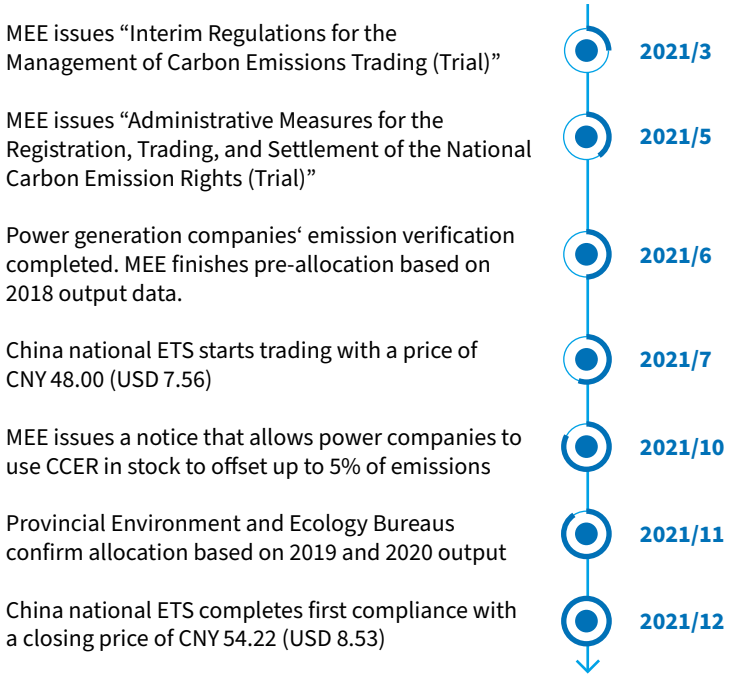


Figure 1. China national ETS timeline 2021

CHINA NATIONAL ETS: PROGRESS IN 2021

The first compliance period of the national ETS closed at the end of 2021, with a compliance rate of 99.5 %, measured in terms of surrendered allowances. During the first compliance period, trading of spot allowances was limited to covered entities only. Though other types of market participants, such as financial institutions, were excluded from the market, they are expected to gradually be allowed to participate in the future. All of the required allowances were distributed to power companies by the government for free, based on historical output and benchmarks.[2] The first compliance period also featured an upper limit on compliance obligations that was designed to favor gas-fired power plants and ease the compliance 'burden' of all covered entities.

China's offset mechanism, the China Certified Emission Reduction (CCER) system, was thrown a lifeline in 2021 when the Ministry of Ecology and Environment (MEE) issued a notice allowing covered entities to use CCERs to offset up to 5 % of their annual verified emissions for compliance purposes, with no restrictions on project type or vintage. The CCER mechanism was initially launched in 2013 but suspended operation four years later in 2017. This meant that the CCER mechanism accumulated tens of millions of offset credits that were unused by the time the national ETS was launched in 2021. The announcement by MEE opened the door to the accumulated CCER credits and enabled the mechanism to play an important role in compliance. The price of CCERs rose sharply after the announcement, rising to near parity with the price of allowances.

By the end of December 2021, the national ETS had been running for 114 trading days, with a cumulative transaction volume of 179 million allowances and a cumulative transaction value of CNY 7.66 billion (USD 1.2 billion). The closing price on 31 December 2021 was 54.22 CNY (USD 8.40), an increase of 12.96 % from the starting price in July.

1 **The South China Morning Post "China's carbon neutral goals"** - February 2022
2 Allocation is divided into two stages – initial allocation followed by ex-post adjustment. First, 70 % of allowances are pre-allocated to power companies based on historical output. Second, after completing verification, the allowance quantities are adjusted and confirmed according to the actual power and heat supplied by generating units.

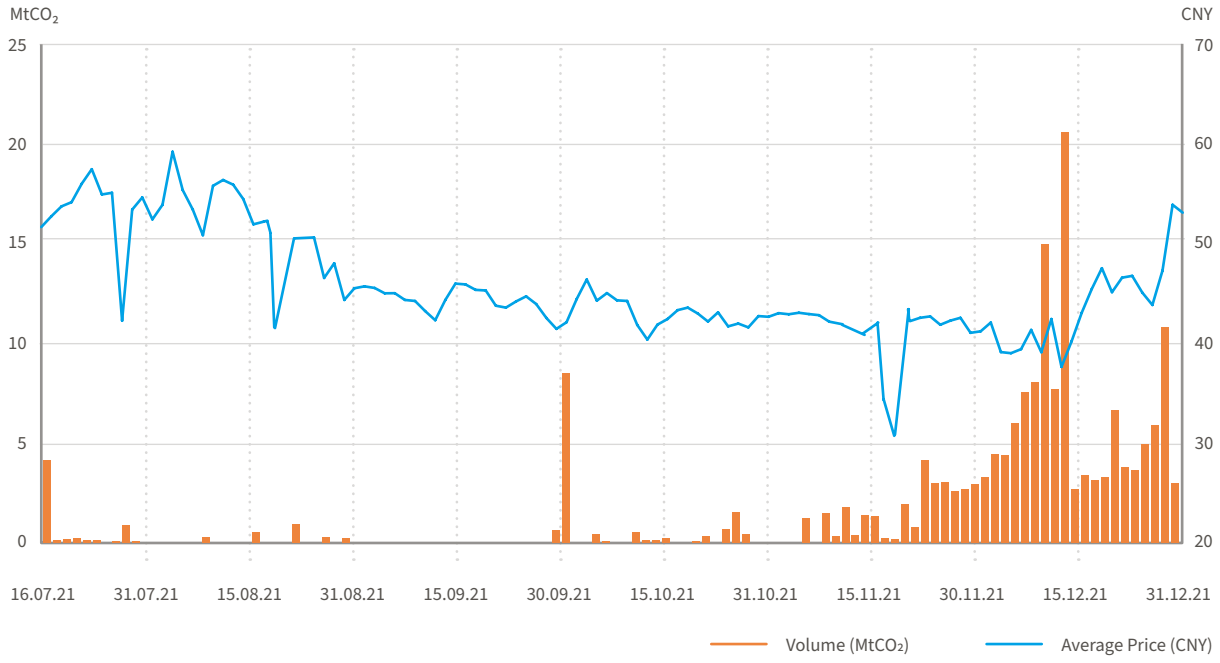


Figure 2. China national ETS average price and volume in 2021

TRADING IN THE FIRST COMPLIANCE CYCLE: A DEEPER DIVE

A more in-depth look into the trading activities of the first compliance period shows several characteristics. The observations that we outline here indicate a functioning market that is still at an early stage and may need time to mature.

There is an obvious "tidal effect" with transactions rising before compliance. Three quarters of transactions occurred in the month prior to the compliance deadline. This could be mainly because many enterprises were not prepared for ongoing trading and hadn't yet developed a routine transaction strategy. Another key factor to consider is that adjustments to allowance allocation were made throughout October and November, and only then could the allocation quantities received by covered entities be formally confirmed. This left less than two months for entities to prepare for compliance and complete transactions.

Trading activity was lower than that of the Chinese regional ETS pilots. The cumulative trading volume of allowances in the national ETS was 179 million tonnes. Compared with the total of 9 billion emission allowances issued for the two-year compliance cycle, the turnover rate[3] is only 2 %, which is lower than the average turnover rate of China's pilot ETSs (5 %). This is also much lower than the turnover rate of the EU ETS spot market (more than 80 % in 2020) and far below that of the EU ETS futures market (more than 500 % in 2020).

Transactions were mainly over-the-counter (OTC) block trades. Of all transactions, OTC block trades (≥100,000 tonnes) accounted for 83 % of the total traded volume. Prices for block trades were on average 8 % lower than those of online trades across the whole trading period. It is thought that large corporates used OTC block trades to match intra-group companies to conduct transactions at lower costs. This way, they were able to take advantage of the block trade price limit (±30 % of the closing price of the previous day), which allows more flexibility than the online transaction limit (±10 %) and thereby reduces overall compliance costs.

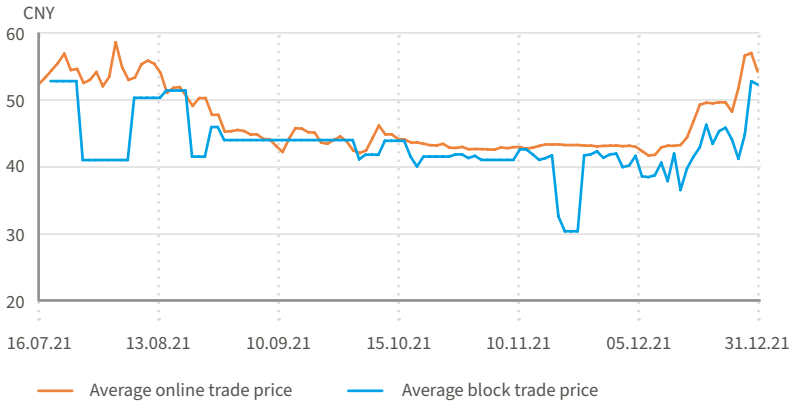


Figure 3. National ETS online vs. block trade price difference

3 The turnover rate is the annual transaction volume divided by the total amount of allowances issued in the year.

ETS ENHANCEMENTS NEEDED TO ACHIEVE NATIONAL CLIMATE TARGETS

The construction of the national ETS cannot be accomplished overnight. It is a multi-year mission that features different phases and continuous efforts of review and progress. "Learning by doing" will be an inevitable path for the construction and development of the national ETS. In the most recent step, China released three important policy documents in its "1+N" framework for carbon peaking and neutrality, confirming plans to strengthen the national ETS and expand it to more sectors. In the near future, we see five key aspects that need to be addressed to ensure that the national ETS fulfills its key role in achieving China's dual climate targets.

(1) Strengthen the legal foundation

It is likely that the State Council will promulgate new high-level legislation to replace the ministry-level decree currently in place. The new legislation will become a key milestone in the further development of China's carbon market. In March 2021, the MEE took an important step by releasing a draft regulation for public consultation, which clarifies the intention to determine the emissions cap and allocation methods over the long run and proposes stricter penalties for non-compliance. Once finalized, the legislation is expected to provide a more robust legal foundation for the national ETS while strengthening some of its core design elements.

(2) Improve data quality

Like in the early stages of other established systems around the world, such as with the EU ETS, data quality issues were uncovered in China's national ETS in 2021, including several instances of data fraud. Therefore, the issue of data quality has been added to the government's high-priority agenda for urgent action. According to the MEE, improving data quality control will be one of the key tasks in the second compliance period. To this end, the MEE will likely take action to strengthen qualification management, build capacity among the verification agencies and personnel, improve data submission and verification management requirements, and enhance law enforcement measures against data fraud.

(3) Expand coverage to include more sectors

It is expected that during the "14th Five-Year Plan" period (2021–25), energy-intensive industries such as aluminum, cement, steel, petrochemicals, and papermaking will be gradually brought into the national ETS one sector at a time. The sequence of inclusion of these industries has not been officially announced yet, but market sentiment indicates that aluminum and cement are preparing to be the covered next.

(4) Refine the allocation approach

Allocation under the Chinese national ETS is currently based on benchmarking with ex-post adjustment for production levels. The current settings have enabled a smooth start to the system, but they could be tightened in the coming period. The government has not yet announced its plan for allowance allocation for the second compliance period, and the pending decisions will have implications for the market. For the covered power companies and other market participants, it is crucial to know whether the current allocation methodology and benchmark levels will remain the same in the next period. China is also considering a long-term emission trajectory in the context of its national target to build a carbon-neutral economy by 2060. To achieve this target, experts are proposing that China's national ETS should at some point move towards setting an absolute emission cap aligned with a long-term allowance allocation plan.

(5) Restart the CCER mechanism

With the decision to allow accumulated historical CCERs onto the market in 2021, the offset mechanism became an important element in the national ETS. However, market participants understand that this is an interim decision. Looking ahead, they are anticipating a clear policy on the usage of offsets as the mechanism is expected to restart in 2022. Some key information is not yet clear, for example, what types of CCERs will be accepted in the compliance market in the future.

In 2021, China successfully set its national carbon market in motion. The analysis is promising, showing a smooth start to trading and compliance. Work is now needed to prepare China's national ETS to take the next steps towards a larger, broader, and more robust carbon market, and take its place as one of the key policies to achieve China's climate goals.

The UK ETS

One year on

Charlie Lewis,
Deputy Director for Emissions Trading, Department for Business, Energy and Industrial Strategy (BEIS)

It has been a year since we launched the United Kingdom Emissions Trading Scheme (UK ETS). We are proud of what we have achieved so far, and it is a good time to reflect on the progress we have made. We said from the start of the UK ETS that we saw the scheme playing an important role in delivering our emissions reduction commitments. The UK government's "Net Zero Strategy", published in October 2021, underlined this, placing fair carbon pricing as one of the key principles of the UK's approach to net zero. We have a wide-reaching plan to develop the scheme and make sure it lives up to these ambitions. But first it is worth reflecting on year one of the UK ETS.

ESTABLISHING A NEW ETS

Setting up the scheme was not without challenges, but our experience with the European Emissions Trading System (EU ETS) was valuable, as we sought to balance continuity for participants with ambition. The sectors covered – industry, power, and aviation – are the same as in the EU ETS, but we reduced the cap by 5 % compared to the UK's notional share of the EU ETS cap.

We started auctioning UK Allowances (UKAs) and trading began on the secondary market in May. We have been pleased to see the high level of interest in auctions and trading developing on the secondary market. In 2021, we issued around 127 million allowances through a combination of free allocation and auctions, with revenues from the latter reaching over GBP 4.5 billion (USD 6.2 billion) across the year. All but one of the auctions in 2021 fully cleared. Rules we put in place ensured one auction in October could still partially clear, with unsold allowances being successfully released to the market before the end of the year.

The end of the year provided another first when the cost containment mechanism (CCM) was triggered, after UKA prices on the secondary market exceeded the trigger price for three consecutive months. The CCM, like in other schemes, is a rules-based market stability tool which allows for – but does not require – intervention to mitigate sustained high prices if the price triggers set in legislation are met. In the early years of the scheme, we have deliberately put in place lower and shorter price triggers, giving us the opportunity to assess the functioning of the market sooner.

Ultimately, the decision on both occasions was not to intervene in the market. These decisions were aimed at upholding the objectives of the UK ETS as a market-based approach to reducing emissions and incentivizing participants to find the most cost-effective solutions to decarbonize. A well-functioning market is a priority for the UK and is an important factor in the success of emissions trading systems. We will continue to monitor the market closely and remain prepared to take timely and proportionate action, within the rules of the scheme, to support its effective functioning should the CCM be triggered again. We will also explore ways to increase liquidity.

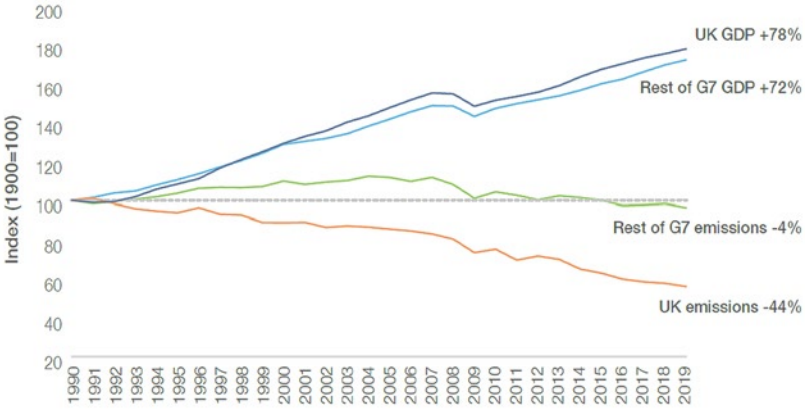


Figure 1 – UK vs Rest of G7 GDP and GHG Emissions
*Source: UK Government "***Net Zero Strategy: Build Back Greener***" Page 41*

THE NET ZERO STRATEGY

The UK's progress so far and comprehensive plan to complete the journey to net zero by 2050 are the context for our plans to develop the UK ETS. We have achieved a lot on our road to net zero already. Since 1990, the UK has almost halved its GHG emissions. Between 1990 and 2019, we grew our economy by 78 % and cut our emissions by 44 %, decarbonizing faster than any other G7 country. However, we know we need to move faster.

The UK's Net Zero Strategy outlines measures to transition the whole economy to a green and sustainable future, helping businesses and consumers to move to clean power, supporting hundreds of thousands of well-paid jobs, and leveraging up to GBP 90 billion (USD 124 billion) of private investment by 2030. It builds on the Prime Minister's "Ten Point Plan" for a green industrial revolution published in 2020 and sets out

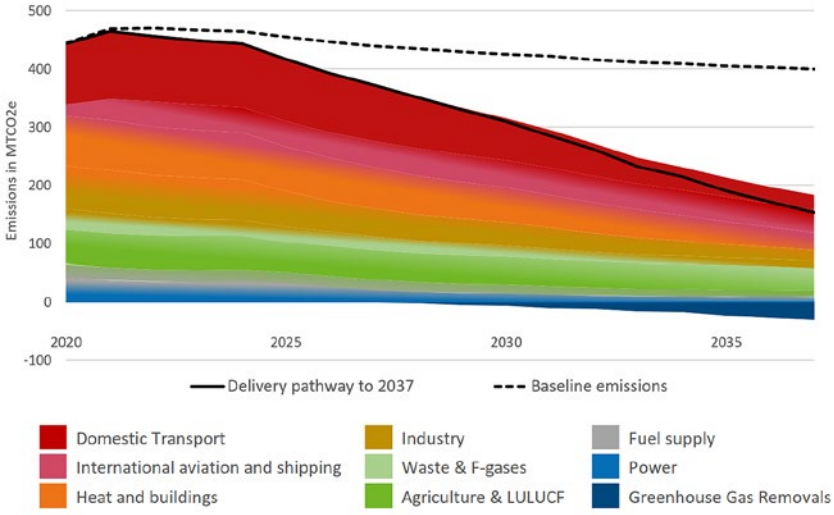


Figure 2 – Indicative delivery pathway to 2037 by sector
*Source: UK Government "***Net Zero Strategy: Build Back Greener***" Page 18, BEIS Analysis 2021*

decarbonization pathways to net zero by 2050, policies and proposals to reduce emissions for each sector and cross-cutting action to support the transition.

The Strategy sets a clear direction, supports investment, and provides opportunities for businesses in new markets at home and abroad. It gives businesses and industry the certainty they need to invest, grow, and make UK home to new ambitious projects. It shows how government is working with them to bring down the costs of key technologies – from electric vehicles to heat pumps – and to give the UK a competitive edge. And, as its prominence in the core principles of the Strategy shows, it recognizes the role of the UK ETS as a key lever on our path to net zero and sets out how we will approach the future growth of the scheme.

WHAT'S NEXT

We want to continue to pursue greater climate ambition and develop the scheme to enable the UK to meet our net-zero targets.

The UK ETS Authority will consult in the coming months on a net zero consistent UK ETS cap, with the intention that any changes to the cap will be implemented by 2024 at the latest. This will set a clear trajectory and send a strong signal on decarbonization for business to follow. We already initiated a Free Allocation Review by holding a call for evidence on free allocation in Spring 2021 and will continue the review by assessing how to appropriately mitigate the risk of carbon leakage while still preserving the incentive to decarbonize. We will do so alongside the review of the cap to ensure any changes are made in a rounded and consistent way.

The Net Zero Strategy reasserted our commitment to exploring expanding the UK ETS to other sectors. We will provide an update on our broader approach to this in due course, but the Strategy put forward some specific areas we are looking to focus on. Furthermore, as part of the upcoming consultation and in partnership with the Devolved Administrations, we intend to launch a call for evidence in the coming months exploring the role of the UK ETS as a potential long-term market for GHG removals.

As we develop the UK ETS, we will rely heavily on effective collaboration. This principle is intrinsic to how the system is set up, with the scheme jointly run by the UK Government and Devolved Administrations. It also applies to our external presence. We will consult with those affected by any changes including scheme participants, as well as with experts and international counterparts. We are proud of our achievements in the UK on carbon pricing and are excited to support and work with other jurisdictions looking to establish or develop their carbon pricing policy. Equally, we recognize that we have a lot to learn from the experience and innovations of others and we hugely value opportunities to work with other schemes on shared issues and challenges.

We can take confidence from polling that shows the UK public supports the "polluter pays" principle,[1] and the focus and positive outcomes on carbon markets achieved at COP 26. We also have a strong foundation to build on, a year on from the establishment of the scheme, and we look forward to seeing what the coming years have in store for emissions trading.

1 Demos and Zero-Carbon Campaign polling both **show strong support for carbon pricing** as part of the UK's approach to net zero.

The EU's plan to extend carbon pricing to maritime transport

Hans Bergman,
European Commission
DG CLIMA

Last year marked the publication of the most comprehensive set of climate proposals ever in the EU. In mid-July 2021, the European Commission proposed the "Fit for 55" package, a set of legislative texts aiming to deliver the EU's 2030 climate objective – reducing net GHG emissions by at least 55 % compared to 1990 levels, a significant step up from the previous target of at least 40 %. This policy package elaborates the framework for the "European Green Deal", a strategy adopted in December 2019 that aims to transform the EU into a modern, resource-efficient, and competitive economy, and to achieve climate neutrality by 2050.

A key aspect is to tackle emissions from transport. While the EU's GHG emissions have decreased during recent years in areas such as industry and power generation – thanks notably to the EU's carbon market – they have increased in the transport sector (see Figure 1). This is why the "Fit for 55" package contains several proposals specifically targeting the aviation, road, and maritime transport sectors. The latter is especially relevant, as emissions from maritime transport (see Figure 2) are both substantial (3–4 % of the EU's total emissions and 13.4 % of transport emissions) and are expected to increase further in the future, driven by the growth of this transport mode and its current heavy reliance on oil derivatives. Absent any additional measures, the International Maritime Organization (IMO) projects that by 2050 annual global maritime emissions could rise by 50 %, compared to 2018 levels (see Figure 3), which would represent more than a doubling of annual emissions since 2008.[1] Policy actions are urgently needed to reverse this curve.

To ensure that maritime transport contributes to the EU's climate effort and to the Paris Agreement commitments, the Commission has proposed a range of measures to address GHG emissions from shipping in Europe, alongside continuing to push for global action at the IMO. In particular, the Commission proposes to

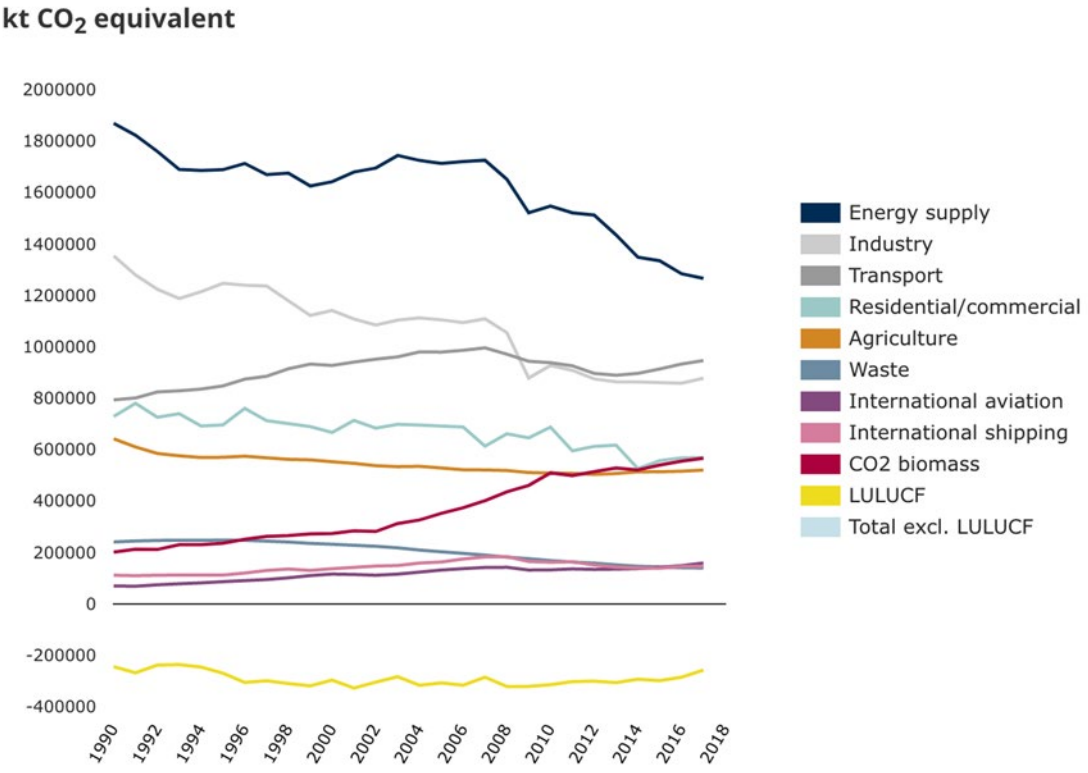


Figure 1 – Greenhouse gas emissions by aggregated sector
Source: **European Environment Agency** *"Greenhouse gas emissions by aggregated sector" 2019*

1 European Environment Agency (EEA), European Maritime Transport Environmental Report 2021

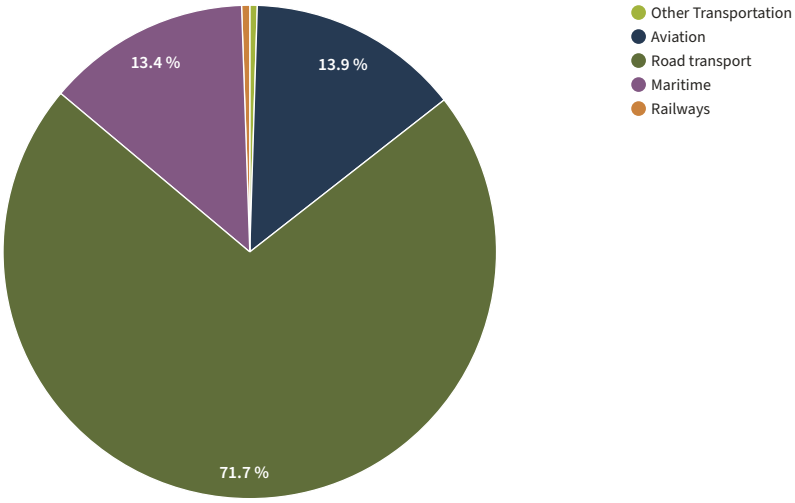


Figure 2 – EU (Convention) - Share of transport greenhouse gas emissions
Source: **European Environment Agency** *"Share of transport greenhouse gas emissions" 2019*

extend the EU ETS to shipping,[2] building on the EU's MRV system for CO_2 emissions from ships, which started in 2018.[3] This proposal is now under scrutiny by the Council of the EU and the European Parliament and will hopefully be adopted by the end of 2022.

The proposed extension of the EU ETS will have many benefits. First of all, the inclusion of maritime transport in the ETS will ensure it contributes to the EU's climate objectives, since emissions will be part of the overall emissions cap, in line with the common level of ambition expected from the sum of all ETS sectors. Moreover, it will give shipping companies incentives to cut emissions where it is the most economical. By creating a price signal in line with the "polluter-pays" principle, it will make energy efficiency investments more financially attractive and will also reduce the cost differential between traditional and alternative fuels. Finally, full auctioning will raise revenues that can be used to support climate mitigation measures, fund research and innovation, and address social impacts.

Of course, extending the ETS does not come without challenges, and the proposal has been designed to mitigate these to the best extent possible. One challenge is to maximize the amount of GHG emissions covered while limiting administrative costs. The proposed ETS extension therefore only covers transport ships larger than 5,000 gross tonnage, which are responsible for about 90 % of CO_2 emissions from the sector. These ships have already been reporting and verifying their CO_2 emissions since 2018, in line with the MRV regulation referred to above.

Another challenge is to avoid the risk of competitive distortion. To ensure an equal treatment and level playing field, the system will be flag-neutral. In total, around 1,600 shipping companies representing about 12,000 ships – both EU and non-EU – will have to purchase and surrender ETS allowances for each tonne of reported emissions. The system will be "route-based" and will cover emissions from all voyages within and between EU countries[4] as well as 50 % of the emissions from voyages starting or ending outside of the EU, leaving third countries to decide how to appropriately address the emissions from the other half of the voyage.

Balancing the need for quick action and the necessity to let stakeholders get used to the new system also presents a challenge. For a smooth transition, a phase-in period is proposed from 2023 to 2025, where regulated entities would only be obliged to surrender allowances for a portion of their reported emissions, gradually rising to 100 % by 2026. Penalties and other enforcement measures – including port access denials – are foreseen to ensure compliance with the new rules. To ease administration, each shipping company will be associated with an administering authority of an EU Member State.

The ETS extension to maritime transport will certainly be a game-changer to reduce GHG emissions from shipping, but it cannot do the trick alone. To address the various technological, economic and regulatory

2 Proposal for a Directive amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757 (**COM/2021/551 final**)
3 Regulation (EU) 2015/757
4 It will apply to European Economic Area (EEA) countries as well.

barriers that currently hinder the decarbonization of the sector, a range of different policy measures are proposed. Among these, the "FuelEU Maritime"[5] initiative is designed to boost demand for clean fuels by setting maximum limits – reduced every five years – on the GHG content of energy used by ships, and by encouraging zero-emissions technologies at berth. With regard to fuel distribution, the proposed "Regulation on Alternative Fuels Infrastructure (AFIR)"[6] will set, among other things, mandatory targets for shore-side electricity at main ports. On the supply side, the revision of the "Renewable Energy Directive (RED)"[7] should increase the current EU-level of 32 % of renewable energy sources in the overall energy mix to at least 40 % by 2030, with a special focus on the transport sector. This basket of measures should greatly help the uptake of renewable and low-carbon fuels and breakthrough technologies.

Finally, action at the international level is also crucial to fully embrace a green and global transition in maritime shipping. The Commission is fully committed to continue supporting ambitious progress under the framework of the IMO, especially as mid- and long-term measures – including market-based mechanisms – come under discussion.

From every angle and at all levels, in the maritime sector and all others, the EU is firmly committed to decarbonizing its economy with efficiency, ambition, and overall coherence. The year 2022 will certainly be decisive in that respect.

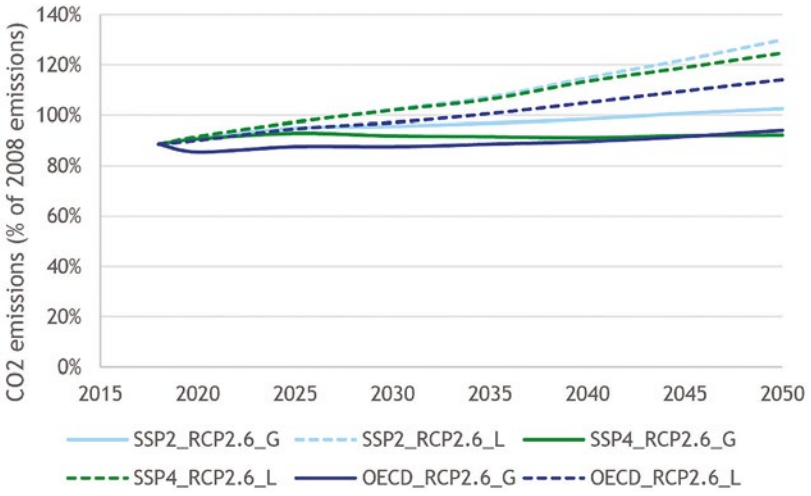


Figure 3 – Projections of maritime ship emissions as a percentage of 2008 emissions
Source: **Fourth IMO GHG Study 2020**

5 Proposal for a Regulation on the use of renewable and low-carbon fuels in maritime transport and amending Directive 2009/16/EC (**COM/2021/562 final**)
6 Proposal for a Regulation on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU of the European Parliament and of the Council (**COM/2021/559 final**)
7 Proposal for a Directive amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652 (**COM/2021/557 final**)

Carbon dioxide removals in reaching net zero

The role of carbon markets

Luca Lo Re, Sara Budinis, and Tom Howes
International Energy Agency (IEA)

2021 saw considerable momentum behind increased climate ambition, but there remains a large gap between announced targets and implemented actions.

In the last few years, many countries have put forward new or updated medium-term targets, including 140 NDCs, and long-term targets, such as the 59 net-zero emission targets and 47 long-term low-emissions development strategies (LT-LEDS). The ambition level of these goals was unimaginable even a few years ago. If met in full and on time, recent IEA analysis suggests these climate pledges could hold the rise in global temperature to 1.8 °C by 2100.[1] Setting an ambitious goal is a necessary starting point but devising workable strategies and implementing effective policies is more important. Many countries are now turning to the task of translating their net-zero targets into near-term policies and plans, including by assessing the role of emission removals and the use of markets.[2]

Emission removals will play a critical role in reaching global net-zero emissions.

All of the IEA scenarios that limit global warming to 1.5 °C include the use of carbon dioxide removal (CDR) approaches.[3] CDR refers to capturing CO_2 from the atmosphere, and permanently storing it. The balance between emission reductions and removals, and the level of reliance on CDR, varies by scenario. Nevertheless, removals are not an alternative to deep mitigation, but a means of achieving net-zero emissions. A portfolio of CDR approaches will also likely be needed, which can encompass the following:

a. **Technology-based CDR options** include direct air carbon capture and storage (DACCS), and bioenergy with carbon capture and storage (BECCS), which involves the capture and permanent storage of CO_2 from processes where biomass is converted to energy.
b. **Nature-based solutions** depend on ecosystems to capture carbon, and typically include afforestation and reforestation (i.e., repurposing land-use by growing forests), and other forms of ecosystem restoration such as the enhancement of wetlands and soils.
c. **Approaches involving enhanced natural processes** include enhanced weathering (artificially accelerating the natural process whereby acid rain dissolves minerals that then react with CO_2 to form carbonates), land-based approaches (such as biochar), and ocean-based approaches (such as ocean fertilization or alkalinization).

Nature-based solutions are considerably less expensive today but more prone to the risk of non-permanence of stored emissions; their vulnerability to fires, pests, diseases, and forestry policy changes could lead to reversals of CO_2 stored. Furthermore, their dependence on land can create complex challenges at scale, with carbon storage potentially conflicting with food production, biodiversity, and local development objectives. Technology-based CDR options are currently costly but could bypass many of these challenges, potentially retaining CO_2 for centuries in appropriately selected and managed geological storage sites.[4] However, the enhanced weathering and ocean-based approaches here mentioned require further research to understand their potential for carbon removals as well as their costs, risks, and trade-offs.

A rapid scale-up of technology-based CDR approaches is needed to reach global net-zero by 2050.

Although the IEA Net Zero by 2050 Roadmap[5] deploys a limited amount of technology-based CDR compared to IPCC 1.5 scenarios[6], this entails a significant scale-up of BECCS and DACCS relative to today, reaching 1.9 $GtCO_2$ in 2050 (see Figures 1 and 2). Currently, around 2.5 $MtCO_2$ is captured annually from the 13 BECC plants (for CO_2 use and storage) and 19 DAC plants in operation globally. Achieving the level of deployment in the Net Zero Scenario will require further large-scale demonstrations to refine technologies, reduce capture costs, and better understand the scale and removal potential of these approaches.

Resources constraints and social acceptance, including of geological CO_2 storage, could limit the scale-up of technology-based CDR approaches[7]. Addressing

1 https://www.iea.org/commentaries/cop26-climate-pledges-could-help-limit-global-warming-to-1-8-c-but-implementing-them-will-be-the-key
2 https://www.oecd-ilibrary.org/environment/understanding-countries-net-zero-emissions-targets_8d25a20c-en
3 Ibid, and https://www.iea.org/reports/net-zero-by-2050
4 Ibid
5 Ibid. Note: the IEA Global Energy Sector Roadmap to Net Zero by 2050 only covers the energy sector and only relies on technology-based carbon removals.
6 https://www.iea.org/commentaries/a-closer-look-at-the-modelling-behind-our-global-roadmap-to-net-zero-emissions-by-2050
7 https://icapcarbonaction.com/en/net-zero-and-ets-paper

high upfront investment costs (for BECCS) and energy needs (for DACCS) would require new business models and policy support to allow large scale deployment for certain regions, while any potential environmental impacts of CDR approaches would need to be carefully managed. Moreover, carbon accounting frameworks for CDR will need to consider potential CO_2 storage reversal. Relying on geological CO_2 storage provides high confidence in both the permanence of the storage and quantification of CO_2 removed.

With new certification and methodologies, carbon markets could support the scale up of technology-based CDR approaches.

Allowing the use of emission removal units in domestic and international carbon markets could generate financial flows and create demand for carbon removal services, spurring investment in CDR.[8] In domestic markets, experience with removals is so far limited to nature-based solutions, most typically forest-based offsets generated under strict methodologies.[9] This is the case in existing markets, such as China's GHG voluntary emission reduction program[10], California's compliance offsets program[11], and New Zealand's unique coverage of the forestry sector under the country's ETS[12].

The inclusion of technology-based CDR approaches and removal units in domestic carbon markets is not trivial – it is both untested and faces considerable economic, legal and policy design challenges. These include how technology-based CDRs can be integrated into an ETS, how they relate to an ETS cap, to the allocation of free allowances, to a possible carbon border adjustment, and how to import or export CDR credits in linked ETS are all areas that require further research.[13] For instance, currently the EU ETS considers the combustion of biomass to be "carbon neutral"[14]; as such, there is no incentive or recognition for the emitted CO_2 to be stored through BECCS. Moreover, as a recent ICAP paper has shown[15], in the context of net zero, ETS caps might fall to zero emissions or even become negative, which would entail an obligation for

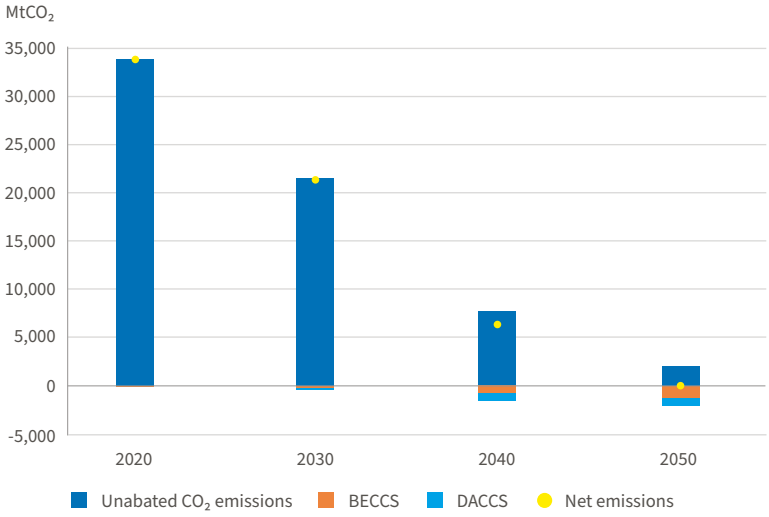


Figure 1: World energy-related CO_2 emissions and removal across the energy system in the IEA Net-Zero Emissions by 2050 Scenario, 2020–2050.

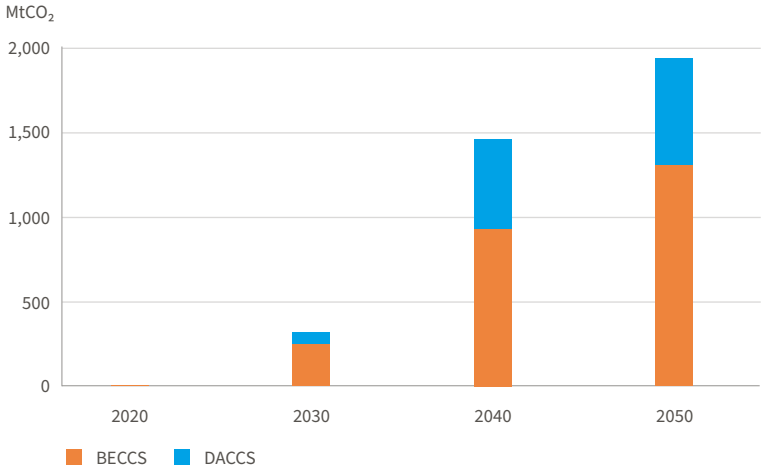


Figure 2: Technology-based removals across the energy system in the IEA Net-Zero Emissions by 2050 Scenario, 2020–2050

8 Ibid
9 https://icapcarbonaction.com/en/net-zero-and-ets-paper
10 https://www.edf.org/climate/status-chinas-voluntary-carbon-market
11 https://ww2.arb.ca.gov/our-work/programs/compliance-offset-program
12 https://www.mpi.govt.nz/forestry/forestry-in-the-emissions-trading-scheme/
13 https://www.frontiersin.org/articles/10.3389/fclim.2021.690023/full
14 https://www.emissions-euets.com/carbon-market-glossary/976-biomass
15 https://icapcarbonaction.com/en/net-zero-and-ets-paper

covered entities to purchase and surrender removal units. The implications of this in terms of carbon leakage and competitiveness concerns would require further exploration.[16]

The experience in crediting technology-based CDR approaches in international carbon markets, including through Article 6 of the Paris Agreement, is still limited and new crediting methodologies are needed. For example, IPCC emissions reporting guidelines for national inventories cover BECCS but not yet DAC.[17] The crediting from DAC could benefit from simplified baseline methodologies since the MRV of removed emissions is more straightforward and transparent compared to the methodologies for projects using counterfactual baselines.

Carbon markets could provide incentives, but additional policies are needed to scale up technology-based CDR approaches.

While some recent developments, such as the EU proposal on carbon removal certification[18], are a good first step towards possible voluntary markets for CDR credits, carbon markets alone are likely not sufficient to provide the incentives needed to bring CDR approaches at scale. Markets need to be complemented by other forms of policy support, especially if the long-term carbon price signal is unclear. This support could be framework policies and targeted support that aims to: (i) foster innovation; (ii) push early deployment; and (iii) co-operate internationally. Some recently launched initiatives aim at addressing these issues, including Mission Innovation's "CDR Mission"[19], the US "Carbon Negative Shot"[20] and support for DAC hubs in the US.[21]

16 Ibid
17 https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/
18 https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-carbon-removal-certification
19 http://mission-innovation.net/wp-content/uploads/2021/11/Joint-Mission-Statement.pdf
20 https://www.energy.gov/articles/secretary-granholm-launches-carbon-negative-earthshots-remove-gigatons-carbon-pollution
21 https://www.iea.org/reports/direct-air-capture

The Carbon Pricing in the Americas Platform

Finding a path to mitigation across continents

By the Co-chairs:
Juan Pedro Searle,
Chile
Jean-Yves Benoit,
Québec

With 2021 ending on a high note for the Carbon Pricing in the Americas (CPA) platform, we, the co-chairs, are very excited to enter 2022 with a clear signal that interest in carbon pricing is alive and strong in the Americas. This signal is coming from a good mix of national and sub-national governments located in all regions of our continent; this diversity in our membership has indeed been recognized as one of our strengths. We are confident that the appeal of the CPA can encourage more governments to join our ranks in the future, and we hope to expand our network this year.

The mission of the CPA platform remains the same: to foster a dialogue and share information, experiences, expertise, and best practices among governments that have already put a price on carbon, are in the processing of implementing one, or are exploring the possibility of doing so. We encourage the convergence of carbon pricing policies that are both cost-effective and efficient, in terms of design and GHG emission reductions.

A NEW CPA DECLARATION IN 2021

Since the unveiling of the first CPA Declaration in Paris in December 2017, the CPA platform has undertaken a range of tasks in pursuit of our mission. Our efforts are driven by our members and partners, so an important step was to understand their diverse views and interests on carbon pricing. To this end, we have organized webinars and polled our members and partners to better understand their needs and priorities with regards to the development and implementation of carbon pricing instruments.

Our members have expressed interest in a broad range of topics in the realm of carbon pricing, ranging from the choice of the best carbon pricing instrument to policy design and infrastructure, approaches to implementation and operation, revenue use and distributional impacts, MRV, benchmarking and linking of carbon pricing instruments, stakeholder consultation and acceptability, as well as competitiveness and carbon leakage issues.

It is our common view that more work needs to be done to promote and support carbon pricing and markets in the Americas, to stimulate the alignment of carbon pricing systems and maximize climate action, while ensuring real progress on reducing emissions. As the CPA platform offers a space where governments of the Americas can showcase what they are doing while receiving feedback from their peers, and where members and partners can build relations based on converging interests, we believe it can play a significant role in that endeavour.

In 2021, CPA members and partners agreed that it would be pertinent to update the 2017 Declaration to reflect the changes that the world was experiencing, from the overall rise in climate ambition to the COVID-19 pandemic and its trail of green recovery packages. We also recognized that a fresh declaration would present a good opportunity to reach out to potential new members in the Americas.

With this background, the CPA platform convened a side event at the IETA Business Hub during COP 26 to unveil the “Glasgow Declaration on Carbon Pricing in the Americas”. It was a great success, and we were very pleased to welcome the following new members: Dominican Republic, Jalisco, Panama, Paraguay, Querétaro, and Yucatán. We should mention that this list is in no way closed — we invite interested governments to endorse the Declaration and join our ranks as members of the platform.

The Glasgow Declaration asserts, among other things, our collective intentions to strive towards carbon neutrality by 2050 or before, to facilitate a just transition, and to emphasize the importance of voluntary international cooperation in carbon markets, including through Article 6 of the Paris Agreement. The endorsers also declare their commitment to pursue the implementation of carbon pricing as a central policy instrument for climate action, including in public investment decisions and as a key component of a green recovery from the COVID-19 pandemic, and to regularly raise the carbon price to better reflect the social cost of carbon. They further commit to continuing their regional cooperation efforts under the CPA with a view to aligning carbon instruments.

LOOKING AHEAD AT 2022 AND BEYOND

As co-chairs of the CPA, we also believe it would be useful to examine potential synergies and opportunities for coordination with other carbon pricing initiatives and forums that are active in the Americas. There is great potential to harness the pool of knowledge and capacities already available, encourage further networking, enable information sharing, and avoid duplication. Gathering these forces could enhance efficiency to fight climate change in the Americas and we are committed to exploring that avenue along with our members and partners.

Juan Pedro Searle

We are hopeful that there is enough commitment in the Americas to rise to the challenge of fighting climate change – and that there is enough vision in this part of the world to use the right tools to do so successfully. Carbon pricing instruments are among the tools that have proven to be efficient in reducing GHG emissions. It is important that ever more governments learn about them, choose the right one for their circumstances, and stay on the lookout for the chance to align these policies across the Americas so that, together, we may all adopt a successful comprehensive approach to fighting climate change.

Jean-Yves Benoit

The Carbon Pricing in the America's platform was born after the launch of the "Paris Declaration on Carbon Pricing in the Americas" in 2017. By endorsing the Glasgow Declaration four years later, member governments of the CPA platform reaffirmed their support of the Paris Agreement and advocated for the scaling up of the climate action in the Americas, notably by highlighting the importance of carbon pricing mechanisms as effective instruments to reduce GHG emissions and committed to work towards the alignment of carbon pricing policies in the region. The endorsers also acknowledge that the alignment of these policies across the Americas can provide a variety of co-benefits, including more efficient emission reductions, improved market liquidity, and reduced competitiveness concerns.

The current endorsers of the Glasgow Declaration on Carbon Pricing in the Americas and members of the CPA platform are: British Columbia, California Air Resources Board on behalf of the State of California, Canada, Chile, Dominican Republic, Jalisco, Nova Scotia, Panama, Paraguay, Québec, Sonora, and Yucatan.

The CPA platform can also count on the support of the following partner organizations: Carbon Trust, Center for Clean Air Policy, Conservation International, ECLAC, EDF, ICAP, IETA, UNEP, the World Bank, and the UNFCCC secretariat.

Charting the course to carbon neutrality for all Californians

Rachel Gold,
California Air Resource Board

In recent years, smoke from the most destructive wildfires on record has cloaked California. Families in the fire zones have hastily evacuated and schools faced closures as teachers and children struggled to breathe in and outside of their classrooms. Downwind of these wildfires and in search of clean air, some have headed to safer areas, aware that others lacked the resources to do the same. California's horrifying fire season in 2017, with 47 deaths and 1.5 million acres burned across the state,[1] is now a moderate year compared to the devasting wildfires, extreme drought, and flooding that are the new normal. Climate change-fueled natural disasters are exacerbating existing disparities in our communities, where families without the means to adapt bear even greater health and economic burdens.

It is in this context, with climate disasters disproportionally impacting communities heavily burdened by pollution from multiple sources and most vulnerable to its effects, that California has set a goal for statewide carbon neutrality by 2045 — a goal in line with what science says is needed to limit global warming to 1.5 °C. Meeting this goal requires transformational change. It entails driving down emissions from all sources in our GHG inventory, drastically reducing or eliminating fossil fuels burned, and converting our natural and working lands from a source of emissions to a sink. In guiding this change, California continues to focus on designing its portfolio of climate change programs to advance equity and environmental justice.

California met its 2020 GHG reduction target[2] four years early. Now, through its Scoping Plan Update process, the California Air Resources Board (CARB) is assessing progress on achieving the faster and deeper reductions needed to meet our 2030 target[3] as we lay out the path to carbon neutrality in 2045. The update occurs every five years,[4] and this current 2022 Scoping Plan Update[5] is focused on identifying both the endpoints for our transition to carbon neutrality and the near-term actions necessary to bring air quality benefits to the most burdened communities, while also providing long-term GHG reductions.

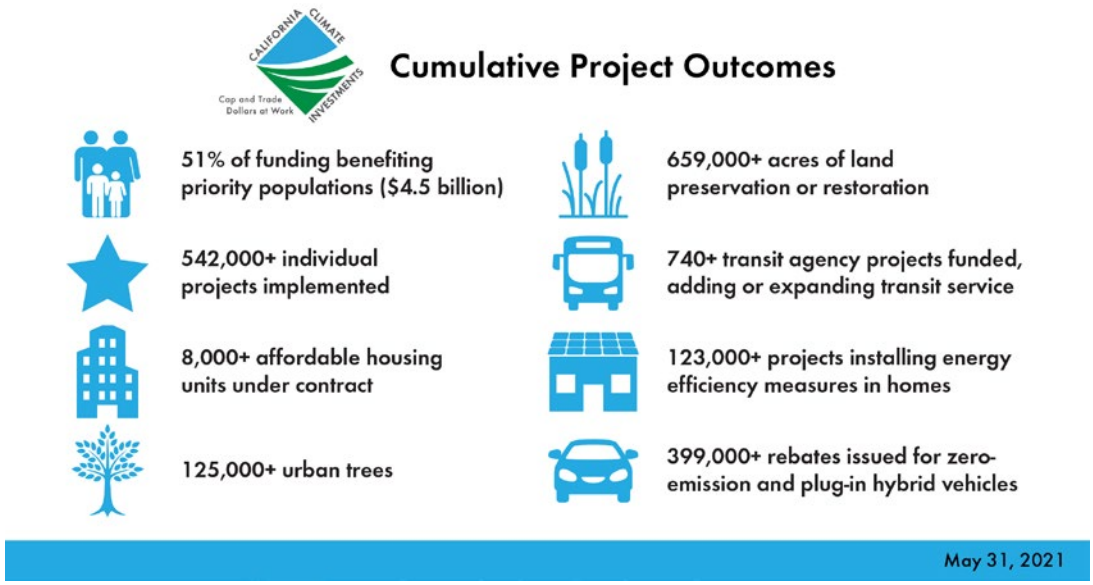
Central among California's suite of climate policies is the Cap-and-Trade Program. To date, by design, California's ETS has tackled the least-cost emissions reductions first. By doing so, we are establishing clear long-term investment signals, allowing time to incorporate technological advances, and reinvesting billions of dollars in auction proceeds to further GHG reductions throughout the state, with a focus on supporting disadvantaged communities. This approach has laid the groundwork for the more difficult reductions ahead. In line with this challenge, CARB has already doubled the stringency of the cap from the 2013–2020 period into this new decade, increasing the rate of cap decline from 2 % to approximately 4 % per year.

Critical to California's approach are design features in the ETS and complementary measures that provide support for heavily burdened communities.

Critical to California's approach are design features in the ETS and complementary measures that provide support for heavily burdened communities. A central strategy is reinvesting state-owned ETS auction proceeds to benefit these communities while simultaneously reducing GHGs. The California Legislature determines the appropriation of state-owned auction proceeds pursuant to statutory requirements that investments achieve emissions reductions and be directed towards the most disadvantaged communities, alongside certain continuous appropriations, and annual budget priorities.[6]

Thus far, California's ETS auctions have generated over USD 18 billion,[7] the majority of which is being directed to individuals and communities most in need of assistance. This emphasis on investing in burdened communities is essential as we strive to ensure our climate

1 **Cal Fire 2017 Incident Archive**
2 Return to California's 1990 level of GHG emissions.
3 For a 40 % reduction in emissions compared with 1990 levels by 2030.
4 As per Assembly Bill 32.
5 See **AB 32 Climate Change Scoping Plan | California Air Resources Board** for more information.
6 See **About California Climate Investments** for more information.
7 **Summary of Auction Proceeds to California and Consigning Entities**



policies support a just transition. These funds are being used to help individuals and local governments purchase zero-emission vehicles, increase access to affordable and energy-efficient housing, assist farmers with purchasing cleaner equipment, and increase alternative mobility options, among other actions.[8]

Another example of reinvesting auction proceeds is the Transformative Climate Communities program, which empowers communities with high levels of poverty and pollution to set their own goals and develop strategies to address air pollution and reduce GHGs in their neighborhoods. So far, this program has resulted in the development of sustainable affordable housing, local renewable energy, increased transit services, urban greening, bicycle sharing programs, and other local initiatives.[9]

California has also implemented a unique approach to protecting consumers from the energy cost increases associated with its ETS. Allowances are freely allocated to electric and natural gas utilities, which then must sell a portion of the allowances at auctions and return the proceeds to consumers through flat, lump-sum credits on electricity and natural gas bills. While the increased energy costs incentivize conservation and efficiency, the flat credits provide relief from the cost increases. This approach is also an important mechanism to ensure the protection of lower-income consumers from cost increases. The flat credits are paired with public messaging encouraging residents to reduce energy usage and are complemented by California's robust energy efficiency programs. Through 2020, California residents have received nearly USD 6 billion in credits since the beginning of the program, easing their financial burden associated with achieving our climate goals.[10]

California's ETS works in concert with a range of complementary measures that protect communities from exposure to air pollution and support the transition to carbon neutrality, including the direct regulation of stationary sources by local air districts[11], emissions standards for vehicles, incentives for electric vehicles, and the Community Air Protection Program. Established in 2017, the Community Air Protection Program develops community-focused actions to reduce air pollution and improve public health in the most impacted communities.[12] Through this program, CARB partners with local communities to identify pollutant

8 See **California Climate Investments**
9 More information is available at: **California Strategic Growth Council, Transformative Climate Communities**.
10 See summaries for **Electrical Distribution Utility and Natural Gas Supplier Use of Allocated Allowance Value** at:
11 Local air districts are government bodies responsible for regional air quality planning, monitoring, and stationary source and facility permitting. California has 35 local air districts.
12 **Community Air Protection Program**

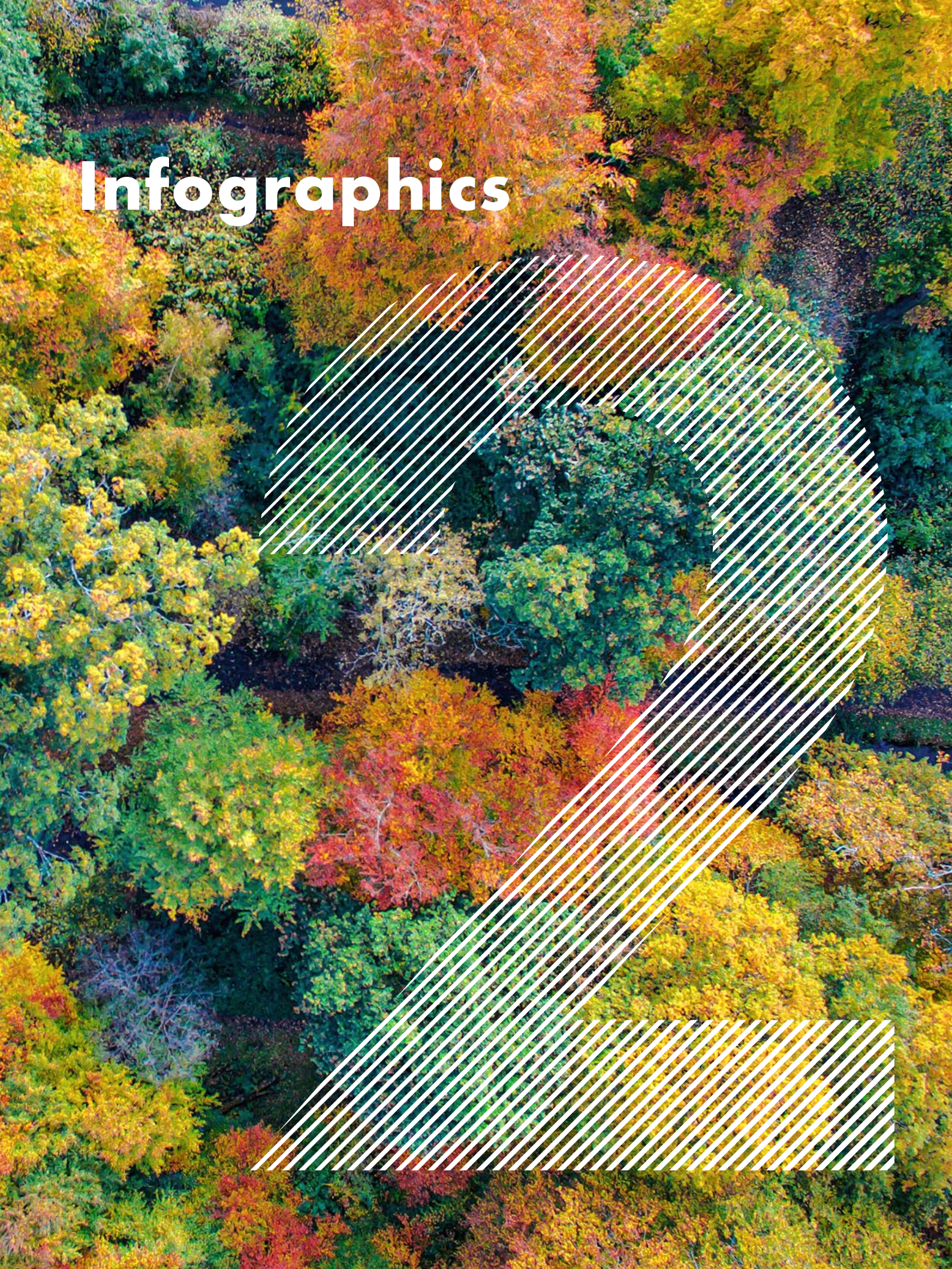
sources of concern and develop strategies to reduce exposure or address the underlying causes of pollution. Each year, this program expands to additional communities throughout the state, applying lessons learned from its community-centered approach.

As we assess California's suite of climate programs through the 2022 Scoping Plan Update, it is of central importance to ensure that these programs continue to protect public health and support opportunities in heavily burdened communities. Our priority is to minimize fossil fuel combustion, which is the primary driver of both climate change and public health problems related to poor air quality. For many applications, alternatives to fossil fuel combustion already exist, and the Scoping Plan Update process is the platform for all Californians to publicly discuss where, when, and how the change to alternatives should happen.

To develop policies that are effective, inclusive, and equitable, it is vital we engage with a diverse set of stakeholders. While California has a robust and extensive public consultation process, we recognized the need to do more to engage with communities that face high barriers to engagement in these processes. Fully incorporating inclusivity and equity into climate change policy design has required us to develop new levels of engagement and coordination with communities, local government, academics, industry, and other agencies. CARB recently expanded its leadership focus on these issues with an executive-level officer for environmental justice, who is dedicated to incorporating environmental justice into policies and building meaningful relationships with community organizations and leaders.

Climate change has already changed California, from the basic need to evacuate due to wildfires to the extreme droughts that are leaving some communities without water. These changes contribute to the urgency of our collective work to tackle the more difficult GHG reductions ahead and support climate adaptation in a manner that is equitable, effective, and supports resilience in our communities.

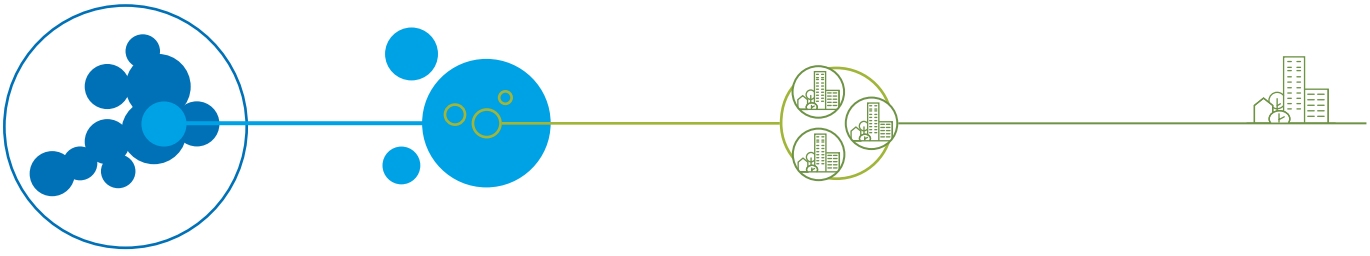
To develop policies that are effective, inclusive, and equitable, it is vital we engage with a diverse set of stakeholders.


Infographics

From Supranational to Local

Emissions trading systems operate at every level of government

This infographic demonstrates the diversity and complexity that exists with respect to the level of government at which emissions trading can be implemented. At one end of the spectrum, the EU ETS operates supranationally in all EU Member States plus Iceland, Liechtenstein, and Norway. At the other end, city-level ETSs are in operation, for example, in Shenzhen and Tokyo. Multiple ETSs may be in force in countries like Germany, where some emissions are covered by the EU ETS and others by the German National ETS. Similarly, the China National ETS currently covers power sector emissions while other province- and city-level ETS pilots regulate emissions from a variety of sectors. In North America, many provincial or state-level ETSs exist, with some linked domestically or internationally. In the rest of ICAP Status Report 2022 you can find a wealth of information about these individual systems that are already in force as well as many others that are under development or consideration.



1 Supranational

EU Member States
+ Iceland
+ Liechtenstein
+ Norway

8 Countries

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

19 Provinces & States

California
Connecticut
Delaware
Fujian
Guangdong
Hubei
Maine
Maryland
Massachusetts
New Hampshire
New Jersey
New York
Nova Scotia
Oregon
Québec
Rhode Island
Saitama Prefecture
Vermont
Virginia

6 Cities

Beijing*
Chongqing*
Shanghai*
Shenzhen
Tianjin*
Tokyo

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

JURISDICTIONS MAKING UP 55 %
OF GLOBAL GDP ARE USING EMISSIONS TRADING

55%

1/3

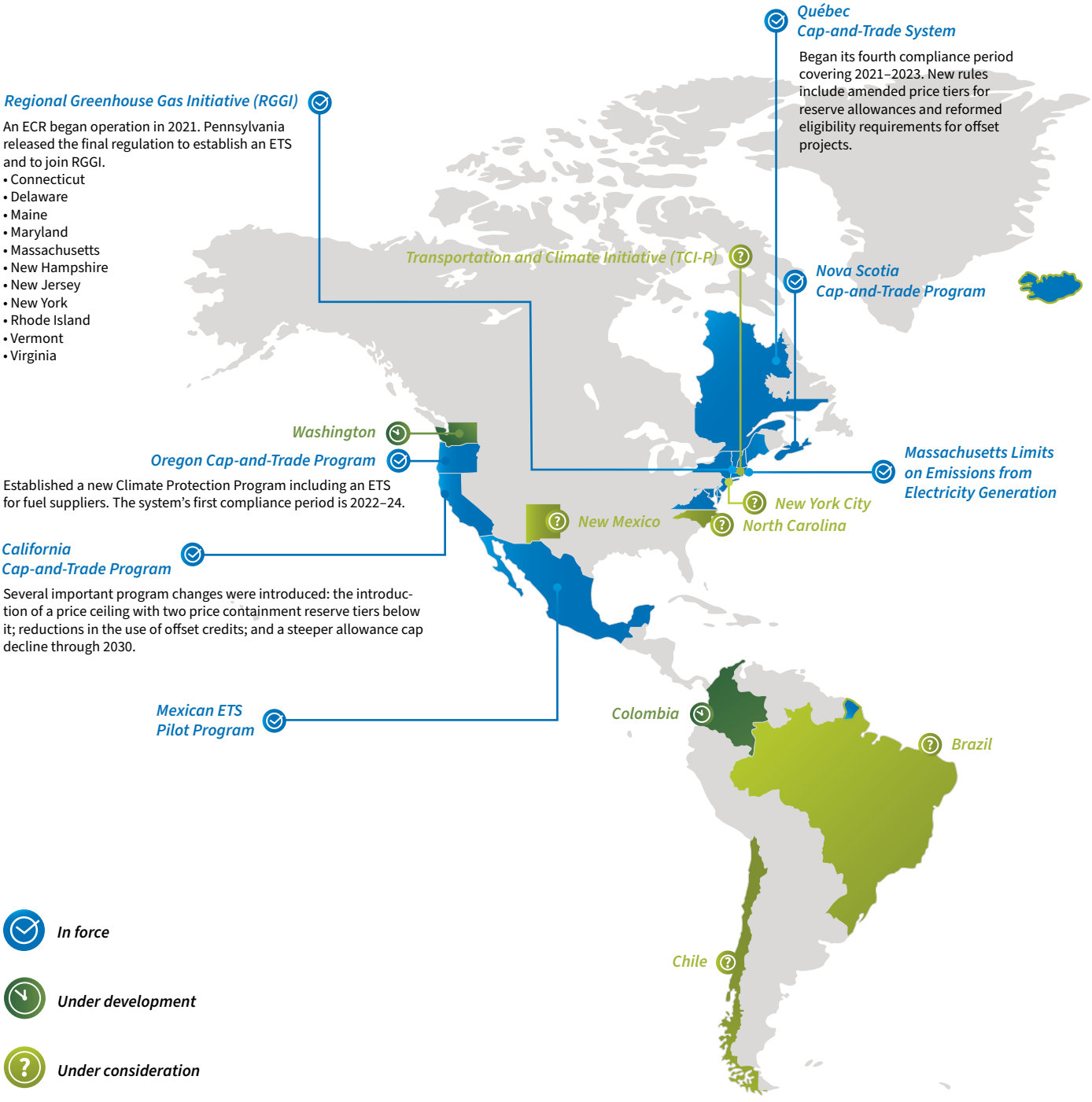
ALMOST 1/3 OF THE GLOBAL POPULATION LIVES
UNDER AN ETS IN FORCE

17%

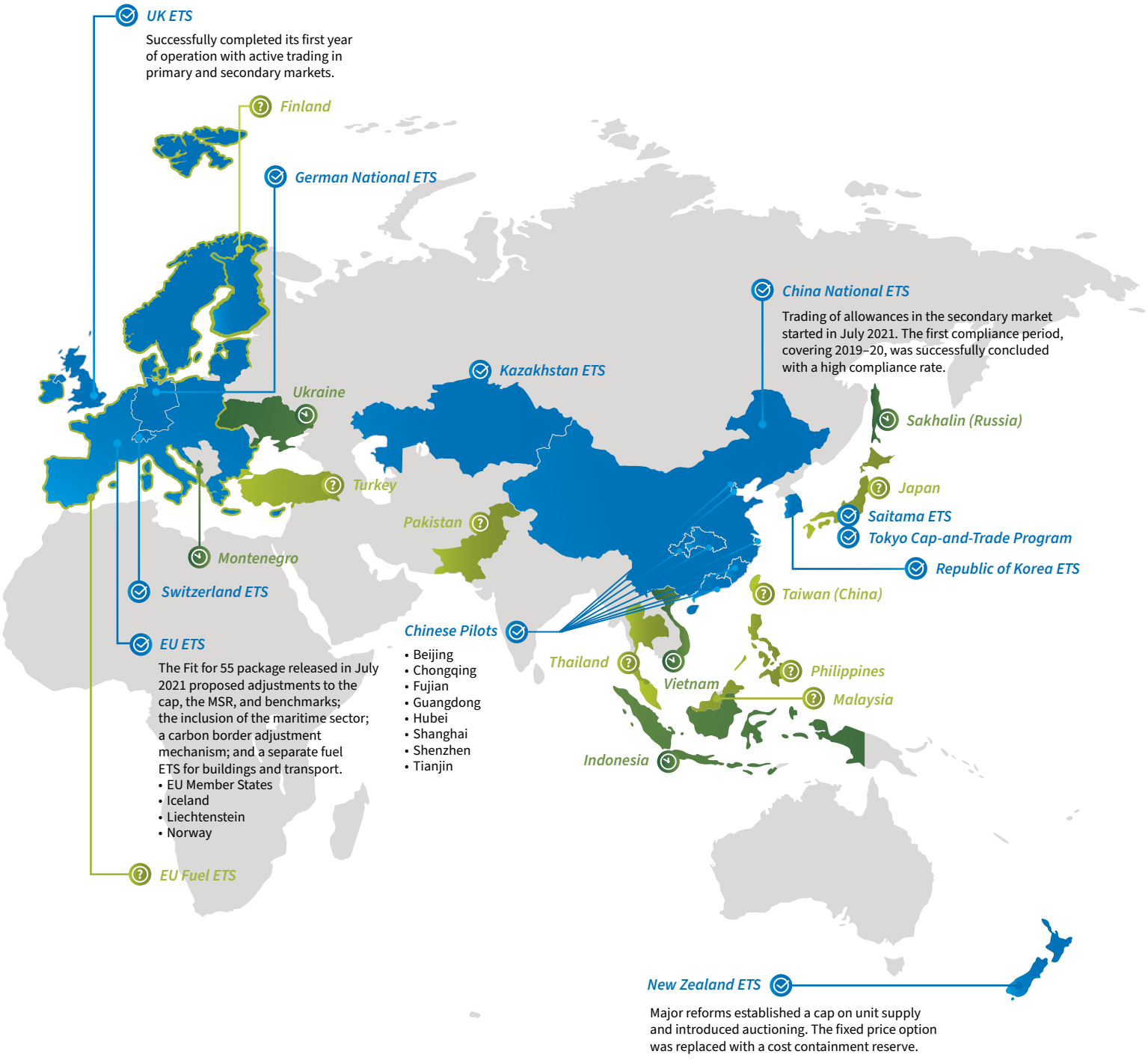
OF GLOBAL GHG EMISSIONS ARE COVERED BY AN ETS

Emissions Trading Worldwide

The state of play of cap-and-trade in 2022



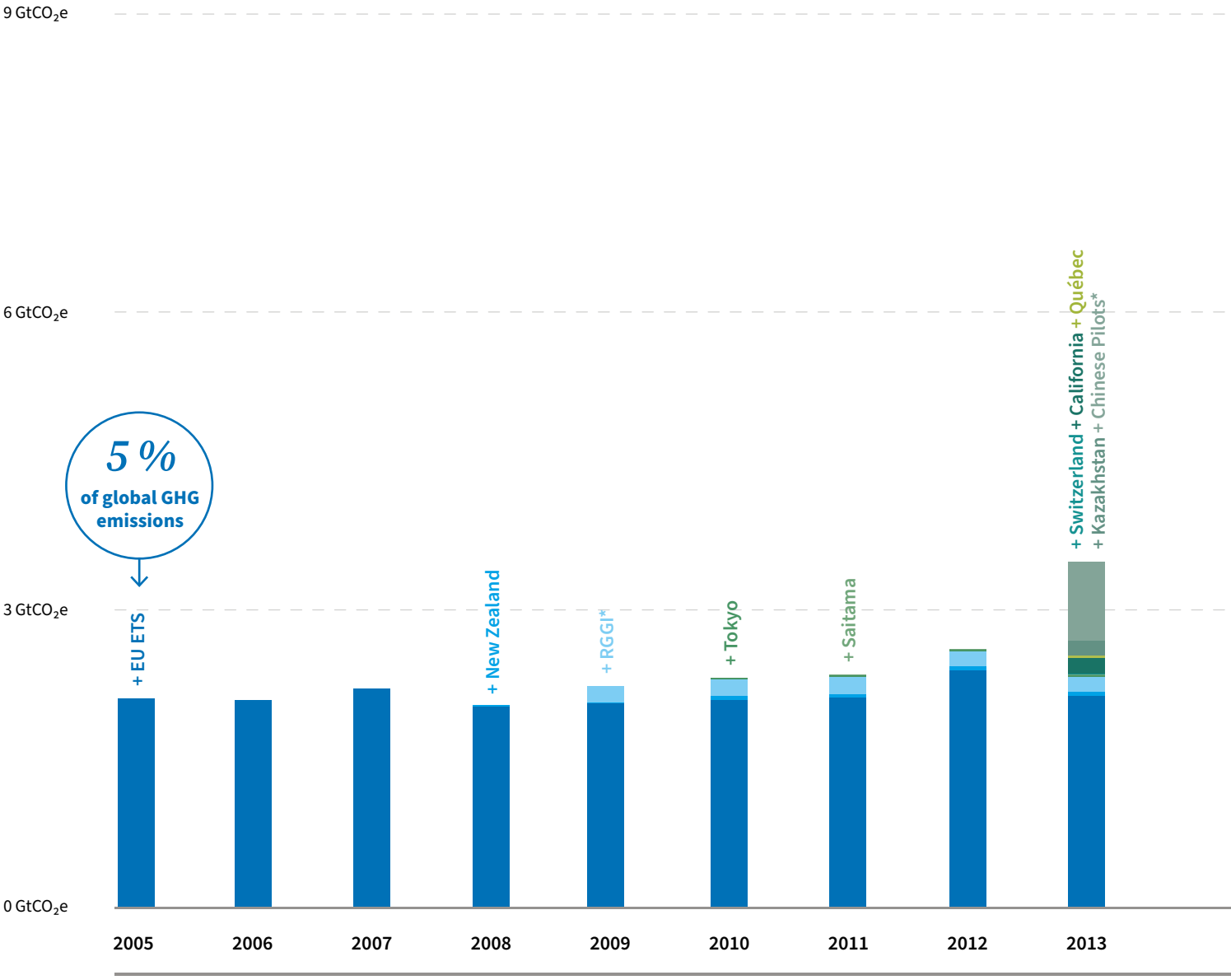
The ICAP ETS world map depicts emissions trading systems currently in force, under development or under consideration. As of January 2022, there are 25 ETSs in force. Another seven are under development and expected to be in operation in the next few years. These include ETSs in Colombia, Indonesia, and Vietnam. 15 jurisdictions including Brazil, Finland, and Japan are also considering the role an ETS can play in their climate change policy mix. If a jurisdiction has multiple systems in force, it is depicted in blue, with the borders of the jurisdiction representing the layered systems (e.g. Germany and Guangdong). If, however, the jurisdiction has a system in force but is also considering an additional system, it is depicted in blue but also features a (light) green border (e.g. Finland). There is currently no jurisdiction with both an ETS in force and another system under development.



Global Expansion of ETS

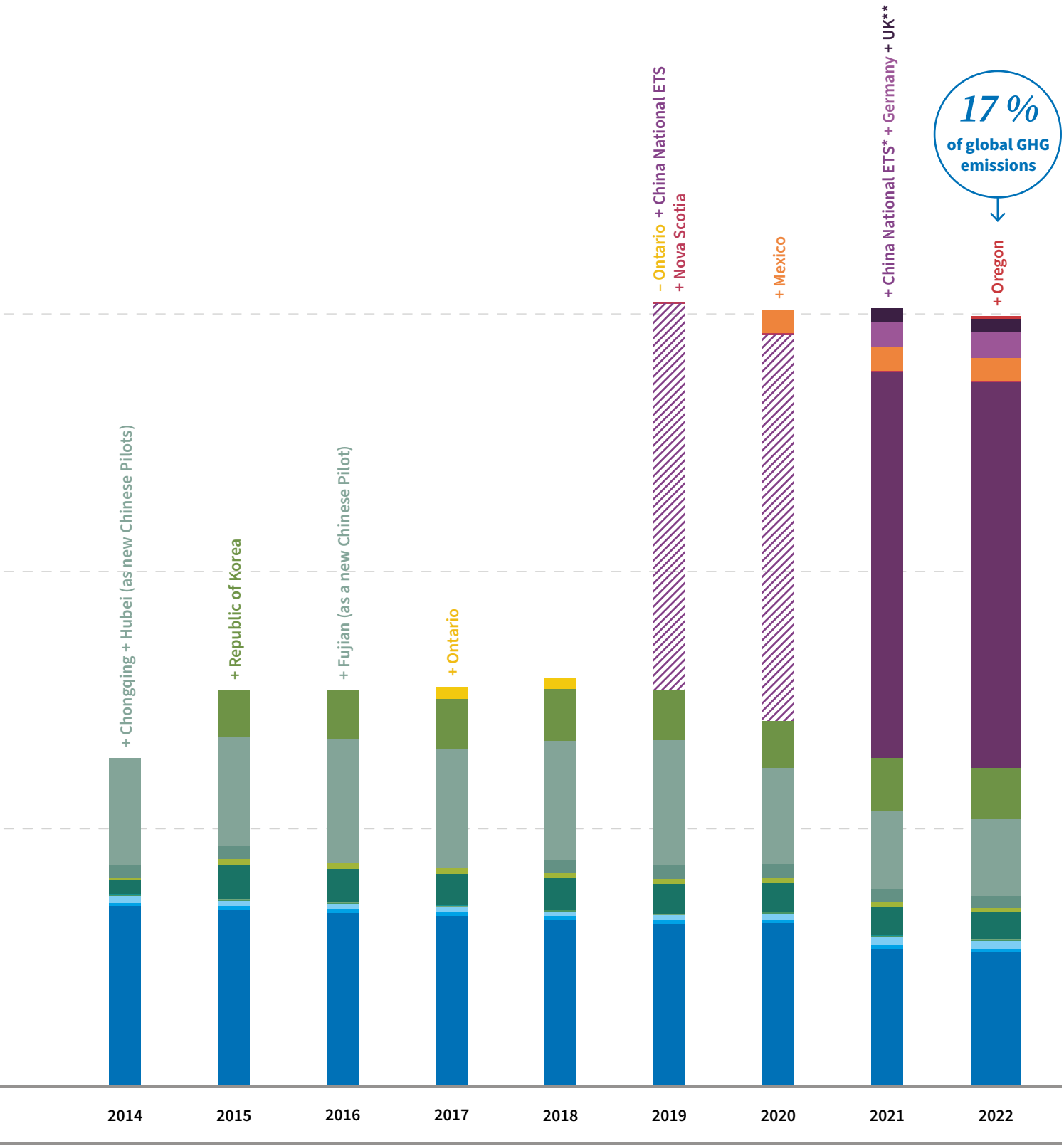
The share of global GHG emissions under an ETS tripled since 2005

The graphic depicts the worldwide growth of emissions trading over time. Systems are spreading around the world. With a new addition this year in Oregon, the share of global GHG emissions covered by emissions trading has reached 17 %, more than triple the amount when the EU ETS was launched 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



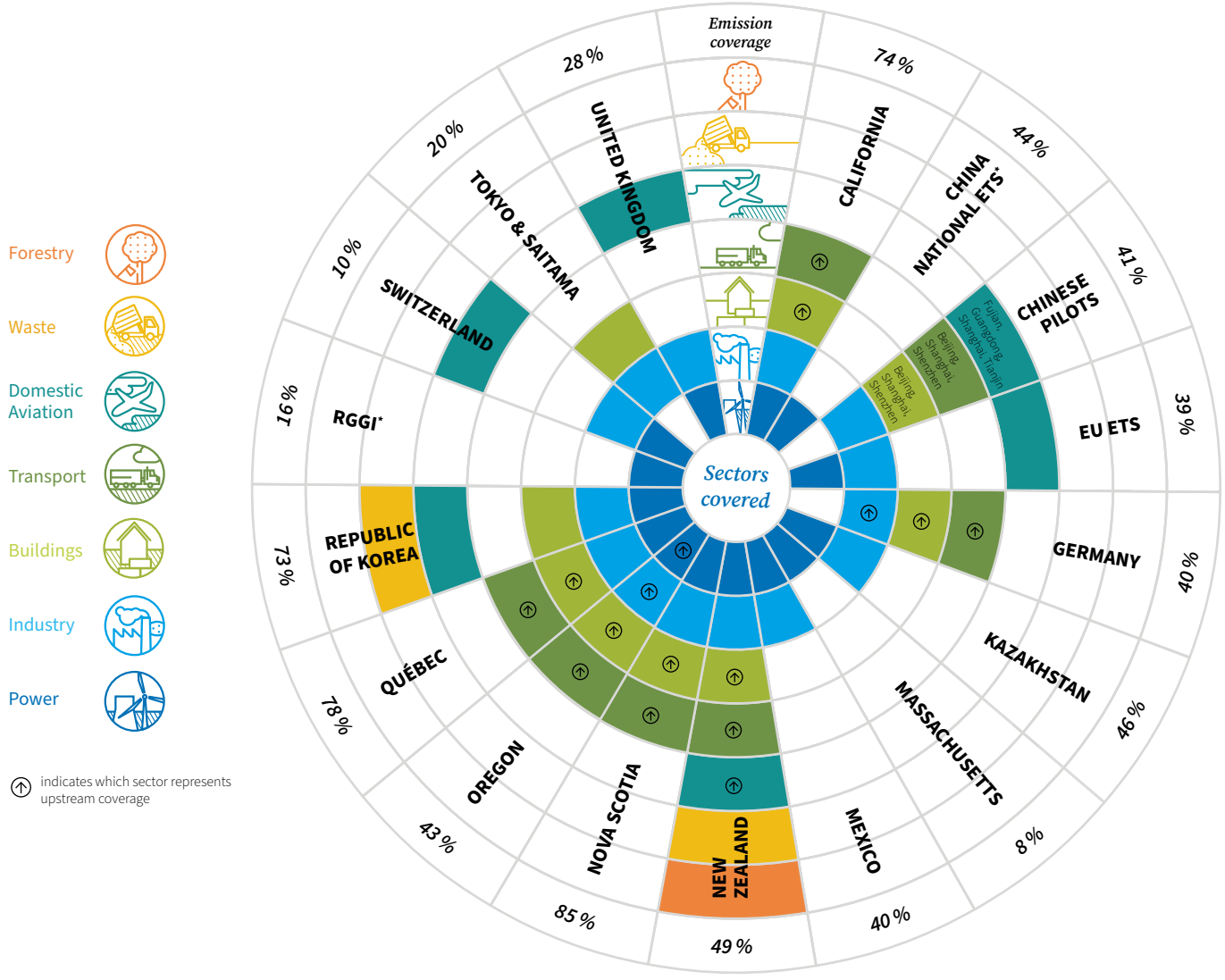
* The Chinese National ETS came into force in 2021 but has retroactive compliance obligations in 2019 and 2020, indicated above by the striped bar

** In 2021, the UK launched its own ETS which required an adjustment in the EU ETS cap.

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 alphabetically, with the numbers in the outermost ring indicating the share of aggregate emissions covered by the system. Upstream coverage in a sector is indicated with an arrow. 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. Note in particular that the coverage figures in the ETSs in China and for RGGI reflect CO_2 emissions only. The graphic includes only sectors which are covered by at least one ETS. See "Notes on Methods and Sources" for further details.

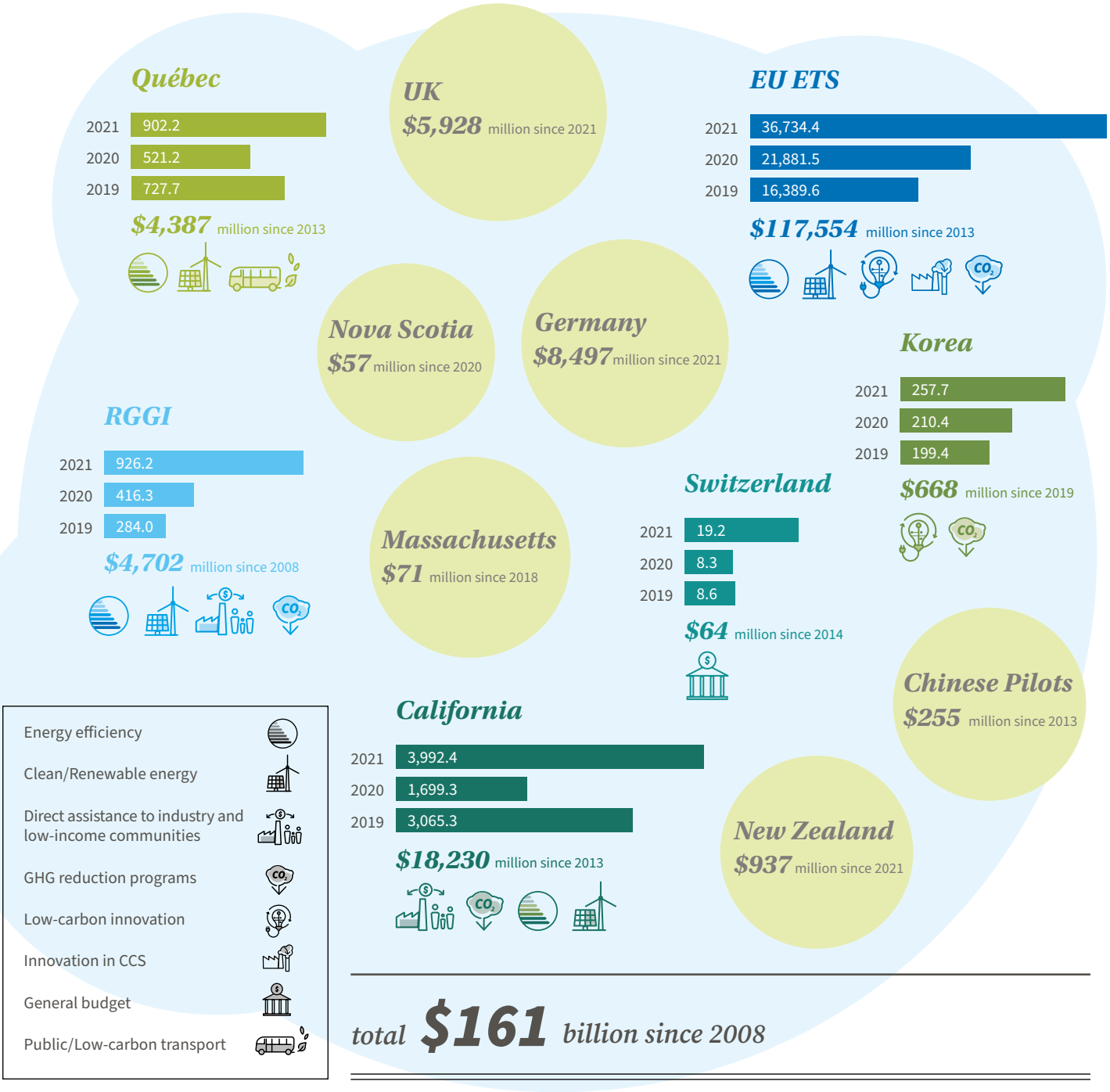


* Coverage numbers reflects CO_2 emissions only

Auctioning 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 clean 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 allowance prices. By the end of 2021, systems worldwide raised over USD 161 billion cumulatively. See "Notes on Methods and Sources" for further details.



Different Shapes of ETS

A comparative look at key metrics in selected systems

The axes on each graph correspond to a specific metric. **Coverage** shows the share of the jurisdiction's GHG emissions covered under the ETS, except in China and RGGI where it represents CO_2 emissions only. **Allowance price** is the average auction settlement price, except in China where it is the average secondary market price. It is measured in USD per metric tonne of CO_2e and averaged over 2021. **Auction share**, expressed as a share of the cap, denotes the share of allowances that were auctioned and generated revenues for the jurisdiction's government. **Offset use** indicates the share of a compliance entity's obligations that can be met using approved offsets. To aid comparison, the axes share the same scale across graphs. See "Notes on Methods and Sources" for further details.

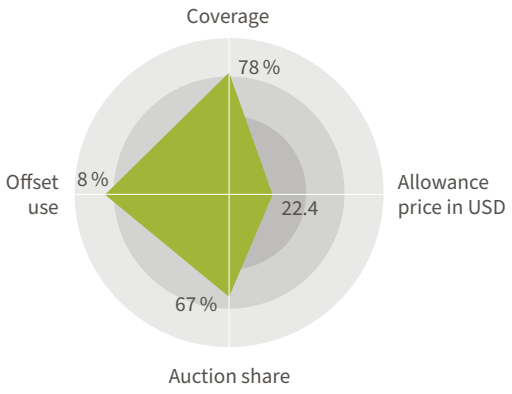
Coverage
Share of jurisdiction emissions covered by the ETS (0–100 %)

Allowance price
Average USD price over 2021 per tonne of CO_2e (USD 0–80)

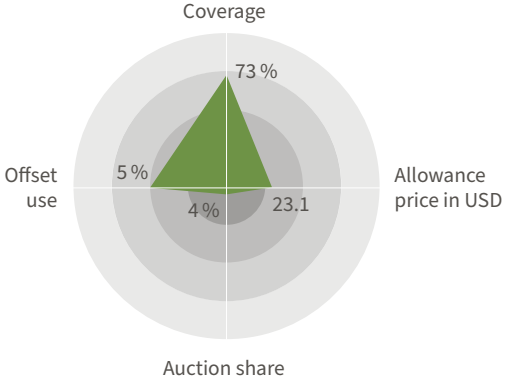
Auction share
Share of allowances not allocated for free (0–100 %)

Offset use
Share of compliance obligations which can be met using offsets (0–10 %)

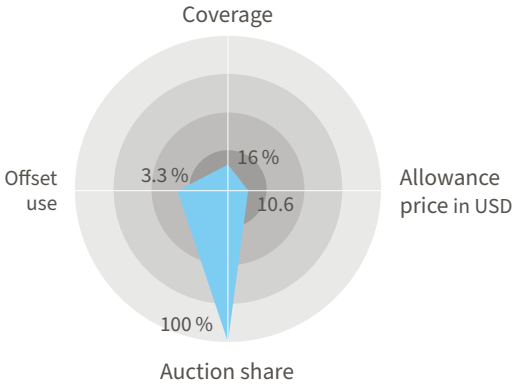
QUÉBEC



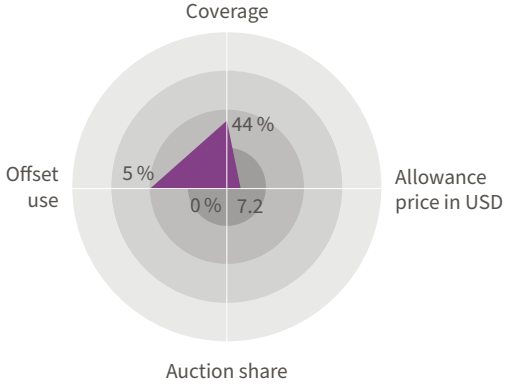
REPUBLIC OF KOREA



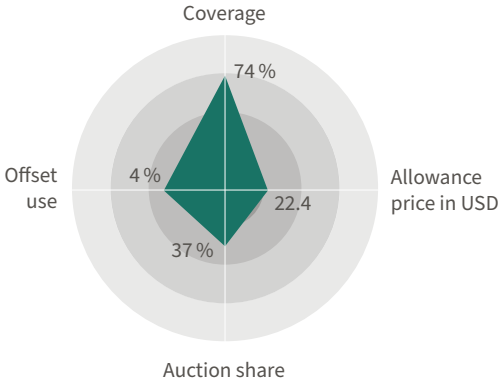
RGGI



CHINA



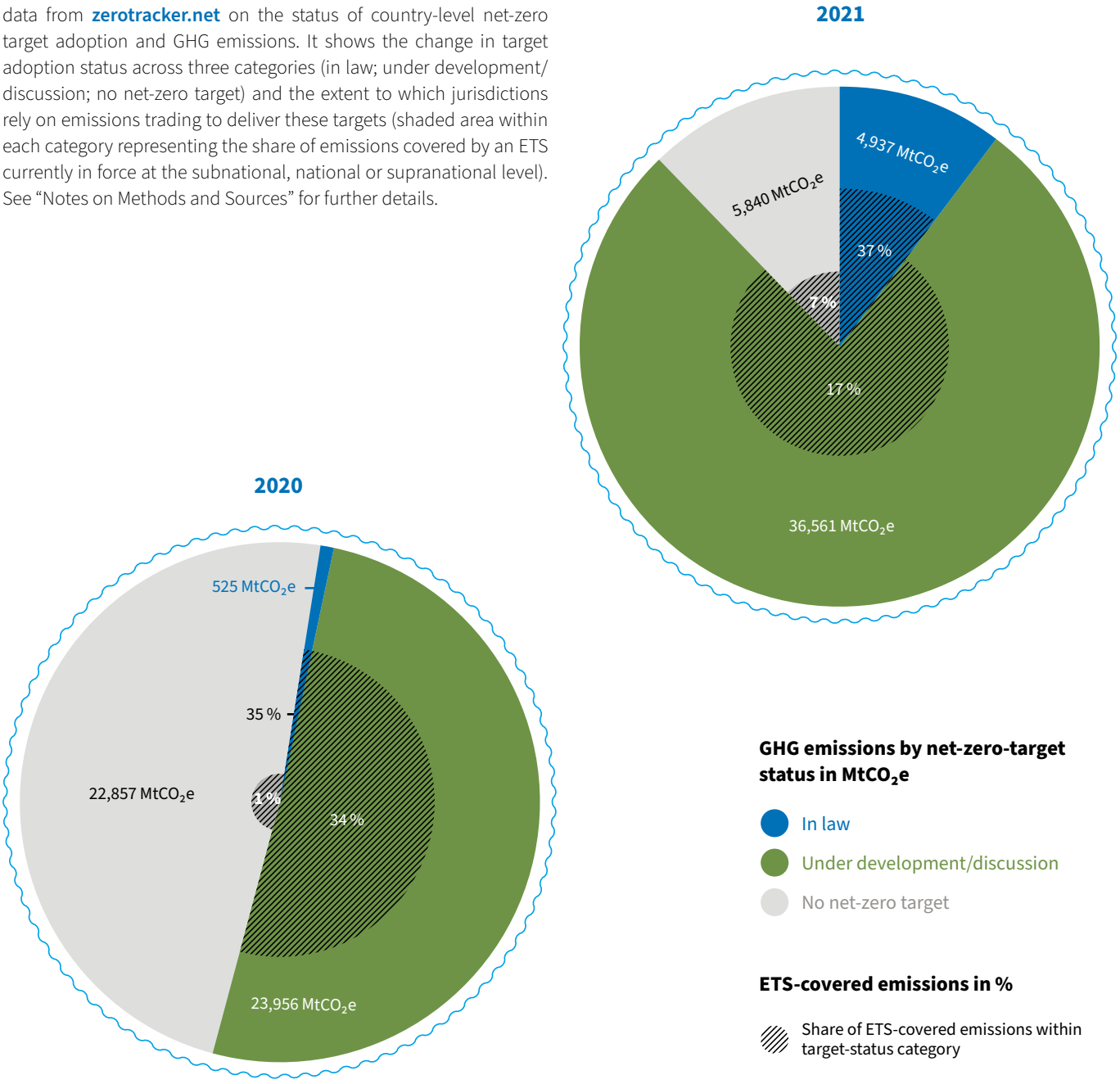
CALIFORNIA



Net-Zero Targets and ETS

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

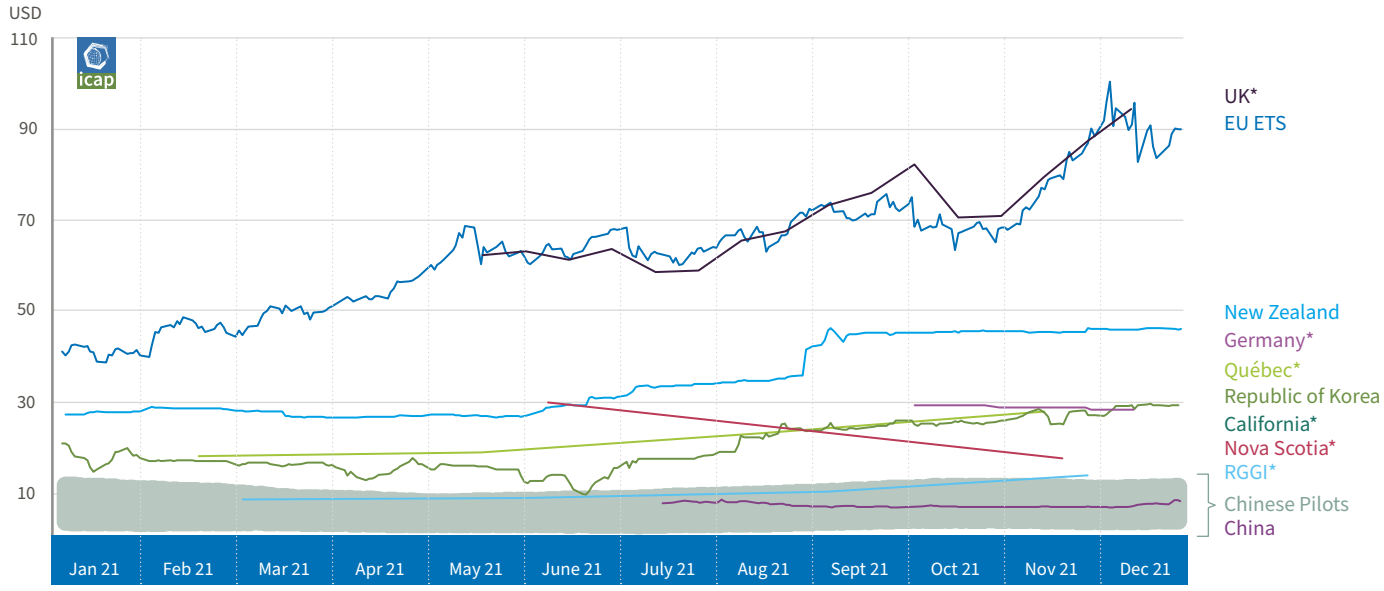
Around the world an increasing number of jurisdictions, representing an ever-greater share of global GHG emissions, are adopting mid-century net-zero emissions targets to limit global warming. Emissions trading is an important component of the climate policy portfolios aimed at achieving these targets. This infographic combines ETS-covered emissions data from ICAP Secretariat with data from **zerotracker.net** on the status of country-level net-zero target adoption and GHG emissions. It shows the change in target adoption status across three categories (in law; under development/ discussion; no net-zero target) and the extent to which jurisdictions rely on emissions trading to deliver these targets (shaded area within each category representing 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.

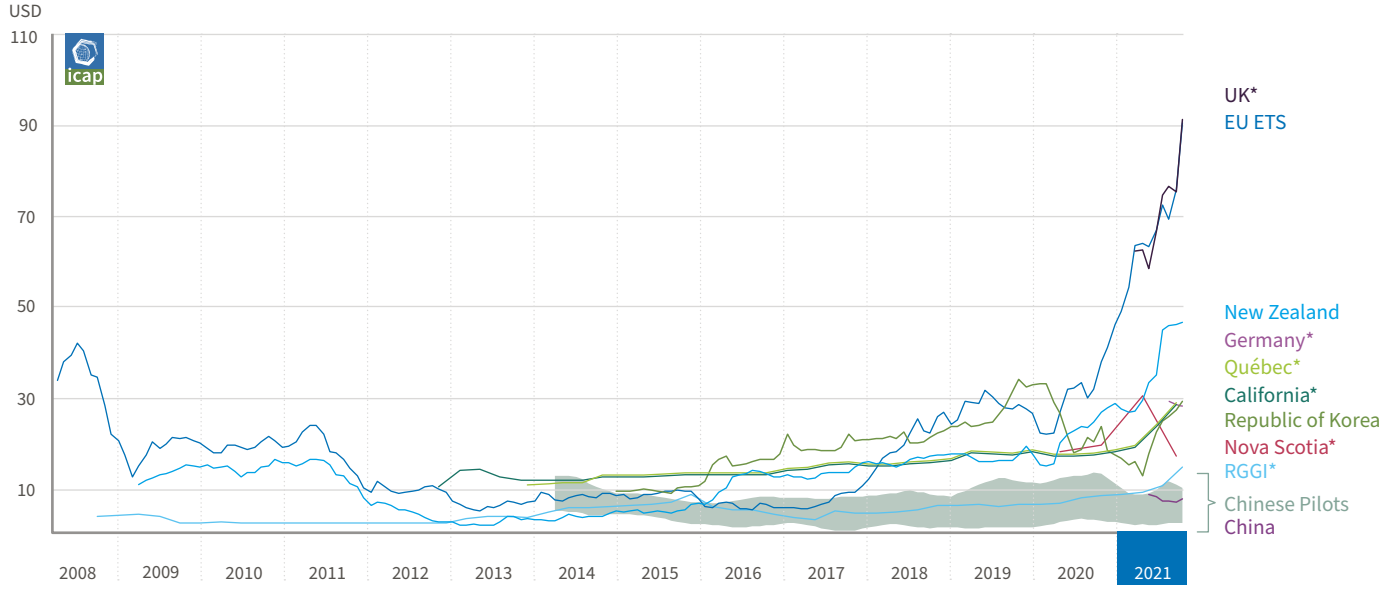


Allowance Price Developments

2021 in a longer historical context

This infographic uses data from the ICAP Allowance Price Explorer to visualize developments allowance markets in 2021 (top panel) and in a long historical context since 2008 (bottom panel). Both the short- and long-term price developments are 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. Prices in the top panel are the daily observations in the systems with secondary market data, and the clearing prices in the systems with primary market data on the day of the auction/sale. In the bottom panel, daily observations are averaged over the calendar month. In both panels, observations in non-USD currencies are converted to USD using monthly exchange rate data from the IMF. The shaded areas indicate the range of prices observed in the Chinese pilot ETSs. See "Notes on Methods and Sources" for further details.





* primary market prices

Factsheets

Table of contents

Europe and Central Asia

European Union

European Union Emissions Trading System

In force

Under development

Under consideration

CAP
1,597 $MtCO_2$ (2021)
1,572 $MtCO_2e$ for stationary installations
24.5 $MtCO_2e$ for aviation operators

GASES
Several gases

OFFSETS AND CREDITS
Offsets and international credits can no longer be used from Phase 4 (2021–2030)

ALLOCATION
Auctioning
Free Allocation: Benchmarking

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: EUR 52.93 (USD 62.61)
Average secondary market price: EUR 54.76 (USD 64.77)

TOTAL REVENUE
EUR 94 billion[2] (USD 118 billion) since 2013
EUR 31 billion (USD 37 billion) in 2021

MEMBER STATES

All EU Member States, plus Iceland, Liechtenstein and Norway

SECTORS

POWER

INDUSTRY

AVIATION[1]

The oldest ETS in force and the largest in terms of trading volume and value

Linked with the Swiss ETS as of 2020, with the first compliance cycle under the link completed

Reforms proposed to deliver on the "European Green Deal"

ETS DESCRIPTION

The European Union Emissions Trading System (EU ETS) is a cornerstone instrument of the EU's policy framework to combat climate change and reduce GHG emissions at least cost. The system covered ~36 % of the total emissions of the European Economic Area (EEA) in 2020–21, encompassing activities from the power sector, manufacturing industry, and aviation (including flights from the EEA to the United Kingdom).

Introduced in 2005 and now in its fourth trading phase, the EU ETS is the oldest system in force. Since 2005, stationary installations have cut emissions by around 43 %.

Since its launch, the EU ETS has gone through several reforms. The latest revision of the system's framework was completed in 2018 and took effect in January 2021, for Phase 4. The European Commission proposed further reforms to the ETS in 2021 to deliver on the "European Green Deal".

The EU ETS and the Swiss ETS are linked as of 2020. Any policy updates in either jurisdiction will have to be considered accordingly under the linking arrangement.

YEAR IN REVIEW

2021 marked the first year of the fourth trading phase of the EU ETS. Triggered by a persisting surplus of allowances, the Market Stability Reserve (MSR) reduced auction volumes for 2021 by nearly 40 %. In March, the Commission published updated benchmark values for free allocation to industrial installations during 2021–2025, based on data submitted by Member States. It also adopted the cross-sectoral correction factor to be applied to free allocation until 2025.

The "European Climate Law" entered into force in July 2021, setting new binding EU-wide climate targets for 2030 (55 % cut in GHG emissions compared to 1990 levels) and 2050 (net-zero emissions), and initiating a process to develop a 2040 target. The European Commission put forward a policy reform package to deliver on the "European Green Deal" and align decarbonization efforts with the updated 2030 climate target. The package places the EU ETS at the heart of the EU's decarbonization agenda with major changes that include:

- an increased linear reduction factor from 2.2 % to 4.2 %, and a one-off reduction to the cap to be applied retroactively when the legislative process for the revision is concluded;
- the inclusion of the maritime sector into the market's scope from 2023, and a separate fuel ETS for buildings and road transport;
- the introduction of uniform product benchmarks to support breakthrough technologies, more stringent benchmark values and a provision that would render free allocation conditional on low-carbon investment by the receiving entity;
- the gradual phase-out of free allocation to aviation sector;
- the introduction of a carbon border adjustment mechanism (CBAM) that prices imported goods based on their embedded emissions from 2026;

1 Within the European Economic Area (EEA) and on routes from the EEA to Switzerland and the UK.
2 Includes revenue from Iceland, Liechtenstein and Norway, and the United Kingdom.

- updated parameters of the MSR including a new buffer threshold and an extension of the current intake rate of 24 % beyond 2023; and
- new regulations around revenue use to address distributional effects and spur innovation, including the creation of the Social Climate Fund.

The updates, split into several legislative proposals, follow an extensive process that included multiple consultation rounds. The Council and the European Parliament need to agree on their final form before they can take effect.

Emissions & Targets of the European Union

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)[3]

Energy	2,764.0	(77 %)
Industrial Processes	339.7	(9 %)
Agriculture	385.5	(11 %)
Waste	105.3	(3 %)
Total *(EU-27)*	**3,610.0**	**(100 %)**
Total *(including UK, Iceland, Liechtenstein, and Norway)*	**4,112.8**	

Energy Industries	900.3	(25 %)
Manufacturing Industries and Construction	435.5	(12 %)
Transport	834.9	(23 %)
Commercial, Institutional and Residential	429.5	(12 %)
Other Energy[4]	180.5	(5 %)

GHG REDUCTION TARGETS

By 2030: At least 55 % below 1990 GHG levels
By 2050: Climate neutrality

ETS Size & Phases

COVERED EMISSIONS 2019

Verified ETS emissions
1,598.4 $MtCO_2e$

39 %

GHGS COVERED

CO_2, N_2O, PFCs

PHASES

PHASE ONE: 3 years (2005–2007)
PHASE TWO: 5 years (2008–2012)
PHASE THREE: 8 years (2013–2020)
PHASE FOUR: 10 years (2021–2030)

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 $MtCO_2e$ in 2005; Phase 2 started with a cap of 2,049 $MtCO_2e$ in 2009.

PHASE THREE (2013–2020): A single EU-wide cap for stationary sources: 2,084 $MtCO_2e$ in 2013, which was annually reduced by a linear reduction factor of 1.74 % (of 2008–2012 baseline emissions). This translated into a year-on-year reduction by ~38.3 million allowances and resulted in a cap of 1,816 $MtCO_2e$ in 2020.

PHASE FOUR (2021–2030): Stationary installations: A single EU-wide cap of 1,572 $MtCO_2e$ in 2021. 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.

3 For EU-27.
4 Including fugitive emissions from fuels.

As of 2021, emissions from UK entities previously covered by the EU ETS are no longer considered in the cap. 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.

The European Commission proposed to revise the cap trajectory downward to align the ETS with the more ambitious 2030 climate target. Under the proposal, emissions covered by the EU ETS would have to decrease by 61 % (including maritime) by 2030 compared to 43 % (excluding maritime) under current regulations.

Aviation sector: The cap for emissions of intra-EEA aviation was reduced from 38 million to 24.5 million in 2021 following Brexit. Emissions from outbound flights from the EEA to the UK remain covered by the EU ETS. The same holds for EEA flights to Switzerland.

As of 2021, the cap for aviation decreases each year by the linear reduction factor of 2.2 %. The cap was initially set at 210 $MtCO_2e$/year in 2012, to reflect the 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 pending developments of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). In 2021, the European Commission proposed legislation to implement CORSIA for extra-EEA flights.

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 tCO_2/year for commercial aviation; >1,000 tCO_2/year for non-commercial aviation since 2013) (see 'Aviation' section). Several countries included NOx 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): An expansion of the system's scope with intra-EEA emissions from the maritime sector from 2023 onward is under discussion (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.

The EU ETS will maintain the intra-EEA scope (plus departing flights from EEA airports to Switzerland and the UK) for aviation emissions. In parallel, CORSIA will apply to extra-EEA flights by the end of November 2022 at the latest.[5]

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

9,628 stationary installations
349 aircraft operators

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

PHASE ONE (2005–2007): Allocation established through the Member State national allocation plans. Allocation through grandparenting. 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 auctioning in eight Member States (Germany, United Kingdom, The Netherlands, Austria, Ireland, Hungary, Czech Republic, and Lithuania), amounting to ~3 % of the total allowance allocation.

5 Under CORSIA, flight operators are required to offset the share of emissions above their 2019 emission levels from 2021 onwards.

PHASE THREE (2013–2020): 57 % of allowances were auctioned; the remainder was allocated for free based on benchmarks.

88 % of allowances were distributed to Member States based on verified 2005 or average 2005–2007 emissions; 10 % were allocated to lower-income EU Member States under the solidarity provision; and the remaining 2 % were distributed among Member States that had reduced their emissions by at least 20 % compared to the applicable base year under the Kyoto Protocol.

Power Sector: 100 % auctioning with an optional derogation for lower-income Member States to grant free allocation to energy installations to support sectoral modernization and diversification. At the end of Phase 3, eligible Member States could decide to continue using the derogation in Phase 4 (2021–2030), monetize allowances left over from the derogation or transfer these allowances to the Modernisation Fund.

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

Sectors deemed at risk of carbon leakage received free allocation at 100 % of the relevant benchmark. Sub-sectors deemed not at risk of carbon leakage had free allocation reduced gradually from 80 % of the respective benchmark in 2013 to 30 % by 2020.

As the demand for free allowances exceeded supply, the free allocation volume of each installation was subject to a uniform cross-sectoral correction factor — which was revised in 2017.

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)]/ gross value added

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

Aviation: 15 % of allowances were auctioned and 82 % were allocated to aircraft operators for free. The remaining 3 % constituted a special reserve for new entrants and fast-growing airlines. Due to the temporary derogation that applied to extra-EEA flights, allocation to aviation was adjusted to reflect the intra-EEA scope of the EU ETS.

New Entrants' Reserve (NER): 5 % of the total allowances for Phase 3 were set aside to assist new installations coming into the EU ETS or to cover installations whose capacity significantly increased since their free allocation had been determined. 300 million allowances from the reserve were allocated to the NER300[6], a large-scale funding program for innovative low-carbon energy demonstration projects.

Initially, the NER held 480.2 million allowances; as of June 2021, a total of 178.3 million had been used by 1,392 installations during throughout Phase 3. Of the remaining 301.9 million allowances, 200 million were placed in the reserve for Phase 4 while the rest were transferred to the MSR.

PHASE FOUR (2021–2030):
Power Sector: 100 % auctioning with an optional derogation for lower-income Member States to grant free allocation to energy installations to support sectoral modernization and diversification. Three out of ten eligible Member States decided to continue using the derogation in Phase 4. Other eligible Member States chose to either monetize allowances left over from the derogation from Phase 3 or transfer them to their respective shares of the Modernization Fund.

Industry: Benchmark values are updated twice in Phase 4 to reflect technological progress in different sectors. The first set of benchmark values applies to the period 2021–2025; the second set will cover 2026–2030.

Member States submitted lists of incumbent installations and updated emissions data in September 2019 and are required to do so again in September 2024. The European Commission calculates the updated benchmarks for Phase 4 based on this data. The first updated set of benchmarks was published in June 2021.

Benchmarks are determined by the average emissions intensity of the 10 % most efficient installations within a (sub-)sector, based on 2016–2017 activity data. The values are adjusted for technological progress on a yearly basis. An annual reduction rate (0.2 % to 1.6 %) is determined for each. For the steel sector, which faces high abatement costs and leakage risks, the lower end of 0.2 % annual benchmark reduction applies.

Free allocation may be updated annually to reflect sustained changes in production (if the change is more than 15 % compared to the initial level, based on a two-year rolling average).

6 The NER300 is an EU low-carbon technology funding program of approximately EUR 2 billion (USD 2.37 billion) monetized through the sale of 300 million allowances. It awarded funding to proposed projects in 2012 and 2014, the latest of which entered into operation in June 2021.

The European Commission proposed further revisions to benchmarks in July 2021 in view of the updated climate target for 2030.

Carbon leakage rules: The third carbon leakage list adopted in February 2019 applies for the period 2021–2030. The list includes a reduced number of sectors classified at risk of carbon leakage. Free allocation for other sectors will be discontinued by 2030 (except for district heating).

As an additional safeguard, the Phase 4 cap includes a 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 is assessed against a composite indicator of trade intensity and emissions intensity, according to the following criteria:

Trade Intensity x Emissions Intensity > 0.2

Trade intensity x Emissions Intensity > 0.15 but < 0.2; qualitative assessment will follow based on abatement potential, market characteristics, and profit margins.

Emissions intensity is determined by:
[direct emissions + (electricity consumption x electricity emission factor)]/ gross value added

Trade exposure is determined by:
(imports + exports)/(imports + production)

In 2021, the European Commission determined the uniform cross-sectoral correction factor for the adjustment of free allocation for the period of 2021–2025. The value of the cross-sectoral correction factor to apply annually between 2021 and 2025 is 1.

Aviation: Same breakdown as in Phase 3 (see above). As part of the review of the EU ETS for aviation proposed in 2021, the European Commission proposed to increase gradually the share of allowances distributed via auctions.

Auctioning: 57 % of allowances are auctioned. Out of these, 90 % are distributed to Member States based on their share of verified emissions, with 10 % distributed among the lower-income Member States under the solidarity provision. Auctions are cancelled if the highest bid is significantly below the prevailing secondary market price, to avoid market distortion. If an auction is cancelled, its volume is distributed over the subsequent four auctions scheduled at the same trading platform.

NER: The NER has been supplied with 200 million residual allowances from the Phase 3 reserve.

USE OF REVENUES

In the EU ETS, revenues from the auctioning of allowances accrue to Member States' national budgets. At least 50 % of revenues should be used for climate- and energy-related purposes. In a recent review of the EU ETS, the European Commission proposed to increase this threshold to 100 %.

Member States report to the Commission on how they spent the auction proceeds. On average, Member States spent ~72 % of their revenues in 2020 on domestic and international climate-related purposes, compared to ~75 % throughout Phase 3.

PHASE FOUR (2021–2030): Two new investment funds were established for Phase 4 to support industrial innovation and the transition to low-carbon energy systems in lower-income Member States. In a recent review of the EU ETS, the Commission proposed to increase the resources to be allocated these funds.

Innovation Fund: Supports innovative and breakthrough technologies in industry such as low-carbon hydrogen, as well as CC(U)S and best available technologies in renewable energy. The fund is monetized through the sale of at least 450 million allowances and the remaining budget from the NER300. It currently has a funding capacity of EUR 1.5 billion (USD 1.8 billion).

Two calls for projects (large- and small-scale) were completed by 2021, with EUR 1.1 billion (USD 1.3 billion) in support awarded to 37 investment projects in clean technologies across the industry, power and heat sectors. 25 additional proposals were selected for project development assistance. Several new calls for projects have been launched since the completion of the first round in 2021.

Modernisation Fund: Supports investments in ten lower-income Member States aimed at modernizing energy systems, improving energy efficiency, and supporting 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 the total allowances for Phase 4.

Flexibility & Linking

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 ETS Directive. In practice, no credits were used in Phase 1.

PHASE TWO (2008–2012):

Qualitative Limits: Most categories of CDM/JI credits were allowed, except for LULUCF and nuclear power. 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).

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 the end of 2012. Projects from industrial gas credits (projects involving the destruction of HFC-23 and N_2O) 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 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 $GtCO_2e$).

PHASE FOUR (2021–2030): The use of offsets is not allowed.

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 in January 2020. The link allows covered entities in both systems to use allowances from either for compliance. Entities can transfer allowances between the ETS registries on pre-announced dates. This system is set to be replaced with an electronic link that would facilitate transfers of allowances between both registries on a continuous basis.

The link caps a ten-year process of formal negotiations. These began in December 2010, culminating in the conclusion of a linking agreement in late 2017.[7] Both sides announced in mid-December 2019 that the link would become operational in January 2020.

Compliance

COMPLIANCE PERIOD

One calendar year: operators must submit an emissions report by the end of March for the preceding calendar 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 the end of March of the following year. Once verified, operators must surrender the equivalent number of allowances by the end of April.

MRV FRAMEWORK: Since Phase 3, the MRV framework for the EU ETS has been further harmonized. Specific regulations 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.

ENFORCEMENT

Regulated entities must pay an excess emissions penalty of EUR 100 (USD 118.27) for each tonne of CO_2 emitted for which no allowance has been surrendered, in addition to buying and surrendering the equivalent number of allowances. The name of the non-compliant operator is also made public. Member States may enforce different penalties for other forms of non-compliance.

7 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.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities, non-compliance entities (investors; brokers; and other service providers)

MARKET TYPES:

Primary: Uniform price auctions with single rounds and sealed bids, conducted daily by EEX. Germany has opted out of the common auctioning platform, instead running national auctions through the EEX. Poland has also opted out but continues to participate in the common auction platform at the EEX until further notice.

Secondary: Spot, futures, options, and forward contracts (OTC) are traded on the secondary markets. Besides the EEX, futures are traded on ICE Futures Europe.

LEGAL STATUS OF ALLOWANCES: "Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014" classified EUAs as financial instruments, thereby enabling derivative trading on the secondary market.

MARKET STABILTY PROVISIONS

BACKLOADING: As a short-term measure to address a growing surplus in the EU ETS, the auction of 900 million allowances from 2014–2016 was postponed to 2019–2020. The back-loaded allowances were placed in the MSR, which became operational in 2019.

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 resilience of the EU ETS to future shocks. The Commission proposed to update MSR thresholds and parameters in view of the overarching review of the EU ETS (see 'Year in review' section).

Current thresholds: The Commission publishes a communication on the total numbers of allowances in circulation (TNAC) in May each year.

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

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. In 2021, auction volumes were reduced by nearly 40 % corresponding to a volume of ~320 million allowances being placed into the reserve.

Swiss allowance supply is not considered in the TNAC, and Swiss auction quotas are not affected by the MSR.

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 cancelled shall not exceed the average verified emissions of the installation from five years preceding the closure.

Other Information

INSTITUTIONS INVOLVED

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

EVALUATION/ETS REVIEW

The European Commission publishes annual reports on the functioning of the European carbon market (most recent being the 2021 report).[8]

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. Two major EU ETS reviews — before Phase 3 and before Phase 4 — have been conducted to date. In light of the more ambitious 2030 emissions reduction target, the European Commission has proposed a revision of the EU ETS. The legislative process for this review is ongoing.

8 https://ec.europa.eu/clima/system/files/2021-10/com_2021_962_en.pdf

REGULATORY FRAMEWORK

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.[9]

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).[10]

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).[11; 12]

All other legislation and documentation can be found **here**.[13]

9 https://eur-lex.europa.eu/eli/dir/2003/87/2018-04-08
10 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32015D1814
11 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02010R1031-20140227
12 https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1547715054952&uri=CELEX:02010R1031-20171108
13 https://ec.europa.eu/clima/policies/ets_en#tab-0-1

European Union

Emissions Trading System for buildings and road transport

In force

Under development

Under consideration

MEMBER STATES

All EU Member States, plus Iceland, Liechtenstein and Norway

SECTORS

TRANSPORT*

BUILDINGS*

*Sectors represent upstream coverage.

The European Commission proposed a new ETS for the buildings and road transport sectors in July 2021

The proposal is part of the package to deliver the "European Green Deal" ("Fit for 55 %")

The Council of the EU and the European Parliament are debating the proposal

ETS DESCRIPTION

The European Commission proposed the new ETS for buildings and road transport to address growing emissions from these sectors in a cost-effective way. The system would complement Member States' national emissions reduction targets under the "Effort Sharing Regulation". It would be separate from the existing EU ETS for energy, industry, and intra-EEA aviation sectors.

The new ETS would cover upstream emissions from fuels used in buildings and road transport. It would regulate fuel suppliers rather than end-consumers. The proposed framework includes a cap and a linear reductions factor to control the emissions reduction trajectory, as well as a market stability reserve to adjust the supply of allowances accordingly. The system is proposed to start operating in 2026. Allowances would be distributed only via auctioning. Auction volumes would be front loaded to ensure a smooth start of the system and sufficient liquidity.

To address social impacts of carbon pricing in the sectors, the European Commission proposed to introduce the Social Climate Fund. A quarter of revenues from the new ETS would be directed to this instrument to support vulnerable groups, and mitigate energy and mobility poverty, with complementary financing from Member States. In addition, the Commission proposed that Member States use the entirety of revenues from emissions trading (both this new and the existing ETS) on climate and energy projects.

The eventual form of these proposals and their details are subject to the negotiations in the Council of the EU and the European Parliament.

YEAR IN REVIEW

The "European Climate Law" entered into force in July 2021. It lays down ambitious climate targets of at least 55 % emissions reduction by 2030 (compared to 1990) and climate neutrality by 2050. The European Commission proposed the "Fit for 55 %" package to deliver on the European Green Deal and to align EU policy with the more ambitious 2030 climate target. A new ETS for buildings and road transport and the Social Climate Fund are two elements of this package. These proposals are subject to negotiations in the Council of the EU and the European Parliament.

Emissions & Targets of the European Union

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	2,764.0	(77 %)
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Total *(EU-27)*	**3,610.0**	**(100 %)**
Total *(including UK, Iceland, Liechtenstein, and Norway)*	**4,112.8**	

Energy Industries	900.3	(25 %)
Manufacturing Industries and Construction	435.5	(12 %)
Transport	834.9	(23 %)
Commercial, Institutional and Residential	429.5	(12 %)
Other Energy[1]	180.5	(5 %)

GHG REDUCTION TARGETS

By 2030: At least 55 % below 1990 GHG levels

By 2050: Climate neutrality

1 Including fugitive emissions from fuels.

Other Information

INSTITUTIONS INVOLVED

The European Commission and the relevant authorities of all EU Member States

REGULATORY FRAMEWORK

ETS proposal[2]

2 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0551

Finland

In force

Under development

Under consideration

SECTORS

TRANSPORT*

*Sectors represent upstream coverage.

Considering an ETS for its road transport sector

Formed an intersectoral working group to assess this policy option

In March 2021, the Ministry of Transport and Communications in Finland set up a cross-sectoral working group tasked with assessing and preparing for a national ETS to cover the road transport sector. The system's objective would be to contribute to the government's goal to halve transport emissions by 2030 compared to 2005 levels.

After the European Commission presented the EU "Fit for 55" package in July 2021, the working group broadened its focus from assessing the option of a national system to considering the proposal for a second EU-level ETS for buildings and road transport. A draft memorandum prepared by the working group contains an overview of the design elements, potential compensatory measures and a roadmap for the implementation of the national system, taking into account the Commission proposal for a second EU-level ETS. The draft was open for public consultation between November and December 2021.

The draft memorandum presents the results of the analysis of the working group, with a final decision by the government on the topic still pending. The draft memorandum observes that both systems are very similar and that a national system could only be introduced in full in 2026, the start year also proposed for the EU system. It concludes that the introduction of a national system would not be required if already-expected national measures (as specified in the "Roadmap to fossil-free transport") and the EU-level ETS for buildings and road transport are implemented.

However, it presents two transitional options to hedge the risk of delays or lack of agreement on a second ETS at EU-level: a "fixed-price" ETS, similar to that of Germany, or an "emissions trading levy"/"fuel tax" that would be implemented as an increase of excise duties. According to the memorandum, these would allow for the introduction of a pricing instrument in Finland before the start of the EU system at relatively low cost. In case an EU system does not materialize, these could then transition into a full auction-based ETS at national level.

Emissions & Targets of Finland

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	39.1	(74 %)
Industrial Processes	5.5	(10 %)
Agriculture	6.6	(12 %)
Waste	1.8	(3 %)
Total	**53.0**	

Energy Industries	16.3	(31 %)
Manufacturing Industries and Construction	6.6	(12 %)
Transport	11.3	(21 %)
Commercial, Institutional and Residential	2.4	(5 %)
Other Energy	2.6	(5 %)

GHG REDUCTION TARGETS

By 2050: 80 % below 1990 GHG emissions (Climate Change Act 609/2015)

Other Information

INSTITUTIONS INVOLVED

Ministry of Transport and Communications
Ministry of Economic Affairs and Employment
Ministry of Finance
Ministry of the Environment
Transport and Communications Agency Traficom
Energy Authority

REGULATORY FRAMEWORK

Roadmap to fossil-free transport[1]
Emissions trading in road transport – Draft estimates[2]

1 https://julkaisut.valtioneuvosto.fi/handle/10024/163260
2 https://api.hankeikkuna.fi/asiakirjat/577ac2a5-3d37-4451-80ae-fad12a0e9c72/cc509980-ba1f-4956-a99a-74a26d8910ed/LAUSUNTOPYYNTO_20211108084742.PDF

Germany

German National Emissions Trading System

In force

Under development

Under consideration

SECTORS:

TRANSPORT*

BUILDINGS*

**Sectors represent upstream coverage.*

National ETS introduced in 2021 covering heating and transport fuels upstream

Fixed price per tonne CO_2 from 2021 to 2025

Auctioning starting in 2026 with a price corridor

CAP
301 $MtCO_2$ (2021)

GASES
CO_2 only

ALLOCATION
Fixed price until 2025, auctioning thereafter; price corridor foreseen for 2026

AVERAGE 2021 ALLOWANCE PRICE
Fixed price: EUR 25.00 (USD 29.57)

TOTAL REVENUE
EUR 7.2 billion (USD 8.5 billion)

ETS DESCRIPTION

Germany launched its National Emissions Trading System (Nationales Emissionshandelssystem, or nEHS) for heating and transport fuels in 2021. This measure complements the EU ETS and forms part of the "Climate Action Program 2030", a package of measures adopted by the German Federal Cabinet to reach Germany's 2030 climate targets and climate neutrality by 2045. Because GHG emissions from the country's energy, heavy industry, and domestic aviation sectors are already covered by the EU ETS, the introduction of the nEHS has led to a comprehensive sectoral coverage of a CO_2 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. Further provisions for the implementation were published in the "Fuel Emissions Trading Regulation" in December 2020.

The national ETS will be phased in gradually, with a fixed price per tCO_2 from 2021 to 2025. In 2026, auctions with minimum and maximum prices will be introduced. The coverage of fuels will also be gradually expanded.

YEAR IN REVIEW

In 2021, the nEHS started operating. Regulated entities had to open a nEHS registry compliance account and start monitoring their emissions. Regulated entities and intermediaries opened trading accounts at the EEX exchange. The sale of nEHS allowances (nEZ) started in October 2021.

In July 2021, a "Carbon Leakage Regulation" was adopted that aims to ensure cross-border competitiveness of firms regulated under the nEHS.

The next steps in the implementation of the nEHS include amending the "Fuel Emissions Trading Regulation" by determining the annual cap of the nEHS and introducing hardship provisions. A first draft was published in October 2021.

Emissions & Targets of Germany

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	677.4	(84 %)
Industrial Processes	61.4	(8 %)
Agriculture	61.8	(8 %)
Waste	9.2	(1 %)
Total	**809.8**	

Energy Industries	249.7	(31 %)
Manufacturing Industries and Construction	125.4	(15 %)
Transport	165.5	(20 %)
Commercial, Institutional and Residential	122.5	(15 %)
Other Energy	14.2	(2 %)

GHG REDUCTION TARGETS

By 2030: 65 % below 1990 GHG levels (Climate Change Act)
By 2045: GHG neutrality (Climate Change Act)

ETS Size & Phases

COVERED EMISSIONS

~40 %

GHGs COVERED

CO_2 only

PHASES

PHASE ONE: 10 years (2021–2030)

CAP

PHASE ONE (2021–2030): The nEHS cap starts at 301 $MtCO_2$ in 2021 and decreases to 233 $MtCO_2e$ in 2030.

The cap is set in line with Germany's reduction targets for the non-EU ETS sectors as defined by the "European Effort Sharing Regulation" (ESR). During the fixed-price period from 2021 to 2025, and as long as a price corridor is deemed necessary, the cap is flexible. 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.

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

SECTORS AND THRESHOLDS

The nEHS covers 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 CO_2 price has been passed through. If such evidence cannot be provided and if CO_2 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 ETS installation receives a full compensation for the nEHS price that has been passed through.

POINT OF REGULATION

Upstream

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

PHASE ONE (2021–2030)

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

- 2021: EUR 25 (USD 29.57)
- 2022: EUR 30 (USD 35.48)
- 2023: EUR 35 (USD 41.40)
- 2024: EUR 45 (USD 53.22)
- 2025: EUR 55 (USD 65.05)

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 year X can be acquired until the end of 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 65.05) and a maximum price of EUR 65 (USD 76.88) per tCO_2 will apply in this year.

CARBON LEAKAGE RULES: The nEHS is accompanied with a compensation mechanism to avoid carbon leakage for emissions-intensive trade-exposed sectors. Respective regulations were released in July 2021 and will have retroactive effect. The carbon leakage rules apply to companies from emission-intensive sectors that face international competition. Industries eligible for compensation are those on the carbon leakage list of the EU ETS Phase 4. Therefore, firms from the same industrial sector regulated under the nEHS and EU ETS should be treated equally.

Furthermore, additional sectors/sub-sectors may qualify upon request if they meet thresholds for emissions and trade intensity. In contrast to the EU ETS, the nEHS does not use free allocation but compensation based on sectoral fuel benchmarks and fixed compensation levels.

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., as a way to re-finance renewable energy subsidies and reduce the "Renewable Energy Surcharge" on electricity.

Flexibility & Linking

BANKING AND BORROWING

Banking is not allowed during the fixed price phase but will be allowed in the auctioning phase.

OFFSETS AND CREDITS

No offsets are allowed in Phase 1.

LINKS WITH OTHER SYSTEMS

The long-term goal is to transfer the nEHS to the EU ETS for buildings and road transport proposed by the EU Commission in July 2021 (see the "EU ETS for buildings and road transport" factsheet for more).

Compliance

COMPLIANCE PERIOD

One calendar year. Entities have until the end of September to surrender allowances to cover the reported emissions of the previous year.

MRV

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

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.

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. Analogously to the monitoring plan requirement, the verification requirement has been waived for the years 2021 and 2022.

ENFORCEMENT

During the fixed-price phase, entities must pay an excess emissions penalty for each tCO_2 emitted for which no allowance has been surrendered, set at two times the fixed price. 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.

After the fixed-price phase, entities must pay an excess emissions penalty of EUR 100/tCO_2 (USD 118.27) for each tCO_2 emitted for which no allowance was surrendered. This amount will increase annually in line with the European consumer price index.

For other instances of non-compliance, e.g., misreporting, or late reporting, entities can be fined.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Trading accounts can be held by any domestic or international natural or legal person. Compliance entities can buy allowances directly from the trading platform or via financial intermediaries.

MARKET TYPES:

Primary: EEX is the nEHS's auction platform. During the fixed-price phase, allowances are issued at the predetermined price. Auctioning will only start in 2026.

Secondary: EEX will likely decide on the implementation and possible design of a secondary market in the course of 2022.

LEGAL STATUS OF ALLOWANCES: Allowances do not have the status of financial instruments or derivates according to neither the German Banking Act nor the Securities Trading Act.

MARKET STABILTY PROVISIONS

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

In 2026, auctions of allowances will contain a price corridor of a minimum price per tCO_2 of EUR 55 (USD 65.05) and a maximum price of EUR 65 (USD 76.88).

Other Information

INSTITUTIONS INVOLVED

German Federal Ministry for Economic Affairs and Climate Action (BMWK)
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.

REGULATORY FRAMEWORK

Fuel Emissions Trading Act[1]
Emissions Reporting Regulation 2022[2]
Fuel Emissions Trading Regulation[3]
Carbon Leakage Regulation[4]

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/
4 https://www.gesetze-im-internet.de/becv/

Kazakhstan

Kazakhstan Emissions Trading Scheme

In force

Under development

Under consideration

SECTORS:

POWER
OIL & GAS

INDUSTRY

Kazakhstan ETS moved into Phase 5

Full transition to benchmarking in 2021

Plans to introduce auctioning

CAP
140.3 $MtCO_2$ (2022)

GASES
CO_2 only

OFFSETS AND CREDITS
Domestic

ALLOCATION
Free Allocation: Benchmarking

AVERAGE 2021 ALLOWANCE PRICE
Average secondary market price: KZT 504 (USD 1.18)

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, although MRV obligations still applied. 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 KAZ ETS currently covers 199 installations belonging to 128 operators.

YEAR IN REVIEW

In 2021, a National Allocation Plan was issued for one year and set a cap of 159.9 $MtCO_2$. The system made a full transition to benchmarking, which is now the only allocation method in KAZ ETS. The current National Allocation Plan for 2022–2025 sets a cap of 140.3 $MtCO_2$ for 2022.

Emissions & Targets of Kazakhstan

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	291.1	(82 %)
Industrial Processes	21.7	(6 %)
Agriculture	37.1	(10 %)
Waste	5	(1 %)
Total	**354.9**	

Energy Industries	123.6	(35 %)
Manufacturing Industries and Construction	25.6	(7 %)
Transport	26.6	(7 %)
Commercial, Institutional and Residential	38.3	(11 %)
Other Energy	77	(22 %)

GHG REDUCTION TARGETS

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

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

By 2060: carbon neutrality (net zero CO_2 emissions) (pledge during United Nations Climate Ambitions Summit, 2020)

ETS Size & Phases

COVERED EMISSIONS 2019

Verified ETS emissions
162.0 $MtCO_2e$ (ETS cap)[1]

46 %

GHGS COVERED
CO_2 only

PHASES
PHASE ONE: one year (2013)
PHASE TWO: two years (2014–2015)
PHASE THREE: three years (2018–2020)
PHASE FOUR: one year (2021)
PHASE FIVE: four years (2022–2025)
(2016–2017: System suspended)

CAP
PHASE ONE (2013): 147 $MtCO_2$ (plus new entrants' reserve of 20.6 $MtCO_2$). This equaled a stabilization of the capped entities' emissions at 2010 levels.

PHASE TWO (2014–2015):
2014: 154.9 $MtCO_2$ (plus a reserve of 18 $MtCO_2$)
2015: 152.8 $MtCO_2$ (plus a reserve of 20.5 $MtCO_2$).
This represented reduction targets of 0 % and 1.5 % respectively, compared to the average CO_2 emissions of capped entities in 2011–2012.

(2016–2017: System suspended)

PHASE THREE (2018–2020): 485.9 $MtCO_2$ (plus a reserve of 35.3 $MtCO_2$). 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 $MtCO_2$ (plus a reserve of 11.5 $MtCO_2$).

PHASE FIVE (2022–2025): 537.2 $MtCO_2$ for the overall period.

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)

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

PHASE FIVE (2022–2025): Same as Phase 3

INCLUSION THRESHOLDS: Facilities emitting more than 20,000 tCO_2/year.

POINT OF REGULATION
Downstream

NUMBER OF ENTITIES
128 companies (199 installations)

Allowance Allocation & Revenue

ALLOWANCE 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 $MtCO_2$ in 2014 and 20.5 $MtCO_2$ 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 chose grandparenting). Additionally, there was a reserve of 35.3 million allowances for new entrants, new stationary emission sources, and changes in output in case of the choice of benchmarking.

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

PHASE FIVE (2022–2025): Benchmarking. A reserve contains 89.6 million allowances.

Flexibility & Linking

BANKING AND BORROWING

Banking is allowed within each phase. Banking between phases is not possible. Borrowing 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 and provision of offset credits are carried out in accordance with IPCC methodologies and the rules developed by the Ministry of Ecology, Geology and Natural Resources.

QUANTITATIVE LIMITS: No quantitative limits exist.

Compliance

COMPLIANCE PERIOD

One year (due by the start of April of the year following the reporting period).

MRV

REPORTING FREQUENCY: Reporting is required annually for installations above the 20,000 tCO_2/year threshold.

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

Aside from CO_2, reporting also is required for CH_4, N_2O, and PFC 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 (KZT 15,315/tCO_2 [USD 35.96] in 2022).

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities; individuals and legal entities involved in the implementation of offset projects. Brokers, banks or other financial institutions are not allowed to trade.

MARKET TYPES:

Primary: While domestic legislation allows for the establishment of a primary market through auctioning, to date allowances have been distributed for free through grandparenting or benchmarking.

Secondary: Pure spot market, no forward contracts or other derivatives. In the beginning of the system, trades had to be executed via the Caspy Commodity Exchange JSC, which still remains the main trading platform. From Phase 3 onwards, several additional exchange platforms that signed an agreement with the operator of the state registry – JSC "Zhasyl Damu" – were made available for trading. Over-the-counter trading has been allowed since Phase 3.

LEGAL STATUS OF ALLOWANCES: In accordance with the "Environmental Code", a carbon unit (emissions allowance, offset unit) is a commodity permitted for transfer among the subjects of the carbon market in the Republic of Kazakhstan.

Other Information

INSTITUTIONS INVOLVED

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

REGULATORY FRAMEWORK

Environmental Code of the Republic of Kazakhstan (2007)[2]
Environmental Code of the Republic of Kazakhstan (2021)[3]
Rules for the allocation of quotas for GHG emissions and formation of reserves of the established number and volume of quotas[4]

2 http://zan.gov.kz/client/#!/doc/31308/rus
3 http://adilet.zan.kz/rus/docs/K2100000400
4 http://zan.gov.kz/client/#!/doc/112765/rus

Montenegro

In force

Under development

Under consideration

SECTORS:

POWER

INDUSTRY

Developing an ETS as part of the EU accession process

Announced several ETS design provisions in 2020, including a minimum price of EUR 24 (USD 28.39)

ETS launch expected by 2024

In December 2019, the "Law on Protection from the Negative Impacts of Climate Change" entered into force in Montenegro. 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 industry and the power sector.

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 grand-parenting, and a market stabilization reserve. It further includes provisions for banking allowances, a minimum reserve price of EUR 24 (USD 28.39), and a linear reduction factor for the emissions cap of 1.5 % annually 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 of "the acquis") 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 EU.

Montenegro recommitted to introducing its ETS in November 2020 as a signatory to the Sofia Declaration. In that document, Western Balkan states expressed their intention to align with the "European Green Deal". In October 2021, they agreed with the EU on a roadmap for implementation reflected in the "Green Agenda Action Plan". The EU will support such efforts with EUR 9 billion (USD 10.6 billion) in grants and EUR 20 billion (USD 26.3 billion) in investments. Under the agreement, Montenegro will need to fully align its national legislation with the EU's by 2024.

Emissions & Targets of Montenegro

GHG EMISSIONS EXCL. LULUCF, 2018 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	2.8	(74 %)
Industrial Processes	0.4	(10 %)
Agriculture	0.3	(8 %)
Waste	0.3	(8 %)
Total	**3.8**	

Energy Industries	1.6	(42 %)
Manufacturing Industries and Construction	0.2	(5 %)
Transport	0.8	(22 %)
Other Energy	0.2	(5 %)

GHG REDUCTION TARGETS

By 2030: 35 % GHG emissions reduction below 1990 levels excl. LULUCF (NDC)

By 2050: aspirational carbon neutrality target (Sofia Declaration)

Other Information

INSTITUTIONS INVOLVED

Ministry of Sustainable Development and Tourism

REGULATORY FRAMEWORK

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

ETS DESCRIPTION

Sakhalin is regarded as a testing ground for identifying GHG regulation measures that can be extended to other Russian regions. In January 2021, the Russian Ministry of Economic Development, in cooperation with the regional government, approved the "Roadmap for the implementation of an experiment to establish special regulation of greenhouse gas emissions in the Sakhalin Region". The overall aim of the roadmap is to ensure that Sakhalin achieves carbon neutrality by 2025.

Among other measures, the roadmap foresees a pilot carbon trading system, expected to start in 2022. The MRV concept approved by the Russian government in 2015 and the federal law "On limiting greenhouse gas emissions" adopted in 2021 lay the foundation for carrying out MRV procedures at facility level and in Russian regions.

YEAR IN REVIEW

In 2021, the results of the regional inventory of GHG emissions and removals in Sakhalin were published, which clarify the economic activities primarily responsible for the emissions in the region. The inventory showed that 95 % of emissions are energy-related.

The Russian Ministry of Economic Development in cooperation with the government of Sakhalin prepared a draft law, which would introduce mandatory emissions reporting requirements for entities emitting at least 50,000 tCO_2e and oblige them to comply with the allocated emissions allowances. The draft passed the first State Duma reading in December 2021 and is expected to become law in early 2022.

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.

Four further regions might be joining the experiment: the Kaliningrad Oblast, Irkutsk Oblast, Khabarovsk Krai and Republic of Bashkortostan.[1]

In force

Under development

Under consideration

Regional inventory of GHG emissions developed in 2021

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

First transfers of carbon units could take place in 2022

Emissions & Targets of Sakhalin

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	11.7	(95 %)
Industrial Processes	0.1	(1 %)
Agriculture	0.2	(2 %)
Waste	0.3	(2 %)
Total	**12.3**	

Energy Industries	3.5	(29 %)
Transport	3.5	(29 %)
Other Energy	4.6	(37 %)

GHG REDUCTION TARGETS

By 2025: carbon neutrality of Sakhalin (Roadmap for the implementation of an experiment to establish special regulation of greenhouse gas emissions in the Sakhalin Region)

1 https://economy.gov.ru/material/news/regiony_smogut_prisoedinitsya_k_uglerodnomu_eksperimentu_vsled_za_sahalinom.html

Other Information

INSTITUTIONS INVOLVED

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

REGULATORY FRAMEWORK

Roadmap for the implementation of an experiment to establish special regulation of greenhouse gas emissions in the Sakhalin Region[2]
Federal Law "On Limiting Greenhouse Gas Emissions"[3]
Draft Federal Law "On conducting an experiment on limiting greenhouse gas emissions in selected federal subjects of the Russian Federation"[4]

2 https://economy.gov.ru/material/file/faf1abaae1e3f2be140971c9e934d0ab/dorozhnaya_karta.pdf
3 http://publication.pravo.gov.ru/Document/View/0001202107020031?index=9&rangeSize=1
4 https://sozd.duma.gov.ru/bill/37939-8

Switzerland

Switzerland Emissions Trading System

CAP
4.9 $MtCO_2e$ (2020, industry)[1]
1.1 $MtCO_2e$ (2021, aviation)

GASES
Several gases

OFFSETS AND CREDITS
No offsets or international credits can be used for compliance since 2021

ALLOCATION
Free Allocation: Benchmarking
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price[2]: EUR 48.65 (USD 57.54)

TOTAL REVENUE
EUR 55.7 million (USD 63.5 million) since beginning of program
EUR 16.2 million (USD 19.2 million) collected in 2021

In force
Under development
Under consideration

SECTORS:

POWER
OIL & GAS*

INDUSTRY*

AVIATION*

* Sectors represent upstream coverage

Entered a new 10-year trading phase in 2021

Updated provisions in line with the EU ETS Phase 4

Linked with the EU ETS since January 2020

ETS DESCRIPTION

The Switzerland (Swiss) ETS started in 2008 with a five-year voluntary phase. 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. The revised "Ordinance on the Reduction of CO_2 Emissions (CO_2 Ordinance)", the implementing legislation of the "CO_2 Act", was adopted in November 2020 to update provisions in line with Phase 4 of the EU ETS. Notable changes to the system included: a revised linear reduction factor from 1.74 % to 2.2 %; the implementation of updated EU ETS benchmarks; and an indefinite extension of the system.

Alongside linking to the EU ETS, the Swiss ETS was expanded to cover domestic aviation and 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, refining, and steel sectors. It covered about 11 % of the country's total GHG emissions in 2019. Participants in the ETS are exempt from the CO_2 levy.

YEAR IN REVIEW

2021 marked the start of the system's third trading period (2021–2030) with further alignment to the EU ETS. Switzerland updated industry benchmarks in line with those of the EU ETS Phase 4, and introduced a market stability mechanism to counter future demand shocks.

Furthermore, it embedded the new legal base for the Swiss ETS into the partially revised "CO_2 Act" – the core framework of Switzerland's climate legislation – that entered into force in January 2021. The subsequent fully revised Act was up for a public vote in June 2021. It contained a range of measures to meet the country's long-term NDC targets but failed to gain a majority by a small margin. In response, the government presented a new policy package for consultation in December 2021 to reach its 50 % emissions reduction target by 2030. In parallel, debate is ongoing to enshrine the net-zero target for 2050 in the constitution triggered by a popular initiative.

1 The authorities expect to release the new cap in spring 2022. The electricity sector is also covered by the Swiss ETS since the link with the EU ETS took effect. However, emissions from the sector are negligible in Switzerland.
2 Arithmetic average

Emissions & Targets of Switzerland

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	35.1	(76 %)
Industrial Processes	4.4	(10 %)
Agriculture	5.9	(13 %)
Waste	0.8	(2 %)
Total	**46.1**	

Energy Industries	3.4	(7 %)
Manufacturing Industries and Construction	4.7	(10 %)
Transport	14.9	(32 %)
Commercial, Institutional and Residential	11.2	(24 %)
Other Energy	0.93	(2 %)

GHG REDUCTION TARGETS

By 2025: 35 % reduction from 1990 GHG levels (NDC)

By 2030: At least 20 % reduction from 1990 GHG levels (unconditional, domestic target)

By 2030: at least 50 % reduction from 1990 GHG levels (indicative; NDC)

By 2050: Net-zero GHG emissions (aspirational; NDC)

ETS Size & Phases

COVERED EMISSIONS 2019

Verified ETS emissions
4.5 $MtCO_2e$

10 %

GHGS COVERED

CO_2, NO_2, CH_4, HFCs, NF_3, SF_6, and theoretically PFCs[3]

PHASES

VOLUNTARY PHASE: 2008–2012
SECOND TRADING PERIOD: 2013–2020
THIRD TRADING PERIOD: 2021–2030

CAP

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

SECOND TRADING PERIOD (2013–2020):
Stationary installations: Overall cap of 5.63 $MtCO_2e$ (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 $MtCO_2e$ in 2020.

Aviation sector: 1.3 $MtCO_2$ (2020)

THIRD TRADING PERIOD 2021–2030: An annual linear reduction factor of 2.2 % (2010 base year) applies to the cap for stationary installations and to the aviation cap. The aviation cap amounted 1.1 $MtCO_2$ in 2021; the cap for stationary installations will be released in spring 2022.

SECTORS AND THRESHOLDS

MANDATORY PARTICIPATION: Industries listed under Annex 6 of the "CO_2 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 has covered emissions from 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 "CO_2 Ordinance" that have a total rated thermal input of >20 MW.

POSSIBLE VOLUNTARY OPT-IN: Industries – listed under Annex 7 of the "CO_2 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 emissions <25,000 tCO_2e 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

3 In principle, all these gases are covered in accordance with the "CO_2 Ordinance". In practice, only CO_2, N_2O, and PFCs require monitoring, as the share of the other gases is negligible.

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 tCO_2e/year.

AVIATION: Commercial aircraft operators emitting more than 10,000 tCO_2/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 tCO_2/year. The thresholds do not apply if the operator has obligations under the EU ETS.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

Stationary installations: 95 (2021)
Aircraft operators: 141 (2020)

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

VOLUNTARY PHASE (2008–2012): Participants received free allowances covering emissions up to their 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 allocations for sectors not exposed to the risk of carbon leakage was phased out gradually. In 2013, such entities received 80 % of their allowances for free, 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-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 are open 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 are 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.

THIRD TRADING PERIOD (2021–2030):
Free allocation: Updated EU ETS benchmarks will apply starting in 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: As of 2022, auction volumes are subject to a market stability mechanism (see 'Market stability provisions' below).

USE OF REVENUES

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

Flexibility & Linking

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 LIMITS: 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 the end of 2012. Since 2021, offsets can no longer be used to meet compliance obligations.

QUANTITATIVE LIMITS: 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 CO_2 emissions.

LINKS WITH OTHER SYSTEMS

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

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 in the Swiss Emissions Trading Register in order to participate. Allowance transfers between the EU and Swiss registries are generally executed bi-monthly on pre-announced dates.

Compliance

COMPLIANCE PERIOD

One calendar year. Covered entities have until the end of 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 the end of 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/tCO_2 (USD 136.77/tCO_2). In addition to the fine, entities must surrender the missing allowances in the following year.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities and non-compliance entities (domestic and international). Traders are subject to a holding limit of one million Swiss/EU allowances.

MARKET TYPES:

Primary: Single round sealed-bid uniform price auction, organized by the Swiss Emissions Trading Registry several times per year.

Secondary: Allowances are not tradable on regulated markets but may be traded over-the-counter.

LEGAL STATUS OF ALLOWANCES: Allowances do not qualify as securities (financial instruments) under Swiss financial market regulations, and therefore spot trades are not covered by them. Emissions allowances may form the underlying asset of derivative contracts which are covered by the “Financial Market Infrastructure Act”.

MARKET STABILTY PROVISIONS

The authorities introduced a market stability mechanism in 2022 that reduces auction volumes if the number of allowances in circulation exceed a certain threshold. The following elements are decisive for the calculation of the threshold: the number of allowances in circulation; and

the maximum amount of emissions allowances available in the previous year (cap).

If the number of allowances in circulation exceeds the cap of the previous year by more than a half, the market stability mechanism reduces the auction volume of the current year by 50 %. In this case, the unauctioned allowances lose their validity after the end of the compliance period. The mechanism is regularly reviewed against market dynamics and developments in the EU. The Swiss ETS is not subject to the EU ETS Market Stability Reserve.

Other Information

INSTITUTIONS INVOLVED

Federal Office for the Environment (FOEN)

EVALUATION/ETS REVIEW

Transitional revisions to the "CO_2 Act" (main ETS legislation) and "CO_2 Ordinance" (implementing legislation) came into effect at the start of January 2021 in order to ensure continuity on Swiss climate policy and extend the ETS (for an unlimited period). Minor revisions came into effect in January 2022.

The full revision of the "CO_2 Act" was rejected in a plebiscite in June 2021. A transitional extension of the Act for 2022–2024 was adopted in December 2021. A new proposal for a revision of the Act from 2025 was put up for consultation in December 2021. The Swiss ETS is unaffected by these developments and operates on an unlimited timeframe and in a linking-compatible manner.

REGULATORY FRAMEWORK

Federal Act on the Reduction of CO_2 Emissions[4]
(CO_2 Act)
Ordinance on the Reduction of CO_2 Emissions[5]
(CO_2 Ordinance)
CO_2 Ordinance – Explanatory report[6]

4 https://www.fedlex.admin.ch/eli/cc/2012/855/en
5 https://www.fedlex.admin.ch/eli/cc/2012/856/en#a5
6 https://www.newsd.admin.ch/newsd/message/attachments/63988.pdf

Turkey

In force

Under development

Under consideration

Establishment of the Directorate of Climate Change

Ministry of Environment and Urbanization renamed as the Ministry of Environment, Urbanization and Climate Change

Draft framework for a pilot ETS developed

Paris agreement ratified and first NDC submitted

Phase 2 of the Partnership for Market Readiness (PMR) completed

Turkey has been studying and preparing for the possible use of carbon pricing instruments to help achieve its mitigation targets for a number of years. It ratified the Paris Agreement and submitted its first NDC in October 2021.[1]

A comprehensive mandatory MRV system at installation level has been in place since 2015. Monitoring started in 2015 and reporting (of 2015 emissions) began in 2016. Turkey has worked with the World Bank's 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 country's Climate Change and Adaptation Coordination Board[2] in November 2018. With additional funding from the PMR, Turkey 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:[3]

(1) a draft legal and institutional framework for a pilot ETS;
(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 in 2020, Turkey has submitted an expression of interest to the Partnership for Market Implementation (PMI), its successor. Turkey is also a candidate for EU accession and thus aims to complete the environmental obligations for membership. The communique from the "Summit on the Fight against Climate Change" in February 2021 refers to Turkey's intention to introduce an ETS.

Emissions & Targets of Turkey

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	364.4	(72 %)
Industrial Processes	56.4	(11 %)
Agriculture	68.0	(13 %)
Waste	17.2	(3 %)
Total	**506.1**	

Energy Industries	148.5	(29 %)
Manufacturing Industries and Construction	54.5	(11 %)
Transport	82.4	(16 %)
Commercial, Institutional and Residential	58.3	(12 %)
Other Energy	20.5	(4 %)

GHG REDUCTION TARGETS

By 2030: Up to 21 % reduction from the BAU scenario (NDC)

By 2053: Net-zero GHG emissions, as announced by the Presidency of the Republic of Turkey in 2021

1 See https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Turkey%20First/The_INDC_of_TURKEY_v.15.19.30.pdf for the country's first NDC.
2 The Board was formerly known as the Climate Change and Air Management Coordination Board and was recently renamed in an institutional reorganization.
3 See https://pmrturkiye.csb.gov.tr/raporlar/ for the associated documents, some of which are only available in Turkish.

Compliance

MRV

REPORTING FREQUENCY: Annual

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

FRAMEWORK: The Turkish MRV legislation establishes an installation-level system for CO_2 emissions for 700 entities. Sector coverage includes the energy sector (total rated thermal input >20 MW) and industry sectors (coke production, metals, cement, glass, ceramic products, insulation materials, pulp and paper, and chemicals over specified threshold sizes/production levels).

Entities had until October 2014 to submit their first monitoring plans. Since then, entities have also submitted subsequent monitoring plans and verified emissions reports for 2015–2020 to the Ministry of Environment, Urbanization and Climate Change.

ENFORCEMENT

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, Urbanization and Climate Change[4]
Directorate of Climate Change

4 See https://www.resmigazete.gov.tr/eskiler/2021/10/20211029-35.pdf (in Turkish) for the Presidential Decree on the recent institutional reorganization.

Ukraine

In force

Under development

Under consideration

First year of application of the MRV law completed in 2021

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 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:

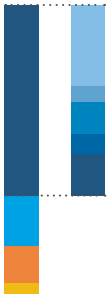
- adopting national legislation and designating competent authority(ies);
- establishing a system for identifying relevant installations and GHGs;
- developing a national allocation plan to distribute allowances;
- establishing a system to issue allowances to be traded domestically among installations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

The country established the national MRV system to provide a solid basis for the upcoming ETS. From 2021 onwards, the MRV procedures as adopted in the framework law on MRV have to be applied by regulated installations. By the end of 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 be in 2025.

Emissions & Targets of Ukraine

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	219.2	(66 %)
Industrial Processes	58.2	(18 %)
Agriculture	42.5	(13 %)
Waste	12.2	(4 %)
Total	**332.1**	



Energy Industries	92.2	(28 %)
Manufacturing Industries and Construction	18.6	(6 %)
Transport	37.7	(11 %)
Commercial, Institutional and Residential	22.0	(7 %)
Other Energy	48.6	(15 %)

GHG REDUCTION TARGETS

By 2030: Economy-wide net domestic reduction of 65 % in GHG emissions compared to 1990 (updated NDC, 2021)

By 2050: GHG emissions from energy and industrial processes will not exceed 31–34 % of 1990 GHG levels (Low Emission Development Strategy 2050)

By 2060: Climate neutrality (National Economic Strategy until 2030)

Compliance

MRV

REPORTING FREQUENCY: Reporting is required annually for CO_2 emissions from the following activities:

- fuel combustion in installations over 20 MW;
- oil refining;
- 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.

Additionally, for nitric acid production, N_2O emissions must also be reported.

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
National Accreditation Agency of Ukraine
State Ecological Inspection of Ukraine

REGULATORY FRAMEWORK

Law on the principles of monitoring, reporting and verification of greenhouse gas emissions[1]
Association Agreement between the European Union and its Member States, of the one part, and Ukraine, of the other part[2]

1 https://zakon.rada.gov.ua/laws/show/377-20
2 https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A22014A0529%2801%29

United Kingdom

United Kingdom Emissions Trading Scheme

In force

Under development

Under consideration

CAP
151.4 $MtCO_2$ (2022)

GASES
Several gases

ALLOCATION
Free Allocation: Benchmarking
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: 51.41 GBP (USD 70.72)

TOTAL REVENUE
GBP 4.3 billion (USD 5.9 billion)

SECTORS:

POWER

INDUSTRY

AVIATION

Twice-monthly auctions started in May 2021

Active primary and secondary market trading in the first year of operation

Cost Containment Mechanism triggered in December 2021 and January 2022, but no intervention made

ETS DESCRIPTION

The UK Emissions Trading Scheme (UK ETS) started in 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 declines by 4.2 Mt per year initially. To ensure market stability, the system has a Cost Containment Mechanism (CCM) and – quite distinct from the EU ETS – a transitional Allowance Reserve Price of GBP 22 (USD 30.26). 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. Phase 1 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 first UK Allowance (UKA) auction took place in May 2021, with all of the more than 6 million allowances on offer sold at the market clearing price of GBP 43.99 (USD 60.50), well above the auction reserve price of GBP 22.00 (USD 30.26). The same day marked the start of UKA futures trading and, a week later, the government transferred the first free UKAs for the 2021 scheme year to eligible regulated entities. The introduction of new allowances to the market has since continued through twice-monthly auctions.

An auction in early October 2021 of just under 5.19 million UKAs partially cleared, with ~ 4.15 million UKAs being sold at GBP 60.00 (USD 82.52). As per the scheme's rules, the bids below this price level were deemed too far below the secondary market price at the time and the 1.04 million unsold UKAs were distributed across the four subsequent auctions. All other auctions in 2021 cleared fully.

The monthly average UKA prices in September, October and November 2021 were above the CCM trigger price of GBP 52.88 (USD 72.73). The Authority announced its decision not to intervene on in mid-December. The CCM was triggered again in January 2022 and an announcement was made in mid-January that, again, no intervention would be made (see 'Market Stability Provisions' section).

Emissions & Targets of the UK

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	363.6	(80 %)
Industrial Processes	28.1	(6 %)
Agriculture	42.1	(9 %)
Waste	19.3	(4 %)
Total	**453.1**	

Energy Industries	87.9	(19 %)
Manufacturing Industries and Construction	50.5	(11 %)
Transport	120.8	(27 %)
Commercial, Institutional and Residential	87.9	(19 %)
Other Energy	16.5	(4 %)

GHG REDUCTION TARGETS

By 2030: At least a 68 % reduction in UK net GHG emissions from 1990 levels, including emissions from LULUCF (UK NDC – Dec 2020)

By 2035: Limit UK net GHG emissions to 965 $MtCO_2e$ over 2033–37, including emissions from LULUCF and international aviation and shipping (Carbon Budget Order 2021)

By 2050: Net-zero UK GHG emissions, including emissions from LULUCF and international aviation and shipping (The Climate Change Act 2008 (2050 Target Amendment) Order 2019)

ETS Size & Phases

COVERED EMISSIONS 2019

Verified ETS emissions[1]
126.9 $MtCO_2e$

28 %

GHGS COVERED

CO_2, N_2O, PFCs

PHASES

PHASE ONE: 10 years (2021–2030)

CAP

FIRST ALLOCATION PERIOD (2021–2025): 736 $MtCO_2e$, to be adjusted to reflect the hospital and small emitter opt-outs.

SECOND ALLOCATION PERIOD (2026–2030): 630.1 $MtCO_2e$, 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 its fourth phase. The annual cap for 2022 is 151.4 $MtCO_2e$ and will decline by 4.2 $MtCO_2e$ each year, which is approximately a 2.8 % reduction in 2022. Allowances for the New Entrants' Reserve (NER) are part of the overall cap.

In its "Net Zero Strategy: Build Back Greener" paper[2] published in October 2021, the government reiterated its commitment to consult on an appropriate cap trajectory consistent with its net zero GHG emissions target by 2050 and stated its goal to implement such a trajectory "by January 2023, or January 2024 at the latest".

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 the 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 integrated Single Electricity Market with the Republic of Ireland.

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/tCO_2 (USD 24.76) 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.

1 The verified emissions of the regulated entities under the EU ETS are provided as an approximation.
2 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

Small Emitter and Hospital Opt-Out Scheme: Hospitals and small emitters with emissions below 25,000 tCO_2e 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 tCO_2e per year, an ultra-small emitter exemption is in place. These installations are required 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 fewer than 243 flights per calendar year for three consecutive four-month periods or total annual emissions of less than 10,000 tonnes of CO_2.

ADDITIONAL SECTORS: The UK government has committed to explore expanding the scope of the UK ETS to the two-thirds of uncovered emissions. This could also include how the UK ETS could incentivise the deployment of GHG removal technologies.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

~1,000 installations

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

AUCTIONING: Auctioning is the primary means of allowance allocation under the UK ETS. Auctions have a GBP 22 (USD 30.26) transitional Auction Reserve Price (ARP). The UK will consult on its intent to withdraw the ARP as part of the planned consultation to appropriately align the UK ETS with a net zero trajectory. Auctions clear even when not all allowances are sold. Unsold allowances are carried over to the next four auctions, up to a limit of 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.

Around 84 million allowances were auctioned in 2021, resulting in total revenues of GBP 4.3 billion (USD 5.91 billion). As set out in the auction calendar, around 80 million UKAs will be sold in 2022.

FREE ALLOCATION: A 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, an industry benchmark, and a carbon leakage exposure factor (CLEF). The benchmarks and CLEFs that have been 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 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 per year.

An "Allocation Table", which lists the volume of free allowances for each installation for the first allocation period, was first published in May 2021. The table has since been updated in January 2022 and will be updated again in early 2022 to reflect Activity Level Changes (see below for more detail on this) and 2022 free allocation.

If an installation is included in the "Allocation Table", they must submit a verified Activity Level Report (see 'Compliance' section). If the data in the Activity Level Report shows an increase or decrease in activity of 15 % or more from historic activity levels (calculated from the previous two years' activity levels), the free allocation will be recalculated.

A review of free allocation in the UK ETS started with a call for evidence in spring 2021 and a further consultation is expected in 2022.

NER: A reserve of free allowances is set aside for installations that become eligible for participation within Phase 1 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.

USE OF REVENUES

The "Autumn Budget and Spending Review 2021" confirmed that, since March 2021, the UK government will have committed a total of GBP 30 billion (USD 41.26 billion) for the Green Industrial Revolution, supported in part by UK ETS revenue. Revenues from the Emissions Trading Scheme help to support these vital investments as well as other public services.

Flexibility & Linking

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.

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."

Compliance

COMPLIANCE PERIOD

One calendar year. Covered entities have until the end of April of the following year to surrender allowances. These provisions are the same as under the EU ETS.

MRV

REPORTING FREQUENCY: Annual self-reporting

VERIFICATION: Verification by independent accredited verifiers is required before the end of 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 CO_2 emitted without surrendering a permit. This penalty is equal to GBP 100/tCO_2e (USD 137.54) initially but is adjusted for inflation over time. The names of non-compliant operators are published.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities, non-compliance entities (domestic and international) and individuals.

MARKET TYPES:

Primary: Auctions are managed by ICE Futures Europe and are held every two weeks, as set out in the auction calendar. Bidders in the auction bid for a number of lots. The minimum bid size is one lot, and each lot represents 500 allowances.

Secondary: UKA daily futures allow market participants to trade contracts for the delivery of allowances on specified dates in the future. Trading is managed by ICE Futures Europe.

LEGAL STATUS OF ALLOWANCES: The "Recognised Auction Platforms (Amendment and Miscellaneous Provisions Regulations 2021) Affirmative Statutory Instrument" establishes UKAs as financial instruments.

MARKET STABILTY PROVISIONS

SUPPLY ADJUSTMENT MECHANISM (SAM): The UK ETS Authority has set out the possibility of establishing a SAM. This could be broadly based on the EU ETS Market Stability

Reserve (MSR), although adaptations would be required to suit the UK context. Due to the need to collect verified UK emissions data, any SAM could not be operational until mid-2022 at the earliest. The UK ETS Authority will consult separately on the design of a SAM if required in due course. There is a transitional ARP in place to ensure minimum price continuity (see 'Allocation' and 'Transitional Auction Reserve Price (ARP)' sections).

COST CONTAINMENT MECHANISM (CCM): The UK ETS has a CCM to avoid spikes in allowance prices by auctioning additional allowances. If the CCM is triggered, regulators can decide on whether and how to intervene. The intervention can include: redistributing allowances between the current year's auctions; bringing forward allowances from future years; drawing from the Market Stability Mechanism Account; or the auctioning of up to 25 % of remaining allowances in the NER.

The CCM was triggered in December 2021 and January 2022, following which the UK ETS Authority met and agreed that the appropriate decision was not to intervene in the market.

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 reactiveness. In the first year, the CCM is triggered if, for three consecutive months, the UK ETS carbon price is double the average allowance price in effect in the UK in the two preceding years.

From February 2022, the CCM will be triggered if the allowance price is more than two and a half times the average price for preceding two-year reference period, for three consecutive months. From February 2023 onwards, the CCM will be triggered if the allowance price is three times the average price for the reference period for six consecutive months.

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 ARP of GBP 22 (USD 30.26) is in place. No further changes to the level of the ARP are planned before it is likely withdrawn as the UK ETS matures. The UK government will consult on its intent to withdraw the ARP as part of the planned consultation to appropriately align the UK ETS cap with a net zero trajectory.

Other Information

INSTITUTIONS INVOLVED

UK Department for Business, Energy & Industrial Strategy
HM Treasury
UK 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

EVALUATION/ETS REVIEW

Phase 1 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.

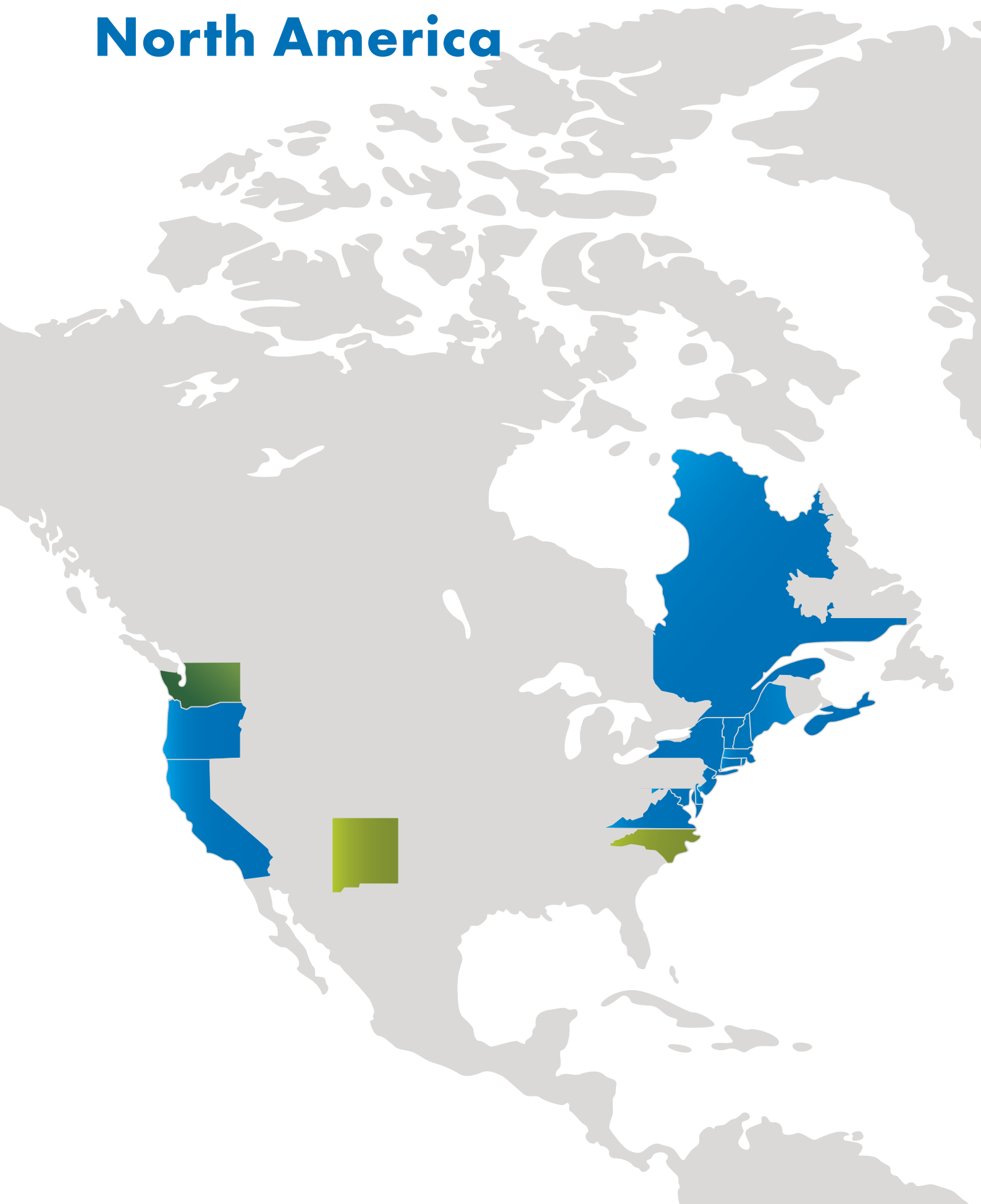
REGULATORY FRAMEWORK

The Greenhouse Gas Emissions Trading Scheme Order 2020[3]

The Climate Change Act 2008 (2050 Target Amendment) Order 2019[4]

3 https://www.legislation.gov.uk/uksi/2020/1265/contents/made
4 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
307.5 $MtCO_2$ (2022)

GASES
Several gases

OFFSETS AND CREDITS
Domestic[1]

ALLOCATION
Free allocation: Benchmarking
Free allocation with consignment
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: USD 22.43

TOTAL REVENUE
USD 18.23 billion since beginning of program
USD 3.99 billion[2] collected in 2021

SECTORS:

POWER

INDUSTRY

TRANSPORT*

BUILDINGS*

* Sectors represent upstream coverage

Broadest carbon pricing system in the US and one of the largest carbon markets in the world

Continued linkage with Québec

Price ceiling introduced in 2021; the 2022 price ceiling is USD 72.29

ETS DESCRIPTION

The California Cap-and-Trade Program began operation in 2012, with the opening of its tracking system for allocation, auction distribution, and trading of compliance instruments. Compliance obligations started in January 2013 under the first compliance period, which ended in 2014.

The program is implemented under the authority of the California Air Resources Board (CARB) and covers sources responsible for approximately 74 % of the state's GHG emissions. California has been part of the Western Climate Initiative (WCI) since 2007 and formally linked its cap-and-trade program with Québec's in January 2014.

YEAR IN REVIEW

In January 2021, major changes to the program took effect, including 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.

During the summer, CARB launched the Climate Change Scoping Plan update process, which seeks to develop policy strategies to achieve 2030 and 2045 targets. The Scoping Plan will be published during 2022.

By May 2021, prices reached record highs for California Carbon Allowances (CCAs), as observed by the auction settlement price and in reported prices for commodity exchange futures contract for near-month delivery and brokered transactions.

Emissions & Targets of California

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	343.6	(82 %)
Industrial Processes	33.1	(8 %)
Agriculture, Forestry and Other Land Use[3]	30.7	(7 %)
Waste	10.9	(3 %)
Total	**418.2**	

Energy Industries	105.1	(25 %)
Manufacturing Industries and Construction	20.9	(5 %)
Transport	165.4	(40 %)
Commercial, Institutional and Residential	40.7	(10 %)
Other Energy	11.5	(3 %)

1 California's Cap-and-Trade Program allows the use of offsets issued by linked jurisdictions (e.g., Québec).
2 Does not include revenue from the auction of consigned allowances.
3 Only includes categories "3A Livestock" and "3C Aggregate Sources and Non-CO_2 Emissions Sources on Land".

GHG REDUCTION TARGETS

By 2030: 40 % reduction from 1990 GHG levels (SB 32)

By 2045: Achieve carbon neutrality (Executive Order B-55-18)

ETS Size & Phases

COVERED EMISSIONS 2019

Verified ETS emissions
311.2 $MtCO_2e$[4]

74 %

GHGS COVERED

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

COMPLIANCE PERIODS

FIRST COMPLIANCE PERIOD: 2 years (2013–2014)
SECOND COMPLIANCE PERIOD: 3 years (2015–2017)
THIRD COMPLIANCE PERIOD: 3 years (2018–2020)
FOURTH COMPLIANCE PERIOD: 3 years (2021–2023)

CAP

FIRST COMPLIANCE PERIOD (2013–2014): The system started in 2013 with a cap of 162.8 $MtCO_2e$, declining to 159.7 $MtCO_2e$ in 2014, at a rate of approximately 2 % annually.

SECOND COMPLIANCE PERIOD (2015–2017): With the program expanding to include fuel distribution, the cap rose to 394.5 $MtCO_2e$ in 2015. The cap decline factor averaged 3.1 % per year in the second compliance period (2015–2017), reaching 370.4 $MtCO_2e$.

THIRD COMPLIANCE PERIOD (2018–2020): The cap in the third compliance period started at 358.3 $MtCO_2e$ and declined at an average annual rate of 3.3 % to 334.2 $MtCO_2e$ in 2020.

FOURTH COMPLIANCE PERIOD (2021–2023) AND BEYOND: During the period 2021–2030, the cap declines by about 13.4 $MtCO_2e$ each year, averaging about 4 % per year, to reach 200.5 $MtCO_2e$ in 2030.

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

SECTORS AND THRESHOLDS

FIRST COMPLIANCE PERIOD (2013–2014): Covered sectors included 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 CO_2 suppliers.

SECOND COMPLIANCE PERIOD AND BEYOND (2015–2030): 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 are covered by the program.

INCLUSION THRESHOLDS: Facilities emitting ≥25,000 tCO_2e per year. Electricity providers that import 25,000 tCO_2e per year or more from specified sources of electricity (i.e., where the imported electricity can be connected to a specific generator with a known emissions factor) are included. All electricity imported from unspecified sources (i.e., where the imported electricity cannot be connected to a specific generator) is deemed above the threshold, and a default emissions factor is applied.

OPT-IN COVERED ENTITIES: A facility in one of the covered sectors that emits less than 25,000 tCO_2e annually can voluntarily participate in the program. Opted-in entities are subject to all reporting, verification, enforcement, registration, and compliance obligations applicable to covered entities.

POINT OF REGULATION

Mixed

NUMBER OF COVERED FACILITIES

~500 facilities[5]

4 Covered emissions for the latest year for which there is both covered emissions and GHG emissions inventory data. Covered emissions data for 2020 are available at https://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/2020-ghg-emissions-2021-11-04.xlsx.
5 Approximately 330 registered covered/opt-in entities. These entities represent approximately 500 registered emitting sources/facilities.

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

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

FREE ALLOCATION: Industrial 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 "low", "medium", and "high" risk tiers based on levels of emissions intensity and trade exposure for each specific industrial sector.

FIRST COMPLIANCE PERIOD (2013–2014): The "Cap-and-Trade Regulation" as adopted in 2011 set assistance factors of 100 % for the first compliance period regardless of leakage risk.

SECOND COMPLIANCE PERIOD AND BEYOND (2015–2030): 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. 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. However, amendments to the "Cap-and-Trade Regulation" in 2013 delayed these assistance factor declines by one compliance period. Pursuant to AB 398, which was adopted in 2017, all assistance factors were changed to 100 % through 2030, citing continued vulnerability to carbon leakage. 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, during the period 2018–2024, waste-to-energy facilities.

FREE ALLOCATION WITH CONSIGNMENT: Electrical distribution utilities and natural gas suppliers receive free allocation on behalf of their ratepayers. 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 2021, about 62 % of total California-issued vintage 2021 allowances were made available through auction, which included allowances owned by CARB (about 37 %) and allowances consigned to auction by utilities (about 25 %).

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 clearing 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.

USE OF REVENUES

REVENUE FROM AUCTION OF CALIFORNIA-OWNED ALLOWANCES: Most of California's revenue goes to the Greenhouse Gas Reduction Fund, of which at least 35 % must benefit disadvantaged and low-income communities. The fund also invests the proceeds in projects that reduce GHG emissions.

REVENUE FROM AUCTION OF UTILITY-OWNED ALLOWANCES: 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.

Flexibility & Linking

BANKING AND BORROWING

Banking is allowed, subject to a holding limit on allowances to which all entities in the system are held. The holding limit varies based on the year's cap and decreases each year. 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 future vintage allowances is not allowed.

OFFSETS AND CREDITS

Offsets, issued by CARB or by the authority of a linked cap-and-trade system, are compliance instruments under the California Cap-and-trade Program.

QUALITATIVE LIMITS: 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; and
- rice cultivation projects.

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 described below.

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.

QUANTITATIVE LIMITS: For 2013–2020 emissions, entities could meet up to 8 % of their obligations using offset credits. For emissions after 2020, entities are subject to new offset usage limits established by AB 398. The share of offsets that can be used to fulfil the compliance obligation decreases to 4 % per year for 2021–2025 before increasing to 6 % from 2026 emissions.

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 compliance obligations for 2021 emissions, no more than one half of any entity's offset usage limit can come from offset projects that do not provide direct environmental benefits to the state (DEBS).

Projects located within California are automatically 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 the state. Recent regulatory amendments specify the criteria that will be used for determining DEBS.

LINKS WITH OTHER SYSTEMS

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

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 the start of November (or the first business day thereafter). Compliance instruments equal to all remaining emissions must be surrendered by the start of November (or the first business day thereafter) of the year following the last year of a compliance period.

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".

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Covered entities, opt-in covered entities and Voluntarily Associated Entities can participate in the program. Voluntarily Associated Entities are approved individuals or entities that intend to:

- purchase, hold, sell, or retire compliance instruments but are not covered under the program;
- operate an offset project registered with CARB; or
- provide clearing services and derivative clearing services as qualified entities.

Voluntarily Associated Entities must be in the United States and have an approved Compliance Instrument Tracking System Service (CITSS) account. There are additional eligibility criteria that apply, including for individual market participants.

MARKET TYPES:

Primary: State-owned and consigned allowances are offered through quarterly allowance auctions organized jointly with Québec. Auctions are administered by the Western Climate Initiative; Inc. Companies can also trade allowances and offsets directly amongst themselves within CITSS.

Secondary: Allowances, offsets, and financial derivatives are traded in the secondary market in the Intercontinental Exchange (ICE) or the CME group platforms. Any company qualified to access ICE or CME can trade directly or through a future commission merchant. Companies can also trade directly over the counter but must have a CITSS account to take delivery of compliance instruments.

LEGAL STATUS OF ALLOWANCES: CCAs are defined as limited tradable authorizations to emit up to one tonne of CO_2e. According to the California Code of Regulations, an allowance does not constitute property or bestow property rights and cannot limit the authority of the regulator to terminate or limit such authorization to emit.

MARKET STABILTY PROVISIONS

AUCTION RESERVE PRICE: USD 19.70 per allowance in 2022. The auction reserve price increases annually by 5 % plus inflation, as measured by the Consumer Price Index.

RESERVE: Allowances from each annual cap are placed in an Allowance Price Containment Reserve (APCR). Prior to amendments mandated by AB 398, these allowances were spread across three reserve tiers in an earlier APCR. Pursuant to AB 398, from 2021 onward, these allowances have been placed into two price tiers and a price ceiling.

Specifically, AB 398 directed where allowances from the earlier APCR would be distributed. Two-thirds of those allowances have been spread evenly across the two 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 into the price ceiling. In addition, the "Cap-and-Trade Regulation" also set 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 greater than or equal to 60 % of the lowest price tier. CARB will also offer the third quarter reserve sale just before the compliance obligation deadline.

At the price ceiling, a covered entity can purchase CCAs (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 tonne for tonne basis. Sales at the price ceiling will only be conducted if no allowances remain at the two lower tiers and a covered entity has demonstrated that it does not have sufficient compliance instruments in its accounts for that year's compliance event.

In 2022, the two cost containment reserve tiers and the price ceiling are set at USD 46.05, USD 59.17, and USD 72.29, respectively. Tier prices increase by 5 % plus inflation (as measured by the Consumer Price Index).

Other Information

INSTITUTIONS INVOLVED

CARB

EVALUATION/ETS REVIEW

Pursuant to requirements in existing legislation (AB 32, AB 197, and AB 398), CARB must update the "California Climate Change Scoping Plan" at least every five years and must provide annual reports to various committees of the legislature and the board. 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.

REGULATORY FRAMEWORK

Global Warming Solutions Act of 2006 (AB 32)[6]
AB 398[7]
2018 amendments to the 2021–2030 period[8]
Current regulation can be found on the CARB website[9]

6 https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200520060AB32
7 http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB398
8 https://ww3.arb.ca.gov/regact/2018/capandtrade18/ct18fro.pdf
9 https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program

Canada

Carbon pricing in place across Canada

Provinces and territories may implement their own carbon pricing systems

All pricing systems across Canada must meet updated federal benchmark for 2023–2030

Since 2019, carbon pricing has been in place across all Canadian provinces and territories. Based on the Pan-Canadian Approach to Pricing Carbon Pollution, adopted in 2016, Canadian jurisdictions have flexibility to design and implement their own pricing system tailored to local needs, provided it meets minimum national stringency criteria (known as the federal benchmark).

To meet the federal benchmark, provinces and territories can design several types of carbon pricing systems, including:

- an explicit price-based system:
  - a carbon levy on fossil fuels; or
  - a combination ("hybrid") of a carbon levy on fossil fuels and a performance-based emissions system for industrial emitters.
- a cap-and-trade system.

All systems are required to apply to a common and broad set of sources. According to the current benchmark, at a minimum, carbon pricing should apply to substantively the same sources as British Columbia's carbon tax, i.e., covering fuels combusted for electricity, heating, transport, and industry.

The benchmark requires systems to increase in stringency to contribute to Canada's national targets. The initial legislated increases to 2022 were set as follows:

Explicit price-based systems have a minimum carbon price of CAD 50 (USD 39.88) in 2022.

Cap-and-trade systems must have a 2030 emissions reduction target equal to or greater than Canada's national target and must have declining caps to at least 2022. Jurisdictions must demonstrate that the resulting expected emissions reductions are at least equal to those that would have resulted from a carbon tax with the above-described price trajectory.

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

FEDERAL CARBON POLLUTION PRICING "BACKSTOP" SYSTEM: The "Greenhouse Gas Pollution Pricing Act" (GGPPA), adopted in 2018, establishes the framework for the federal backstop system. The federal backstop consists of 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 tCO_2e (USD 15.95) in 2019 and has been increasing annually by CAD 10 (USD 7.98), until it reaches CAD 50 per tCO_2e (USD 39.88) in 2022.
- A performance-based system for industries, known as the **federal Output-Based Pricing System (OBPS)**. The federal OBPS is designed to provide a carbon price signal for industrial emitters to reduce their GHG emissions, while mitigating the risk of carbon leakage and competitiveness impacts due to carbon pollution pricing.

The OBPS applies to facilities in emissions-intensive and trade-exposed industrial and electricity sectors that emit equal to 50,000 tCO_2e or more annually. Smaller facilities with annual emissions of 10,000 tCO_2e or more from sectors at risk of carbon leakage and adverse competitiveness impacts can apply to participate voluntarily.

The OBPS sets a performance standard (i.e., GHG emissions per unit of output) based on the national production-weighted average emissions intensity for a given activity in covered sectors. Facilities are required to provide compensation for emissions that exceed the standard. Facilities performing better than the standard are issued surplus credits that 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.

Revenues from all provincial and territorial carbon pricing systems remain in the jurisdiction of origin for use according to their needs. All direct proceeds from the federal backstop system also remain in the jurisdiction of origin.

The federal government provides guidance for using carbon pollution pricing proceeds[1] in a way that maintains the carbon price signal while ensuring affordability for households, particularly vulnerable households, and supporting affected sectors.

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.

1 https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/pricing-pollution/carbon/Carbon%20Pricing%20Return%20Guide-EN.pdf

LATEST DEVELOPMENTS AND OUTLOOK FOR 2023–2030: In March 2021, the Supreme Court of Canada upheld the constitutionality of the federal GGPPA in response to a legal challenge brought by Alberta, Ontario, and Saskatchewan. This ruling allows the federal government to regulate carbon emissions and require provincial carbon pricing regimes to meet minimum national standards.

In 2020–2021, an independent review of carbon pricing systems in Canada was undertaken and in August 2021 the Government of Canada issued an update to the Pan-Canadian Approach to Pricing Carbon Pollution (the federal benchmark) for 2023–2030. The updated benchmark replaces the 2018–2022 benchmark and associated guidance. It builds on key principles identified by the 2016 federal-provincial-territorial Working Group on Carbon Pricing Mechanisms.

The update strengthens the federal benchmark criteria in the following ways, in line with Canada's 2020 strengthened climate plan, *A Healthy Environment and a Healthy Economy:*

- **Minimum national carbon pollution prices:** the price trajectory is strengthened and extended to 2030, with the minimum rate increasing by CAD 15 (USD 11.96) each year, to reach CAD 170 (USD 135.58) in 2030.
- **Recognized carbon pollution pricing systems:** As in the previous phase, provinces and territories can choose to implement an explicit price-based system, a hybrid system (combination of carbon levy and OBPS) or a cap-and-trade system. Jurisdictions may implement a partial explicit price-based system designed to work with the federal backstop, provided it fully replaces either the federal fuel charge or the federal OBPS.
- **Minimum criteria for recognized carbon pricing systems:**
  - Common scope and coverage: at minimum, the same proportion of emissions as would be covered by the federal backstop in their jurisdiction. Industrial process emissions must be covered.
  - Maintaining the carbon pollution price signal: provincial/territorial governments must not weaken the price signal with measures that negate the price signal (for example, reducing fuel taxes in order to offset the carbon price).
  - Minimum quality standards for offset credits allowed for compliance.

All provinces and territories must establish systems that align with the benchmark requirements out to 2030. Systems that are in place in 2023 will do so until at least the end of 2026; the same applies for jurisdictions where the federal backstop is in place. Consequently, systems will change less frequently, ensuring more stability for consumers and businesses.

All provinces and territories must propose a carbon pricing system for 2023–2030 that meets the updated benchmark criteria. For provinces and territories where the federal backstop system currently applies, any new proposed system will not start before January 2023. Existing provincial/territorial systems and the recently implemented OBPS in New Brunswick (since 2021) and Ontario (since 2022) can continue to apply in 2022 as long as they meet the federal benchmark.

An interim review of the federal benchmark will be undertaken in 2026.

Emissions & Targets of Canada

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	589.3	(81 %)
Industrial Processes	54.3	(7 %)
Agriculture, Forestry and Other Land Use[3]	59.1	(8 %)
Waste	27.6	(4 %)
Total	**730.2**	

Energy Industries	188.8	(26 %)
Manufacturing Industries and Construction	63.9	(9 %)
Transport	186.5	(26 %)
Commercial, Institutional and Residential	80.8	(11 %)
Other Energy	69.3	(9 %)

GHG REDUCTION TARGETS

By 2030: 40–45 % below 2005 levels (NDC)

By 2050: net-zero target by 2050 (according to the Canadian Net-Zero Emissions Accountability Act[2])

Other Information

INSTITUTIONS INVOLVED

Environment and Climate Change Canada
Finance Canada
Canadian provinces and territories

EVALUATION/ETS REVIEW

Pan-Canadian Approach to Pricing Carbon Pollution – Interim Report 2020[3]
Greenhouse Gas Pollution Pricing Act Annual Report for 2019[4]
Pan-Canadian Framework on Clean Growth and Climate Change: annual reports[5]

REGULATORY FRAMEWORK

Pan-Canadian Framework on Clean Growth and Climate Change[6]
A Healthy Environment and a Healthy Economy[7]
Update to the Pan-Canadian Approach to Carbon Pollution Pricing 2023–2030[8]
Output-Based Pricing System Regulations[9]
Greenhouse Gas Pollution Pricing Act[10]
Net-Zero Emissions Accountability Act[11]

2 https://laws-lois.justice.gc.ca/PDF/C-19.3.pdf
3 https://publications.gc.ca/collections/collection_2021/eccc/En4-423-1-2021-eng.pdf
4 https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/greenhouse-gas-annual-report-2019.html
5 https://www.canada.ca/en/environment-climate-change/services/climate-change/pan-canadian-framework-reports.html
6 http://publications.gc.ca/collections/collection_2017/eccc/En4-294-2016-eng.pdf
7 https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/climate-plan/healthy_environment_healthy_economy_plan.pdf
8 https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/carbon-pollution-pricing-federal-benchmark-information/federal-benchmark-2023-2030.html
9 https://laws-lois.justice.gc.ca/PDF/SOR-2019-266.pdf
10 https://laws-lois.justice.gc.ca/PDF/G-11.55.pdf
11 https://laws-lois.justice.gc.ca/PDF/C-19.3.pdf

Massachusetts

Massachusetts Limits on Emissions from Electricity Generators

CAP
8.0 $MtCO_2$ (2022)

GASES
CO_2 only

ALLOCATION
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: USD 8.40

TOTAL REVENUE
USD 71.4 million (since beginning of program)
USD 44.3 million (collected in 2021)

In force
Under development
Under consideration

ETS DESCRIPTION

The Massachusetts Limits on Emissions from Electricity Generators began operating in 2018 and covers CO_2 emissions from the power sector. It complements RGGI to help ensure that Massachusetts achieves its mandatory mitigation targets. Electricity generators in the state must comply, i.e. hold and surrender allowances, with both RGGI and the Massachusetts program.

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). In response to the ruling, the regulation "310 CMR 7.74" was adopted that required Massachusetts to establish a statewide cap-and-trade program, in addition to its existing participation in RGGI, to control emissions located specifically in Massachusetts. 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, establishing a mid-century statewide net zero GHG emissions limit.

YEAR IN REVIEW

The share of allowances distributed through free allocation was 50 % in 2020. The system changed to full auctioning in 2021. In March 2021, Massachusetts passed a new climate law with binding emission reduction targets of 50 % by 2030 and 75 % by 2040, below 1990 levels, as well as net-zero emissions by 2050.

The "310 CMR 7.74" regulation required a review of the Massachusetts ETS by the end of 2021. The market monitor reports, prepared by Potomac Economics for the Massachusetts Department of Environmental Protection (MassDEP), have identified liquidity issues in the market. To mitigate these issues, the program review considered the following actions: limits on allowance banking, auctioning of future allowances, and adjustment of auction bid limits.

SECTORS:

POWER

Complements RGGI to help ensure that Massachusetts achieves its mandatory mitigation targets

Three years of full compliance from all regulated entities

Program is under review

Emissions & Targets of Massachusetts

GHG EMISSIONS EXCL. LULUCF, 2017 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	65.3	(92 %)
Industrial Processes	3.8	(5 %)
Agriculture, Forestry and Other Land Use[3]	0.1	(0 %)
Waste	0.8	(1 %)
Others	0.8	(1 %)
Total	**70.8**	

GHG REDUCTION TARGETS

By 2030: 50 % GHG emissions reduction below the 1990 level (An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy)

By 2040: 75 % GHG emissions reduction below the 1990 level (An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy)

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 (An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy)

ETS Size & Phases

COVERED EMISSIONS 2020

8 %

GHGS COVERED

CO_2

CAP

The cap declines annually by 223,876 tCO_2 until it reaches 1.8 $MtCO_2$ by 2050.

ANNUAL CAPS:

2019: 8.7 $MtCO_2$
2020: 8.5 $MtCO_2$
2021: 8.2 $MtCO_2$
2022: 8.0 $MtCO_2$

SECTORS AND THRESHOLDS

Large electricity generators subject to RGGI (with an installed capacity of or greater than 25 MW)

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

25 (2021)

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

AUCTIONING: From 2019 onwards, allowances were partially auctioned, with 25 % sold in 2019, 50 % in 2020, and 100 % from 2021 onwards. Currently, auctions take place on a quarterly basis. The results are included in market monitoring reports posted on the program's web page.

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

USE OF REVENUES

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

Flexibility & Linking

BANKING AND BORROWING

Banking is allowed, but restrictions apply to guarantee that emissions in any year cannot exceed the previous year's cap. This is done by annually adjusting the number of auctioned allowances downward to compensate for banked allowances.

Borrowing is not allowed, but the possibility of "emergency deferred compliance" exists. The provision allows an electricity generating facility to defer, for one year, compliance for a portion or the entirety of the emissions emitted during an emergency. Those emissions are required to be offset on a two for one basis in that following year. An emergency is defined as "a period during when the regional transmis-

sion organization has issued an alert that an abnormal condition affecting the reliability of the power system exists or is anticipated in Massachusetts".

OFFSETS AND CREDITS

The use of offsets is not allowed.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Regulated entities must report the CO_2 emissions for the previous calendar year by the start of March.

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 MassDEP may choose to conduct audits.

ENFORCEMENT

If 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 non-compliance.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities

MARKET TYPES:

Primary: The allowance auctions use a sealed bid, uniform price auction format. No bidder can purchase more than 50 % of the allowances offered for sale in any one auction. Auction results are published no later than 45 calendar days after the sale.

Secondary: Compliance entities may transfer allowances to other compliance entities by submitting a notice of transfer to MassDEP at any time except during the month of March.

The Massachusetts Carbon Allowance Registry is used to track the ownership of allowances. Potomac Economics monitors the conduct of market participants in the auctions and in the secondary market to identify indications of anti-competitive conduct.

MARKET STABILTY PROVISIONS

AUCTION RESERVE PRICE: The auctions have a reserve price of USD 0.50 per allowance.

Other Information

INSTITUTIONS INVOLVED

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

EVALUATION/ETS REVIEW

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

REGULATORY FRAMEWORK

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

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

New Mexico

In force

Under development

Under consideration

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

The New Mexico Environment Department has developed a five-year climate action plan

Implementing policies to cut emissions in multiple sectors

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 limits on CO_2 and other GHG emissions in New Mexico. Over the course of 2021, state agencies continued to evaluate climate actions, including the option for a future market-based program potentially through cooperating with other states that already operate cap-and-trade programs.

The New Mexico Environment Department is in the process of adopting California's Advanced Clean Car standards, aimed at cutting transport emissions. The state has also implemented incentives for sustainable building and clean hydrogen production and distribution, as well as implemented standards to reduce carbon intensity in transportation fuels.

If approved, the Clean Future Act will embed into state statute GHG reduction targets of 50 % by 2030 from 2005 levels and net zero by 2050.

Emissions & Targets of New Mexico

GHG EMISSIONS EXCL. LULUCF, 2018 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	95.2	(89 %)
Industrial Processes	2.7	(2 %)
Agriculture	7.3	(7 %)
Waste	1.8	(2 %)
Total	**107.5**	

Energy Industries	39.8	(37 %)
Manufacturing Industries and Construction	2.1	(2 %)
Transport	15.8	(15 %)
Commercial, Institutional and Residential	3.9	(4 %)
Other Energy	33.6	(31 %)

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

REGULATORY FRAMEWORK

Executive Order 2019-003 on Addressing Climate Change and Energy Waste Prevention (EO 2019-003)[1]

1 https://www.governor.state.nm.us/wp-content/uploads/2019/01/EO_2019-003.pdf

New York City

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) in 2021 published the results of a study assessing the feasibility of a citywide trading program. The trading program would be supplemental to Local Law 97 (LL97).

LL97, 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 metric ton of CO_2e in excess of their cap. Buildings in which more than 35 % of the dwelling units are rent regulated have an alternate compliance pathway, which includes implementing a list of prescriptive energy conservation measures. After LL97 takes effect in 2024, the cap will become progressively stricter until 2050.

LL97 does not inherently provide for emissions credit trading between regulated building owners. However, in accordance with the requirement to study the feasibility of a citywide trading scheme as an alternative compliance pathway, NYC MOS published the corresponding results and recommendations in June 2021. The study assessed and outlined two trading program proposals to advance NYC's policy goals and compared them to the implementation of LL97 without the trading aspect. Proposal #1 focuses on an auction system, while Proposal #2 analyzes a decentralized allocation of credits.

The feasibility study found that, when compared with LL97 implementation without trading, the suggested trading programs for NYC buildings could yield more efficient GHG reductions, greater investment in the local economy and less local air pollution.

If NYC opts to progress with a trading program, it will require new legislation at the local level. Should the city decide to pursue Proposal 1, it would also require State legislative authorization to implement the suggested auction.

In December 2021, the New York Climate Action Council approved a draft Scoping Plan for New York's GHG reduction strategy. Among the included emission reduction opportunities, it opened discussion for carbon pricing.

In force

Under development

Under consideration

Study confirms feasibility of a NYC trading program for large buildings

Two proposals for trading programs compare auctioning and decentralized credit allocation

Emissions & Targets of New York City

GHG EMISSIONS EXCL. LULUCF, 2020 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	46.3	(96 %)
Waste	2.1	(4 %)
Total	**48.4**	

Manufacturing Industries and Construction	4.0	(9 %)
Transport	12.3	(25 %)
Commercial, Institutional and Residential	29.5	(61 %)
Other Energy	0.5	(1 %)

GHG REDUCTION TARGETS

By 2030: 40 % below 2005 levels city-wide (50 % for government buildings)

By 2050: Net-zero emissions citywide; 80 % below 2005 for the building sector (OneNYC 2050 Strategy)

Other Information

INSTITUTIONS INVOLVED

NYC Mayor's Office of Sustainability
NYC Department of Buildings
NYC Office of Climate Policy and Programs

REGULATORY FRAMEWORK

Local Law 97[1]
Climate Mobilization Act[2]

1 https://www1.nyc.gov/assets/buildings/local_laws/ll97of2019.pdf
2 https://www1.nyc.gov/site/sustainability/legislation/climate-mobilization-act-2019.page#:~:text=The%20Climate%20Mobilization%20Act%20is,York%20City%2C%20including%20the%20following

North Carolina

North Carolina's Department of Environmental Quality (DEQ) released the "Clean Energy Plan" (CEP) in 2019 to outline policy recommendations to reach the state's GHG reduction targets of 40 % below 2005 levels by 2025 (Executive Order No. 80) and of 50 % by 2030 (Executive Order No. 246). A core component of the CEP is to reduce electricity sector GHG emissions to 70 % below 2005 levels by 2030 and attain overall carbon neutrality by 2050.

The DEQ commissioned an academic report to evaluate policy options to decarbonize the electricity sector, released in March 2021. The report lists the introduction of an ETS and participation in the Regional Greenhouse Gas Initiative (RGGI) as an option to achieve the reductions sought.

In July 2021, North Carolina's Environmental Management Commission (EMC) instructed the DEQ to start a rulemaking process to establish an ETS that is consistent with the design features of the Model Rule of the RGGI. Aligning the system's design features to that of RGGI would enable the state to join the regional initiative.

According to the Air Quality Committee Meeting outcomes, any start date before 2023 is unlikely due to the length of the rulemaking process.

In October of 2021, North Carolina (NC) passed House Bill (HB) 951 which requires the NC Utilities Commission to take all reasonable steps to reduce CO_2 emissions by 70 % by 2030, compared with 2005 levels, and achieve carbon neutrality by 2050. It allows for 5 % of the reductions to be achieved through the use of offsets rather than actual reductions. It also allows for financing early retirement of coal-fired power plants via securitization. Lastly, electric public utilities receive some freedom in rate making in order to address emission reduction needs (e.g. multi-year rate making, decoupling rate making and performance-based rate making). The CO_2 reductions must be achieved following a least cost path.

In force

Under development

Under consideration

Clean Energy Plan targets GHG emission reductions in the power sector

Rulemaking process to establish ETS consistent with RGGI Model Rule underway

North Carolina completed electricity modeling and policy discussion of various carbon reduction strategies in early 2021

House Bill 951 requires the NC Utilities Commission to take all reasonable steps to reduce CO_2 emissions to 70 % by 2030 and achieve carbon neutrality by 2050

Emissions & Targets of North Carolina

GHG EMISSIONS EXCL. LULUCF, 2017 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	123.6	(82 %)
Industrial Processes	7.2	(5 %)
Agriculture, Forestry and Other Land Use[3]	10.5	7 %)
Waste	8.8	(6 %)
Total	**150.1**	

GHG REDUCTION TARGETS

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

By 2030: 50 % of total emissions (Executive Order No. 246) and 70 % of electricity sector emissions compared to 2005 (CEP)

By 2050: Achieve carbon neutrality (Executive Order No. 246)

Other Information

INSTITUTIONS INVOLVED

North Carolina Department of Environmental Quality
Environmental Management Commission
NC Utilities Commission

REGULATORY FRAMEWORK

Executive Order No. 80[1]
Clean Energy Plan[2]
HB 951[3]
Executive Order No. 246[4]

1 https://files.nc.gov/governor/documents/files/EO80-%20NC%27s%20Commitment%20to%20Address%20Climate%20Change%20%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
3 https://ncleg.gov/Sessions/2021/Bills/House/PDF/H951v6.pdf
4 https://governor.nc.gov/media/2907/open

Nova Scotia

Nova Scotia Cap-and-Trade

CAP
12.1 $MtCO_2e$ (2022)

GASES
Several gases

ALLOCATION
Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: CAD 28.90 (USD 23.05)

TOTAL REVENUE
CAD 73.5 million (USD 57.2 million) since beginning of program
CAD 44.8 million (USD 35.7 million) in 2021

In force
Under development
Under consideration

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 established 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 (WCI), which provides technical services and support for the province's cap-and-trade program. It is not linked to any jurisdictions.

Nova Scotia's "Environmental Goals and Climate Change Reduction Act" 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 these targets.

YEAR IN REVIEW

In 2021, Nova Scotia held two auctions. The minimum price for these auctions was set at CAD 21.09 (USD 16.82). In June, when 767,000 allowances were on offer, the auction cleared at a record high of CAD 36.71 (USD 29.28), 75 % above the floor price and selling all allowances on offer. The November auction, with 912,000 allowances on offer, was undersubscribed and 790,000 allowances sold at the auction's floor price.

The current federal approval for the province's carbon pricing system expires after 2022 and Nova Scotia is reviewing options for post-2022 carbon pricing. Nova Scotia held a public consultation in 2021, which included carbon pricing as well as broader environmental goals and climate change policies.

SECTORS:

POWER

INDUSTRY

BUILDINGS*

TRANSPORT*

*Sectors represent upstream coverage

Two auctions held in 2021

Government working on details for the post-2022 pricing approach

In compliance with Pan-Canadian carbon pricing framework

Emissions & Targets of Nova Scotia

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	14.7	(91 %)
Industrial Processes	0.5	(3 %)
Agriculture	0.4	(2 %)
Waste	0.6	(4 %)
Total	**16.2**	

Energy Industries	6.7	(41 %)
Manufacturing Industries and Construction	0.4	(3 %)
Transport	5.6	(35 %)
Commercial, Institutional and Residential	1.8	(11 %)
Other Energy	0.2	(1 %)

GHG REDUCTION TARGETS

By 2030: 53 % below 2005 levels (Environmental Goals and Climate Change Reduction Act)

By 2050: Net-zero emissions (Environmental Goals and Climate Change Reduction Act)

ETS Size & Phases

COVERED EMISSIONS 2019

Verified ETS emissions
13.7 $MtCO_2e$

85 %

GHGS COVERED

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

PHASES

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

CAP

FIRST COMPLIANCE PERIOD (2019–2022):
2019: 13.7 $MtCO_2e$
2020: 12.7 $MtCO_2e$
2021: 12.3 $MtCO_2e$
2022: 12.1 $MtCO_2e$

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

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

POINT OF REGULATION

Mixed

NUMBER OF COVERED FACILITIES

26 entities (December 2021)

Allowance Allocation & Revenue

ALLOWANCE 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 in mid-January of each year. The remaining 25 % is 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 BAU projections (established by the regulator) for GHG emissions from the electricity sector for the

compliance period. ~5.5 million allowances were freely allocated in 2020 and ~5.1 million allowances in 2021, declining to just over 5 million in 2022. Allowances are allocated in mid-January of each year.

AUCTIONING: The province holds two to four auctions per calendar year. Two auctions were held in 2021: the first in June and the second in November.

Minimum price: CAD 21.09 (USD 16.82) for auctions held in 2021; 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.

USE OF REVENUES

A Green Fund was established in 2019 to receive and distribute revenues from the program. In 2020–21, CAD 28.8 million (USD 22.97 million) was invested in renewable energy and energy efficiency programs, youth employment in environment and climate change fields, climate change adaptation, and program administration. In 2021–22, CAD 36.5 million (USD 29.11 million) was invested in renewable energy, low income and small business energy efficiency programs, community-based climate change grants, flood mapping, and program administration.

Flexibility & Linking

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. A study was completed in 2020 to explore offset potential in the province's carbon market.

LINKS WITH OTHER SYSTEMS

Nova Scotia does not plan to link at this time.

Compliance

COMPLIANCE PERIOD

Four years (2019–2022) to provide year-to-year flexibility (see "ETS Size and Phases" above).

By December 2023, entities must true-up and surrender one allowance for each tonne of CO_2e 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.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities (for inclusion thresholds see "Sectors and Thresholds")

MARKET TYPES:

Primary: The province holds two to four auctions per calendar year. Mandatory participants registered in the program may take part in an auction and must submit a financial guarantee to the province before the auction. Regulated entities have the option to consign allowances to auction and purchase limits apply in the auctions to secure market functioning (see "Allowance Allocation"). Nova Scotia Environment and Climate change holds the auctions. The auctions are administered through Western Climate Initiative's Compliance Instrument Tracking Service System and Auction Platform.

Secondary: Over-the-counter trading of allowances between participants is allowed. Sellers must provide information to both the intended buyer and the provincial government, including: the quantity, type and vintage of allowances; the settlement price and how it was reached; and type of trade agreement.

LEGAL STATUS OF ALLOWANCES: Allowances are not considered financial instruments in Nova Scotia.

MARKET STABILTY PROVISIONS

INSTRUMENT NAME: Reserve

TRIGGERS: 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.

Other Information

INSTITUTIONS INVOLVED

Nova Scotia Environment and Climate Change

EVALUATION/ETS REVIEW

Annual reports on the program are published by the regulator.

REGULATORY FRAMEWORK

Nova Scotia's Cap and Trade Program Regulatory Framework[1]
Cap-and-Trade Program Regulations, Section 112Q of the Environment Act[2]
Quantification, Reporting, and Verification of Greenhouse Gas Emissions Regulations[3]
Standards for Quantification, Reporting, and Verification of Greenhouse Gas Emissions[4]
Environmental Goals and Climate Change Reduction Act[5]
Environment Act[6]

1 https://climatechange.novascotia.ca/sites/default/files/Nova-Scotia-Cap-and-Trade-Regulatory-Framework.pdf
2 https://www.novascotia.ca/just/regulations/regs/envcapandtrade.htm
3 https://www.novascotia.ca/just/regulations/regs/envqrv.htm
4 https://climatechange.novascotia.ca/sites/default/files/uploads/QRV_Standards.pdf
5 https://nslegislature.ca/sites/default/files/legc/statutes/environmental%20goals%20and%20climate%20change%20reduction.pdf
6 https://nslegislature.ca/sites/default/files/legc/PDFs/annual%20statutes/2017%20Fall/c010.pdf

Oregon

Oregon Climate Protection Program

CAP
28 $MtCO_2e$ (2022)

GASES
Several gases

OFFSETS AND CREDITS
Domestic

ALLOCATION
Free Allocation

In force

Under development

Under consideration

SECTORS:

POWER[1]*

INDUSTRY*

BUILDINGS*

TRANSPORT*

**Sectors represent upstream coverage for liquid fuels and natural gas supply*

The Environmental Quality Commission adopted rules that establish a new Climate Protection Program

Program includes an ETS for fuel suppliers

First compliance period is 2022–2024

Priority to environmental justice and impacted communities

ETS DESCRIPTION

In December 2021, the Environmental Quality Commission (EQC) adopted the rules for the Climate Protection Program (CCP) which started in January 2022. The CPP places a declining limit on GHG emissions from suppliers of liquid fuels and propane and natural gas utilities, also dubbed local distribution companies.

Each year the Department of Environmental Quality (DEQ) will distribute free compliance instruments to fuel suppliers according to the declining cap. After every compliance period (three years), entities will have to surrender compliance instruments to cover their emissions. Entities can bank compliance instruments for future periods or trade their unused instruments with other covered entities.

For the first compliance period (2022–2024), covered suppliers may cover up to 10 % of their compliance obligations with community climate investment credits (CCI), which are earned by contributing funds to third-party entities to implement projects that reduce GHG emissions in Oregon. Funds may only be contributed to DEQ-approved third parties called CCI entities. Priorities include reducing emissions at least one $MtCO_2e$ on average per CCI credit, reducing non-GHG emissions, promoting benefits for environmental justice communities, and accelerating the transition from fossil fuels to low carbon energy sources. Over time, the cap on use will increase to 20 %.

YEAR IN REVIEW

In December 2021, EQC adopted rules that establish the CPP, culminating a process which began in January 2021 with the first meeting of the Rulemaking Advisory Committee (RAC). The 34-member RAC offered a diversity of perspectives, expertise and firsthand experience on program goals and design. There were also opportunities for the public to provide comments throughout the RAC process, as well as formal consultations with tribal governments and a formal public comment after the proposed rule was released. The agency received over 7,000 comments in response to the proposed rule. After reviewing comments, DEQ updated the proposed rule for presentation and adoption by the EQC.

The CPP establishes declining mandatory limits for fuel suppliers and covers stationary sources for covered emissions from industrial processes and fuel combustion. Stationary sources will not be subject to a mandatory declining cap under the proposed regulation but will be required to implement actions to reduce covered emissions based on a ‘Best available emission reduction’ (BAER) determination from DEQ every five years. The BAER determination will include actions and a timeline to be followed by the covered entity.

1 Excludes natural gas used at electricity generation facilities.

Emissions & Targets of Oregon

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Electricity use	19	(29 %)
Natural gas use	8	(12 %)
Agriculture	7	(11 %)
Transport	23	(35 %)
Other Residential and Commercial	4	(6 %)
Other Industrials	4	(6 %)
Total	**65**	

GHG REDUCTION TARGETS

By 2035: 50 % reduction from 2017–2019 GHG levels

By 2050: 90 % reduction from 2017–2019 GHG levels

ETS Size & Phases

COVERED EMISSIONS 2022

Covered emissions under the cap
28 $MtCO_2e$[2]

43 %

GHGS COVERED

CO_2, CH_4, N_2O and HGWP gases (including HFCs, PFCs, SF_6 and NF_3 from stationary sources).

COMPLIANCE PERIODS

First Compliance Period: 3 years (2022–2024)
Second Compliance Period: 3 years (2025–2027)
Third Compliance Period: 3 years (2028–2030)
Fourth Compliance Period: 3 years (2031–2033)

CAP

The annual cap on emissions from covered fuel suppliers will be based on average 2017–2019 reported emissions. For 2022, the sectoral cap on emissions for covered fuel suppliers will be 28.2 $MtCO_2e$. By 2035, the cap will decline to 15.0 $MtCO_2e$ and by 2050 to 3 $MtCO_2e$. The DEQ will adjust the cap as it lowers the threshold for regulation, bringing a greater portion of the fuels sector into the program.

The 2050 cap is a 90 percent reduction from 2017 to 2019 average emissions calculated using the lowest program threshold of 25,000 $MtCO_2e$.

SECTORS AND THRESHOLDS

The program covers two types of fuel suppliers:

- Local distribution companies, dubbed natural gas utilities, are covered for emissions produced from the combustion of supplied natural gas, excluding natural gas used for electricity generation. All such utilities in the state are included.
- Suppliers of liquid fuels and propane, which are included into the program based on the following thresholds:

INCLUSION THRESHOLDS FOR SUPPLIERS OF LIQUID FUELS AND PROPANE

First Compliance Period (2022–2024): if emissions produced from supplied fuels meet or exceed 200,000 tCO_2e in 2018 or any subsequent year.

Second Compliance Period (2025–2027): if emissions meet or exceed 100,000 tCO_2e in 2021 or any subsequent year.

Third Compliance Period (2028–2030): if emissions meet or exceed 50,000 tCO_2e in 2024 or any subsequent year.

Fourth Compliance Period (2031-onwards): if emissions meet or exceed 25,000 tCO_2e in 2027 or any subsequent year.

2 Due to the system only starting in 2022, coverage given here represents the 2022 cap as a proportion of 2019 emissions.

POINT OF REGULATION
Upstream

NUMBER OF COVERED FACILITIES
Suppliers of liquid fuels and propane: 15
Local distribution companies: 3

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

DEQ generates the compliance instruments in amounts equal to each annual emissions cap and allocates them for free to covered fuel suppliers as follows:

- Natural gas utilities receive a fixed number of instruments for each year under the cap. The number of allowances reduces at the same rate as the cap, approx. 4 % each year during the first compliance period.
- Suppliers of liquid fuels and propane receive instruments proportionate to their share of the total covered emissions. The calculation considers the emissions from biofuels to incentivize fuel switching. This proportion is updated annually with a rolling three-year average of fuel suppliers' relative proportions.
- A proportion of the compliance instruments will be held in a reserve for new entrants and for liquid fuel suppliers which do not have three years of emissions data to calculate the correct proportion of their emissions.

Flexibility & Linking

BANKING AND BORROWING

Both gas utilities and covered suppliers of liquid fuels and propane may bank compliance instruments indefinitely.

OFFSETS AND CREDITS

Covered suppliers may cover a percentage of their compliance obligations with CCI credits, earned by contributing funds to community-based projects implemented to reduce anthropogenic GHG emissions in Oregon by an average of 1 tCO_2e per credit.

Covered entities will receive CCIs from the DEQ only after making a verifiable contribution to a DEQ-approved CCI entity and applying for the credits. The CCI entity is a non-profit organization which implements projects with the funds from covered fuel suppliers. The contribution amount to earn one CCI credit begins at USD 107 (2021 dollars) in 2023, adjusted for inflation. The contribution amount increases by $1 (2021 dollars), adjusted for inflation, every year from March.

CCI credits will be cancelled if not used for two consecutive compliance periods.

QUANTITATIVE LIMITS:
First Compliance Period (2022–2024): 10 % of compliance obligation may be covered with CCI credits

Second Compliance Period (2025–2027): 15 % of compliance obligation may be covered with CCI credits

From 2028 onwards: 20 % of compliance obligation may be covered with CCI credits

QUALITATIVE LIMITS: A CCI entity can only use funds to implement eligible projects in Oregon that reduce anthropogenic GHG emissions. CCI priorities include:

- Reducing emissions at least 1 tCO_2e on average per CCI credit
- Reducing non-GHG emissions
- Promoting benefits for environmental justice communities
- Accelerating the transition from fossil fuels to low-carbon energy sources

Compliance

COMPLIANCE PERIOD

Three-year compliance periods, starting from 2022

By late November of the year after the compliance period, the covered supplier must demonstrate compliance for the total emissions from the compliance period.

MRV

REPORTING FREQUENCY: Covered entities must continuously report their trading activity and report GHG emissions. Covered entities must retain records for determining compliance obligations.

When submitted information is not sufficient, calculations of emissions and compliance obligations will be informed by additional best data available at DEQ.

VERIFICATION: Covered entities may be subject to verification of calculations of covered emissions, compliance obligations and distribution of compliance instruments.

ENFORCEMENT

Covered entities can face financial penalties under the laws of the State of Oregon for providing untrue, inaccurate, or incomplete information when reporting, submitting an application or providing information to the DEQ under the CCP.

Covered entities will also face a penalty for failing to comply with the requirements for trading of compliance instruments under the CPP, for operating covered facilities without a CPP permit, or for violating any requirement under the CPP.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities only

MARKET TYPES:

Primary: Covered entities may trade compliance instruments with other covered suppliers. Trading must be notified to the DEQ and both parties need to sign and submit a compliance instrument trade form.

Unlimited trading and banking of compliance instruments. Banking limitations on CCIs and no trading.

MARKET STABILTY PROVISIONS

RESERVE FOR NEW ENTRANTS: The DEQ will establish a reserve for covered liquid fuels and propane suppliers that are new to the program. The DEQ will hold instruments in the reserve as a subset of compliance instruments under the cap.

DEQ can only distribute the instruments in the reserve to covered suppliers of liquid fuels and propane.

TRIGGERS:

- A covered supplier of liquid fuels and propane may request a distribution from the reserve if it did not receive compliance instruments in the corresponding annual distribution due to a lack of information, or because it joined the program after the DEQ had distributed the compliance instruments.
- DEQ may also distribute the instruments in the reserve as it adjusts the reserve size over time. DEQ will distribute instruments if there are at least 10,000 compliance instruments above the size limit in the regulation.

Other Information

INSTITUTIONS INVOLVED

Oregon Environmental Quality Commission
Oregon Department of Environmental Quality

EVALUATION/ETS REVIEW

DEQ will report to the EQC on the CPP's implementation, with the first report due five years after its 2022 start and once every five years thereafter. This will include a review of GHG emissions reductions, compliance rates, trading, and evaluation of the emissions reductions being achieved by stationary sources not covered by the cap-and-trade program.

In the case of year-on-year increases in the retail cost of gasoline, diesel, or natural gas, the DEQ could recommend changes in the rules, such as to caps, distribution of additional compliance instruments, changes to the compliance instrument reserve, or alter the allowable usage of CCI credits.

DEQ will provide an additional report on community climate investments to the EQC. The first of these reports will be in August 2024 and every two years thereafter.

REGULATORY FRAMEWORK

Division 271 – Oregon Climate Protection Program[3]
Executive Order 20-04[4]

3 https://www.oregon.gov/deq/rulemaking/Pages/rghgcr2021.aspx
4 https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf

Québec

Québec Cap-and-Trade System

CAP
54 $MtCO_2e$ (2022)

GASES
Several gases

OFFSETS AND CREDITS
Domestic[1]

ALLOCATION
Free allocation: Benchmarking
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction settlement price: CAD 28.10 (USD 22.40)

TOTAL REVENUE
CAD 5.68 billion (USD 4.53 billion) since the beginning of the program
CAD 1.12 billion (USD 893 million) in 2021

In force
Under development
Under consideration

SECTORS:

POWER
INDUSTRY
BUILDINGS*
TRANSPORT *(excl. maritime and aviation)**

**Sectors represent upstream coverage*

Covers ~80 % of Québec's overall emissions

Linked with California since 2014

First and still largest linked market between subnational governments from different countries

ETS DESCRIPTION

Québec's Cap-and-Trade System became operational in 2013 to mitigate the cost of reducing GHG emissions. Québec has been a member of the Western Climate Initiative (WCI) since 2008 and formally linked its system with California's in 2014. The system covers fuel combustion emissions in power, buildings, transport, and industry, as well as industrial process emissions.

YEAR IN REVIEW

The fourth compliance period began in January 2021 and new regulations took effect, including amended price tiers for allowances in the reserve account, to align with the California Cap-and-Trade Program. In Spring 2021, Québec announced a proposal to update the free allocation rules for the period 2024–2030. In July 2021, the government reformed the offset regulatory framework, including the conversion of two offset protocols into ministerial offset regulations to expand the project eligibility scope, and initiated a public consultation on a new draft regulation on afforestation or reforestation projects on private lands. The cumulative number of offset credits issued by the Québec Government surpassed the one million mark in 2021.

The start of November 2021 saw the deadline for the 2018–2020 compliance period, with 100 % compliance in the province.

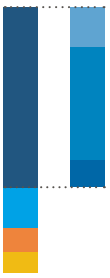
At COP 26 in Glasgow in early November 2021, Québec issued a memorandum of understanding for collaboration with California and New Zealand on climate action and, with Chile, launched the Glasgow Declaration on Carbon Pricing in the Americas, reiterating their commitment to carbon pricing in the region.

As experienced in other carbon markets in the second half of 2021, allowance prices increased and there was a more active secondary market.

Emissions & Targets of Québec

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	57.7	(68 %)
Industrial Processes	12.2	(15 %)
Agriculture	7.8	(9 %)
Waste	6.6	(8 %)
Total	**84.3**	



Manufacturing Industries and Construction	12.6	(15 %)
Transport	36.5	(43 %)
Commercial, Institutional and Residential	8.4	(10 %)
Other Energy	0.2	(0.3 %)

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 objective (2030 Plan for a Green Economy)

ETS Size & Phases

COVERED EMISSIONS 2018

Verified ETS emissions
60.3 $MtCO_2e$

78 %[1]

GHGS COVERED

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

COMPLIANCE PERIODS

FIRST COMPLIANCE PERIOD: 2 years (2013–2014)
SECOND COMPLIANCE PERIOD: 3 years (2015–2017)
THIRD COMPLIANCE PERIOD: 3 years (2018–2020)
FOURTH COMPLIANCE PERIOD: 3 years (2021–2023)

CAP

FIRST COMPLIANCE PERIOD (2013–2014): The system started in 2013 with a cap of 23.2 $MtCO_2e$.

SECOND COMPLIANCE PERIOD (2015–2017): With the program expanding to include fuel distribution, the cap rose to 65.3 $MtCO_2e$ in 2015. The cap declined to 61 $MtCO_2e$ in 2017, an average of 3.2 % per year.

THIRD COMPLIANCE PERIOD (2018–2020): The cap in the third compliance period started at 59.0 $MtCO_2e$ and declined at an average annual rate of 3.5 % to 54.7 $MtCO_2e$ in 2020.

FOURTH COMPLIANCE PERIOD (2021–2023) AND BEYOND: After a slight nominal increase in the cap in 2021 (55.3 $MtCO_2e$) 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 44.1 $MtCO_2e$ in 2030.

SECTORS AND THRESHOLDS

FIRST COMPLIANCE PERIOD (2013–2014): Producers and importers of electricity and industrial facilities.

SECOND COMPLIANCE PERIOD AND BEYOND: Sectors from phase one as well as the distribution and importation of fuels used in the transport and building sectors and in small- and medium-sized businesses.

INCLUSION THRESHOLDS: Emissions>25,000 tCO_2e/year. Fuel distributors that distributed 200L or more of fuel are also subject to inclusion, even if the combustion of their fuel resulted in emissions of less than 25,000 tCO_2e.

VOLUNTARY EMITTERS (OPT-IN COVERED ENTITIES): Since 2019, emitters from capped sectors that have reported emissions between 10,000 tCO_2e/year and 25,000 tCO_2e/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 COVERED FACILITIES

125 covered entities, representing 162 facilities (113 industrial facilities and 49 fuel distributors)[2] (2020)

1 2018 coverage estimates, which reconciles the differences between verified ETS emissions and the GHG inventory methodology.
2 125 covered entities, but some entities operate more than one facility. These entities represent 162 emitting facilities.

Allowance Allocation & Revenue

ALLOWANCE 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.

In most cases, the volume of free allocation is 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. When insufficient historical data is available, an energy-based methodology is used to determine the amount of free allocation issued.

FIRST TO THIRD COMPLIANCE PERIOD (2013–2020): Until 2020, the assistance factors for all EITE sectors were set at 100 %.

FOURTH COMPLIANCE PERIOD (2021–2023): 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.

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 when the price at two consecutive auctions settles above the minimum price.

In 2020, about 67 % of allowances were allocated by auction or directed to reserves. About 33 % of allowances were allocated for free.

USE OF REVENUES

All auction revenues go to the Electrification and Climate Change Fund, which funds mitigation and adaptation measures that include energy efficiency, electrification (Québec's electricity is 99.7 % renewable), and public transport, stemming from the 2030 Green Economy Plan. Bill 44, passed by the National Assembly of Québec in 2020, devotes the Electrification and Climate Change Fund entirely to climate action and brings it fully under the direction of the Ministry of the Environment and the Fight against Climate Change.

Flexibility & Linking

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

QUALITATIVE CRITERIA: Offset credits generated in Québec from eligible projects are fungible in the WCI carbon market. A new regulatory framework based on ministerial regulations, which came into force in July 2021, will gradually replace the previous regime. The ministerial regulations allow the following offset project types:

- reclamation and destruction of methane from landfill sites; and
- destruction of halocarbons.

For a transition period, the following project types will remain eligible under three protocols:

- destruction of methane from covered manure storage facilities;
- destruction of methane from drainage systems at active coal mines; and
- destruction of methane from ventilation systems of active underground coal mines.

The following project types should be the object of ministerial regulations in 2022:
- afforestation or reforestation on private lands in Québec; and
- biomethanization of slurry.

Other types of projects under consideration include fuel substitution in the marine transport sector, conversion of refrigeration systems, and improvements in the application of agricultural fertilizers.

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.

QUANTITATIVE LIMITS: Up to 8 % in offset credits of each entity's compliance obligation.

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.

Compliance

COMPLIANCE PERIOD

The Québec cap-and-trade system is structured around three-year compliance periods, except for the first period (see 'ETS Size & Phases' section). A cap trajectory until 2030 has been set (see 'Cap' section). Allowances must be surrendered by the start of November following the end of a 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 by the compliance deadline must remit each missing allowance plus three additional allowances for each allowance it failed to surrender.

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 non-compliance, entities can be fined CAD 3,000–500,000 (USD 2,393–398,763) and spend up to 18 months in jail in the case of a natural person, and a fine of CAD 10,000–3,000,000 (USD 7,975–2,392,579) in the case of a legal person.

Fines are doubled in the event of a second offence. In addition, the Minister of the Environment and the Fight against Climate Change may suspend allowance allocation to any non-compliant emitter.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities, including entities that opt-in to the system, non-compliance entities and individuals can participate.

MARKET TYPES:

Primary: A maximum of four auctions are held per year and eligible EITE emitters may receive free allowances. Participants must have an account in the Compliance Instrument Tracking System Service (CITSS). Auctions are administered by Western Climate Initiative, Inc.

Secondary: Companies can trade directly over the counter. There are also financial derivatives that are traded in platforms such as the Intercontinental Exchange (ICE), the CME group or the Nodal exchange. Any company qualified to access these platforms can trade directly or through a future commission merchant.

LEGAL STATUS OF ALLOWANCES: Under the "Environmental Quality Act", allowances are authorizations to emit up to one tonne of CO_2e to comply with the pertinent regulation. They do not constitute financial instruments in Québec.

MARKET STABILTY PROVISIONS

AUCTION RESERVE PRICE: The auction reserve price sets the minimum price at which allowances are available at auction and is equivalent to the annual minimum price of the previous year, increased by 5 % and the inflation rate measured by the Price Index Consumption (CPI). It is set at CAD 17.70 (USD 14.12) for Québec and USD 19.70 for California in 2022. For joint auctions with California in 2022, the highest value in USD between Québec's and California's auction reserve prices, based on the exchange rate of the Bank of Canada the day prior to the auction, will be the reserve price for that sale.

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 align with California more closely. For 2022, the prices of the three tiers are CAD 44.60 (USD 35.57), CAD 57.30 (USD 45.7), and CAD 69.70 (USD 55.59). However, if partner entities have 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. Just like auction reserve prices, reserve prices increase annually by 5 % plus inflation.

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 jurisdictions.

REGULATORY FRAMEWORK

Regulation respecting a cap-and-trade system for greenhouse gas emission allowances[3]
Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere[4]
Amendments to the cap-and-trade regulations[5]
Environment Quality Act[6]

3 http://legisquebec.gouv.qc.ca/en/ShowDoc/cr/Q-2,%20r.%2046.1
4 http://legisquebec.gouv.qc.ca/en/document/cr/Q-2,%20r.%2015
5 http://www.environnement.gouv.qc.ca/changements/carbone/documentation-en.htm#regulations
6 http://legisquebec.gouv.qc.ca/en/ShowDoc/cs/Q-2/

Regional Greenhouse Gas Initiative

In force

Under development

Under consideration

CAP
97.0 million short tons CO_2 or 88.0 $MtCO_2e$ (2022)[1]

GASES
CO_2 only

OFFSETS AND CREDITS
Domestic (within RGGI states only)

ALLOCATION
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: USD 10.59

TOTAL REVENUE
Since the beginning of the program: USD 4.7 billion
In 2021: USD 926 million

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

A third program review is ongoing and aims to be finalized in 2023

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 ten 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 CO_2 budget trading programs. After withdrawing from RGGI at the end of the first control period in December 2011, New Jersey renewed its participation in 2020, while Virginia joined in 2021.

RGGI has gone through two review processes that updated 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. RGGI's third review process is currently ongoing.

YEAR IN REVIEW

In May 2021, the final regulation to establish an ETS in Pennsylvania covering CO_2 emissions from the power sector and to join RGGI was released alongside updated modeling results of the effects of the ETS. It would allow for RGGI participation starting 2022, barring litigation or action from the state legislature. The final regulation is largely based on the September 2020 draft regulation and consistent with design features of the RGGI Model Rule, which serves as the basis for state-level legislation and regulations. Pennsylvania's share of emissions in the 2022 RGGI cap would amount to 45 %.

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.

The RGGI states initiated the Third Program Review in summer 2021 to analyze program successes, impacts, potential additional reductions to the cap post-2030, and other design elements. The review is expected to be concluded in 2023.

1 These values do not include Pennsylvania.

Emissions & Targets of RGGI

ENERGY-RELATED EMISSIONS, 2018[2] (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Electric Power	113.5	(19 %)
Industry	44.7	(7 %)
Transport	293.2	(48 %)
Commercial	64.3	(11 %)
Residential	96.6	(16 %)
Total	**612.2**	

GHG REDUCTION TARGETS

By 2030: 30 % cut in power sector emissions compared to the 2020 CO_2 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.

ETS Size & Phases

COVERED EMISSIONS 2018

16 %

GHGS COVERED

CO_2

PHASES

A cap trajectory until 2030 has been set.

FIRST PHASE: 2009–2011
SECOND PHASE: 2012–2014
THIRD PHASE: 2015–2017
FOURTH PHASE: 2018–2020
FIFTH PHASE: 2021–2023

CAP

FIRST PHASE (2009–2011): 564 million short tons CO_2 or 512 $MtCO_2$ (188 million short tons CO_2 or 171 $MtCO_2$ per year)

SECOND PHASE (2012–2014): 413 million short tons CO_2 or 374 $MtCO_2$
2012–2013: 165 million short tons CO_2 or 150 $MtCO_2$ per year
2014: 83 million short tons CO_2 or 75 $MtCO_2$

THIRD PHASE (2015–2017): 194 million short tons CO_2 or 176 $MtCO_2$
2015: 67 million short tons CO_2 or 61 $MtCO_2$
2016: 65 million short tons CO_2 or 59 $MtCO_2$
2017: 62 million short tons CO_2 or 57 $MtCO_2$

FOURTH PHASE (2018–2020): 193 million short tons CO_2 or 175 $MtCO_2$
2018: 60 million short tons CO_2 or 55 $MtCO_2$
2019: 58 million short tons CO_2 or 53 $MtCO_2$
2020: 74 million short tons CO_2 or 67 $MtCO_2$

FIFTH PHASE (2021–2023)[3]: 291 million short tons CO_2 or 264 $MtCO_2$
2021: 101 million short tons CO_2 or 91 $MtCO_2$
2022: 97 million short tons CO_2 or 88 $MtCO_2$
2023: 93 million short tons CO_2 or 85 $MtCO_2$

2 These values do not include Pennsylvania.
3 These values do not include Pennsylvania.

By 2012, verified emissions under RGGI were more than 40 % below the cap, so the states tightened the cap in 2014. There was a 2.5 % annual reduction factor from 2015 through 2018. The revised regulations extended the 2.5 % annual reduction factor through 2020.

The RGGI states further adjusted the caps between 2014 and 2020 to account for banked CO_2 allowances from the first and second phases. The annual reduction factor between 2021 and 2030 as set out in the "2017 Model Rule" is ~3 % of the 2020 cap.

The caps above include New Jersey from 2020 and Virginia from 2021.

SECTORS AND THRESHOLDS

Fossil fuel electric generating units

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

In New York, since January 2021, the program applies to power plants that have nameplate capacity equal to or above 15 MW and reside at a regulated generating unit or near two or more units of the same source.

POINT OF REGULATION

Downstream

NUMBER OF COVERED FACILITIES

228 (November 2021)

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

CO_2 allowances issued by each RGGI state are distributed through quarterly auctions. A limited amount may be held in set-aside accounts and distributed according to state-specific programs. Auctions are open to all parties with financial security, with a maximum bid of 25 % of offered allowances per quarterly auction.

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. A report released in June 2021 found that the direct lifetime benefits of RGGI investments made in 2019 include USD 1.8 billion in lifetime energy bill savings and 2.5 million short tons of CO_2 emissions avoided.

Flexibility & Linking

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 number of allowances available for auctions in future years is reduced by the number of allowances not used for compliance in previous control periods (see also 'Cap' above).

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; and
(3) avoidance of methane emissions from agricultural manure management operations.

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

Compliance

COMPLIANCE PERIOD

Three years

Compliance is evaluated at the end of each three-year phase, or "control period". From the third phase, regulated entities must surrender allowances corresponding to 50 % of their verified emissions in each of the first two years of a phase. They must cover 100 % of the remaining allowances at the end of the three-year phase.

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 "CO_2 Budget Trading Program" regulations and US EPA regulations. Provisions are based on the US EPA monitoring provisions. Data are then automatically transferred to the electronic platform of the RGGI CO_2 Allowance Tracking System (RGGI COATS), which is publicly available.

ENFORCEMENT

In case of excess emissions (i.e., if entities do not surrender all required allowances), allowances for three times the number of excess emissions must be surrendered. Furthermore, covered entities may also be subject to specific penalties imposed by the RGGI state where it is located.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities, non-compliance entities (domestic and international) and individuals can participate if they provide a financial security.

MARKET TYPES:

Primary: Most CO_2 allowances issued by each RGGI state are distributed through quarterly regional auctions. The RGGI CO_2 Allowance Tracking System (RGGI COATS) records and tracks data for each state's CO_2 Budget Trading Program, including the transfer of allowances that are offered for sale by the states and purchased by the winning qualified bidders in the quarterly auctions. Potomac Economics, an independent market monitor, monitors the performance and efficiency of the RGGI CO_2 allowance auctions and the secondary CO_2 allowance market.

Secondary: The secondary market for RGGI CO_2 allowances comprises the trading of physical allowances and financial derivatives, including futures, forwards, call options, and put options. RGGI COATS facilitates participation in the secondary market and enables the public to view and download reports of RGGI data and CO_2 allowance market activity.

MARKET STABILTY PROVISIONS

AUCTION PRICE FLOOR: USD 2.44 per short ton in 2022, 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. The trigger price is USD 13.91 in 2022, increasing by 7 % per year thereafter. It had previously increased by 2.5 % per year starting from USD 10 between 2017 and 2020.

The CCR had been triggered in 2014 and 2015. All 15 million allowances were sold from the CCR for the period from 2014 to 2015. The CCR was also triggered in the last quarterly auction of 2021, where 3.9 million of the available 11.9 million allowances were sold.

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 2022, the trigger price is USD 6.42, increasing by 7 % per year thereafter. Maine and New Hampshire are not participating in the ECR.

Other Information

INSTITUTIONS INVOLVED

Statutory and/or regulatory authority of each RGGI state
Environmental and energy agencies for each RGGI state
RGGI Inc. (non-profit cooperative supporting RGGI's development and implementation)

EVALUATION/ETS REVIEW

The RGGI participating states periodically review the ETS program 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 RGGI states initiated the third review in summer 2021 to analyze program successes, impacts, potential additional reductions to the cap post-2030, and other design elements. The review is expected to be concluded in 2023.

REGULATORY FRAMEWORK

2017 RGGI Model Rule[4]
2017 RGGI Model Rule Updates (Summary)[5]
RGGI States' Statutes & Regulations[6]
RGGI Program Design[7]

4 https://www.rggi.org/sites/default/files/Uploads/Program-Review/12-19-2017/Model_Rule_2017_12_19.pdf
5 https://www.rggi.org/sites/default/files/Uploads/Program-Review/12-19-2017/Summary_Model_Rule_Updates.pdf
6 https://www.rggi.org/program-overview-and-design/state-regulations
7 https://www.rggi.org/program-overview-and-design/elements

Transportation and Climate Initiative

Transportation and Climate Initiative Program

CAP
42.1 $MtCO_2$ (2022)[1]

OFFSETS AND CREDITS
Domestic

GASES
CO_2 only

ALLOCATION
Auctioning

In force

Under development

Under consideration

ETS DESCRIPTION

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 February 2021, Connecticut, Washington (D.C.), Massachusetts, and Rhode Island signed a Memorandum of Understanding (MoU) formalizing their participation in a cap-and-invest program, the Transportation and Climate Initiative Program (TCI-P). The program includes the auctioning of emission allowances with a cap that declines over time. The proceeds will be invested by the participating jurisdictions to further reduce GHG emissions and other air pollutants.

TCI-P caps CO_2 emissions from the combustion of gasoline and on-road diesel fuel in the participating areas. Compliance obligations fall upstream, on firms that supply the covered fuels within these jurisdictions.

YEAR IN REVIEW

In June 2021, the four participating jurisdictions released a final "Model Rule" for the implementation of the TCI-P, with reporting of emissions and fuel shipment data under the program scheduled to start in 2022.

TCI-P released further documents for public comment by August 2021: a "Draft Framework for Public Engagement", including guiding principles for TCI-P jurisdictions when conducting outreach and public engagement; a "Draft TCI-P Model Implementation Plan", providing a common framework for jurisdictions to follow in developing their own Implementation Plans; and a "Draft Proposed Strategies for Regional Collaboration", summarizing a range of additional policies and programs that current TCI-P signatory jurisdictions are proposing.

In the second half of 2021, most of the participating States halted participation in TCI-P. According to the final Memorandum of Understanding "the first compliance period of TCI-P will commence 1 January 2023 or at such later time as at least three jurisdictions have completed the legal processes required to implement their individual programs". After the recent developments, it is unlikely that the implementation of TCI-P in its current form will continue.

SECTORS:

TRANSPORT*

**Upstream coverage*

MEMBER STATES:

Massachusetts, Connecticut, Rhode Island, Washington (D.C.)[2]

Regional collaboration to reduce transportation sector CO_2 emissions

Final Model Rule on design elements for ETS released in June 2021

After several states withdrew support, TCI-P is unlikely to go ahead in its current form

Emissions of TCI-P

ENERGY-RELATED EMISSIONS EXCL. LULUCF, 2018[3,4] (IN $MtCO_2$, SHARE OF TOTAL IN %)

Electric Power	18.9	(16 %)
Industry	6.0	(5 %)
Transport	53.2	(46 %)
Commercial	23.8	(20 %)
Residential	14.2	(12 %)
Total	**116.1**	

1 Also includes offset credits from linked jurisdictions (i.e., California).
2 In the second half of 2021, several other states indicated they will abandon plans to operationalize the TCI-P.
3 Based on the participation of Connecticut, Massachusetts, Rhode Island and Washington (D.C.).
4 Carbon dioxide emissions reported here are based only on energy-related emissions data and retrieved from the U.S. Energy Information Agency (EIA). Energy-related CO_2 emissions refer to emissions released at the location where fossil fuels are consumed.

Other Information

INSTITUTIONS INVOLVED

Statutory and/or regulatory authority of each TCI-P jurisdiction
Environmental and energy agencies for each TCI-P participant

EVALUATION/ETS REVIEW

Equity Review and Reporting: The Model Rule provides for the annual review and reporting on impacts of the TCI-P program, including with respect to equity.

REGULATORY FRAMEWORK

Final Memorandum of Understanding[5]
Elements of Program Design[6]
Model Rule[7]

5 https://www.transportationandclimate.org/sites/default/files/TCI%20MOU%2012.2020.pdf
6 https://www.transportationandclimate.org/sites/default/files/TCI-P_EPD_12-21-2020.pdf
7 https://www.transportationandclimate.org/sites/default/files/TCI-P-Model-Rule.pdf

Washington

In May 2021, Governor Jay Inslee signed into law the "Climate Commitment Act" (CCA), which puts in place an economy-wide cap-and-invest program that begins January 2023. Washington is the second state in the United States to pass a law requiring such a program, after California. Washington will not be linked to any other jurisdictions at its start, but the CCA allows for linkage in the future if certain conditions are met.

Entities that emit more than 25,000 tCO_2e/year must acquire allowances for their emissions to meet a cap that decreases proportionally to Washington's GHG limits. These include industrial facilities, in-state electricity producers, electricity importers, natural gas distributors and fuel suppliers. In 2027, the program will add waste-to-energy facilities, and landfills and railroad companies in 2031. Uncovered entities that wish to participate in the program can do so by registering as an opt-in entity or as a general market participant. Covered entities that fail to comply with their obligations will be subject to fines up to USD 10,000 per day.

The Washington Department of Ecology is the administrative authority for the program and will adopt annual allowance budgets to be distributed through a combination of auctions and free allocation. Washington joined the Western Climate Initiative, Inc., in December 2021, and that organization will provide the trading platform and technical services and support for Washington's cap-and-invest program. The Department will conduct auctions as often as quarterly, as well as additional reserve auctions in the event of prices reaching an auction price ceiling. The CCA also contains market stability measures such an allowance price containment reserve, an emissions containment reserve, and an auction floor price.

Through at least 2035, emissions-intensive trade-exposed industries (EITE) will receive free allowances based either on their carbon intensity baselines, multiplied by their yearly production or, in some cases, on their baseline historical CO_2e emissions, regardless of changes in production volumes. From the second compliance period, starting in 2027, free allocation will be adjusted according to benchmark reduction schedules.

Covered entities will be able to cover up to 5 % of their compliance obligations with offset credits through 2026, and up to 4 % from 2027 to 2030. Covered entities will be able to cover their obligations for up to an additional 3 % with units from offset projects on Tribal Lands through 2026, and with up to 2 % additional from 2027 to 2030. Available allowances must be reduced in an amount equivalent to offset use.

Allowance auction proceeds can be invested in initiatives to decarbonize transportation and other sectors of the economy, promote clean energy, and advance equity and environmental justice. The CCA attempts to ensure that all communities will benefit from decarbonization. For example, at least 35 % of investments will be dedicated towards overburdened communities and an additional 10 % directed towards Tribes.

Through 2022, the Department of Ecology is developing the rules to implement the CCA, including: the main cap-and-invest program rules; the criteria for determining emissions-intensive, trade-exposed industries; and updated rules for GHG emissions reporting.

In force

Under development

Under consideration

The Climate Commitment Act puts in place an economy-wide emissions trading system starting January 2023

The cap aligns with the state's legislated greenhouse gas emission limits – covering industry, energy, and fuel suppliers with emissions over 25,000 tCO_2e/year

Allows for linking with other jurisdictions in the future

Emissions & Targets of Washington

GHG EMISSIONS EXCL. LULUCF, 2018 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	85.1	(85 %)
Industrial Processes	5.4	(5 %)
Agriculture	6.7	(7 %)
Waste	2.4	(2 %)
Total	**99.6**	

Electricity	16.2	(16 %)
Transport	44.7	(45 %)
Commercial, Institutional and Residential	23.3	(23 %)
Other Energy	0.8	(1 %)

GHG REDUCTION TARGETS

By 2030: 45 % reduction from 1990 GHG levels (Greenhouse Gas Emission Limits – Amendment (2020))

By 2040: 70 % reduction from 1990 GHG levels (Greenhouse Gas Emission Limits – Amendment (2020))

By 2050: reduction of total GHG emissions to 95 % below 1990 levels and achievement of net-zero emissions (Greenhouse Gas Emission Limits – Amendment (2020))

Other Information

INSTITUTIONS INVOLVED

Washington Department of Ecology
Office of Governor Jay Inslee

REGULATORY FRAMEWORK

Washington Climate Commitment Act[1]
Greenhouse Gas Emission Limits – Amendment (2020)[2]

1 Chapter 70A.65 RCW: GREENHOUSE GAS EMISSIONS—CAP AND INVEST PROGRAM (https://app.leg.wa.gov/RCW/default.aspx?cite=70A.65)
2 https://lawfilesext.leg.wa.gov/biennium/2019-20/Pdf/Bills/Session%20Laws/House/2311-S2.SL.pdf?cite=2020%20c%2079%20%C2%A7%202

Latin America and the Caribbean

Brazil

In force

Under development

Under consideration

Considering the implementation of an ETS for the power sector

In parallel, discussing the creation of an ETS under Bill 528/2021

Brazil's National Climate Change Policy, enacted in December 2009, aims to promote the development of a Brazilian market for emissions reductions. By the end of 2021, the Presidency of the Republic put out for public consultation a draft law creating the National Policy on Climate Change and Green Growth, which would establish the objectives, principles, guidelines and instruments of the new Policy as well as the Interministerial Committee on Climate Change and Green Growth, the highest governance body of the climate change agenda in the country.

Two parallel and ongoing processes are considering the implementation of an ETS in Brazil. One is the "Consideration of Environmental Benefits in the Electricity Sector" under Law 14,120/2021, coordinated by the Energy Research Corporation (Empresa de Pesquisa Energética, EPE) and the Ministry of Mines and Energy, with the support of the International Energy Agency. In workshops organized by the EPE in 2021, stakeholders discussed the possibility of implementing an ETS in the power sector, as well as different design options.

Another process is the discussion of bills at the Brazilian National Congress, including Bill 528/2021. This bill would create the Brazilian Market of Emission Reductions and give the government a period of five years to develop regulations for the national program of emission reductions. One version of this bill, which is currently being discussed, would provide for an ETS in Brazil. In this context, several proposals from the private sector and civil society have also emerged around the establishment of an ETS in the country.

As part of its activities under the World Bank's Partnership for Market Readiness (PMR), the Brazilian government had carried out studies on the possible implementation of market instruments to meet its 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.

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, which remains ongoing, is coordinated by the Centro de Estudos em Sustentabilidade da Fundação Getulio Vargas.

Emissions & Targets of Brazil

GHG EMISSIONS EXCL. LULUCF, 2016 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	422.5	(42 %)
Industrial Processes	90.1	(9 %)
Agriculture	439.2	(43 %)
Waste	62.9	(6 %)
Total	**1,014.7**	

Energy Industries	84.0	(8 %)
Manufacturing Industries and Construction	67.2	(7 %)
Transport	206.6	(20 %)
Commercial, Institutional and Residential	26.5	(3 %)
Other Energy	38.2	(4 %)

GHG REDUCTION TARGETS

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

By 2030: 50 % reduction from 2005 GHG levels (target announced during COP 26)

By 2050: Climate neutrality (indicative objective submitted to the UNFCCC)

Other Information

INSTITUTIONS INVOLVED

Ministry of Environment
Ministry of Economy
Ministry of Mines and Energy
Ministry of Science, Technology and Innovation

REGULATORY FRAMEWORK

Law 12,187 of 2009[1]
Law 14,120 of 2021[2]
Bill 528/2021[3] (ultimately attached to **Bill 2148/2015**)[4]

1 https://www.camara.leg.br/proposicoesWeb/prop_mostrarintegra?codteor=841507&filename=Legislac
2 https://www.in.gov.br/en/web/dou/-/lei-n-14.120-de-1-de-marco-de-2021-306116199
3 https://www.camara.leg.br/propostas-legislativas/2270639
4 https://www.camara.leg.br/propostas-legislativas/1548579

Chile

In force

Under development

Under consideration

Provisions for a system of GHG emissions limits contained in the draft Framework Law on Climate Change

National Mitigation Actions Registry has been developed

Planning to increase carbon price trajectory between 2025 and 2030

In October 2021, Chile presented its Long-Term Climate Strategy, which presents the instruments and measures that Chile will take over a 30-year horizon to transition to a carbon neutral and resilient development. It specifies that Chile would set an increasing trajectory for its carbon price to 2050 between 2025 and 2030, while also specifying that Chile seeks to have an integral and efficient carbon pricing portfolio to deliver coherent and predictable price signals. Chile has had a carbon tax in place since 2017.

Chile's prospective climate policy framework is the draft "Framework Law on Climate Change", which sets a 2050 carbon neutrality goal, alongside a detailed governance framework to reach it. Approved by the Senate in October 2021, it was turned to the Chamber of Deputies to continue its legislative process.

The draft Framework Law defines a system in which the Ministry of Environment would establish GHG emissions limits for individual or groups of emitting sources (in tCO_2e/year). Any 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 fulfill their obligations or transfer those reductions to third parties. A dedicated registry would track the projects and transfers.

Chile is set to continue its cooperation with the World Bank. 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 Article 6 and the development of the cap-and-trade system contained in the draft Framework Law.

Emissions & Targets of Chile

GHG EMISSIONS EXCL. LULUCF, 2018 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	87.0	(77 %)
Industrial Processes	6.6	(6 %)
Agriculture	11.8	(11 %)
Waste	7.0	(6 %)
Total	**112.3**	

Energy Industries	33.7	(30 %)
Manufacturing Industries and Construction	15.7	(14 %)
Transport	28.6	(25 %)
Commercial, Institutional and Residential	7.1	(6 %)
Other Energy	1.9	(2 %)

GHG REDUCTION TARGETS

By 2025: Peak GHG emissions (updated NDC)

By 2030: GHG emissions level of 95 $MtCO_2e$. Reduction of at least 25 % of total emissions of black carbon, as compared to 2016. Carbon budget 1,100 $MtCO_2e$ between 2020 and 2030 (updated NDC).

Compliance

MRV

The current GHG MRV system primarily serves 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 were changed by a tax reform approved in 2020. With these changes, the carbon tax will apply to entities that emit more than 25,000 tCO_2 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 streamlined various reporting needs and aims to improve the quality of the information provided. This new system, developed with support from the PMR, is considered a basis for Chile to advance to the development of a Unified GHG Report, which will help evaluate Chile's National Climate Policy.

The government has also developed a National Mitigation Actions Registry (Registro Nacional de Acciones de Mitigación –RENAMI). 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 the "Framework Law on Climate Change" or Article 6 of the Paris Agreement.

VERIFICATION: Verification procedures are administered by the Superintendency of the Environment under the Ministry of the Environment (no third-party verification is currently used). Once the offset scheme is operating, the implementation of a third-party verification process is planned to issue credits.

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

New Climate Action Law creates an obligation for legal persons to report GHG emissions

ETS pilot phase expected to start in the next years

Full ETS operation expected by 2030

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. Non-compliance is to be punishable by a fine of 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 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.

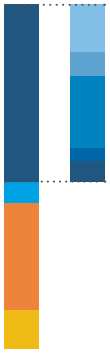
The PNCTE will complement other mitigation instruments, such as the country's existing USD 5/tonne carbon tax and its offsetting program, both of which have been in place since 2017. The 2018 Climate Change Law states that the government may recognize carbon tax payments as part of the compliance obligation of regulated entities under the PNCTE.

The ETS design is currently being analyzed by the government. The "Climate Action Law" (Ley de Acción Climática), which came into force in December 2021, consolidates the commitments presented in Colombia's NDC and sets a goal to fully implement the ETS by 2030. This law has also set an obligation for legal persons to report direct and indirect GHG emissions, following criteria to be set by Minambiente. It also appoints an independent group of experts (the Study Commission) to generate recommendations and promote and develop carbon markets in Colombia. These recommendations are to be considered by the environment and finance ministries.

Emissions & Targets of Colombia

GHG EMISSIONS EXCL. CATEGORIES "3B LAND" AND "3D PRODUCTS OF COLLECTED WOOD", 2018 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	92.9	(51 %)
Industrial Processes	10.5	(6 %)
Agriculture, Forestry, and Other Land Use[1]	56.8	(31 %)
Waste	20.5	(11 %)
Total	**180.7**[2]	



Energy Industries	24.5	(14 %)
Manufacturing Industries and Construction	13.2	(7 %)
Transport	37.8	(21 %)
Commercial, Institutional and Residential	7.0	(4 %)
Other Energy	10.4	(6 %)

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 categories "3B Land" and "3D Products of collected wood", but includes the categories "3A Livestock" and "3C Aggregate sources and non-CO_2 emissions sources on land".

2 Land emissions (category 3B), not included here, accounted for 98.5 $MtCO_2e$ of total net emissions in 2018, whereas category 3D, Products of collected wood, accounted for 0.6 $MtCO_2e$ in absorptions.

GHG REDUCTION TARGETS

By 2022: Accumulated reduction of GHG emissions of 36 $MtCO_2e$, 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).

By 2050: Carbon neutrality (Climate Action Law)

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

REGULATORY FRAMEWORK

Ley 1931 de 2018[3]
Ley de Acción Climática[4]

3 https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=87765
4 https://dapre.presidencia.gov.co/normativa/normativa/LEY%202169%20DEL%2022%20DE%20DICIEMBRE%20DE%202021.pdf

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

AVERAGE 2021 ALLOWANCE PRICE
Average secondary market price: MXN 0 (USD 0)

SECTORS:

POWER
OIL & GAS

INDUSTRY

First ETS in operation in Latin America

Pilot phase started in 2020, with 2022 as a transition year to the operational phase in 2023

Covers direct annual emissions of entities emitting at least 100,000 tCO_2

ETS DESCRIPTION

The Mexican Pilot ETS started operating in January 2020. It was mandated by Transitional Article 94 of the "General Law on Climate Change" (as amended in July 2018) and is regulated by implementing regulation finalized in 2019. The Pilot ETS helps test the system design and ran 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. The Ministry of Environment and Natural Resources (SEMARNAT) is expected to publish the regulations of the operational period of the ETS in the first half of 2023. Together, the Pilot phase (2020–2021) and the transition phase (2022) constitute the Pilot Program of the Mexican ETS.

The Pilot covers direct CO_2 emissions from entities in the energy and industry sectors generating at least 100,000 tCO_2 per year. 282 entities are covered by the Pilot, corresponding to ~40 % of national emissions and 90 % of emissions reported in the National Emissions Registry (RENE).

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 2021, the first and second allowance allocations took place. SEMARNAT concluded the analysis and revision of the information for the first compliance period and participants surrendered allowances corresponding to this period, achieving a 97 % compliance rate.

The country continued the development of offset provisions in priority sectors. Moreover, SEMARNAT is preparing a registry for mitigation outcomes from voluntary and regulated sources (such as offsets, early action credits, Internationally Transferred Mitigation Outcomes (ITMOs), or voluntary projects, among others), referred to as the "second component" of 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.

SEMARNAT, with the support of GIZ, has continued training activities with different actors. These include technical dialog events with experts, as well as with representatives and professionals from other jurisdictions with an ETS in force, and capacity building activities for regulated entities.

The Consultative Committee of the Pilot ETS has had five ordinary sessions and three extraordinary sessions as of December 2021. 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 of the Confederation of Industrial Chambers; a representative from the Coordinating Business Council; five representatives of the regulated sectors; a representative from financial institutions

1 The Ministry of Environment and Natural Resources is in the process of establishing a domestic offsetting program.
2 A local voluntary offset scheme with credits generated via mitigation projects or low-carbon behaviors.

or exchanges; and two representatives from civil society and two from universities, but without voting rights.

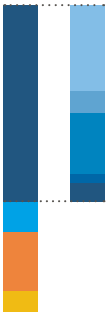
Different studies and analyses are also being developed, including:

- 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.

Emissions & Targets of Mexico

GHG EMISSIONS EXCL. CATEGORIES "3B LAND" AND "3D PRODUCTS OF COLLECTED WOOD", 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	467.9	(64 %)
Industrial Processes	73.7	(10 %)
Agriculture, Forestry, and Other Land Use[3]	140.8	(19 %)
Waste	54.3	(7 %)
Total	**736.6**	



Energy Industries	203.3	(28 %)
Manufacturing Industries and Construction	51.5	(7 %)
Transport	147.9	(20 %)
Commercial, Institutional and Residential	23.8	(3 %)
Other Energy	41.4	(6 %)

GHG REDUCTION TARGETS[3]

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 & Phases

COVERED CO_2 EMISSIONS

40 %[4]

GHGS COVERED

Direct emissions of CO_2 only

PHASES

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 from 2022 will be covered by the operational period of the ETS.

3 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 categories "3B Land" and "3D1 Products of collected wood" but includes the categories "3A Livestock" and "3C Aggregate sources and non-CO_2 emissions sources on land".

4 As per information published by SEMARNAT.

CAP

PILOT (2020–2021):
Year 2020: 271.3 $MtCO_2$
Year 2021: 273.1 $MtCO_2$[5]

Three reserves will be filled each year with allowances additional to the cap:

- auctions reserve (equivalent to 5 % of the cap, for regular auctions, which have not yet happened);
- 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).

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".

SECTORS AND THRESHOLDS

PILOT (2020–2021): 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, chemicals, food and beverages, glass, iron and steel, metals, mining, petrochemicals, and pulp and paper, as well as other industrial sub-sectors generating direct CO_2 emissions from stationary sources at or above the threshold.

Inclusion thresholds: The Pilot ETS covers installations with annual direct emissions from stationary sources amounting to at least 100,000 tCO_2.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

~282 until now[6]

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

PILOT (2020–2021): The Pilot uses free allocation with the following specifications.

Initial Allocation: Entities receive free allowances based on the most recent verified emissions. New entrants receive free allowances based on their verified emissions in the year in which they first crossed the 100,000 tCO_2 threshold. For participants that have not yet verified their emissions, initial allocation is done based on their historical emissions as reported to RENE.

Ex-Post Adjustment: An adjustment allocation is carried out from the general reserve for those participants with higher verified emissions in that year than the free allocation received. Also, as per the "Notice on the rules and criteria for allowance allocation"[10], participants may request additional allowances when an expansion in their production results in additional direct CO_2 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 should return the free allowances received for the compliance period in which it closes. Whether the installation has to only surrender allowances, 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. No auctions had taken place as of the end of 2021, although preliminary activities for the implementation of auctions are currently being prepared.

USE OF REVENUES

As the Pilot phase is intended to have no economic impact on regulated entities, all allowances are allocated freely and there is no revenue.

5 The increase in the cap between 2020 and 2021 is due to an extension in the sectoral allocation for regulated entities categorized as "others".
6 According to SEMARNAT.

Flexibility & Linking

BANKING AND BORROWING

If participants have fulfilled their surrender obligations, any remaining allowances may be banked for use in subsequent compliance periods within the Pilot. Allowances issued in the Pilot are valid only for the Pilot, although SEMARNAT is tasked with assessing the feasibility 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 LIMITS: 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 compliance in the national ETS. Eligible mitigation projects or activities will be domestic projects that have been validated and verified under internationally or domestically recognized protocols (still to be specified which ones). Emission reductions related to all GHGs will be eligible, except for those related to direct CO_2 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 are allowed to continue generating offsets during the Pilot.

QUANTITATIVE LIMITS: Participants can 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. The Ministry is also preparing a registry for mitigation outcomes from voluntary and regulated sources (such as offsets, early action credits, Internationally Transferred Mitigation Outcomes (ITMOs), or voluntary projects, among others). 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.

Articles 89 and 90 of the "General Law of Climate Change" provide the general framework for the registry of mitigation outcomes, whereas articles 26–29 of the RENE regulation provide further information of the types of projects that can be registered, the information on the project that must be registered, the procedure for the registration and information on which certificates from international registries are to be accepted.

LINKS WITH OTHER SYSTEMS

The "General Law of Climate Change" foresees possible linkages between the Mexican ETS and those 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 emissions trading. 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.

Compliance

COMPLIANCE PERIOD

From 1 January to 31 December.
Regulated entities have until 1 November of the subsequent year to surrender allowances.

MRV

REPORTING FREQUENCY: Annual self-reporting based on electronic templates prepared by SEMARNAT.

VERIFICATION: Verification by independent accredited verifiers is required by 30 the end of June of the subsequent 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 CO_2 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 of at least 25,000 tCO_2e 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. Articles 87 and 88 of the "General Law of Climate Change" provide the general framework for GHG reporting to RENE.

ENFORCEMENT

The system is designed to pose no economic impact on regulated entities; however, in case of non-compliance, entities lose the opportunity to bank unused allowances for the next compliance periods within the Pilot. Moreover, non-compliant entities will receive fewer allowances during the operational period of the national ETS (two fewer allowances for each non-delivered allowance during the Pilot).

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: The ETS Pilot Regulation does not foresee the participation of entities in the ETS other than compliance entities and entities that provide offset credits.

MARKET TYPES:

Primary: As of the end of 2021, there have been no auctions in the Mexican ETS Pilot.

Secondary: There is no exchange that trades allowances. As of the end of 2021, transactions can only take place via negotiation between participants.

LEGAL STATUS OF ALLOWANCES: Allowances in the Mexican ETS Pilot are "administrative instruments". The legal nature of allowances is currently being analyzed.

Other Information

INSTITUTIONS INVOLVED

SEMARNAT

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 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.

A preliminary study on different methods, criteria, metrics, and international experiences on the evaluation of ETSs has been developed, as an input for the evaluation process of the Pilot, with the support of consultancies from external organizations.

Additionally, this study has served as an input for The Consultative Committee for the continuous improvement and evaluation of the ETS.

REGULATORY FRAMEWORK

General Law of Climate Change[7]

Agreement on the establishment of the preliminary basis of the Pilot Program of the Emissions Trading System (implementing regulation of the pilot)[8]

Regulation of the General Law of Climate Change on the National Emissions Register[9]

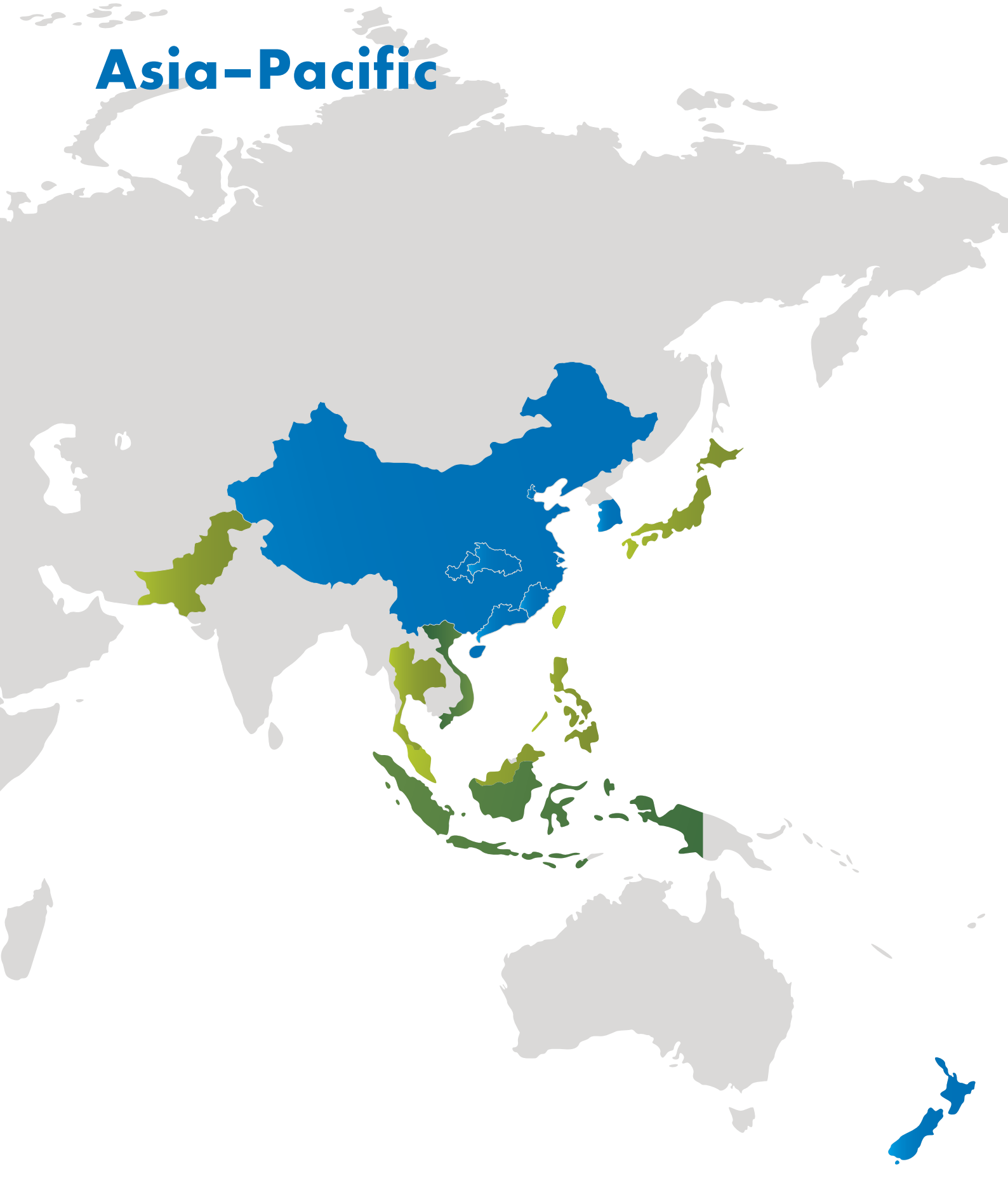
Notice on the cap for the years 2020 and 2021[10]

Notice on the reserve and sectoral allocation of allowances for the years 2020 and 2021[11]

Notice on the rules and criteria for allowance allocation[12]

7 http://www.diputados.gob.mx/LeyesBiblio/pdf/LGCC_061120.pdf
8 https://www.dof.gob.mx/nota_detalle.php?codigo=5573934&fecha=01/10/2019
9 https://biblioteca.semarnat.gob.mx/janium/Documentos/Ciga/agenda/DOFsr/DO3452.pdf
10 https://www.gob.mx/cms/uploads/attachment/file/513702/Aviso_Tope.pdf
11 https://www.gob.mx/cms/uploads/attachment/file/513701/Aviso_Asignacion_Sectorial.pdf
12 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
35 $MtCO_2$ (2021)

GASES
CO_2 only

OFFSETS AND CREDITS
National
Provincial

ALLOCATION
Free Allocation: Grandparenting
Free Allocation: Benchmarking

AVERAGE 2021 ALLOWANCE PRICE
Average secondary market price: CNY 61.13 (USD 9.48)

SECTORS:

POWER
Covered until transition to national ETS

INDUSTRY

BUILDINGS

TRANSPORT

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

Price corridor as price stability mechanism and cross-regional trading pioneered

Wide coverage of sectors and experienced scope expansion

ETS DESCRIPTION

The Beijing Pilot ETS was launched in November 2013. Beijing is one of the two Chinese pilots with ETS regulation passed by its regional congress. The ETS covers ~24 % of the city's total emissions, including those from: heat, cement, petrochemicals, and other industrial enterprises; manufacturers; the service sector; and public transport. The system covered electricity generation until 2020, after which it was integrated into the national ETS. In 2016, it lowered the inclusion thresholds from the original 10,000 tCO_2/year to 5,000 tCO_2/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 without a specific timeline.

Beijing is the only regional pilot in China that uses a price floor (CNY 20.00 (USD 3.10)) and ceiling (CNY 150.00 (USD 23.26)) 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, compared to the other ETS pilots in China. The Beijing pilot is also open to a range of 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, provides 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 ETS in 2019. Updated implementing legislation is contained in the "2018 Carbon Emission Management and Trading Plan".

In addition, Beijing plays a supporting role in the national offset program. Beijing Green Exchange operates the China Certified Emissions Reduction (CCER) national registry.

YEAR IN REVIEW

In 2021, regulated entities from the power sector moved from the Beijing Pilot ETS to the Chinese national ETS.

In April 2021, the Beijing EEB released a notice on the "Management of Key Carbon Emission Units and the Pilot Work of Carbon Emissions Trading in 2021"; the notice had several documents on MRV, allowance allocation, and offsets as attachments. Most noticeably, the 2021 MRV is implemented in accordance with the local MRV standards released in January 2021. This is the first time that Beijing has stipulated MRV standards for seven sectors (power generation, cement, petrochemical, heat production, service, road transportation and other industries) in the form of provincial standards, upgrading from regional guidelines. The new standard adjusts the form and content of MRV: the emissions accounting boundary has been expanded and now includes emissions from purchased heat, emissions from the desulfurization process in the power industry, and emissions from the decomposition of carbonates in the petrochemical industry. Furthermore, the content of the emissions reporting has been streamlined and additional requirements for the preparation of monitoring plans have been introduced. The standard also adjusted the default or recommended values for key parameters and emission factors.

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 allocation method for the three sectors of cement, heating, and data center, from grandparenting to benchmarking, increasing their stringency.

Like in the previous year, the Beijing EEB moved the compliance deadline for 2020 emissions from mid-June to mid-October 2021. As of mid-January 2022, Beijing had not yet announced its 2020 compliance status, although local experts expected that it was completed with 100 % compliance.

Emissions & Targets of Beijing

CO_2 EMISSIONS EXCL. LULUCF, 2020 (IN $MtCO_2$)

147.2[2]

GHG REDUCTION TARGETS

By 2020: 20.5 % reduction in carbon intensity compared to 2015 levels (reduction of over 16 % was achieved); pledge to peak Beijing CO_2 emissions by 2020 (Beijing 13th Five-Year Plan on Energy Saving and Climate Change)

By 2025: CO_2 emissions (excluding passenger and cargo aviation) to reduce by at least 10 % compared to peaking level, carbon intensity to reduce by around 18 % compared to 2020 levels (Beijing 14th Five-Year Plan on Environment Protection)

ETS Size & Phases

COVERED CO_2 EMISSIONS (2021)[1]

~24 %

GHGs COVERED

CO_2 only

PHASES

2013 and ongoing[2]

CAP

~50 $MtCO_2$ (2020)

~35 $MtCO_2$ (2021, mainly due to the transfer of power sector into national ETS)

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. [3]

INCLUSION THRESHOLDS:

Until 2015: 10,000 tCO_2/year, considering both direct and indirect emissions.

From 2016 onwards: 5,000 tCO_2/year, considering both direct and indirect emissions.

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

POINT OF REGULATION

Downstream

Both direct emissions from fuel combustion and indirect emissions from electricity consumption are covered.

NUMBER OF ENTITIES

839 (2020), including 13 power which then transferred to the national ETS in the following year. In addition, 11 aviation entities, 18 transportation entities and 570 other entities had mandatory reporting but no surrender obligations for 2020 compliance year.

1 There is no publicly available data for the recent years and the data here is estimated by local experts. At its launch year of 2013, the coverage of CO_2 emissions was around 40 %, according to the local government. n 2020 the coverage was estimated to be around 45 %. The previously reported data based on public source in the launch year of the ETS is 188.1 $MtCO_2$ (2012).

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.

3 Currently, the domestic aviation sector is only subject to mandatory reporting.

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

FREE ALLOCATION: Free allocation through grandparenting based on historical emissions or emissions intensity in the baseline years, which are the previous three years.

Benchmarking is used for new entrants and entities with expanded capacity in the power sector (until 2020), heat production, cement and data centers (three new sectors with benchmarking since 2020).

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.

USE OF REVENUES

There is no detailed regulation on the use of revenues.

Flexibility & Linking

BANKING AND BORROWING

Banking is allowed.
Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Domestic project-based carbon offset credits – CCER credits – are allowed. In addition, Beijing also has introduced a local offset program focusing on carbon sinks, low-carbon transport, and energy saving. Offset use is limited to 5 % of the annual allocation. The limit was increased to 20 % from 2019, but only for local low-carbon transport offsets.

QUALITATIVE LIMIT: CCERs from energy conservation projects and forestry carbon sink projects are allowed, whereas credits from hydropower, HFCs, PFCs, N_2O, and SF_6 projects are not eligible. CCERs must come from projects that began operations from 2013 onwards (with exceptions for carbon sink projects, for which the date is February 2005).

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).

Compliance

COMPLIANCE PERIOD

One calendar year: covered entities have until mid-June of the following year to surrender allowances.[4]

MRV

REPORTING FREQUENCY: Annual

VERIFICATION: Third-party verification is required. In addition, the government organizes expert review of all the verification reports; 30 % 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 in excess of 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 of up to CNY 50,000 (USD 7,753.17). 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 non-financial penalties include negative impacts on access to bank loans and subsidy programs.

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.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Covered entities, domestic non-compliance entities, and domestic individuals that meet the requirements of the carbon emission trading rules set up by Beijing Environment Exchange (renamed Beijing Green Exchange in June 2020).

MARKET TYPES:

Primary: Allowances are distributed through free allocation. Although no auctions have been held to date, there is the possibility of setting aside up to 5 % of allowances for regular and irregular auctions.

Secondary: Trading consists of five spot products: Beijing carbon emission allowance (BEA), CCER, forest certified emission reduction (FCER), green transport certified emission reduction (PCER)[5] and energy-saving project certified emission reductions. The Beijing Green Exchange manages trading of all five products.

Due to the financial market related regulations in China, no forward markets or derivatives are allowed.

LEGAL STATUS OF ALLOWANCES: The allowances are not considered financial instruments.

MARKET STABILTY PROVISIONS

PRICE FLOOR AND CEILING: The competent authority can auction extra allowances if the weighted average price exceeds CNY 150 (USD 23.26) for ten consecutive days, and buy-back allowances from the market using a special funding source from the municipal budget if the price is below CNY 20 (USD 3.10).

EXCHANGE: The Beijing Green Exchange implements a system of limits on price increases and decreases for trading over the exchange[6] which is ±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.

Other Information

INSTITUTIONS INVOLVED

Beijing Ecology and Environment Bureau (competent authority)
Beijing Green Exchange (trading platform)
Beijing Research Center for Climate Change (registry)

EVALUATION/ETS REVIEW

No public information about the evaluation or review system. However, the local carbon exchange has published annual reports with an overview of the system's performance from 2014 to 2018. In addition, research on improving MRV and benchmarking etc. has been funded by the local government.

REGULATORY FRAMEWORK

Beijing Municipal People's Congress ETS Pilot Bill (2013)[7]
Interim Measures for the Management of Emissions Trading in Beijing (2014)[8]
List of Covered Entities (2019 compliance year)[9]
Beijing EEB Notice on the Management of Key Carbon Emission Units and the Pilot Work of Carbon Emission Rights Trading in 2020[10]
Beijing EEB Notice on the Management of Key Carbon Emission Units and the Pilot Work of Carbon Emission Rights Trading in 2021[11]
Beijing Local MRV Standards for Seven Industries (power generation, cement, petrochemical, heat production, service, road transportation and other industries) (2021).[12]

5 The acronym is related to its Chinese title, rather than English.
6 Besides this type of trading, the Beijing pilot also allows over-the-counter (OTC) trading.
7 http://www.tanpaifang.com/zhengcefagui/2013/122927524.html
8 http://www.tanjiaoyi.com/article-1562-1.html
9 http://sthjj.beijing.gov.cn/bjhrb/index/xxgk69/zfxxgk43/fdzdgknr2/hbjfw/1745093/index.html
10 http://sthjj.beijing.gov.cn/bjhrb/index/xxgk69/zfxxgk43/fdzdgknr2/hbjfw/1758471/index.html
11 http://sthjj.beijing.gov.cn/bjhrb/index/xxgk69/zfxxgk43/fdzdgknr2/hbjfw/10967866/index.html
12 http://sthjj.beijing.gov.cn/bjhrb/index/xxgk69/sthjlyzwg/ydqhbh/10914037/index.html

China

China National Emissions Trading System

In force

Under development

Under consideration

SECTORS:

POWER*

**Captive power plants in other sectors are also covered*

Became operational in 2021 as the world's largest ETS, covering more than four billion tCO_2

Operates as an intensity-based ETS

Covers the power sector initially and will expand to other sectors over time

ESTIMATED COVERAGE
~4,500 $MtCO_2$ (2019 and 2020 each)

GASES
CO_2 only

OFFSETS AND CREDITS
Domestic

ALLOCATION
Free Allocation: Benchmarking

AVERAGE 2021 ALLOWANCE PRICE
Average secondary market price:
CNY 46.61 (USD 7.23)

ETS DESCRIPTION

China's national ETS – the world's largest in terms of covered emissions – started operating in 2021. It builds on the successful experience of pilot carbon markets implemented in eight regions. The objective of the ETS is to contribute to the effective control and gradual reduction of carbon emissions and, as confirmed as part of the 1+N policy framework in October 2021, will be an important policy measure to achieve China's targets to peak emissions by 2030 and achieve carbon neutrality by 2060. The ETS regulates more than 2,000 companies from the power sector (including combined heat and power, as well as captive power plants in other sectors), which emit more than 26,000 tCO_2 per year. The Chinese national ETS is estimated to cover more than 4 billion tCO_2, accounting for over 40 % of national carbon emissions. It is an intensity-based system with ex-post adjustments to the cap based on actual production levels. Compliance obligations are currently limited and vary between different types of power generation. The system will expand to other sectors over time and fine-tune its policy design and implementation.

The existing Chinese regional ETS pilots are gradually transitioning into the national ETS. In the short term, the pilots will 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, entities already covered by regional systems are expected to be integrated into the national market.

Originally under the responsibility of the National Development and Reform Commission (NDRC), in 2018 the climate change policy portfolio (including the development of the ETS) was shifted to the newly-established Ministry of Ecology and Environment (MEE). Interim regulations published in 2021 elaborated on the governance structure of the ETS, which, while remaining centered on the MEE, would grant authority to other national-level regulators as well as envisage cooperation between the MEE and other government entities in supervising market operations and compliance procedures.

YEAR IN REVIEW

2021 saw the publication of important policy documents by the MEE, which collectively confirmed key design elements of the China national ETS. In January, the MEE released final versions of two documents: "The National Measures for the Administration of Carbon Emission Trading (Trial)", which provide the legal basis for the national ETS and confirm the governance structure; and the "2019–2020 National Carbon Emission Trading Cap Setting and Allowance Allocation Implementation Plan (Power Generation Industry)", which adopted benchmarking as the main approach for allowance allocation and established benchmarks for different types of power generation.

In March 2021, the MEE published policy documents on monitoring, reporting and verification. The "Notice on Strengthening the Management of Enterprise Greenhouse Gas emissions Reporting" and the "Guidelines for Enterprise Greenhouse Gas Verification (Trial)" confirmed deadlines for emissions reporting and verification, allowance allocation for 2019 and 2020, and the verification process to be managed by provincial-level authorities. The MEE also released for public comment new draft ETS legislation that would refine existing measures and elevate them within the legal hierarchy. The "Interim Regulations for the Management of Carbon Emissions Trading (draft)" propose changes or additional features in a number of areas: in addition to the established three-tier governance structure, the regulatory role of other national government entities beside the MEE; financial and non-financial enforcement measures; the intention to move towards a top-down model of cap setting; the gradual introduction of auctioning; and the process for integrating regional pilots into the national ETS. When finalized, these will replace the existing National Measures.

In May, the MEE published further rules related to market operation, which clarified eligibility to participate in the ETS as well as permitted trading products in the market. Trading of carbon emissions allowances (CEAs) commenced in July, at an opening price of CNY 48 (USD 7,48). According to local media, the total trading volume on the first day was 4.1 million tonnes at CNY 210 million (USD 32.56 million).

In October, as part of the '1+N' policy framework, China confirmed targets to peak emissions by 2030 and achieve carbon neutrality by 2060. These targets were also submitted to the UNFCCC in its updated NDC and new long-term low GHG emissions development strategy. The guidance clarified the intention to expand the coverage of the ETS, diversify permitted trading instruments and improve the allocation and management of allowances. It also underlined the importance of carbon sinks within the national carbon market and the role of forestry offsets in the ETS. Shortly after this announcement, the MEE confirmed the compliance obligations for 2019 and 2020 and that compliance would be completed by the end of the year. At the end of 2021, the MEE announced the successful conclusion of the first compliance period covering 2019 and 2020, with entities representing 99.5 % of emissions covered having complied.

Emissions & Targets of China

GHG EMISSIONS EXCL. LULUCF, 2014 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	9,559	(78 %)
Industrial Processes	1,718	(14 %)
Agriculture	830	(7 %)
Waste	195	(2 %)
Total	**12,301**	

Energy Industries	4,065	(33 %)
Manufacturing Industries and Construction	3,450	(28 %)
Transport	828	(7 %)
Other Energy	750	(10 %)

GHG REDUCTION TARGETS

By 2025: Reduction in carbon emissions per unit of GDP of 18 % compared to 2020 levels (14th Five-Year Plan)

By 2030: Peak CO_2 emissions before 2030; lower CO_2 emissions per unit of GDP by over 65 % from 2005 levels ('1+N' policy framework; updated NDC)

By 2060: Carbon neutrality ('1+N' policy framework; updated NDC)

ETS Size & Phases

COVERED CO_2 EMISSIONS 2019–20

> 44 %

GHGs COVERED

CO_2 only

PHASES

There are currently no specific phases for the Chinese national ETS. The current rules only apply to the first compliance period, which covers 2019 and 2020.

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 an intensity-based cap, which changes according to the actual production levels. The national ETS is estimated to have a cap of 4,500 $MtCO_2$/year for 2019 and 2020 respectively.

The Draft Interim Regulations published by the MEE in 2021 outline the possibility of centralized development of a cap and allocation plan, implying the potential for a top-down process of cap setting in future.

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: petrochemicals, chemicals, 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 tCO_2 in any year over the period 2013–2019.

POINT OF REGULATION

Downstream

In the long run, when expanding to other sectors beyond power, both direct emissions from the power sector and indirect emissions from electricity and heat consumption are expected to be included.

NUMBER OF ENTITIES

2,162 (2020 and 2021)

Power entities covered by the Chinese regional ETS pilots have gone through a transition into the national market.

Allowance Allocation & Revenue

ALLOWANCE 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.

Entities received allowances at 70 % of their 2018 output multiplied by the corresponding benchmark factor. Allocation was subsequently adjusted to reflect actual generation in 2019 and 2020. A unit load (output) adjustment factor distributed more allowances for entities operating at load rates lower than 85 %. This may have provided more allowances to less efficient power units.[1]

AUCTIONING: Allocation currently takes place through free allocation, but the Draft Interim Regulations clarify that auctioning is to be introduced and gradually expanded. There is currently no timeline for this.

USE OF REVENUES

The Draft Interim Regulations propose to set up a new national ETS fund, channeling auction revenues to further support the development of the national carbon market and key GHG reduction projects. There is currently no timeline for this.

Flexibility & Linking

BANKING AND BORROWING

Detailed rules on banking and borrowing are not yet specified. The system is expected to allow for banking but not for borrowing.

OFFSETS AND CREDITS

Covered entities can use China Certified Emissions Reductions (CCERs) generated from projects not covered by the national ETS for up to 5 % of their verified emissions. There are no additional project or vintage restrictions.

Development of the CCER offset program began in 2009 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", which provide guidelines for the issuance of CCERs. The registration of CCER projects started in 2015 but the program was suspended in 2017 while regulations were reviewed, without a specific timeline for reinstatement. In addition, the 1+N policy framework indicates the government's plan to incorporate carbon sink offset trading into the national carbon market.

The Beijing Environmental Exchange (renamed Beijing Green Exchange in June 2020) operates the CCER registry, and nine regional carbon exchanges in China are dedicated CCER trading platforms.[2]

1 A regional adjustment factor that would give regional governments the opportunity to tighten allocations 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.
2 Beijing, Chongqing, Fujian, Guangzhou, Hubei, Shanghai, Shenzhen, Sichuan, and Tianjin.

Compliance

COMPLIANCE PERIOD

One calendar year. Entities were requested to surrender allowances in 2021 for 2019 and 2020.

MRV

REPORTING FREQUENCY: Covered entities submit the previous year's emission reports by the end of April each year.

VERIFICATION: Provincial-level ecological and environmental authorities are in charge of organizing the verification of GHG reports. They may commission technical service agencies to provide verification services. Verification must be complete by the end of June and results are to be made publicly available.

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, covering the eight key sectors (see 'Sectors and Thresholds').

OTHER: The MEE will further improve the existing MRV guidelines and technical specifications for the national ETS, based on experience from the initial phase.

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 Draft Interim Regulations propose higher financial fines than those in the existing National Measures. Fines for failing to submit a report would increase from CNY 10,000–30,000 (USD 1,550–4,652) to CNY 50,000–200,000 (USD 7,753–31,013), while fines for failures in compliance obligations would increase from CNY 20,000–30,000 (USD 3,101–4,652) to CNY 100,000–500,000 (USD 15,506–77,532). Any gap between the compliance obligation and allowances surrendered also would be deducted from the following year's allocation.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Currently only compliance entities. The Draft Interim Regulations indicate that other types of institutions or individuals may be allowed later in the market, without a specific timeline.

MARKET TYPES:

Primary: Allowances are currently only distributed by free allocation. The Draft Interim Regulations state the intention to introduce auctioning, without a specific timeline.

Secondary: Carbon emissions allowances can be traded on a dedicated trading platform managed by the Shanghai Environment and Energy Exchange. Due to financial market-related regulations, other products (e.g. derivatives) are currently not allowed. The Draft Interim Regulations indicate that other trading products may be allowed later in the market, without a specific timeline.

LEGAL STATUS OF ALLOWANCES: The allowances are currently not considered as financial instruments. As for financial accounting of the allowances, the Ministry of Finance published an interim policy that requests to categorize only the purchased allowances (not those received for free) as assets in financial statements.

MARKET STABILTY PROVISIONS

In May 2021, the MEE announced the option of establishing a market-regulating and protection mechanism. This would enable MEE to respond to abnormal fluctuations in trading prices, for instance through buy-back, auctioning or adjusting the rules related to CCER use. The necessary triggers and specifics of this mechanism are yet to be defined.

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;
- MEE subsidiaries at the provincial level oversee the implementation of these rules; and
- municipal-level authorities take on some management duties locally.

The Draft Interim Regulations further develop this structure, proposing responsibilities for other national-level regulators and coordination among other state agencies. Besides provincial- and municipal-level authorities, environmental and ecology authorities may also participate in ETS management.

EVALUATION/ETS REVIEW

An evaluation framework is currently under development.

REGULATORY FRAMEWORK

Interim Administrative Measures on Emissions Trading (2014)[3]

The National Measures for the Administration of Carbon Emission Trading (Trial) (2021)[4]

Interim Regulations for the Management of Carbon Emissions Trading (draft) (2021)[5]

Allocation Plan for the Power Sector (2019–2020) and list of covered entities (2021)[6]

(English translation)[7]

Notice on the First Compliance Cycle of Emission Allowance Surrendering for the National ETS (2021)[8]

Guidelines on enterprises greenhouse gas emissions accounting and reporting – Power generation facilities (2021)[9]

Guidelines for Enterprise Greenhouse Gas Verification (Trial) (2021)[10]

Notice on Strengthening the Management of Enterprise Greenhouse Gas Emissions Reporting (2021)[11]

24 Guidelines for GHG Monitoring and Reporting for various sectors (**2013**[12], **2014**[13], and **2015**[14])

3 http://extwprlegs1.fao.org/docs/pdf/chn163081.pdf
4 http://www.mee.gov.cn/xxgk2018/xxgk/xxgk02/202101/t20210105_816131.html
5 https://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202103/t20210330_826642.html
6 https://www.mee.gov.cn/xxgk2018/xxgk/xxgk03/202012/t20201230_815546.html
7 https://chinaenergyportal.org/en/implementation-plan-for-the-2019-2020-national-carbon-emission-trading-quota-setting-and-allocation-power-generation-industry/
8 https://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202110/t20211026_957871.html
9 http://www.mee.gov.cn/xxgk2018/xxgk/xxgk05/202103/t20210330_826728.html
10 http://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202103/t20210329_826480.html
11 http://www.mee.gov.cn/xxgk2018/xxgk/xxgk05/202103/t20210330_826728.html
12 http://www.gov.cn/zwgk/2013-11/04/content_2520743.htm
13 http://www.ncsc.org.cn/SY/tpfqjy/202003/t20200319_769745.shtml
14 http://www.ncsc.org.cn/SY/tpfqjy/202003/t20200319_769747.shtml

Chongqing

Chongqing Pilot Emissions Trading System

CAP
78.39 $MtCO_2e$ (2020)

GASES
Several gases

OFFSETS AND CREDITS
Domestic

ALLOCATION
Free Allocation: Grandparenting
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: CNY 29.31 (USD 4.54)
Average secondary market price: CNY 26.53 (USD 4.11)

TOTAL REVENUE
CNY 255.9 million (USD 39.7 million)

In force
Under development
Under consideration

ETS DESCRIPTION

Chongqing launched its pilot ETS in June 2014; to date, it has concluded seven compliance years.[1] The Ecology and Environment Bureau (EEB) of Chongqing is responsible for the ETS.[2] The system covers electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel, and other industrial sectors. The power sector was covered until 2019, after which it transitioned to the national ETS. 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 152 enterprises covered by the system accounted for ~51 % of the city's total carbon emissions in 2020. The latest publicly available allocation plan dates from 2019 and is for the 2018 compliance year. Among the eight Chinese pilots, the Chongqing ETS is the only one that covers non-CO_2 gases.

Another unique feature of the Chongqing Pilot ETS, compared to the other Chinese pilots, is that it has a clear path for cap-setting in which an annual reduction rate is set and applied to the base-year emissions level (i.e., the sum of each covered entity's highest annual emissions of the year from 2008 to 2012). From 2013 to 2015, the annual reduction rate was 4.13 % and thereafter 4.85 %.

The latest publicly available Chongqing allocation plan for the 2018 compliance year differed from those of other Chinese pilots in that allowances were allocated based on entities' self-reported demand. Adjustments are made when an 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. 2018 was the second consecutive year where the cap (97 $MtCO_2e$) was lower than the sum of the allocation based on self-declared demanded amount (106 $MtCO_2e$); hence, the allocation was subject to a downward adjustment. Since then, no detailed allocation plan has been publicly released.

YEAR IN REVIEW

In February 2021, for the first time since launching the ETS pilot, the Chongqing EEB announced a list of 22 companies that had failed to fulfill their compliance obligations, for 2018. This indicates that the regional government is putting pressure on covered entities to fulfill their compliance obligations.

In July 2021, the Chongqing EEB issued the draft of "Measures for Management of Emissions Trading in Chongqing" for public consultation. The draft would replace the interim measures of the Chongqing ETS pilot published in 2014. The key changes from the 2014 version are: confirming the role of the market mechanism to support the city's carbon peaking and neutrality targets; highlighting the market orientation as a key rule; providing more details of the institutional setup; separating the roles of Chongqing Resource and Environment Trading Center and Chongqing United Property Exchange Group Co. regarding the operation of registry and trading platform; allowing the introduction of auctioning and setting aside a certain amount of allowances from the cap for auctioning or market stability purposes; and tightening the non-compliance measures.

SECTORS:

POWER
Covered until transition to national ETS

INDUSTRY

The only Chinese pilot to cover non-CO_2 gases

Annual cap reduction rate

Allocation based on entities' self-reported demand and historical highest emissions

1 The first compliance cycle covered both 2013 and 2014 emissions. The 2019 compliance cycle is the latest to have been completed.
2 2019 saw the completion of the transition of ETS-related responsibilities in Chongqing from the Development and Reform Commission to the EEB.

In September 2021, the Chongqing EEB issued a new policy to support local offset development titled "Management Measures of 'Carbon Hui Tong' (also called CQCER) Eco-Product Value Realization Platform (Trial)", which entered into force in mid-October. The CQCERs can be used by entities covered by the Chongqing ETS for compliance purposes as well as by enterprises, institutions and individuals to voluntarily offset their emissions (see "Offsets & Credits").

In addition, Chongqing also saw a breakthrough in auctioning in 2021. In September, the Chongqing government issued the work program for auctioning allowances for 2019 and 2020 compliance. In November and December 2021, the two auctions were held (see "Allowance Allocation").

In November 2021, Chongqing's Development and Reform Commission released a draft policy for public consultation titled "Joint Action Plan for Carbon Neutralization in the Twin Cities Economic Circle of Chengdu and Chongqing". It has endorsed a relatively short-term qualitative (rather than quantitative) mitigation target for 2025, stating that by then the two cities' CO_2 growth rate will be lower and energy and carbon intensity will continue to decrease. It provides further impetus for advancing the development of compliance carbon markets as well as offset projects (including from wind power, biogas, and forestry) in the two cities as well as enhancing their collaboration. Furthermore, it proposes a goal to jointly develop China's Western Environmental Resources Trading Center.

Emissions & Targets of Chongqing

CO_2 EMISSIONS EXCL. LULUCF, 2020 (IN $MtCO_2$)

142.89[3]

GHG REDUCTION TARGETS

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

By 2025: CO_2 growth rate will be lower and both energy and carbon intensity will continue to decrease without specifying the rates (draft for comments "Joint Action Plan for Carbon Neutralization in the Twin Cities Economic Circle of Chengdu and Chongqing"). The carbon intensity target will be specified by the central government.

ETS Size & Phases

COVERED CO_2 EMISSIONS (2020)[4]

51 %

GHGS COVERED

CO_2, CH_4, N_2O, HFCs, PFCs, SF_6

PHASES

2013 and ongoing[5]

CAP

97 $MtCO_2e$ (2018 and 2019)

78.39 $MtCO_2e$ (2020, mainly due to the transfer of power sector into national ETS)

From 2013 to 2015, the annual reduction rate of the cap was 4.13 %. From 2016 onwards, it was revised to 4.85 %.

SECTORS AND THRESHOLDS

Different from most other Chinese pilots, Chongqing 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 are covered, including electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel, and other industrial sectors. The power sector was covered until 2019, after which it transitioned to the national ETS.

INCLUSION THRESHOLDS:

Until 2020: 26,000 tCO_2/year or energy consumption of 10,000 tonnes of coal equivalent (tce)/year.

From vintage 2021: Chongqing plans to lower the threshold to 13,000 tCO_2/year or energy consumption of 5,000 tce/year.

3 As there is no publicly available data for the most recent years, the data here is provided by local experts in Beijing. The previously reported data based on expert estimates is 156 $MtCO_2$ (2018).
4 There is no official data, so emissions coverage given here is an estimate. Coverage for 2019 was estimated at ~62 %, when power sector was still under the Chongqing ETS.
5 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.

POINT OF REGULATION

Downstream

Both direct and indirect emissions from electricity and heat consumption are covered.

NUMBER OF ENTITIES

180 (2019)

152 (2020)

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

FREE ALLOCATION: Free allocation through grandparenting based on historical emissions (highest number in period 2008–2012). Regulated entities submit their allowance allocation 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.

AUCTIONING: Auctioning was introduced in 2021. 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, with the first two taking place in 2021.

The first auction (with 3.5 million allowances on offer) was for companies in a short position for the 2019 compliance year, while the second (of 8 million allowances) was for those in a short position for both 2019 and 2020. The floor price was set at 80 % of the market weighted average price of the previous 6 months, or CNY 25.97 (USD 4.03) and CNY 28.41 (USD 4.41). The first auction sold all allowances with a clearing price of CNY 30.31 (USD 4.70) and the second sold 5.3 million allowances at CNY 28.41 (USD 4.41).

Flexibility & Linking

BANKING AND BORROWING

Banking is allowed.

Borrowing is not allowed.

OFFSETS AND CREDITS

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

Since September 2021, a local carbon offset program has been also operationalized which generates CQCER credits for both compliance and voluntary use.

QUALITATIVE LIMIT: For CCERs, reductions must be achieved after 2010 with the exception of carbon sink projects. Credits from hydro projects are not allowed.

For the CQCERs, no specific project types are defined in the respective regulation but based on the existing experience of Chongqing regarding offset projects, it is likely to cover a wide range of project types such as forestry carbon sink, household biogas, solar PV power generation, and waste separation.

Compliance

COMPLIANCE PERIOD

One calendar year: 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.

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

ENFORCEMENT

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

The draft measures propose several additional publishments, including deduction of 10 % of the allowances issued free of charge for the following year.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION:

Compliance and non-compliance entities and individuals that meet the requirements of the carbon emission trading rules.

MARKET TYPES:

Primary: So far, allowances are mainly allocated for free, with auctioning introduced in 2021, without a fixed schedule. Two auctions have been held so far.

Secondary: There is a spot market at Chongqing Carbon Emissions Trading Center for trading of allowances, CCERs and CQCERs. Due to the financial market-related regulations in China, no forward markets or derivatives are allowed yet.

LEGAL STATUS OF ALLOWANCES: Allowances are not considered financial instruments.

MARKET STABILTY PROVISIONS

The draft measures state that a certain number of allowances from the cap could be set aside for several purposes including market stability. However, there are no details of the market stability mechanism yet.

Other Information

INSTITUTIONS INVOLVED

Chongqing Ecology and Environment Bureau (competent authority)
Chongqing Resource and Environment Trading Center (registry)
Chongqing Carbon Emissions Trading Center (trading platform)[6]

REGULATORY FRAMEWORK

Interim Measures for Management of Emissions Trading in Chongqing 2014[7]
Measures for Management of Emissions Trading in Chongqing (draft for comments) 2021[8]
Chongqing Allowance Allocation Management Rules (2014)[9]
Chongqing EEB Notice on Carrying out ETS Work for Compliance Year 2019[10]
Chongqing EEB Notice on Carrying out ETS Work for Compliance Year 2020[11]
Chongqing Work Program for Auctioning Allowances for 2019 and 2020 Compliance (2021)[12]

6 The Center belongs to Chongqing Asset and Equity Exchange.
7 http://www.tanpaifang.com/tanjiaoyisuo/2014/0504/31858.html
8 http://sthjj.cq.gov.cn/hdjl_249/myzj/202107/t20210721_9496232.html
9 http://www.tanpaifang.com/tanjiaoyi/2014/0530/32965.html
10 http://sthjj.cq.gov.cn/zwgk_249/zfxxgkml/zcwj/qtwj/202106/t20210621_9413094_wap.html
11 http://sthjj.cq.gov.cn/zwgk_249/zfxxgkml/zcwj/qtwj/202111/t20211115_9975435_wap.html
12 http://sthjj.cq.gov.cn/zwgk_249/zfxxgkml/zcwj/qtwj/202109/t20210924_9752179_wap.html

Fujian

Fujian Pilot Emissions Trading System

CAP
~126 $MtCO_2$ (2020)

GASES
CO_2 only

OFFSETS AND CREDITS
National
Provincial

ALLOCATION
Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average secondary market price: CNY 16.75 (USD 2.6)

TOTAL REVENUE
CNY 1.25 million (USD 193,829)[2]

In force
Under development
Under consideration

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 achieved full compliance in its five compliance years. The system covers nine sectors: electricity grid, petrochemicals, chemicals, building materials, iron and steel, nonferrous metals, paper, aviation, and ceramics. The ETS covered electricity generation until 2019, after which it was incorporated into the national ETS.

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 the end of 2020, 2.8 million tonnes of forestry offset credits had traded in the Fujian ETS, with a total turnover of over CNY 40 million (USD 6.2 million), overachieving the province's target of forestry offsets set in 2017.

Unlike other Chinese pilots, which were mandated 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.

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 broader governance restructuring across China. In August 2020, the Fujian DEE amended the "Interim Measures for the Administration of Carbon Emissions Trading in Fujian Province", fine-tuning its reporting, verification, and market oversight system.

According to the Chinese national ETS rules, power sector entities that are overlapping between Fujian and the national ETS were covered under the regional carbon market in 2019 and moved to the national one from 2020 onwards. In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the national carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.

YEAR IN REVIEW

The Fujian ETS finished its compliance work for 2020 at the end of November 2021, with full compliance by its 284 covered entities across nine sectors.

The Fujian DEE released the latest publicly available detailed allocation plan, for 2020, in October 2021. Around 50 % of the regulated entities are architectural ceramics companies. It newly introduces benchmarking as the allocation method for the chemicals and aviation sectors. For the plate glass and ceramics sectors, a so-called energy structure adjustment mechanism was also introduced, in order to promote transformation of the energy mix (see 'Allowance Allocation' below). No allowances were allocated to the market stability reserve in 2020 due to surplus allowances over the previous years.

SECTORS:

POWER
Covered until transition to national ETS

INDUSTRY

DOMESTIC AVIATION

Not one of the seven regional pilots originally assigned by NDRC

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

Broad sector coverage, with 100 % compliance rate in five consecutive years

1 The Fujian pilot has held only one auction, in 2016, which provided 50,000 allowances at 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.

The province's first integrated carbon market service platform was launched in December 2021. This platform provides a whole range of services for enterprises and the public in the areas of carbon management, integrating the carbon market's registry, reporting and verification, and allowance trading and compliance functions into one system.

The Fujian DEE also published the "Fujian Province Ecological and Environmental Protection Plan during the 14th Five-Year Plan Period (2020–2025)". It requires the province to further improve its ETS and offsetting program, increase trading product types, and promote marine carbon sinks to be integrated into the Fujian ETS as offsets.

Emissions & Targets of Fujian

CO_2 EMISSIONS EXCL. LULUCF, 2020 (IN $MtCO_2$)

245.4[2]

GHG REDUCTION TARGETS

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

By 2025: Reduction of carbon intensity according to national government requirement. Clarify the province's carbon peaking timeline and promote advanced cities and areas to achieve carbon peaking earlier. (Fujian Province Ecological and Environmental Protection Plan During the 14th Five-Year Plan Period)

By 2035: Carbon emissions peak and decrease steadily (Fujian Province Ecological and Environmental Protection Plan During the 14th Five-Year Plan Period)

ETS Size & Phases

COVERED CO_2 EMISSIONS (2020)

51 %

GHGS COVERED

CO_2

PHASES

2016-ongoing[3]

CAP

~220 $MtCO_2$ (2019)[4]
~126 $MtCO_2$ (2020)

The cap includes three elements: existing entities' allowances, new entrants' reserve, and market stability reserve.

SECTORS AND THRESHOLDS

Electricity grid, petrochemical, chemical, building materials, iron and steel, nonferrous metals, paper, aviation, and ceramics. Electricity production was covered until 2019, after which it transitioned to the national ETS.

INCLUSION THRESHOLDS:

2016–2019: Energy consumption of 10,000 tonnes of coal equivalent (tce)/year, for any year between 2013 and 2019.

Since 2020: Emitters with energy consumption of 5,000 tce or more in any year from 2013 to 2020 are also included.

POINT OF REGULATION

Downstream
Both direct and indirect emissions from electricity and heat consumption are covered.

NUMBER OF ENTITIES

269 (2019), including 28 power entities which then transferred to the national ETS in the following year.
284 (2020), including 242 existing entities and 42 new entities.

2 As there is no publicly available data for the most recent years, the data here is provided by local experts. The previously reported data based on public source in the launch year of the ETS is 240.0 $MtCO_2$ (2014).
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.
4 There is no public data on the total cap or of its three elements. This number is based on an estimate by experts. The cap for 2019 was estimated to cover 87 % of carbon emissions.

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

Allowances are largely distributed for free, using benchmarking or grandparenting. 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. Allocation is then adjusted ex-post to reflect the actual production in the respective compliance year.

FREE ALLOCATION, BENCHMARKING: Benchmarking is applied to the electricity (until 2019), cement, aluminum, plate glass, chemical and aviation sectors.

FREE ALLOCATION, GRANDPARENTING: The other sectors are allocated allowances based on historical carbon intensity. These entities can also apply for more allowances as reward for early mitigation actions. From 2020, for the plate glass and ceramics sectors, a so-called energy structure adjustment mechanism was introduced. This mechanism sets an energy structure adjustment factor based on the share of gas in the total energy consumption. It has four levels, ranging from 0.9 (0 % of gas usage) to 1.03 (50 % to 100 % of gas usage). As such, entities with a higher use of gas would receive more allowances. The aim of the mechanism is to promote the use of gas to transform the energy mix.

AUCTIONING: Auctioning may take place when 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 (non-uniform price) auction of 50,000 allowances in 2016 from the government reserve, with the settlement prices ranging from CNY 26.50 (USD 4.11) to CNY 30 (USD 4.65). No further auctions have taken place to date.

USE OF REVENUES

Revenues are attributed to the provincial treasury.

Flexibility & Linking

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 (FFCERs) are allowed. The use of CCERs 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 entities not regulated under the ETS, from CO_2 or CH_4 projects. Hydropower-related credits are not eligible. FFCER projects from three project types (afforestation, forest management, and bamboo management) are eligible if implementation took place after mid-February 2005 and if the project developers have independent legal personality.

Compliance

COMPLIANCE PERIOD

One calendar year: covered entities have until the end of June of the following year to surrender allowances.[5]

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions to the competent authority before the end of February of the following year.[6]

VERIFICATION: Third-party verification is required for all 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

REGULATED ENTITIES: 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 1,550.6) to CNY 30,000 (USD 4,651.9). 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 4,651.9). Additionally, twice the amount of the missing allowances can be withdrawn from the account of the company or deducted from next year's allocation.

TRADING INSTITUTIONS: Penalties for the misconduct of trading entities and their staff, such as not publishing relevant trading information, failing to establish and implement a risk management system or leaking commercial secrets, can range from CNY 10,000 (USD 1,550.6) to CNY 30,000 (USD 4,651.9).

THIRD-PARTY VERIFIERS: Penalties for misconduct, such as publishing false reports, reporting with errors, leaking commercial secrets, or participating in the market, could range from CNY 10,000 (USD 1,550.63) to CNY 30,000 (USD 4,651.9).

In addition, the Fujian DRC also released guidelines concerning ETS credit information management in 2018, providing further details regarding recording and misbehaviors and corresponding incentives and penalties. Incentives for ETS compliance include priority lending, priority approval for project administration, reduced frequency of inspections, among other things. Punishments for non-compliance include restrictions on approval of new projects, increased frequency of inspections, record in the bank credit system, among other things.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Covered entities and institutional investors (domestic only) that meet the requirements of the emissions trading rules set up by Fujian DEE.

MARKET TYPES:

Primary: While most allowances are allocated for free, Fujian Haixia Equity Exchange organizes ad hoc auctions for the primary market. So far, only one auction has been held.

Secondary: Spot trading of Fujian Emission Allowances (FJEA), CCERs and FFCERs takes place on Fujian Haixia Equity Exchange.

LEGAL STATUS OF ALLOWANCES: Allowances are not considered financial instruments.

5 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.
6 In recent years, the deadline has been postponed.

MARKET STABILTY 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.

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)

EVALUATION/ETS REVIEW

Research on improving the Fujian ETS has been undertaken every year, funded by the local government.

REGULATORY FRAMEWORK

Implementation Plan of Emissions Trading Market Construction in Fujian Province (2016)[7]
Interim Measures for the Management of Emissions Trading in Fujian Province (2016)[8]
2020 Amendments to the Interim Measures[9]
Fujian Provincial Department of Ecology and Environment—Allocation Plan for Vintage 2018 and 2019[10]
Fujian Provincial Department of Ecology and Environment – Allocation Plan for Vintage 2020[11]

7 http://fgw.fuzhou.gov.cn/zz/fgwzwgk/fg/201901/t20190108_2735580.htm
8 http://www.npcxj.com/index.php/Mobile/Lew/info/type1/difangxingfaguiguizhang/id/17342.html
9 http://fjnews.fjsen.com/2020-09/15/content_30478231.htm
10 http://www.tanpaifang.com/tanzhibiao/201906/1864234.html
11 http://sthjt.fujian.gov.cn/zwgk/zfxxgkzl/zfxxgkml/mlwrfz/202110/t20211018_5743345.html

Guangdong

Guangdong Pilot Emissions Trading System

In force

Under development

Under consideration

CAP
265 $MtCO_2$ (2021)

GASES
CO_2 only

OFFSETS AND CREDITS
National
Provincial

ALLOCATION
Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: CNY 28.2 (USD 4.37), as per the April 2020 auction; no auction has been held since.
Average secondary market price: CNY 38.13 (USD 5.91)

TOTAL REVENUE
CNY 815.46 million (USD 126.45 million) since beginning of program

SECTORS:

POWER
Covered until transition to national ETS

INDUSTRY

DOMESTIC AVIATION

Largest market size with ongoing scope expansion and largest spot trading among pilots

Diversified market participants, including foreign investors, and pioneered auctioning

First pilot to introduce Tan Pu Hui[2] Offset Mechanism for compliance

ETS DESCRIPTION

Launched in December 2013, the Guangdong Pilot ETS has concluded eight compliance years to date with high compliance rates. It is the largest of the Chinese ETS pilots in terms of market size. Following several scope expansions since 2016, the ETS covers cement, steel, petrochemical, paper, and domestic aviation sectors, accounting for about 40 % of the province's carbon emissions. The ETS covered electricity generation until 2020, after which it was integrated into the national ETS. The system expects to further expand in 2022 (see 'Year in Review' below).

The Guangdong Pilot ETS has one of the most active markets among the Chinese pilots, with the largest spot trading volume. By the end of December 2021, the Guangdong pilot had traded a total of 199.69 million allowances, worth over CNY 4.61 billion (USD 0.71 billion). From 2019 to 2020, the spot trading volume in the Guangdong ETS exceeded the EUA spot trading on the European Energy Exchange (EEX) for the same period.

Guangdong was the first pilot to introduce auctioning as one of the key allocation methods. It was mandatory for enterprises to purchase 3 % of their allowances at auction in 2013 before receiving the remainder for free. Since 2014, participation in auctions has been voluntary and the share of allowances allocated for free is 95 % for the power sector and 97 % for the remaining sectors, with some modifications in 2020 and 2021 (see 'Allowance Allocation' below).[1] Since 2017, auctions have been held on an ad hoc basis.

Guangdong has introduced new trading methods of allowance transaction for the secondary market in recent years to enhance further market liquidity. In June 2020, a so-called 'bidding transfer' was introduced, in which covered entities entrust the China Emissions Exchange (Guangzhou) (CEEX) to organize auctions of their allowances instead of pursuing bilateral trading.

Guangdong is among the few pilots that are open to foreign investors. Guangdong also allows unincorporated organizations, such as securities companies and trusts, to trade in its carbon market. As of January 2022, it has 132 institutional investors participating, accounting for over 65 % of total trading volume.

As a result of the governance restructuring across China, the ETS-related responsibilities in Guangdong transitioned in 2018 from the Development and Reform Commission to the Department of Ecology and Environment (DEE).

1 This has been slightly modified for the 2020 compliance year for the aviation sector, which receives 100 % free allocation.

YEAR IN REVIEW

After delaying compliance deadline for 2019 due to the COVID-19 crisis, Guangdong DEE issued a notice in February 2021, maintaining the compliance deadline of June 2021 for the year 2020. In the same notice, the DEE also made minor modifications to the carbon verification specifications and the reporting guidelines for covered entities. In July 2021, the Guangdong DEE announced that the region achieved 100 % compliance for 2020, marking its fifth 100 % compliance within eight years of operation.

Guangdong released its 2021 allocation plan with the list of covered entities in December 2021. The total cap for the 178 covered entities for 2021 is 265 $MtCO_2$, with an additional 13 $MtCO_2$ reserved for new entrants and market stability measures. Compared to previous years, the allocation plan introduced several changes, with the most significant being the transfer of the power sector entities to the national ETS. In addition, the volume of free allowances allocated to the remaining sectors dropped by one percentage point, compared to 97 % in 2020, except for the aviation sector which remained unchanged at 100 %. The allocation plan also stated that, from 2022 onwards, the threshold to enter the compliance market will drop from 20,000 tCO_2 to 10,000 tCO_2 per year, corresponding to 5,000 tce of energy consumption, and the sectors covered will further expand to ceramics, textiles and data centers.

Guangdong has seen momentum to further develop its market products. In April 2021, the Guangzhou Futures Exchange was officially inaugurated. The same month, the "Notice of the General Scheme of the China (Guangdong) Pilot Free Trade Zone" issued by the State Council stated that "the establishment of an innovative futures exchange with carbon emission permits as the first trading product will be studied."

According to the Guangdong Province Work Plan for Construction of Ecological Civilization During the 14th Five-Year Plan Period released in November 2021, the Guangdong ETS pilot plans to further expand its sectoral scope under the compliance market, as well as explore the expansion of the regional offset program. In addition, Guangdong will also conduct research about the feasibility of the construction of a joint or linked carbon market within the Guangdong-Hong Kong-Macao Greater Bay Area. Details of such plan are not yet available.

Emissions & Targets of Guangdong

CO_2 EMISSIONS EXCL. LULUCF, 2020 (IN $MtCO_2$)

693.5[2]

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 2025: Cities with the capability to reach carbon peak will gradually start to achieve this goal from 2025 onwards (Guangdong Province Work Plan for Construction of Ecological Civilization During the 14th Five-Year Plan Period)

By 2035: CO_2 reducing steadily after being peaked (Guangdong Province Work Plan for Ecological Civilization Development During the 14th Five-Year Plan Period)

ETS Size & Phases

COVERED CO_2 EMISSIONS (2021)[3]

~ 40 %

GHGS COVERED

CO_2 only

PHASES

PHASE ONE: 3 years (2013–2015)
PHASE TWO: 5 years (2016–2020)
PHASE THREE: ongoing (2021-present)[4]

2 As there is no publicly available data for the most recent years, the data here is provided by local experts. The previously reported data based on public source in he launch year of the ETS is 610.5 $MtCO_2$ (2012).
3 There is no publicly available data for the recent years and the data here is estimated by local experts. For 2020 (with power generation entities still under the Guangdong ETS) the coverage is estimated to be 65 %.
4 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.

CAP

Guangdong is one of a few pilots in China that announces its annual emissions cap. Within the annual cap, government also keeps a certain amount as reserves for new entrants and market stability.

PHASE ONE (2013–2015):
2013: 388 $MtCO_2$ (including 38 $MtCO_2$ reserves)
2014: 370 $MtCO_2$ (including 38 $MtCO_2$ reserves)
2015: 408 $MtCO_2$ (including 38 $MtCO_2$ reserves)

PHASE TWO (2016–2020):
2016: 386 $MtCO_2$ (including 21 $MtCO_2$ reserves)
2017: 422 $MtCO_2$ (including 23 $MtCO_2$ reserves)
2018: 422 $MtCO_2$ (including 23 $MtCO_2$ reserves)
2019: 465 $MtCO_2$ (including 27 $MtCO_2$ reserves)
2020: 465 $MtCO_2$ (including 27 $MtCO_2$ reserves)

PHASE THREE (2021-present):
2021: 265 $MtCO_2$, (including 13 $MtCO_2$ reserves), the drop is mainly due to the transfer of the power sector into national ETS

SECTORS AND THRESHOLDS

PHASE ONE (2013–2015): Power, iron and steel, cement, and petrochemicals

PHASE TWO (2016–2020):
2016: Power, iron and steel, cement, aviation, and petrochemicals
2017–2020: As above, plus papermaking

PHASE THREE (2021-present):
2021: Iron and steel, cement, papermaking, aviation, and petrochemicals
2022: As above, plus ceramics, textiles and data centers

INCLUSION THRESHOLDS:
2013–2021: 20,000 tCO_2/year or energy consumption of 10,000 tce/year
2022 onwards: 10,000 tCO_2/year or energy consumption of 5,000 tce/year

POINT OF REGULATION

Downstream
Both direct and indirect emissions from electricity and heat consumption are covered.

NUMBER OF ENTITIES

245 existing entities, 23 new entrants (2020)
178 existing entities, 29 new entrants (2021), with transition of electricity sector to the national ETS

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

FREE ALLOCATION: Mainly free allocation through grandparenting based on historical emissions or emissions intensity, or benchmarking.

Benchmarking is applied to industrial processes in the aviation, cement, paper, and steel sectors.

Grandparenting on the basis of total 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 also applied to some products in the 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.

PHASE ONE (2013–2015):
2013 & 2014: 97 % free allocation for all sectors
2015: 95 % free allocation for the power sector,
97 % free allocation for other sectors

PHASE TWO (2016–2020):
2016–2019: 95 % free allocation for the power sector, 97 % for other sectors
2020: 95 % free allocation for the power sector,
100 % for aviation,
97 % free allocation for other sectors

PHASE THREE (2021-present):
100 % free allocation for aviation,
96 % for other sectors

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 at auctions in order to become eligible to receive their freely allocated allowances. This requirement was terminated in 2014.

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 calendar years 2018, 2019 and 2021.

The allowance volume available for auction was adjusted from two million allowances (as had been the case until year 2018) to five million for 2019. The last auction took place in April 2020 for the 2019 compliance year, with a floor price of CNY 25.84 (USD 3.74). In the end, 400,000 allowances were sold, at CNY 28.20 (USD 4.37).

The auction volume for the 2021 compliance year was reduced to 2.5 million. They are expected to be sold sometime in 2022.

USE OF REVENUES

Currently, revenues are attributed to the provincial treasury.[5]

Flexibility & Linking

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) and Tan Pu Hui Certified Emission Reduction (PHCER), a local offset program introduced in the Guangdong pilot in 2017, are allowed.

In addition to the quantitative limit applied to individual entities, Guangdong sets an upper limit to the total volume of offsets allowed. In 2020, entities were allowed to use up to 1.5 million offsets (CCERs and PHCERs) towards compliance obligations, with the priority given to the province's own CCERs and PHCERs first; then, those generated outside of Guangdong will be allowed.

QUALITATIVE LIMIT: At least 70 % of offsets used by each regulated entity must come from within Guangdong province. 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 CO_2 and CH_4 emissions.

OFFSET AUCTIONS: Guangdong introduced auctioning for PHCERs in addition to the existing secondary market trading modes, with an auction reserve price set by the local exchange and offset project developers. In 2021, six PHCER auctions were held.

LINKS WITH OTHER SYSTEMS

Guangdong plans to explore the feasibility of the construction of a joint or linked carbon market within the Guangdong-Hong Kong-Macao Greater Bay Area. Details of such plan are not yet available.[6]

Compliance

COMPLIANCE PERIOD

One calendar year: covered entities have until 20 June of the following year to surrender allowances.[7]

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions in March.

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 randomly selected entities.

5 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, this has not yet been successful.
6 In addition, Guangdong and Hubei also explored linking their pilot markets at the early stage initially, back in 2012/2013, but it did not materialize.
7 The 2020 compliance deadline was postponed due to the COVID-19 pandemic.

A so-called "fourth-party independent evaluation system" has been in place since the 2016 compliance period, in which "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. The government also conducts random checks on the carbon emission reports.

FRAMEWORK: Guangdong's DEE has released guidelines for monitoring and reporting for the compliance and reporting sectors.

OTHER: Industrial enterprises with annual CO_2 emissions of more than 5,000 tonnes and less than 10,000 tonnes are required to report their emissions. Verification is not required.

ENFORCEMENT

ENTITIES: Penalties for failing to submit emissions or verification reports on time range from CNY 10,000 (USD 1,551) 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 7,753). Other non-financial penalties include negative impacts on access to bank loans and subsidy programs.

TRADING INSTITUTIONS: Penalties for failing to publish transaction information or for failing to establish and implement a risk management system range from CNY 10,000 (USD 1,551) to CNY 50,000 (USD 7,753).

THIRD PARTY VERIFIERS: Third-party agencies shall be penalized with a fine of between CNY 30,000 (USD 4,652) to CNY 50,000 (USD 7,753) for issuing false verification reports, material errors in verification reports, as well as for unauthorized use or publication of confidential corporate and emissions information.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Covered entities and domestic and international institutional investors that meet the requirement of the carbon emission trading rules set up by CEEX.

MARKET TYPES:

Primary: As the first Chinese region to introduce auctioning as a method for allowance allocation, Guangdong held quarterly auctions until 2016; since 2017, auctions have been held on an ad hoc basis. CEEX organizes auctions for the primary market.

Secondary: Guangdong Emission Allowance (GDEA) is the main spot trading product in the secondary market. Bidding transfer was introduced in June 2020 to organize auctions for covered entities to enhance market efficiency for the secondary market. CCERs and PHCERs also trade in the secondary market. All products trade on CEEX.

Due to the financial market-related regulations in China, no standardized forward markets or derivatives are allowed yet. However, with the Guangzhou Futures Exchange established in April 2021, Guangdong is seeing new momentum for studying and exploring the launch of carbon futures or other innovative financial products.

LEGAL STATUS OF ALLOWANCES: Allowances are not considered to be financial instruments.

MARKET STABILTY 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".[8]

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 9.30), and it was lowered to CNY 25 (USD 3.88) and increased to CNY 40 (USD 6.2) in steps of CNY 5 (USD 0.78) 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.

8 The auctioning ratio might be adjusted in the future, but no concrete plan is available yet.

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 1.45), CNY 11.27 (USD 1.75), CNY 16.09 (USD 2.49), and CNY 15.15 (USD 2.35). 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. No auctions were held in 2021.

Other Information

INSTITUTIONS INVOLVED

Department of Ecology and Environment of Guangdong Province (competent authority)
China Emissions Exchange (Guangzhou) (trading platform)
Guangdong Research Center for Climate Change (registry)

EVALUATION/ETS REVIEW

No public information about the evaluation or review system. However, Guangdong Research Center for Climate Change has published a biannual/annual report of Guangdong ETS with an overview of its performance 2013 to 2018. In addition, research on improving MRV and allowance allocation has been undertaken, funded by the local government.

REGULATORY FRAMEWORK

Guangdong Pilot ETS Implementation Plan (2012)[9]
Trial Measures for Carbon Emissions Trading in Guangdong(2014)[10]
Department of Ecology and Environment of Guangdong—Allocation Plan for Vintage 2019 (including list of covered entities)[11]
Department of Ecology and Environment of Guangdong—Allocation Plan for Vintage 2020 (including list of covered entities)[12]
Department of Ecology and Environment of Guangdong—Allocation Plan for Vintage 2021 (including list of covered entities)[13]

9 http://www.gd.gov.cn/gkmlpt/content/0/141/post_141049.html#7
10 http://www.gd.gov.cn/zwgk/wjk/zcfgk/content/post_2524340.html
11 http://www.cnemission.cn/article/zcfg/201911/20191100001804.shtml
12 http://www.cnemission.com/article/zcfg/202012/20201200002034.shtml
13 http://gdee.gd.gov.cn/shbtwj/content/post_3735194.html

Hubei

Hubei Pilot Emissions Trading System

In force

Under development

Under consideration

SECTORS:

POWER
Covered until transition to national ETS

INDUSTRY

One of the largest pilot markets, with diversified participants and an established market stability mechanism

Lowered inclusion threshold

Leading in the operation of the national ETS registry

CAP
166 $MtCO_2$ (2020)

GASES
CO_2 only

OFFSETS AND CREDITS
Provincial

ALLOCATION
Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: CNY 30.60 (USD 4.74)
Average secondary market price: CNY 34.28 (USD 5.32)

TOTAL REVENUE
CNY 297.21 million (USD 46.09 million) since beginning of program
CNY 85.5 million (USD 13.26 million) in 2021

ETS DESCRIPTION

Launched in April 2014, the Hubei Pilot ETS has since concluded seven compliance years. It covers a broad range of industrial sectors and has expanded its scope several times. The ETS covered the power sector until 2019, which was subsequently integrated into the national ETS. In 2016, it lowered the thresholds of seven sectors from 60,000 tce to 10,000 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 2019, the system covers more than 373 entities and ~27 %[1] of the province's CO_2 emissions.

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.[2] When spot forward trading is also considered, Hubei has the largest market as of the end of 2021, with a total secondary market transaction volume of 365 million tonnes and value of CNY 8.65 billion (USD 1.34 billion). Hubei allows foreign institutional and individual investors to participate in its carbon market.

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.

In early 2019, the ETS-related responsibilities in Hubei completed the transition from Development and Reform Commission (DRC) to the Department of Ecology and Environment (DEE) of Hubei, as a result of the governance restructuring across China.

Hubei also plays an important role in the national ETS: in December 2017, Hubei was selected to lead the development of the registry for the national ETS, which has been operated by the China Hubei Emission Exchange since the national ETS began.

YEAR IN REVIEW

The Hubei DEE released the 2020 allocation plan in September 2021. Key changes compared to the previous year's plan include: an adjustment of the cap to reflect the transfer of power sector entities into the national ETS; an increase in the market adjustment factor, which is a factor applied to all covered entities to reduce overall allocation-slightly loosening the allocation; and updating the base year from 2016–2018 to 2017–2019.

Two auctions were held in 2021.The Hubei DEE moved the compliance deadline for 2019 and 2020 emissions from May to December 2020 and 2021 respectively because of the COVID-19 pandemic. In December 2020, the Hubei pilot completed its 2019 compliance period with 100 % compliance rate for the fifth consecutive year.

1 There is no official data, so emissions coverage given here is an estimate. Coverage for 2019 was estimated at ~45%.
2 China is still in the exploratory and research stage of carbon futures trading; 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.

Emissions & Targets of Hubei

CO_2 EMISSIONS EXCL. LULUCF, 2012 (IN $MtCO_2$)

463.1[3]

GHG REDUCTION TARGETS

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

By 2025: Reduction of carbon intensity according to national government requirement. Clarify the province's carbon peaking timeline – with further policy documents and promote advanced cities and areas to achieve carbon peaking earlier. (Outline of the 14th Five Year Plan and 2035 Vision for Economic and Social Development of Hubei Province)

ETS Size & Phases

COVERED CO_2 EMISSIONS (2020)[4]

~ 27 %

GHGS COVERED

CO_2

PHASES

2014 and ongoing[5]

CAP

Inclusive of reserves:
2014: 324 $MtCO_2$
2015: 281 $MtCO_2$
2016: 253 $MtCO_2$
2017: 257 $MtCO_2$
2018: 256 $MtCO_2$
2019: 270 $MtCO_2$
2020: 166 $MtCO_2$; the drop is mainly due to the transfer of the power sector into national ETS

SECTORS AND THRESHOLDS

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 are then covered.

Those currently covered include: heat supply, iron and steel, nonferrous metals, petrochemicals, chemicals, textiles, cement, glass and other building materials, pulp and paper, ceramics, automobile manufacturing, equipment manufacturing, food and beverage, and medicine producers, and water supply, and others. Until 2019 electricity generation was also covered, after which it was integrated into the national ETS.

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 of recent two years, 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), of which 34 power entities transferred to the national ETS in the following year
332 (2020)

3 There is no publicly available data, the data reported here is estimated based on public source in the launch year of the ETS.
4 There is no publicly available data for the recent years and the data here is estimated by local experts. For 2020 (with power generation entities still under the Guangdong ETS) the coverage is estimated to be 65 %.
5 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.

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

FREE ALLOCATION, BENCHMARKING: Free allocation of allowances through benchmarks for power (until 2019) and cement (except for entities using outsourced clinker).

FREE ALLOCATION, GRANDPARENTING: Historical emissions intensity for heat production and supply, pulp and paper, glass and other building materials, water supply, and automobile and equipment manufacturing; grandparenting based on the 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.[6]

Hubei also uses a so-called market adjustment factor, applied to all covered entities to reduce overall allocation. It is determined based on the previous year's supply-demand status 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 2020 compliance year, it was set at 0.9828 (as compared to 0.973 of the previous year).

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 took place in 2014, 2019, 2020 and 2021. The 2014 auction sold two million allowances at the floor price of CNY 20 (USD 3.1). Recent years have seen two auctions per year, with a first auction for regulated entities only and the second open to all participants. The reserve price of the auctions is the weighted average spot market price of the previous two years. Allowances have sold at the reserve price or slightly above.

In December 2021, 2.8 million allowances were issued from the government reserve, with two million of these for compliance entities only. The two auctions both operated with a reserve price of CNY 29.45 (USD 4.57). 1.41 million and 1.38 million allowances were successfully auctioned respectively, with an average price of CNY 30.54 (USD 4.74), higher than the previous two years' clearance price levels.

USE OF REVENUES

Revenues are attributed to the provincial treasury.

Flexibility & Linking

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: Generally, CCERs must be generated within the administrative areas of the province, but outside the covered entities of Hubei ETS. According to the latest rules on offset use published for 2018 compliance, CCERs must come from rural biogas or forestry projects in the key counties under the national or provincial poverty alleviation plan in areas of the middle reaches of the Yangtze River (within Hubei). CCERs must have been generated between 2013–2015 – reductions must be achieved between these dates.

LINKS WITH OTHER SYSTEMS

Hubei explored linking with the Guangdong pilot initially, back in 2012/2013, but it did not materialize.

6 In this case, entities first receive half of their total allowances based on the previous year's actual emission data or historical emission baseline; actual production data are then used to update allocation ex-post.

Compliance

COMPLIANCE PERIOD

One calendar year; covered entities have until the last working day of May of the following year to surrender allowances according to the local ETS regulation. In practice, in most compliance years 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

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 eleven sectors: power, glass, aluminum, calcium carbide, pulp and paper, automobile manufacturing, iron and steel, ferroalloys, ammonia, cement, and petroleum processing. The national-level guidelines on MRV, especially for the sectors outside these eleven, are also used as reference for Hubei.

ENFORCEMENT

REGULATED ENTITIES: Hubei has introduced a capped mechanism for the compliance obligations. If the difference between an entity's annual verified emissions and the allocation exceeds either 20 % of the allocation or 200,000 tonnes (above or below the allocation), the allowances will be added or deducted to cap the surplus or deficit within the 20 % or 200,000 tonnes limit.[7]

Penalties for failing to submit an emissions or verification report on time range from CNY 10,000 (USD 1,551) to CNY 30,000 (USD 4,652). Trade participants that manipulate the market face up to CNY 150,000 (USD 23,260) in fines. Furthermore, companies that fail to surrender enough allowances to match their emissions will have double that amount deducted from the following 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 23,260).

Other non-financial penalties include disqualification from the national or provincial energy-saving program and blacklisting for carbon emission and credit record.

TRADING INSTITUTIONS: Penalties for publishing false information or manipulating the market range from CNY 10,000 (USD 1,551) to CNY 50,000 (USD 7,753). Institutions involved in illegal payments are fined one to three times the amount of the payment, with a maximum limit of CNY 150,000 (USD 23,260).

THIRD-PARTY VERIFIERS: Penalties for submitting false verification reports range from CNY 10,000 (USD 1,551) to CNY 50,000 (USD 7,753). Verifiers involved in illegal payments and a false verification report are fined one to three times the value of the payment, with a maximum limit of CNY 150,000 (USD 23,260).

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Covered entities, and domestic and international institutional and individual investors meeting the participation requirements of the relevant local trading exchange.

MARKET TYPES:

Primary: China Hubei Emission Exchange organizes ad hoc auctions for the primary market. Since 2019, Hubei has held two separate rounds of auctions targeting different types of entities each compliance year.

Secondary: Spot products include Hubei Emission Allowances (HBEAs) and CCERs. HBEA spot forward product was introduced in 2016 but has not been traded since May 2017. China Hubei Emission Exchange manages trading of all products.

LEGAL STATUS OF ALLOWANCES: The allowances are not considered financial instruments.

7 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 larger ones.

MARKET STABILTY PROVISIONS

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

INTERVENTION: In case of market fluctuations, severe supply-demand imbalances, or liquidity issues, the Ecology and Environment Bureau (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 a 10 % move in either direction.

Other Information

INSTITUTIONS INVOLVED

Department of Ecology Environment of Hubei Province (competent authority)
China Hubei Emission Exchange (trading platform and registry)

EVALUATION/ETS REVIEW

No public information about the evaluation or review system. However, research on improving the Hubei ETS has been undertaken every year, funded by the local government.

REGULATORY FRAMEWORK

Hubei Pilot ETS Implementation Plan (2013)[8]
Interim Measures for Management of Emissions Trading in Hubei Province re (2014)[9]
Department of Ecology Environment of Hubei Province- Allocation Plan for Vintage 2019 (including list of covered entities)[10]
Department of Ecology Environment of Hubei Province- Allocation Plan for Vintage 2020 (including list of covered entities)[11]

8 http://www.hubei.gov.cn/zfwj/ezbf/201302/t20130227_1713131.shtml
9 http://www.tanpaifang.com/zhengcefagui/2014/032330239.html
10 http://www.yidianzixun.com/article/0QP8E8ng?s=&appid=
11 http://sthjt.hubei.gov.cn/fbjd/zc/zcwj/sthjt/ehf/202109/t20210918_3769548.shtml

Indonesia

A presidential regulation that provides a national framework for carbon pricing instruments, including an ETS, was signed in October 2021. This regulation extends the "Government Regulation on Environmental Economic Instruments", which provided a first mandate for an emissions and/or waste permit trading system to be implemented by 2024 (within seven years from its passage). The ETS will eventually work as a hybrid "cap-trade-and-tax" system alongside a carbon tax to be imposed from April 2022, which was regulated in the "Law of the Harmonization of Tax Regulations". Once the mandatory ETS is in place, facilities that fail to meet their obligations under the system will be subject to the tax, the rate of which will be linked to the price of the domestic carbon market.

These developments follow a period of intense preparation. The MRV guidelines for the power sector were released in mid-2018 based on inputs from 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. 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. 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, and a voluntary pilot was conducted for the power sector in 2021.

In force

Under development

Under consideration

MRV system in operation for industry and power sectors

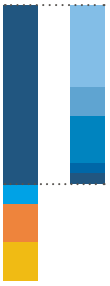
Voluntary intensity-based ETS pilot for power sector completed in 2021

Hybrid "cap-trade-and-tax" system to start April 2022

Emissions & Targets of Indonesia

GHG EMISSIONS EXCL. LULUCF, 2016 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	538.0	(65 %)
Industrial Processes	55.3	(7 %)
Agriculture, Forestry, and Other Land Use[1]	116.7	(14 %)
Waste	112.4	(14 %)
Total	**822.3**	



Energy Industries	246.9	(30 %)
Manufacturing Industries and Construction	87.9	(11 %)
Transport	136.4	(17 %)
Commercial, Institutional and Residential	36.1	(4 %)
Other Energy	30.7	(4 %)

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)

By 2060: Net zero (included in long-term strategy report submitted to the UNFCCC in July 2021)

1 Indonesia 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-CO_2 emissions sources on land". Emissions from the category "3B Land" represent 635.4 $MtCO_2e$.

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

REGULATORY FRAMEWORK

GR 46/2017 Government Regulation on Environmental Economic Instruments[2]

Act No. 32/2009 on Environmental Conservation and Management[3]

Law No.7/2021 Concerning Harmonization of Tax Regulations[4]

Presidential Regulation No. 98 on the Instrument for the Economic Value of Carbon for Achievement of the NDC and Control of Carbon Emissions in Development[5]

2 https://peraturan.bpk.go.id/Home/Details/64701
3 http://extwprlegs1.fao.org/docs/pdf/ins97643.pdf
4 https://jdih.setkab.go.id/puu/buka_puu/176559/Salinan_UU_Nomor_7_Tahun_2021.pdf
5 https://jdih.setkab.go.id/puu/buka_puu/176561/Salinan_Perpres_Nomor_98_Tahun_2021.pdf

Japan

The possible expansion of carbon pricing policies beyond the country's existing carbon tax has been under consideration in Japan for a number of years. Since 2017, several expert committees in Japan have emphasized the key role of a carbon price in decarbonizing the economy.

Following the country's updated NDC setting a target to reduce GHG emissions in Japan to net zero by 2050, then-Prime Minister Yoshihide Suga instructed the Ministry of the Environment (MoE) and the Ministry of Economy, Trade and Industry (METI) to set up working groups outlining plans for carbon pricing. In August 2021, both ministries issued their interim reports. MoE's proposes a carbon tax with an eventual rate sufficient to trigger abatement across the economy and raise revenue for supporting technology innovation and diffusion, though it should start low. It also proposes an ETS that scales up auctioning in the early 2030s, with access to voluntary markets. METI's interim report from the "Study Group on Ideal Economic and Other Approaches for Achieving Worldwide Carbon Neutrality" outlines developing existing domestic credit markets and infrastructure for carbon pricing as part of the future policy response.

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 partner countries (Mongolia, Bangladesh, Kenya, Ethiopia, Indonesia, Vietnam, Lao PDR, Cambodia, Maldives, Palau, Costa Rica, Mexico, Chile, Saudi Arabia, Myanmar, Thailand, and the Philippines).

From 2022, the government is also working on the detailed design for the implementation of the Green Transformation (GX) League, a baseline-and-credit system for companies setting voluntary targets. This new mechanism will likely build upon existing carbon trading systems such as the JCM or J-Credit scheme.

In force

Under development

Under consideration

Expert committee discussing carbon pricing options

Relevant ministries laying out proposals for carbon pricing

Operating voluntary ETS

Emissions & Targets of Japan

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	1,055.9	(87 %)
Industrial Processes	101.5	(8 %)
Agriculture	31.7	(3 %)
Waste	20.4	(2 %)
Total	**1,211.6**	

Energy Industries	450.2	(37 %)
Manufacturing Industries and Construction	262.5	(22 %)
Transport	200.6	(17 %)
Commercial, Institutional and Residential	127.1	(11 %)
Other Energy	15.5	(1 %)

GHG REDUCTION TARGETS

By FY2030: 46 % reduction from FY2013 GHG levels with continued efforts to meet a 50 % reduction (Updated NDC)

By 2050: Climate net neutrality (October 2020 pledge)

Other Information

INSTITUTIONS INVOLVED

Ministry of the Environment, which manages the
Subcommittee on the Utilization of Carbon Pricing
Ministry of Trade, Economy, and Industry
Global Environmental Subcommittee
Central Environment Council

Malaysia

In September 2021, the Malaysian Ministry of Environment and Water (KASA) published the "National Guidance on International Voluntary Market Mechanisms". The document provides guidance to any entity in Malaysia that intends to participate in international voluntary carbon markets (VCM) and indicates the Ministry's intent to implement a domestic ETS.

The Cabinet agreed with KASA's policy document. The KASA Minister said in parliament that a carbon trading platform is planned to be implemented by late 2022, starting first with VCM standards and later a domestic ETS.

In an interview in September 2021, the KASA minister said that the plans are fueled by Malaysia's ambition to meet its NDC commitment and national net-zero GHG emissions aspiration. Moreover, the plans are to prepare industry players for EU's proposed carbon border adjustment mechanism and support Malaysia's low carbon transition in the corporate sector.

In another interview in December 2021, the KASA Minister said that the development of the domestic ETS is in the middle of securing buy-ins from state governments. Furthermore, he explained that the federal government is looking into the ETS market design frameworks, registration, and alignment with international standards. Finally, he mentioned that they are looking into how to make the ETS Shariah compliant.

In force

Under development

Under consideration

Government published a policy document with plans for a domestic ETS

Trading platform for voluntary carbon market credits to start in 2022 as preceding infrastructure for the ETS

Emissions & Targets of Malaysia

GHG EMISSIONS EXCL. LULUCF, 2016 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	251.7	(79 %)
Industrial Processes	27.3	(9 %)
Agriculture	10.6	(3 %)
Waste	27.2	(9 %)
Total	**316.8**	

Energy Industries	131.4	(41 %)
Manufacturing Industries and Construction	23.9	(8 %)
Transport	63.3	(20 %)
Other Energy	33.1	(10 %)

GHG REDUCTION TARGETS

By 2030: 45 % reduction of economy-wide carbon intensity compared to 2005 level (unconditional target in the updated NDC)

By 2050: Carbon neutrality at the earliest by 2050 (speech by the Prime Minister in September 2021)

Other Information

INSTITUTIONS INVOLVED

Ministry of Environment and Water (KASA)

REGULATORY FRAMEWORK

National Guidance on Voluntary Carbon Market Mechanisms[1]

1 https://www.kasa.gov.my/resources/alam-sekitar/National-Guidance-on-Voluntary-Carbon-Market-KASA.pdf

New Zealand

New Zealand Emissions Trading Scheme

In force

Under development

Under consideration

SECTORS:

- POWER
- INDUSTRY
- BUILDINGS*
- TRANSPORT*
- AVIATION*
- WASTE
- FORESTRY

**Sectors represent upstream coverage*

Broad ETS sectoral coverage including forestry

Auctioning underway with new price controls

Pricing mechanism for the agricultural sector scheduled

CAP
34.5 $MtCO_2e$ (2022)[1]

GASES
Several gases

OFFSETS AND CREDITS
None[2]

ALLOCATION
Auctioning
Allowances granted for forestry and other removal activities
Free allocation for emissions-intensive trade-exposed (EITE) activities: Benchmarking

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: NZD 50.95 (USD 36.04)
Average secondary market price: NZD 49.41 (USD 34.95)

TOTAL REVENUE
NZD 3.02 billion (USD 2.14 billion) since the beginning of the program
NZD 2.38 billion (USD 1.69 billion) collected in 2021[3]

ETS DESCRIPTION

The 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, in 2020 the government 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.

YEAR IN REVIEW

2021 was a year of major reforms for the NZ ETS, following on from the passing of the "Climate Change Response (Emissions Trading Reform) Amendment Act 2020". The reforms include a new cap on unit supply and the introduction of an auctioning mechanism. The cap represents an annual limit on units that may be supplied into the NZ ETS by the government. Under the Act, the government is required to announce the annual cap over time, which should be aligned with the economy-wide, five-yearly emissions budgets set by the government with advice from the independent Climate Change Commission. The latest update in August 2021 set unit supply volumes for the period 2022–2026.

Auctioning began in March 2021. Throughout 2021, auctions consistently sold out and the clearing price rose significantly. With auctioning underway, the fixed price option, which previously acted as a price ceiling, was withdrawn after 2020. It was replaced with a cost containment reserve (CCR). The CCR was triggered during the September auction and all available reserve allowances for 2021 were released for sale. Price control settings (including both the CCR trigger and auction reserve price floor) were also updated in August and are set to increase over the next five years.

1 The cap, as described here, is the limit on units supplied by the government from auction volumes, auction reserves, and industrial allocation. It does not include units from removal activities, forecast to be an additional 16.3 $MtCO_2e$ in 2022, mainly from forestry activities.
2 International offsets allowed until June 2015.
3 Comprises auction revenues for 2021 of NZD 1.32 billion (USD 0.94 billion) and money paid to meet surrender obligations under the "fixed price option" for the reporting year 2020/2021.

Emissions & Targets of New Zealand

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	34.3	(42 %)
Industrial Processes	5.1	(6 %)
Agriculture	39.6	(48 %)
Waste	3.3	(4 %)
Total	**82.3**	

Energy Industries	5.4	(7 %)
Manufacturing Industries and Construction	7.6	(9 %)
Transport	16.2	(20 %)
Commercial, Institutional and Residential	1.8	(2 %)
Other Energy	3.2	(4 %)

GHG REDUCTION TARGETS

By 2030: 50 % reduction of net emissions below gross 2005 levels (NDC); reduce biogenic methane emissions 10 % below 2017 levels by 2030 (Climate Change Response (Zero Carbon) Amendment Act 2019)

By 2050: Reduce net emissions of all greenhouse gases (except biogenic methane) to zero; reduce biogenic methane emissions to 24–47 % below 2017 levels (Climate Change Response (Zero Carbon) Amendment Act 2019)

ETS Size & Phases

COVERED CO_2 EMISSIONS (2019)

Verified ETS emissions[4] 2019/2020
40.3 $MtCO_2e$

49 %

GHGS COVERED

CO_2, CH_4, N_2O, SF_6, HFCs, and PFCs

CAP

34.5 $MtCO_2e$ (2022)

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 government updated regulations for unit supply settings in August 2021, setting the annual cap for the years 2022–2026. The cap limits the number of allowances that can be released to the market from auctioning, industrial allocation, and the CCR, as well as from any international units (not currently allowed). In setting supply limits, the government also considers the stockpile of banked allowances already in circulation and projected units from removal activities.

There is no limit on New Zealand Units (NZUs) generated from removal activities. These are forecast to be 16.3 million units in 2022, mainly generated in the forestry sector.

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 NZUs in 2015. Potential future access to international units will be subject to quantitative limits.

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 at present. Under the current legislation, a carbon price will be levied on agricultural emissions by 2025, either through the NZ ETS or a separate pricing scheme.

4 With surrender obligations.

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, agricultural emissions can be brought directly into the NZ ETS as early as 2023, with livestock emissions priced at the processor level (e.g., milk processors and abattoirs). GHG emissions from fertilizer would be covered upstream under the NZ ETS at the importer/manufacturer level.

POINT OF REGULATION

The point of obligation is generally placed upstream. Some large businesses that purchase fossil fuels directly from mandatory NZ ETS participants can choose to opt into the NZ ETS rather than have the costs passed down from their suppliers.

NUMBER OF ENTITIES[5]

2,475 entities registered, of which 2,398 have surrender obligations:

- 200 entities with mandatory reporting and surrender obligations;
- 2,189 entities with voluntary reporting and surrender obligations, most of which are for post-1989 forestry activities; and,
- 77 entities with mandatory reporting without surrender obligations, all of which are for agricultural processing activities.

Allowance Allocation & Revenue

ALLOWANCE 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 EITE criteria are met. Highly emissions-intensive activities (over 1,600 tCO_2e per NZD 1 million of revenue [1,600 tCO_2e per USD 707.3 thousand]) receive 90 % free allocation. Moderately emissions-intensive activities (over 800 tCO_2e per NZD 1 million of revenue [USD 707.3 thousand]) receive 60 % free allocation. An activity is deemed to be trade-exposed if there is transoceanic trade in the good produced.

7.1 million NZUs were allocated for industrial EITE activities in the 2020/2021 reporting year (1 July 2020 to 30 June 2021).

Industrial free allocation will be phased down. 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.

AUCTIONING: Auctioning was introduced in 2021. The volume of NZUs made available for auctioning is set on an annual basis, five years in advance (see 'Cap'). The annual quantity is split between the quarterly auctions. In 2021, 19 million allowances were made available for auctioning, plus an additional 7 million allowances that were released from the CCR.

Auctions follow a sealed-bid, single-round format. The clearing price is set at the lowest successful bid and NZUs are sold to all successful bidders at this price, providing it is not below the confidential reserve price (see 'Market Stability Provisions'). Otherwise, the auction fails and all allowances on offer are rolled forward to the next auction within the same calendar year or cancelled if it is the last auction of that year.

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.

Forestry Removal Activities: Participants are entitled to receive one NZU per tCO_2 removed for registered post-1989 forest land. If the forest is harvested[6] 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. 6.3 million NZUs were issued for forest removal activities for the 2020/2021 reporting year.

5 All figures as of June 2021.
6 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.

The forestry sector is undergoing reforms due to come into force in 2023, including simplified accounting measures for new entrants (a transition from "stock-change" to "averaging" accounting methodology).

Other removal activities: 2.3 million allowances were granted for other removal activities for the 2020/2021 reporting year.

USE OF REVENUES

Currently, NZ ETS revenues are assigned to the general budget, as managed by the New Zealand Treasury. From 2022, NZ ETS revenues will be ringfenced for further emissions reductions, in line with New Zealand's forthcoming national Emissions Reduction Plan.

Flexibility & Linking

BANKING AND BORROWING

Banking is allowed, except for those units that were purchased under the fixed price option (see 'Market Stability Provisions' below).
Borrowing is not allowed.

OFFSETS AND CREDITS

Currently no offsets.
Units from Kyoto Protocol flexible mechanisms were eligible for use in the system with no restrictions until June 2015. As of June 2015, international units became ineligible 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.

LINKS WITH OTHER SYSTEMS

Until 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 limited international linking in the future.

Compliance

COMPLIANCE PERIOD

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; the deadline is end 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 16,976) 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 35,365) 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 applies to entities that deliberately lie about obligations under the NZ ETS to gain financial benefit or avoid financial loss.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Any individual or organization can own and trade NZUs, if they hold an account with the NZ ETS Registry.

MARKET TYPES:

Primary: Auctions are operated jointly by NZX (New Zealand Exchange) and European Energy Exchange (EEX) and are held four times a year. Any NZ ETS Register Account Holder can participate in the auctions.

Secondary: Most NZUs are traded on the secondary market. Trades can take place directly between companies (OTC) or via a trading platform. Trades can be on a spot basis or through forward contract.

LEGAL STATUS OF ALLOWANCES: Allowances are considered commodities in New Zealand. There is currently no single integrated market governance framework that would manage risks of misconduct in the NZ ETS. The government consulted in 2021 on options to improve governance, and work on this is ongoing.

MARKET STABILTY PROVISIONS

FIXED PRICE OPTION (repealed): A Fixed Price Option of NZD 25 (USD 17,68) per tCO_2e, which acted as a form of price ceiling, was introduced in 2009 and raised to NZD 35 (USD 24,76) for emissions that occurred in 2020. It was replaced with a CCR in the transition to auctioning in 2021.

COST CONTAINMENT RESERVE: If a predetermined trigger price is reached at auction, a specified number of allowances from the CCR is additionally released for sale. The trigger price was originally set at NZD 50 (USD 35,37) in 2021 and scheduled to rise by 2 % per year in line with projected inflation. Based on advice from the Climate Change Commission, the CCR trigger price was updated to NZD 70 (USD 49,51) for auctions in 2022, rising to ~NZD 110 (USD 77,8) in 2026, a rate of increase higher than projected inflation.

In 2021, the volume of the CCR was set at 7 million allowances. These were released to the market and sold during the third quarterly auction in September 2021 after the CCR was triggered. The volume of the reserve, in the years 2022–2026, is currently set at 7 million per year until 2024, dropping to 6.7 million in 2026.

The reserve is comprised of allowances from two sources:

1) units which are to be withheld from auctioning in order to reduce the stockpile of units in circulation (5.4 million per year); and,
2) an additional volume equal to 5 % of the total volume of the NZ ETS (~1.6 million per year). These volumes 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: With the start of auctioning, the government introduced a price floor of NZD 20 (USD 14,15) for 2021–2025, scheduled to rise at 2 % per year in line with inflation. The price floor operates through a reserve price or minimum accepted bid at auction. Based on advice from the Climate Change Commission, the price floor was updated to NZD 30 (USD 21,22) in 2022, rising to ~NZD 39 (USD 27,59) by 2026, a rate of increase higher than projected inflation.

In addition to the hard auction reserve price floor, the government has introduced a confidential reserve price. This is set by referencing prices from the secondary market and uses a confidential methodology to determine a reserve price below which units cannot be sold. If it is set higher than the hard auction reserve price, then it becomes the new reserve price floor for that auction.

Other Information

INSTITUTIONS INVOLVED

Ministry for the Environment
Environmental Protection Authority
Ministry for Primary Industries
NZX and EEX auctioning platform

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.

REGULATORY FRAMEWORK

Climate Change Response Act 2002—Part 4 New Zealand greenhouse gas emissions trading scheme[7]

Note: 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.

7 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

MRV system is under development

A communication strategy on carbon pricing is underway

Pakistan is considering market-based climate policy instruments, including an ETS, to tap into low-cost abatement opportunities and leverage low-carbon investments. The Ministry of Climate Change (MoCC) has received support from the UNFCCC in developing an MRV roadmap, establishing a domestic ETS framework, and in building a communication strategy for carbon pricing. The ongoing work on establishing a MRV system has progressed to the implementation phase while the communication strategy is set to be released in 2022. The MoCC also plans to develop a national carbon registry.

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 MoCC, in cooperation with the UNFCCC secretariat and the Institute for Global Environmental Strategies, published a study on carbon pricing which underlined the potential for emissions trading in Pakistan in the power and industrial sectors.

Following the outcomes of the study, Pakistan launched the National Committee on Establishment of Carbon Markets in December 2019 which coordinated ministerial activities on carbon pricing. Among other responsibilities, the one-year committee was 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. It reviewed existing carbon market designs, deliberated with national stakeholders, and coordinated information-sharing and capacity-building activities. The MoCC is currently advancing the work in these areas.

Besides a domestic ETS, Pakistan aims to launch credit-based trading mechanisms linked to international carbon markets, which would enable it to supply offsets to partner countries. Provisions are being drafted for domestic instruments under Article 6. Pakistan is also interested in exploring the voluntary carbon market and is in discussion with Verra to build capacity within the private sector.

Emissions & Targets of Pakistan

GHG EMISSIONS EXCL. LULUCF, 2018 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	218.9	(47 %)
Industrial Processes	25.8	(6 %)
Agriculture	198.6	(43 %)
Waste	21.7	(5 %)
Total	**465.0**	

Energy Industries	53.4	(12 %)
Manufacturing Industries and Construction	66.2	(14 %)
Transport	51.3	(11 %)
Other Energy	48	(10 %)

GHG REDUCTION TARGETS

By 2030: 50 % below BAU including LULUCF; the first 15 % below BAU is unconditional and the remaining 35 % conditional on international support (NDC)

Other Information

INSTITUTIONS INVOLVED

Ministry of Climate Change
Pakistan Climate Change Council
Pakistan Climate Change Authority
National Committee on Establishment of Carbon Markets

REGULATORY FRAMEWORK

Pakistan Climate Change Act 2017[1]

1 www.na.gov.pk/uploads/documents/1485513841_966.pdf

Philippines

In force

Under development

Under consideration

Legal basis being developed for an ETS in the industrial and commercial sectors

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 and provide recommendations. In its current form, 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.

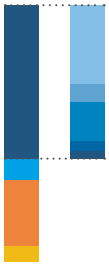
However, review of the bill by the technical working group has been delayed by the impacts of Typhoon Rai and the COVID-19 pandemic. An updated version of the bill is expected to be tabled in 2022.

According to the current version of the bill, the cap-and-trade system would cover a variety of GHGs. DENR would be responsible for the design and operation of the system and would determine the key parameters, such as annual targets, cap setting, allocation, monitoring and enforcement. Furthermore, the bill would establish a Climate Reinvestment Fund to be used by DENR to exclusively address global warming. A timeline for implementation has not been specified.

Emissions & Targets of the Philippines

GHG EMISSIONS EXCL. LULUCF, 2018 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	138.5	(60 %)
Industrial Processes	18.7	(8 %)
Agriculture	61.4	(26 %)
Waste	13.8	(6 %)
Total	**232.4**	



Energy Industries	70.4	(30 %)
Manufacturing Industries and Construction	15.4	(7 %)
Transport	35.6	(15 %)
Commercial, Institutional and Residential	10.0	(4 %)
Other Energy	7.0	(3 %)

GHG REDUCTION TARGETS

By 2030: Conditional pledge to keep 2030 emissions 75 % below BAU levels (excluding LULUCF sectors) (NDC)

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

CAP
589 $MtCO_2$ (2022)

GASES
Several gases

OFFSETS AND CREDITS
Domestic
International

ALLOCATION
Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: KRW 26,373 (USD 23.06)
Average secondary market price: KRW 19,709 (USD 17.23)

TOTAL REVENUE
Since the beginning of the program: KRW 775.5 billion (USD 667.5 million)
In 2021: KRW 294.8 billion (USD 257.7 million)

In force
Under development
Under consideration

SECTORS:

POWER
INDUSTRY
BUILDINGS
DOMESTIC AVIATION
WASTE

East Asia's first national ETS

Phase 3 commenced in 2021 with a stricter cap, updated allocation provisions, and third-party participation

14th country to legislate a 2050 net-zero target

ETS DESCRIPTION

The Korea ETS (K-ETS) was launched in 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 684 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.

The 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 have been outlined in three "Master Plans" (January 2014, February 2017 and December 2019). Detailed Allocation Plans have been 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) launched in 2012 (following a two-year pilot phase that 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

In 2021, Korea enacted the "Carbon Neutral Green Growth Framework Act for Response to Climate Crisis" (Carbon Neutral Framework Act), which institutionalized the carbon neutrality goal for 2050 that the government had originally announced in 2020. Furthermore, during COP 26, the government announced that it would seek to increase its 2030 NDC goal, initially for a 24.4 % reduction from 2017 emissions, to 40 % below 2018 emissions. This proposed increase in ambition is also 5 % above the minimum set in the Carbon Neutral Framework Act.

With regards to the ETS, the government decided to suspend the monthly allowance auctions from February to May, following assessments of low allowance prices and oversupply for the 2020 compliance year, in part due to lower emissions in covered entities arising from the COVID-19 pandemic. These circumstances also led the government to implement a temporary price floor for allowances traded in the secondary market in the Korea Exchange (KRX) from 19 to 26 of in late April. In the second half of the year, both prices and trading volumes increased.

Starting from Phase 3, domestic financial intermediaries ("third parties") can participate in the secondary market and trade allowances as well as converted carbon offsets on KRX. In line with this, 20 third parties were approved for participation in the carbon market from December 2021. However, they can only hold up to 200,000 allowances each, to avoid excessive market share. To support market liquidity, the "market maker system" that was introduced in Phase 2 saw the appointment of three new financial institutions in April 2021, in addition to the two market makers that had been appointed in 2019.

Emissions & Targets of the Republic of Korea

GHG EMISSIONS EXCL. LULUCF, 2018 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	611.5	(87 %)
Industrial Processes	52.0	(7 %)
Agriculture	21.0	(3 %)
Waste	16.9	(2 %)
Total	**701.4**	

GHG REDUCTION TARGETS

By 2030: At least 35 % reduction below 2018 emissions (Carbon Neutral Framework Act); 40 % reduction below 2018 levels (proposed revised NDC)

By 2050: Carbon neutrality (Carbon Neutral Framework Act)

ETS Size & Phases

COVERED CO_2 EMISSIONS (2019)

73 %[1]

GHGS COVERED

CO_2, CH_4, N_2O, PFCs, HFCs, SF_6

PHASES

PHASE ONE: 3 years (2015–2017)
PHASE TWO: 3 years (2018–2020)
PHASE THREE: 5 years (2021–2025)

CAP

PHASE ONE (2015–2017): 1,686.3 $MtCO_2e$, including a reserve of 88 $MtCO_2e$ for early action and new entrants. 84.5 % of the reserve was used within the phase. 14.3 million allowances were set side 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 $MtCO_2e$
2016: 560.7 $MtCO_2e$
2017: 585.5 $MtCO_2e$

PHASE TWO (2018–2020): 1,777 $MtCO_2e$, including 134 million for new entrants and other purposes. 14 million allowances were set aside for market stabilization and 5 million for the market makers (see 'Market Stability Mechanisms' section) bringing the total amount of allowances to 1,796.1 million in Phase 2.

Annual Caps in Phase Two:
2018: 593.5 $MtCO_2e$
2019: 563.2 $MtCO_2e$
2020: 562.5 $MtCO_2e$

PHASE THREE (2021–2025): 3,048.3 $MtCO_2e$. This corresponds to an average annual cap of 610 $MtCO_2e$, including reserves. Annual caps appear 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 $MtCO_2e$
2022: 589.3 $MtCO_2e$
2023: 589.3 $MtCO_2e$
2024: 567.1 $MtCO_2e$
2025: 567.1 $MtCO_2e$

1 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=

SECTORS AND THRESHOLDS

PHASE ONE (2015–2017): 23 sub-sectors 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, and the public sector. These sectors are divided into 62 sub-sectors.

PHASE THREE (2021–2025): The K-ETS covers the following six sectors: heat and power, industry, buildings, transportation, waste, and the public sector. The transport sector was widened to include freight, rail, passenger, and shipping, and construction industries have also been brought into the system's scope. This increased the number of sub-sectors to 69.

INCLUSION THRESHOLDS: Companies emitting more than 125,000 tCO_2/year, and facility emissions in excess of 25,000 tCO_2/year.

Next to direct emissions coverage, the K-ETS also covers indirect emissions from electricity consumption. The same inclusion thresholds apply.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

684 (2022)

Allowance Allocation & Revenue

ALLOWANCE 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 sub-sectors (grey clinker, oil refining, 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 sub-sectors: grey clinker, oil refining, 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:[2]

- Additional Production Cost of >5 % and Trade Intensity of >10 %; or
- Additional Production Cost of >30 %; or
- Trade Intensity of >30 %.[3]

Auctioning: 3 % of allocation to entities in sub-sectors subject to auctioning. 26 sub-sectors 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, and 9.3 million 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 offered. 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 free allocation to entities in sub-sectors that are 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 sub-sectors: grey clinker, oil refining, domestic aviation, waste, industrial parks, electricity generation, and district heating/cooling, with the addition of steel, petrochemicals, buildings, paper, and wood processing.

2 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

3 Trade Intensity is calculated relative to the base year: (annual average exports + annual average imports) / (annual average sales + annual average imports)

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 ≥ 0.002*

A tightening of benchmarks to align the K-ETS with long-term climate targets is under discussion.

Auctioning: At least 10 % of allocation to entities in sub-sectors subject to auctioning. Entities from 41 sub-sectors, which excludes EITE sectors, can participate in auctions. The same auction provisions as for Phase 2 apply.

As per the 2022 Auction Allocation Plan, total auction volume for the year is planned to be 25.8 $MtCO_2e$, which represents around 4 % of the 589.3 $MtCO_2e$ 2022 cap (excluding reserves).

Domestic 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.

USE OF REVENUES

Climate response fund including support for mitigation equipment, low-carbon innovation, and technology development of ETS-covered entities.

Flexibility & Linking

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, according to the following formula: *compliance obligation of the entity x [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 >125,000 tCO_2e (or 15,000 allowances for companies emitting >25,000 tCO_2e) — whichever 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.

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 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 met international standards — could be used for compliance in this phase. Domestic CDM credits (CERs), and credits from domestically certified projects (KOCs) were allowed. Eligible activities included those eligible under the CDM and carbon capture and storage. However, only activities implemented after mid-April 2010 were eligible.[4]

Quantitative Limit: Up to 10 % of each entity's compliance obligation.

PHASE TWO (2018–2020)

Qualitative Limit: In Phase 2, CERs generated from June 2016 from international CDM projects developed by domestic companies were allowed. CDM projects operated by Korean companies were allowed when:

- at least 20 % of the ownership rights, operating rights, or the voting stocks were 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 an 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.

LINKS WITH OTHER SYSTEMS

No linkage is currently considered.

Compliance

COMPLIANCE PERIOD

One year. Entities need to surrender allowances for the previous emissions year by the 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 87.42)/tonne.

4 As of December 2017, a total of 35 domestic and 211 CDM methodologies had been approved for use under the K-ETS.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Initially only compliance entities could trade in the K-ETS, but sectors that receive 100 % free allocation are not allowed to participate in auctions (in Phase 3, this represents 41 of 69 industries). Since 2019, financial institutions designated by the government can participate in the K-ETS as market makers, in order to increase the liquidity of the market. As of December 2021, there are five such market makers.

Furthermore, as per the "Emissions Trading Act" and the Presidential Decree, emission trading brokers can also participate in the market, and 20 financial intermediaries are participating as of December 2021. However, each can only hold up to 200,000 allowances, to prevent any from obtaining excessive market share.

MARKET TYPES:

Primary: Although allowances were occasionally auctioned in 2016 and 2018, a regular auction schedule only began in 2019. Auctions take place via the KRX.

Secondary: The K-ETS has traditionally had a high share of over-the-counter transactions. Additionally, the KRX manages the platform where the spot secondary market transactions take place. Allowances, KCUs and KOCs are traded in the exchange for different vintage years.

LEGAL STATUS OF ALLOWANCES: The legal status of KAUs is not explicitly referenced in "Emissions Trading Act" or the Presidential Decree. However, KAUs are not regulated under financial market law. For the purpose of preventing market price manipulation, unfair trade and to regulate exchange of information, Article 22, paragraph 3 of the "Emissions Trading Act" specifies that certain provisions of "Capital Market and Financial Investment Business Act" apply.

MARKET STABILTY 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 entities can hold: minimum (70 %) or maximum (150 %) of the allowances of the compliance year;
- an increase or decrease of the borrowing limit;
- an increase or decrease of the offset 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 offered for sale at a reserve price of KRW 16,200 (USD 14.16), of which almost one-third were sold.

In 2018, the Allocation Committee put up for auction 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 2021, the Allocation Committee set a price floor of KRW 12,900/t (USD 11.28) in April and KRW 9,450/t (USD 8.26) in June.

As of the end of 2021, there are five K-ETS market makers. These institutions can draw on a government-held reserve of 20 million allowances in a bid to increase liquidity in the market.[5]

5 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.

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.

REGULATORY FRAMEWORK

Carbon Neutral Framework Act[6]
Enforcement Decree of the Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances[7]
Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances[8]
First Basic Plan for 2015–2024[9]
Second Basic Plan for 2017–2026[10]
Third Basic Plan of the ETS[11]
First Allocation Plan[12]
Second Allocation Plan[13]
Greenhouse Gas Emissions Allocation and Trade Act (amended as of June 2020)[14]
Third Allocation Plan[15]

6 https://www.law.go.kr/%EB%B2%95%EB%A0%B9/%EA%B8%B0%ED%9B%84%EC%9C%84%EA%B8%B0%EB%8C%80%EC%9D%91%EC%9D%84%EC%9C%84%ED%95%9C%ED%83%84%EC%86%8C%EC%A4%91%EB%A6%BD%E3%86%8D%EB%85%B9%EC%83%89%EC%84%B1%EC%9E%A5%EA%B8%B0%EB%B3%B8%EB%B2%95/(18469,20210924)
7 https://www.samili.com/law/Content.asp?bcode=7411-2#middle
8 https://www.law.go.kr/LSW/lsInfoP.do?nwJoYnInfo=N&ancYnChk=0&efYd=20200601&lsiSeq=215913&ancNo=17104&efGubun=Y&chrClsCd=010202&ancYd=20200324#0000
9 http://www.moef.go.kr/nw/nes/detailNesDtaView.do?menuNo=4010100&searchNttId1=OLD_4020294&searchBbsId1=MOSFBBS_000000000028
10 http://www.moef.go.kr/com/cmm/fms/FileDown.do?atchFileId=ATCH_000000000003839&fileSn=3
11 http://me.go.kr/home/file/readDownloadFile.do;jsessionid=bC6XpwGMToJc4qEXWU7x7Pmt.mehome1?fileId=186504&fileSeq=1
12 http://www.me.go.kr/home/web/index.do?menuId=10262
13 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=
14 https://www.law.go.kr/LSW/lsInfoP.do?efYd=20200601&lsiSeq=215913&ancYd=20200324&nwJoYnInfo=N&ancYnChk=0&ancNo=17104&chrClsCd=010202&efGubun=Y#0000
15 https://ors.gir.go.kr/home/board/read.do?menuId=2&boardMasterId=4&boardId=44

Saitama

Target Setting Emissions Trading System in Saitama

CAP
7.3 $MtCO_2$ (2019)

OFFSETS AND CREDITS
Domestic and national

GASES
CO_2 only

ALLOCATION
Free Allocation: Grandparenting

In force

Under development

Under consideration

SECTORS:

INDUSTRY

BUILDINGS

Covers large buildings and factories

Linked to Tokyo Cap-and-Trade Program since 2011 launch

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 2019, the Saitama ETS achieved a 31 % reduction in emissions below base-year levels (see 'Allowance allocation' section for base-year calculation).

The Saitama ETS is now in its third compliance period (FY2020–2024), which requires facilities to reduce emissions to 20 % or 22 % below base-year emissions, depending on their assigned category.

Saitama cooperated with the Tokyo 2020 Organizing Committee under the "Zero Carbon Saitama" initiative to offset the GHG emissions from the Tokyo 2020 Olympic and Paralympic Games. As part of this initiative, companies donated excess credits from the ETS. Companies that did not possess credits but still wished to make donations could purchase credits from larger facilities within the ETS. A total of 915,078 credits from the ETS were fed into this initiative.

Emissions & Targets of Saitama

ENERGY-RELATED CO_2 EMISSIONS, 2018 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Transport	9.3 (27 %)
Industry	8.4 (24 %)
Businesses	8.1 (23 %)
Residential	9.1 (26 %)
Total GHG Emissions	**38.0**

GHG REDUCTION TARGETS

By FY2030: 26 % reduction from FY2013 levels (Saitama Prefecture Global Warming Countermeasures Action Plan Second Phase)

ETS Size & Phases

COVERED CO_2 EMISSIONS (FY2018)

20 %

GHGS COVERED

CO_2

PHASES

PHASE ONE: 1 April 2011 to 30 September 2016
PHASE TWO: 1 April 2015 to 31 January 2022
PHASE THREE: 1 April 2020 to 30 September 2026

The Saitama ETS has both phases and compliance periods (see 'Compliance' section). A phase is defined as the compliance period plus an additional 18-month adjustment period (a 22-month additional adjustment period only in the second period due to impacts of the COVID-19 pandemic), during which time facilities may continue to trade credits in order to reach their targets for the corresponding compliance period.

CAP

The cap is aggregated bottom-up, based on facility-level "baselines" which are calculated using base-year emissions and a compliance factor (see "Allowance Allocation" section).

The bottom-up cap for the first compliance period (FY2011–FY2014) was 33.3 $MtCO_2$.

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.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

592 facilities (FY2019):

- Office/commercial buildings: 169
- Factories: 423

Allowance Allocation & Revenue

ALLOWANCE 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 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 where 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 compliance period (FY2011–FY2014): 8 % or 6 % reduction below base-year emissions

Second compliance period (FY2015–FY2019): 15 % or 13 % reduction below base-year emissions

Third compliance 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 to be reported.
- Low carbon electricity: In order to evaluate energy efficiency efforts of the covered facilities, CO_2 emissions factors of electricity suppliers are fixed during each compliance period. When covered facilities procure electricity from suppliers with lower emissions factors, from the third compliance period, they can deduct the difference between these emission factors from their reported emissions accordingly, to reflect this lower emissions factor of energy purchased.

Facilities demonstrating outstanding performance in reducing emissions, 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 & Linking

BANKING AND BORROWING

Banking is allowed only between two consecutive compliance periods.
Borrowing is not allowed.

OFFSETS AND CREDITS

QUALITATIVE LIMITS: Five types of offset credits are allowed to complement the emissions reduction credits issued to facilities covered by the Saitama ETS when their emissions fall below their baseline:

- Small and mid-size facility credits: Emissions reductions from non-covered small and medium-sized facilities in Saitama Prefecture.
- Outside Saitama credits: Emission reductions achieved from large facilities outside of Saitama Prefecture. Large facilities are those with an energy consumption of 1,500 kL of crude oil equivalent or more in a base year, and with base-year emissions of 150,000 tonnes or less.
- 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.
- Tokyo credits (via link): These encompass (1) Excess credits: Emissions reductions from facilities with base-year emissions of 150,000 tonnes or less; and (2) Small and mid-size facility credits issued by Tokyo Metropolitan Government.
- 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: Quantitative limits apply only for Outside Saitama credits: these 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 %.

All offsets must be verified by verification agencies.

LINKS WITH OTHER SYSTEMS

The Saitama ETS has been linked with the Tokyo Cap-and-Trade Program since the former's launch in April 2011. Tokyo and Saitama credits are fungible in 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).

Compliance

COMPLIANCE PERIOD

Four or five years

FIRST COMPLIANCE PERIOD: FY2011–2014
SECOND COMPLIANCE PERIOD: FY2015–2019
THIRD COMPLIANCE PERIOD: FY2020–2024

Covered facilities must submit a global warming countermeasures plan preparation report and implementation status report by the end of 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 the end of July.

Compliance instruments must be submitted and the predetermined target achieved by the end of the 18-month adjustment period, i.e., by the end of 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.

The deadline for meeting the targets under the second compliance period was postponed to the end of January 2022.

MRV

REPORTING FREQUENCY: Annual emissions reporting, including emission reduction plans. All seven GHGs must be monitored and reported: CO_2, CH_4, N_2O, PFCs, HFCs, SF_6, and NF_3.

VERIFICATION: These reports require third-party verification by the end of the adjustment period.

FRAMEWORK: These are based on "Saitama Monitoring/Reporting Guidelines" and "Saitama Verification Guidelines".

ENFORCEMENT

Every year, global warming countermeasures plans and implementation status reports of all covered facilities are published on Saitama Prefecture's website. If a facility does not achieve its reduction target, its name is made public, and the insufficient reduction amount is added to its target for the following compliance period.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Facilities subject to compliance, i.e., those above the inclusion threshold (see 'Sectors and Thresholds' section). One can earn credits only after achieving emission reductions, and only emitting facilities can participate in trading.

MARKET TYPES:
Primary: All allowances are allocated for free.
Secondary: Covered facilities trade over the counter. Businesses wishing to buy or sell credits can go through a private intermediary to find a buyer and negotiate the price.

MARKET STABILTY PROVISIONS

Saitama Prefecture does not use market stability provisions.

Other Information

INSTITUTIONS INVOLVED

Saitama Prefectural Government

REGULATORY FRAMEWORK

Saitama Prefecture Global Warming Strategy Promotion Ordinance[1]
Regulation on Saitama Prefecture Global Warming Strategy Promotion Ordinance[2]

1 https://www.pref.saitama.lg.jp/a0502/ontaijourei.html
2 https://en3-jg.d1-law.com/saitama-pref/d1w_reiki/421902100019000000000/421902100019000000000/421902100019000000000.html

Shanghai

Shanghai Pilot Emissions Trading System

In force

Under development

Under consideration

SECTORS:

POWER
Covered until transition to national ETS

INDUSTRY

BUILDINGS

TRANSPORT

DOMESTIC AVIATION

Broad sector coverage with 100 % compliance rate in eight consecutive years

Active offset trading market, pioneered allowance spot forward trading

Scope expansion through lowering the threshold and expanding to more sectors

CAP
105 $MtCO_2$ (2020)[1]

GASES
CO_2 only

OFFSETS AND CREDITS
Provincial

ALLOCATION
Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: CNY 39.76 (USD 6.17)
Average secondary market price: CNY 40.16 (USD 6.23)

TOTAL REVENUE
CNY 124.21 million (USD 19.26 million) since beginning of program
CNY 21.59 million (USD 3.35 million) in 2021

ETS DESCRIPTION

Shanghai was the second Chinese region to start its pilot ETS, in November 2013. The pilot covers more than half of the city's emissions, including industry and non-industrial sectors such as buildings, aviation, and shipping. The system covered electricity generation until 2020, after which it was integrated into the national ETS. It is the only pilot that has achieved a 100 % compliance rate continuously since its launch.

In 2016, Shanghai expanded its ETS coverage by adding shipping and more industrial sectors, as well as by lowering the participation threshold of existing power plants and participant industries to 10,000 tCO_2 per year.

Shanghai is the most active among the Chinese pilots in terms of offset credits trading. It also pioneered allowance spot forward trading in China. In January 2017, the Shanghai Environmental and Energy Exchange (SEEE) and the Shanghai Clearing House jointly launched an 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.[2] By the end of September 2021, the Shanghai carbon market had traded a total of 173 million tonnes of spot products, with a cumulative transaction volume of about CNY 2 billion (USD 310 million), while also handling the highest trading volume of offsets credits. Shanghai has carried out various other carbon finance innovations such as repurchases, carbon funds, carbon trusts, CCER pledge loans, green bonds, and carbon margin trading.

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.

In December 2017, Shanghai was selected to lead the development of the trading platform for the national ETS. Since July 2021, the trading platform operated by the SEEE has been the dedicated avenue for allowances trading in the national ETS.

YEAR IN REVIEW

The Shanghai EEB released the 2020 allocation plan in January 2021. No significant changes were implemented, compared to the allocation plan of the previous year. The addition of 27 new companies represents a record for the highest number of companies included in the Shanghai regional carbon market since its launch year. It follows the departure of 19 power generation companies to the national ETS, as well as the closure of seven companies. The Shanghai pilot ETS completed its compliance work for 2020 in September 2021, reporting its eighth consecutive 100 % compliance rate.

Shanghai has further improved its MRV system in the past few years. In December 2020, the Shanghai EEB revised

1 The 2020 cap reduced significantly from the previous year (158 $MtCO_2$) mainly as a result of 19 electricity generation entities transferring to the national ETS.
2 China is still in the exploratory and research stage of carbon futures trading and, according to the "Administrative Regulations on Futures Trading" document, futures contracts can only be traded on approved professional futures exchanges. Therefore, regional ETS pilots cannot introduce futures trading. However, a few have developed carbon forward trading products with their own characteristics.

the "Interim Measures for the Management of Third Party Organizations for Carbon Emission Verification in Shanghai". In October 2021, the EEB developed and published the "Shanghai Carbon Emission Verification Third Party Agency Supervision and Assessment Rules".

In August and September 2021, two auctions were held. The total revenue of the auctions is CNY 21.59 million (USD 3.35 million).

In September, the Shanghai government also proposed to revise the current management measures for the ETS in Shanghai and explore the introduction of a local offset program and more financial practices, such as repurchases of allowances.

Emissions & Targets of Shanghai

CO_2 EMISSIONS EXCL. LULUCF, 2012 (IN $MtCO_2$)

297.7[3]

GHG REDUCTION TARGETS

By 2020: 20.5 % reduction in carbon intensity compared to 2015 levels. The total CO_2 emissions to be limited within 250 million tonnes (13th Five-Year Plan).

By 2025: pledged to peak the total and per capita CO_2 emissions (Shanghai Urban Master Plan 2017–2035 and 14th Five-Year Plan) and to achieve the carbon intensity reduction rate that is to be specified by the central government (14th Five-Year Plan).

By 2035: ~5 % reduction in CO_2 emissions compared to the peak level (Shanghai Urban Master Plan 2017–2035).

ETS Size & Phases

COVERED CO_2 EMISSIONS (2019)[4]

57 %

GHGS COVERED

CO_2 only

PHASES

PHASE ONE: 3 years (2013–2015), also called trial phase
PHASE TWO: ongoing (2016-present)

CAP

All including reserves:
PHASE ONE (2013–2015):
around 150 $MtCO_2$ per year

PHASE TWO (2016-present):
2016: 155 $MtCO_2$
2017: 156 $MtCO_2$
2018: 158 $MtCO_2$
2019: 158 $MtCO_2$
2020: 105 $MtCO_2$, the drop is mainly due to the transfer of the power plants into national ETS

SECTORS AND THRESHOLDS

PHASE ONE (2013–2015): Airports, domestic aviation, chemical fibers, chemicals, commercial, power and heat, water suppliers, hotels, financial, iron and steel, petrochemicals, ports, nonferrous metals, building materials, paper, railways, rubber, and textiles.

Inclusion thresholds:
- For power and industry: 20,000 tCO_2/year
- For other sectors: 10,000 tCO_2/year

PHASE TWO (2016-present): Previous sectors plus shipping, electronic materials, pharmaceuticals, automotive manufacturing, food manufacturing and minting. Power plants transferred to the national ETS from 2020, while some special captive power plants and heat generation entities remain in the Shanghai carbon market.

3 There is no publicly available data, the data reported here is estimated based on public source in the launch year of the ETS.
4 The coverage rate would reduce significantly in 2020 given the transfer of power generation entities into national ETS but there is no publicly available data.

Inclusion thresholds:

- For power and industry: Either 20,000 tCO_2/year or 10,000 tce/year; and those that participated in the 2013–2015 phase with 10,000 tCO_2/year or 5,000 tce/year.
- For transport: Either 10,000 tCO_2/year or 5,000 tce/year (aviation and ports), 100,000 tCO_2/year or 50,000 tce/year (shipping).
- For buildings: Either 10,000 t CO_2/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)
314 (2020), among them 26 excluded and 27 new entities. Among the 26 excluded companies, 19 of them were transferred to the national ETS and the remaining seven closed.

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

In Phase One, entities received allowances for the whole period at once. In Phase Two, the allowances are allocated on an annual basis. In addition, the allocation methods have been progressively improved, including expansion of the usage of benchmarks.

FREE ALLOCATION: Free allocation based on sector-specific benchmarks (for the electricity and heat producers, and electricity grid sector).

Grandparenting based on historic emissions intensity for some industrial sectors, aviation, ports, shipping, and water suppliers, generally based on the previous three years' data.

Grandparenting based on historic emissions for airports, buildings, commercial sector, and some industrial sectors with complex products or a 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. Since then, two auctions have been held each year.

In 2021, the auctions were held in August and in September. 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 weighted average price of all trading days in the second quarter of 2021. The auction offered 0.8 million allowances, 68 % of which were sold at the floor price of CNY 39.76 (USD 6.17) per tonne.

For the second auction, which was open to compliance entities only, the floor price was set at 1.2 times the weighted average price of all trading days from the start of November 2020 to the end of August 2021. Two million allowances were offered, however no bids were received.

USE OF REVENUES

The revenues are deposited into the state treasury.

Flexibility & Linking

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 without such annual maximum limit.
Borrowing is not allowed.

OFFSETS AND CREDITS

Domestic project-based carbon offset credits – CCERs – are allowed, with quantitative and qualitative limits.

QUANTITATIVE LIMIT:
Phase One: The use of CCER credits was limited to 5 % of the verified emissions.

Phase Two: Between 2016 and 2018, the use of CCER credits was limited to 1 % of the annual allocation. For the compliance year 2019 and 2020, the use of CCER credits was limited to 3 % of the verified emissions. In 2019, only 2 % was allowed for credits generated outside the Yangtze River Delta region and 1 % must be from within the region. This limitation was lifted in 2020.[5]

QUALITATIVE LIMIT:
Phase One: Credits for reductions that were realized before January 2013 cannot be used for compliance.

Phase Two: Same restriction as in phase one, plus credits from hydro projects are not allowed.

LINKS WITH OTHER SYSTEMS

Although the SEEE operates the trading systems for both the national ETS and Shanghai regional pilot, the two markets are seperated. Shanghai ETS is also not linked with any other ETSs within and outside of China.

Compliance

COMPLIANCE PERIOD

One calendar year. Covered entities have to surrender allowances in June of the following year.[6]

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions to Shanghai EEB before the end of March.

VERIFICATION: Third-party verification is required. Shanghai EEB commissions an independent third-party to carry out the verfication. 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. The govenrment also assesses the performance of the verifiers through a perfomance evaluation meachanism.

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 transportation (e.g. port sites).

Third-party verification related rules have been strengthened in recent years. In December 2020, Shanghai EEB amended the interim measures for managing the third party verifiers and in October 2021 it further released a new policy on supervision and assessment of the verifiers.

ENFORCEMENT

REGULATED ENTITIES: Penalties for failing to submit an emissions report or verification report on time or providing fraudulent information range from CNY 10,000 (USD 1,551) to CNY 50,000 (USD 7,753).

Between CNY 50,000 (USD 7,753) and CNY 100,000 (USD 15,506) can be imposed for non-compliance, in addition to the obligation to surrender the missing amount of allowances. Further sanctions may also be imposed, such as entry into the credit record of the company, publication on the internet, cancelation of ability to access special funds for energy conservation, and emissions reduction measures.

THIRD-PARTY VERIFIERS: Third-party agencies shall be penalised with a fine of between CNY 10,000 (USD 1,551) to CNY 50,000 (USD 7,753) for issuing false verification reports, material errors in verification reports, as well as for unauthorised use or publication of confidential corporate and carbon emission information.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Covered entities and institutional investors (domestic ones only) that meet the requirement of the carbon emission trading rules set up by the SEEE.

MARKET TYPES:
Primary: No specific percentage of the allowances are allocated via auctioning although the pilot's ETS regulations states that aucutioning is to be introduced timely. However, ad hoc auctions have been held since 2014 to provide compliance entities with additional supply to

5 The region covers Shanghai, Jiangsu, Zhejiang, and Anhui.
6 In recent years, the compliance deadline has been postponed to later dates, for reasons such as the COVID-19 pandemic and other factors.

meet their compliance demand. In addition, since 2020, further auctions have also been held where institutional investors are allowed to participate alongside the compliance entites. The SEEE organizes all the auctions.

Secondary: Products include Shanghai Emission Allowance (SHEA), Shanghai Emission Allowance Forward (SHEAF) and CCER. SHEA and CCER are spot products. SHEAF is the standardized spot forward product. The SEEE manages trading of all three products. Due to the financial market related regulations in China, no forward markets or derivatives are allowed yet (see 'ETS Description' section).

LEGAL STATUS OF ALLOWANCES: Allowances are not considered financial instruments.

MARKET STABILTY PROVISIONS

EXCHANGE: Depending on transaction types, if prices vary more than 10 % or 30 % in one day, the SEEE 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).

Other Information

INSTITUTIONS INVOLVED

Shanghai Ecology and Environment Bureau
(competent authority)
Shanghai Environment and Energy Exchange
(trading platform)
Shanghai Information Center (registry)

EVALUATION/ETS REVIEW

No public information about the evaluation or review system. However, the local carbon exchange has published annual report of Shanghai ETS with an overview of its performance 2013 to 2020. Research on improving the ETS has been undertaken every year, funded by the local government.

REGULATORY FRAMEWORK

Shanghai Pilot ETS Implementation Plan Trial[7]
Measures for Management of Emissions Trading in Shanghai[8]
Shanghai EEB- Allocation Plan for Vintage 2019
(including list of covered entities)[9]
Shanghai EEB- Allocation Plan for Vintage 2020
(including list of covered entities)[10]

7 https://www.cneeex.com/c/2013-11-22/487442.shtml
8 http://www.tanpaifang.com/tanjiaoyi/2013/0712/22185.html
9 https://sthj.sh.gov.cn/hbzhywpt2025/20200630/20348b1adf354c9ab73b7a461c9ec0a9.html
10 https://sthj.sh.gov.cn/hbzhywpt2025/20210202/510b31e87df149348d73c7a40faab484.html

Shenzhen

Shenzhen Pilot Emissions Trading System

CAP
31. 5 $MtCO_2$ (excluding buildings, 2015)[1]

GASES
CO_2 only

OFFSETS AND CREDITS
National
Provincial (in development)

ALLOCATION
Free Allocation: Grandparenting
Free Allocation: Benchmarking

AVERAGE 2021 ALLOWANCE PRICE
Average secondary market price: CNY 11.23 (USD 1.74)

TOTAL REVENUE
CNY 2.66 million (USD 411,900) since the beginning of the program[3]
No auctions were held in 2021

In force
Under development
Under consideration

SECTORS:

POWER
Covered until transition to national ETS

INDUSTRY

BUILDINGS

TRANSPORT

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

Relatively active market despite small market size with diversified participants including foreign investors

Experienced sectoral expansion and pioneered cross-regional trading

ETS DESCRIPTION

The Shenzhen Pilot ETS began in June 2013 and was the first of the Chinese pilots to start operation. As a city of Guangdong province (that has its own separate ETS pilot), Shenzhen 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 687 entities. Mainly based on free allocation, Shenzhen's allocation plans have not been made publicly available since 2016. 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. By the end of 2021, Shenzhen's cumulative trading volume and turnover amounted to 65.17 million tonnes and CNY 1.46 billion (USD 230 million) respectively, one of the few pilots to surpass CNY 1 billion (USD 167 million). The Shenzhen ETS pilot is open to diversified market participants, including covered entities and institutional as well as individual (domestic and foreign) investors. Shenzhen has carried out various carbon finance innovations such as repurchases and allowance pledge loans.

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 of Shenzhen Municipality to the Ecology Environment Bureau of Shenzhen Municipality (EEB),[3] as a result of the governance restructuring across China.

YEAR IN REVIEW

In the past year, Shenzhen has further advanced its carbon market innovation. In March 2021, as the first regional green finance legislation in China, the Shenzhen Special Economic Zone Green Finance Regulation entered into force. It states that Shenzhen should further advance its carbon market and develop a regional offset program, Tan Pu Hui. It encourages financial institutions to participate in cross-border trading in the carbon market of Guangdong-Hong Kong-Macao Greater Bay Area.[4] It also supports the China Emissions Exchange (Shenzhen) to carry out domestic and cross-border trading of carbon assets and further develop innovative carbon trading products.

1 No more recent data has been made public by the competent authority, including no further information following the transfer of the power entities into the national ETS.
2 The only auction so far was held in 2014 and its 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.
3 MEEB's predecessor was the Human Settlements and Environment Commission of Shenzhen Municipality.
4 The Greater Bay Area joint or linked carbon market is still in exploration and no detailed plan is available.

In June 2021, the Shenzhen Municipal Bureau of Justice released a draft version of the revised "Provisional Regulation of Shenzhen Emission Trading Pilot Scheme" for public consultation, amending the 2014 version. The key policy changes are: confirming the role of the market mechanism to support the city's carbon peaking and neutrality targets, further consolidating the institutional set-up, gradually moving to an absolute cap and increasing the proportion of allowance auctioning (decreasing the free allocation); establishing a new Carbon Emissions Trading Fund; introducing the local offset program of Tan Pu Hui; enhancing market oversight and modifying the non-compliance punishment measures.

Shenzhen has also developed a local offset program, Tan Pu Hui. The "Work Plan for the Construction of Shenzhen Tan Pu Hui System" was published in November 2021 and the first methodology, focusing on public transportation, was released in December 2021. In addition, Shenzhen Tan Pu Hui Alliance was established end May 2021, with nine founding members led by the China Emissions Exchange (Shenzhen).

In March 2021, Shenzhen EEB released the "Notice on Carrying out ETS Work for Compliance Year 2020" which included an updated list of covered entities. No further allocation-related policy has been released since then. Power plants eligible for inclusion in the national carbon market were transferred out of the Shenzhen carbon market in 2020 and into the national ETS.

In August 2021, the Shenzhen EEB announced that the regional pilot had achieved 100 % compliance for 2020. Evidence of the decoupling of economic growth from carbon emissions can be seen in Shenzhen: as of the end of 2020, the average carbon intensity of the covered industrial entities had dropped by 40.3 % since the launch of the ETS, while the industrial value added has increased by 61.6 %.

Emissions & Targets of Shenzhen

CO_2 EMISSIONS EXCL. LULUCF, 2010 (IN $MtCO_2$)

83.45[5]

GHG REDUCTION TARGETS

By 2020: 45 % reduction in carbon intensity compared to 2005 (13th Five-Year Plan)

By 2025: to achieve the carbon intensity reduction rate that is to be specified by the central government (Outline of the 14th Five-Year Plan and 2035 Vision)

By 2030: to achieve a steady decrease in carbon emissions after reaching the peak (Outline of the 14th Five-Year Plan and 2035 Vision)

ETS Size & Phases

COVERED EMISSIONS (2019)

~40 %[6]

GHGS COVERED

CO_2 only

PHASES

2013 and ongoing[7]

CAP

31.45 $MtCO_2$ (2015) for the existing regulated entities, excluding buildings. In addition, the government sets aside reserves for new entrants (2 %) and market stability measures (2 %).

SECTORS AND THRESHOLDS

Water, gas, manufacturing sectors, buildings, ports, airports, subways, public buses, and other non-transport sectors (among which ports, airports, subways and public buses were added in 2016). Electricity production was covered until 2019, after which it transitioned to the national ETS. According to latest publicly available information, 31 sectors were covered in 2020.

5 There is no publicly available data, the data reported here is estimated based on public source in the launch year of the ETS.
6 The coverage rate would reduce significantly in 2020 given the transfer of power sector into national ETS but there is no publicly available data.
7 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.

INCLUSION THRESHOLDS: Annual emissions of 3,000 tCO_2/year for enterprises; 10,000 m^2 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

706 (2019), including eight power entities which then transferred to the national ETS in the following year.
687 (2020)

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

Allowances are largely distributed for free and 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 manufacturing sectors, ports, airports, subways, public buses, and other non-transport sectors based on the entity's historical emissions intensity.

AUCTIONING: Although the "Provisional Regulation of Shenzhen Emission Trading Pilot Scheme" document from 2014 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.

USE OF REVENUES

According to the Shenzhen ETS regulation (2014), auctioning revenues are attributed to the city treasury.[8] However, Shenzhen's draft amendment of the ETS regulation released in 2021 confirms that the city will establish a new Carbon Emissions Trading Fund and enhance the transparency of revenue usage.

Flexibility & Linking

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.

In addition, Shenzhen is in the process of developing a local offset program, Tan Pu Hui. With the Work Plan published in November 2021 and the first project methodology focusing on public transportation released in December 2021, a dedicated work program and a series of other methodologies are being developed. Once fully operational, it will generate local offset credits that can be used by the entities under the Shenzhen ETS for compliance purposes and also by enterprises, institutions and individuals to voluntarily offset their emissions.

LINKS WITH OTHER SYSTEMS

There is no link with other carbon markets yet. Guangdong-Hong Kong-Macao Greater Bay Area (to which Shenzhen belongs) plans to explore the feasibility of a joint or linked carbon market. According to the local green finance legislation in Shenzhen, financial institutes are encouraged to participate in cross-border trading in this market in the future.

8 The 2014 Shenzhen ETS regulation did include a provision stating that the city government will set up a market stability fund, dedicated for market stabilization measures, supporting companies' mitigation activities, market service institutes promotion, capacity building and ETS management, etc., with its funding sources from auction revenue, donations and other channels.

Compliance

COMPLIANCE PERIOD

One calendar year: covered entities have until the end of June of the following year to surrender allowances.

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions to the ETS competent authority by end March of the following year, using different tiers of emission factors depending on different emission sources. 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 annual emissions report is required (deadline for submission is end April of the following year). 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 be at least 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 15,506). 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 non-financial 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.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities, institutional investors and individuals (both domestic and international) can participate, subject to meeting the requirements of the carbon emission trading rules set up by the China Emissions Exchange (Shenzhen).

MARKET TYPES:

Primary: Shenzhen so far has very limited experience with auctioning: only one auction has been held in 2014. The China Emissions Exchange (Shenzhen) is the dedicated institute to organize the auctions.

Secondary: Shenzhen Allowance (SZA) is the main spot trading product in the secondary market, besides the CCERs. In the future, the local Tan Pu Hui offset credits will be another spot product. The China Emissions Exchange (Shenzhen) is the trading platform for all products.

Due to the financial market-related regulations in China, no forward markets or derivatives are allowed yet. However, with the regional green finance legislation that entered into force in March 2021, Shenzhen sees new momentum of studying and exploring the development of innovative carbon financial products.

LEGAL STATUS OF ALLOWANCES: Allowances are not considered as financial instruments. There are no specific financial accounting rules yet.[9]

MARKET STABILTY 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.

9 However, because of the pledgeability of allowances, experts in Shenzhen think the allowances could be regarded as carbon assets.

Other Information

INSTITUTIONS INVOLVED

Ecology Environment Bureau of Shenzhen Municipality (competent authority; registry)
China Emissions Exchange (Shenzhen) (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.

REGULATORY FRAMEWORK

Carbon Emissions Management Regulations of Shenzhen Special Economic Zone (the local ETS bill) (2012)[10]
Interim Measures for Management of Emissions Trading in Shenzhen (2014)[11]
Interim Measures for Management of Emissions Trading in Shenzhen amendment (draft for comments) (2021)[12]
Shenzhen DRC—Notice of Carrying Out Emissions Trading Work for Vintage 2016 (with allocation plan and list of covered entities)[13]
Shenzhen EEB—Notice on Carrying out ETS Work for Compliance Year 2019 (with list of covered entities)[14]

10 http://www.cerx.cn/szPolicy/377.htm
11 http://www.cerx.cn/szPolicy/385.htm
12 http://sf.sz.gov.cn/xxgk/xxgkml/gsgg/content/post_8857892.html
13 http://www.szets.com/jystongzhi/4496.htm
14 http://www.sz.gov.cn/cn/xxgk/zfxxgj/tzgg/content/post_7650474.html

Taiwan, China

In force

Under development

Under consideration

The 2015 "GHG Reduction and Management Act" calls for ETS implementation

Proposed revision of the Act calls for a carbon fee in addition to the ETS

Mandatory GHG reporting program and domestic offset program in place

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 buildings, 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 tCO_2e 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.

Since the beginning of 2021, TEPA has been revising the Act. In July 2021, TEPA established a new internal climate change office to accelerate relevant legal amendments to keep pace with the EU and international carbon reduction trends. In late October 2021, the draft revision of the Act was published for public consultation and renamed the "Climate Change Response Act". It proposed a new carbon fee for domestic emissions, covering potentially both direct and indirect emissions, with revenues to be used to support domestic climate mitigation and the transition to a low carbon economy. The carbon fee would allow the use of domestic offsets. In addition, in response to the international trend of promoting carbon border adjustment mechanisms to avoid carbon leakage, it would also propose a new scheme of levying carbon fees on imported products with high carbon content.

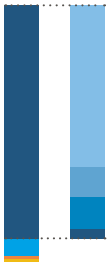
After public consultation, the "Climate Change Response Act" is expected to be submitted to the Legislative Yuan in the first half of 2022 for further review and finalization. Further details of the carbon fee and ETS will be developed via sub-laws. Regulatory discussions are pending on the specific design of the carbon fee and ETS system, timeline of implementation, as well as on how the carbon fee could be transitioned to the ETS in the future and/or co-exist as a complementary mechanism.

Regarding the institutional set up, the carbon fee and the ETS will be managed by TEPA. For the carbon fee, the targets, rate, and percentage of domestic offset allowed will be determined by TEPA. The agency will also design the ETS in consultation with other relevant central competent authorities, and will implement the ETS.

Emissions & Targets of Taiwan, China

GHG EMISSIONS EXCL. LULUCF, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	260.7	(91 %)
Industrial Processes	20.4	(7 %)
Agriculture	3.3	(1 %)
Waste	2.7	(1 %)
Total	**287.06**	



Energy Industries	181.3	(70 %)
Manufacturing Industries and Construction	32.6	(13 %)
Transport	35.4	(14 %)
Other Energy	9.3	(4 %)

GHG REDUCTION TARGETS

By 2025: 10 % below 2005 GHG levels (TEPA)

By 2030: 20 % reduction from BAU levels (TEPA)

By 2050: Net-zero emissions (the new Climate Change Response Act draft)

Flexibility & Linking

OFFSETS AND CREDITS

The Act stipulates that the potential future use of offset credits should give priority to domestic efforts, but that there would also be potential for international collaboration. TEPA, in consultation with relevant central competent authorities, is expected to recognize international offset standards, the credits from which cannot exceed 10 % of the ETS allowances.

Compliance

MRV

REPORTING FREQUENCY: Annual reporting of GHGs (CO_2, CH_4, N_2O, SF_6, NF_3, PFCs and HFCs) for entities from certain sectors (power, steel, petrochemicals, cement, and manufacturing of semiconductors and flat panel displays) with annual emissions greater than 25,000 tCO_2e. Currently, 293 entities are covered by 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. Then the reporting was further required by the Act after it was enacted in 2015.

Other Information

INSTITUTIONS INVOLVED

TEPA
Ministry of Economic Affairs
The Financial Supervisory Commission
Other relevant central competent authorities

REGULATORY FRAMEWORK

Greenhouse Gas Reduction and Management Act (2015)[1]
Climate Change Response Act draft for comments (amendment of the Act)[2]
Climate Change Action Guidelines[3]
National GHG Inventory Report (Executive Summary)[4]

1 https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?pcode=O0020098
2 https://ghgrule.epa.gov.tw/admin/resource/files/1101021_%E6%BA%AB%E5%AE%A4%E6%B0%A3%E9%AB%94%E6%B8%9B%E9%87%8F%E5%8F%8A%E7%AE%A1%E7%90%86%E6%B3%95%E4%BF%AE%E6%AD%A3%E8%8D%89%E6%A1%88.pdf
3 https://adapt.epa.gov.tw/eng/TCCIP-1-D/TCCIP-1-D-6_en.html
4 https://unfccc.saveoursky.org.tw/nir/tw_nir_2021.php

Thailand

In force

Under development

Under consideration

Pilot emissions trading project planned in the Thai Eastern Economic Corridor (EEC)

New carbon credit trading rules and guidelines expected in early 2022

Capacity-building for voluntary ETS expanding to key industries

The "National Reform Plan" (2018) mandated the Thai government to develop an economic instrument to incentivize GHG emissions reductions. This will be considered as part of the policy and legislative process following the formulation of the framework "Climate Change Act", which is currently under review.

Since 2013, Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) has developed an MRV system and basic trading infrastructures for the Thailand Voluntary Emissions Trading Scheme (Thailand V-ETS). This voluntary pilot program aims to develop and test MRV systems for 12 key GHG-intensive sectors. It also explores target-setting for direct and indirect emissions of individual facilities, practices allocation based on MRV reporting, and simulates allowance trading. TGO also conducts ongoing capacity building activities to engage key stakeholders across Thailand.

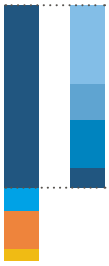
Since 2021, TGO has been collaborating with the Eastern Economic Corridor Initiative (Department of Industrial Promotion and Industrial Estate Authority of Thailand) to develop a pilot ETS in Thailand's EEC region. The emissions trading pilot implementation project will be executed in 2022. It aims to engage 10 pilot organizations to build capabilities in ETS elements, and to provide technical assistance on Thailand Voluntary Emission Reduction (T-VER) project development.

Following COP 26, the government is developing rules and guidelines for carbon credit trading, expected to be released in 2022. As part of this work, TGO is collaborating with the Federation of Thai Industries (FTI) to develop a carbon credit trading platform.

Emissions & Targets of Thailand

GHG EMISSIONS EXCL. LULUCF, 2016 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	253.9	(72 %)
Industrial Processes	31.5	(9 %)
Agriculture	52.2	(15 %)
Waste	16.8	(5 %)
Total	**354.4**	



Energy Industries	108.2	(31 %)
Manufacturing Industries and Construction	49.5	(14 %)
Transport	68.2	(19 %)
Other Energy	28.0	(8 %)

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)

At COP 26, the Prime Minister of Thailand announced the goal of reaching carbon neutrality by 2065, as outlined in Thailand's long-term low GHG emission development strategy (LT-LEDS). The Prime Minister also announced that Thailand could increase its conditional NDC target to 40 % with adequate international support.

Other Information

INSTITUTIONS INVOLVED

Thailand Greenhouse Gas Management Organization (Public Organization)

REGULATORY FRAMEWORK

National Reform Plan (2018)

Tianjin

Tianjin Pilot Emissions Trading System

CAP
120 $MtCO_2$ (2020)[1]

GASES
CO_2 only

OFFSETS AND CREDITS
Provincial

ALLOCATION
Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2021 ALLOWANCE PRICE
Average auction price: CNY 27.44 (USD 4.25)
Average secondary market price: CNY 30.53 (USD 4.73)

TOTAL REVENUE
CNY 148.18 million (USD 22.98 million) since beginning of program
CNY 75.66 million (USD 11.73 million) collected in 2021

In force
Under development
Under consideration

SECTORS:

POWER
Covered until transition to national ETS

INDUSTRY

DOMESTIC AVIATION

System design strengthened recently by e.g. introducing financial penalties and auctioning

Tightened cap setting and allowance allocation rules

Sectoral expansion to building materials, pulp & paper, and aviation sectors

ETS DESCRIPTION

Tianjin launched its pilot ETS in December 2013 and has concluded eight compliance years so far. The system covers: heat and electricity production (until 2020; from 2021 power is covered by the national ETS); iron and steel; petrochemicals; chemicals; oil and gas exploration; papermaking; aviation; and building materials. Covered entities accounted for 50–60 % of the city's total emissions in 2020.

The Tianjin Ecology and Environment Bureau (EEB) is responsible for the governance of the Tianjin Pilot ETS since 2019, taking over from the Development and Reform Commission. Since then, Tianjin has further enhanced the legal foundation of its ETS and continuously improved its market performance.

In 2020, the Tianjin municipal government released the latest version of the "Tianjin Interim Measures for the Administration of Carbon Emissions Trading", which is a regulatory document released every few years providing the legal basis for the regional carbon market. The latest iteration extends the Tianjin Pilot ETS until the end of June 2025 and introduces the following main changes:

- 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 double the amount of the shortfall deducted from the next year's allocation, and third-party verifiers found to not comply with regulations will be banned for three years.

Tianjin also introduced auctioning gradually and has seen more active trading recently. In 2019, a successful auction was held for the first time. In 2020 and 2021, Tianjin ETS held two auctions in each compliance year.

Tianjin's market size for China Certified Emission Reductions (CCERs) and allowances has also increased significantly in the past years. For 2021, the Tianjin ETS was the third-largest regional pilot in terms of traded CCER volume and second largest when allowances are also considered.

YEAR IN REVIEW

The latest allocation plan to date was released in December 2020 for the 2020 compliance 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 previous year's emissions data and the remaining as ex-post adjustments on the basis of real production data. Power plants eligible for inclusion in the national ETS were transferred out of the Tianjin carbon market in 2021 and are now covered under the national ETS.

The Tianjin pilot held two auctions in 2021. The first auction for the 2020 compliance year was held in May 2021, with two million allowances sold at prices between CNY 24.29 (USD 3.77) and CNY 32.80 (USD 5.09). In the second auction, held in June 2021, 760,000 of the offered 1.5 million allowances were sold at CNY 34.19 (USD 5.30).

1 Figure includes power sector emissions. Cap data for 2021, which excludes the power sector, was not available at the time of writing (February 2022).

In June 2021, the Tianjin pilot completed its 2020 compliance period with a 100 % reported compliance rate, achieving six full compliance cycles within eight operational years.

In September 2021, the Standing Committee of Tianjin Municipal People's Congress issued the "Tianjin Carbon Peaking and Neutrality Promotion Regulations". For the first time, this regulation formally introduces financial penalties for non-compliance in the regional carbon market through a high-level regional legislation (See 'Enforcement' below).

Emissions & Targets of Tianjin

CO_2 EMISSIONS EXCL. LULUCF, 2012 (IN $MtCO_2$)

215[2]

GHG REDUCTION TARGETS

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

By 2025: To achieve the carbon intensity reduction rate that is to be specified by the central government; promote steel and electricity industries to reach carbon emissions peak. (Outline of the 14th Five Year Plan and 2035 Vision for Economic and Social Development of Tianjin)

ETS Size & Phases

COVERED EMISSIONS (2020)

~55 %[3]

GHGS COVERED

CO_2 only

PHASES

2013 and ongoing[4]

CAP

120 $MtCO_2$ (2020)

SECTORS AND THRESHOLDS

Heat, iron and steel, petrochemicals, chemicals, oil and gas exploration, papermaking, aviation, and building materials.[5] Electricity production was covered until 2020, after which it transitioned to the national ETS.

Tianjin is preparing to expand its ETS to entities above the inclusion threshold from all industrial sectors (without pre-selection of specific sectors) for 2021 compliance year, with the following new sectors expected to be added: food and beverage, non-ferrous metals, machinery and equipment manufacturing, mining, agricultural and food processing, pharmaceutical manufacturing, and electronic equipment manufacturing.

INCLUSION THRESHOLDS: 20,000 tCO_2/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

104 (2020)

139 (2021), based on expert estimates

2 There is no publicly available data, the data reported here is estimated based on public source in the launch year of the ETS.
3 There is no official data, so emissions coverage given here is an estimate.
4 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.
5 The last three sectors were added in 2019.

Allowance Allocation & Revenue

ALLOWANCE ALLOCATION

FREE ALLOCATION: Mainly free allocation through grandparenting based on either the base year (for example, 2019 for the allocation of 2020 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). In the 2020 compliance year, an emission reduction factor for all sectors was set at 0.98, indicating a relatively stringent allocation. Benchmarking applies for new entrants and for entities expanding capacity.

Pre-allocation allowance amount is 50 % of the previous year's emissions. Ex-post allocation adjustments based on actual production level are applied to determine the final allocation, especially for those sectors that use benchmarks and emissions intensity.

AUCTIONING: A small share of the annual cap can 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.

For the 2020 compliance year, the Tianjin EEB organized two allowance auctions. In May 2021, 2 million tonnes sold at an average price of (USD 3.86/tonne). More than half of the offered 1.5 million allowances at the second auction, in June 2021, were sold at an average price of CNY 34.19 (USD 5.30) per tonne.

USE OF REVENUES

Revenues are deposited into the city treasury.

Main purpose of revenue usage is to support the work related to the control of GHG emissions.

Flexibility & Linking

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 2020 compliance year, at least 50 % of the CCER credits must have originated from Beijing, Tianjin, or Hebei.

QUALITATIVE LIMIT: Credits must stem from CO_2 reduction projects, excluding hydroelectric power plants. The emissions reductions must have occurred after 2013.

LINKS WITH OTHER SYSTEMS

There is currently no link with other carbon markets.

Compliance

COMPLIANCE PERIOD

One calendar year: covered entities have until the end of June of the following year to surrender allowances.[6]

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions.

VERIFICATION: Third-party verification is required. Covered entities cannot use the same verifiers for three consecutive years.

FRAMEWORK: The Tianjin DRC has released a guiding document on monitoring and reporting. The document includes sector-specific guidance for the covered sectors, which EEB – as the competent authority since 2019 – is continuing to improve.

6 In some years, the compliance deadlines have been postponed to later dates, for reasons such as the COVID-19 pandemic and other factors.

ENFORCEMENT

REGULATED ENTITIES: No financial penalties for non-compliance. In case of non-compliance, 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 July 2020, companies failing to surrender enough allowances to match their emissions faced deduction of double the amount of the gap in the next year's allocation (this rule is valid until June 2025).

The "Tianjin Carbon Peaking and Neutrality Promotion Regulations", which took effect in November 2021, further introduces financial penalties for failing to submit emission reports as required, ranging from CNY 20,000 (USD 3,101) to CNY 200,000 (USD 31,013). Companies that fail to comply are subject to fines of between five and ten times the average market transaction price for the volume of allowances not surrendered.

THIRD PARTY VERIFIERS: 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.

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Covered entities, institutional investors (domestic and international) and individuals (domestic and international) that meet the requirements of the carbon emission trading rules set up by Tianjin Climate Exchange.

MARKET TYPES:

Primary: Most allowances are freely allocated. Tianjin Climate Exchange organizes ad-hoc auctions for the primary market. Since 2019, it has held two auctions in each compliance year.

Secondary: Products include spot Tianjin carbon emission allowances and spot CCERs. Tianjin Climate Exchange manages trading of all products.

LEGAL STATUS OF ALLOWANCES: Allowances are not considered as financial instruments. Invoices are issued as intangible assets.

MARKET STABILTY 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.

Other Information

INSTITUTIONS INVOLVED

Tianjin Ecology and Environment Bureau
Tianjin Climate Exchange (trading platform and registry)

EVALUATION/ETS REVIEW

Research on improving the Tianjin ETS has been undertaken by supporting institutes such as Tianjin Climate Exchange.

REGULATORY FRAMEWORK

Tianjin Pilot ETS Implementation Plan (2013)[7]
Interim Measure for Management of Emissions Trading in Tianjin (2013)[8]
Interim Measure for Management of Emissions Trading in Tianjin (2016)[9]
Interim Measure for Management of Emissions Trading in Tianjin (2018)[10]
Interim Measure for Management of Emissions Trading in Tianjin (2020)[11]
Allocation Plan for Vintage 2020[12]
Tianjin Carbon Peaking and Neutrality Promotion Regulations (2021)[13]

7 http://www.cdmfund.org/10898.html
8 http://www.carbonmanager.net/media/carbonbutler/images/tianjin05.pdf
9 http://www.tj.gov.cn/zwgk/szfwj/tjsrmzfbgt/202005/t20200519_2370115.html
10 http://www.tj.gov.cn/zwgk/szfwj/tjsrmzfbgt/202005/t20200519_2370498.html
11 https://www.chinatcx.com.cn/view/4253.html
12 http://sthj.tj.gov.cn/ZWGK4828/ZCWJ6738/sthjjwj/202012/t20201231_5263663.html
13 http://credit.fzgg.tj.gov.cn/detail.do?contentId=e922918f2b2d4307b74cd9d082cf7082&channelId=5f324bf347114ac3a74f887a80461042

Tokyo

Tokyo Cap-and-Trade Program

CAP
12.1 $MtCO_2$ (2019)

GASES
CO_2 only

OFFSETS AND CREDITS
Domestic and national

ALLOCATION
Free Allocation: Grandparenting

AVERAGE 2021 ALLOWANCE PRICE
Average price: ~JPY 540 (USD 4.92)[1]

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

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.

Facilities covered under the program are assigned a higher or lower target, depending on type of facility and factors such as expected energy efficiency gains and the extent to which they consume energy supplied by other facilities. Facilities that achieve emissions reductions beyond their compliance rate can trade their earned "reduction credits".

YEAR IN REVIEW

In June 2021, the TMG released emissions data for fiscal year 2019 indicating that, on aggregate, emissions were reduced by 27 % overall among covered facilities during the five years of the second compliance period (FY2015–FY2019) compared to base-year emissions, overachieving the 15–17 % target set for the period. It was expected that by the end of the adjustment period (end of January 2022), approximately 80 % of covered facilities would have achieved reductions over their compliance factors for the second compliance period.

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. It is currently midway through its third compliance period (FY2020–FY2024), which requires facilities to reduce emissions by 25 % or 27 % below base-year emissions, depending on their assigned category. The third compliance period also aims to expand the use and production of low-carbon and renewable energy through additional incentives for covered facilities to reduce their compliance obligations by switching to cleaner electricity or heat.

Emissions & Targets of Tokyo

ENERGY-RELATED CO_2 EMISSIONS, 2019 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Transport	9.4	(17 %)
Manufacturing	3.8	(7 %)
Businesses	23.8	(43 %)
Residential	16.1	(29 %)
Waste	1.9	(4 %)
Total CO_2 Emissions	**55.0**	

1 Estimated standard transaction price provided by TMG.

GHG REDUCTION TARGETS

By 2030: 50 % reduction from 2000 GHG levels
(Zero Emission Tokyo Strategy 2020 Update & Report)

By 2050: Net zero CO_2 emissions
(Zero Emission Tokyo Strategy 2020 Update & Report)

*The overall emissions figure for Tokyo is higher than the total of the emissions by sector because the former includes all GHGs in Tokyo, whereas the emissions by sector only measures CO_2 emissions.

ETS Size & Phases

COVERED EMISSIONS

~20 %

GHGS COVERED

CO_2

PHASES

PHASE ONE: 1 April 2011 to 30 September 2016
PHASE TWO: 1 April 2015 to 31 January 2022
PHASE THREE: 1 April 2020 to 30 September 2026

The Tokyo ETS has phases as well as compliance periods (see 'Compliance' section). The phase is defined as the compliance period plus an additional 18-month adjustment period, during which time facilities may continue to trade credits in order to reach their targets for the corresponding compliance period.

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).

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 m^2 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 1,500kL of crude oil per year.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

~1,200 facilities:
- Office/commercial buildings: ~1,000
- Factories: ~200

Allowance Allocation & Revenue

ALLOWANCE 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.

For facilities that have been designated as compliance facilities since the launch of the ETS, base-year emissions are based on the average emissions of any three consecutive years between FY2002 and FY2007. To calculate their base-year emissions, new entrant facilities can choose either historical emissions (the average of annual emissions for three consecutive fiscal years among the four consecutive fiscal years before the first fiscal year of the compliance period) or emission intensity standards.

Credits are issued to facilities whose emissions fall below their baselines. Additional emissions reductions may also be issued through the use of renewable electricity (see also 'Offsets and Credits' section).

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 lower compliance factor applies to factories and office buildings that use district heating and cooling for more than 20 % of their energy consumption.

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 25 % or 50 % 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 & Linking

BANKING AND BORROWING

Banking is allowed only between consecutive compliance periods.
Borrowing is not allowed.

OFFSETS AND CREDITS

QUALITATIVE LIMITS: Four types of offset credits 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.
- 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.
- 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 1,000kW) electricity production for use under the Tokyo ETS are converted on a one-to-one basis, as are credits from biomass (biomass rate of 95 % or more, black liquor excluded).
- Saitama credits (via link): These encompass (1) Excess credits: Emissions reductions from facilities in Saitama with base-year emissions of 150,000 tonnes or less. These credits have been issued since FY2015; and (2) small and mid-size facility credits issued by Saitama Prefecture since FY2012.

QUANTITATIVE LIMITS: Quantitative limits apply only for Outside Tokyo credits: these 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.

All offsets must be verified by verification agencies.

QUALIFYING FOR ADDITIONAL EMISSIONS REDUCTIONS THROUGH USE OF RENEWABLE ELECTRICITY: In order to evaluate the energy efficiency efforts of the covered facilities, CO_2 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-CO_2/1,000 kWh] or less), they can deduct the difference between these emission factors from their reported emissions accordingly, to reflect this lower emissions factor of energy purchased.

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.

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.

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).

Compliance

COMPLIANCE PERIOD

Five years

Facilities must submit a GHG Emissions Reduction Plan and implementation status report by the end of November every year.

Compliance instruments to meet each facility's targets must be submitted by the end of the 18-month adjustment period, 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 COMPLIANCE PERIOD: FY2010–FY2014
SECOND COMPLIANCE PERIOD: FY2015–FY2019
THIRD COMPLIANCE PERIOD: FY2020–FY2024

MRV

REPORTING FREQUENCY: Annual emissions reporting, including emission reduction plans. All seven GHGs must be monitored and reported: CO_2, CH_4, N_2O, PFCs, HFCs, SF_6, and NF_3. Large tenants, i.e., those with a floor space above 5,000 m^2 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.

VERIFICATION: Annual emissions reports require third-party verification.

FRAMEWORK: These are based on "TMG Monitoring/Reporting Guidelines" and "TMG Verification Guidelines".

ENFORCEMENT

In the case of non-compliance, 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 4555.63]) and surcharges (1.3 times the shortfall).

Market Regulation

MARKET DESIGN

MARKET PARTICIPATION: Compliance facilities, i.e., those above the inclusion threshold (see "Sectors and Thresholds" section), and others who wish to participate in emissions trading. The TMG allows only "reduction credits" and not "emission credits", i.e., one can earn credits only after achieving emission reductions.

MARKET TYPES:
Primary: All allowances are allocated for free.
Secondary: Covered facilities and other market participants (trading account holders) trade over the counter. Businesses wishing to buy or sell credits can also go through a private intermediary to find a buyer and negotiate the price.

MARKET STABILTY PROVISIONS

In general, covered facilities and other market participants (trading account holders) 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 increases.

Other Information

INSTITUTIONS INVOLVED

Tokyo Metropolitan Government

EVALUATION/ETS REVIEW

For every new compliance period, TMG establishes a committee of experts to discuss and determine compliance factors and other important issues for the next compliance period. The next committee meeting for the fourth compliance period is scheduled to begin in FY2022.

REGULATORY FRAMEWORK

Tokyo Metropolitan Security Ordinance and Regulation for the Enforcement of the Tokyo Metropolitan Environmental Security Ordinance[2]
Outline documents[3] and **detailed documents**[4] on the Tokyo ETS
Zero Emission Tokyo Strategy 2020 Update & Report[5]

2 https://www.kankyo.metro.tokyo.lg.jp/basic/guide/security_ordinance/index.html
3 https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap_and_trade/index.files/TokyoCaT_outline_documents.pdf
4 https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap_and_trade/index.files/TokyoCaT_detailed_documents.pdf
5 https://www.kankyo.metro.tokyo.lg.jp/en/about_us/zero_emission_tokyo/strategy_2020update.html

Vietnam

In force

Under development

Under consideration

Established the legal mandate to design a domestic ETS and a national crediting mechanism (NCM)

Pilot NCM is expected to start by 2023, and a pilot ETS by 2025. ETS to become fully operational by 2028

Draft regulation for the NCM and the ETS is now under development

In November 2021, Vietnam's revised "Law on Environmental Protection" was issued. The Law establishes a mandate for the Ministry of Natural Resources and Environment (MONRE) and for the Ministry of Finance to design a national crediting mechanism (NCM) and a domestic ETS. The framework legislation also empowers MONRE to set the ETS cap and determine the method of allowance allocation and allows for the inclusion of domestic and international offsets in the ETS.

In January 2022, the Government of Vietnam issued "Decree 06/2022/ND-CP", which provides regulations under the "Law on Environmental Protection" and outlines a roadmap for the implementation of the NCM and the ETS. The decree requires facilities with annual GHG emissions above 3,000 tCO_2e to submit a biennial inventory report of their emissions from 2025 onwards (for example, in 2025 the facility must submit an inventory report covering emissions from 2024). The accompanying "Decision 01/2022/QD-TTg" lists the sectors and facilities with emissions inventory obligations.

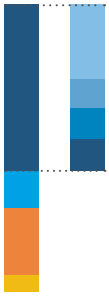
The Decree also includes provisions for developing a national ETS, focusing initially on the steel, cement, and thermal power sectors, with a declining cap corresponding to Vietnam's NDC. The roadmap for the NCM laid out in the Decree envisages that the legal framework and technical foundations should be in place by 2023, and that a pilot NCM can take place between 2023 and 2024, focusing on the solid waste and transport sectors. From 2026, the NCM and crediting mechanisms under Article 6 of the Paris Agreement should be fully implemented in the country.

For the ETS, the roadmap states that ETS regulations and a trading platform should be in place by 2025. A pilot voluntary ETS is planned to take place between 2026 and 2027. The mandatory ETS should be implemented from 2028 onwards and will be designed to link with others under Article 6 of the Paris Agreement.

Background Information

GHG EMISSIONS EXCL. CATEGORIES "3B LAND" AND "3D PRODUCTS OF COLLECTED WOOD", 2016 (IN $MtCO_2e$, SHARE OF TOTAL IN %)

Energy	205.8	(58 %)
Industrial Processes	46.1	(13 %)
Agriculture, Forestry and Other Land Use[1]	83.6	(23 %)
Waste	20.7	(6 %)
Total	**356.2**	



Energy Industries	91	(26 %)
Manufacturing Industries and Construction	35.8	(10 %)
Transport	38.2	(11 %)
Other Energy	40.7	(11 %)

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).

By 2050: At COP 26, Prime Minister Pham Minh Chinh announced the goal of net-zero emissions by 2050.

1 Vietnam 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-CO_2 emissions sources on land."

Other Information

INSTITUTIONS INVOLVED

Ministry of Natural Resources and Environment
Ministry of Finance

REGULATORY FRAMEWORK

Law No. 72/2020/QH14 on Environmental Protection, 133–139'20/OG [2]
Decree 06/2022/ND-CP[3]
Decision 01/2022/QD-TTg[4]

2 https://thuvienphapluat.vn/van-ban/EN/Tai-nguyen-Moi-truong/Law-72-2020-QH14-on-Environmental-Protection/463512/tieng-anh.aspx
3 http://dwrm.gov.vn/index.php?language=vi&nv=laws&op=Linh-vuc-lien-quan-den-tai-nguyen-nuoc/Nghi-dinh-so-06-2022-ND-CP-Quy-dinh-giam-nhe-phat-thai-khi-nha-kinh-va-bao-ve-tang-o-don
4 https://luatvietnam.vn/tai-nguyen/quyet-dinh-01-2022-qd-ttg-thu-tuong-chinh-phu-216078-d1.html#:~:text=Ng%C3%A0y%2018%2F01%2F2022%2C,ki%E1%BB%83m%20k%C3%AA%20kh%C3%AD%20nh%C3%A0%20k%C3%ADnh.&text=Quy%E1%BA%BFt%20%C4%91%E1%BB%8Bnh%20c%C3%B3%20hi%E1%BB%87u%20l%E1%BB%B1c%20t%E1%BB%AB%20ng%C3%A0y%20k%C3%BD

About ICAP

About the International Carbon Action Partnership

Founded in 2007, ICAP brings together policymakers from all levels of government that are operating an emissions trading system (ETS) or are taking steps to introduce one. The Partnership provides a unique platform for governments to discuss the latest knowledge and practical experiences with emissions trading. Since its formation, ICAP has established itself as an ETS knowledge hub and its membership has grown to 33 members and seven observers.

ICAP's Objectives

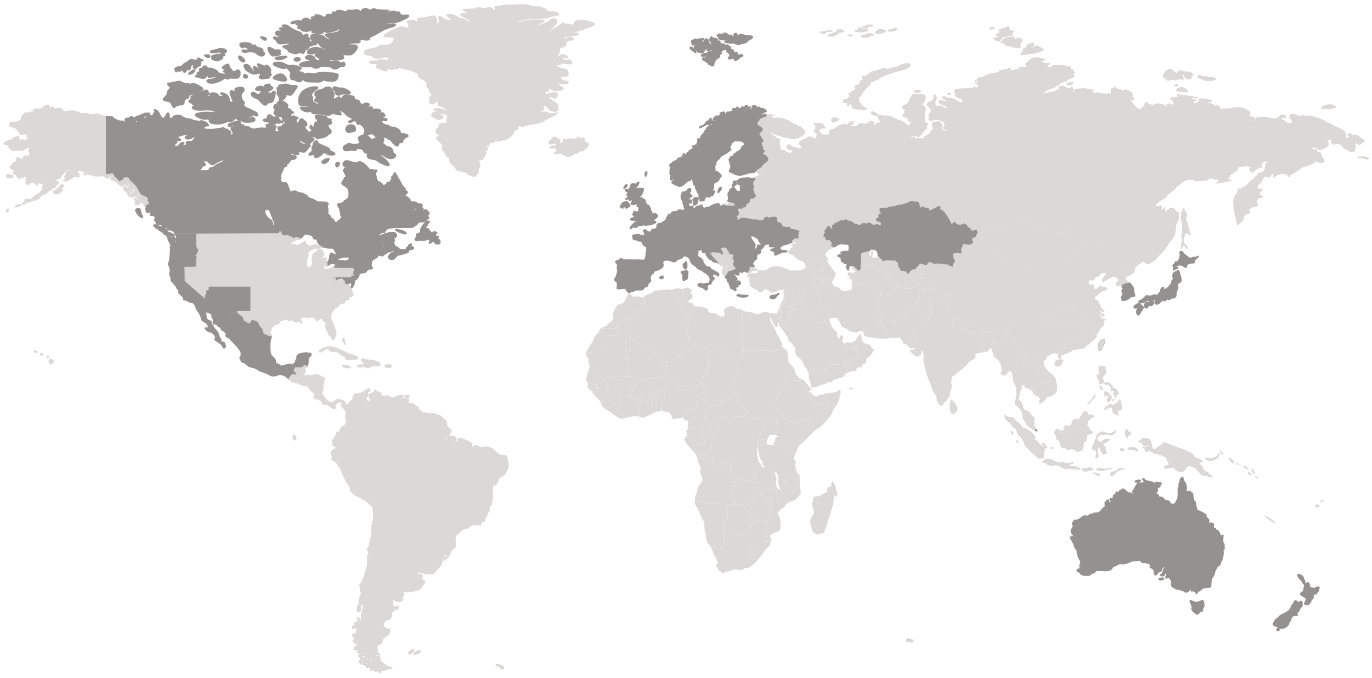
- Share best practices and learn from each other's experiences with ETS
- Help policymakers recognize ETS design compatibility issues and opportunities for establishing an ETS at an early stage
- Facilitate future linking of trading programs
- Highlight emissions trading as a key aspect of an effective climate policy response
- Build and strengthen partnerships amongst governments

Members (as of February 2022)

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, Sweden, Switzerland, the Tokyo Metropolitan Government, Vermont, the United Kingdom, and the state of Washington

Observers

Canada, Japan, Kazakhstan, the Republic of Korea, Mexico, Singapore, and Ukraine



ICAP members & observers

22 *Countries*

16 *Provinces & States*

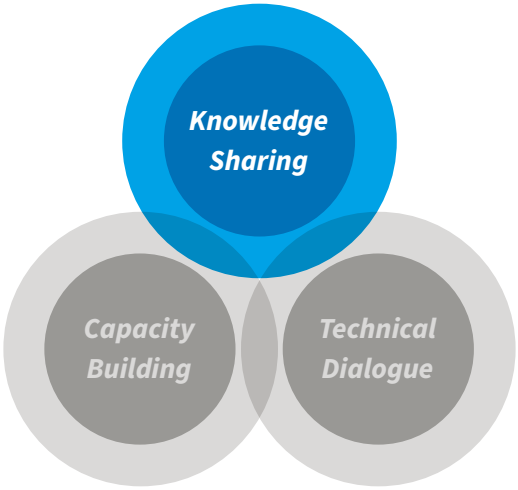
1 *Union*

1 *City*

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

ICAP acts as a unique repository of information on emissions trading, promoting it as an important policy instrument to address climate change. Over the years, ICAP has become an ETS knowledge hub for all people who want to learn more about emissions trading and the latest developments relating to ETS worldwide.

ICAP WEBSITE

As the primary knowledge sharing channel, the ICAP website has been reconceptualized and renewed, enabling smooth navigation across components and featuring ICAP's key services and knowledge products more prominently, underlining ICAP's credibility as a knowledge hub for state-of-the-art information on ETS.

ETS MAP

The ICAP ETS Map is one of the main features of the ICAP website. It provides and visualizes 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 gives granular information on individual design aspects.

ICAP ALLOWANCE PRICE EXPLORER

The quarterly-updated Allowance Price Explorer is an interactive tool which lets the user compare price developments between ETSs. With full data downloads as well as deep diving on market stability mechanisms, this tool allows the user to create individualized charts.

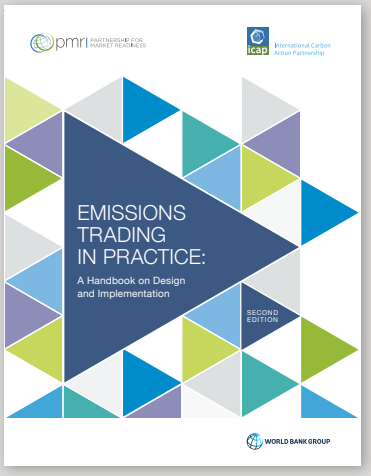
KEY PUBLICATIONS

ICAP publishes a variety of different knowledge products on various topics of ETS design and implementation, drawing on the rich experience of all ICAP jurisdictions. Among many others, these publications 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, best practice design, and experiences from ETS jurisdictions around the world. An updated version was published in April 2021 and is available in various languages.

- The series of ICAP Briefs on ETS basics, which was initiated in 2015 and thoroughly updated ever since. The ICAP Briefs provide simple explainers on what is an ETS and how it operates in practice. To reach a wider audience, the ICAP Briefs are available in English, Spanish, Portuguese, French, Russian, Chinese and Korean, and can be downloaded from the ICAP website.

- The annual ICAP Status Report, which has become a leading reference on the state of domestic ETSs around the world since its first edition in 2014.



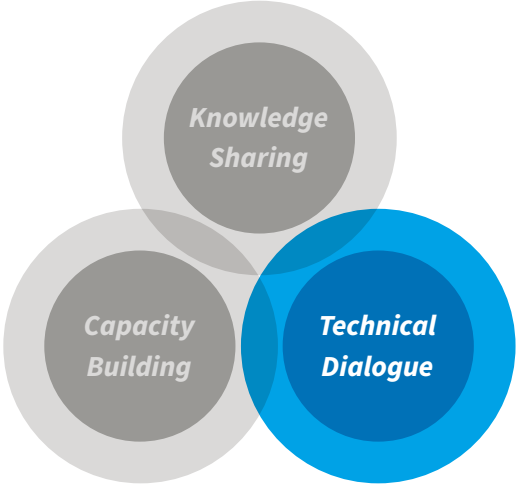
Technical Dialogue

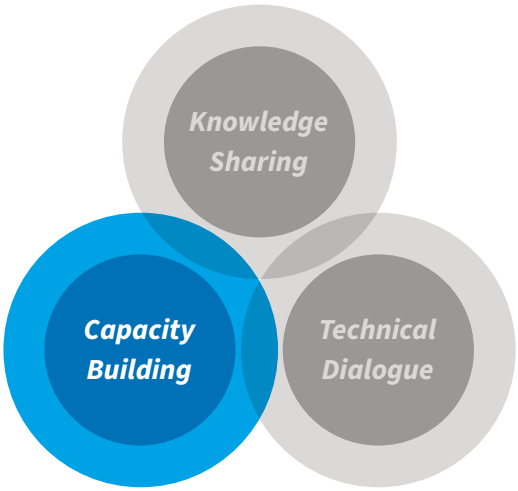
The technical dialogue workstream focuses on key aspects of emissions trading, drawing on the rich experience of all ICAP jurisdictions and facilitating dialogue and exchange on ETS issues among experts and people interested in carbon markets.

ICAP has been working on a variety of issues in different formats, including workshops, webinars, papers and reports.

In 2021, ICAP focused on emissions trading and net zero, which resulted in the paper on 'Emissions Trading Systems and Net Zero: Trading Removals' and an accompanying virtual workshop. The paper sought to understand the challenges that net-zero emission targets could present for the operation of ETSs and developed a series of models for the possible interactions between markets and removal units from negative emissions technologies.

Other important topics of the technical dialogue workstream include dialogues on competitiveness and carbon leakage, emissions trading and international cooperation, ETS and Article 6, and ETS linking.





Capacity Building

Since 2009, ICAP has held courses on emissions trading for developing countries and emerging economies. These include the ICAP ETS courses, which are supported and funded by the European Commission, as well as in-country and virtual courses with various other partners. Over the past years, a total of 700 participants from more than 60 countries have participated in these courses, learning about all aspects of the design and implementation of emissions trading as a tool to mitigate GHG emissions.

Due to the COVID-19 pandemic, the capacity building work stream has adapted and evolved into several virtual formats, which include multi-day ETS virtual workshops and trainings, like the ICAP Online ETS Academy 2021. Seventy-nine participants from over 30 countries and four continents were selected to attend the academy, giving them the opportunity to deepen their understanding of ETS design and implementation.

In addition, ICAP launched a new series of virtual webinars with the support of the European Commission. These virtual 90-minute webinars, called 'ETS for Policy Practitioners', are held on a monthly basis and cover different specific ETS topics targeting ICAP alumni as well as the broader climate community globally.

Both the emergence of new ETS jurisdictions, and government and other staff rotations, create a basic and rising level of demand for ETS training in the upcoming years. ICAP aims to meet this need by continuing to create and organize its successful ICAP Training Courses on Emissions Trading.

24 *Courses*

700 *Participants*

60 *Different Countries*

4 *Continents*

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 represent the current situation as of January 2022, unless otherwise noted.
3. Where 2022 data is not yet available, we use the most recently available data. The covered emissions graph in the factsheets shows the latest year for which both verified emissions data and inventory data are available.
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 emissions. 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 2021 and 31 December 2021. 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 emissions categories, 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 an 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.

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 2022. They typically cover 2019 or 2020 data. The total population of jurisdictions with an ETS in force and the total 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 process described in note 5 under "Global Expansion of ETS" below. 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**.

GLOBAL EXPANSION OF ETS

1. 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.
2. EU ETS cap in 2021 was 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 $MtCO_2e$ and from 2013 to 2021 has been around 38 $MtCO_2e$ per year. For more details, see the EU ETS factsheet.
3. China 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. When official data were not available, the caps for the China National ETS and Chinese Pilots were estimated values provided by domestic ETS experts.
4. There are two cases where an existing and a scheduled system regulate the same emissions. In those cases, we made the following assumptions:
    a. Massachusetts ETS & RGGI: Massachusetts' system covers the same emissions as RGGI, so the Massachusetts system is excluded from the infographic to avoid double counting.
    b. China National ETS & Pilots: According to the China National ETS rules, Chinese Pilots that had already allocated allowances for 2019 and/or 2020 for the power sector remained under the pilots for those years. This implies the power sector entities subject to overlapping regulation were covered under the pilots where appropriate and moved to the national ETS thereafter. Accordingly, the infographic reduces the Chinese Pilots' cap in 2020–2022 based on the latest estimates provided by domestic ETS experts.
5. Global emissions data refer to GHG emissions in CO_2e excluding LULUCF and are obtained from
    a. Olivier and Peters (2020) for 2005–2019 which is available at https://www.pbl.nl/sites/default/files/downloads/pbl-2020-trends-in-global-co2-and_total-greenhouse-gas-emissions-2020-report_4331.pdf
    b. Rhodium Group for 2020 which is available at https://rhg.com/research/preliminary-2020-global-greenhouse-gas-emissions-estimates/

    To obtain estimates of global GHG emissions in 2021 and 2022, we have deviated from our usual assumption of using recent growth rates of GHG emissions, as this would imply continued decline in emissions which is inconsistent with the recovery of CO_2 emissions to pre-pandemic levels in many individual countries. Instead, we have assumed that emissions return to 2019 levels and remain there in 2021 and 2022. Percentages of global emissions covered are rounded to the nearest full percentage. They are slightly above 5 % and 17 % in 2005 and 2022, respectively.
6. 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.

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).

2. 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.

3. In most cases, emissions coverage of the different systems corresponds to the value that is reported in the relevant 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 sum of the most recent reported emissions in the pilots. Note that sector coverage differs across Chinese pilots as indicated in the relevant slice of the infographic. A limited number of heat plants which are below the inclusion threshold in China National ETS continue to be covered under Chinese pilots where applicable but this is not shown in the infographic. In the case of China National ETS the coverage figure (44 % of total CO_2 emissions) is a jurisdiction-provided estimate, which is likely to be conservative.

AUCTIONING REVENUE

1. Auction revenues for the 19 systems (including the eight Chinese pilots reported as a group) were calculated using data from the European Commission; ICE and UK Department for Business, Energy & Industrial Strategy; German Environment Agency; ICE and Swiss Emissions Registry; California Air Resources Board; Québec Ministry of Sustainable Development, Environment, and Fight Against Climate Change; Nova Scotia Environment; Regional Greenhouse Gas Initiative; New Zealand Ministry for the Environment; Massachusetts Department of Environmental Protection; Ecoeye as well as from the factsheets of the Chinese pilot systems (links available upon request, **info@icapcarbonaction.com**). There have been minor revisions to historical revenue figures due to the consolidation of exchange rate concepts used in converting revenues in national currencies to USD. Specifically, annual average exchange rates from the IMF are now used consistently across jurisdictions and over time.

2. Auction revenue for the EU ETS includes revenue from the domestic aviation sector.
3. For the California cap-and-trade system, the proceeds from consignment auctions are excluded.
4. 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.
5. The Massachusetts quarterly reports are published by Potomac Economics, which is the official market monitor for the Massachusetts Department of Environmental Protection.

DIFFERENT SHAPES OF ETS

1. **Coverage:** The figure indicates the percentage of the jurisdiction's total GHG emissions that is covered by the ETS. The data are taken from the factsheets and refer to the latest emissions coverage figures available for each system. For the China National ETS and RGGI, coverage values represent the share of CO_2 emissions covered by the ETS in the aggregate CO_2 emissions of these jurisdictions. In the case of China National ETS the coverage figure (44 % of total CO_2 emissions) is a jurisdiction-provided estimate, which is likely to be conservative. Additional jurisdiction-specific information on coverage figures can be found in the relevant factsheet.
2. **Allowance Price:** The figure provides the average auction settlement price in USD over 2021 per tonne of CO_2e. The prices in EU and Swiss ETSs differ despite the linkage between the two systems because the jurisdictions do not hold joint auctions. Where necessary local currency prices were converted using the annual average exchange rate as published in the IMF Financial Statistics. For additional information on sources of allowance prices and exchange rates see **https://icapcarbonaction.com/en/documentation-allowance-price-explorer**.
3. **Auction share:** This figure indicates the share that is not allocated for free but must be acquired either at an auction or otherwise for the latest year where information is available. The consignment auctions in California are not included in calculating the auction share. Until 2026 German ETS allowances are sold at a fixed price rather than in an auction. In the case of the New Zealand ETS, the reported figure is calculated by dividing the allowances available in the four 2022 auctions by the 2022 cap. 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. Additional jurisdiction-specific information on auction share figures can be found in the relevant factsheet.
4. **Offset Use:** This figure provides the share of a compliance entity's obligations which can be met using offsets for the latest year where information is available. Additional jurisdiction-specific information on offset use figures can be found in the relevant factsheet.

NET-ZERO TARGETS AND ETS

1. Information on the status of net-zero target development and GHG emissions in 2020 and 2021 are drawn from zerotracker.net and its predecessor eciu.net/netzerotracker. We focus only on country-level targets plus the EU as a supranational entity whose net-zero target "in law" is assumed to apply to all 27 Member States. This source contains a higher-resolution characterization of target status than our three categories. For simplicity, we aggregate all net-zero targets that are not in law or absent into a single category "under development/discussion". We categorize Norway's legislated 95 % GHG emissions reduction target by 2050 as a net-zero target "in law". Our categorization of "in law", "under development/discussion" and "no net-zero target" is accurate as of 01 Feb 2022 for 2021, and 10 Mar 2021 for 2020.
2. Data on ETS-covered emissions are from jurisdiction factsheets. The aggregate emissions figure is obtained by adding together country-level emissions from zerotracker.net to maintain consistency but has the implication that 1) the aggregate emissions figure is an amalgamation of data from different years as reported at source; and 2) it remains constant from 2020 to 2021.

ALLOWANCE PRICE DEVELOPMENTS

1. An allowance represents the right to emit one tonne of CO_2e in the jurisdiction(s) that accept(s) 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.
2. The top panel of the infographic displays the daily allowance prices in 2021, while the bottom panel presents the monthly average allowance prices between March 2008 and December 2021 using data from the ICAP Allowance Price Explorer, except for Germany (see note below). For additional information on sources of allowance prices and exchange rates see **https://icapcarbonaction.com/en/documentation-allowance-price-explorer**.
3. All data are in USD and are converted using the average exchange rate of the corresponding month as reported by the IMF.
4. The data for the UK, Quebec, California, Nova Scotia and RGGI are from the primary market. For these systems the observations from two successive auctions are connected linearly. The data for the remaining systems, except Germany, are secondary market prices. They reflect settlement prices and do not capture intra-day trade variation. German ETS allowances are sold at a fixed price in the initial years of the system. The fixed price increases annually until 2026 when trading begins in earnest. In 2021, the fixed price in the German ETS is equal to EUR 25 so the variation in the series reflects the changes in the EUR-USD exchange rate.
5. RGGI allowance prices are in short tonnes and have been converted to metric tonnes for the purposes of this infographic.
6. Where allowances have a limited vintage, the time series data compile these vintages in a way that reflects the compliance cycle.
7. The price range for the Chinese Pilot ETSs was determined as follows: 1) We computed the monthly average prices in USD; 2) For a given month, we determined the minimum and maximum prices across Chinese Pilots; 3) We applied a six-month moving average to smooth out the variability in maximum and minimum prices; 4) We shaded the region between the smooth series.

List of acronyms

AB	Assembly Bill
APCR	Allowance Price Containment Reserve
ARP	Auction Reserve Price
ASSET	Advanced Technologies Promotion Subsidy Scheme with Emission Reduction Targets
BAU	Business as Usual
BECCS	Bioenergy with Carbon Capture and Storage
CAD	Canadian Dollar
CARB	California Air Resources Board
CBAM	Carbon Border Adjustment Mechanism
CCA	Climate Commitment Act
CCER	Chinese Certified Emission Reduction
CCI	Community Climate Investments
CCM	Cost Containment Mechanism
CCR	Cost Containment Reserve
CDM	Clean Development Mechanism
CDR	Carbon Dioxide Removal
CEEX	China Emissions Exchange
CEP	Clean Energy Plan
CER	Certified Emission Reduction
CHF	Swiss Franc
CITSS	Compliance Instrument Tracking System Service
CLEF	Carbon Leakage Exposure Factor
CNY	Chinese Yuan Renminbi
CO_2	Carbon Dioxide
COP26	26th Conference of the Parties
CORSIA	Carbon Offsetting and Reduction Scheme
COVID-19	2019 novel coronavirus
CPA	Carbon Pricing in the Americas
CPP	Climate Protection Program
CPS	Carbon Price Support
CQCER	Chongqing Certified Emissions Reduction
DAC	Direct Air Capture
DACCS	Direct Air Carbon Capture and Storage
DEBS	Direct Environmental Benefits
DEE	Department of Ecology and Environment
DENR	Department of Environment and Natural Resources
DEQ	Department of Environmental Quality
DHC	District Heating and Cooling
DRC	Development and Reform Commission
ECR	Emissions Containment Reserve
EEB	Ecology and Environment Bureau
EEC	Eastern Economic Corridor
EEX	European Exchange
EITE	Emission-Intensive and Trade-Exposed
EPE	Empresa de Pesquisa Energética (Energy Research Corporation)
EQC	Environmental Quality Commission
ESR	European Effort Sharing Regulation
ETS	Emissions Trading System or Emissions Trading Scheme
EU	European Union
EU ETS	European Union Emissions Trading System
EUR	Euro
FFCER	Fujian Forestry Certified Emission Reduction
FY	Fiscal Year
GBP	British Pound Sterling
GDP	Gross Domestic Product
GGPPA	Greenhouse Gas Pollution Pricing Act
GHG	Greenhouse Gas
GIR	Greenhouse Gas Inventory and Research Center of Korea
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Corporation for International Cooperation)
HB	House Bill
HBEA	Hubei Emission Allowance
HFCs	Hydrofluorocarbons
HFC-23	Fluoroform
ICAO	International Civil Aviation Organization
ICAP	International Carbon Action Partnership
ICE	Intercontinental Exchange
IEA	International Energy Agency
IMF	International Monetary Fund
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
ITMOs	Internationally Transferred Mitigation Outcomes
JCM	Joint Crediting Mechanism
JI	Joint Implementation
JPY	Japanese Yen
KASA	Kementerian Alam Sekitar Dan Air (Malaysian Ministry of Environment and Water)
KAU	Koran Allowance Unit
KAZ ETS	Kazakhstan Emissions Trading Scheme
KCU	Korean Credit Unit
K-ETS	Korean Emissions Trading System
KOC	Korean Offset Credit
KRW	South Korean Won
KRX	Korea Exchange
kWh	Kilowatt hour
KZT	Kazakhstani Tenge
LL	Local Law
LPG	Liquefied Petroleum Gas
LT-LEDS	Long-term Low GHG Emission Development Strategy

LULUCF	Land Use, Land-Use Change and Forestry
m^2	Square Metre
MassDEP	Massachusetts Department of Environmental Protection
MEE	Ministry of Ecology and Environment
METI	Ministry of Economy, Trade and Industry
MoCC	Ministry of Climate Change
MOE	Ministry of Environment
MOEF	Ministry of Economy and Finance
MONRE	Ministry of Natural Resources and Environment
MRV	Monitoring, Reporting and Verification
MSR	Market Stability Reserve
$MtCO_2$	Million Tonnes of Carbon Dioxide
$MtCO_2e$	Million Tonnes of Carbon Dioxide equivalent
MW	Megawatt
MXN	Mexican Peso
N_2O	Nitrous Oxide
NC	North Carolina
NCM	National Crediting Mechanism
NDC	Nationally Determined Contribution
NDRC	National Development Reform Commission
nEHS	Nationales Emissionshandelssystem (German National ETS)
NETs	Negative Emissions Technologies
NER	New Entrants' Reserve
NF_3	Nitrogen Trifluoride
NO_x	Nitrogen Oxide
NYC	New York City
NZ	New Zealand
NZ ETS	New Zealand Emissions Trading Scheme
NZD	New Zealand Dollar
NZU	New Zealand Unit
NZX	New Zealand Exchange
OBPS	Output-Based Pricing System
OTC	Over-the-Counter
PDR	People's Democratic Republic
PFCs	Perfluorocarbons
PHCER	Pu Hui Certified Emission Reductions
PMR	Partnership for Market Readiness
PNCTE	Programa Nacional de Cupos Transables de Emisión de Gases de Efecto Invernadero (National Program of Greenhouse Gas Tradable Emission Quotas)
RAC	Rulemaking Advisory Committee
RENE	Registro Nacional de Emisiones (Mexico National Emissions Register)
RGGI	Regional Greenhouse Gas Initiative
RGGI COATS	RGGI CO_2 Allowance Tracking System
SAM	Supply Adjustment Mechanism
SB	Senate Bill
SEEE	Shanghai Environmental and Energy Exchange
SEMARNAT	Secretaría del Medio Ambiente y Recursos Naturales (Ministry of Environment and Natural Resources of Mexico)
SF_6	Sulfur Fluoride
SHEA	Shanghai Emission Allowance
SHEAF	Shanghai Emission Allowance Forward
tce	Tonne of Coal equivalent
TCI	Transportation and Climate Initiative
TCI-P	Transportation and Climate Initiative Program
tCO_2	Tonne of Carbon Dioxide
tCO_2e	Tonne of Carbon Dioxide equivalent
TEPA	Taiwanese Environmental Protection Administration
TGO	Thailand Greenhouse Gas Management Organization
TMG	Tokyo Metropolitan Government
TMS	Target Management System
TNAC	Total Number of Allowances in Circulation
UK	United Kingdom
UKA	UK Allowance
UK ETS	UK Emissions Trading Scheme
UN	United Nations
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USD	US Dollar
US EPA	US Environment Protection Agency
VCM	Voluntary Carbon Markets
WCI	Western Climate Initiative

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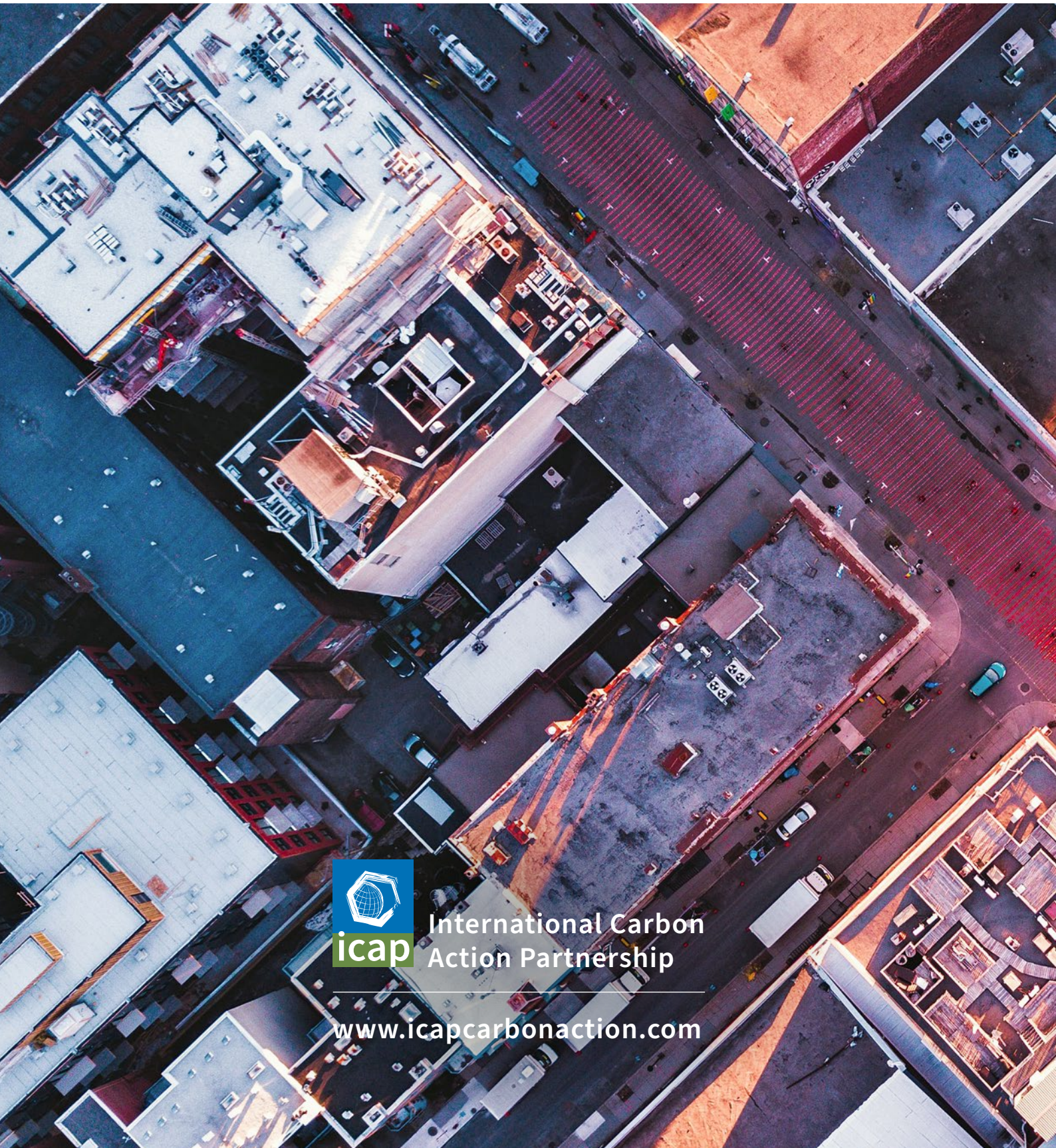
International Carbon Action Partnership (ICAP)
Köthener Strasse 2, 10963 Berlin, Germany

www.icapcarbonaction.com
info@icapcarbonaction.com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