International Carbon Action Partnership

EMISSIONS TRADING WORLDWIDE

STATUS REPORT 2023

EMISSIONS TRADING WORLDWIDE

INTERNATIONAL CARBON ACTION PARTNERSHIP STATUS REPORT 2023

CITE AS:

ICAP (2023). Emissions Trading Worldwide: Status Report 2023.
Berlin: International Carbon Action Partnership.

EDITORIAL TEAM:

Zhibin Chen, Stefano De Clara, Baran Doda, Alexander Eden, Maia Hall, Leon Heckmann, Iryna Holovko, David Hynes, Martina Kehrer, Stephanie La Hoz Theuer, Trevor Laroche-Theune, Andrés Olarte Peña, Victor Ortiz Rivera, Santiago Ramírez Niembro, Anastasia Steinlein, Theresa Wildgrube.

The ICAP Secretariat expresses its gratitude to policymakers from the ICAP membership and further collaborators from the emissions trading field, who provided insightful written contributions and/or carefully reviewed the report:

Robin Damberger (Austria), Petra Krems-Ladenberger (Austria), Henrik Neier (Austria), Fabian Stöckl (Austria), Luiz Mauricio de Araujo Navarro (Brazil), Raquel Breda dos Santos (Brazil), Gustavo Saboia Fontenele e Silva (Brazil), Rachel Gold (California), Bob Languell (California), Shelby Livingston (California), Amy Ng (California), Rajinder Sahota (California), Mark Sippola (California), Camille Sultana (California), Jeff Lindberg (Canada), Simon Tudiver (Canada), Marijke Vermaak (Canada), Maria Jose García Cabello (Chile), Juan Pedro Searle (Chile), Isabella Villanueva (Chile), Yi Zou (China Beijing Environment Exchange), Qiang Li (Chongqing International Investment Consultation Group), Marco Antonio Murcia Baquero (Colombia), Polona Gregorin (European Commission), Damien Meadows (European Commission), Mette Quinn (European Commission), Joao Serrano Gomes (European Commission), Beatriz Yordi (European Commission), Julia Ziemann (European Commission), Jos Delbeke (European University Institute), Michael Themann (Germany), Dirk Weinreich (Germany), Saurabh Diddi (India), Dida Gardera (Indonesia), Ministry of the Environment of Japan, Botagoz Akhmetova (Kazakhstan), Muhamad Ridzwan Bin Ali (Malaysia), Ahmad Farid Bin Mohammed (Malaysia), Mohd Hafdzuan Adzmi (Malaysia), Zainorfarah Zainuddin (Malaysia), William Space (Massachusetts), Diana Karin Guzmán Torres (Mexico), Suriel Islas Martínez (Mexico), Jelena Ban (Montenegro), Ranko Lazovic (Montenegro), Jonathan Binder (New York State), Lois New (New York State), Sarah Deblock (New Zealand), Freeya Farrar (New Zealand), Scott Gulliver (New Zealand), Kyla van Heerden (New Zealand), Ted Jamieson (New Zealand), Jacqueline Ruesga (New Zealand), Robert Ondhowe (Nigeria), Katherine Quinlan (North Carolina), Randy Strait (North Carolina), Jonas Goldman (Nova Scotia), Nancy Rondeaux

(Nova Scotia), Andrew Webber (Nova Scotia), Whitney Dorer (Oregon), Rachel Fernandez (Oregon), Nicole Singh (Oregon), Hadika Syeda Jamshaid (Pakistan), Jennie Demjanick (Pennsylvania), Louie Krak (Pennsylvania), Ottmar Edenhofer (Potsdam Institute for Climate Impact Research), Michael Pahle (Potsdam Institute for Climate Impact Research), Jonathan Beaulieu (Québec), Claude Côté (Québec), Julie Côté (Québec), Steve Doucet-Héon (Québec), Nicolas Garceau (Québec), Olivier Lacroix (Québec), Kim Ricard (Québec), Mourad Ziani (Québec), Ministry of the Environment of the Republic of Korea, Jin Li (Shanghai Environment and Energy Exchange), Lishen Li (SinoCarbon), Siyue Liu (SinoCarbon), Simon Fellermeyer (Switzerland), Thomas Kellerhals (Switzerland), Rongphet Bunchuaidee (Thailand), Pathom Chaiyapruksaton(Thailand), Phakamon Suparppunt (Thailand), Noriko Adachi (Tokyo Metropolitan Government), Aoki Tomotaka (Tokyo Metropolitan Government), Abdulkadir Bektaş (Türkiye), Kaan Moralı (Türkiye), Okan Uğurlu (Türkiye), Öykü Uyanık (Türkiye), Pavlo Masiukov (Ukraine), Olga Yukhymchuk (Ukraine), Rufina Acheampong (United Kingdom), Ishtar Ali (United Kingdom), Joe Cooper (United Kingdom), Matthew Davies (United Kingdom), Seamus Gallagher (United Kingdom), Joe Glynn (United Kingdom), Charlie Lewis (United Kingdom), Hannah Lewis (United Kingdom), Jacob Rose (United Kingdom), Greg Smith (United Kingdom), Brian Woods (Vermont), Tang The Cuong (Vietnam), Luong Quang Huy (Vietnam), Mai Kim Lien (Vietnam), Bill Drumheller (Washington), Luke Martland (Washington).

The ICAP Secretariat is grateful to the Federal Ministry for Economic Affairs and Climate Action, Germany, for funding this report. adelphi consult GmbH lends scientific and technical support to the ICAP Secretariat and coordinated the compilation and production of the report.

We wish to thank Katie Kouchakji (KKE Communications) for her careful editing and proofreading of the report, as well as for her communication advice.

A special thanks to Carolin Faulenbach and Janibel Munoz Torres for editorial assistance.

CONTENTS

FOREWORD

ADVANCING EMISSIONS TRADING SYSTEMS: CHALLENGES AND OPPORTUNITIES ON THE PATH TO DEEP DECARBONIZATION

This report marks a double anniversary for the International Carbon Action Partnership. Founded in 2007 in Lisbon, ICAP celebrated its 15th birthday at the end of last year. At the time, 19 government representatives gathered in Portugal to create a space for governments and public authorities to discuss market-based solutions as a response to global climate change. "Strong, immediate, and sustained action is essential to avert severe environmental, health, economic, and security impacts": ICAP's founding members chose these words 15 years ago to alert us to the urgency of action.

And action there was. Over the past decade and a half, ICAP has increased its membership base to 40 member and observer jurisdictions from across the globe. It has become the central discussion forum and knowledge hub for emissions trading for both specialized and broader audiences. It has delivered courses to over 700 participants from more than 60 countries, building capacity on emissions trading as a key policy instrument to tackle climate change globally.

This year, we also celebrate the 10th edition of our annual Status Report on emissions trading worldwide. In ten years, the world of emissions trading has changed drastically. Systems have undergone important structural reforms to ensure they can deliver on increasingly ambitious climate targets. Jurisdictions have legislated tighter caps and founded new cooperation initiatives. Looking back to 2014, the first edition of our report counted only 13 ETSs in force and 15 under consideration. Today, we have reached 28 systems around the world in force, and 21 at different stages of development and consideration, cast across different supra-, national, and subnational geographies and economies.

Some of these markets have now been operating for nearly two decades and have overcome major crises. The world's oldest carbon market, the European Union ETS, survived the 2008 global financial crisis and its economic aftermath. Reforms since then have made it more resilient, and other systems around the world, from California to New Zealand, have implemented similar bolstering measures. These reforms were put to the test during the COVID-19 pandemic at the turn of this decade, but the markets responded as hoped and have weathered this well.

"In ten years, the world of emissions trading has changed drastically. Systems have undergone important structural reforms to ensure they can deliver on increasingly ambitious climate targets."

The past year has marked our entry into another storm with a yet uncertain outcome: the global energy crisis. This crisis is characterized by record high energy prices, fuel shortages, and rising poverty. These effects are not the result of ambitious climate policies such as carbon pricing, as some are quick to claim, but stem from our excessive dependence on fossil fuels. We made great strides to curb our use of fossil fuels in 2022, with the uptake of heat pumps, installation of renewables, and purchases of electric vehicles on the rise around the world. But we need to keep striving to do more, to keep developing reliable and affordable zero-carbon options while protecting vulnerable populations.

An ETS is a powerful instrument that can help bring about these necessary changes. As the signed articles in this report show, the price signal of an ETS provides an important incentive to invest in a green economy and encourages compliance with emission reduction targets. Revenue recycling can subsidize emerging technologies, help accelerate the decarbonization of our industrial, energy, and transportation sectors and support vulnerable communities. Indeed, these are all measures that help protect society from high energy prices.

Emissions trading has a critical role to play, not only in our exit from the current energy crisis but also to help governments achieve their net-zero targets by mid-century. It supports reduction trajectories and sets milestones on the road to carbon neutrality. In 15 years, ICAP has become an essential forum for governments and public authorities to share knowledge and experiences of ETS. As we enter the most decisive years of climate action, we at ICAP promise to continue to pave the way towards a decarbonized world.

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

This year's edition marks the 10th anniversary of the International Carbon Action Partnership (ICAP) Status Report and provides a good opportunity to look back at developments in emissions trading systems (ETSs) over the last decade. Since the first Status Report, the number of ETSs in operation has more than doubled, growing from 13 to the current 28, and so too did the share of global emissions covered by an ETS, which jumped from 8% to 17%, following the increase from below 4 gigatons in 2014 to the current 9 gigatons.

Beyond the bare numbers, it is remarkable to look back and see what themes and developments characterized the first ICAP ETS Status Report in 2014. The report's foreword opened by sorely noting that "despite years of international negotiations, a comprehensive global accord to halt climate change remains elusive". In the report's first signed article, EU policymakers reflected on the ongoing debate around backloading in the EU ETS, a measure aimed at mitigating overallocation in the system due to the global economic downturn that followed the 2008 financial crisis. Other articles focused on the lessons learned from the first few months of operation of the Shenzhen carbon market, China's first pilot ETS, and on the experiences with the investment of auction proceeds in the Regional Greenhouse Gas Initiative (RGGI), which was the only ETS with extensive experience, given that auctioning in other systems was just beginning. The report was eagerly awaiting the operationalization of the ETS linkage between California and Quebec, with the first joint auction scheduled for later that year, and the launch of the Korean ETS in 2015.

Fast forward ten years and the Paris Agreement is in full force and a key driver for global climate action. The EU ETS, along with the other existing ETSs, has fully recovered from the effects of the 2008 financial crisis, weathered a global pandemic, and is proving resilient to an unprecedented global energy crisis. Building on the experience gained with the ETS pilots, China has launched a nation-wide ETS, which is now the world's largest such system. The use of auction revenues has become a key aspect in most mature systems, and it is especially useful in maintaining public support for carbon pricing, mitigating the effects of the energy crisis, and achieving additional co-benefits. The linkage between California and Quebec is now a prime example of successful cross-border linking and the Korean ETS, now in its third phase of operation, is a reference for other jurisdictions in Asia. And these are just some examples.

The last decade has not been smooth sailing. As the global economy slowly lifted itself out of the pandemic, war in Europe has triggered yet another series of tempests that have affected many countries across the world. The starkest of these is the ongoing energy crisis. It has not only laid bare severe energy dependencies but has once again served as a stress test for climate policies like emissions trading.

As governments and companies address these challenges both in the immediate and mid- to longer term, it is important to keep sight of ambitious climate targets and commitments to net zero by

mid-century. At the same time, vulnerable segments of the population must be protected through supportive policies to ensure a socially just green transition. Emissions trading remains pivotal in this context and lies at the core of decarbonization strategies in an increasing number of jurisdictions.

This 10th edition of the ICAP Emissions Trading Worldwide report provides a comprehensive analysis of the latest developments and key trends in the ETS space from the past year. It includes a series of infographics that illustrate important ETS facts and figures, as well as detailed factsheets on all systems currently in force, under development, or under consideration.

The report confirms the growing momentum for the ETS developments, as the number of systems continues to rise. There are now 28 such systems in force, three more than last year, with 20 more systems under development or consideration across the world, particularly in the Latin American and Asia-Pacific regions. For the first time, we see concrete steps towards emissions trading being taken in Africa. The share of global emissions covered by an ETS remains unchanged at 17%, as the increase in coverage thanks to the introduction of new systems was offset by the overall reduction in emissions under ETS caps – as is expected from systems designed to reduce emissions.

Despite the challenging and unprecedented global backdrop, existing systems showcased maturity and proved to be remarkably resilient to significant external shocks. Systems currently in operation have weathered an eventful year without major disruptions. After making significant gains in 2021, prices in most systems started and ended 2022 at around the same levels, despite some fluctuations over the course of the year. The observation that allowance prices did not rise in 2022 is worth noting in the context of the ongoing energy crisis and its impacts on consumers, who have experienced significant rises in the consumer price index as well as its energy component.

Emissions trading confirmed itself to be a valuable source of revenues as 2022 marked another record, with more than USD 63 billion of actioning proceeds collected in a year. As a result of higher allowance prices and an increasing use of auctioning, more than half of the total revenue raised by ETSs since 2008 was collected in 2021 and 2022, with many governments channeling these resources back into further climate action, subsidizing emerging technologies, or supporting lower-income households.

The report also features a collection of deep-dive articles written by policymakers and experts from key jurisdictions around the world, which offer valuable insights into the rapidly evolving ETS landscape.

The Russian invasion of Ukraine in early 2022 made Europe's energy dependence painfully clear, just after the EU committed to becoming climate neutral by 2050 and reduce net emissions by 55% by 2030, compared to 1990. The war has significantly impacted climate policy. In his article, Jos Delbeke of the European University Institute and former Director-General of the European Commission's DG for Climate Action, raises the question: are energy security and decarbonization compatible goals? He lays out the importance of combining Europe's energy security and climate objectives and engaging in strong bilateral and multilateral cooperation. Looking ahead, the EU must leverage its Green Deal, energy policies, and carbon pricing mechanisms to accelerate the transition.

As the energy crisis has taken hold, there are further lessons to be learned as we push ahead with carbon pricing. An article by Ottmar Edenhofer and Michael Pahle of the Potsdam Institute for Climate Impact Research highlights how the EU has successfully upheld its climate ambitions, despite concerns that carbon pricing would directly expose households to increased costs and wane public support for broader climate policy. The authors emphasize the need to integrate all reforms with other policy domains, such as social policy to protect vulnerable communities and energy security to leverage its synergy with climate policy and foster European solidarity.

The EU has moved rapidly to address the urgent climate crisis, committing to reducing net GHG emissions by at least 55% below 1990 levels by 2030. An article by the European Commission details how the bloc's climate and energy policy, including the EU ETS, has been undergoing revisions to support this goal. These reforms include a reduced cap, expansion of the ETS's coverage to maritime transport, and more concerted use of the Innovation Fund and Modernisation Fund to catalyze the deployment of low-carbon technologies and provide support to lower-income Member States. The new EU ETS 2 will incentivize emissions reductions from road transport, buildings, and industry not covered by the existing system. The accompanying Social Climate Fund will channel revenues from emissions trading to provide dedicated support to vulnerable citizens and businesses. In these ways, the EU is committed to advancing the green transition across the entire economy while leaving no one behind.

Next, the United Kingdom reflects on its progress to further develop the UK ETS and engage with stakeholders, particularly amid the ongoing energy crisis. The UK ETS is at the heart of delivering on the UK's net zero target. The article emphasizes the importance of complementary policies and a holistic decarbonization approach to addressing climate change and the challenge of increasing costs. It also highlights the role that carbon leakage mitigation measures and the expansion of the scheme to new sectors could play in providing certainty to the market and decarbonization efforts.

Meanwhile across the Atlantic, Québec's cap-and-trade system, launched in 2013 and linked to California's program since 2014, is going strong after 10 years. Over time, it has proven that it can withstand external shocks. As it looks ahead, Québec is prioritizing a just and

equitable transition towards a green economy. In its article, Québec shows how its collaboration with California has been fruitful, how it has channeled ETS revenues into further climate action, and how the high share of renewables in its electricity grid have shielded it from the worst impacts of the energy crisis.

In its article, Chile shows how carbon pricing policies can be tailored to specific contexts. The country has had a carbon tax in place since 2017. Starting in 2023, entities covered under the tax will be able to comply with their obligations using offsets stemming from sources not regulated by the tax. This new system aims to promote mitigation in other sectors and develop a domestic market for offsets. Looking ahead, under the banner of the framework law on climate change, the Ministry of Energy is looking into establishing a system of GHG emission caps, similar to a baseline-and-credit system for high-emitting sectors, as well as a cap-and-trade system for the power sector. Both instruments would support a cost-effective transition towards carbon neutrality.

The New Zealand Emissions Trading Scheme (NZ ETS) has been the country's primary tool to help reach its climate targets. In its article, New Zealand describes the role of its first Emissions Reduction Plan, which sets the course to net zero by 2050 and highlights emissions pricing as a key instrument. The plan compiles a host of regulations and supporting policies that will help unlock new ideas, businesses, and markets to cost-effectively drive climate action. The article points to the importance of addressing the distributional impacts of the NZ ETS and weaving such considerations into the policy design itself.

YEAR IN REVIEW

Throughout 2022, ETSs across the globe have undergone a series of developments, including policy decisions spurred by rising prices caused by the energy crisis. New systems are also being introduced as jurisdictions work to design and implement ETSs. Below, we summarize major updates from the systems currently in force (i.e., those already in operation) and those under development (i.e., where a mandate for an ETS is in place, and where system rules are currently being developed but not yet in force), as well as other jurisdictions which are considering an ETS.

EUROPE AND CENTRAL ASIA

Austria: Austria's national ETS began operation in October. Originally set to begin in July, the system was suspended for three months as part of the Austrian government's energy price relief plan. By its launch in October, regulated entities had to open a registration account on the dedicated platform. Late registration was possible without penalty until 1 February 2023.

European Union: In December, the EU Parliament and Council reached an agreement on a major reform of the EU ETS, strengthening its ambition in order to achieve the EU's 55% emissions reduction target for 2030. The reform includes a tighter cap for the existing ETS for electricity, industry, and aviation and a phase-in of the maritime sector from 2024 onward. A phase-out of free allocation for some industrial sectors will be accompanied by a phase-in of a carbon border adjustment mechanism from 2026. Moreover, the EU decided to introduce a new EU ETS for buildings, road transport, and process heat in industry in 2027 or, in case of high energy prices, in 2028.

Germany: 2022 marked the second year of operation of the German ETS. According to an evaluation report published in November, the system has been successfully implemented. As of October, 1,700 regulated entities and 500 intermediaries had opened a registry account. The first compliance period covering 2021 concluded in September, with a compliance rate of 98% in terms of surrendered allowances.

Kazakhstan: In July, a new National Allocation Plan for 2022-2025 was approved, establishing a cap of 163.7 $MtCO_2$ for 2023.

Montenegro: The operation of the Montenegro ETS was negatively affected by several changes of government throughout 2022, which caused major delays in the adoption of the annual allocation plan. The government set up a working group mid-year to review the country's climate legislation, including the ETS. This work is still ongoing as of January 2023, with the adoption of the revised "ETS Decree" and "Climate Law" expected by April 2023.

Sakhalin (Russia): In March, a "Federal Law on Conducting an Experiment to Limit GHG Emissions in Selected Federal States of the Russian Federation" was approved in its final reading, introducing mandatory emissions reporting and verification requirements for regulated entities in the Sakhalin region and obliging them to comply with the allocated emissions allowances. The law also sets a legal basis for "allowance circulation". As a mandatory scheme to regulate GHG emissions, the Sakhalin pilot ETS was meant to launch in September but has been delayed pending cap-setting and allowance allocation processes.

Switzerland: A market stability mechanism was introduced in the Swiss ETS. Due to a large number of allowances in circulation, the auction volume was reduced by 50%. A revision of the "CO_2 Act" that covers the period 2025-2030 is in process.

Türkiye: Türkiye held its first Climate Council meeting with participation by public and private institutions and NGOs. The Council's recommendations included the launch of a pilot ETS in 2024 to align the development of a national ETS with the country's 2053 net zero target. These recommendations were reflected in Türkiye's Medium-Term Program for 2023-2025 and, following approval from the president, published in the Official Gazette.

Ukraine: The design process of the Ukrainian ETS has been severely impacted by the Russian war of aggression, making it impossible to finalize the draft instruments for cap-setting and allowance allocation developed during the year. A stakeholder engagement process was nevertheless carried out and finalized in early 2023.

United Kingdom: The UK launched a major consultation on scheme reforms addressing several issues, including how to align the cap trajectory with the country's net zero target and expanding the scheme's sectoral coverage. An initial response with changes to be implemented from 2023 was published in August, while the full response is expected in 2023.

NORTH AMERICA

California: In December, the Board of the California Air Resources Board (CARB) adopted the state's "Final 2022 Scoping Plan", which establishes the strategy to meet California's emissions reduction targets. In light of the additional emissions reductions now expected by 2030, CARB announced it would review all major programs, including the state's Cap-and-Trade system. CARB will report to the state legislature on any potential program changes by the end of 2023.

Canada Federal: All Canadian provinces and territories had to hand in proposals for carbon pricing systems for the 2023-2030 period. These must meet the strengthened federal benchmark criteria of CAD 65 (USD 50) per tonne of CO_2 equivalent in 2023, increasing by CAD 15 per year to CAD 170/tCO_2e in 2030. In November, the Canadian government announced which proposals had been approved and where the federal carbon pollution pricing "backstop" system would apply from 2023.

Massachusetts: As a result of the review of the "310 CMR 7.74" regulation which concluded at the end of 2021, the Massachusetts Department of Environmental Protection started auctioning future vintage allowances in June and September. In each of the auctions, MassDEP offered almost 400,000 2023 vintage allowances, equivalent to 5% of the 2023 cap.

New York State: In January 2023, New York's Climate Action Council issued a "Final 2022 Scoping Plan" that proposes a range of policies and actions to meet the State's carbon neutrality goal in 2050 – including an economy-wide cap-and-invest program. When adopted, the program will cover all emitting sectors under an enforceable and declining cap, with the caps for 2030 and 2050 corresponding to state-wide emission limits. The Governor has directed the Department of Environmental Conservation and the New York State Energy Research and Development Authority to develop ETS regulations before January 2024.

North Carolina: In an Environmental Management Commission Air Quality Committee meeting in July, North Carolina's Department of Environmental Quality provided information on how a proposed regulation to become a participating state in RGGI deviates from the existing RGGI Model Rule. Among others, the North Carolina regulation would cover industrial units, regardless of grid connectivity, and emissions from biomass/biofuel. Consideration of the RGGI rule by North Carolina's Environmental Management Commission has been delayed to 2023.

Nova Scotia: In 2023, the province's cap-and-trade system is being replaced by an output-based pricing system (OBPS), approved by the federal government in November. The cap-and-trade system will be phased out after the 2022 compliance deadline in December 2023, with two more auctions scheduled during the year to allow entities to purchase allowances for their verified 2022 emissions.

Oregon: In March, Oregon's Department of Environmental Quality (DEQ) distributed allowances to the 18 covered fuel suppliers currently subject to the emissions cap under the Climate Protection Program. The distribution of allowances was based on the program rules for the first compliance period, which began in 2022 and includes calendar years 2023 and 2024. In September, DEQ launched a voluntary trading platform and the forms needed for trading between transferring and acquiring covered fuel suppliers.

Pennsylvania: In April, the final regulation to establish an ETS in Pennsylvania and to participate in RGGI was published. The regulation is currently being challenged by several lawsuits. Until legal proceedings are concluded, the Pennsylvania Department of Environmental Protection will not take steps to implement or enforce the RGGI regulation.

Québec: In September, Québec adopted a new approach for free allocation, which will apply from 2024. Without reform, freely allocated allowances were forecast to represent an increasing share of the total cap, as industrial output grew. It is expected that the new approach will see a reduction of free allocation of 2.9 million allowances between 2024-2030.

Regional Greenhouse Gas Initiative: RGGI states are currently conducting the Third Program Review. As per the timeline for the program review released in November, an updated draft Model Rule would be released in fall 2023, with the program review concluding in December 2023.

Washington: Following a year of intensive preparations, Washington state's new cap-and-invest program started operating in January 2023. The system's design closely resembles that of California's program. Washington began a public process to explore the possibility of linking to other cap-and-trade systems.

LATIN AMERICA AND THE CARIBBEAN

Chile: The government published its 2022-2026 Energy Agenda in August. It states that a pilot ETS project for the energy sector will be developed to evaluate the role of this instrument in achieving emissions reductions and a just transition in a cost-effective manner.

Colombia: The "Climate Action Law" (Ley de Acción Climática), which came into force in December 2021, sets a goal to fully implement an ETS by 2030. This law also appoints an independent group of experts to generate recommendations to promote and develop carbon markets in Colombia. These recommendations are to be considered by the environment and finance ministries.

Mexico: The operational phase of the Mexican ETS began in January 2022. The Ministry of Environment and Natural Resources is expected to publish regulations for the operational phase of the ETS in the first half of 2023.

AFRICA

Nigeria: In August, the Nigerian Minister of the Environment announced that the country has started activities towards establishing a national ETS. The National Council for Climate Change, established in November 2021, is responsible for developing the system. Key design elements such as the timeline and sectoral scope remain to be decided. The proposal will go through stakeholder engagement before decisions are made on features such as the allocation framework.

ASIA-PACIFIC

China: With the experience from the first compliance period, the Ministry of Ecology and Environment updated MRV guidelines in March, with the aim of improving data quality. In November, the Ministry released draft allocation plans for 2021 and 2022 for public consultation, significantly tightening benchmark values for coal-fired power plants.

Chinese Pilots: All Chinese regional pilots continued trading and compliance. Besides regular activities, Beijing, Chongqing, Guangdong, Shanghai, Shenzhen, and Tianjin released or updated their Tan Pu Hui offsets framework to incentivize individual or small-scale GHG reduction projects. Credits generated from these projects will be used for compliance purposes in these pilots.

India: The Indian government took steps towards the establishment of a national carbon market. A draft blueprint by the Bureau of Energy Efficiency proposes a phased introduction involving two mechanisms: a voluntary market supported by a domestic project-based offset scheme and a compliance market with mandatory participation for regulated entities. The voluntary market is expected to enter into force by July 2023, followed by the compliance market.

Indonesia: In October, the Ministry of Environment and Forestry released implementing regulations for the upcoming national ETS, with details on offsets, sectoral roadmaps, MRV procedures, and institutional arrangements. Sectoral regulations are currently under development. In January 2023, the Ministry of Energy and Mineral Resources announced that the mandatory, intensity-based ETS for the power sector, initially set to begin in 2022, would launch in February and cover 99 coal-fired power plants.

Japan: In February, the government announced the upcoming Green Transformation (GX) League, a baseline-and-credit system for companies expected to become fully operational in April 2023. This will build upon existing carbon trading systems such as the JCM and J-Credit scheme. Although participation in the GX League is voluntary, compliance is mandatory once formally a participant. The government is currently working on the rules for the GX League, which will become fully operational in April 2023. In February 2023, the Cabinet passed the basic GX plan, a 10-year roadmap which includes initial arrangements for a mandatory national ETS from 2026.

Malaysia: The Ministry of Natural Resources, Environment, and Climate Change will conduct a study under the 12th Malaysia Plan to develop a policy and design framework for the domestic ETS. The study is looking into ETS market design frameworks, registration, and alignment with international standards and is expected to commence in 2023.

New Zealand: After the major reforms of previous years, the New Zealand government continued to make incremental improvements to the operation of the NZ ETS. Changes coming into effect for the forestry sector in 2023 include a shift to averaging accounting and a new "permanent forest" category. Decisions were also taken to tighten the eligibility and accounting rules for industrial allocation. Consultations continue on an improved market governance framework, as well as a carbon pricing mechanism for biological emissions from agriculture.

Republic of Korea: In November, the government announced several near-term changes to the K-ETS. These include: increasing incentives to reduce emissions and facilitate low-carbon investment by issuing more free allowances to the most efficient covered entities; encouraging trading and mitigating price volatility by opening up the ETS to more financial firms and increasing the allowance holding limit; facilitating the conversion of international offset credits to Korean Credit Units; strengthening MRV; and increasing support for small businesses and new entrants.

Thailand: The Thailand Voluntary ETS (T-VETS) pilot project was extended to the Eastern Economic Corridor area, a key industrial region of Thailand. Early in the year, the government also published rules and guidelines for carbon credit trading, which were followed in September by the launch of the carbon credit trading platform FTIX.

Vietnam: In July, Vietnam issued a Decision by which the country commits to achieving net zero GHG emissions by 2050, with a mid-term target of 43.5% below BAU levels by 2030. This decision follows "Decree 06/2022/ND-CP", which outlines a roadmap for the implementation of an ETS with a declining cap corresponding to Vietnam's NDC. The pilot ETS is expected to start in 2026 and become fully operational by 2028.

01

PRACTITIONER INSIGHTS

EUROPEAN UNIVERSITY INSTITUTE

THE IMPACT OF THE WAR IN UKRAINE ON EUROPE'S CLIMATE AND ENERGY POLICY

Jos Delbeke
European Investment Bank Chair on Climate Policy and International Carbon European University Institute and former Director-General of the European Commission's DG for Climate Action

The invasion of Ukraine by Russia made Europe's energy dependence painfully clear soon after the EU committed itself to become climate neutral by 2050 and reduce its net emissions by 55% by 2030 compared to 1990. The war changed the policy context for reaching these climate goals significantly and the question arises whether energy security and decarbonization are compatible goals. The following elements stand out.

Using all available non-Russian energy resources in the short-term

The short-term outlook for energy markets looks difficult. Prices for coal, oil, and in particular natural gas, have risen significantly, with knock-on consequences for the price of electricity. Emergency policies were developed to deal with the social and economic impact on households and businesses, but the more important issue was to mobilize all available energy resources to substitute for Russian supplies. Scarcity of energy suddenly made it more expensive in Europe.

Measures taken to replace supply have been diverse, ranging from suspending the phase-out of old nuclear power stations, to the ramping up of LNG purchases from a wide range of supplier countries, and the use of more coal and lignite in older power stations. The decades-long decline in EU's greenhouse gas emissions, primarily through the switching of power generation from coal to gas and the expansion of renewables, was reversed. However, this should be temporary, and, in the meantime, it is important to avoid new fossil-fuel-related investments whose climate-compatibility are questionable in the medium-term, and unacceptable in the longer-term.

Double-down on energy efficiency improvements and investments in renewables

Policies developed under the European Green Deal, not least those on renewable energy and energy efficiency, were intended to make the European economy more resilient and less dependent on imported energy. The Ukraine crisis has only emphasized the urgency of these objectives, and efforts are being reinforced. Moreover, energy consumers have reacted to the increase in energy prices. Many households have made deliberate efforts to save on their energy use, insulate their homes, install heat pumps, or fit solar panels onto their rooftops sooner than they otherwise would have done.

Instead of the many untargeted social measures to generally shield consumers, government support should be focused on supporting poorer households that cannot afford higher energy costs, let alone make such investments. For these efforts to be most effective, governments must simplify overly lengthy and complicated permitting procedures, support the electrification of heating, transport, and industry, and intensify investments in grid infrastructure, storage, and digitalization. While the challenges are acute, price support measures must be temporary and not undermine long-term price signals towards decarbonization and saving energy.

Resisting direct price interventions in energy and carbon markets

Some are proposing major changes to the current energy market regulation. They are criticizing the design of European wholesale electricity markets whereby the marginal plant determines the price of electricity at any given moment in time. Suggestions have also been made to impose energy price caps at the European level. However, care must be taken to avoid unwanted side effects, such as making the short-term supply problems even worse by undermining investment incentives or by diverting energy resources away from Europe.

Equally, discretionary price interventions on Europe's carbon market must be resisted. The Market Stability Reserve functioned well and supported a relatively stable price in the range of EUR 60-90 (USD 63-95) per tonne of CO_2. Maintaining this price level represents a strong long-term incentive to bring forward low carbon innovation and to support the emergence of new technologies, such as 'green' hydrogen. Such innovations are essential for delivering climate neutrality. This price level also generates significant auctioning revenues that should be consistently used to encourage the deployment of low-carbon investments. Equally, the Innovation and Modernisation Funds have become important sources of finance to accelerate the climate transition and at the same time to improve Europe's long-term energy security.

Policies should support – and not thwart – the functioning of markets as energy and carbon prices guide consumers towards using less and choosing more climate-friendly energy.

"Policies should support – and not thwart – the functioning of markets as energy and carbon prices guide consumers towards using less and choosing more climate-friendly energy."

Supporting industry to invest in low carbon technology

The European Green Deal supports the development of new climate-neutral technologies such as 'green' steel, cement, chemicals, non-ferrous products, or hydrogen. This is an opportunity to reduce the EU's reliance on fossil fuels, provided renewable energy deployment receives a huge boost. Across industries, the first pilot installations are already being put in operation, but a massive scaling up of these industrial technologies will be key. Infrastructure investments for the transport of renewable electricity and hydrogen, or for storage of captured carbon, should facilitate this scaling up.

The EU is unlikely to be fully autonomous in energy and materials, because the supply chains of renewable and nuclear energy resources, as well as green hydrogen and associated products, will inevitably also involve non-EU countries. A new geopolitical strategy is urgently needed to diversify essential imports, whether of green hydrogen from places where it can be produced cost-effectively, or the rare earths and precious metals needed for an electrified economy.

Conclusion

The EU has lots of opportunities to combine its energy security and climate objectives. A short-term temporary deviation from purely climate considerations must be accepted as necessary in the current circumstances. Fortunately, in the medium- and longer-term, the EU's Green Deal, together with energy and carbon pricing policies, will accelerate the energy transition and enhance security. In addition, the EU must engage in strong bilateral and multilateral cooperation on energy, industry, trade, and climate, while reducing its dependence on any one country for its essential imports. If the EU has not learnt that lesson now, it never will.

POTSDAM INSTITUTE FOR CLIMATE IMPACT RESEARCH

LESSONS FROM THE ENERGY CRISIS FOR THE WAY FORWARD FOR CARBON PRICING

Ottmar Edenhofer & Michael Pahle
Director and Chief Economist & Working Group Leader
Potsdam Institute for Climate Impact Research

Despite being hit by an energy crisis, the EU has lived up to its aspired climate leadership and adopted an ambitious reform of its ETS last December.

In summer 2021 the EU Commission proposed to tighten the cap of the existing EU ETS for energy and industry and to establish a second ETS (ETS 2) for the building and transport sector from 2027. The ETS 2 proposal drew particularly heavy pushback since it would 'directly' expose households to carbon pricing, bearing the risk that public support for EU climate policy would wane. Opposition only grew stronger as energy prices surged in the fall of 2021, which turned into a full-scale energy crisis when Russia invaded Ukraine in February 2022. Natural gas prices climbed even further and became highly volatile, peaking at twentyfold the pre-crisis level in August.

Given the circumstances, many observers thought it likely that any policy reform to make fossil energy even more expensive would fail. But their concerns proved wrong. On 18 December 2022, the three main executive EU institutions agreed on the reform, which the EU Parliament's lead negotiator dubbed 'the EU's biggest climate law ever'. Many factors helped in getting to an agreement, among them the realization that climate policy and energy security can be highly synergetic and the great dedication of the lead negotiators as well as the Czech EU Presidency.

But major concessions that may eventually impair future stringency had to be made, which reflects the fact that the parties negotiated the agreement amidst an energy crisis. The first concessions were provisions to keep the allowance price low in the ETS 2 in the first years of operation, including an "emergency brake" to delay implementation if oil and natural gas prices are too high. Moreover, while a new Social Climate Fund (SCF) will address the distributional impacts of the new ETS 2, its implementation principles are rudimentary and arguably leave too much leeway for broad income support. Both issues raise concerns that the ETS 2 might either be too soft to deliver the 2030 climate targets or that in the event of high demand for allowances and steeply rising prices, political support for the system may "crack" politically. To deal with these concerns, it is instrumental to increase the ETS's political robustness, and thereby "proof it" against future shocks and crises.

A promising way forward in that regard is dedicated integration with other policy domains. The first domain where such integration is needed is social policy. The SCF aims to ensure that funds from auction revenues are used to (1) compensate vulnerable households, and (2) fund green investments. While funds to be used for (1) are capped, this nevertheless leaves an important trade-off unsolved: what share of auction revenues should be used for which purpose? A largely unacknowledged consideration here is that targeting investment support to the needs of vulnerable groups would reduce the need for compensation in the long run.

Furthermore, the right balance between the two funding purposes has become even more important since the pandemic and the energy crisis have cut deeply into government budgets and now even threaten the financial stability of the Eurozone. A major reason for the budget stress is that compensation and support measures have rarely been targeted at groups that are really in need. The energy crisis laid bare this structural shortcoming. It is thus clear that establishing suitable mechanisms for targeted compensation is essential, because the SCF needs to build on them. Designing targeted measures in turn requires the consideration of existing social policy and its norms, notably the use of proper indicators for energy poverty and vulnerability. It also requires the creation of mechanisms for direct financial compensation, which so far do not exist in many EU member states. Both are crucial to enable targeted compensation and thus ensure social fairness at the lowest cost.

"A major reason for the budget stress is that compensation and support measures have rarely been targeted at groups that are really in need."

A second domain where integration is promising is energy security. As mentioned, the energy crisis has clearly shown that climate policy can be highly synergetic with energy security, at least in Europe. Ambitious climate policy reduces the dependency on (mostly imported) fossil fuels by replacing them with (mostly domestic) renewable energy sources. However, during the transitional period in which European countries will still need fossil fuel imports, policy is needed that ensures (a) imports are sufficiently diverse, and (b) exporting countries are politically stable and reliable trade partners. Here carbon pricing could play a role, especially if implemented as an upstream system. The carbon price could be adjusted to reflect energy security considerations through, e.g., a country and fuel-specific markup: the higher the share of imports from a particular country and the less stable its political system, the higher the markup would be. It is clear that many legal, political, and economic challenges would need to be overcome, e.g., how to account for indirect imports through third-party countries. But it is a very transparent approach, which could foster European solidarity and is a better common policy for energy security than the currently-planned joint purchases of natural gas by member states.

In summary, the energy crisis in Europe has acted as a stress test for carbon pricing. It has shown what can happen if energy prices rise to (very) high levels, as will foreseeably be the case when climate policy becomes more ambitious. The main lesson to be learned is that making carbon pricing more politically robust against higher prices, and also unanticipated shocks, is essential for the way forward. To that end, dedicated integration with other policy realms, such as social development and energy security, has considerable potential to achieve an equitable low-carbon transition at lowest cost. It is now on policymakers to follow up on this lesson in the spirit of Churchill's 'never let a crisis go to waste'.

EUROPEAN COMMISSION

LEVERAGING EMISSIONS TRADING IN THE EU TO FACILITATE A GREEN AND SOCIALLY JUST TRANSITION

Beatriz Yordi
Director of European and International Carbon Markets, Directorate-General for Climate Action, European Commission

Whilst the world has faced severe crises in recent years, the climate crisis has not become any less urgent, and the European Union's (EU) commitment to climate action through the European Green Deal persists. In the "European Climate Law", the EU has legally committed to becoming climate neutral by 2050, with a first milestone of reducing net greenhouse gas emissions to at least 55% below 1990 levels by 2030. To this end, the EU has been revising its climate and energy policy framework since 2021, including the EU Emissions Trading System (EU ETS).

The revision coincided with the unprecedented energy crisis brought by Russia's invasion of Ukraine. Just as with the economic recovery from the COVID-19 pandemic, the European Commission and Member States are orienting the EU's response to the energy crisis around the green transition. The "REPowerEU Plan", adopted in May 2022, pursues measures to address high energy prices and rapidly reduce the EU's dependence on Russian gas. It also makes a case for accelerating the clean energy transition, building on the European Green Deal's ambition and objectives to tackle the climate crisis and foster energy security, resilience, and cost-efficiency.

The EU ETS is a key pillar of the implementation of the European Green Deal. It regulates emissions from electricity and heat generation, industry, and aviation, representing around 40% of the EU's total emissions. The system provides an economic incentive for reducing emissions whilst raising revenues for Member States to invest in the green transition. Since its launch, the EU ETS has helped drive down emissions from energy and industry installations by 34.6% by 2021. In parallel, the system has raised over EUR 100 billion (USD 105 billion) in auction revenues.

An important political agreement

In December 2022, the European Parliament and the Council of the EU reached a political agreement to revise the EU ETS to contribute to the more ambitious 2030 climate target. Emissions under the EU ETS will now be reduced by 62% by 2030, compared with 2005 levels. The sharper reductions take effect already from next year (2024), delivering a substantially greater cumulative reduction over the next seven years.

It is essential that action on climate change is taken economy wide. The agreement contributes to this by extending the EU ETS to the bloc's fair share of emissions from maritime transport. The system's application to aviation is also strengthened, with a transition to full auctioning from 2026. In addition, a review in 2027 will consider whether the EU ETS should require a stronger contribution from international aviation to climate action.

In parallel, a new system (ETS 2) is being created to incentivize emission reductions from road transport, buildings, and industry not covered by the existing market-based system. It will regulate emissions upstream, meaning the compliance obligation will fall on fuel companies rather than end consumers. The new system should apply from 2027,[1] complementing Member States' efforts to reduce emissions under national targets.

Considering the increased ambition and expanded application of emissions trading, the agreement mobilizes the necessary enabling framework for the green transition. It commits more resources to funding energy transformation and industrial innovation, as well as helping vulnerable groups and microenterprises to invest in decarbonization. These resources include Member States' auction revenues and dedicated funds: the EU ETS's Innovation and Modernisation Funds and the new Social Climate Fund will all have an important role in facilitating a green and socially just transition.

"It is essential that action on climate change is taken economy wide."

Innovation Fund

The ETS Innovation Fund finances the commercial demonstration and deployment of innovative low-carbon technologies and industrial solutions to decarbonize Europe's energy-intensive industries, as well as energy storage and carbon capture, use, and storage. With a currently-estimated budget of over EUR 34 billion[2] (USD 35.7 billion), it is one of the largest grant-funding programmes in the world, and it is funded entirely by the EU ETS.

Since 2020, the fund has awarded over EUR 3.1 billion (USD 3.3 billion) to some 70 projects in a wide variety of sectors including chemicals, steel, cement refineries, green hydrogen production, and renewables. The latest call for large-scale projects under the Innovation Fund was launched in November 2022, with a budget of EUR 3 billion (USD 3.1 billion). It focuses on the "REPowerEU Plan" priorities, specifically hydrogen and electrification, clean-tech manufacturing, and mid-size pilots.

1 Possibly postponed to 2028 in the event of exceptionally high energy prices.
2 Assuming a carbon price of EUR 75/tonne CO_2e.

With the agreed revision of the EU ETS, the Innovation Fund is being strengthened and adapted to the system's increased ambition. The fund's total size is estimated to be increasing by at least 18%[3] and dedicated topics are being introduced in calls for proposals, including for the maritime sector. The Innovation Fund will also operationalize competitive bidding through carbon contracts for difference.

Modernisation Fund

Alongside support for innovation-driven transformation of the EU ETS sectors, the system also addresses Member States' different starting points in the green transition challenge. The ETS Modernisation Fund is one of its solidarity mechanisms to help lower-income Member States[4] decarbonize and develop their energy systems. Currently, at least 70% of the budget, projected to be EUR 48.2 billion (USD 50.7 billion) in 2030,[5] must be dedicated to priority projects that advance the beneficiary countries' transition to climate neutrality.

Since 2021, around EUR 5 billion (USD 5.3 billion) has already been made available for investments in energy efficiency improvements, renewables, energy storage, and the modernization of power grids in the beneficiary countries. The agreed revision of the EU ETS increases the size of the Modernisation Fund (by 2.5% of the allowances under the cap) and expands its support to Greece, Portugal, and Slovenia. Furthermore, an even bigger share of the fund is committed to priority investments (up to 90%) and the limitations on funding fossil fuel projects are strengthened.

Social Climate Fund and auction proceeds

The European Parliament and Council of the EU have also agreed to create a Social Climate Fund alongside the new ETS 2. It will provide dedicated support to Member States to help vulnerable citizens and microenterprises undertake green investments in energy efficiency, decarbonization, and sustainable transport, such as home insulation, heat pumps, solar panels, and electric mobility.

The Social Climate Fund will start operating before the ETS 2 launches. In the period 2026-2032, it will mobilize an estimated EUR 86.7 billion (USD 91.3 billion) across the EU, financed from auction revenues together with 25% of national contributions. Alongside the funding for green investments, Member States will also have the option of spending up to 37.5% of the fund's resources on direct income support for vulnerable households and transport users.

Finally, to complement the substantial spending on climate that should take place from the EU budget, Member States agreed to spend the entirety of their emission trading revenues from the EU ETS and ETS 2 (or an equivalent amount) on climate- and energy-related projects and to address the social impacts of the transition. Member States already report that they use, on average, 75% of their revenues this way. This new commitment will ensure that the polluter pays principle is fully leveraged to bridge the green transition investment gap and benefit EU citizens.

On the way to becoming climate neutral by 2050, the EU must advance the green transition across the entire economy in a timely and consistent manner. To this end, a potent enabling framework is necessary – to advance systemic change and drive innovation yet leave no one behind. The strengthened and expanded role of emissions trading in the EU will be key to incentivising and enabling the transition.

The agreement is now in the process of being formally adopted by the Parliament and the Council.

3 Increase in the share of allowances, with a potential further increase dependent on the free allocation conditionality.
4 Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Slovakia.
5 Assuming a carbon price of EUR 75/tonne CO_2e.

UNITED KINGDOM

TAKING STOCK OF THE UK ETS AFTER TWO YEARS OF OPERATION

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

How the UK ETS is responding to the energy crisis

The UK ETS was established in 2021, following the UK's departure from the EU. Despite a long history of emissions trading in the UK, this is still very much a new market and it has had to contend with a unique set of challenges during its early years. In 2022, as with many other jurisdictions, we had to balance running an ETS in the context of high energy prices with making progress to develop our scheme. This was also a year that saw historic heatwaves – a reminder that the effects of climate change are already being felt around the world. In this article, we reflect on our work to develop the scheme, the context of the energy crisis and the UK's response to it, and the challenges and opportunities that lie ahead for carbon pricing.

Developing the UK ETS

The UK ETS is at the heart of delivering on the UK's ambitious net zero target - focusing on our ambitions for the UK ETS will ensure the scheme contributes to driving the necessary pace and scale of decarbonization and supports the increased uptake of low carbon energy. At the same time, we are acutely aware that carbon pricing adds to the costs faced by businesses, and that a holistic approach to supporting decarbonization is required.

The framework of the UK ETS offers businesses both the certainty needed on overall emissions reductions and the flexibility needed to choose how to react. In line with commitments in the government's Net Zero Strategy and in response to asks from industry for clarity over the future of the scheme, in 2022 the UK ETS Authority[1] ran a public consultation on how to align the scheme's cap with a net zero consistent trajectory. This will send a clear long-term signal to businesses and will provide much-needed certainty. It will give businesses the confidence to invest for 2050 and beyond in the transition to cheap, clean homegrown energy that is ending the reliance on fossil fuels and reducing exposure to volatile oil and gas prices on global markets. Innovation incentivized by the UK ETS can also make participants more productive in the long run, thereby reducing their long-term costs.

The consultation not only covered the cap alignment, but also addressed a host of related changes and started the process of expanding the scheme to new sectors. We spoke to or received submissions from over 350 organizations to ensure we develop the scheme in a way that works for participants and the climate. Based on the feedback, this year we will confirm the details of the new cap trajectory and other design changes. The adjusted cap and associated changes to the industry cap, which sets a ceiling on free allocation levels, will be implemented in 2024. We have guaranteed current levels of free allocation until 2026 to give confidence over carbon leakage support.

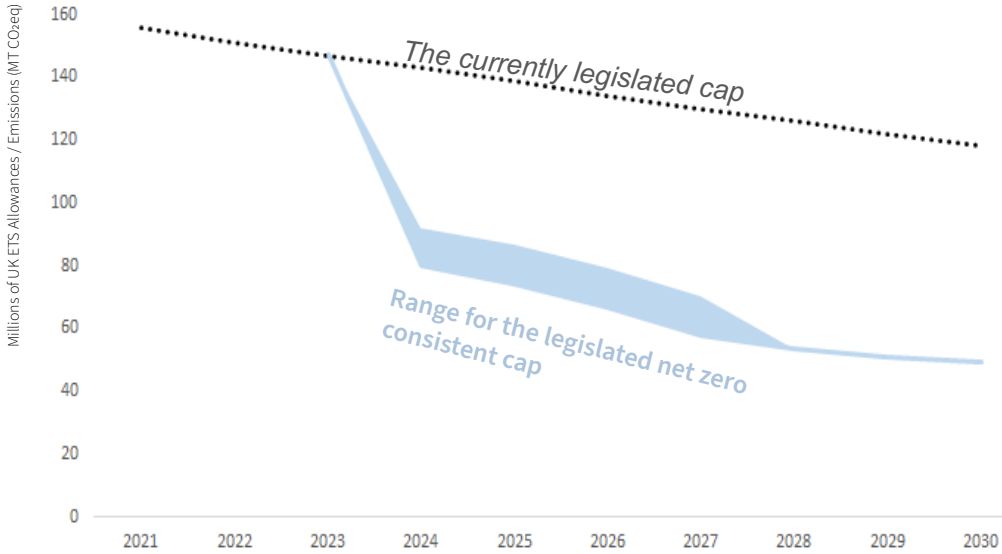


Figure 1: A net zero consistent cap

The currently legislated cap, which is not consistent with delivering net zero, will remain in place until end 2023. The illustrative trajectory for the net zero consistent cap, represented as a range, is shaded in blue.

Support for businesses and households

We realize that this year business costs have risen across the board. Abatement options have become more expensive. Increases in scheme ambition have also driven ETS allowance prices higher in recent years. Reflecting the costs required to meet our targets, we recognize the importance of supporting firms across the UK with the costs of the transition to net zero. This is particularly true in the current energy crisis, affecting households and businesses in the UK and across the globe.

1 Made up of the UK Government, Welsh Government, Scottish Government and Northern Ireland's Department for Agriculture, Environment and Rural Affairs.

To deal with the immediate issue of energy costs, the UK government has implemented policies to support UK households, notably through the Energy Bills Support Scheme (EBSS) and the Energy Price Guarantee. The EBSS is a GBP 400 (USD 494) non-repayable government discount on electricity bills, granted to most households in Great Britain for the 2022-2023 winter. The Energy Price Guarantee protects customers from increases in energy costs by limiting the price suppliers can charge per unit of energy used. All households with a domestic electricity and/or gas contract with a licensed supplier are eligible to receive support, which is applied automatically. This winter, the Energy Price Guarantee is saving a typical household around GBP 900 (USD 1,111).

"The energy crisis is a challenge for households, businesses, and governments alike, but it only increases the importance of decisive climate action."

The government is also targeting relief at businesses via the Energy Bill Relief Scheme (EBRS), which provides a discount on wholesale gas and electricity prices. All businesses, voluntary sector, and public organizations whose energy is delivered via the gas or electricity grid are eligible for support, with the discounted wholesale rates automatically applied to energy bills.

More directly related to carbon pricing, we announced in April that the long-running Energy Intensive Industries Compensation Scheme, which provides relief from ETS costs on businesses' electricity use, will be extended for a further three years and the level of aid doubled. We will also consider strengthening the Energy-Intensive Industries Exemption Scheme, which relieves industries from other policy-related costs, such as renewable energy obligations and feed-in tariffs. These support schemes are provided in recognition of the fact that UK industrial electricity prices are higher than those of other countries.

These support measures demonstrate how ETS revenues and wider government income can be reinvested to support people through the energy crisis. Equally, we are investing in a more efficient and lower-carbon future to meet our climate goals and reduce our exposure to such shocks.

Across the economy, the UK Government has committed GPB 30 billion (USD 37 billion) of domestic investment for the green industrial revolution, which will leverage up to GPB 90 billion (USD 111 billion) of private investment by 2030. We will continue to review whether these funds are sufficient to support the transition to net zero, and to ensure an equitable balance of contributions from the private and public sectors.

The future of the UK ETS

Alongside this support, robust and fair carbon pricing will be a key incentive for businesses. The changes to the cap will send a clear overall signal, and we will begin expanding the UK ETS to new sectors, such as waste and maritime transport, to bring that incentive to bear on more of the economy.

At the same time, we will continue to review how we distribute free allocations and consult further in 2023 to make sure we target support at sectors most at risk of carbon leakage. This will also provide an opportunity to consider the availability of decarbonization technologies, to ensure that geographies with access to fewer abatement options are not treated unfairly in the transition to net zero. We will consider further changes to free allocation in the context of wider policy development, including other carbon leakage mitigation measures, which we will consult on in spring 2023. Decarbonization does not mean deindustrialization: we are determined that our industry will receive appropriate protection from competitors in areas with less stringent climate policies.

Furthermore, Chris Skidmore's government-wide "Mission Zero" review provides convincing arguments that the transition to a net-zero economy is the growth opportunity of the 21st century. This outlines how the UK is well-placed to benefit from the increasing demand for net-zero goods and services if we make the right public and private investments, and that Government has an important role in facilitating this investment by providing clarity, certainty, consistency, and continuity of policy.

The energy crisis is a challenge for households, businesses, and governments alike, but it only increases the importance of decisive climate action. Equally, the sense of urgency and public pressure to act has risen, as climate change has made extreme weather events more frequent. We need to act everywhere, and emissions trading can be a vital part of the solution if we use it carefully and continue to make changes collaboratively.

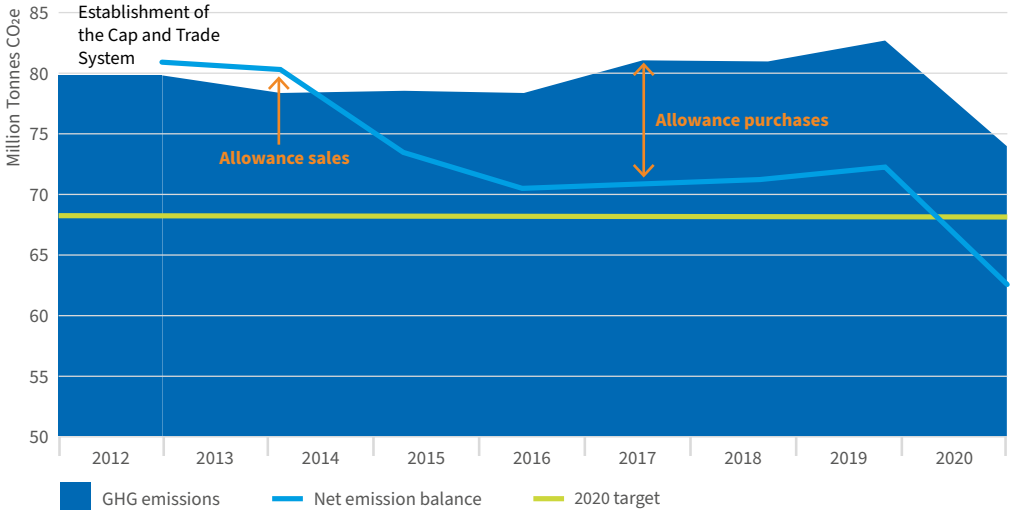
QUÉBEC

QUÉBEC'S CAP-AND-TRADE SYSTEM: STILL GOING STRONG AFTER 10 YEARS!

Claude Côté
Climate Change Advisor, Ministère de l'Environnement et de la Lutte contre les changements climatiques du Québec

Québec's cap-and-trade system, launched in 2013 and linked to California's program since 2014, is still going strong, mainly because it was designed to withstand external shocks, such as the one induced by the recent pandemic and its aftermaths. For 2024-2030, new rules for free allocation that are consistent with Québec's climate objectives, and that will accelerate emitters' investments in their climate transition, were introduced. Québec strongly believes that a just and equitable transition towards a green economy is a key part of responses to crises like the one we are facing.

Recently, Québec released its 2020 Mitigation Goal Achievement Report. Greenhouse gas emissions in Québec were 13.2% below 1990 levels in 2020,[1] in good part because of the COVID effect. For 2020, Québec was a net buyer of 11.4 Mt CO_2e on the Québec-California carbon market, which brought its net reductions to 26.6%.[2] Québec's ETS did its job and allowed us to exceed our mitigation goal of 20% below 1990 levels. These results also show that our fruitful collaboration with California is working as planned.



When the economy slowed considerably, with a 5.3% GDP drop in 2020, the ETS held steady thanks to its featured minimum price for allowances which stopped unneeded allowances from being sold into the market and prevented the price from crashing. Two auctions in 2020 were undersubscribed due to the significant decrease in production and transportation during the pandemic. Unsold allowances were then removed from the market and are now gradually being put back as demand recovers. The demand for allowances has been strong since the economy started to recover, pushing up prices and reaching a historical price peak of CAD 39.59 (USD 30.95) at the May 2022 auction.

Since its inception, all the revenues from the cap-and-trade system, close to CAD 7 billion (above USD 5.1 billion), have been dedicated to the climate fight in Québec. The government has chosen to transfer all that money into the Québec's Electrification and Climate Change Fund (FECC), which finances the measures outlined in the "2030 Plan for a Green Economy (PGE)". Each year, the government announces new and updated measures under the PGE to help electrify our transport and buildings, encourage low-carbon strategies and innovation, increase energy efficiency, and help society and the economy adapt to the impacts of climate change.

While Québec is resolutely working to make the necessary transition towards a green economy, it also acknowledges that the transition needs to be a just and equitable one. Even though revenues from the cap-and-trade system are not specifically allocated to that end, Québec is counting on broader budgetary measures and its wide social safety net, one of the most generous in North America, to help workers resettle and acquire new skills if their livelihoods are threatened by the transition. In addition, the PGE provides CAD 23.8 million (USD 32.8 million) to track the labour market's needs and anticipate the required professional, technical, and academic skills necessary to make the transition successful. To help Québec residents, particularly the middle class and elderly, cope with high inflation, the government has also announced CAD 14 billion (USD 19.3 billion) in new spending in 2022. Overall, though, Québec believes that economic growth spurred by new technologies that help decarbonize the economy will far outweigh the negative impacts of job displacements, especially since Québec is currently experiencing an acute labour shortage.

1 Inventaire québécois des émissions de gaz à effet de serre (gouv.qc.ca)

2 Rapport sur l'atteinte de la cible de réduction des émissions de gaz à effet de serre du Québec pour l'année 2020 (gouv.qc.ca)

Québec was lucky enough to have been only marginally affected by the energy crisis that is still rocking European economies because it enjoys an enviable position when it comes to energy[3]. Indeed, 99.9% of Québec's electricity comes from renewable, non-GHG-emitting sources, mainly hydro and wind power, and excess power is often exported to our neighbours. An overwhelming majority of Québec households and businesses heat their homes and buildings with clean electricity and enjoy one of the lowest prices in North America. The cap-and-trade system only covers a small fraction of the electricity consumed in Québec, mainly that which may be imported from the United States in moments of peak demand.

Even with such a high level of clean electricity, in all, 50% of Québec's overall energy consumption comes from renewables. The main impacts from increased energy prices were therefore felt in the transportation sector, which accounted for over 36% of Québec's GHG emissions in 2019 and is the largest emitting sector in Québec.

In 2022, the government announced new rules on free allocation for eligible industrial emitters for the 2024-2030 period. These rules provide for a mechanism to consign a portion of the allowances resulting from the reduction in the level of free allocation. The revenues from auctioning of these allowances will be set aside on behalf of each emitter to finance projects related to the climate transition. Businesses will need to use those funds to reduce GHG emissions, directly or through research and development projects. This innovative approach will incentivize them to increase their productivity and will serve as a lever for them to invest in reducing their GHG footprint.

Québec sees the global energy crisis as an opportunity to urgently accelerate investments in the transition towards a low-carbon economy, especially if we are to collectively limit global rising temperatures to 1.5°C and fulfil the promises of the Paris Agreement.

3 At COP 25 in Madrid in 2021, Québec became a core member of the Beyond Oil and Gas Alliance after pledging to end oil and gas exploration and exploitation on its territory.

CHILE

THE NEXT STEPS IN THE EVOLUTION OF CHILE'S CARBON PRICING

Juan Pedro Searle
Head of Climate Change, Ministry of Energy of Chile

Chile is working on the necessary institutional arrangements to meet its climate objectives. In June 2022, the President enacted the "Framework Law on Climate Change", the first climate change law in the country. The Law includes binding commitments for both the government and the private sector and provides new market mechanisms to support the transition to carbon neutrality. The carbon tax is now undergoing a detailed review process, as part of a general fiscal reform, with the purpose of promoting mitigation in unregulated sectors and increasing the tax rate to meet the commitments adopted in the Paris Agreement.

Carbon tax

Since 2017, Chile has had an operational carbon tax for stationary sources, which taxed emissions of CO_2 and local pollutants from boilers and turbines equal or exceeding 50 MW of installed capacity. The carbon tax has a flat rate of USD 5 per tonne of CO_2, and the rate for local pollutants such as particulate matter, SO_2 and NO_X is calculated using specific local information related to the population affected by each facility's industrial activities, including the number of people affected and the social cost of emissions per capita. Electricity generation using biomass is exempt from the carbon tax but must pay the levy on local pollutants. To date, the tax has collected an annual average of USD 190 million that goes to the national treasury as part of the general budget.

Two modifications to the tax came into force in February 2023. The first is related to the installed capacity threshold, which was replaced for one of CO_2 emissions (25,000 tonnes) and particulate matter (100 tonnes). If either of these two thresholds is equaled or exceeded, the regulated source must pay for the total emissions of the pollutants concerned. The other modification introduced an offsetting system whose reductions will come from sources not regulated by the tax; this carbon credits system has the aim of promoting mitigation in other sectors as well as the establishment of a domestic market for offsets.

Possible changes to the tax rate

As there seems to be a consensus that the price of the carbon tax is low, official guidance has been given recently as to where its value should go. For example, the updated National Energy Policy indicates that it should reach USD 35/tCO_2 by 2030 and increase to USD 80/t by 2040. The new government has proposed a review of the current tax as part of its fiscal reforms, with the goal of raising it to at least USD 40. Although no date is indicated for this increase, the process has begun. Among its objectives, the review will assess possible increases in the tax rate and identify measures to correct for distortions that the tax has entailed to date, for example, the fact that the carbon tax is not charged at the marginal cost in the case of the electricity sector. Although it is not possible to anticipate the results of this internal process led by the Ministry of Finance, stakeholders have so far shown a remarkable interest in the matter.

Market instruments under the new Framework Law on Climate Change

The "Framework Law on Climate Change" establishes a 2050 carbon neutrality goal for the country and a series of policy instruments to support this objective. Among them, it establishes a system of greenhouse gas emission caps that could be applied to individual sources, groups of sources, or sectors. Similar to a baseline-and-credit system, each regulated entity will have to keep their emissions within a limit, and if they reduce beyond their baseline, they will be able to trade their surplus on a domestic market set up for this purpose. These same entities may also use offsets from other non-regulated domestic entities, including offsets generated under Article 6 of the Paris Agreement. In order to implement the system, the Ministry of Environment should have a regulation in place by June 2023.

In addition to these specific instruments, the Law further empowers the responsible ministries to use economic instruments, which may be financial, fiscal, or market-based, to address the negative externalities of GHG emissions.

Work ahead in the energy sector

Under Article 37 of the Law, and with the support of the World Bank's Partnership for Market Implementation (PMI), the Ministry of Energy will this year begin to evaluate the technical and economic relevance of a cap-and-trade system for the energy sector. The aim is to develop and implement a cap-and-trade pilot for the sector, which could evolve into a more binding mechanism and support a cost-effective transition to carbon neutrality.

The PMI will also assist the government in defining and implementing the baseline and credit system under the Law, including the associated infrastructure, such as the registries and MRV systems.

The energy sector's GHG emissions are close to 80% of national emissions. At the same time, it is where the main mitigation measures are coming from. In order to fully meet national and international goals and commitments, the energy sector will require cost-effective instruments to achieve and even advance these goals. Among them, we envision that an ETS can contribute to these objectives and, moreover, can open the door to linking with other similar markets, especially in the Americas. We look forward to advancing the design and implementation of such a system.

NEW ZEALAND

NEW ZEALAND ETS IN REVIEW

Freeya Farrar & Kyla van Heerden
Ministry for the Environment, New Zealand

Since its establishment in 2008, the New Zealand Emissions Trading Scheme (NZ ETS) has been the primary tool enabling New Zealand to meet international and domestic climate change obligations and targets. The NZ ETS requires all sectors, except agriculture, to pay for their emissions through obligations to surrender a commensurate amount of so-called New Zealand Units (NZUs). In 2021, auctioning of units commenced, following a package of reforms to the NZ ETS. NZUs are also given freely to firms carrying out activities that are emissions intensive and trade exposed to address the risk of emissions leakage, and for emissions removals through forestry and exports of emitting products from New Zealand.

In the past year, New Zealand has published its first Emissions Reduction Plan, which sets the country on course to achieve its 2050 net-zero target.[1] Emissions pricing through the NZ ETS is a key part of this plan. Through a strong and stable price signal, emissions pricing supports a low-carbon transition by providing a clear, consistent, economy-wide signal of the cost of emissions, and the relative benefit of lower-emissions choices or investing in removals like forestry.

Emissions pricing plays a central role in reducing New Zealand's gross and net emissions.

Still, by itself it is not sufficient to motivate action at the scale and urgency required to meet New Zealand's climate goals. Instead, a mix of regulation and supporting policies will help unlock new ideas, businesses, and markets that would have been uneconomic at lower emissions prices, thereby driving more climate action at a lower overall cost to the economy. Furthermore, the revenue generated by NZU auctions is used to support immediate and future emissions reductions through the Climate Emergency Response Fund, established in 2022.

While upstream emitters are responsible for sourcing and surrendering emissions units, the cost can be passed through to businesses and households. Overall, the impact on households from an increased emissions price is estimated to be moderate because New Zealand households typically spend only a small proportion of their budgets on emissions-intensive goods such as petrol. However, the lowest-income households could face a greater impact because they spend a larger share of their income on such goods, while also having fewer options to invest in alternatives. The policies within the emissions reduction plan, and subsequent plans (to be published every five years from 2025), are intended to reduce New Zealand's reliance on the carbon-intensive fuel sources covered by the NZ ETS.

The distributional impacts the NZ ETS has on communities is an important issue, especially given the recent spikes in energy prices, mainly experienced in New Zealand through rising liquid fossil fuel prices. It is worth noting that New Zealand has a high proportion of renewable electricity sources, so it has not experienced the same dramatic electricity price increases as other economies that are more reliant on fossil fuels. But because the NZ ETS puts a price on all emissions from transport and energy, it has a more direct impact on people's daily lives compared to other such systems that cover only electricity and industrial processes. Even so, the NZ ETS is not the primary cause of the recent increases in fuel and energy prices that have impacted New Zealand's vulnerable communities the most. However, distributional impacts from the NZ ETS may become more severe in the future if the NZU price were to increase rapidly.

The NZ ETS is designed with price control measures that are intended to prevent prices from reaching a level considered unacceptable. Each year, the government updates key price control settings, such as the cost containment reserve trigger price, which is designed to moderate high prices. And while it is essential to consider inflation and the impact of emissions prices on households and the economy when updating price control settings, these measures are not designed to address distributional impacts directly. For this, more targeted policies are required, to make sure that the appropriate support goes to those that need it.

As the emissions price rises in line with our increasing climate ambition, targeted policies are needed to support vulnerable communities and ensure an equitable transition. This includes targeted support for Māori communities (New Zealand's indigenous peoples) – which typically have higher representation in lower-income households – and may need tailored help to adapt to the increasing price of emissions. Actions within the first emissions reduction plan, including New Zealand's Equitable Transitions Strategy and associated complementary measures to address future distributional impacts of potentially higher carbon prices, are currently being developed.

1 The "Zero Carbon Act 2019" mandates that all greenhouse gases, other than biogenic methane, should reach net zero by 2050 and these should be a minimum 10% reduction in biogenic methane emissions by 2030, and a 24-47% reduction by 2050 (compared with 2017 levels).

"As the emissions price rises in line with our increasing climate ambition, targeted policies are needed to… ensure an equitable transition."

The emissions reduction plan contains the policies needed to raise the ability of the NZ ETS to motivate action at the scale and urgency required to meet New Zealand's climate goals. Other policies – such as those in the emissions reduction plan – can incentivize innovation and thereby drive more climate action at a lower overall cost to the economy. Alongside economy-wide emissions pricing and other abatement policies, the plan includes actions to ensure a fair, equitable, and inclusive transition. The plan proposes a range of interventions to manage the immediate effects of the transition, such as subsidies for public transport and improved support for workers who need to change jobs as the economy transitions. The government is also helping industries and communities prepare for change; this includes Industry Transformation Plans across eight sectors and reform of the Vocational Education system to ensure New Zealanders have the education and skills relevant to work today and in the future.

Globally there is a lot of work to be done to turn the tide on climate change. New Zealand has a strong framework with the NZ ETS and complementary policies, such as those contained within the emissions reduction plan. Complementary policy work will help ensure that all New Zealanders are brought along on the country's transition to a low-emissions, climate-resilient economy.

02

INFOGRAPHICS

FROM LOCAL TO SUPRANATIONAL

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, city-level ETSs are in operation, for example, in Shenzhen and Tokyo. At the other end, the EU ETS operates supranationally in all EU Member States plus Iceland, Liechtenstein, and Norway. Multiple ETSs may be in force in countries like Germany and Austria, where some emissions are covered by the EU ETS and others by the German or the Austrian 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 2023 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.

6 Cities

Beijing*
Chongqing*
Shanghai*
Shenzhen
Tianjin*
Tokyo

20 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
Washington

10 Countries

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

1 Supranational

EU Member States
+ Iceland
+ Liechtenstein
+ Norway

* 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

1/3

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

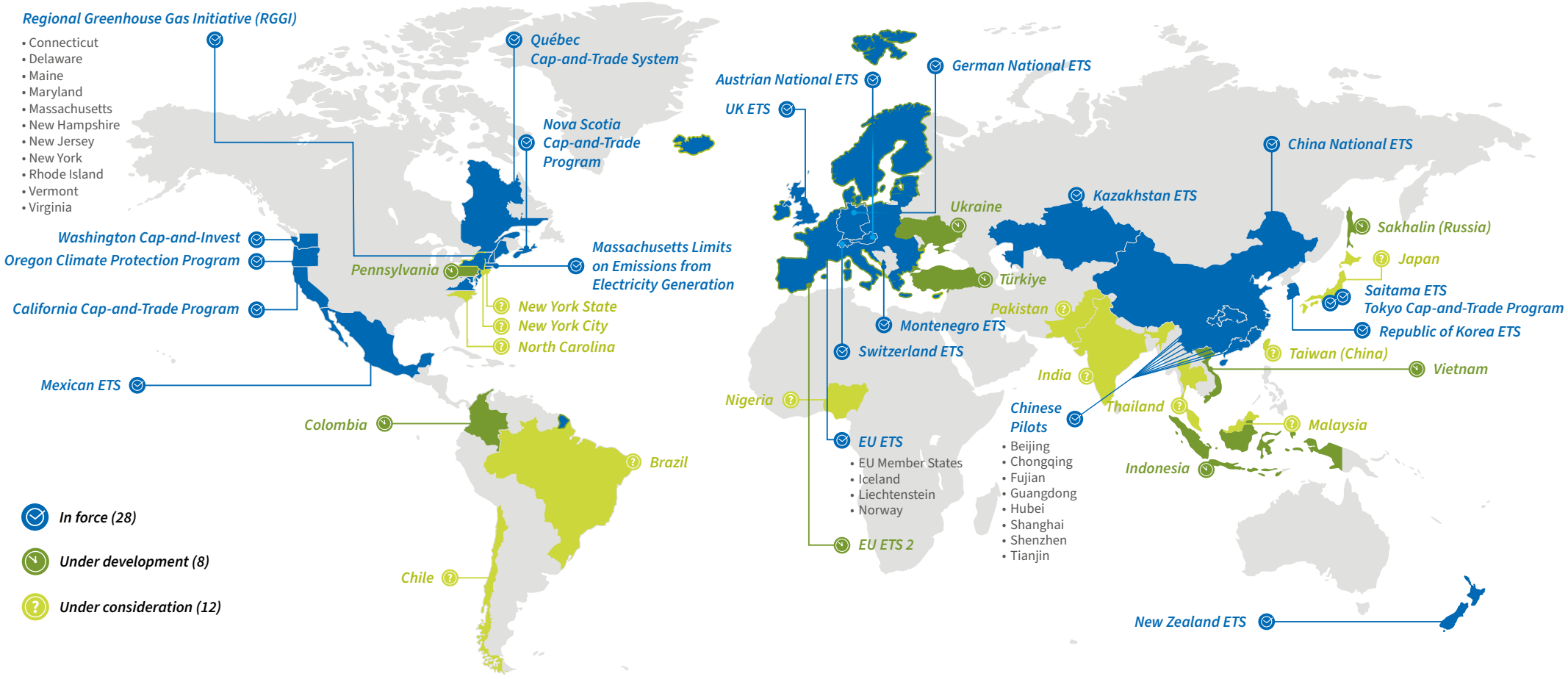
17%

OF GLOBAL GHG EMISSIONS ARE COVERED BY AN ETS

EMISSIONS TRADING WORLDWIDE

THE CURRENT STATE OF PLAY IN CAP-AND-TRADE

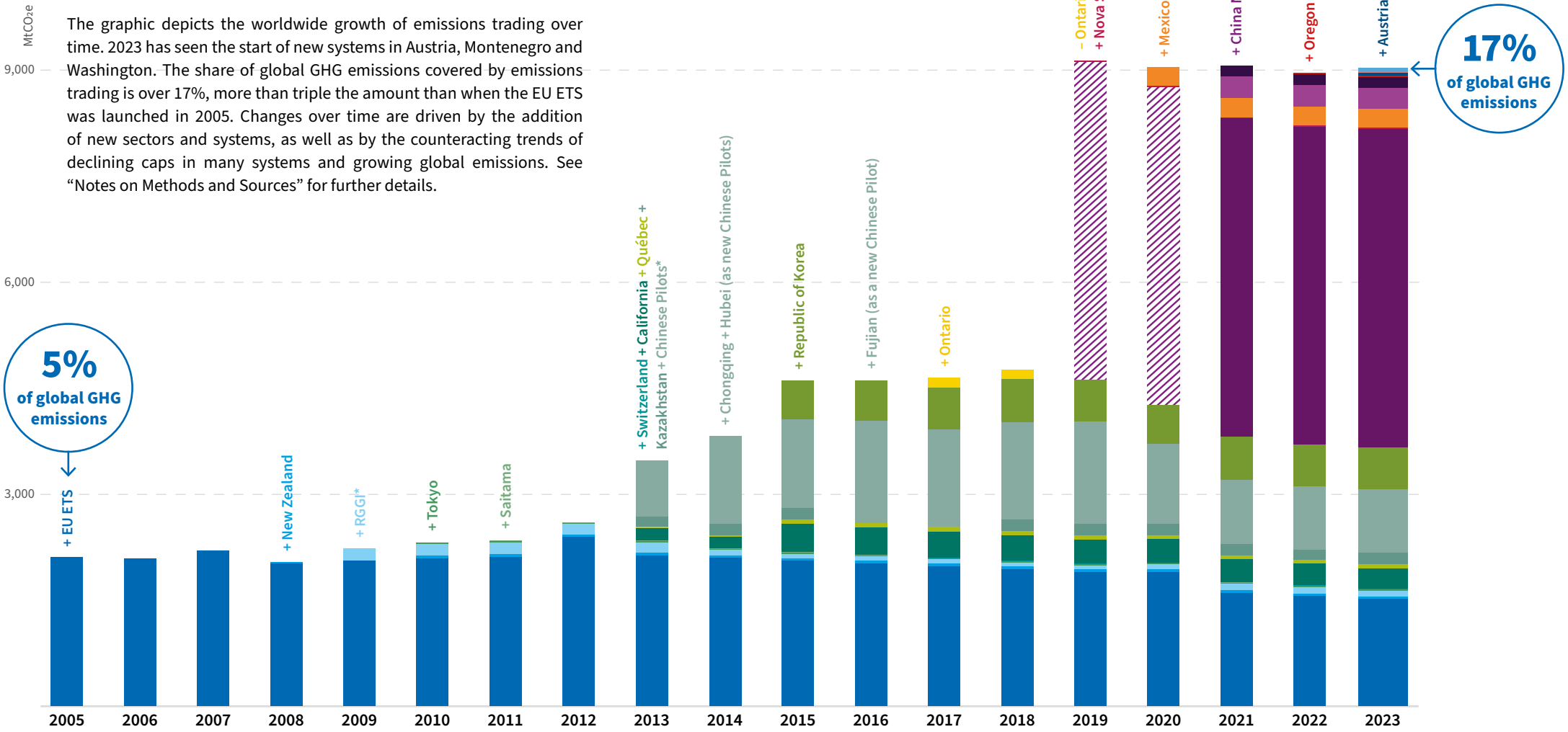
The ICAP ETS world map depicts emissions trading systems currently in force, under development or under consideration. As of January 2023, there are 28 ETSs in force. Another eight are under development and expected to be in operation in the next few years. These include ETSs in Colombia, Indonesia, and Vietnam. Twelve jurisdictions are also considering the role an ETS can play in their climate change policy mix, including the first African jurisdiction depicted in the map: Nigeria. 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, it has a system in force but is also developing an additional system, it is depicted in blue but also features a green border (e.g. the EU).



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. 2023 has seen the start of new systems in Austria, Montenegro and Washington. The share of global GHG emissions covered by emissions trading is over 17%, more than triple the amount than 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

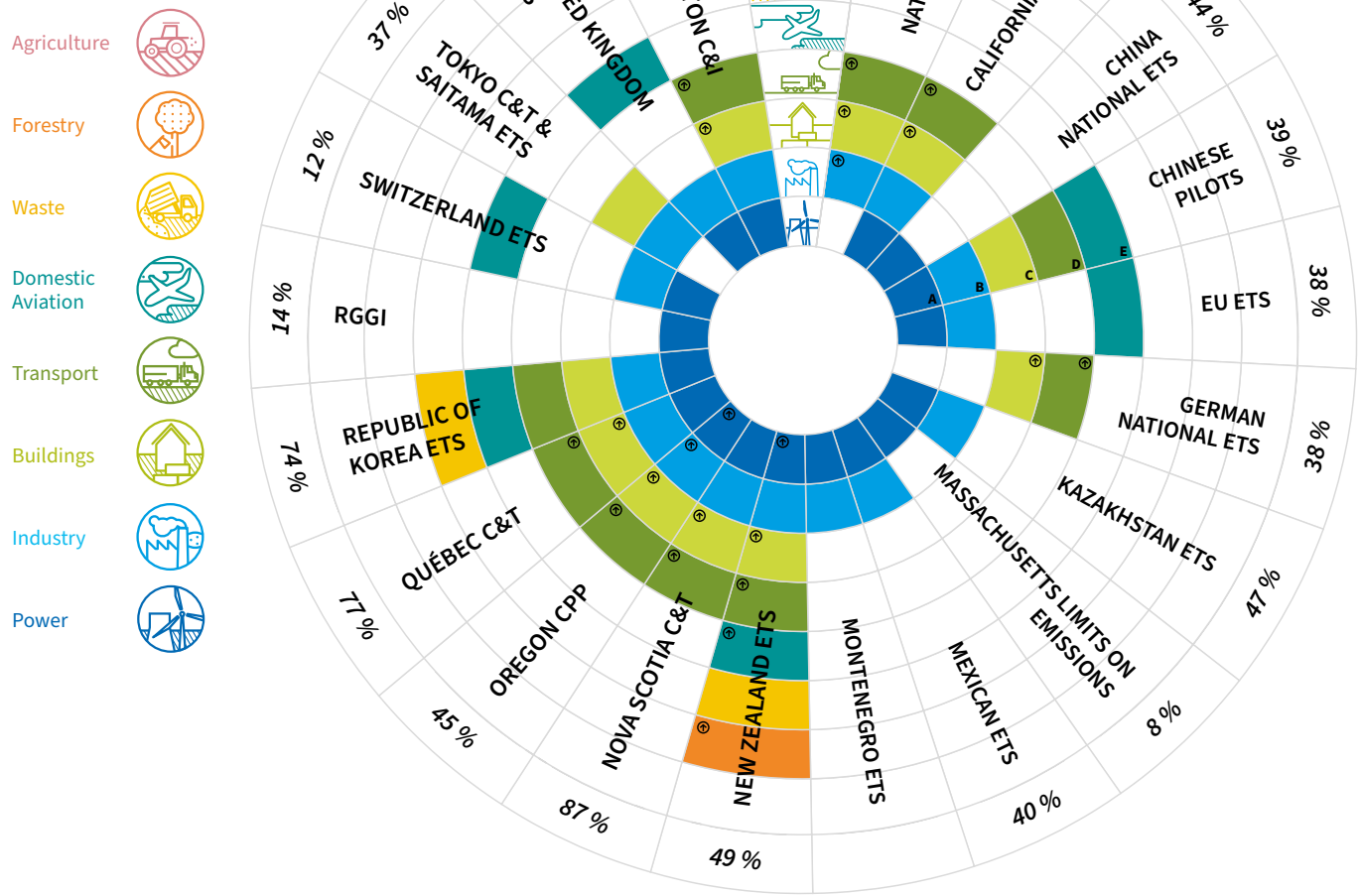
* The Chinese National ETS came into force in 2021 but has retroactive compliance obligations in 2019 and 2020, indicated above by the striped bar

** 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 2023. Systems are listed clockwise alphabetically, with the numbers in the outermost ring indicating the share of aggregate emissions covered by the system as per the most recent available data. 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 may be covered. The jurisdictions' respective factsheets provide more information on system coverage. The graphic includes only sectors which are covered by at least one ETS. See "Notes on Methods and Sources" for further details.



A The Fujian ETS covers the electricity grid
B Beijing, Chongqing, Fujian, Guangdong, Hubei, Shanghai, Shenzhen, Tianjin
C Beijing, Shanghai
D Beijing, Shanghai, Shenzhen
E Fujian, Guangdong, Shanghai

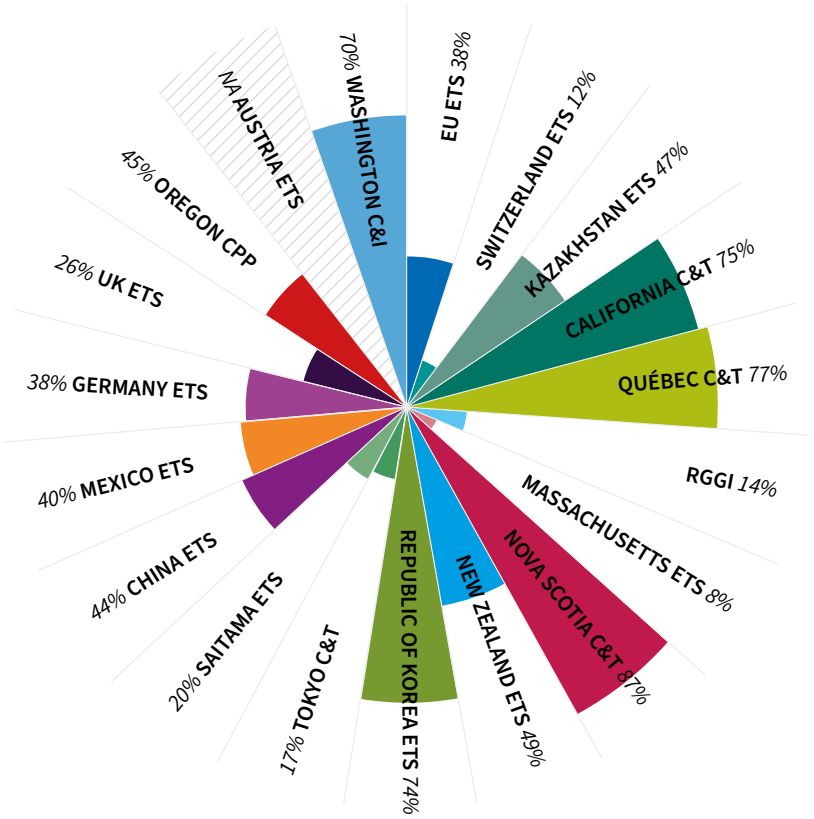
↑ indicates which sector is covered upstream

DIFFERENT SHAPES OF ETS

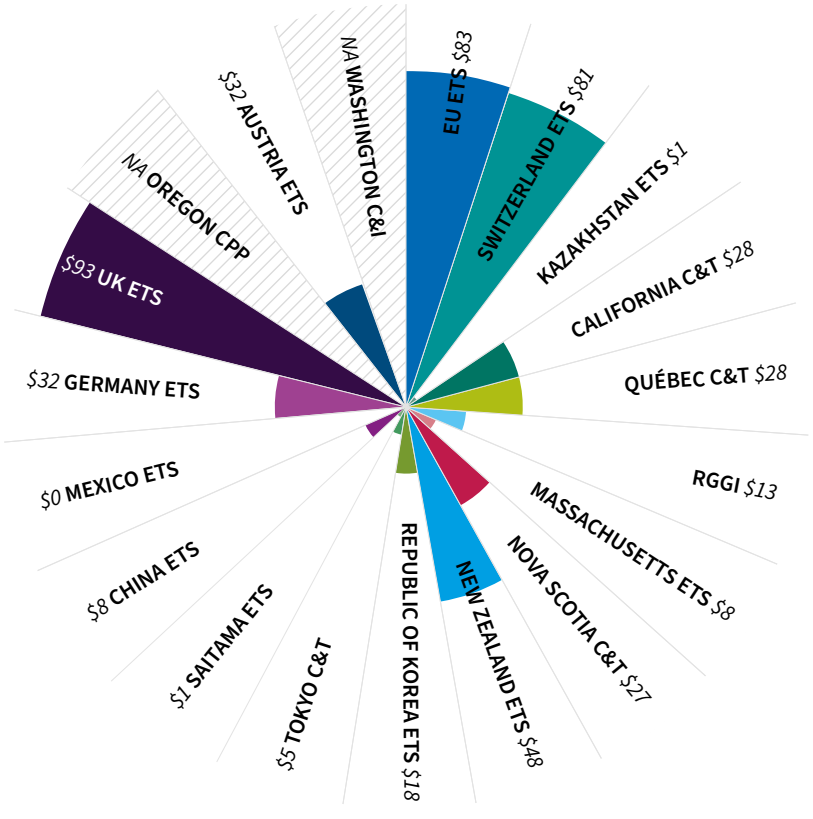
A COMPARATIVE LOOK AT KEY METRICS IN SELECTED SYSTEMS

Each of the graphs below presents a different metric across ETSs in force. **Coverage** shows the share of the jurisdiction's GHG emissions covered under the ETS. **Allowance price** is measured in USD per metric tonne of CO_2e and averaged over 2022. **Auction share**, expressed as a share of the 2022 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. See "Notes on Methods and Sources" for further details.

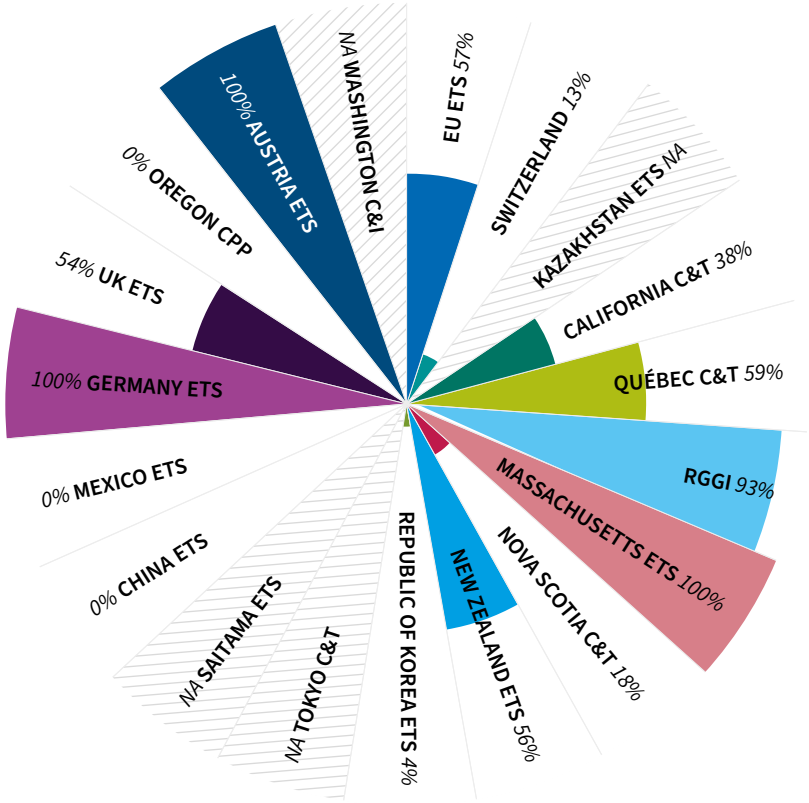
Coverage
0-100%



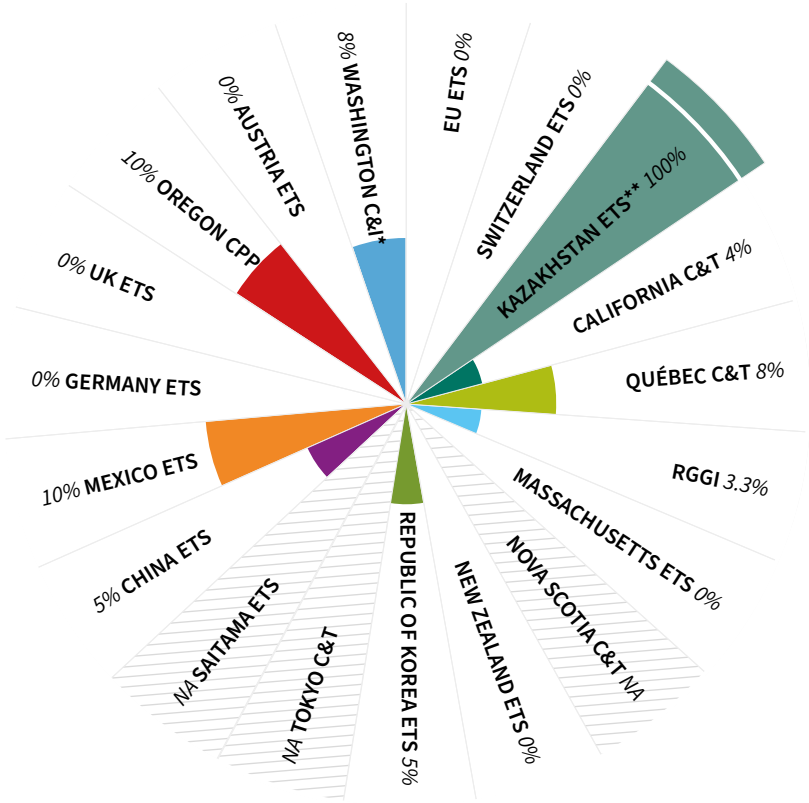
Allowance price
in USD



Auction share
0-100%



Offset use
0-20%



* Up to 5% from projects not located on federally recognized tribal land, plus an additional 3% from projects located on federally recognized tribal land
** The Kazakhstan ETS is represented out of scale in this infographic.

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

Allowance price
The weighted average price for allowances across 2022, for one metric tonne of CO_2e emissions (in USD).

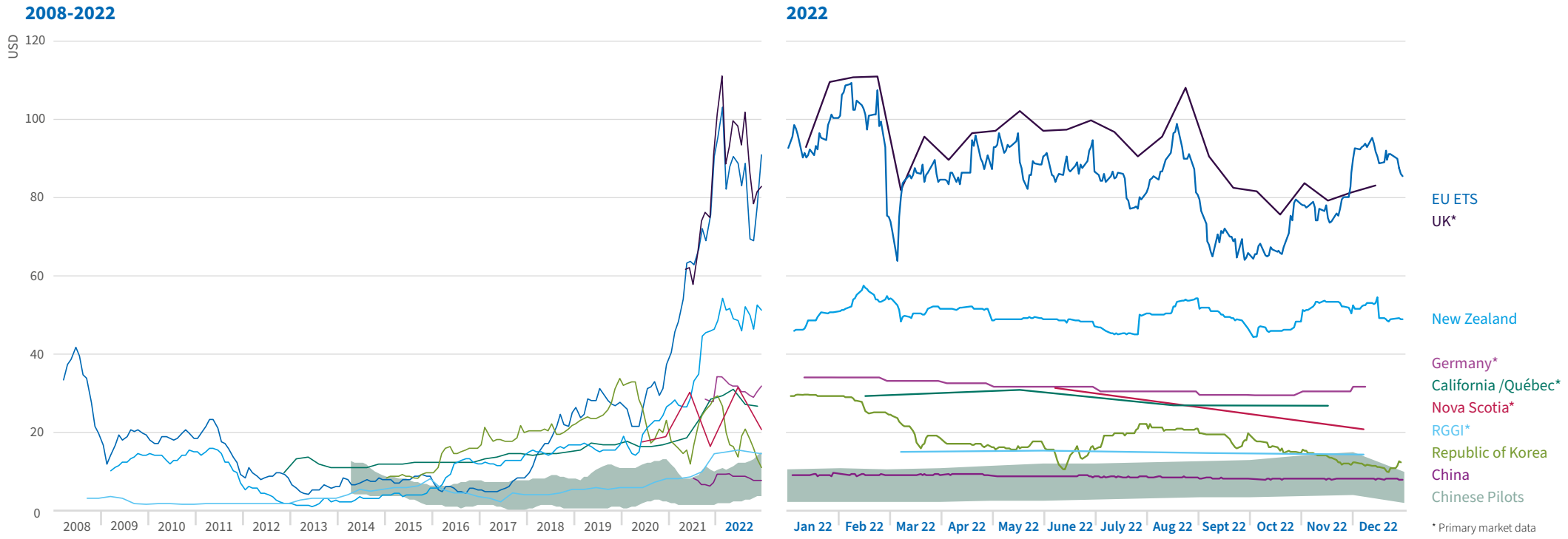
Auction share
Proportion of allowances that is not allocated for free, but must be acquired either at auction or otherwise (in %).

Offset use
Share of compliance obligation that can be met using approved offsets.

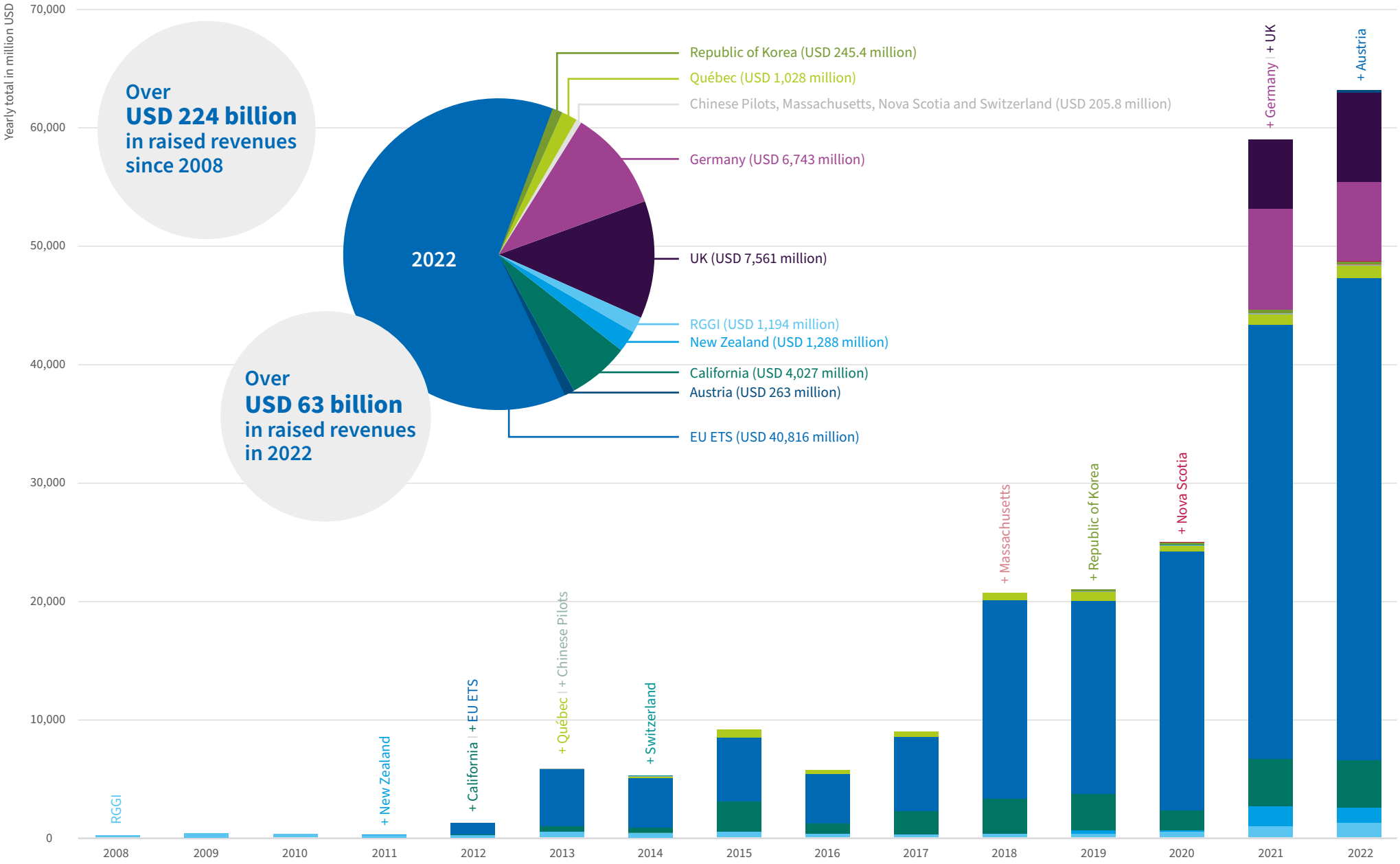
ALLOWANCE PRICES AND REVENUES

2022 IN A LONGER HISTORICAL CONTEXT

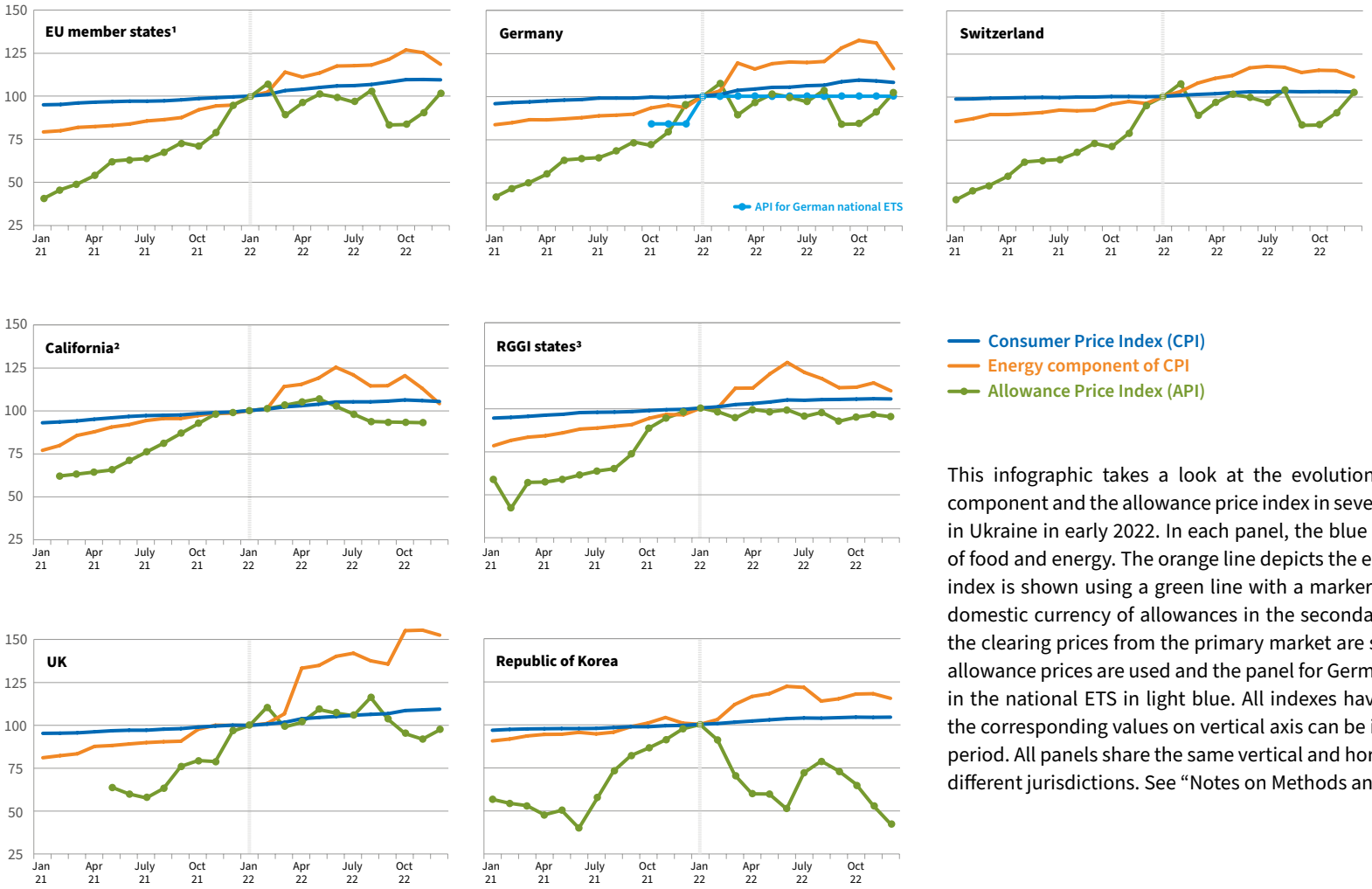
The upper panels of this infographic use data from the ICAP Allowance Price Explorer to visualize developments in allowance markets in a long historical context since 2008 (left panel) and in 2022 (right panel). Both the short- and long-term price developments are driven by changes in current and expected 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. The shaded areas indicate the range of prices observed in the Chinese pilot ETSs. The panel on the next page displays information on revenues raised by governments at auctions of allowances over time. The amount of revenue collected depends on the jurisdiction's size, ETS coverage, share of auctioned allowances and allowance prices. Over time, increases in allowance prices and the introduction of new systems has led to an increase in revenues raised from the auction of allowances. In all panels, observations in non-USD currencies are converted to USD using exchange rate data from the IMF. See "Notes on Methods and Sources" for further details.



YEARLY REVENUES RAISED BY EACH SYSTEM



CONSUMER, ENERGY AND ALLOWANCE PRICES IN 2021 AND 2022



Allowance price increases seen in 2021 have not continued at the same rate in 2022.

Energy prices rose significantly in 2022, particularly in the first half of the year, while allowance prices were broadly stable in most jurisdictions.

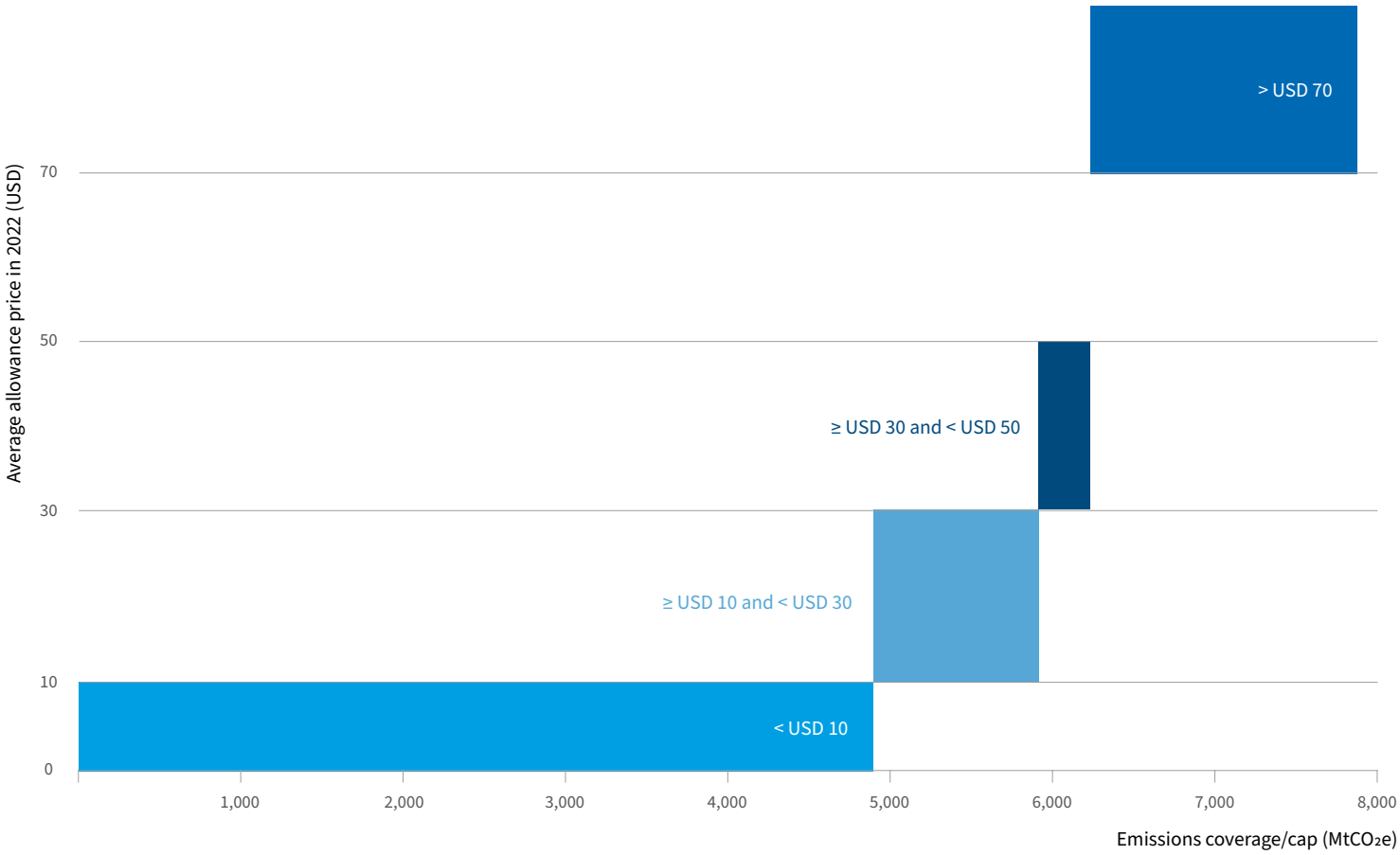
- Consumer Price Index (CPI)
- Energy component of CPI
- Allowance Price Index (API)

This infographic takes a look at the evolution of the consumer price index (CPI), its energy component and the allowance price index in seven jurisdictions before and after the start of the war in Ukraine in early 2022. In each panel, the blue line is the CPI in the jurisdiction, including prices of food and energy. The orange line depicts the energy component of the CPI. The allowance price index is shown using a green line with a marker. It corresponds to the monthly average prices in domestic currency of allowances in the secondary market except in the case of California, where the clearing prices from the primary market are shown. For Switzerland and Germany, the EU ETS allowance prices are used and the panel for Germany additionally displays the prices of allowances in the national ETS in light blue. All indexes have been rebased to equal 100 in January 2022 so the corresponding values on vertical axis can be interpreted as percent change relative to the base period. All panels share the same vertical and horizontal axes to aid comparison of price changes in different jurisdictions. See “Notes on Methods and Sources” for further details.

1 CPI and and energy component of CPI correspond to values for the EU 27 member states.
2 CPI and the energy component of CPI in California correspond to values in the West urban region.
3 CPI and the energy component of CPI in RGGI states correspond to values in the Northeast urban region.

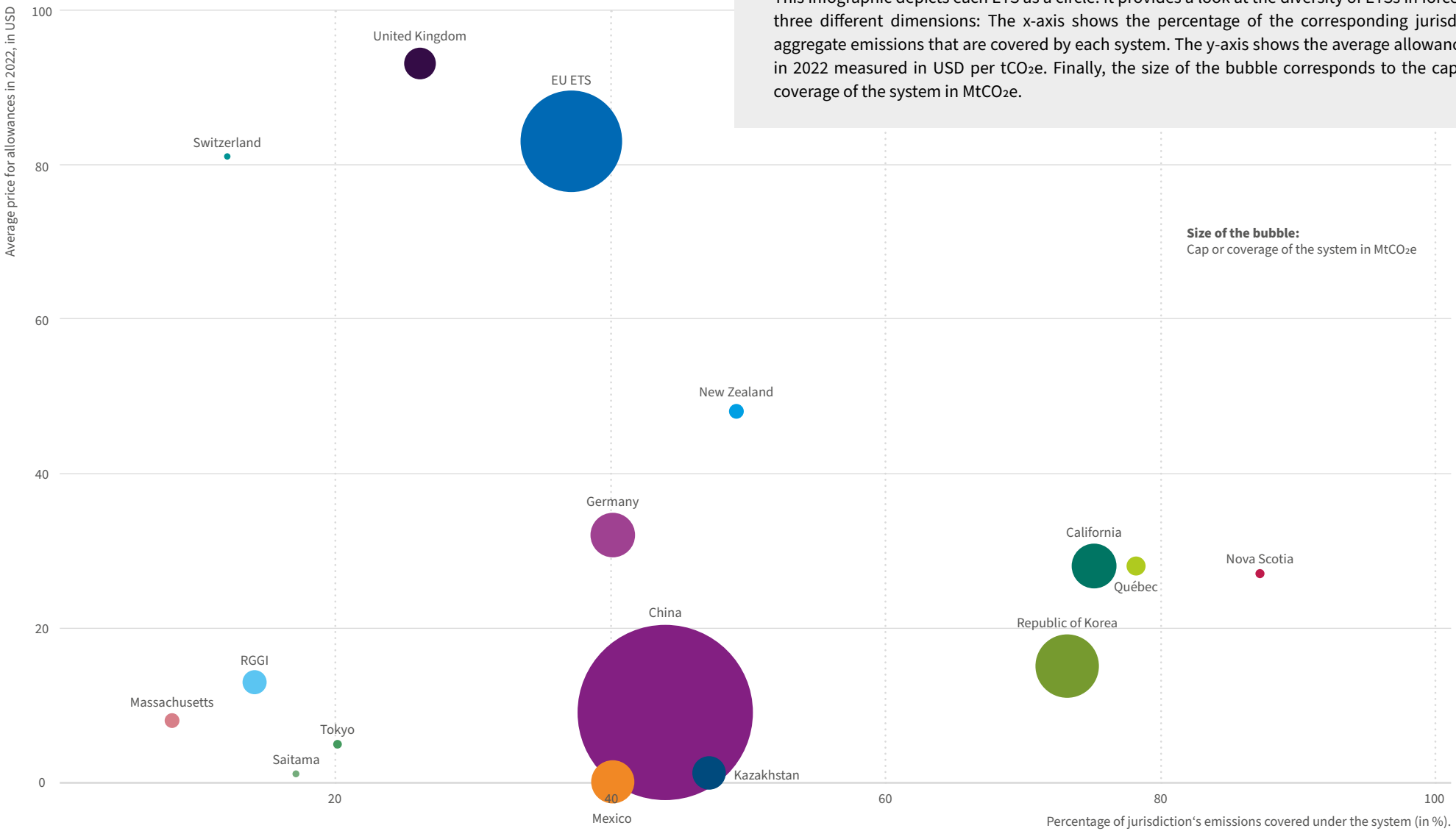
PRICES OF COVERED EMISSIONS

This infographic shows the range of allowance prices in 2022 in ETSs in force, and the volume of emissions that ETS with those price levels cover. Most ETS-covered emissions are in systems where average prices were below USD 10 in 2022. About one sixth of ETS-covered emissions were in systems where average prices in 2022 were between USD 10 and USD 50. There was no system where prices were in USD 50 to USD 70 range, while the EU, Swiss and UK ETSs featured average prices over USD 70. Over one fifth of ETS-covered emissions are in systems where the 2022 average allowance price was above USD 70. Differences in allowance prices are driven by, among others, changes in current and expected future scarcity of allowances in each system, variations in general economic conditions, system design and policy reforms.



ETS IN PERSPECTIVE

This infographic depicts each ETS as a circle. It provides a look at the diversity of ETSs in force across three different dimensions: The x-axis shows the percentage of the corresponding jurisdiction's aggregate emissions that are covered by each system. The y-axis shows the average allowance price in 2022 measured in USD per tCO_2e. Finally, the size of the bubble corresponds to the cap or the coverage of the system in $MtCO_2e$.



03

FACTSHEETS

FACTSHEETS: CONTENTS

AUSTRIA

AUSTRIAN NATIONAL EMISSIONS CERTIFICATE TRADING SYSTEM

- **National carbon pricing (NEHG 2022) introduced in October 2022 covering fuel consumption upstream**
- **Fixed price per tonne CO_2e from 2022 to 2025**
- **Auctioning foreseen from 2026 onwards**

ETS DESCRIPTION

Austria launched its national emissions certificate trading system (NEHG 2022) for fossil fuels not already covered by the EU ETS in October 2022 as part of the eco-social tax reform of autumn 2022.

Although the NEHG 2022 does not establish a carbon tax, the carbon pricing instrument follows in central parts the logic of existing energy taxes (fuel tax, coal tax, and natural gas tax) that are based on the Energy Taxation Directive (ETD). Thus, if a certain event is taxable under the existing energy taxes regime, an obligation to buy allowances arises under the NEHG. Taxable events are the production, import, or release of energy products from a tax warehouse in Austria or the supply of coal and natural gas to consumers. In practice, only a limited number of energy distributors and oil companies are responsible for the payment of energy taxes, while the majority of (end) consumers are not directly liable.

The NEHG 2022 aims to cover emissions outside the EU ETS, encompassing mainly emissions in the building and transport sectors. Between 2022 and 2025, the system will operate with an annually-increasing fixed price and a flexible cap, such that more allowances will be available for entities if needed.

The NEHG 2022 will be phased in gradually. The system has been designed in line with the reduction targets for non-EU ETS sectors as defined by the "European Effort Sharing Regulation" (ESR). The system might eventually transfer partially into the EU ETS II for which a political agreement was reached in December 2022 (see the "EU ETS II" factsheet for more).

YEAR IN REVIEW

In October, the NEHG 2022 started operating. Its start was delayed by the energy crisis; it was pushed back three months from its original start date of July 2022 as part of the government's energy price relief plan.

By October, regulated entities had to open a registration account on the dedicated platform. Late registration was possible without penalty until the start of February 2023. Companies must surrender national emission allowances based on their emissions every quarter of the year; the first surrender day is the end of March 2023.

In force
Under development
Under consideration

SECTORS

- POWER
- INDUSTRY
- BUILDINGS
- TRANSPORT
- AGRICULTURE

CAP

No cap in the introduction and transition phases

GREENHOUSE GASES

Several gases

ALLOCATION

Fixed price until 2025; auctioning foreseen from 2026 onwards

AVERAGE 2022 ALLOWANCE PRICE

Fixed price: EUR 30 (USD 31.59)

TOTAL REVENUE

Estimated EUR 250 million (USD 263 million) since beginning of program in October 2022

EMISSIONS & TARGETS OF AUSTRIA

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	49.9	(68%)
Industrial processes	15.5	(21%)
Agriculture	7.0	(9%)
Waste	1.2	(2%)
Total	**73.6**	

Energy industries	8.8	(12%)
Manufacturing industries and construction	10.5	(14%)
Transport	21.2	(29%)
Commercial, institutional, and residential	8.1	(11%)
Other energy	1.3	(2%)

GHG REDUCTION TARGETS

By 2030: 36% below 2005 GHG levels (Climate Change Act; foreseen to be 48% below 2005 GHG levels as agreed at the EU level in November 2022)
By 2040: GHG neutrality (foreseen to be established in the current legislative program)

ETS SIZE & PHASES

PHASES

PHASE ONE: Five years (2022-2026), including:
Introduction phase (2022-2023)
Transition phase (2024-2025)
Market phase (starting 2026)

CAP

There is no cap foreseen for the introduction and transition phase. For the market phase, the cap and annual reduction factor are still to be determined.

SECTORS AND THRESHOLDS

The NEHG 2022 covers all fossil fuel distributors (producers/importers) of fuels used in the transport, buildings, agriculture, and energy sectors, as well as from small industries. This essentially concerns the following fossil energy sources: petrol, gasoil (diesel), heating oil, natural gas, liquefied gas, coal, and kerosene. Fuels in admixture with biogenic fuels receive a lower emissions factor than purely fossil fuels.

Aviation and navigation in international inland waters as well as certain fuels like sustainable LNG are exempted from the surrender of allowances during the fixed-price phase.

Provisions are in place to avoid unnecessary double burdens for installations covered by the EU ETS. Emissions that arise from a fuel delivered to and used in an EU ETS installation must be reported by the EU ETS installation in any case and can then be exempted from the NEHG 2022. The exemption can be granted in advance, although a subsequent refund is also possible.

In addition, companies that are particularly affected by the NEHG 2022 (e.g., in the transport sector) can also apply for a partial refund of the carbon price to avoid so-called hardship cases. Moreover, the NEHG 2022 foresees compensatory measures for firms facing additional costs in the agricultural and forestry sectors.

INCLUSION THRESHOLDS: Trading participants that place less than one tonne of CO_2e emissions per year into circulation are exempt from the obligations.

POINT OF REGULATION

Upstream

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

Introduction and transition phases (2022-2025): The number of available allowances is not limited. Allowances are sold for an annually increasing fixed price:
2022: EUR 30 (USD 31.59)
2023: EUR 32.5 (USD 34.22)
2024: EUR 45 (USD 47.39)
2025: EUR 55 (USD 57.92)

Market phase (starting January 2026): Auctioning of allowances starts in 2026 with free price determination.

CARBON LEAKAGE SCHEME: The NEHG 2022 is accompanied by predefined exemptions and relief measures to specific sectors for certain specific additional burdens that might result from the NEHG 2022. Specifically, the relief is provided to significantly affected economic sectors that are at particular risk of relocating their production to countries with less stringent climate policies (carbon leakage).[1]

In these cases, companies can benefit from a reimbursement of additional costs induced by the NEHG 2022. Energy-intensive industries pursuant to Article 10b of Directive 2003/87/EC[2] are particularly at risk of carbon leakage and therefore eligible for the partial refund.

The system uses compensation based on fuel benchmarks and fixed compensation levels.

USE OF REVENUES

Revenues will be partly recycled to consumers via the "regional climate bonus". This bonus is designed as a regionalized climate compensation for the carbon price (regionalized lump-sum cash transfer). Primary residents will receive financial support that increases with the carbon price (no hard link).

FLEXIBILITY & LINKING

BANKING AND BORROWING
Banking is not allowed during the introduction and transition phase.

OFFSETS AND CREDITS
No offsets are allowed.

LINKS WITH OTHER SYSTEMS
The system may eventually transfer partially into the EU ETS II (see the "EU ETS II" factsheet for more).

COMPLIANCE

COMPLIANCE PERIOD
One calendar year. Entities have until the end of July 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 ("Treibhausgasemissionsbericht") based on electronic templates is to be submitted by the end of June. During the introductory phase (2022-2023), a simplified emissions report, which is based on the already available data of the energy tax declarations, is to be submitted by the end of June.

The emissions report must be based on a previously approved monitoring plan. Every modification to the monitoring plan needs to be addressed to the competent authority by the end of each calendar year. During the introductory phase (2022-2023), a simplified registration and emissions reporting regulation applies. In this phase, no monitoring plan must be submitted.

VERIFICATION: The emissions report must be accompanied by a verification report by an independent verifier.

ENFORCEMENT
During the fixed-price phase, entities must pay an increased certificate price for each tonne CO_2e for which no allowance has been surrendered, set at two times the fixed price, in addition to a financial penalty.

After the fixed-price phase, entities pay an increased certificate price of EUR 125 per tonne CO_2e (USD 131.63).

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

MARKET REGULATION

MARKET DESIGN
The NEHG 2022 does not contain details on the concrete design of the primary market for the market phase. These provisions are expected after the evaluation of the ETS at the end of 2024.

MARKET STABILTY PROVISIONS
A price stability mechanism is introduced as an accompanying measure for the introduction and transition phases of the ETS. If the average energy price increases by more than 12.5% within one year, the ETS price increase for the next year decreases by 50% compared to the price increase planned by the NEHG. Likewise, if the average energy price decreases by more than 12.5%, the ETS allowance price will also increase by 50% in the following year.

Due to high energy prices in 2022, the price stability mechanism has become applicable for 2023. The price of an emission allowance is therefore EUR 32.50 in 2023 (USD 34.22).

1 NEHG §24, (2)
2 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2019:120:FULL

OTHER INFORMATION

INSTITUTIONS INVOLVED

Austrian Federal Ministry for Finance (BMF): Authority responsible for establishing the regulatory framework of the ETS.

Office for National Emissions Allowance Trading at the Austria Customs Office: Implementing authority, e.g., responsible for receiving emissions reports.

EVALUATION/ETS REVIEW

A first evaluation of the national ETS is expected by mid-December 2024. Article 19 of the NEHG 2022 foresees an evaluation process which also covers the specification of the market phase in line with Austria's climate targets, as well as an evaluation of the maintenance of exemptions for certain sectors. The evaluation also considers the introduction of a possible second EU ETS covering the buildings and road transport sectors.

REGULATORY FRAMEWORK

→ National Emissions Trading Act 2022 - NEHG 2022

→ Eco-social tax reform 2022

EUROPEAN UNION

EUROPEAN UNION EMISSIONS TRADING SYSTEM

- **The oldest ETS in force and the largest in terms of trading volume and value**
- **Linked with the Swiss ETS as of 2020**
- **Under revision to align with the European Green Deal and the 2030 emissions reduction target**

ETS DESCRIPTION

Operational since 2005, the European Union Emissions Trading System (EU ETS) is the oldest system in force. It is a cornerstone instrument of the EU's policy framework to combat climate change and reduce GHG emissions cost-effectively. The system covers some 10,000 stationary installations, in the energy and industry sectors, and airlines operating in the EU. This represents around 38% of the EU's total emissions. In 2021, the EU ETS entered its fourth trading phase (2021-2030).

The legal framework of the EU ETS is established in Directive 2003/87/EC. Its latest revision, for Phase 4, had been completed in 2018. However, in light of the "European Green Deal", in 2021 the European Commission proposed reforms to the EU ETS to align the system with the updated 2030 climate target of at least 55% net emission reductions compared to 1990 levels.

YEAR IN REVIEW

In December, the European Parliament and the Council of the EU reached a provisional agreement on the reform of the EU ETS as part of the negotiating process to deliver on the European Green Deal. The agreement, among other things, includes:[4]

- Increasing the level of emission reductions to be achieved by the EU ETS sectors by 2030 to 62% below 2005 levels;
- Raising the linear reduction factor to 4.3% for the period 2024-2027 and to 4.4% for the period 2028-2030;
- Rebasing the cap in two steps: in 2024 by 90 million allowances and in 2026 by 27 million;
- Updating parameters of the Market Stability Reserve, including a cancellation threshold of 400 million allowances and an extension of the intake rate of 24% until 2030;
- Increasing the sizes of the Innovation and Modernisation Funds;
- Gradually phasing out free allocation in the aviation sector by 2026;
- Gradually phasing out free allocation over 2026-2034 in the industries covered by the new carbon border adjustment mechanism;
- Including emissions from the maritime sector in the EU ETS from 2024;
- Establishing a separate emissions trading system, ETS 2, for fuels used in buildings, road transport and industry (see "ETS 2" factsheet).

In December, the European Parliament and the Council of the EU also reached a provisional agreement to apply ICAO's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) to international flights from 2022 to 2027. The intra EU-scope of the EU ETS is maintained.

In March, the European Securities and Market Authority published a report on the integrity of the EU carbon market. The report found no evidence of excessive price speculation, concluding that the price signal was mainly driven by market fundamentals.

1 Within the European Economic Area (EEA) and on routes from the EEA to Switzerland and to the UK.
2 Includes revenue from Iceland, Liechtenstein and Norway, and the UK, as well as of the Innovation and Modernisation Funds funded from the EU ETS.
3 Includes revenue from Iceland, Liechtenstein and Norway, and Northern Ireland, as well as of the Innovation and Modernisation Funds funded from the EU ETS.
4 Press releases from the **European Parliament** and the **Council of the EU**. **Draft text** of the reformed Directive 2003/87/EC and Decision (EU) 2015/1814 agreed on by the Committee of Permanent Representatives and the ENVI Committee of the European Parliament on 8 February 2023.

In force
Under development
Under consideration

SECTORS

POWER
INDUSTRY
AVIATION[1]

CAP

1,529 $MtCO_2e$ (2022, stationary installations)
28.4 $MtCO_2e$ (2022, aviation)

GREENHOUSE GASES

CO_2, N_2O, PFCs

ALLOCATION

Auctioning
Free Allocation: Benchmarking

AVERAGE 2022 ALLOWANCE PRICE

Average auction price: EUR 78.91 (USD 83.10)
Average secondary market price: EUR 80.82 (USD 85.11)

TOTAL REVENUE

EUR 139.5 billion[2] (USD 158.4 billion) since 2013
EUR 38.8 billion[3] (USD 40.8 billion) in 2022

MEMBER STATES

All EU Member States, plus Iceland, Liechtenstein and Norway (plus power generators in Northern Ireland)

EMISSIONS & TARGETS OF THE EUROPEAN UNION

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	2,485.5	(75%)
Industrial processes	313.3	(10%)
Agriculture	382.1	(12%)
Waste	112.1	(3%)
Total (EU-27)	**3,293.1**	
Total (including UK, Iceland, Liechtenstein, and Norway)	**3,752.9**	

Energy industries	779.8	(24%)
Manufacturing industries and construction	406.0	(12%)
Transport	721.1	(22%)
Commercial, institutional, and residential	434.2	(13%)
Other energy	144.7	(4%)

GHG REDUCTION TARGETS

By 2030: At least 55% below 1990 GHG levels

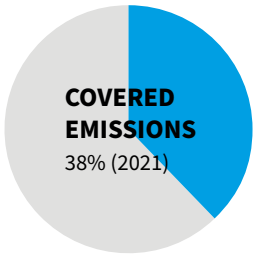
By 2050: Climate neutrality

ETS SIZE & PHASES

COVERED EMISSIONS

Verified ETS emissions

1,335 $MtCO_2e$ (by 2021)



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 (2005-2007) and PHASE TWO (2008-2012): 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 2008.

PHASE THREE (2013-2020):

Stationary installations: A single EU-wide cap set at 2,084 $MtCO_2e$ in 2013, reduced annually by a linear reduction factor of 1.74% (of 2008-2012 baseline emissions). This translated into a year-on-year reduction of the cap by some 38 million allowances and resulted in a cap of 1,816 $MtCO_2e$ in 2020.

Aviation: Included in the EU ETS in 2012 under a separate cap. The cap for aviation was initially set at 221 million allowances (95% of 2004-2006 emissions) to reflect the coverage of all flights taking off or landing in an EEA state. However, following the "stop the clock" temporary suspension of the regulation, the system's scope was limited to flights within the EEA and the number of aviation allowances put into circulation in 2013-2016 was reduced to 38 million allowances annually until 2016. This scope reduction was subsequently prolonged until 2023 to support the development of a global measure for aviation emissions under ICAO.

PHASE FOUR (2021-2030):

Stationary installations: A single EU-wide cap of 1,572 $MtCO_2e$ in 2021, subject to a linear reduction factor of 2.2% per year (of 2008-2012 baseline emissions). This translates into a year-on-year reduction of the cap by some 43 million allowances. The linear reduction factor does not have a sunset clause and the cap will continue to decline beyond 2030.

As of 2021, emissions from UK installations, previously covered by the EU ETS, are no longer considered in the cap. Pursuant to the Protocol on Ireland/Northern Ireland of the EU-UK Withdrawal Agreement and the Trade and Cooperation Agreement between the EU and the UK, the cap in Phase 4 accounts only for electricity generators in Northern Ireland.

Aviation: The cap for 2021 was 28.3 million allowances, after being adjusted following the UK's departure from the EU. As of Phase 4, the cap for aviation is subject to the linear reduction factor of 2.2% per year.

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): Several countries included NOx emissions from the production of nitric acid. The EU ETS also expanded to include Iceland, Liechtenstein and Norway.

Aviation: Emissions from international aviation were included in the EU ETS in 2012 (>10,000 tCO_2/year for commercial aviation; >1,000 tCO_2/year for non-commercial aviation since 2013). In November 2012, the EU temporarily limited the scope of the EU ETS to flights within the EEA only. Exemptions for operators with low emissions were also introduced.

PHASE THREE (2013-2020): Carbon capture and storage installations, production of petro-chemicals, ammonia, nonferrous and ferrous metals, gypsum, aluminum, as well as nitric, adipic, and glyoxylic acid (various thresholds) were added to the system's scope.

Aviation: In 2017, the reduced scope of the EU ETS for aviation was prolonged until 2023 to support the development of a global measure for aviation emissions under ICAO.

In line with the Agreement between the EU and Switzerland on the linking of their emissions trading systems, the EU ETS covers emissions from flights departing from the EEA to Switzerland as of 2020.

PHASE FOUR (2021-2030): Phase 3 coverage continues.

Aviation: In line with the Trade and Cooperation Agreement between the EU and the UK, the EU ETS applies to emissions from flights departing from the EEA to the UK as of 2021.

POINT OF REGULATION
Point source

NUMBER OF ENTITIES
8,757 stationary installations
371 aircraft operators

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION
PHASE ONE (2005-2007): Allocation based on Member States' national allocation plans. Allocation through grandparenting. Some Member States used auctioning and some used benchmark-based allocation.

PHASE TWO (2008-2012): Like in 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, Czechia and Lithuania), amounting to ~3% of the total allowance allocation.

PHASE THREE (2013-2020): 57% of allowances auctioned and the remainder allocated for free based on benchmarks.

Of the freely-allocated allowances, 88% were distributed to Member States based on verified 2005 or average 2005-2007 emissions; 10% were allocated to 16 lower-income 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 ten lower-income Member States to grant free allowances 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 remaining allowances or transfer them to the newly created Modernisation Fund.

Industry: Free allocation based on benchmarks. Benchmarks were calculated using 2007-2008 activity levels and 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 the supply, the free allocation volume of each installation was subject to a uniform cross-sectoral correction factor — which was revised in 2017.

The 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 limiting the scope of the EU ETS for aviation to intra-EEA flights, free allocation was adjusted accordingly.

New Entrants' Reserve (NER): 5% of the cap for Phase 3 was set aside to assist new installations 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, a large-scale funding program for innovative low-carbon energy demonstration projects.

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.

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. The European Commission calculates updated benchmark values based on data submitted by Member States (a list of incumbent installations and associated emissions). The first updated set of benchmarks was published in March 2021.[5]

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 benchmark. For the steel sector, which faces high abatement costs and leakage risks, the 0.2% annual benchmark reduction applies.

As of Phase 4, the volume of free allocation is adjusted when changes in industrial production occur. The threshold for adjustments is set at 15% increasing or decreasing production.

Carbon leakage rules: The third carbon leakage list, adopted in February 2019, applies for 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 if the initial free allocation volume is fully absorbed (thereby avoiding the need to apply the cross-sectoral 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)

The uniform cross-sectoral correction factor for the adjustment of free allocation is 1 for 2021-2025.

Free allocation of allowances will be phased out from 2026 to 2034, together with the phase-in of EU CBAM obligations for third-country imports in covered sectors (initially iron and steel, cement, aluminum, fertilizers, electricity, and hydrogen).

Aviation: Same breakdown as in Phase 3. Free allocation will be phased out gradually with planned free allocation reduced to 75% in 2024, 50% in 2025 and 0% from 2026 onward.

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.

New Entrants' Reserve: The initial volume of the NER at the start of Phase 4 amounted to 331.3 million allowances. This included unallocated allowances from Phase 3 and 200 million allowances from the Market Stability Reserve.

USE OF REVENUES

In the EU ETS, the main share of revenues from auctioning allowances accrues to Member States' budgets. At least 50% of these revenues should be used for climate- and energy-related purposes.

Member States report annually to the Commission on how they spent their auction revenues. On average, Member States spent ~76% of their revenues in 2021 on domestic and international climate- and energy-related purposes.

A share of allowances is auctioned to supply the Innovation and Modernisation Funds – two funds established for Phase 4 (2021-2030) to support decarbonization in the EU ETS sectors.

Innovation Fund: Supports the commercial demonstration of innovative low-carbon technologies and industrial solutions to decarbonize Europe's energy-intensive industries, as well as the development of renewable energy, energy storage, and carbon capture use and storage.

5 Revised **benchmark values** for free allocation of emission allowances for the period from 2021 to 2025.

The fund is monetized through auctioning 450 million allowances and the remaining budget from the NER300, a funding program from Phase 3 (2013-2020). It is expected to have a funding capacity of EUR 33.8 billion (USD 35.6 billion) until 2030.

Since 2020, four calls for projects (two for large-scale and two for small-scale ones) have been completed, awarding over EUR 3.1 billion (USD 3.3 billion) in development grants to around 70 projects. A third call for large-scale projects launched in November 2022.

Modernisation Fund: Supports investments in ten lower-income Member States (Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia) aimed at modernizing energy systems, improving energy efficiency, and supporting a socially just transition to climate neutrality. It is one of the solidarity mechanisms of the EU ETS, which addresses Member States' different starting points.

The fund is capitalized through auctioning 2% of the cap for Phase 4 (2021-2030) and transfers of allowances from other EU ETS solidarity mechanisms. By 2030, it is expected to have raised around EUR 48.2 billion (USD 50.7 billion).

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 allowed. 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 applied 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 Plan. Unused entitlements were transferred to Phase 3 (2013-2020).

PHASE THREE (2013-2020):
QUALITATIVE LIMITS: Newly generated international credits (post-2012) 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 Gt CO_2e).

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

LINKS WITH OTHER SYSTEMS

As of 2020, the EU ETS and the Swiss ETS are linked. This means that allowances issued in one system can be surrendered for emissions generated in either of the two systems. The Linking Agreement between the EU and Switzerland sets out the conditions and requirements under which the two systems are linked. A direct link was created between the registries of both systems. It allows regulated entities to transfer allowances from an account in one system to an account in the other system. The transfers are planned, generally taking place twice a month.

COMPLIANCE

COMPLIANCE PERIOD

One calendar year: operators must submit an emission 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.

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 105.30), adjusted for inflation, 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.

MARKET REGULATION

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities and non-compliance entities.

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 are traded on the secondary markets, both on exchange and over the counter. Besides the EEX, futures are traded on ICE, ENDEX and Nazdaq.

LEGAL STATUS OF ALLOWANCES:

Directive 2014/65/EU classifies EU ETS emission allowances as financial instruments. The associated derivatives can hence be traded on secondary markets.

MARKET STABILTY PROVISIONS

BACKLOADING: As a short-term measure to address a growing surplus of allowances in the EU ETS, the auction of 900 million allowances was postponed from 2014-2016 to 2019-2020. The allowances were eventually placed in the Market Stability Reserve.

MARKET STABILITY RESERVE (MSR): The MSR was created in 2015 as a long-term measure to address a growing surplus of allowances in the EU ETS. It adjusts auction volumes according to pre-defined thresholds of the total number of allowances in circulation (TNAC), fostering balance in the EU carbon market and resilience to demand shocks. The reserve started operating in 2019.

Thresholds: The Commission publishes the TNAC communication in May each year.

- When the TNAC is above 833 million, 24% of its volume is withdrawn from future auctions and placed into the MSR over a period of 12 months.
- When the TNAC is less than 400 million allowances, 100 million allowances are released from the reserve and auctioned.

At the start of 2022, the MSR held 2,663 million allowances, with 348 million placed in the reserve between September 2022 and August 2023.

Swiss ETS 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 cancel allowances from their auction share if they take additional policy measures that result in a 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

European Commission: Authority responsible for establishing the regulatory framework of the EU ETS and implementing centralized administration of the system, e.g., the EU registry.
Competent authorities of all EU Member States as well as Iceland, Liechtenstein, and Norway: Implementing authorities, e.g., verifying compliance with MRV and surrender obligations.

EVALUATION/ETS REVIEW

The European Commission publishes annual reports on the functioning of the European carbon market (most recent being a **2022 report** on market functioning in 2021).

The Directive 2003/87/EU 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. With the more ambitious 2030 emissions reduction target, the European Commission is currently implementing a third major revision of the EU ETS.

In March 2022, the European Securities and Markets Authority (ESMA) published a **report** on emission allowances and associated derivatives, which analyzed trading behaviour on the EU carbon market. ESMA concluded that the market was functioning well and that the carbon price signal was in line with market fundamentals.

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.
- → **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).
- → **Consolidated Auctioning Regulation**: Commission Regulation 2019/1868 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).
- → All other legislation and documentation can be found **here**.

EUROPEAN UNION

EMISSIONS TRADING SYSTEM 2

- New ETS 2 starting in 2027 or 2028
- Covers emissions from fuels used in the buildings, road transport and certain industrial sectors
- Part of the revenues directed to the newly created Social Climate Fund

DESCRIPTION

In July 2021, the European Commission proposed the "Fit for 55%" package of reforms to align EU policy with the European Green Deal objectives, most importantly the more ambitious 2030 climate target of at least a 55% net emissions reduction compared to 1990. Among other things, the package included a proposal to extend emissions trading to new sectors.

In December 2022, the European Parliament and the Council of the EU agreed to establish a new ETS for emissions from fuels used in buildings, road transport and certain industrial sectors not already covered by the existing EU ETS. The agreement is now pending formal approval by the respective institutions.

This new ETS ("ETS 2") will complement Member States' efforts to reduce emissions in line with national targets under the "Effort Sharing Regulation" (Regulation (EU) 2018/842). It will be separate from the existing EU ETS for emissions from electricity and heat generation, industrial production, maritime transport and commercial aviation in the bloc.

The agreement provides that the ETS 2 will launch in 2027 or 2028. The start may be postponed by one year in the event of exceptionally high energy prices. The system will cover emissions upstream, thus regulating fuel suppliers rather than end-consumers. It will put an absolute cap on emissions, which will decrease in line with a linear reduction factor. Allowances will be distributed exclusively via auctioning. Auction volumes will be frontloaded in the first year to ensure a smooth start of the system. In addition, a market stability reserve will adjust the supply of allowances in support of market balance.

The ETS 2 will be introduced alongside a new Social Climate Fund. Part of the revenues raised will be directed to the Fund to support vulnerable households and micro-enterprises, with 25% co-financing from Member States.

In force

Under development[1]

Under consideration

SECTORS

INDUSTRY[2]

TRANSPORT

BUILDINGS

MEMBER STATES

All EU Member States, plus Iceland, Liechtenstein and Norway

1 Pending formal approval
2 Emissions not covered by the existing EU ETS

EMISSIONS & TARGETS OF THE EUROPEAN UNION

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	2,485.5	(75%)
Industrial processes	313.3	(10%)
Agriculture	382.1	(12%)
Waste	112.1	(3%)
Total (EU-27)	**3,293.1**	
Total (including Iceland, Liechtenstein, and Norway)	**3,347.1**	

Energy industries	779.8	(24%)
Manufacturing industries and construction	406.0	(12%)
Transport	721.1	(22%)
Commercial, institutional, and residential	434.2	(13%)
Other energy	144.7	(4%)

GHG REDUCTION TARGETS

By 2030: At least 55% below 1990 GHG levels

By 2050: Climate neutrality

OTHER INFORMATION

REGULATORY FRAMEWORK

- → Press releases from the **European Parliament** and **Council of the EU** on the reform of the EU ETS, including the creation of a new ETS 2.
- → **Draft text** of the reformed Directive 2003/87/EC and Decision (EU) 2015/1814 agreed on by the Committee of Permanent Representatives and the ENVI Committee of the European Parliament on 8 February 2023.

GERMANY

GERMAN NATIONAL EMISSIONS TRADING SYSTEM

- **German 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**
- **Coal-derived fuels included from 2023**

ETS DESCRIPTION

Germany launched its national ETS for heating and transport fuels in 2021. With the introduction of the ETS, a wide range of sectors in Germany are now subject to a carbon price.

The national ETS complements the EU ETS by covering all fuel emissions not covered by the bloc's system. It is phased in gradually, with an increasing fixed price per tonne of CO_2 from 2021 to 2025. In 2026, auctions with minimum and maximum prices will be introduced. All main fuel types (gasoline, diesel, heating oil, natural and liquid gases) were covered from the outset, while other fuels will gradually be phased in by 2024. During the fixed price and price corridor phases, the cap is flexible.

The national ETS was established through the 2019 "Fuel Emissions Trading Act" 2019, which was amended in 2022. It 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 aim for climate neutrality by 2045.

YEAR IN REVIEW

2022 marked the second year of operation of the German ETS. According to an evaluation report published in November, the system has been successfully implemented. As of October, 1,700 regulated entities and 500 intermediaries had opened a registry account. The first compliance period covering 2021 concluded in September, with a compliance rate of 98% in terms of surrendered allowances.

In November, the German Parliament adopted an amendment to the "Fuel Emissions Trading Act" to suspend the planned increase of the CO_2 price in 2023 in response to the energy crisis. The price increase of EUR 5 (USD 5.26) per tonne to reach EUR 35 (USD 36.84), which was due to take effect from January 2023, will now come into force from January 2024. The follow-up increases planned for 2024 and 2025 will also be postponed by one year. The postponement will not affect the start of the auctioning phase in 2026.

The amendment also delayed including fuels from waste incinerators in the ETS for one year, until January 2024. The inclusion of GHG emissions from the combustion of coal started as planned from January 2023.

In force

Under development

Under consideration

SECTORS

TRANSPORT

BUILDINGS

CAP

291.1 $MtCO_2$ (2022)

GREENHOUSE GASES

CO_2 only

ALLOCATION

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

AVERAGE 2022 ALLOWANCE PRICE

Fixed price: EUR 30 (USD 31.58)

TOTAL REVENUE

EUR 13.6 billion (USD 14.32 billion) since the beginning of the program

EUR 6.4 billion (USD 6.74 billion) in 2022[1]

1 Not including up to 10% late purchases of 2022 allowances in 2023.

EMISSIONS & TARGETS OF GERMANY

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	608.4	(83%)
Industrial processes	55.5	(8%)
Agriculture	56.1	(8%)
Waste	8.8	(1%)
Total	**728.7**	

Energy industries	212.5	(29%)
Manufacturing industries and construction	116.4	(16%)
Transport	147.2	(20%)
Commercial, institutional, and residential	118.6	(16%)
Other energy	13.7	(2%)

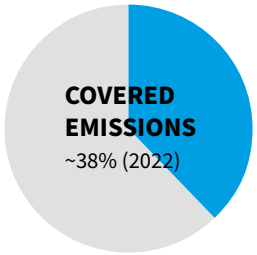
GHG REDUCTION TARGETS

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

ETS SIZE & PHASES

COVERED EMISSIONS

Verified ETS emissions
291.1 $MtCO_2$ (2022)



PHASES

PHASE ONE: 10 years (2021-2030)

CAP

PHASE ONE (2021-2030): 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). Given the recent revision of the ESR as part of the "Fit for 55" package, the German government will set a revised cap for the national ETS that decreases yearly in accordance with reduction targets.

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 German ETS exceed the cap, additional allowances will be available for compliance entities.

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 German ETS 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 system. 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 started with a limited scope in 2021 and 2022, including fuel oil, LPG, natural gas, gasoline, and diesel. Coal has been added in 2023. Fuels from waste incineration will be covered from 2024 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 German ETS 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 system 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 full compensation for the price that has been passed through.

POINT OF REGULATION

Upstream

NUMBER OF ENTITIES

1,700 (2022)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

PHASE ONE (2021-2030)

Fixed price phase (2021-2025): Allowances will be sold for a fixed price. The price increase for 2023 has been suspended and further increases have been postponed by one year as a response to the energy crisis. The new price schedule is as follows:

- **2021:** EUR 25 (USD 26.33)
- **2022:** EUR 30 (USD 31.59)
- **2023:** EUR 30 (USD 31.59)
- **2024:** EUR 35 (USD 36.86)
- **2025:** EUR 45 (USD 47.39)

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): The auctioning phase will start as planned in 2026, and a price corridor with a minimum price of EUR 55 (USD 57.92) and a maximum price of EUR 65 (USD 68.45) per tCO_2 will apply in 2026.

CARBON LEAKAGE RULES: The German ETS is accompanied by a compensation mechanism to avoid carbon leakage for emissions-intensive trade-exposed sectors. 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 German ETS 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 German ETS does not use free allocation, but compensation based on sectoral fuel benchmarks and fixed compensation levels.

USE OF REVENUES

All revenues from the national ETS go into the Government's "Climate and Transformation Fund" (KTF). The fund is used to support measures under the climate protection program such as GHG reduction programs, e.g. incentivizing climate-friendly transport and energy-efficient buildings, and direct assistance to industry or households, e.g., as a way to re-finance renewable energy subsidies and reduce the "Renewable Energy Surcharge" on electricity.

FLEXIBILITY & LINKING

BANKING AND BORROWING

While banking is not allowed during the fixed price phase, up to 10% of allowances of year x can be acquired at the price of year x until September of year x+1. Banking will be allowed in the auctioning phase.

OFFSETS AND CREDITS

No offsets are allowed in Phase 1.

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 was 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. As with the monitoring plan requirement, the verification requirement was 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 105.30) 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 German ETS's auction platform. During the fixed-price phase, allowances are issued at the predetermined price. Auctioning will only start in 2026.

Secondary: Allowances can be purchased on the secondary market throughout the year.

LEGAL STATUS OF ALLOWANCES: Allowances do not have the status of financial instruments or derivates according to the "German Banking Act" or 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 tonne of CO_2 of EUR 55 (USD 57.92) and a maximum price of EUR 65 (USD 68.45).

OTHER INFORMATION

INSTITUTIONS INVOLVED

German Federal Ministry for Economic Affairs and Climate Action (BMWK): Authority responsible for establishing the regulatory framework of the national ETS.
German Emissions Trading Authority (DEHSt) at the German Environment Agency (UBA): Implementing authority, e.g., responsible for the registry and receiving emission reports.

EVALUATION/ETS REVIEW

The German government published its first **evaluation report** in December 2022. It analyzes the program implementation, impacts, and assesses the inclusion of waste from 2024.

The next evaluation report will be published in 2024. From 2024 onwards, the German ETS will be evaluated every four years.

REGULATORY FRAMEWORK

- → **Fuel Emissions Trading Act**
- → **Emissions Reporting Regulation 2022**
- → **Fuel Emissions Trading Regulation**
- → **Carbon Leakage Regulation**

KAZAKHSTAN

KAZAKHSTAN EMISSIONS TRADING SYSTEM

- **Kazakhstan ETS moved into Phase 5**
- **Full transition to benchmarking in 2021**
- **Plans to introduction of auctioning**

ETS DESCRIPTION

Kazakhstan launched its ETS (KAZ ETS) in January 2013. It covered around half of Kazakhstan's emissions in 2020.

The KAZ ETS cap is formed bottom up and the system covers CO_2 emissions from 218 installations in the power sector, centralized heating, extracting industries, and manufacturing. Since 2021, all allowances have been allocated through benchmarking. There is no quantitative limit to the offset credits that covered entities can use for compliance. Domestic offset projects in all economic sectors, other than at installations covered by the ETS, can generate credits.

The groundwork for the ETS development was laid out in 2011 through amendments to Kazakhstan's existing environmental legislation. The system was suspended in 2016-2017 to tackle operational issues and reform allocation rules, although MRV obligations still applied.

YEAR IN REVIEW

In July, a new National Allocation Plan for 2022-2025 was approved, establishing a cap of 163.7 $MtCO_2$ for 2023.

In force

Under development

Under consideration

SECTORS

POWER, OIL & GAS

INDUSTRY

CAP

163.7 $MtCO_2$ (2023)

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

Domestic

ALLOCATION

Free Allocation: Benchmarking

AVERAGE 2022 ALLOWANCE PRICE

Average secondary market price: KZT 563 (USD 1.22)

EMISSIONS & TARGETS OF KAZAKHSTAN

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	272.5	(80%)
Industrial processes	22.3	(6%)
Agriculture	40.7	(12%)
Waste	7.4	(2%)
Total	**342.9**	

Energy industries	144.4	(42%)
Manufacturing industries and construction	25.1	(7%)
Transport	18.7	(6%)
Commercial, institutional, and residential	30.4	(9%)
Other energy	53.9	(16%)

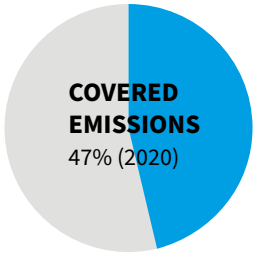
GHG REDUCTION TARGETS

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

Verified ETS emissions
160 $MtCO_2$ (2020)



PHASES

PHASE ONE: One year (2013)
PHASE TWO: Two years (2014-2015)
(2016-2017: System suspended)
PHASE THREE: Three years (2018-2020)
PHASE FOUR: One year (2021)
PHASE FIVE: Four years (2022-2025)

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.

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): 649.8 $MtCO_2$ for the overall period, with declining annual caps.
2023: 163.7 $MtCO_2$ (plus a reserve of 11.6 $MtCO_2$)
2024: 161.2 $MtCO_2$ (plus a reserve of 11.5 $MtCO_2$)
2025: 158.8 $MtCO_2$ (plus a reserve of 11.3 $MtCO_2$)

SECTORS AND THRESHOLDS

INCLUSION THRESHOLDS: Facilities emitting more than 20,000 tCO_2/year from the following sectors:
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.
PHASE THREE (2018-2020): Same as Phase 1 plus 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.

POINT OF REGULATION

Point source

NUMBER OF ENTITIES

132 companies (218 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.

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.

PHASE FOUR (2021): Benchmarking. A reserve contained 11.5 million allowances for the same purposes as in previous Phase.

PHASE FIVE (2022-2025): Benchmarking. A reserve contains 46.3 million allowances for new entrants, new stationary emission sources, changes in output and for auctioning.

FLEXIBILITY & LINKING

BANKING AND BORROWING

Banking is allowed within each phase, but not between phases. 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 installations covered by the ETS. Project applicants can submit their projects for consideration to the Ministry of Ecology 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 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 19,999 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 17,250/tCO_2 (USD 37.49) 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 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 and Natural Resources: Authority responsible for establishing the ETS regulatory framework.

JSC Zhasyl Damu: Implementing authority, responsible for the registry and reserve management.

REGULATORY FRAMEWORK

- → Environmental Code of the Republic of Kazakhstan (2007)
- → Environmental Code of the Republic of Kazakhstan (2021)
- → Rules of state regulation of emissions and absorption of GHG (2022)

MONTENEGRO

MONTENEGRO EMISSIONS TRADING SYSTEM

- **Implementing an ETS as part of the EU accession process**
- **ETS in force since February 2020**
- **Climate Law and ETS Decree currently under revision**

ETS DESCRIPTION

In December 2019, the "Law on Protection from the Negative Impacts of Climate Change" (Climate Law) 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 provides the legal basis for a national ETS covering emissions from the industry and power sectors.

A bylaw specific to the ETS, the "Decree on Activities for which a GHG Permit is Issued" (ETS Decree), was adopted in February 2020. This regulation determines sectoral coverage and inclusion thresholds, rules governing trading of permits, allocation rules for auctions, benchmarking and grandparenting, and a market stabilization reserve. It further includes provisions for banking allowances, a minimum reserve price of EUR 24 (USD 25.26), and a linear reduction factor for the emissions cap of 1.5% annually in the period 2020-2030. Auction revenues go to the country's 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 that began in late 2018. The establishment of a national ETS is a requirement to ensure that Montenegro has the climate policy framework in place to take part in the EU ETS should it become an EU member state.

The ETS formally began operations in February 2020 and applies in practice to three installations: the Pljevlja coal plant, the KAP aluminium plant and the Tosčelik steel mill. They received 100% of their allowances for free in 2020 and 2021, which represents 60% of total available allowances.

YEAR IN REVIEW

The operation of the Montenegro ETS was negatively affected by several changes of government throughout 2022, which caused major delays in the adoption of the yearly allocation plan. In addition, two of the three covered installations reduced or temporarily shut down their operations in response to rapidly rising energy prices.

The Montenegro government set up a working group in mid-2022 to review the country's climate legislation including the ETS. This work was still ongoing as of December 2022, with the adoption of the revised ETS Decree and Climate Law expected by April 2023. This will likely involve a revision of the ETS cap as well as the introduction of auctioning for 100% of allowances.

In force
Under development
Under consideration

SECTORS

POWER

INDUSTRY

CAP

3.2 $MtCO_2e$ (2022)

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

No offsets allowed

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking (for new installations)
Auctioning

EMISSIONS & TARGETS OF MONTENEGRO

GHG EMISSIONS (EXCL. LULUCF), 2019

(in $MtCO_2e$, share of total in %)

Energy	2.7	(75%)
Industrial processes	0.4	(10%)
Agriculture	0.3	(8%)
Waste	0.2	(7%)
Total	**3.6**	

Energy industries	1.5	(41%)
Manufacturing industries and construction	0.2	(6%)
Transport	0.9	(25%)
Other energy	0.1	(3%)

GHG REDUCTION TARGETS

By 2030: 55% below 1990 levels excl. LULUCF (NDC)
By 2050: Climate neutrality (aspirational, Sofia Declaration)

ETS SIZE & PHASES

CAP

2020: 3.3 $MtCO_2e$
2021: 3.3 $MtCO_2e$
2022: 3.2 $MtCO_2e$
Annual reduction factor: 1.5%

SECTORS AND THRESHOLDS

MANDATORY PARTICIPATION: Industries listed under Appendix 1 of the "Decree on Activities for which a GHG Permit is Issued" must participate in the ETS. These include power plants, oil refineries, coke production, the production or processing of iron and steel, non-ferrous metals, cement clinker, glass, ceramic products, and paper (pulp).

INCLUSION THRESHOLDS:

- Power plants with a capacity in excess of 20 MW
- Installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting, with a capacity exceeding 2.5 tonnes per hour
- Installations for the production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or lime in rotary kilns with a production capacity exceeding 50 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day
- Installations for the manufacture of glass including glass fibre with a melting capacity exceeding 20 tonnes per day
- Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain, with a production capacity exceeding 75 tonnes per day, and/or with a kiln capacity exceeding 4 m^3 and with a setting density per kiln exceeding 300 kg/m^3

POINT OF REGULATION

Point source

NUMBER OF ENTITIES

3 (2022)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

2020-2022: Free allocation of allowances
2023: The government appointed the auctioning committee in December 2022 and auctioning was scheduled for January 2023.

USE OF REVENUES

Auction revenues go to the country's Environmental Protection Fund ("Eko Fond") to finance climate innovation, renewable energy, and environmental protection.

COMPLIANCE

COMPLIANCE PERIOD

One calendar year

MRV

MONITORING: The regulated entity is obliged to submit, together with the permit application, a plan for monitoring GHG emissions from the installation. The content of the Monitoring Plan, the procedures, processes and the methodology for monitoring GHG emissions are laid down by the bylaws. The entity is also obliged to improve the methodology for monitoring GHG emissions and amend the Monitoring Plan on the request of the administration authority, the Environmental Protection Agency (EPA).

REPORTING: Regulated entities are obliged to submit a verified report on GHG emissions to the EPA by 31 March for the previous year.

If the regulated entity fails to submit the verified report, the EPA makes a conservative estimate of the level of GHG emissions. The costs of making the estimate are to be paid by the regulated entity.

The form and content of the report, procedures and the method of making a conservative estimate are prescribed by the bylaws.

VERIFICATION: Verification of the GHG reports may be performed only by an accredited legal entity that fulfils the requirements regarding personnel and equipment for report verification.

ENFORCEMENT

Penalties as stipulated by the Climate Law range from EUR 2,000 (USD 2,105) to EUR 40,000 (USD 42,105) and can be imposed against legal entities and responsible natural persons in the legal entity.

MARKET REGULATION

MARKET DESIGN

MARKET PARTICIPATION: Due to the very small size of the Montenegro ETS, participation of intermediaries is not possible. There is no established secondary market, allocation and auctioning of allowances are organized by the government. However, the covered entities can trade allowances among themselves.

OTHER INFORMATION

INSTITUTIONS INVOLVED

Ministry of Ecology, Spatial planning and Urbanism: Responsible for environmental and climate policy, including the national ETS
Environmental Protection Agency (EPA): Responsible for allowance issuance and monitoring of verification reports

REGULATORY FRAMEWORK

→ Decree on Activities for which a GHG Permit is Issued (2020)
→ Law on Protection from the Negative Impacts of Climate Change (2019)

SAKHALIN

In force

Under development

Under consideration

- **Mandate and regulatory framework elements for pilot carbon trading system in place**
- **Cap setting and allocation to be carried out in 2023**
- **First compliance period to start in 2024**

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. 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 the facility level and in Russian regions.

YEAR IN REVIEW

In March, a "Federal Law on Conducting an Experiment to Limit GHG Emissions in Selected Federal States of the Russian Federation" was approved in its final reading by the State Duma, introducing mandatory emissions reporting and verification requirements for regulated entities and obliging them to comply with the allocated emissions allowances. The law also sets a legal basis for "allowances circulation" between entities. The Sakhalin pilot as a mandatory GHG regulation scheme was mandated to launch on 1 September but the start has been delayed pending cap setting and allowance allocation processes. The scope of the experiment can be extended to other federal states of Russian Federation by introducing changes to the respective federal law.

A list of 50 regulated entities, emitting at least 20,000 tCO_2 per year, was approved by the Sakhalin government and a carbon registry started operating in test mode in September. GHG emissions for 2021 were calculated centrally, based on the firms' production levels which were used to determine entities to be regulated. MRV obligations for entities start from the year they are assigned as "regulated", meaning that 2022 will be the first year the abovementioned 50 regulated firms are to submit their verified emission reports. Penalty for not complying with the individual allocated caps is set at RUB 1,000 per tonne of tCO_2e (USD 14.82). The allowance allocation process is to be carried out in 2023 based on 2022 verified emissions and should be accompanied by stakeholder consultations[1].

1 Order of the Ministry of Economic Development no. 452 from 24.08.2022 „On approval of the methodology for determining projected GHG emissions caps within the experiment on limiting GHG emissions in regions of the Russian Federation".

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)

ETS SIZE & PHASES

NUMBER OF ENTITIES

50 regulated entities

SECTORS AND THRESHOLDS

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

OTHER INFORMATION

INSTITUTIONS INVOLVED

Russian Ministry of Economic Development: Coordinator of the Sakhalin pilot

Government of Sakhalin Region: Implements Sakhalin pilot, in close coordination with Ministry of Economic Development

JSC Kontur: An operator of Russian national carbon registry

REGULATORY FRAMEWORK

- → Federal Law on Limiting Greenhouse Gas Emissions
- → Federal Law on Conducting an Experiment on Limiting Greenhouse Gas Emissions in Selected Federal States of the Russian Federation
- → Order of the Ministry of Economic Development on approval of the methodology for determining projected GHG emissions caps within the experiment on limiting of GHG emissions in regions of the Russian Federation

SWITZERLAND

SWITZERLAND EMISSIONS TRADING SYSTEM

- **Entered a new 10-year trading phase in 2021**
- **Linked with the EU ETS since January 2020**
- **Aligned allocation benchmarks with EU ETS**

ETS DESCRIPTION

The Switzerland (Swiss) ETS started in 2008 with a five-year voluntary phase. Thereafter, participation was mandatory for large, energy-intensive entities and voluntary for medium-sized entities. The Swiss ETS covered about 12% of the country's total GHG emissions in 2020. Participants in the ETS are exempt from the national CO_2 levy.

The Swiss ETS covers electricity generation, industrial entities (largely comprising companies from the cement, chemicals, pharmaceuticals, paper, refining, and steel sectors), domestic aviation, flights to the European Economic Area, and from 2023 flights to the UK. Allowances are allocated through benchmarking and auctioning. The same benchmarks as in the EU ETS apply to entities covered by the Swiss ETS. Auctioning volumes may be reduced if the total number of allowances in circulation exceeds a certain threshold.

The system is mandated by the Federal Act on the Reduction of CO_2 Emissions ("CO_2 Act") and regulated through an implementing regulation ("CO_2 Ordinance"). The Swiss ETS has been linked with the EU ETS since January 2020.

YEAR IN REVIEW

After a revision of the CO_2 Act failed to pass a referendum in June 2021, the Swiss Parliament extended the current CO_2 Act to 2024. This included the climate target to reduce emissions by 1.5% per year compared to 1990 levels. In November, the Swiss Federal Council published a new proposal for a revision of the CO_2 Act that covers the period from 2025 to 2030 and hence Switzerland's 50% emission reduction target for 2030. The law is currently being debated in Parliament.

2022 saw the introduction of a market stability mechanism that reduces auction volumes by 50% if the quantity of emissions allowances in circulation exceeds 50% of the cap for installations of the previous year. With 4.3 million allowances in circulation and a 2021 cap of 4.7 million, the conditions were met to reduce the volume of allowances to be auctioned in 2022 from 460,000 to 230,000. Of these, 110,000 were auctioned, with an additional 302,700 allowances auctioned from the 2021 cap.

In force
Under development
Under consideration

SECTORS

POWER
INDUSTRY
AVIATION

CAP

4.5 $MtCO_2e$ (2023, power and industry)
1.2 $MtCO_2e$ (2023, aviation)

GREENHOUSE GASES

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

OFFSETS AND CREDITS

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

ALLOCATION

Free Allocation: Benchmarking
Auctioning

AVERAGE ALLOWANCE PRICE IN 2022

Average auction price: EUR 76.49 (USD 80.55)

TOTAL REVENUE

EUR 99.3 million (USD 104.6 million) since the beginning of the program
EUR 43.6 million (USD 45.9 million) in 2022

1 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.

EMISSIONS & TARGETS OF SWITZERLAND

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	32.7	(76%)
Industrial processes	4.3	(10%)
Agriculture	5.8	(13%)
Waste	0.7	(2%)
Total	**43.4**	

Energy industries	3.3	(8%)
Manufacturing industries and construction	4.5	(10%)
Transport	13.6	(31%)
Commercial, institutional, and residential	10.4	(24%)
Other energy	0.9	(2%)

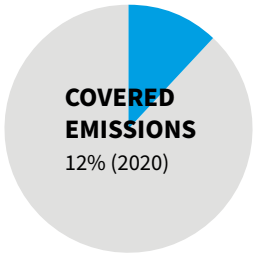
GHG REDUCTION TARGETS

From 2021 to 2030: On average 35% reduction from 1990 GHG levels (NDC and draft CO_2 Act)
By 2025: Anticipated 35% reduction from 1990 GHG levels (NDC)
By 2030: At least 50% reduction from 1990 GHG levels (NDC and draft CO_2 Act)
By 2050: Net-zero GHG emissions (aspirational; NDC)

ETS SIZE & PHASES

COVERED EMISSIONS

Verified ETS emissions
5.5 $MtCO_2e$ (2020)



PHASES

VOLUNTARY PHASE: 5 years (2008-2012)
SECOND TRADING PERIOD: 8 years (2013-2020)
THIRD TRADING PERIOD: 10 years (2021-2030)

CAP

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

SECOND TRADING PERIOD (2013-2020):
Stationary installations: Overall top-down cap of 5.6 $MtCO_2e$ (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 caps for stationary installations and aviation amounted to 4.6 and 1.0 $MtCO_2$, respectively, in 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, such as 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 in 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 within the following six months.

POSSIBLE OPT-OUT: Industries with a total rated thermal input greater than 20 MW, but emissions below 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 the ETS starting from 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

Point source

NUMBER OF ENTITIES

Stationary installations: 95 (2021)
Aircraft operators: 148 (2021)

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, these entities received 80% of their allowances for free, which was reduced to 30% by 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 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 are 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: As of 2022, the Swiss ETS applies the same allocation benchmarks as the EU ETS. 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 accrue to the general budget of the federal government.

FLEXIBILITY & LINKING

BANKING AND BORROWING

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

Valid certificates from the UNFCCC flexible mechanisms (Certified Emission Reductions and Emission Reduction Units) from the 2008-2012 phase could be banked into the second trading period and surrendered until April 2015.

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 Clean Development Mechanism (CDM) projects in least-developed countries were allowed. Credits from CDM and Joint Implementation 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 system was set at 11% of average emissions allowances allocated in the voluntary phase (2008-2012), minus offset credits used in that same time period, multiplied by five.

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%.

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 Registry in order to participate. Allowance transfers between the EU and Swiss registries are generally executed twice a week (Tuesday and Thursday).

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 (no later than three months after the registration deadline. Monitoring plans must be approved by a competent authority.

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 131.63/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, non-compliance entities (domestic and international) and individuals. 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: Swiss allowances are not traded on regulated trading platforms but may be traded over the counter. EU ETS allowances, which can be used for compliance in the Swiss ETS, are traded on multiple exchanges, including ICE Futures and EEX.

LEGAL STATUS OF ALLOWANCES:

Allowances do not qualify as financial instruments under Swiss financial market regulations. 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 quantity of emissions allowances in circulation exceed a certain threshold. If the number of allowances in circulation exceeds 50% of the cap of the previous year, the market stability mechanism reduces the auction volume of the current year by 50%. In 2022, the market stability mechanism reduced the auction volume from 460,000 to 230,000 allowances.

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): Implementing authority, e.g., responsible for the registry, for auctioning allowances, and receiving emission reports.

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 lifetime of 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 popular vote 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 that covers the period from 2025 to 2030 was published by the Federal Council in November 2022 and is currently being debated in Parliament. 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 (CO_2 Act)**
→ **Draft for a CO_2 Act revision**
→ **Ordinance on the Reduction of CO_2 Emissions (CO_2 Ordinance)**

TÜRKİYE

- **Announced updated NDC during COP27**
- **Recommendation of Climate Council for ETS launch adopted in Medium Term Programme (2023-2025)**
- **Partnership for Market Implementation Türkiye program planned to begin in 2023**

In force

Under development

Under consideration

DESCRIPTION

Türkiye has been preparing for the possible use of carbon pricing instruments to help achieve its mitigation targets for several years. It ratified the Paris Agreement in 2021 and announced a new target at COP27 as part of its updated NDC, which increases the 2030 emissions reduction target from 21% of BAU emissions to 41%. Currently under development, the new Climate Law will create the legal basis for the main features of a future ETS.

In February 2022, Türkiye organised its first Climate Council meeting.[1] The Council's seven sub-commissions adopted 217 advisory decisions with participation by public and private institutions as well as NGOs. The Council recommended the launch of a pilot ETS in 2024 to align the development of a national ETS in Türkiye with the country's 2053 net zero target. The Council also recommended that future allowance auction revenues be devoted to green transformation. These recommendations were reflected in Türkiye's "Medium Term Programme (2023-2025)", which was approved by the President and published in the Official Gazette in September.[2]

A comprehensive mandatory MRV system at installation level has been in place since 2015. Following the end of World Bank's Partnership for Market Readiness (PMR) program, Türkiye is participating in its successor program, the Partnership for Market Implementation (PMI), from 2023. Under the PMI, a pilot phase of the ETS will be implemented and supplementary technical studies undertaken to inform policy decisions.

Türkiye is a candidate for EU accession and thus aims to complete the environmental obligations for membership. As a part of this process, Türkiye is planning to commence an Instrument for Pre-Accession Assistance (IPA III) project in 2024 for the transposition of the EU ETS legislation into secondary legislation which will define national ETS' technical features.

1 See **https://iklimsurasi.gov.tr/en/**
2 See **https://www.resmigazete.gov.tr/eskiler/2022/09/20220904M1-1.pdf**

EMISSIONS & TARGETS OF TÜRKİYE

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	367.6	(70%)
Industrial processes	66.8	(13%)
Agriculture	73.2	(14%)
Waste	16.4	(3%)
Total	**523.9**	

Energy industries	142.9	(27%)
Manufacturing industries and construction	60.1	(11%)
Transport	80.7	(15%)
Commercial, institutional, and residential	64.0	(12%)
Other energy	19.9	(4%)

GHG REDUCTION TARGETS

By 2030: Up to 41% reduction from the BAU scenario (announced as a part of the updated NDC)
By 2053: Net-zero GHG emissions

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 Agency is the institution that accredits the verifiers.

FRAMEWORK: The Turkish MRV legislation (mainly based on the EU system) establishes an installation-level system for CO_2 emissions for approximately 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 2015-2021 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 (MoEUCC): Ministry responsible for climate change policies as established and mandated by **Presidential Decree** in 2021.

Directorate of Climate Change: **Directorate** under the MoEUCC for determining policies, strategies and actions (including those related to carbon pricing and ETS) at national and international level within the scope of Türkiye's efforts to combat and adapt to climate change, conducting negotiation processes, and ensuring coordination with relevant institutions and organizations.

UNITED KINGDOM

UK EMISSIONS TRADING SCHEME

- **Completed a consultation on making the cap consistent with the UK's net-zero target**
- **Legislated for operational improvements to enter into force from 2023**
- **Reached agreement with Switzerland to include flights between the two countries in their respective ETSs**

ETS DESCRIPTION

The UK Emissions Trading Scheme (UK ETS) began operating in January 2021, following the departure of the UK (excluding power operators located in Northern Ireland) from the EU ETS. Verified emissions from stationary UK ETS operators currently cover around a quarter of the UK's territorial GHG emissions. The first phase of the UK ETS runs until 2030.

The UK ETS covers around 1,000 entities in the power and industrial sectors, as well as aviation within the UK and flights departing the UK to Switzerland and the European Economic Area (EEA). Allowances are primarily allocated through auctioning, with a portion freely allocated to safeguard the competitiveness of emissions-intensive trade-exposed (EITE) sectors and minimize the risk of carbon leakage. The system has both a cost containment mechanism (CCM) and auction reserve price, to support market stability.

The scheme is due to be reviewed in 2023 and 2028, with ongoing reforms and developments of specific elements in the meantime. The UK government remains open to the possibility of linking the UK ETS to other systems, if such a link would be advantageous for both systems.

YEAR IN REVIEW

The year began with the CCM being triggered, with an announcement in mid-January that no market intervention would be made. There was no further triggering of the CCM, although allowance prices were generally higher than in 2021.

In March, the UK launched a major consultation on reforming the ETS. The UK ETS Authority proposed to align the ETS trajectory with its net-zero target by rebasing the cap in 2024, alongside a suggestion to reset the share of free allocations available in light of this change. The consultation also sought views on expanding the ETS scope to cover emissions from domestic maritime, waste incineration, and energy from waste. The consultation addressed the integration of GHG removals into the scheme, amending rules for the aviation sector, and further development of market design.

In August, an initial response to the consultation was published, outlining changes to be implemented from 2023. These included covering emissions from flights departing the UK for Switzerland, amending free allocation for 2022 to reflect activity level changes in 2020 caused by the COVID-19 pandemic, and minor amendments to MRV provisions. A full response to the consultation is expected in 2023.

The UK government will launch a consultation in spring 2023 to explore policies that could potentially mitigate future risk of carbon leakage, including measures such as product standards and a carbon border adjustment mechanism (CBAM).

In force
Under development
Under consideration

SECTORS

POWER

INDUSTRY

DOMESTIC AVIATION

CAP

147.2 $MtCO_2e$ (2023)

GREENHOUSE GASES

CO_2, N_2O, PFCs

ALLOCATION

Free Allocation: Benchmarking
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average auction price: GBP 75.42 (USD 92.96)

TOTAL REVENUE

GBP 10.4 billion (USD 12.9 billion) since beginning of scheme
GBP 6.1 billion (USD 7.6 billion) in 2022

EMISSIONS & TARGETS OF THE UNITED KINGDOM

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	312.3	(77%)
Industrial processes	34.9	(9%)
Agriculture	40.7	(10%)
Waste	17.9	(4%)
Total	**405.8**[1]	

Energy industries	77	(19%)
Manufacturing industries and construction	39	(10%)
Transport	97	(24%)
Commercial, institutional, and residential	84	(21%)
Other energy	15	(3%)

GHG REDUCTION TARGETS

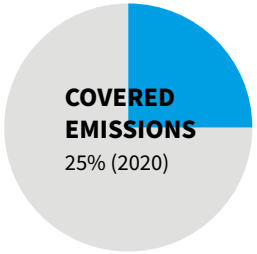
By 2030: At least a 68% reduction in UK net GHG emissions from 1990 levels, including emissions from LULUCF (UK NDC, December 2020)

By 2035: Limit UK net GHG emissions to 965 $MtCO_2e$ over 2033-2037, representing ~77% reduction on 1990 levels, 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

Verified ETS emissions
102.6 $MtCO_2e$ (2020)



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 $MtCO_2e$, 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 2023 is 147.2 $MtCO_2e$ and will decline by 4.2 $MtCO_2e$ each year, which is a ~2.8% reduction in 2023. Allowances for the New Entrants' Reserve (NER) are part of the overall cap.

In March 2022, the UK launched a consultation on reforming the ETS, including on aligning the cap trajectory with the UK's net-zero emissions target. A decision on changes to the cap is expected in 2023.

SECTORS AND THRESHOLDS

POWER SECTOR AND 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 per tCO_2 (USD 22.22) for power generators using fossil fuels. The CPS will continue to support the decarbonization of the power sector and will stay in place at least until unabated coal-fired power generation is phased out. The government has committed to end the use of unabated coal by 2024.

Small Emitter and Hospital Opt-Out Scheme: Hospitals and small emitters with emissions 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 tCO_2. From January 2023, flights from Great Britain to Switzerland (and vice versa) have also been included in the scope of the UK ETS.

ADDITIONAL SECTORS: The 2022 consultation on reforming the UK ETS sought views on expanding the scheme to emissions from domestic maritime (by the mid-2020s), waste incineration and energy from waste (by the mid- to late-2020s).

1 Includes Northern Ireland and UK overseas territories and crown dependencies.

POINT OF REGULATION
Point source

NUMBER OF ENTITIES
1,006 entities (2021)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION
AUCTIONING: Auctioning is the primary means of allowance allocation in the UK ETS. Auctions have a GBP 22 (USD 27.16) transitional Auction Reserve Price (ARP), below which allowances will not be sold. The 2022 consultation on UK ETS reforms sought views on the timeline to withdraw the ARP and whether it should be replaced by another mechanism. 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 allowances originally intended for sale at those auctions. 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.

In 2022, around 81 million allowances were allocated through auctioning, raising GBP 6.1 billion (USD 7.6 billion). As set out in the auction calendar, around 79 million UK Allowances (UKAs) will be sold in 2023.

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 used in Phase 4 of the EU ETS. Historical activity levels are based on data collected under the EU ETS.

There is a maximum number of allowances allocated for free (the "industry cap"). This was set at around 58 million allowances in 2021 (~37% of the 2021 cap) and declines by 1.6 million allowances per year. If the total amount of free allocation exceeds the industry cap for a particular year, unallocated allowances from the industry cap from the previous year, as well as allowances from a flexible reserve, can be used. As a last resort, a cross-sectoral correction factor would be applied to ensure a uniform reduction across eligible participants.

An initial allocation table, which lists the volume of free allowances for each installation for the first allocation period, was published in May 2021. Eligible installations 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 historical activity levels (calculated based on the previous two years' activity levels), their free allocation will be recalculated.

A review of free allocation started with a call for evidence in spring 2021 and continued in 2022 as part of the consultation on developing the UK ETS, which addressed resetting the industry cap in the context of a net-zero consistent cap and proposals on technical changes to free allocations. The review will continue in 2023 with a second phase focusing on the free allocation methodology and better targeting support for those sectors most at risk of carbon leakage.

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. The number of free allowances for new entrants is determined based on their activity in the first year of operation, the industry benchmark, and CLEF.

USE OF REVENUES
Revenues from UK ETS auctions accrue to the general budget and are not earmarked.

FLEXIBILITY & LINKING

BANKING AND BORROWING
Banking of allowances is permitted, and allowances remain valid in future years of the scheme.

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 surplus allowances from the EU ETS for compliance with the UK ETS.

OFFSETS AND CREDITS
The use of offsets for compliance is not permitted at this time. The UK is considering introducing GHG removals in the UK ETS to be used for compliance within the scheme, and a call for evidence on this issue closed in June 2022. The UK is also considering how the UK ETS should interact with the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

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 tCO_2e emitted without surrendering a permit. This penalty is equal to GBP 100 per tCO_2e (USD 123.46) 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: The majority of allowances are allocated through auctioning. Auctions are held every two weeks, with dates and allowance amounts set out in the auction calendar. Compliance entities, financial institutions, and business groupings and public bodies acting on behalf of compliance entities can participate. Auctions are managed by ICE Futures Europe.

Secondary: UKAs are traded on the ICE Futures Europe exchange. Contracts for daily futures, futures and options on futures contracts are available. Participants in the secondary market must meet the requirements of the ICE Futures Exchange and have an account in the UK registry. Participants may also trade allowances over the counter.

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. 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 'Allowance Allocation' section).

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; auctioning up to 25% of remaining allowances in the NER; or auctioning allowances left unallocated from the industry cap in a given year.

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 year, the CCM was triggered if, for three consecutive months, the UK ETS carbon price was double the average allowance price in effect in the UK in the two preceding years. From February 2022, the CCM was triggered if the allowance price was 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 is 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. The 2022 consultation on UK ETS reforms sought views on the timeline to withdraw the ARP and whether it should be replaced by another mechanism.

OTHER INFORMATION

INSTITUTIONS INVOLVED

UK ETS Authority: Overall responsibility for designing and implementing the UK ETS. It is composed of the representatives of the UK Government, Scottish Government, Welsh Government, and the Department of Agriculture, Environment and Rural Affairs of Northern Ireland.
National Regulators (Environment Agency; Scottish Environment Protection Agency; Natural Resources Body for Wales; Northern Ireland Environment Agency): Responsible for enforcing compliance with the UK ETS Regulations. The Environment Agency serves as the registry administrator and is responsible for the management of accounts in the UK Emissions Trading Registry.

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 is in the process of reviewing free allocation for stationary installations and aviation and changes required to align with CORSIA.

REGULATORY FRAMEWORK

→ **The Greenhouse Gas Emissions Trading Scheme Order 2020**
→ **The Climate Change Act 2008 (2050 Target Amendment) Order 2019**

UKRAINE

- **First monitoring reports submitted in 2022 following the MRV law introduction in 2021**
- **Data from the operation of the MRV system will provide the basis for an ETS**
- **Stakeholder engagement process took place**

In force

Under development

Under consideration

DESCRIPTION

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, the MRV procedures as adopted in the framework law on MRV be applied by regulated installations.

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 may be launched in 2025.

By the end of March 2022, covered installations were supposed to submit first monitoring reports for 2021 but the requirement was temporarily suspended in 2022 due to the Russian war of aggression against the country. Draft instruments for cap setting and allowances allocation were developed, and a stakeholder engagement process was carried out. Next steps comprise development and adoption of an ETS law, as well as legislation on cap setting and allocation plan development, which are conditional to the war ending and receiving complete MRV data for 2022-2023.

EMISSIONS & TARGETS OF UKRAINE

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	208.0	(65%)
Industrial processes	56.1	(18%)
Agriculture	41.6	(13%)
Waste	12.0	(4%)
Total	**317.7**	

Energy industries	86.4	(27%)
Manufacturing industries and construction	19.8	(6%)
Transport	31.8	(10%)
Commercial, institutional, and residential	18.7	(6%)
Other energy	51.3	(16%)

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: Competent authority for implementing the MRV law and the upcoming ETS.

National Accreditation Agency of Ukraine: Accredits third-party verifiers.

State Ecological Inspection of Ukraine: Controlling compliance with MRV requirements.

REGULATORY FRAMEWORK

→ **Law on the principles of monitoring, reporting and verification of greenhouse gas emissions (MRV law)**

→ **Association Agreement between the European Union and its Member States, of the one part, and Ukraine, of the other part**

CALIFORNIA

CALIFORNIA CAP-AND-TRADE PROGRAM

- **Broadest carbon pricing system in the US and one of the largest carbon markets in the world**
- **Continued linkage with Québec**
- **Public consultation process will begin in 2023 to consider potential program updates**

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. The program covers ~75% of the state's GHG emissions.

The program covers ~400 facilities and emissions from the power, industrial, transport, and buildings sectors. Allowances are distributed via a combination of auctioning, free allocation, and free allocation with consignment. The proceeds from auctioning are reinvested in projects that reduce emissions, strengthening the economy, public health, and the environment, especially in disadvantaged communities.

The California Cap-and-Trade Program is implemented under the authority of the California Air Resources Board (CARB). California has been part of the Western Climate Initiative (WCI) since 2007 and formally linked its program with Québec's in January 2014.

YEAR IN REVIEW

In May, after over a year of public consultation, CARB presented its "Draft 2022 Scoping Plan Update", a document that is updated every five years and sets out the strategy to meet California's emissions reduction targets. The "2022 Scoping Plan" identified a technologically feasible and cost-effective pathway to achieving carbon neutrality by 2045. After continued public consultation over the summer, the "Final 2022 Scoping Plan" published in November projected a 48% reduction of emissions below 1990 levels in 2030, which exceeds the statutory 40% reduction target. The Final 2022 Scoping Plan was adopted by the CARB Board in December.

Considering the new modeling results, new legislation, and the need to accelerate the 2030 emissions reductions target, CARB stated in the Final 2022 Scoping Plan that it would evaluate all major programs, including the Cap-and-Trade Program, to assess the need to increase their stringency between now and 2030. CARB will report to the state legislature by the end of 2023 on any potential program changes to help achieve the accelerated 2030 target and carbon neutrality no later than 2045.

In force
Under development
Under consideration

SECTORS

POWER
INDUSTRY
BUILDINGS
TRANSPORT

CAP

294.1 $MtCO_2e$ (2023)

GREENHOUSE GASES

CO_2, CH_4, N_2O, SF_6, HFCs, PFCs, NF_3, and other fluorinated GHGs[1]

OFFSETS AND CREDITS

Domestic[2]

ALLOCATION

Free Allocation: Benchmarking
Free Allocation with Consignment
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average auction price: USD 28.08[3]

TOTAL REVENUE

USD 22.25 billion since beginning of program
USD 4.03 billion in 2022[4]

1 Compliance obligations are currently only assessed on emissions of CO_2, CH_4, and N_2O
2 California's Cap-and-Trade Program allows the use of offsets issued by linked jurisdictions (i.e., Québec).
3 Includes settlement prices of both current and future vintage allowances, and excludes consigned allowances.
4 Does not include revenue from the auction of consigned allowances.

EMISSIONS & TARGETS OF CALIFORNIA

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	293.7	(80%)
Industrial processes	33.8	(9%)
Agriculture, forestry and other land use[5]	30.8	(8%)
Waste	10.9	(3%)
Total	**369.2**	

Energy industries	96.4	(26%)
Manufacturing industries and construction	13.4	(4%)
Transport	136.9	(37%)
Commercial, institutional, and residential	35.9	(10%)
Other energy	11	(3%)

GHG REDUCTION TARGETS

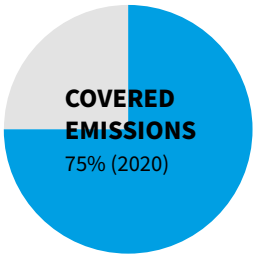
By 2030: 40% reduction from 1990 GHG levels (SB 32)

By 2045: Carbon neutrality and an 85% reduction from 1990 anthropogenic GHG levels (AB 1279)

ETS SIZE & PHASES

COVERED EMISSIONS

Verified ETS emissions 278.7 $MtCO_2e$ (2020)



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 ~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 2021-2030 period, the cap declines by about 13.4 MtCO2e each year, averaging ~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. All electricity imported from specified sources connected to a specific generator with emissions over 25,000 tCO_2e per year is covered. All emissions reported for imported electricity from unspecified sources are considered to be above the threshold and are covered using a default emissions factor.

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. Opt-in entities are subject to all reporting, verification, enforcement, registration, and compliance obligations applicable to covered entities.

POINT OF REGULATION

Upstream (buildings and transport); point source (industry, in-state power generation); imported electricity at the point of first delivery onto California's electricity grid.

NUMBER OF ENTITIES

~400 facilities[5]

5 ~300 registered covered/opt-in entities. These entities represent ~400 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 made in 2013 delayed these assistance factor declines by one compliance period. Pursuant to AB 398 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 electric utilities must use the allowance value for ratepayer benefit and for GHG 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 electric utilities can choose to consign freely allocated allowances to auction or use them for their own compliance needs.

AUCTIONING: In 2022, ~65% of total California-issued vintage 2022 allowances were made available through auction, which included allowances owned by CARB (~38%) and allowances consigned to auction by utilities (~27%).

Unsold allowances in past auctions are gradually 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 these 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 funds are then distributed as California Climate Investments, which support projects that deliver significant environmental, economic, and public health benefits across the state. As of May 2022, USD 11.4 billion has been invested in over 560,000 projects, with expected GHG reductions of 79 $MtCO_2e$. Over USD 5.4 billion has reached disadvantaged and low-income communities.

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 GHG 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 is based on the year's cap and decreases annually. Entities may also be eligible for a limited exemption from the holding limit based on their emissions levels to support meeting 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, offset credits originating from projects carried out according to one of six compliance offset protocols are accepted as compliance units:

- 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 (i.e., Québec) are eligible to be used to satisfy a California entity's compliance obligation, subject to the quantitative limits 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 emissions, before increasing to 6% for 2026-2030 emissions.

In addition to setting new quantitative limits on the use of offsets, AB 398 set new limits on the types of offset credits that can be used to fulfil compliance obligations. Starting with compliance obligations for 2021 emissions, no more than 50% of any entity's offset usage 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 water flowing through the state. Recent regulatory amendments specify the criteria used for determining DEBS.

LINKS WITH OTHER SYSTEMS

California's program 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 1 November (or the first business day thereafter). Compliance instruments equal to all remaining emissions must be surrendered by 1 November (or the first business day thereafter) of the year following the last year of a compliance period.

MRV

REPORTING FREQUENCY: Annually

VERIFICATION: Emissions data reports and their underlying data require annual verification by an independent third-party 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 reported data.

ENFORCEMENT

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

Failure to meet this untimely surrender obligation 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. Additional eligibility criteria apply, including for individual market participants.

MARKET TYPES:
Primary: Allowances are made available through a sealed-bid auctions. State-owned and consigned allowances are offered through quarterly allowance auctions organized jointly with Québec. Auctions are administered by WCI, Inc.

Secondary: Allowances, offsets, and financial derivatives are traded in the secondary market on the Intercontinental Exchange (ICE), CME group, and Nodal Exchange platforms. Any company qualified to access these platforms 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: Allowances are defined as limited tradable authorizations to emit up to one tCO_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 22.21 per allowance in 2023. The auction reserve price increases annually by 5% plus inflation, as measured by the Consumer Price Index.

RESERVE: Some 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 were 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 had been transferred into the APCR (about 37 million to date), have been placed into the price ceiling. In addition, the Cap-and-Trade Regulation also set aside portions of annual 2021-2030 allowance caps for the two lower price tiers.

Although no reserve sale has been held to date, CARB will offer one if 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 allowances (or, if no allowances remain, "price ceiling units") up to the amount of its current unfulfilled emissions obligation. The revenues from the sale of price ceiling units will be used to purchase real, permanent, quantifiable, verifiable, enforceable, and additional emissions reductions on at least a tonne for tonne basis. Sales at the price ceiling will only be conducted if no allowances remain at the two lower reserve 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 2023, the two cost containment reserve tiers and the price ceiling are set at USD 51.92, USD 66.71 and USD 81.50, respectively. Tier prices and the price ceiling increase by 5% plus inflation (as measured by the Consumer Price Index).

OTHER INFORMATION

INSTITUTIONS INVOLVED

California Air Resources Board: Responsible for the design and implementation of the Cap-and-Trade Program.
Western Climate Initiative, Inc.: Non-profit organization that provides cost-effective administrative and technical solutions for supporting the coordinated development and implementation of participating jurisdictions' GHG emissions trading programs, such as administering auctions and maintaining the system registry.

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 to different programs in the state's portfolio approach to climate mitigation.

REGULATORY FRAMEWORK

→ **Global Warming Solutions Act of 2006 (AB 32)**
→ **AB 398**
→ **2018 amendments to the 2021-2030 period**
→ Current regulation can be found on the **CARB website**

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**

DESCRIPTION

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 the 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 may 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 emissions sources. According to the updated benchmark, at a minimum, carbon pricing should apply to an equivalent percentage of GHG emissions from combustion sources as would be covered by the federal backstop system in the jurisdiction, and industrial trading systems should apply to industrial process emissions.

To contribute to Canada's national targets, the benchmark requires systems to increase in stringency. The initial benchmark went from CAD 10 (USD 7.69) per tCO_2e in 2018 to CAD 50 (USD 38.46) in 2022. In August 2021, the Canadian government issued an update to the "Pan-Canadian Approach to Pricing Carbon Pollution" (the federal benchmark) for 2023-2030, with the benchmark in 2023 increasing by CAD 15 (USD 11.54) each year, to reach CAD 170 (USD 130.77) in 2030. The legislated benchmark for 2023 has been set as follows:

Explicit price-based systems must have a minimum carbon price of CAD 65 (USD 50) in 2023.

Cap-and-trade systems must have annually declining caps to at least 2030 that correspond, at minimum, to the projected emissions levels that would result from the application of the minimum national carbon pollution price that year in explicit price-based systems.

FEDERAL CARBON POLLUTION PRICING "BACKSTOP" SYSTEM: The federal carbon pollution pricing "backstop" system applies in jurisdictions that request it or that do not implement systems that meet the federal benchmark.

The "Greenhouse Gas Pollution Pricing Act" (GGPPA), adopted in 2018, establishes the framework for the federal backstop system, which comprises 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 (USD 15.39) per tCO_2e in 2019 and increased annually by CAD 10 (USD 7.69), until it reached CAD 50 (USD 38.46) per tCO_2e in 2022. The updated fuel charge starts at CAD 65 (USD 50) from April 2023, increasing by CAD 15 (USD 11.54) each year until it reaches CAD 170 (USD 130.77) in 2030.

→ A performance-based system for industries, known as the **federal Output-Based Pricing System (OBPS)**. This system is designed to maintain the carbon price signal for industrial emitters to reduce their GHG emissions, while mitigating the risk of carbon leakage and competitiveness impacts.

The OBPS applies to facilities in the emissions-intensive and trade-exposed industrial and electricity sectors that emit equal to or more than 50,000 tCO_2e. Smaller facilities with annual emissions equal to or more than 10,000 tCO_2e 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 this standard. Those 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.

For provinces that voluntarily opt for the federal system, all proceeds from the federal fuel charge and the federal OBPS are returned directly to the jurisdiction of origin for use according to their needs. 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 (particularly vulnerable) households and supporting affected sectors. In other provinces where the federal system applies, approximately 90% of proceeds from the federal fuel charge are returned directly to households through federal Climate Action Incentive payments. The remaining proceeds are used to support small businesses, farmers, and Indigenous groups. Proceeds from the OBPS in these jurisdictions are returned to the provinces or territories through the OBPS Proceeds Fund to support low-carbon technology.

Recent developments: All Canadian provinces and territories had until September 2022 to either request the federal carbon pollution pricing system or propose their own plan for a carbon pricing system for 2023-2030 that meets the updated benchmark criteria. Systems that have been approved by the federal government will remain in place until at least the end of 2026 for OBPS approaches and until the end of March 2027 for carbon levies; 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. The federal government will review carbon pricing programs by 2026 to ensure that they still meet the federal benchmark requirements for 2027-2030. An interim review of the federal benchmark will also be undertaken by 2026.

Pricing policies across Canada from 2023: The Canadian government has confirmed that the proposed changes to carbon pollution pricing systems in the following provinces/territories **fully meet** federal benchmark stringency requirements from 2023 onwards (note that some jurisdictions are still finalizing changes to system designs which are therefore subject to change):

- British Columbia: carbon tax;
- New Brunswick: carbon levy and provincial OBPS;
- Northwest Territories: territorial carbon tax;
- Québec: cap-and-trade system, linked to California.

In the following provinces, the **federal backstop applies or will apply in part:**

- Alberta: federal fuel charge and provincial OBPS (Alberta's TIER [Technology Innovation and Emissions Reductions Regulation]-system for large industrial emitters);
- Newfoundland and Labrador: federal fuel charge (will take effect from July 2023) and provincial OBPS;
- Nova Scotia: federal fuel charge (will take effect from July 2023) and provincial OBPS (from 2023, but the preceding cap-and-trade system will still see two auctions in 2023 due to the December 2023 compliance deadline);
- Ontario: federal fuel charge and provincial OBPS (Ontario's EPS [Emissions Performance Standards]-system for large industrial emitters);
- Saskatchewan: federal fuel charge and provincial OBPS (which will be expanded to retroactively cover all industrial sectors as of January 2023).

The **federal backstop is or will be fully in place** in:

- Manitoba: federal OBPS and federal fuel charge apply;
- Yukon and Nunavut: federal OBPS and federal fuel charge apply; and
- Prince Edward Island: federal OBPS applies in the province; federal fuel charge will take effect from July 2023.

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

EMISSIONS & TARGETS OF CANADA

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	539.5	(80%)
Industrial processes	50.3	(7%)
Agriculture	55.2	(8%)
Waste	27.3	(4%)
Total	**672.4**	

Energy industries	177.0	(26%)
Manufacturing industries and construction	59.7	(9%)
Transport	159.6	(24%)
Commercial, institutional, and residential	78.4	(12%)
Other energy	64.8	(10%)

GHG REDUCTION TARGETS

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

By 2050: Climate neutrality (Canadian Net-Zero Emissions Accountability Act)

OTHER INFORMATION

INSTITUTIONS INVOLVED

Environment and Climate Change Canada: Responsible for the design, coordination, implementation and monitoring of Canada's climate action plans and targets, and the implementation of the federal carbon pollution pricing backstop system; specifically the federal carbon pricing system for industry (the OBPS), in provinces and territories where it applies.

Finance Canada: Responsible for the federal fuel charge (administered by the Canada Revenue Agency) and for processing the Climate Action Incentive payments.

Canadian provinces and territories: Responsible for the design and implementation of their own provincial carbon pricing systems.

EVALUATION/ETS REVIEW

In 2020-2021, a review of carbon pricing systems in Canada was undertaken, resulting in the strengthened federal benchmark for 2023-2030. By 2026, an interim review of the benchmark will take place to ensure that the existing benchmark criteria are still sufficient. The federal government will involve provinces, territories and Indigenous organizations in the review process.

→ **Pan-Canadian Approach to Pricing Carbon Pollution – Interim Report 2020**
→ **Greenhouse Gas Pollution Pricing Act Annual Report for 2020**
→ **Pan-Canadian Framework on Clean Growth and Climate Change: annual reports**

REGULATORY FRAMEWORK

→ **Pan-Canadian Framework on Clean Growth and Climate Change**
→ **A Healthy Environment and a Healthy Economy**
→ **Update to the Pan-Canadian Approach to Carbon Pollution Pricing 2023-2030**
→ **Output-Based Pricing System Regulations**
→ **Greenhouse Gas Pollution Pricing Act**
→ **Net-Zero Emissions Accountability Act**

MASSACHUSETTS

MASSACHUSETTS LIMITS ON EMISSIONS FROM ELECTRICITY GENERATORS

- **Complements RGGI to help ensure that Massachusetts achieves its mandatory mitigation targets**
- **Four years of full compliance from all regulated entities**
- **Began auctioning future year vintage allowances in 2022**

ETS DESCRIPTION

The Massachusetts Limits on Emissions from Electricity Generators (regulation "310 CMR 7.74") began operating in 2018. It covers around 8% of the state's CO_2 emissions, all from the power sector.

Since 2021, 100% of allowances are allocated in quarterly auctions. The revenues raised are used to further reduce GHG emissions, as well as to fund adaptation programs and projects targeting communities adversely impacted by air pollution. A third party monitors the market to identify indications of anti-competitive behavior.

The program complements RGGI: electricity generators in the state must comply (i.e. hold and surrender allowances) with both RGGI and the Massachusetts program. The program was implemented in response to a 2016 ruling from the state's Supreme Court to ensure that Massachusetts achieves its mandatory mitigation targets.

YEAR IN REVIEW

As a result of the review of the "310 CMR 7.74" regulation by the end of 2021, the Massachusetts Department of Environmental Protection (MassDEP) started auctioning future vintage allowances in June, followed by a second sale in September. In each of the auctions, MassDEP offered almost 400,000 2023-vintage allowances, equivalent to 5% of the 2023 cap.

The March auction saw the price of 2022 allowances drop to the reserve price of USD 0.50 per allowance, down from the USD 9.75 settlement in the December 2021 auction. Prices rebounded to USD 9.75 and USD 14.73 in the June and September auctions, respectively. Prices for 2023 allowances went up from USD 4 in the June auction to USD 7.51 in September's.

In force
Under development
Under consideration

SECTORS

POWER

CAP

7.8 $MtCO_2$ (2023)

GREENHOUSE GASES

CO_2 only

ALLOCATION

Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average auction price: USD 8.17
Average secondary market price: USD 8.10

TOTAL REVENUE

USD 125.2 million since the beginning of the program
USD 53.8 million in 2022

EMISSIONS & TARGETS OF MASSACHUSETTS

GHG EMISSIONS (EXCL. LULUCF), 2019

(in $MtCO_2e$, share of total in %)

Energy	67.5	(94%)
Industrial processes	3.1	(4%)
Agriculture and land use	0.3	(0%)
Waste	0.7	(1%)
Total	**71.7**	

Building consumption[1]	25.3	(35%)
Electricity consumption[1]	10.7	(15%)
Mobile combustion[1]	30.8	(43%)
Natural gas systems	0.7	(1%)

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

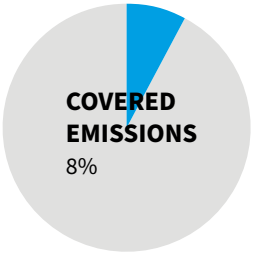
COVERED EMISSIONS

Verified ETS emissions

5.8 $MtCO_2$ (2019)

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 $MtCO_2$
2023: 7.8 $MtCO_2$

SECTORS AND THRESHOLDS

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

POINT OF REGULATION

Point source

NUMBER OF ENTITIES

25 (2022)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

AUCTIONING: From 2019 onwards, allowances were partially auctioned, with 25% sold in 2019 and 50% in 2020. Full auctioning began in 2021. Currently, auctions take place on a quarterly basis. The results are included in market monitoring reports posted on the program's web page. From 2022, MassDEP offers future vintage allowances at every auction.

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.

1 CO_2e from fossil fuel combustion

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. This 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. Allowances for those emissions must be surrendered on a two-for-one basis in the following year. An emergency is defined as "a period during when the regional transmission 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: Restricted to compliance entities.

MARKET TYPES:

Primary: The allowance auctions use a sealed bid, uniform price auction format. No bidder can purchase more than 33% of the allowances offered for sale in any one auction. Auctions are managed by Enel X.

Secondary: Compliance entities may transfer allowances to other compliance entities 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.

LEGAL STATUS OF ALLOWANCES: Allowances constitute a "limited authorization to emit one metric ton of CO_2" to comply with the regulation. They are not property rights.

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: Cabinet-level office that oversees MassDEP.
Massachusetts Department of Environmental Protection: Regulatory agency implementing the Massachusetts Limits on Emissions from Electricity Generators (regulation "310 CMR 7.74").
Potomac Economics: Current market monitor. monitors the conduct of market participants in the auctions and in the secondary market to identify indications of anti-competitive conduct
Enel X: Manages the auctions.
APX: Maintains allowance tracking software platform.

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)

NEW YORK CITY

- **Study confirms feasibility of a NYC trading program for large buildings**
- **Proposed rules include emissions limits for buildings through to 2050 and offset use**
- **Proposed rules do not provide for allowance trading**

In force

Under development

Under consideration

DESCRIPTION

In 2019, the City Council passed the “Climate Mobilization Act” as part of New York City’s Green New Deal. "Local Law 97" (LL97), one part of the Act, 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 are liable for a civil penalty equal to USD 268 per metric ton of CO_2e in excess of their cap. Buildings where 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, the NYC Mayor’s Office of Sustainability (MOS) published the results of a study assessing the feasibility of a citywide trading program 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 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.

In October 2022, the NYC Department of Buildings (DOB) released the Proposed Rules for LL97, including building emissions limits to 2050 and rules for building owners to offset their annual emissions through the purchase of renewable energy credits (RECs). The draft provisions do not include regulation for trading of compliance instruments or allowances between covered entities. The DOB will continue developing regulation through 2023, before compliance obligations take effect in 2024.

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

OTHER INFORMATION

INSTITUTIONS INVOLVED

NYC Mayor's Office of Climate & Environmental Justice: Authority responsible for implementing policies that close the gap on environmental and health disparities; conducted a study on the feasibility of a citywide trading scheme for GHG emissions from buildings; coordinates with the DOB in the promulgation of rules for the implementation of the cap on GHG emissions from buildings.
NYC Department of Buildings (DOB): Authority responsible for overseeing implementation of energy and emissions performance laws and policies for buildings, monitoring buildings emissions limits, goals, and timeframes.

REGULATORY FRAMEWORK

→ **Local Law 97**
→ **Climate Mobilization Act**

NEW YORK STATE

- **Governor Hochul committed New York to implement an economy-wide cap-and-invest program to help meet New York's statutory statewide emission limits**
- **Department of Environmental Conservation to promulgate regulations as outlined in Scoping Plan by 1 January 2024**

DESCRIPTION

In 2019, the "Climate Leadership and Community Protection Act" (Climate Act) enshrined in law a net zero emissions target for New York State. The Act called for the issuance of a Scoping Plan under the direction of a 22-member Climate Action Council (Council) by 1 January 2023. The Scoping Plan, which serves as a roadmap for the Department of Environmental Conservation (DEC) to implement climate regulations in the State, includes the recommendation to implement an economy-wide cap-and-invest program. Governor Hochul has directed the DEC and the New York State Energy Research and Development Authority to develop the ETS to meet five core principles: affordability, climate leadership, creating jobs and preserving competitiveness, investing in disadvantaged communities, and funding a sustainable future.

As proposed, the program will cover all emitting sectors under an enforceable cap. The cap will decrease over time, with the caps for 2030 and 2050 corresponding to statewide emission limits. Source categories not subject to compliance obligations (due to federal constraints, consistency with the Regional Greenhouse Gas Initiative [RGGI], or other considerations) will be monitored with the purpose of removing these emissions from the statewide cap through the retirement of allowances.

Transport and heating will be regulated upstream, with fuel producers and fuel distributors subject to compliance obligations equal to the carbon content of their fuels. The industry, waste, and power sectors will be regulated at point source. In the case of the power sector, the program will be structured to reflect that these sources are already subject to the RGGI.

Allowances will mostly be allocated through auctioning. However, a direct allocation mechanism for qualifying sources in energy-intensive and trade-exposed industries will be put in place, to mitigate the risk of economic or carbon leakage. Limited banking may be allowed, and offsets will have no role in the program. The program is to be designed for the possibility of linkage with other ETS.

Auction revenues will be used in accordance with the Climate Act and any subsequent legislation, with a focus on investing in emissions reduction strategies and clean energy. At least 35% of the revenues will be directed to investments that benefit disadvantaged communities. Separately, a portion of the revenues will be directed to a universal Climate Action Rebate to mitigate any increased energy prices for households. The program will also include cost-containment mechanisms.

Implementation is underway as the DEC has until 1 January 2024 to promulgate regulations to meet the Climate Act's statewide GHG emission limits.

EMISSIONS & TARGETS OF NEW YORK STATE

GHG EMISSIONS (EXCL. LULUCF), 2019

(in $MtCO_2e$, share of total in %)

Energy	164.8	(85%)
Industrial processes and product use	11.6	(6%)
Agriculture, forestry, and other land use	7.8	(4%)
Waste	10.5	(5%)
Total	**194.7**	

Energy industries	21.7	(11%)
Manufacturing industries and construction	7.4	(4%)
Transport	72.3	(37%)
Commercial, institutional, and residential	58.1	(30%)
Other energy	5.3	(3%)

GHG REDUCTION TARGETS

By 2030: 40% reduction from 1990 levels

By 2040: 100% emissions-free power sector

By 2050: 85% reduction from 1990 levels and climate neutrality (Climate Act)

OTHER INFORMATION

INSTITUTIONS INVOLVED

Climate Action Council: Public body tasked with developing a Scoping Plan to serve as the framework for how the state will reduce GHG emissions and achieve the Statewide GHG emission limit requirements and net-zero target in the Climate Act.

Department of Environmental Conservation (DEC): Agency responsible for state programs designed to protect and enhance the environment; leads the development of regulations required to achieve the goals of the Climate Act.

New York State Energy Research and Development Authority (NYSERDA): Public benefit corporation providing information and analysis, innovative programs, technical expertise, and support to increase energy efficiency, use renewable energy, and reduce reliance on fossil fuels in New York.

REGULATORY FRAMEWORK

→ **Final Scoping Plan**

→ **The Climate Leadership and Community Protection Act**

NORTH CAROLINA

In force

Under development

Under consideration

- **Clean Energy Plan targets GHG emission reductions in the power sector**
- **Rulemaking process underway to establish an ETS consistent with Regional Greenhouse Gas Initiative Model Rule**
- **Developing plan to reduce CO_2 emissions from state's largest investor-owned utilities**

DESCRIPTION

In 2019, North Carolina's Department of Environmental Quality (DEQ) released the "Clean Energy Plan" (CEP), which outlined policy recommendations to reach the state's GHG reduction targets of 40% below 2005 levels by 2025 (as specified by "Executive Order No. 80") and 50% by 2030 (as specified by "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.

In July 2021, in response to a third-party petition, North Carolina's Environmental Management Commission (EMC) instructed the DEQ to start a rulemaking process to establish an ETS which would enable the state to participate in RGGI.

In October 2021, North Carolina passed House Bill (HB) 951 (Session Law 2021-165) which requires the North Carolina Utilities Commission (NCUC) to develop a plan that takes all reasonable steps to reduce CO_2 emissions from the state's largest investor-owned utilities – Duke Energy Carolinas and Duke Energy Progress – by 70% by 2030, compared with 2005 levels, and achieve carbon neutrality by 2050. The resulting "Carbon Plan" was adopted in December 2022 and includes a series of measures addressed at the utilities to achieve these goals.

YEAR IN REVIEW

At an EMC Air Quality Committee meeting in July, the DEQ provided information on how the proposed North Carolina regulation to become a participating state in RGGI deviates from the existing RGGI Model Rule. The North Carolina regulation would cover industrial units, regardless of grid connectivity, as well as emissions from biomass/biofuel, such that biomass emissions would not be deductible from the compliance obligation of regulated entities. It would adopt consignment auctions, would not accept offset project applications, and would have a steeper annual decline in the CO_2 budget to achieve the state's 70% reduction target.

Because the Carbon Plan is required by state law, it must be included in the baseline for analyzing future CO_2 reduction policies in the state. Therefore, consideration of the RGGI rule by the EMC has been delayed to 2023.

EMISSIONS & TARGETS OF NORTH CAROLINA

GHG EMISSIONS (EXCL. LULUCF), 2018

(in $MtCO_2e$, share of total in %)

Energy	132.3	(82%)
Industrial processes	7.7	(5%)
Agriculture	10.5	(7%)
Waste	8.9	(6%)
Total	**159.5**	

Electricity generation and use	52.3	(33%)
Transportation	57.3	(36%)
Residential, Commercial and Industrial combustion	21.3	(13%)
Natural gas systems	1.4	(1%)

GHG REDUCTION TARGETS

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

By 2030: 50% reduction of total emissions ("Executive Order No. 246") and 70% of State's investor-owned electric utilities emissions compared to 2005 (Session Law 2021-165)

By 2050: Achieve overall statewide net-zero emissions ("Executive Order No. 246") and State's largest investor-owned electric utilities achieve carbon neutrality (Session Law 2021-165)

REGULATORY FRAMEWORK

- → Executive Order No. 80
- → Clean Energy Plan
- → HB 951 (Session Law 2021-165)
- → Executive Order No. 246

OTHER INFORMATION

INSTITUTIONS INVOLVED

North Carolina Department of Environmental Quality: Government agency in charge of the protection of North Carolina's environmental resources. Would be the body in charge of the administration and implementation of the CO_2 Budget Trading Program.

Environmental Management Commission: Body responsible for adopting rules for the protection, preservation and enhancement of the state's air and water resources. This body would be in charge of adopting the CO_2 Budget Trading Program.

North Carolina Utilities Commission: An agency of the State of North Carolina created by the General Assembly to regulate the rates and services of public utilities in North Carolina. Responsible for developing and implementing the Carbon Plan.

NOVA SCOTIA

NOVA SCOTIA CAP-AND-TRADE

- **Two auctions held in 2022**
- **In place until end of compliance period in December 2023**
- **Being replaced by a provincial output-based pricing system**

ETS DESCRIPTION

Nova Scotia's cap-and-trade program began operating in 2019. The program covers more than 80% of GHG emissions in the province. It was established to meet the federal benchmark (see "Canada" factsheet), but it is now being phased out and replaced by an output-based pricing system (OBPS), which was approved by the Canadian federal government in November 2022. The current cap-and-trade system will officially end after the scheduled compliance deadline in December 2023, with at least two more auctions scheduled for 2023.

The cap-and-trade program currently covers 26 participants in the power, industrial, buildings, and transportation sectors. Allocation of allowances is done through auctioning and free allocation, using both grandparenting and benchmarking. The first compliance period covered the years 2019-2022.

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 other jurisdictions.

YEAR IN REVIEW

In 2022, Nova Scotia held two auctions. The minimum price was set at CAD 22.92 (USD 17.63). In June, 816,000 allowances were on offer and included 2019, 2020, and 2021 vintage allowances. The auction cleared almost 75% above the floor price at CAD 40 (USD 30.77), with all allowances on offer sold. In December, 686,000 allowances were on offer, which cleared at CAD 28.25 (USD 21.73), 23% above the 2022 auction reserve price. All allowances on offer were sold.

In October 2022, Nova Scotia's government submitted a plan to replace the province's cap-and-trade system with an OBPS. This plan has been approved by the federal government. 2023 will be a transition period: the cap-and-trade system will officially end after the scheduled compliance deadline in December 2023 with at least two more auctions scheduled for 2023. At the same time, the province's OBPS began in January 2023.

Furthermore, Nova Scotia released a climate change plan in December 2022, detailing how the 2030 emissions target will be achieved and setting the course for 2050.

In force
Under development
Under consideration

SECTORS

POWER
BUILDINGS
INDUSTRY
TRANSPORT

CAP

12.1 $MtCO_2e$ (2022)

GREENHOUSE GASES

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

OFFSETS AND CREDITS

Domestic
International

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average (weighted) auction price: CAD 34.63 (USD 26.64)

TOTAL REVENUE

CAD 125.6 million (USD 75.7 million) since beginning of program
CAD 52.0 million (USD 40 million) in 2022

EMISSIONS & TARGETS OF NOVA SCOTIA

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	13.2	(90%)
Industrial processes	0.5	(3%)
Agriculture	0.3	(2%)
Waste	0.6	(4%)
Total	**14.6**	

Energy industries	6.4	(44%)
Manufacturing industries and construction	0.3	(2%)
Transport	4.7	(32%)
Commercial, institutional, and residential	1.8	(12%)
Other energy	0.1	(1%)

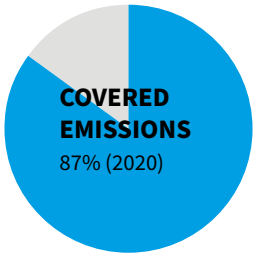
GHG REDUCTION TARGETS

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

Verified ETS emissions
12.7 $MtCO_2e$ (2020)



PHASES

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

CAP

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 power sectors, as well as fuel suppliers.

INCLUSION THRESHOLDS: For the industrial and power sectors, facilities generating ≥50,000 tCO_2e/year. Power 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

Upstream (buildings and transport); point source (industry, power, fuel combustion of coal); mixed for fuel combustion of natural gas (59% point source, 41% upstream), gasoline (7% point source, 93% upstream), diesel (38% point source, 62% upstream) and LPG (30% point source, 70% upstream).

NUMBER OF ENTITIES

26 entities (December 2022)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

FREE ALLOCATION: Each year within the compliance period, free allowances are transferred to the program participants' accounts. The number 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% are provided in the following year with production-level adjustments after the submission of a verified emissions report.

The benchmark is based on historical facility emissions intensity, an assistance factor that varies between 1 for cement and 0.9 (90%) for pulp and paper as well as natural gas processing (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 approximately 90% of BAU projections (established by the regulator) for GHG emissions from the power 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: Nova Scotia holds two to four auctions per calendar year. Two auctions were held in 2022, in June and December.

Minimum price: CAD 22.92 (USD 17.63) for auctions held in 2022; 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 revenues from allowances sold on consignment is returned to the participants.
(2) Purchase limits to secure market functioning, as outlined above.

USE OF REVENUES

A Green Fund was established in 2019 to receive and distribute revenues from the program. In 2020-2021, CAD 28.8 million (USD 22.2 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 2021-2022, CAD 36.5 million (USD 28.1 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 nor borrowing across compliance periods.

OFFSETS AND CREDITS

Nova Scotia's cap-and-trade legislation includes the possibility for an offset system, but no system has been introduced.

LINKS WITH OTHER SYSTEMS

Nova Scotia is not linked with any other jurisdiction.

COMPLIANCE

COMPLIANCE PERIOD

Four years (2019-2022) to provide year-to-year flexibility (see 'ETS Size and Phases' section).
The compliance deadline is 15 December of the following year.

By December 2023, entities must true-up and surrender one allowance for each tonne of CO_2e 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 are subject to financial penalties under the "Environment Act". All revenue from fines go into the Nova Scotia Green Fund.

MARKET REGULATION

MARKET PARTICIPATION: Compliance entities (for inclusion thresholds see 'Sectors and Thresholds' section.)

MARKET TYPES:
Primary: Nova Scotia 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 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' section). 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 the 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 38.46) in 2020, rising 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: Authority responsible for establishing the regulatory framework and implementing the cap-and-trade program in Nova Scotia.
Western Climate Initiative, Inc.: Non-profit organization which provides the IT system to manage and track the cap-and-trade system in Nova Scotia.

EVALUATION/ETS REVIEW

Annual reports on the program are published by the Nova Scotia Environment and Climate Change.

REGULATORY FRAMEWORK

→ Nova Scotia's Cap and Trade Program Regulatory Framework
→ Cap-and-Trade Program Regulations, Section 112Q of the Environment Act
→ Quantification, Reporting, and Verification of Greenhouse Gas Emissions Regulations

OREGON

CLIMATE PROTECTION PROGRAM

- **First compliance period began in 2022 and runs until 2024**
- **Trading functionality for covered entities launched in September**
- **From 2023, the use of domestic Community Climate Investment credits for compliance is allowed**

ETS DESCRIPTION

The Oregon Climate Protection Program (CPP) was adopted in December 2021 to reduce GHGs in Oregon over the following 30 years. The CPP sets an overall cap on regulated emissions for covered fuel suppliers each year. The cap currently amounts to ~40% of the state's emissions and is reduced each year, to reach 90% below 2017-2019 emissions levels by 2050.

The program establishes a limit on emissions from natural gas utilities, also referred to as 'local distribution companies' and non-natural gas fuel suppliers. Based on their historical emissions, covered entities receive yearly allowances, or 'compliance instruments', for free. Regulated companies can use additional compliance credits sourced from within the state to comply with up to 10% of their emissions obligations. Over time, this limit will increase to 20%. Compliance periods last for three years, with the first covering 2022-2024.

YEAR IN REVIEW

The first compliance period for the CPP began in 2022 and includes calendar years 2022, 2023, and 2024. The 2023 annual cap is 28.1 $MtCO_2e$, based on average 2017-2019 reported emissions.

In March, the Department of Environmental Quality (DEQ) distributed allowances to the 18 covered fuel suppliers that are currently subject to the CPP. Oregon's three natural gas utilities received 7.2 million allowances, based on a fixed amount of the cap established in the program rules; covered fuel suppliers that are not natural gas utilities received 20.4 million allowances, an amount proportionate to their share of covered and biofuel emissions.

In September, DEQ launched a voluntary trading platform as well as the forms needed for trading between covered fuel suppliers.

In December, DEQ selected members for the Equity Advisory Committee, an active partner in reviewing and recommending projects and priorities for Community Climate Investments (CCIs) while ensuring that the program is meeting goals set for equitable outcomes in prioritizing environmental justice communities.

In force
Under development
Under consideration

SECTORS

POWER
INDUSTRY
TRANSPORT
BUILDINGS

CAP

28 $MtCO_2e$ (2023)

GREENHOUSE GASES

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

OFFSETS AND CREDITS

Domestic[1]

ALLOCATION

Free Allocation: Grandparenting

1 Within the state of Oregon.

EMISSIONS & TARGETS OF OREGON

GHG EMISSIONS (EXCL. LULUCF), 2021

(in $MtCO_2e$, share of total in %)

Electricity use	18	(29%)
Natural gas use	7	(11%)
Agriculture	7	(11%)
Transport	22	(36%)
Other residential and commercial	4	(7%)
Other industrials	4	(7%)
Total	**62**	

GHG REDUCTION TARGETS

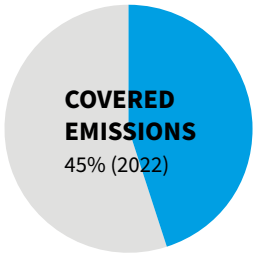
By 2050: Reduce GHG levels at least 75% below 1990 levels (Chapter 907 Oregon Laws 2007)

ETS SIZE & PHASES

COVERED EMISSIONS

Covered emissions under the cap

28 $MtCO_2e$ (2022)



PHASES

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

First Compliance Period: 28.2 $MtCO_2e$ (2022-2024)
Second Compliance Period: 25.7 $MtCO_2e$ (2025-2027)
Third Compliance Period: 23 $MtCO_2e$ (2028-2030)
Fourth Compliance Period: 19.9 $MtCO_2e$ (2031-2033)

The annual cap on emissions from covered fuel suppliers was determined using historical emissions. The 2022 cap was informed by the 2017-2019 average of covered emissions. The cap reduces by 50% by 2035 and 90% by 2050. By 2035, the cap will decline to 15 $MtCO_2e$ and by 2050 to 3 $MtCO_2e$. DEQ adjusts the cap as it lowers the threshold for inclusion, bringing a greater portion of the fuels sector into the program.

SECTORS AND THRESHOLDS

INCLUSION THRESHOLDS

The program does not cover emissions coming from biomass derived fuels. The program covers two types of fuel suppliers:

- Local distribution companies, also known as natural gas utilities, 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, excluding aviation fuels, based on the thresholds below.

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.

POINT OF REGULATION

Upstream

NUMBER OF ENTITIES

Suppliers of liquid fuels and propane: 15
Local distribution companies: 3

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

DEQ generates compliance instruments in amounts equal to each annual emissions cap and distributes 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 compliance instruments reduces at the same rate as the cap, ~4% each year during the first compliance period.
- Suppliers of liquid fuels and propane receive instruments proportionate to their share of 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 are held in a reserve for new entrants and for liquid fuel suppliers that do not have three years of emissions data to calculate the correct proportion of their emissions.

FLEXIBILITY & LINKING

BANKING AND BORROWING

Covered fuel suppliers may bank compliance instruments indefinitely. Banking limitations apply for CCIs (for only two compliance periods). Borrowing from future compliance periods is not allowed.

OFFSETS AND CREDITS

Covered suppliers may cover a percentage of their compliance obligations with CCI credits, earned by contributing funds to DEQ-approved non-profit entities which implement community projects that reduce anthropogenic GHG emissions in Oregon. Investments are prioritized for projects that are located in or benefit environmental justice communities. Overall, the CCI program is tasked with reducing on average one tonne CO_2e per credit awarded.

Once DEQ-approved CCI entities are selected and have completed a contract with DEQ, covered fuel suppliers can receive CCI credits from DEQ after making a verifiable contribution to an approved CCI entity. CCI entities must be a non-profit organization, but subcontractors need not be. The Equity Advisory Committee helps to ensure the program generates equitable outcomes and benefits communities overburdened by pollution and climate change and have historically been marginalized (see 'Institutions Involved' section).

The contribution amount to earn one CCI credit begins at USD 107 (2021 dollars) in 2023, adjusted for inflation. This contribution amount increases by USD 1 (2021 dollars), adjusted for inflation, every March.

CCI credits are cancelled if not used for two consecutive compliance periods. CCI credits cannot be traded.

QUANTITATIVE LIMITS:

First Compliance Period (2022-2024): 10% of the compliance obligation may be covered with CCI credits

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

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

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

- Reducing emissions by at least one tonne CO_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 (November 2025 for the first compliance period), covered fuel suppliers must demonstrate compliance for the total emissions by surrendering an equivalent number of compliance instruments and/or CCI credits, subject to the limits above, as their covered emissions.

MRV

REPORTING FREQUENCY: Covered entities are subject to the detailed emission reporting requirements established by the state's GHG emissions reporting program. This emissions data is used to implement the program, including calculations of covered emissions and compliance obligations and determining compliance instrument distribution.

Covered fuel suppliers are required to provide certain information about compliance instrument trading, including but not limited to, the number of instruments traded, the agreed upon date of the trade(s), and the total price per compliance instrument (USD). Trades may only be reported to DEQ after it has made the compliance instrument trade form available. Additionally, covered entities must retain records related to each trade for a minimum of seven years following the submission date of the trade form.

VERIFICATION: Covered entities are subject to third-party verification of calculations of covered emissions, compliance obligations, and distribution of compliance instruments.

ENFORCEMENT

DEQ's enforcement provisions and civil penalties include significant penalties for failing to comply with the program. In addition to failure to comply, covered entities can face financial penalties for providing untrue, inaccurate, or incomplete information when reporting, applying, or providing information to the DEQ under the CPP.

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

Failing to demonstrate compliance is a Class I air quality violation. Each tonne of CO_2e of a compliance obligation not covered by a corresponding compliance instrument or CCI credit is considered a separate violation.

MARKET REGULATION

MARKET DESIGN

MARKET PARTICIPATION: Only compliance entities may hold and trade allowances.

MARKET TYPES:

Primary: Compliance instruments are distributed for free by DEQ.

Secondary: Covered entities may only trade compliance instruments with other covered entities. Trading must be notified to DEQ, and both parties must sign and submit a compliance instrument trade form.

LEGAL STATUS OF ALLOWANCES:

A compliance instrument is a regulatory instrument and does not constitute personal property, a security, or any other form of property.

MARKET STABILTY PROVISIONS

RESERVE FOR NEW ENTRANTS: DEQ establishes a reserve for covered liquid fuels and propane suppliers that are new to the program. 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 if it became a covered entity after DEQ had distributed the compliance instruments.
- DEQ may also decide to distribute the instruments in the reserve as it adjusts the reserve size over time. DEQ can also choose to retire these instruments. DEQ will only distribute instruments if there are at least 10,000 compliance instruments above the applicable reserve size limit.

COMMUNITY CLIMATE INVESTMENTS: In addition to using compliance instruments, covered entities can also choose to use a limited number of CCI credits. Fuel suppliers can earn CCI credits by contributing funds to DEQ-approved CCI entities.

OTHER INFORMATION

INSTITUTIONS INVOLVED

Oregon Department of Environmental Quality (DEQ): Implementing state agency for the CPP.
Oregon Environmental Quality Commission (EQC): Panel appointed by the governor of Oregon to serve as DEQ's policy and rulemaking board. EQC adopted the CPP rules.
Equity Advisory Committee: Group of individuals from across Oregon State selected by DEQ; determines what types of emission reduction projects are supported by CCIs.

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 achieved by stationary sources not covered by the cap-and-trade program.

DEQ tracks the average annual statewide retail cost of gasoline, diesel, or natural gas in Oregon, and if these prices increase year-over-year by an amount more than 20% higher than the average change in cost for the same fuel over the same period in Washington, Idaho, and Nevada, DEQ will investigate the cause(s) of the increase and report to the EQC regarding whether changes are needed to ameliorate a relative increase in costs in Oregon.

DEQ will provide an additional report on CCIs to the EQC in August 2024 and every two years thereafter.

REGULATORY FRAMEWORK

→ Division 271 – Oregon Climate Protection Program
→ Division 12 – Enforcement Procedure and Civil Penalties
→ Chapter 907 Oregon Laws 2007

PENNSYLVANIA

- Executive order for a power sector ETS and participating in RGGI
- ETS regulation consistent with RGGI Model Rule finalized in April 2022
- Court-imposed injunction preventing participation in RGGI

DESCRIPTION

In October 2019, Pennsylvania's Governor Tom Wolf signed an executive order directing the Pennsylvania Department of Environmental Protection (DEP) to develop and present to the Environmental Quality Board (EQB) a proposal for an ETS covering CO_2 emissions from the electric power sector and its linkage to the Regional Greenhouse Gas Initiative (RGGI). The legal basis for developing an ETS is the state's "Air Pollution Control Act", which regulates air resources necessary for the protection of public health.

In April 2022, the final regulation to establish an ETS in Pennsylvania and to participate in RGGI was published. It set a base cap of 78 million short tons (70.8 $MtCO_2$) if Pennsylvania was a participating state of RGGI as of 1 January 2022. The cap decreases by 3% annually to 58.1 million short tons (52.7 $MtCO_2$) in 2030. The regulation includes the implementation of both emissions containment and cost containment reserves, as well as quarterly auctions to allocate allowances. It includes additional features such as set-aside accounts (accounts from which allowances may be transferred to the accounts of regulated units or retired on their behalf) for waste coal and cogeneration units (including combined heat and power systems), and a limited exemption for cogeneration units that supply less than 15% of their total energy to the electricity grid.

If Pennsylvania participates in RGGI, the Initiative's carbon market would increase significantly, with Pennsylvania's share comprising 44% of the 2023 RGGI cap.

YEAR IN REVIEW

In April, the final regulation to establish an ETS in Pennsylvania and to participate in RGGI was published. Under the regulation, covered entities in Pennsylvania had to begin accounting for their emissions as of 1 July 2022.

Prior to its publication, the regulation was challenged by members of Pennsylvania's legislature. That lawsuit resulted in the issuance of a preliminary injunction preventing implementation and enforcement of the regulation. The Pennsylvania DEP is currently appealing the Commonwealth Court's injunction order in the Pennsylvania Supreme Court.

Shortly after its publication, the regulation was also disputed by a collection of local coal stakeholders, including power plant owners, coal mine owners, and workers' unions, who filed a lawsuit in front of the Commonwealth Court. The final rulings in both cases are still pending and there is no defined deadline for issuance. The rulings by the Commonwealth Court could subsequently be appealed to the Pennsylvania Supreme Court. The regulation is also being separately challenged in Commonwealth Court by natural gas stakeholders, including power plant owners and operators.

Until legal proceedings are concluded, the Pennsylvania DEP will not take steps to implement or enforce the RGGI regulation.

1 Regulation finalized but enjoined from implementation and enforcement.

In force
Under development[1]
Under consideration

SECTORS

POWER

GREENHOUSE GASES

CO_2

EMISSIONS & TARGETS OF PENNSYLVANIA

GHG EMISSIONS (EXCL. LULUCF), 2019

(in $MtCO_2e$, share of total in %)

Electricity production	75.1	(28%)
Industrial	86.4	(34%)
Transportation	59.7	(22%)
Residential	19.5	(7%)
Commercial	11.9	(4%)
Agriculture	9.6	(4%)
Waste management	3.8	(1%)
Total	**266.0**	

GHG REDUCTION TARGETS

By 2025: 26% below 2005 levels (Executive Order 2019-1)

By 2050: 80% below 2005 levels (Executive Order 2019-1)

OTHER INFORMATION

INSTITUTIONS INVOLVED

Pennsylvania Department of Environmental Protection (DEP): Government agency in charge of implementing, administering, and enforcing the CO_2 Budget Trading Program (RGGI regulation)

REGULATORY FRAMEWORK

→ Executive Order 2019-07

→ CO_2 Budget Trading Program

QUÉBEC

QUÉBEC CAP-AND-TRADE SYSTEM

- **Covers ~80% of Québec's overall emissions**
- **Linked with California's ETS since 2014**
- **First and largest linked market between subnational governments from different countries**

In force
Under development
Under consideration

ETS DESCRIPTION

Québec's Cap-and-Trade System started operation in 2013 and covers ~80% of Québec's GHG emissions.

The system covers fuel combustion emissions in the power, buildings, transport, and industrial sectors, as well as industrial process emissions. Most allowances are auctioned, with a portion freely allocated to emissions-intensive, trade-exposed (EITE) sectors and to electricity producers with fixed-price sales contracts concluded before the announcement of the system. Québec also keeps an allowance reserve account to adjust levels of free allocation and sell to entities that do not have enough allowances to cover their obligations.

Québec has been a member of the Western Climate Initiative (WCI) since 2008 and formally linked its system with California's in 2014.

YEAR IN REVIEW

In September, Québec adopted a new approach for free allocation for the 2024-2030 period, as committed in the "2030 Plan for a Green Economy" published in 2020.

The new approach will see a decrease in the level of free allocation, based on three additional factors: the cap decline factor of 2.34%; an extra expected effort based on the carbon leakage risk and the proportion of fixed process emissions; and a trajectory modulation factor, which will reduce the rate of reduction in the initial years and increase it in the later ones. A portion of the allowances resulting from the reduction in the level of free allocation will be consigned for auction on behalf of businesses. The proceeds from the sale of these allowances will be set aside on behalf of each business to finance projects related to the climate transition. It is expected that the new approach will see a reduction of 2.9 $MtCO_2e$ free allowances between 2024-2030.

In June, California and Québec presented a mechanism to account for the flow of compliance instruments between the linked systems. This mechanism was developed pursuant to Article 8 of their market linkage agreement. In December, they published the Report on the Net Flow of Compliance Instruments between Québec and California for the period 2013-2020 as calculated using this mechanism. At this time, Québec also published its 2020 Target Achievement Report. GHG emissions in Québec were 13.2% below 1990 levels in 2020. For 2020, Québec was a net buyer of 11.4 Mt CO_2e on the Québec-California carbon market, which represents 13.4% of the 1990 emissions level. Quebec's net GHG emissions balance in 2020 was therefore 26.6% below the 1990 level.

SECTORS

- **POWER**
- **INDUSTRY**
- **BUILDINGS**
- **TRANSPORT** *(EXCL. MARITIME AND AVIATION)*

CAP

52.8 $MtCO_2e$ (2023)

GREENHOUSE GASES

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

OFFSETS AND CREDITS

Domestic[1]

ALLOCATION

Free Allocation: Benchmarking
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average auction settlement price: CAD 36.29[2]
(USD 28.08)

TOTAL REVENUE

CAD 7 billion (USD 5.38 billion) since beginning of program
CAD 1.34 billion (USD 1.03 billion) in 2022

1 Also includes offset credits from linked jurisdictions (i.e., California).
2 Includes settlement prices of both current and future vintage allowances.

EMISSIONS & TARGETS OF QUÉBEC

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	49.4	(67%)
Industrial processes	12.3	(17%)
Agriculture	7.9	(11%)
Waste	4.5	(6%)
Total	**74.1**	

Energy industries[3]	0.2	(0.3%)
Manufacturing industries and construction[4]	10.2	(14%)
Transport	31.6	(43%)
Commercial, institutional, and residential	7.1	(10%)
Other energy	0.1	(0.2%)

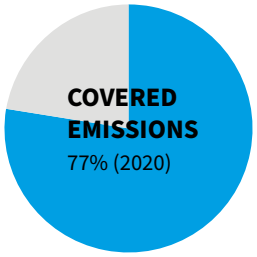
GHG REDUCTION TARGETS

By 2030: 37.5% reduction from 1990 GHG levels (Decree 1018-2015)
By 2050: Carbon neutrality (2030 Plan for a Green Economy)

ETS SIZE & PHASES

COVERED EMISSIONS

Verified ETS emissions
56.1 $MtCO_2e$ (2020)



PHASES

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, at an average rate of 3.2% per year.

THIRD COMPLIANCE PERIOD (2018-2020): The cap 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, to 55.3 $MtCO_2e$, due to an adjustment of the global warming potential of different GHGs, the cap will be reduced annually by ~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 1 as well as the distribution and importation of fuels used in the transport and buildings sectors and in small- and medium-sized businesses.

INCLUSION THRESHOLDS: Emissions equal to or greater than 25,000 tCO_2e per year. Fuel distributors that distribute 200L or more of fuel are also subject to inclusion.

VOLUNTARY EMITTERS (OPT-IN COVERED ENTITIES): Since 2019, emitters from capped sectors that have reported emissions equal to or greater than 10,000 tCO_2e per year but less than 25,000 tCO_2e per 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

Upstream (buildings, transport); point source (industry, in-province power); imported electricity at the point of first delivery onto Québec's electricity grid.

NUMBER OF ENTITIES

127 covered entities, representing 165 facilities (82 industrial facilities, 45 fuel distributors and 38 opt-in emitters)[5] (2021)

3 Covers public electricity and heat production.
4 Include petroleum refining.
5 127 covered entities, but some entities operate more than one facility. These entities represent 165 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: EITE sectors receive a portion of their allowances for free 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 such as 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 historical averages, depending on the type of emissions (e.g., fixed process, combustion, and other, mainly fugitive emissions), and an assistance factor. If 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 are determined based on trade exposure and emissions intensity. These metrics have been 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 steam production for industrial purposes and off-site electricity producers with the fixed-price sales contracts signed before 2008.

BEYOND THE FOURTH COMPLIANCE PERIOD (2024-2030): New rules adopted in September 2022 will see a gradual decrease in the level of free allocation from 2024. The rate of reduction will be determined by three additional parameters: the cap decline factor of 2.34%; an extra expected effort based on the carbon leakage risk and the proportion of fixed process emissions; and a modulation adjustment factor, which will reduce the rate of reduction in the initial years and increase it in the later ones, with no net effect over the 2024-2030 period. A portion of the allowances resulting from the reduction in the level of free allocation will be consigned for auction on behalf of businesses. The proceeds from the auctioning of the consigned allowances will be set aside on behalf of each business to finance projects related to the climate transition. Average actual emissions from 2017-2019 will be progressively phased in to replace the existing intensity values based on 2007-2010 emissions.

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 2021, ~65% of allowances were allocated by auction or directed to reserves, and ~35% of allowances were allocated for free.

USE OF REVENUES

All auction revenues go to the Electrification and Climate Change Fund, which replaced the Green Fund in November 2020. The new fund, entirely dedicated to climate action, supports the implementation of mitigation and adaptation measures contained in the 2030 Green Economy Plan and include energy efficiency, electrification, and public transport.

Since the beginning of the program, more than CAD 7 billion (USD 5.38 billion) has been raised.

FLEXIBILITY & LINKING

BANKING AND BORROWING

Banking is allowed, but the emitter is subject to a 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 system of offset protocols.
The ministerial regulations allow the following offset project types:

- Reclamation and destruction of methane from landfill sites;
- Destruction of halocarbons; and
- Carbon sequestration through afforestation or reforestation on private lands.

For a transitionary 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.

Technical work is currently underway to develop a draft regulation for the anaerobic digestion of manure. Other types of projects under consideration include fuel substitution in the marine transport sector, conversion of refrigeration systems, improvements in the application of agricultural fertilizers, and afforestation or reforestation on public lands.

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 (i.e., project owner) is required to replace them. If credit recovery is not possible, an equivalent number of credits is retired from the government's environmental integrity account. This account is funded by the automatic withholding of 3% of issued offset credits from all offset projects.

QUANTITATIVE LIMITS: Offsets can be used for up to 8% of each entity's compliance obligation.

LINKS WITH OTHER SYSTEMS

Québec linked its system with California's 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 1 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 2,308-384,615) 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 7,692-2,307,692) 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 into the system ("emitters"). Non-compliance entities with an establishment in Canada and individuals domiciled in Canada ("participants") can participate through:

- purchasing, holding, selling or retiring compliance instruments;
- operating an offset project registered with the Ministry; or
- providing clearing services as qualified entities.

Emitters and participants must have an account in the Compliance Instrument Tracking System Service (CITSS). Additional eligibility criteria apply.

MARKET TYPES:

Primary: The majority of allowances are distributed via auctioning. Four auctions, held jointly with California, take place each year. Participants must have an approved account in CITSS and apply to take part in auctions at least 30 days in advance. Auctions are administered by the Western Climate Initiative, Inc.

Secondary: Exchange trading of allowances and offsets issued by both California and Québec takes place on platforms such as the Intercontinental Exchange (ICE), the CME group or the Nodal Exchange. Allowances and offsets are traded through futures and options contracts. Any company qualified to access these platforms can trade directly or through a future commission merchant. Companies can also trade directly over the counter. All transactions must be notified to the Ministry, with information such as the quantity and vintage of allowances and the settlement price.

LEGAL STATUS OF ALLOWANCES: Under the "Environmental Quality Act", allowances are authorizations to emit up to one tCO_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. It is equivalent to the annual minimum price of the previous year, increased by 5% and an Indexation rate based on the Price Index Consumption (CPI) as established by the "Financial Administration Act". For 2023, it is set at CAD 20.83 (USD 16.02) for Québec and USD 22.21 for California. For joint auctions with California, 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 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 enough compliance instruments that can be used to cover emissions for the current period in their general account. To date, no sales by mutual agreement have been held.

In December 2020, Québec amended the prices of its three tiers to align more closely with California. For 2023, the prices of the three tiers are CAD 49.66 (USD 38.20), CAD 63.81 (USD 49.08), and CAD 77.97 (USD 59.98). 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, de la Lutte contre les changements climatiques, de la Faune et des Parcs (Ministry of the Environment, the Fight against Climate Change, Wildlife and Parks): Overall responsibility for implementing the cap-and-trade program in Québec.
Western Climate Initiative, Inc.: Non-profit organization that provides cost-effective administrative and technical solutions for supporting the coordinated development and implementation of participating jurisdictions' GHG emissions trading programs, such as administering auctions and maintaining the system registry.

EVALUATION/ETS REVIEW

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

REGULATORY FRAMEWORK

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

REGIONAL GREENHOUSE GAS INITIATIVE

- 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), the first mandatory GHG ETS in the United States, launched in 2009. It started operating 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. New Jersey withdrew from RGGI at the end of the first control period in December 2011 and later rejoined in 2020, while Virginia joined in 2021.

RGGI covers power sector emissions in participating states. In 2020, it covered around 14% of the aggregate participant states' emissions; in 2021, 228 facilities were covered by the state regulations. The aggregate cap will reduce by 30% compared to 2020 between 2021 and 2030. Regulated entities obtain most of their allowances through regular auctions, while some states have "set-aside" accounts from which they may transfer a limited number of allowances to entities' compliance accounts.

RGGI has undergone two review processes that updated the Model Rule and enshrined tighter caps and adjustments to system design. RGGI's third review process is currently ongoing.

YEAR IN REVIEW

In April, Pennsylvania published its CO_2 Budget Trading Program regulation, under which covered entities in Pennsylvania had to begin accounting for their emissions from July. Prior to its publication, the regulation was challenged by members of Pennsylvania's legislature. The lawsuit resulted in the issuance of a preliminary injunction preventing implementation and enforcement of the regulation. The Pennsylvania Department of Environmental Protection (DEP) is currently appealing the Commonwealth Court's injunction order in the state's Supreme Court. The regulation has also been disputed in front of the Commonwealth Court in two separate cases. Until legal proceedings are concluded, the Pennsylvania DEP will not take steps to implement or enforce the RGGI regulation.[2]

The RGGI states initiated the Third Program Review in summer 2021 to analyze the program's successes, impacts, potential additional reductions to the cap post-2030, and other design elements. In 2022, states gathered comments from stakeholders, held a series of public meetings, and discussed comments received together with a variety of program topics. They also worked to develop and refine their electricity sector modelling assumptions, which will inform the modelling of reference and policy scenarios to be conducted in 2023. As per the current timeline for the program review, released in November 2022, an updated draft Model Rule would be released in Fall 2023, with the program review concluding in December 2023.

In force
Under development
Under consideration

SECTORS

POWER

CAP

97.0 million short tons CO_2 or 88.0 $MtCO_2$ (2022)[1]

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

Domestic (within RGGI states only)

ALLOCATION

Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average auction price: USD 13.46

TOTAL REVENUE

USD 5.9 billion since the beginning of the program
USD 1.2 billion in 2022

PARTICIPATING STATES

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

1 These values do not include Pennsylvania.
2 For more information, see the "Pennsylvania" factsheet.

EMISSIONS & TARGETS OF RGGI

GHG EMISSIONS (EXCL. LULUCF), 2020[3]

(in $MtCO_2e$, share of total in %)

Electric power	105.8	(18%)
Industry	69.2	(12%)
Transport	232.3	(39%)
Residential	79.1	(15%)
Commercial	87.1	(13%)
Agriculture	22.0	(4%)
Total	**595.4[4]**	**100%**

GHG REDUCTION TARGETS

By 2030: 30% cut in power sector emissions compared to the 2020 CO_2 emissions cap (2017 Model Rule)

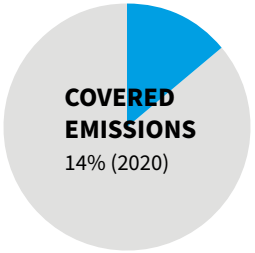
Note: The participating states have their own emission targets; economy-wide targets are not defined at the level of RGGI.

ETS SIZE & PHASES

COVERED EMISSIONS

Verified ETS emissions

66.8 $MtCO_2$[5] (2020)



PHASES

FIRST PHASE: 2009-2011
SECOND PHASE: 2012-2014
THIRD PHASE: 2015-2017
FOURTH PHASE: 2018-2020
FIFTH PHASE: 2021-2023

CAP

A cap trajectory until 2030 has been set.

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)[6]: 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 $MtCO_2$

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.

3 These values include Virginia but not Pennsylvania.
4 This value includes Virginia but not Pennsylvania. Values presented here are taken from the "Inventory of U.S. Greenhouse Gas Emissions and Sinks by State" by the Environmental Protection Agency (EPA, available here), aggregated for the RGGI states. While each state publishes official inventory data and the values published by the EPA should not be viewed as official state data, the EPA estimates are presented here to ensure the methodological consistency of data collection and aggregation for inventory categories across RGGI states, as well as to ensure a common reporting year in the data. There may be differences between the EPA estimates and the official state inventories.
5 This value does not include Pennsylvania or Virginia.
6 These values do not include Pennsylvania.

SECTORS AND THRESHOLDS

Fossil fuel electric generating units. Most RGGI states cover units with 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

Point source

NUMBER OF ENTITIES

228[7] (current control period)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

CO_2 allowances issued by each RGGI state are distributed through quarterly auctions. States hold a limited amount in "set-aside" accounts and distribute them according to state-specific regulations.

Of the 101 million 2021 allowances, 91% were sold at auction and 2% were sold at fixed price. The remainder were either transferred from, retired, or remained in set-aside accounts. Additionally, almost 4 million 2021 allowances from the cost containment reserve were sold (see 'Market Stability Provisions' section).

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 May 2022 found that the direct lifetime benefits of RGGI investments made in 2020 include USD 1.9 billion in lifetime energy bill savings and 6.6 million short tons of CO_2 (6 $MtCO_2$) emissions avoided.

The distribution of RGGI investments in 2020 was: energy efficiency (35%); direct bill assistance (19%); clean and renewable energy (18%), beneficial electrification[8] (11%); greenhouse gas abatement[9] (5%).

FLEXIBILITY & LINKING

BANKING AND BORROWING

Banking of allowances is allowed without restrictions. Current regulations include provisions to adjust the cap to address the aggregate bank, so that allowances available for auctions are reduced by the number of allowances not used for compliance in previous control periods (see also 'Cap' above). The RGGI states are currently implementing the third adjustment for banked allowances, which runs until 2025. As part of the RGGI review process, RGGI states are considering whether to address or adjust for banked allowances into the future if a bank of surplus allowances remains in circulation post-2025.

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.

LINKS WITH OTHER SYSTEMS

RGGI is a cooperative effort between participating states. Each state establishes an individual "CO_2 budget trading program" based on the RGGI Model Rule. Regulated sources in each participating state can surrender allowances issued by any participating state for compliance and participating states use joint auctions.

7 This value does not include Pennsylvania.
8 Programs implementing or facilitating replacement of fossil fuel use with electric power.
9 Programs promoting the research and development of advanced energy technologies, the reduction of vehicle miles traveled, GHG reductions in the power generation sector, tree-planting projects designed to increase carbon sequestration, and other initiatives to reduce GHGs.

COMPLIANCE

COMPLIANCE PERIOD

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 are recorded in the US EPA's Clean Air Markets Division database in accordance with state "CO_2 Budget Trading Program" regulations and agency 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 accessible.

ENFORCEMENT

In case of excess emissions (i.e., if entities do not surrender all required allowances), allowances equivalent to 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 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. Auctions are open to all parties with financial security, with a maximum bid of 25% of the volume on offer per sale. There is no allowance holding limit. Auctions are managed by Enel X.

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 RGGI data and CO_2 allowance market activity reports. Financial derivatives are traded on the ICE platform.

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.

LEGAL STATUS OF ALLOWANCES: The RGGI Model Rule specifies that allowances are limited authorizations by the participating state's regulatory agencies to emit up to one ton of CO_2.

MARKET STABILTY PROVISIONS

AUCTION PRICE FLOOR: USD 2.50 per short ton in 2023, 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 14.88 in 2023 and increases by 7% per year. It had previously increased by 2.5% annually between the years 2017 and 2020, from a starting value of USD 10.

The CCR was triggered in 2014 and 2015 and all 15 million allowances it contained were sold. 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 2023, the trigger price is USD 6.87, 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: Each state implements the program under its particular statutory authority.
Environmental and energy agencies for each RGGI state: Agencies implementing the respective CO_2 budget trading programs.
RGGI Inc.: Non-profit cooperative supporting RGGI's development and implementation. This includes engaging contractors for various tasks including allowance and emissions tracking, market monitoring, and management of the auctions.
Potomac Economics: Current market monitor. Monitors the conduct of market participants in the auctions and in the secondary market to identify indications of anti-competitive conduct.
Enel X: Manages the auctions.

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
→ 2017 RGGI Model Rule Updates (Summary)
→ RGGI States' Statutes & Regulations
→ RGGI Program Design

WASHINGTON

CAP-AND-INVEST PROGRAM

- **Program started operation in 2023**
- **Covers around 70% of state emissions**
- **May link with California-Québec in future**

ETS DESCRIPTION

Washington's cap-and-invest program began operating in January 2023. It covers around 70% of the state's emissions, and its trajectory is consistent with the long-term target to reduce statewide emissions to 95% below 1990 levels by 2050.

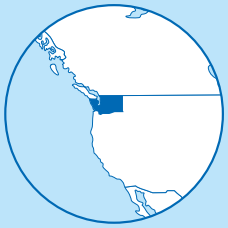
The program covers around 130 entities in the energy, industrial, buildings, and transport sectors. Many of the cap-and-invest program's design elements are similar to those of California's cap-and-trade program. Allowances are distributed through auctioning and free allocation, with the latter based primarily on benchmarking. The program has a cost containment reserve and auction reserve price to support market stability and moderate covered entities' compliance costs.

The cap-and-invest program was established by the "Climate Commitment Act" (CCA), signed into law by Governor Jay Inslee in May 2021. Washington is the second state in the United States to pass a law requiring such an economy-wide program, after California. At the outset, the program will not be linked to any other trading schemes, but the CCA allows for linkage in the future if certain conditions are met.

YEAR IN REVIEW

2022 began with a series of stakeholder consultations on initial proposals for different elements of the cap-and-invest program. In May, the Department of Ecology published a proposed regulation, which was followed in June by the release of a study modelling the economic effects of the program under different scenarios (i.e., linked with California and Québec or standalone, and with or without frontloading of allowances). The study modeled possible pathways of allowance prices until 2030, as well as reductions in covered emissions. It found that linking the program to the carbon markets of California and Québec would be the most cost-effective option.

A further round of stakeholder engagement on the proposed final regulation took place over the summer, including four public hearings. The final regulation – which established slightly lower emissions caps than previously proposed – was adopted at the end of September and came into force one month later. The Department of Ecology began a public process in January 2023 to explore the possibility of linking the program to other cap-and-trade systems.



In force
Under development
Under consideration

SECTORS

POWER
INDUSTRY
TRANSPORT
BUILDINGS

CAP

63 $MtCO_2e$ (2023)

GREENHOUSE GASES

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

OFFSETS AND CREDITS

Domestic

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking
Free Allocation with Consignment
Auctioning

EMISSIONS & TARGETS OF WASHINGTON

GHG EMISSIONS (EXCL. LULUCF), 2019

(in $MtCO_2e$, share of total in %)

Energy	88.2	(86%)
Industrial processes	5.3	(5%)
Agriculture	6.2	(6%)
Waste	2.4	(2%)
Total	**102.1**	

Electricity	21.9	(21%)
Transport	40.3	(40%)
Commercial, Industrial and Residential	25.3	(25%)
Other energy	0.7	(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))

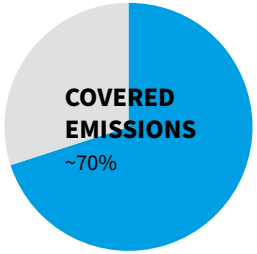
ETS SIZE & PHASES

PHASES

FIRST COMPLIANCE PERIOD: 4 years (2023-2026)

SECOND COMPLIANCE PERIOD: 4 years (2027-2030)

THIRD COMPLIANCE PERIOD: 4 years (2031-2034):



CAP

FIRST COMPLIANCE PERIOD (2023-2026): The cap for 2023 was set at 63 $MtCO_2e$, which is equal to 93% of average emissions levels of covered entities between the years 2015-2019. The cap declines annually by 7%, reaching 49 $MtCO_2e$ in 2026.

SECOND COMPLIANCE PERIOD (2027-2030): The cap for 2027 will be set at 93% of the sum of the 2026 cap and emissions from new entities entering the program for the second compliance period. The cap declines by 7% annually through 2030.

THIRD COMPLIANCE PERIOD (2031-2034) AND BEYOND: The cap for 2031 will be set at 98.2% of the sum of the 2030 cap and emissions from new entities entering the program for the third compliance period. In the period 2032-2042, the cap declines annually by 1.8%.

In 2043-2049, the cap declines annually by 2.6%, reaching a 95% reduction from 1990 emissions levels by 2050.

SECTORS AND THRESHOLDS

FIRST COMPLIANCE PERIOD (2023-2026): All facilities with emissions over 25,000 tCO_2e, including industrial facilities, electricity generators, importers of electricity, fuel distributors, and natural gas suppliers. Excludes emissions from waste-to-energy and solid waste management.

SECOND COMPLIANCE PERIOD (2027-2030): Waste-to-energy facilities with emissions over 25,000 tCO_2e will be added.

THIRD COMPLIANCE PERIOD (2031-2034): Railroad companies with emissions over 25,000 tCO_2e will be included.

INCLUSION THRESHOLDS: For the first compliance period, eligible facilities are those with emissions over 25,000 tCO_2e in at least one year between 2015-2022. For the second compliance period, waste-to-energy with emissions over 25,000 tCO_2e in at least one year between 2023-2025. For the third compliance period, railroad companies with emissions over 25,000 tCO_2e in at least one year between 2027-2029.

VOLUNTARY OPT-IN PARTICIPATION: Any facility that is already covered by the mandatory MRV system but with emissions below the 25,000 tCO_2e cap-and-invest program inclusion threshold may voluntarily participate as an opt-in entity. Other facilities are also able to participate as opt-in entities, following the voluntary reporting requirements of the MRV regulation.

POINT OF REGULATION

Upstream (building, power (imported electricity) transport); point source (industry, power).

NUMBER OF ENTITIES

~130

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

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

FREE ALLOCATION: Emissions-intensive, trade-exposed facilities receive free allowances to mitigate the risk of carbon leakage. Allocation is done using facility-specific benchmarks, based on their average carbon intensity over the period 2015-2019.

Only in instances where facilities were unable to calculate the emissions intensity of their production over this period could they request free allocation based on their average emissions (i.e., grandparenting).

FIRST COMPLIANCE PERIOD (2023-2026): Set at 100% of the benchmark multiplied by actual production, or historical emissions level.

SECOND COMPLIANCE PERIOD (2027-2030): Set at 97% of the benchmark multiplied by actual production, or historical emissions level.

THIRD COMPLIANCE PERIOD (2031-2034): Set at 94% of the benchmark multiplied by actual production, or historical emissions level.

FREE ALLOCATION WITH CONSIGNMENT: Electricity utilities receive free allowances based on forecasts of the electricity supply and administrative costs associated with complying with the cap-and-invest program. During the first compliance period, they can choose to consign up to 100% of their allowances to auction. Natural gas facilities received an initial free allocation equal to 93% of their average emissions in the period 2015-2019. The amount reduces annually in line with the cap decline factor. In 2023, 65% of free allowances must be consigned for auction. This amount increases by 5% each year, reaching full consignment in 2030. Freely allocated allowances that are not consigned for auction may only be used for surrender and cannot be traded.

AUCTIONING: Auctions occur four times a year. Unsold allowances will be held for future auctions and only sold if the settlement price is above the auction floor price for two consecutive auctions. Any that remain unsold within 24 months are transferred to an emissions containment reserve (see 'Market Stability Provisions' section below).

USE OF REVENUES

USE OF REVENUE FROM FREE ALLOWANCES CONSIGNED FOR AUCTION: Revenues raised from the auctioning of free allowances to electricity utilities and natural gas facilities must be used to benefit rate payers or customers, prioritizing those from low-income groups. In most cases how the revenues are used is determined by the state's Utilities and Transportation Commission.

USE OF REVENUES FROM ALLOWANCES AUCTIONED BY THE DEPARTMENT OF ECOLOGY: Proceeds from auctions must be invested in climate projects focused on improving clean transportation options, increasing climate resilience in ecosystems and communities, and addressing issues of environmental justice and health inequity in Washington. At least 35% of funds must be invested in projects that benefit overburdened communities, and a minimum of an additional 10% must go to projects with tribal support.

FLEXIBILITY & LINKING

BANKING AND BORROWING

While unlimited banking is allowed between periods, covered entities are subject to general holding limits, which depend on the cap level. Allowances held in a compliance account or that are to be consigned for auction do not count towards the holding limit.

Borrowing allowances of future vintages is not allowed.

OFFSETS AND CREDITS

QUALITATIVE LIMITS: Washington has adopted – with modifications – the following offset protocols developed under the California cap-and-trade program:

- Livestock projects;
- Ozone depleting substance projects;
- US forest projects; and
- Urban forestry projects.

QUANTITATIVE LIMITS: The following limits apply:
FIRST COMPLIANCE PERIOD (2023-2026): Up to 5% of an entity's compliance obligation from projects not located on federally recognized tribal land. An additional 3% can be met from projects located on federally recognized tribal land.

SECOND COMPLIANCE PERIOD (2027-2030): Up to 4% of an entity's compliance obligation from projects not located on federally recognized tribal land. An additional 2% can be met from projects located on federally recognized tribal land.

THIRD COMPLIANCE PERIOD (2031-2034) AND BEYOND: Up to 4% of an entity's compliance obligation, which can include projects located on federally recognized tribal land. An additional 2% can be met from projects located on federally recognized tribal land.

In the event of a link to another trading system, at least 50% of offsets must provide direct environmental benefits to the state (DEBS) in the first compliance period, rising to 75% from the second compliance period. Without a link, all offsets must provide DEBS.

LINKS WITH OTHER SYSTEMS

The cap-and-invest program has started as a standalone program, but the "Climate Commitment Act" that established it allows for linkage in the future if certain conditions are met. The Department of Ecology began a public process in the fall of 2022 to explore the possibility of linking.

COMPLIANCE

COMPLIANCE PERIOD

Except for the year following the last year of a compliance period, compliance instruments equal to at least 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: Annual

VERIFICATION: All reports are verified by independent third-party verifiers.

FRAMEWORK: The MRV framework was established by the regulation "Reporting of Emissions of Greenhouse Gases".

ENFORCEMENT

Should an entity have insufficient allowances to cover its annual and final compliance obligations, within six months of the deadline it must submit four penalty allowances for each missing allowance it did not surrender. If the entity fails to comply, a fine of up to USD 10,000 per day per missing allowance will be incurred. Under certain circumstances this fine could increase to USD 50,000.

MARKET REGULATION

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities, including opt-in entities; non-compliance entities, including offset project participants; individuals with primary residence in the United States.

MARKET TYPES:

Primary: Auctions are held four times per year, with a calendar giving dates and volumes published in January of each year. Participants must have an account in the Compliance Instrument Tracking System Service (CITSS). Auctions are delivered through the Western Climate Initiative, Inc.

Secondary: A futures contract for allowances was launched on the Nodal Exchange in December 2022. Allowances can be traded over the counter directly between market participants.

MARKET STABILTY PROVISIONS

AUCTION FLOOR PRICE: USD 22.20 for 2023. The auction reserve price increases by 5% plus inflation, as measured by the Consumer Price Index.

ALLOWANCE PRICE CONTAINMENT RESERVE (APCR): The APCR is a separate account managed by the Department of Ecology, from which allowances can be auctioned at pre-defined prices in the event of unexpectedly high allowance costs. The APCR was frontloaded, with 5% of the caps in the first and second compliance periods (2023-2030) set aside at the outset of the program. The APCR has two price tiers, which in 2023 are set at USD 51.90 and USD 66.68 for Tiers 1 and 2 respectively. Prices increase annually by 5% plus inflation, as measured by the Consumer Price Index.

Auctions from the APCR are held if the settlement price in the last auction reaches the Tier 1 price level. These sales may only be held once a year before the compliance deadline, and only covered and opt-in entities can participate. Bids must be at one of the two tier price levels. Any unsold allowances are carried over to future APCR auctions.

PRICE CEILING UNITS: If there are no units remaining in the APCR, price ceiling units are made available to covered entities with insufficient allowances to meet their compliance obligations. Price unit sales only occur following the request of a covered entity, which must be at least ten days before the compliance deadline. The ceiling price is USD 81.47 for 2023, increasing annually by 5% plus inflation, as measured by the Consumer Price Index.

EMISSIONS CONTAINMENT RESERVE (ECR): Up to 10% of allowances can be withheld from an auction and placed in the ECR if auction settlement prices fall below the ECR trigger price. The trigger price is currently suspended, and this provision is therefore not operational.

OTHER INFORMATION

INSTITUTIONS INVOLVED

Department of Ecology: Responsible for the program rules and implementation of the cap-and-invest program.

Western Climate Initiative Inc.: Non-profit organization responsible for administering auctions, the CITSS registry, and conducting market surveillance.

EVALUATION/ETS REVIEW

By 1 December 2027, and every 4 years afterwards, the Department of Ecology is required to submit a comprehensive review of the program to the legislature.

REGULATORY FRAMEWORK

→ Climate Commitment Act

→ Climate Commitment Act Program Rule

BRAZIL

- **Considering the implementation of an ETS for the power sector under Law 14,120/2021**
- **In parallel, discussing the creation of an ETS under Bill 2,148/2015 in the Chamber of Deputies and Bill 412/2021 in the Brazilian Senate**

In force

Under development

Under consideration

DESCRIPTION

In 2009, Brazil adopted the National Policy on Climate Change (Política Nacional sobre Mudança do Clima, PNMC), aiming to identify, plan, and coordinate actions and measures for GHG abatement as well as to adapt to climate change. The PNMC lays out the basis for a carbon pricing regulation.

Several 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. This proposal was open to public consultation in January 2022.

In May 2022, the government published Decree 11,075, which established the National Greenhouse Gas Emissions Reduction System, Sinare. The Decree requires the environment and economy ministries to develop sectoral climate change mitigation plans, including concrete emission targets, and establishes a roadmap for this process. It further calls for establishing "integration mechanisms with the internationally regulated market."

The Decree was published in parallel to draft bills (Projeto de Lei, PL) aiming to regulate emissions trading. In particular, PL No. 2,148/2015 differentiates and forms a basis for two concurrent carbon pricing systems: (1) an emissions trading system, and (2) an offsetting system for registering and trading carbon credits. This bill and all its appendices will possibly bring new guidelines to emissions trading and enable its implementation.

The most recent legislative initiative is Senate Bill (PL) 412/2022, which proposes the institution of the Brazilian Greenhouse Gas Emissions Management System, a national plan for the allocation of GHG emission rights. The plan will also establish the percentage of financial assets (based on verified reductions and removals of emissions) that may be used in association with the GHG emission rights to achieve the goals stipulated for each sector and for its companies.

As part of its activities under the World Bank's Partnership for Market Readiness (PMR), the Brazilian government has carried out studies on the possible implementation of market instruments to meet its mitigation targets and reduce overall mitigation costs. These 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 have 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 at the 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 2030: 50% reduction from 2005 GHG levels (target announced during COP26)
By 2050: Climate neutrality (indicative objective submitted to the UNFCCC)

OTHER INFORMATION

INSTITUTIONS INVOLVED

Ministry of Environment
Ministry of Development, Industry, Trade and Services
Ministry of Mines and Energy
Ministry of Science, Technology and Innovation

REGULATORY FRAMEWORK

- → **Law 12,187 of 2009**
- → **Law 14,120 of 2021**
- → **Bill 2,148/2015** and its appendices
- → **Senate Bill (PLS) 412/2022**

CHILE

- **Provisions for a system of GHG emissions limits contained in the Framework Law on Climate Change**
- **Energy Agenda proposes an ETS pilot project for the energy sector**
- **Planning to increase carbon price trajectory between 2025 and 2030**

In force

Under development

Under consideration

DESCRIPTION

In June 2022, Chile enacted its "Framework Law on Climate Change", which sets a 2050 carbon neutrality goal, as well as a description of the national, regional, and local climate policies that Chile will implement to achieve it. These include Chile's NDC, Long-Term Climate Strategy, Climate Change Financial Strategy, and sectoral mitigation and adaptation plans.

Article 14 of the Law mandates the Ministry of Environment to specify GHG emissions limits set by technology, sector, or activity. GHG emissions limits may be set as emissions benchmarks for individual installations or in aggregate, for a group of installations or a sector. If set in aggregate, GHG emissions limits could be akin to a cap. Furthermore, according to Article 15, installations that perform better than their benchmark will have their surplus emissions reductions certified, which may then be used by other regulated entities for compliance with their respective emissions limits. The specific design of the emissions limits system is not yet defined and could be implemented either as an ETS or a tradable performance standard.

In August, the government published its 2022-2026 Energy Agenda. It states that a pilot ETS project for the energy sector will be developed to evaluate the role of this instrument in achieving emissions reductions and a just transition in a cost-effective manner. This commitment is based on Article 37 of the Law, which provides a basis for the development of market-based, fiscal, and financial instruments intended to address the negative impacts of GHG emissions. A market instrument such as an ETS will help the energy sector to achieve its obligations under the Climate Change Law. Work around this will be supported by the World Bank's Partnership for Market Implementation.

Chile has had a carbon tax in place since 2017. The country's Long-Term Climate Strategy, presented in October 2021, specifies that Chile will set an increasing trajectory for its carbon price between 2025 and 2030. It also specifies that the country seeks to have an integral carbon pricing portfolio to deliver coherent and predictable price signals. In line with this, the Government launched its National Energy Policy by 2050, which states that carbon price in Chile should reach USD 35/tCO_2e by 2030 and USD 80/tCO_2e by 2040.

EMISSIONS & TARGETS OF CHILE

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	79.7	(76%)
Industrial processes	6.9	(7%)
Agriculture	11.2	(11%)
Waste	7.7	(7%)
Total	**105.6**	

Energy industries	29.8	(28%)
Manufacturing industries and construction	15.5	(15%)
Transport	26.1	(25%)
Commercial, institutional, and residential	6.6	(7%)
Other energy	0.8	(1%)

GHG REDUCTION TARGETS

By 2025: Peak GHG emissions (updated NDC). Revert the increasing trend of methane emissions **(NDC Strengthening Annex)**

By 2030: GHG emissions 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)

By 2050: Climate neutrality (Framework Law on Climate Change)

FLEXIBILITY & LINKING

OFFSETS AND CREDITS

Article 14 of the Framework Law on Climate Change stipulates that emissions reduction or removal certificates from projects implemented within Chile may be used for compliance with the emissions standards defined in the Article 14 and 15 of the Law.

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, such as the scheme proposed in the "Framework Law on Climate Change" or emerging instruments under Article 6 of the Paris Agreement.

Regulated entities under the carbon tax scheme can use offsets to meet their compliance obligations. Third-party verification is required to issue offsets.

COMPLIANCE

MRV

The current GHG MRV system primarily serves the implementation of the carbon tax. Entities that emit more than 25,000 tCO_2 and/or 100 tonnes of particulate matter due to combustion processes per year are required to monitor and report emissions through government-approved methodologies. Current methodologies are expected to be updated in the future to incorporate all possible regulated fixed sources.

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

FRAMEWORK: 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 system is considered a basis for Chile to advance the development of a Unified GHG Emissions Report, which will help evaluate Chile's National Climate Policy.

OTHER INFORMATION

INSTITUTIONS INVOLVED

Ministry of Energy: in charge of the development and implementation of the Energy Agenda 2022-2026, the Energy Policy for 2050 and the carbon budgets and mitigation plan under the Framework Law on Climate Change.

Ministry of Environment: in charge of the development and implementation of the system specified in Articles 14 and 15 of the Framework Law on Climate Change.

Ministry of Finance: in charge of revising the carbon tax under the Tax Reform.

Ministry of Foreign Affairs: leads the national board under the Joint Crediting Mechanism and cooperation agreements in the context of Article 6.

Ministry of Agriculture: leads discussions on carbon credits in the non-energy sector, specifically, LULUCF and Nature-Based Solutions.

Inter-Ministerial Committee on Climate Change: proposes declarations, draft laws, and administrative acts on climate change to the President of the Republic.

REGULATORY FRAMEWORK

→ **Framework Law on Climate Change**
→ **Energy Agenda 2022-2026**
→ **Energy Policy**

COLOMBIA

NATIONAL PROGRAM OF TRADABLE GREENHOUSE GAS EMISSION QUOTAS

In force

Under development

Under consideration

- **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**

DESCRIPTION

In 2018, Colombia adopted a law for climate change management, which outlines provisions for the establishment of an ETS, "National Program of Tradable Greenhouse Gas 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 double the auction price. Auction revenues will be directed to the National Environmental Fund and will be used for GHG reductions and mitigation projects, as well as to manage the 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, and 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 COP 20,500 (USD 4.30) per 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 tonnes paid through the carbon tax 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, 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[1]

(in $MtCO_2e$, share of total in %)

Energy	92.9	(52%)
Industrial processes	10.5	(6%)
Agriculture[2]	56.8	(31%)
Waste	20.5	(11%)
Total	**180.7**	

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%)

GHG REDUCTION TARGETS

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: Public entity in charge of defining national environmental policy and promoting the recovery, conservation, protection, ordering, management, use and exploitation of renewable natural resources.

Department of National Planning: The DNP is the think tank of the national government that coordinates, articulates, and supports the country's short, medium, and long-term planning and guides the cycle of public policies and the prioritization of investment resources.

Ministry of Finance: Coordinates macroeconomic policy; defines, formulates and executes the fiscal policy of the country; and manages the nation's public resources from the budgetary and financial perspective.

National Climate Change System: The National Climate Change System (SISCLIMA) is a set of state, private, and non-profit entities, policies, standards, processes, resources, plans, strategies, instruments, mechanisms, and information related to climate change applied to manage the mitigation of greenhouse gases and adaptation to climate change in the country.

Ministry of Mines and Energy: Public entity in charge of formulating and adopting policies aimed at the sustainable use of mining and energy resources.

REGULATORY FRAMEWORK

→ **Ley 1931 de 2018**

→ Ley 2169 de 2021: **Ley de Acción Climática**

1 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.

2 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".

MEXICO

MEXICAN EMISSIONS TRADING SYSTEM

- **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 emissions from fixed sources of entities emitting at least 100,000 tCO_2**

ETS DESCRIPTION

The Mexican ETS, the first in Latin America, started in January 2020. It covers direct CO_2 emissions from fixed sources in the energy and industry sectors emitting at least 100,000 tCO_2 per year, covering around 40% of national GHG emissions and 90% of emissions reported in the National Emissions Registry (RENE).[2] Allowances are allocated through grandparenting based on historical emissions, which are verified annually.

The Mexican ETS started with a Pilot Program with two phases: a pilot phase between 2020 and 2021, and a transition phase in 2022. The Pilot Program aimed to implement its main components as a public policy mitigation instrument, and to contribute to the NDC and other national mitigation goals. The Pilot Program also aimed to enhance the quality of emissions data and build capacity in emissions trading, ultimately improving the design of the operational phase from 2023 onwards.

The Pilot Program was designed to pose no economic impact on regulated entities; however, in case of noncompliance, entities lost the opportunity to bank unused allowances into subsequent compliance periods of the Pilot, and receive fewer allowances in the first allocation of the operational phase.

YEAR IN REVIEW

In 2022, the third allocation took place. The Ministry of Environment and Natural Resources (SEMARNAT) analyzed and revised the first compliance period and found that participants achieved a 93% compliance rate. The rules for the operational phase starting in 2023 are yet to be announced. SEMARNAT is expected to publish them in the first half of 2023.

The country is expected to implement its domestic crediting mechanism and is considering the development of offset protocols in priority sectors. Moreover, SEMARNAT is preparing a registry for certified emissions mitigation, reduction or absorptions from national mitigation projects (such as offsets, early action credits, Internationally Transferred Mitigation Outcomes, or voluntary projects), referred to as the "second component" of RENE. 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.

The Consultative Committee (COCOSCE) of the Pilot ETS had nine sessions in 2022 and constituted four working groups: cap and allocation, offset credits, electricity sector, and legal and accounting. In addition, different studies and analyses are being developed by the federal government in preparation of the regulation of the operational phase, including: an analysis to help define the cap, a study on benchmarking and competitiveness, and an analysis of the current regulatory framework and evaluation of changes to be made.

1 The Ministry of Environment and Natural Resources is in the process of establishing a domestic offsetting program.
2 According to SEMARNAT.

In force
Under development
Under consideration

SECTORS

POWER

INDUSTRY

CAP

273.1 $MtCO_2$ (2021)

GREENHOUSE GASES

Direct CO_2 emissions from fixed sources

OFFSETS AND CREDITS

Domestic[1]

ALLOCATION

Free Allocation: Grandparenting

AVERAGE 2022 ALLOWANCE PRICE

Average secondary market price: MXN 0 (USD 0)

EMISSIONS & TARGETS OF MEXICO

GHG EMISSIONS (EXCLUDING CATEGORIES "3B LAND" AND "3D1 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

By 2030: Unconditional 35% below BAU GHG emissions baseline (Updated NDC)
By 2050: 50% below 2000 GHG levels (aspirational, included in the "General Law of Climate Change")

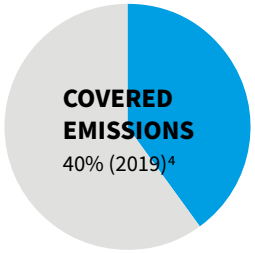
ETS SIZE & PHASES

PHASES

PILOT PHASE: 2 years (2020-2021)
TRANSITIONAL PHASE: 1 year (2022)
OPERATIONAL PHASE: From 2023

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 function 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 industrial sector includes automobile manufacturing, 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

Point source

NUMBER OF ENTITIES

~289 currently[6]

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

PILOT (2020-2021): The Pilot featured 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

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 Partial values for covered emissions from ETS participants were 219.7 $MtCO_2$ in 2021. This value does not yet include all ETS participants.
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.

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 that did not receive a quantity of free allowances equivalent to their verified emissions.

Participants may request additional allowances when an expansion in their production results in additional direct CO_2 emissions from stationary sources.

Plant Closures: When an installation closes permanently, it 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. SEMARNAT then cancels these allowances.

Auctions: SEMARNAT may auction allowances from the auction reserve. No auctions had taken place as of the end of 2022, although preliminary activities for the implementation of auctions are currently being prepared.

USE OF REVENUES

SEMARNAT is developing institutional arrangements to manage revenues during the operational phase.

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 ETS: 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). 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 will be expected to continue generating offsets during the operational phase.

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 certified emissions mitigation, reduction or absorptions from national mitigation projects (such as offsets, early action credits, Internationally Transferred Mitigation Outcomes (ITMOs), or voluntary projects, among others), which is 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.

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 additional specifications on the projects that can be registered, such as the procedure for registration and basic 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 in the region.

COMPLIANCE

COMPLIANCE PERIOD

From 1 January to 31 December. SEMARNAT is evaluating the surrender date according to the experience obtained during the pilot.

MRV

REPORTING FREQUENCY: Annual self-reporting based on electronic templates prepared by SEMARNAT.

VERIFICATION: Verification by independent accredited verifiers is required by the end of June of the subsequent year.

Reporting and verification should be made according to the criteria and procedures of the RENE[7].

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 key 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 Pilot Program was designed to pose no economic impact on regulated entities; however, in case of noncompliance, entities lost the opportunity to bank unused allowances into subsequent compliance periods within the Pilot. Moreover, noncompliant entities receive fewer allowances in the first allocation of the operational phase of the ETS (two fewer allowances for each nondelivered allowance during the Pilot).

MARKET REGULATION

MARKET DESIGN

MARKET PARTICIPATION: For the Pilot, the Regulation did not foresee the participation of entities in the ETS other than compliance entities and those that provide offset credits. SEMARNAT is designing and developing the process and rules to allow participants without obligations.

MARKET TYPES:

Primary: As of the end of 2022, there had been no auctions in the Mexican ETS Pilot. SEMARNAT is preparing institutional arrangements to implement auctions during the operational phase.

Secondary: There is no exchange that trades allowances. As of the end of 2022, transactions can only take place via negotiation between participants.

LEGAL STATUS OF ALLOWANCES: Allowances in the Mexican ETS Pilot were "administrative instruments". They remain as such in the operational phase.

OTHER INFORMATION

INSTITUTIONS INVOLVED

SEMARNAT: Ministry in charge of implementing the ETS.

COCOSCE: 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; and representatives of the regulated sectors.

EVALUATION/ETS REVIEW

Article 10 of the Agreement on the establishment of the preliminary basis of the Pilot Program provided for SEMARNAT to 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 COCOSCE, will be conducted to determine if adjustments to the ETS design are necessary. This evaluation process may involve consultations with civil society and academia.

SEMARNAT developed an internal evaluation on the ETS´s components during the Pilot, in order to improve and update the regulation of the operational phase.

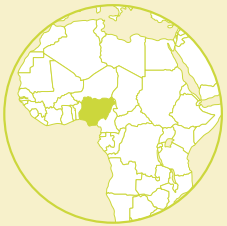
COCOSCE's working groups have developed different recommendations to the Federal Government on the cap and allocation methods, offsets, as well as key topics on the energy sector and legal recommendations.

REGULATORY FRAMEWORK

- General Law of Climate Change
- Agreement on the establishment of the preliminary basis of the Pilot Program of the Emissions Trading System (implementing regulation of the pilot)
- Regulation of the General Law of Climate Change on the National Emissions Register
- Notice on the cap for the years 2020 and 2021
- Notice on the reserve and sectoral allocation of allowances for the years 2020 and 2021

7 According to SEMARNAT. RENE https://www.gob.mx/semarnat/acciones-y-programas/programa-de-prueba-del-sistema-de-comercio-de-emisiones-179414

NIGERIA



In force

Under development

Under consideration

- **Government adopted Climate Change Act with plans for a domestic ETS**
- **Next steps include stakeholder engagement and deciding on the allocation framework**

DESCRIPTION

In November 2021, the Nigerian government adopted Nigeria's "Climate Change Act". The Act provides a framework for achieving low greenhouse gas emission and establishes the National Council for Climate Change (NCCC), vested with powers to make policies and decisions on all matters concerning climate change in Nigeria. According to Art. 4 (J) of the Act, the NCCC must "collaborate with the Federal Ministry responsible for Environment and the Federal Ministry responsible for Trade to develop and implement a mechanism for carbon emissions trading".

Speaking at a high-level meeting between the Ministry of the Environment, the NCCC, and representatives from United Nations Development Program in August 2022, the Nigerian Minister of the Environment announced that the country had commenced activities towards the establishment of a national ETS. The purpose of the meeting was to understand how a national ETS could fit into a framework that has been developed to help the country achieve its national commitments. Key design elements, such as the nature of the planned activities, the expected timeline, and the envisaged sectoral scope, remain to be clarified.

The proposal will undergo a process of stakeholder engagement before decisions are made on features such as the allocation framework.

EMISSIONS & TARGETS OF NIGERIA

GHG EMISSIONS (EXCL. LULUCF), 2017

(in $MtCO_2e$, share of total in %)

Energy	245.9	(36%)
Industrial processes	11.6	(2%)
Agriculture	389.8	(57%)
Waste	30.9	(5%)
Total	**678.2**	

GHG REDUCTION TARGETS

By 2030: Unconditional contribution of 20% below business-as-usual emissions. Contribution of 47% below business-as-usual emissions conditional on international support (Updated NDC, 2021)
By 2060: Carbon neutrality by 2060 (speech by the President in November 2021)

OTHER INFORMATION

INSTITUTIONS INVOLVED

Nigerian Ministry of the Environment: Co-responsible for developing and implementing the Nigerian ETS. Precise responsibilities are yet to be determined.
Nigerian Ministry responsible for Trade: Co-responsible for developing and implementing the Nigerian ETS. Precise responsibilities are yet to be determined.
National Council for Climate Change: Inter-ministerial council created in 2022 to implement the "Climate Change Act 2021", including the Nigerian ETS. Precise responsibilities are yet to be determined.

REGULATORY FRAMEWORK

→ Climate Change Act 2021

BEIJING

BEIJING PILOT EMISSIONS TRADING SYSTEM

- One of two Chinese pilots with ETS regulation passed by regional congress
- Pioneered price corridor as price stability mechanism and cross-regional trading
- Wide coverage of sectors and experienced scope expansion

ETS DESCRIPTION

The Beijing Pilot ETS was launched in November 2013 and is one of two Chinese pilots with ETS regulation passed by its regional congress. Beijing applies a bottom-up approach to cap-setting. The ETS covers ~45% of the city's total emissions, including those from: heat, cement, petrochemicals, and other industrial enterprises; manufacturers; the service sector; and public transport. In 2016, it lowered the inclusion thresholds from the original 10,000 tCO_2 per year to 5,000 tCO_2 while adding the public transport sector. In 2020, Beijing also included aviation in its mandatory reporting scheme, preparing the sector to be included in the carbon market although without a specific timeline.

Beijing is the only regional pilot in China that uses a price floor (CNY 20 [USD 2.97]) and ceiling (CNY 150 [USD 22.26]) 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.

In addition, Beijing plays a supporting role in the national offset program. The Beijing Green Exchange operates the China Certified Emissions Reduction (CCER) national registry. The exchange is currently upgrading the registry system in anticipation of the restart of the CCER program.

YEAR IN REVIEW

In March, the Beijing Municipal Ecology and Environment Bureau (EEB), which manages the pilot, released a notice on the "Management of Key Carbon Emission Units and the Pilot Work of Carbon Emissions Trading in 2022", which included several documents on MRV, allowance allocation, and offsets. The allocation of allowances to the pumped-storage hydroelectricity sector and power grid sector switched from the historical intensity method to benchmarking. The EEB also introduced a methodology to develop low-carbon transportation offset projects.

Like in the previous year, the EEB moved the compliance deadline for 2021 emissions from late October to late November. As of mid-January 2023, Beijing had not yet announced its 2020 and 2021 compliance status, though local experts expect that it was completed with 100% compliance. In October, the EEB published a draft of management measures for public consultation. This is expected to be renewed in 2023.

In force
Under development
Under consideration

SECTORS

INDUSTRY
BUILDINGS
TRANSPORT

CAP

~35 $MtCO_2$ (2021)

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

Domestic (national and provincial)

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average auction price: CNY 117.54 (USD 17.44)
Average secondary market price: CNY 93.32 (USD 13.85)

TOTAL REVENUE

CNY 113 million (USD 16.8 million) since beginning of program
CNY 113 million (USD 16.8 million) in 2022

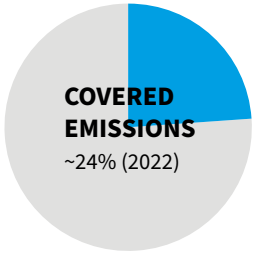
EMISSIONS & TARGETS OF BEIJING

OVERALL GHG EMISSIONS (EXCLUDING LULUCF)
147.2[1] $MtCO_2e$ (2022)

GHG REDUCTION TARGETS
By 2025: Reduce CO_2 emissions (excluding passenger and cargo aviation) by at least 10% compared to the peaking level; reduce CO_2 intensity by ~18% compared to 2020 levels (Beijing 14th Five-Year Plan on Environment Protection)
By 2030: 25% renewable energy consumption, peak Beijing CO_2 emissions (Beijing Carbon Peaking Plan)
By 2035: "Significant" reduction of CO_2 emissions, peak energy consumption (Beijing 14th Five-Year Plan on Energy Saving and Climate Change)

ETS SIZE & PHASES

PHASES
2013 and ongoing[2]



CAP
2020: ~50 $MtCO_2$
2021: ~35 $MtCO_2$[3]

SECTORS AND THRESHOLDS
Industrial and non-industrial companies and entities, including electricity providers, heating, cement, petrochemicals, other industrial enterprises, manufacturers, the service sector, public transport, and domestic aviation.[4]

INCLUSION THRESHOLDS:
Until 2015: 10,000 tCO_2 per year, considering both direct and indirect emissions.

From 2016 onwards: 5,000 tCO_2 per year, considering both direct and indirect emissions.
MANDATORY REPORTING: 2,000 tonnes of coal equivalent (tce) energy consumption per year.

POINT OF REGULATION
Point source (industry); downstream (indirect emissions from electricity and heat consumption).

NUMBER OF ENTITIES
886 within the pilot and another 14 power companies in the national ETS (2021). In addition, 430 other entities had mandatory reporting but no surrender obligations for the 2021 compliance year.

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION
FREE ALLOCATION: Free allocation through grandparenting based on historical emissions or emissions intensity in the baseline years (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 may set aside up to 5% of allowances for regular and irregular auctions (see 'Market Stability Provisions' section). Beijing held its first auction in November 2022.

USE OF REVENUES
Revenues are attributed to the central treasury.

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 has also 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.

1 No data is publicly available for recent years; the data here is estimated by local experts. In its launch year of 2013, the coverage of CO_2 emissions was around 40%, according to the local government. Previously reported data based on public sources in the ETS's launch year 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 ETS, once it is fully operational.
3 Lower than 2020 mainly due to transfer of power sector into national ETS
4 Currently, the domestic aviation sector is only subject to mandatory reporting.

QUALITATIVE LIMIT: CCERs from energy conservation projects and forestry carbon sink projects are eligible, whereas credits from hydropower, HFC, PFC, N_2O, and SF_6 projects are not. CCERs must come from projects that began operating 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).

LINKS WITH OTHER SYSTEMS

The Beijing pilot ETS is not linked with any other system.

COMPLIANCE

COMPLIANCE PERIOD

One calendar year: covered entities have until mid-June of the following year to surrender allowances.[5]

MRV

REPORTING FREQUENCY: Annual

VERIFICATION: Third-party verification is required. In addition, the government organizes expert review of all 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 over 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 7,418.40). 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.

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 Green Exchange.

MARKET TYPES:

Primary: Allowances are distributed through free allocation. Beijing could set up to 5% of allowances for regular and irregular auctions.

Secondary: Trading consists of five spot products: Beijing carbon emission allowances (BEA), CCERs, forest certified emission reductions (FCER), green transport certified emission reductions (PCER), and energy-saving project certified emission reductions. The Beijing Green Exchange manages the trading of all five products.

Due to financial market regulations in China, no forward markets or derivatives are allowed.

LEGAL STATUS OF ALLOWANCES: 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 22.26) for ten consecutive days. It can also buy back allowances from the market using a special funding source from the municipal budget if the price is below CNY 20 (USD 2.97).

EXCHANGE: The Beijing Green Exchange implements a system of limits on price increases and decreases for trading over the exchange 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 compliance entities, one million tonnes for institutional investors, and 50,000 tonnes for natural persons.

RESERVE: The competent authority may set aside up to 5% of allowances for regular and irregular auctions.

5 In recent years, the compliance deadlines have been postponed to later dates, for reasons such as the COVID-19 pandemic.

OTHER INFORMATION

INSTITUTIONS INVOLVED

Beijing Municipal Commission of Development and Reform: Authority responsible for establishing the Beijing ETS until governmental restructure in 2019.
Beijing Ecology and Environment Bureau: Authority responsible for the Beijing ETS after governmental restructure in 2019.
Beijing Green Exchange: Responsible for the trading platform (previously known as the Beijing Environment Exchange).
Beijing Research Center for Climate Change: Responsible for the registry.

EVALUATION/ETS REVIEW

No public information is available about the evaluation or review system. However, the local carbon exchange has published annual reports with an overview of the system's performance from 2014-2018. In addition, research on improving legislation, MRV, and benchmarking, among other issues, has been funded by the local government.

REGULATORY FRAMEWORK

- → Beijing Municipal People's Congress ETS Pilot Bill (2013)
- → Interim Measures for the Management of Emissions Trading in Beijing (2014)
- → Beijing EEB Notice on the Management of Key Carbon Emission Units and the Pilot Work of Carbon Emission Rights Trading in 2020
- → Beijing EEB Notice on the Management of Key Carbon Emission Units and the Pilot Work of Carbon Emission Rights Trading in 2021
- → Beijing Local MRV Standards for Seven Industries (power generation, cement, petro-chemical, heat production, service, road transportation and other industries) (2021)
- → Beijing EEB Notice on the Management of Key Carbon Emission Units and the Pilot Work of Carbon Emission Rights Trading in 2022

CHINA

CHINA NATIONAL EMISSIONS TRADING SYSTEM

- **Became operational in 2021 as the world's largest ETS, covering more than 4 billion tCO_2**
- **Operates as an intensity-based ETS**
- **Covers the power sector initially and will expand to other sectors over time**

ETS DESCRIPTION

China's national ETS began operating in 2021, with the objective of contributing to the effective control and gradual reduction of carbon emissions. China's national ETS is the world's largest in terms of covered emissions, estimated to cover more than 4 billion tCO_2 and accounting for over 40% of the country's carbon emissions.

The China national ETS regulates more than 2,000 companies from the power sector with annual emissions of more than 26,000 tCO_2, including combined heat and power, as well as captive power plants in other sectors. It is an intensity-based system, with allowances freely allocated using benchmarks and based on actual production levels. Compliance obligations are currently limited and vary between different types of power generation. The system's coverage will expand to other sectors over time.

The national ETS builds on the successful experience of pilot carbon markets implemented in eight regions. The pilots will continue to operate in parallel with the national ETS, covering the sectors and entities not included in the national system. As the coverage of the system expands, entities covered by regional systems are expected to be integrated into the national ETS.

YEAR IN REVIEW

In March, the Ministry of Ecology and Environment (MEE) published the "Work Plan on the Management of Enterprise Greenhouse Gas emissions Reporting and verification in 2022" with the updated "2022 Guidelines for Power Greenhouse Gas Emission Measurement and Reporting". These documents confirmed the deadlines for emissions reporting and verification of 2021 emissions, as well as the verification process managed by provincial-level authorities. More detailed MRV requirements were introduced to address issues with data fraud discovered in 2021. In June, considering the impact of the COVID-19 pandemic and the global energy crises, MEE published the "Adjustment on the Management of Enterprise Greenhouse Gas emissions Reporting and verification in 2022", which extended the deadline for verification to September and simplified emissions measurement procedures.

In November, MEE released the draft allocation plan for 2021 and 2022. The plan proposed significantly tighter benchmarks values for coal-fired power plants. The process of compliance for the two-year period was also proposed, with a final compliance deadline of December 2023. Following the draft allocation plan, MEE published "Guidelines for Power Greenhouse Gas Emission Measurement and Reporting" and "Guidelines for Verification", which provided more detailed MRV instructions for verifiers and covered entities.

In force

Under development

Under consideration

SECTORS

POWER[1]

CAP

~4,500 $MtCO_2$ (2019 and 2020)

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

Domestic

ALLOCATION

Free Allocation: Benchmarking

AVERAGE 2022 ALLOWANCE PRICE

Average secondary market price: CNY 55.30 (USD 8.20)

1 Captive power plants in other sectors are also covered.

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, forestry and other land use[5]	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 (14^{th} Five-Year Plan)

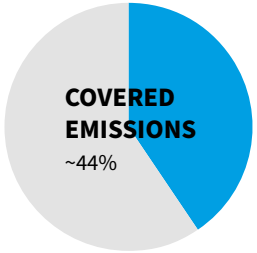
By 2030: Peak CO_2 emissions before 2030; lower CO_2 emissions per unit of GDP by over 65% from 2005 levels ('1+N' policy framework; updated NDC)

By 2060: Carbon neutrality ('1+N' policy framework; updated NDC)

ETS SIZE & PHASES

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. MEE is updating the allocation and compliance rules for the second compliance period, which covers 2021 and 2022.



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 had a cap of 4,500 $MtCO_2$ in 2021.

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:

For 2019-2020: Entities with annual emissions of 26,000 tCO_2 or greater in any year over the period 2013-2019.

For 2021-2022: Entities with annual emissions of 26,000 tCO_2 or more in any year over the period 2020-2021.

POINT OF REGULATION

Point source (power); downstream (indirect emissions from electricity and heat consumption)

NUMBER OF ENTITIES

2,162 (2019 and 2020)

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.

In 2022, MEE proposed revised benchmark values for allocation for the 2021-2022 compliance period. These propose a significant tightening, especially for coal-fired power plants. The process for finalizing the allocation plan and benchmark values is still ongoing.

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 Green Exchange operates the CCER registry. Nine regional carbon exchanges in China are dedicated CCER trading platforms.

COMPLIANCE

COMPLIANCE PERIOD

One calendar year. Entities were requested to surrender allowances in 2021 for emissions from 2019 and 2020. And they are requested to surrender allowance in 2023 for emissions from 2021 and 2022.

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 of emissions from the power sector must be complete by the end of June. Verification of the other seven sectors, which have no compliance obligations, must be complete by the end of the year.

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 improves the existing MRV guidelines and technical specifications for the national ETS every year.

ENFORCEMENT

According to the 2019-2020 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 1,484–4,453) to CNY 50,000-200,000 (USD 7,421-29,686), while fines for failures in compliance obligations would increase from CNY 20,000-30,000 (USD 2,969-4,453) to CNY 100,000-500,000 (USD 14,843-74,215). 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: 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 (i.e., 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: Allowances are currently not considered as financial instruments. For financial accounting purposes, the Ministry of Finance published an interim policy that categorizes only purchased allowances, and 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:
Ministry of Ecology and Environment (MEE): acts as the national competent authority setting the rules and overseeing the system, with joint oversight of trading activities with other national regulators
Provincial-level MEE subsidiaries: oversee the implementation of the ETS, including identifying covered entities, organizing MRV, hiring verifiers, calculating allowance, managing provincial registry account, oversee compliance, etc.
Municipal-level authorities: responsible for managing covered entities directly.
China Carbon Emissions Registration and Clearing Co., Ltd.: responsible for operating the registry and clearing platform.
Shanghai Environment and Energy Exchange: operates the trading platform.

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

- The National Measures for the Administration of Carbon Emission Trading (Trial) (2021)
- Interim Regulations for the Management of Carbon Emissions Trading (draft) (2021)
- Allocation Plan for the Power Sector (2019-2020) and list of covered entities (2021) (English translation)
- Notice on the First Compliance Cycle of Emission Allowance Surrendering for the National ETS (2021)
- Guidelines on enterprises greenhouse gas emissions accounting and reporting – Power generation facilities (2021)
- Guidelines for Enterprise Greenhouse Gas Verification (Trial) (2021)
- Notice on Strengthening the Management of Enterprise Greenhouse Gas Emissions Reporting (2021)
- 24 Guidelines for GHG Monitoring and Reporting for various sectors (2013, 2014, and 2015)
- Notification on Key Points for Management of Enterprises' Greenhouse Gas Emissions Reporting in 2022 (2022)

CHONGQING

CHONGQING PILOT EMISSIONS TRADING SYSTEM

- **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**

ETS DESCRIPTION

Chongqing launched its pilot ETS in June 2014. The ETS covered around 51% of the city's emissions in 2020. Among the eight Chinese pilots, the Chongqing ETS is the only one that covers non-CO_2 gases.

The Chongqing Pilot ETS covers 152 entities in the electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, iron and steel, and other industrial sectors. The Chongqing Pilot ETS operates with an absolute cap, with an annual reduction rate 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%. Allowances are freely allocated through grandparenting based on historical emissions. Auctioning was introduced in 2021 to provide compliance entities with additional supply to meet their compliance demand. The Chongqing Ecology and Environment Bureau (EEB) started to revise the ETS management rules in 2021, including general management rules and specific rules for MRV, allowance management, allocation, and the registry.

In the short-term, the Chongqing Pilot ETS will operate in parallel with the national Chinese carbon market, with a long-term outlook to integrate into the national market.

YEAR IN REVIEW

In March, the Chongqing EEB issued the "Management rules of 'Carbon Hui Tong' (also called CQCER) Eco-Product Value Realization Platform" which regulates the issuance of offset credits and the management of the respective platform. 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' section). The regulatory document for the platform was released for public consultation in July 2021.

In August, the Chongqing EEB issued drafts of "Management rules of allowance in Chongqing", "Management rules of registry in Chongqing", "Management rules of verification agency in Chongqing", and "MRV guidelines for Chongqing ETS" for public consultation. These drafts are updated management rules according to the draft of "Management rules of Emissions Trading in Chongqing", which was issued for public consultation in July 2021 to replace the 2014 Interim management rules.

In December, the Chongqing EEB issued the drafts of "2021 Allocation Plan for Chongqing ETS" for public consultation. In this draft, the Chongqing ETS employs a benchmarking method and historical intensity method for the first time. The Chongqing EEB also announced an increase in the ETS's compliance rate (from 22 non-compliant entities in 2018 to 11 in 2019 and 2020).

In force
Under development
Under consideration

SECTORS

INDUSTRY

CAP

78.39 $MtCO_2e$ (2020)

GREENHOUSE GASES

CO_2, CH_4, N_2O, HFCs, PFCs, SF_6

OFFSETS AND CREDITS

Domestic (national and provincial)

ALLOCATION

Free Allocation: Grandparenting
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average auction price: CNY 28.67/tCO_2 (USD 4.26/tCO_2)
Average secondary market price: CNY 39.51/tCO_2 (USD 5.86/tCO_2)

TOTAL REVENUE

CNY 335.83 million (USD 49.83 million) since the beginning of the program
CNY 79.91 million (USD 11.86 million) in 2022

EMISSIONS & TARGETS OF CHONGQING

OVERALL GHG EMISSIONS (EXCLUDING LULUCF)

142.9 $MtCO_2$ (2020)[1]

GHG REDUCTION TARGETS

By 2025: MEE determined the carbon intensity reduction target (Chongqing 14th Five-Year Plan on Climate Change)

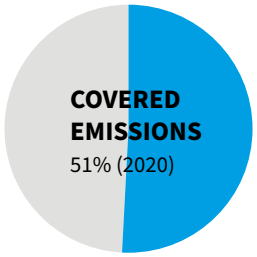
By 2030: Achieve emissions peak (Chongqing Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy)

By 2060: Climate neutrality (Chong Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy)

ETS SIZE & PHASES

PHASES

2013 and ongoing



CAP

2013: 125 $MtCO_2e$

From 2013 to 2015, the annual reduction rate of the cap was 4.13%. From 2016 onwards, it was revised to 4.85%.

2018 and 2019: 97 $MtCO_2e$

2020: 78.4 $MtCO_2e$

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 2021: In the draft allocation, Chongqing plans to lower the threshold to 13,000 tCO_2/year or energy consumption of 5,000 tce/year.

POINT OF REGULATION

Point source (direct emissions), downstream (indirect emissions from electricity and heat consumption)

NUMBER OF ENTITIES

152 (2021)

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.

In the draft 2021 allocation plan, Chongqing EEB introduced both a historical intensity method and benchmark methods. There are four methods in the draft. Benchmarks will be used in cement clinker and electrolytic aluminium production. Grandfathering will be used in mechanical equipment manufacturing and car manufacturing. For incineration waste power generation and 100% heat generation, the allocation will be the same as the emissions. The historical intensity method will be used for the remaining sectors.

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. In 2022, one auction was held in February.

USE OF REVENUES

Revenues are attributed to the provincial treasury.

FLEXIBILITY & LINKING

BANKING AND BORROWING

Banking is allowed. Borrowing is not.

1 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 expert estimates is 156 $MtCO_2$ (2018).

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Domestic project-based carbon offset credits – CCERs – are allowed for up to 8% of an entity's 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 except for carbon sink projects. Credits from hydropower 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.

LINKS WITH OTHER SYSTEMS

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 provides 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.

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 guidance 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 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: Authority responsible for establishing the Chongqing ETS after governmental restructure in 2020.
Chongqing Carbon Emissions Trading Center: Responsible for operating the trading platform.
Chongqing Resource and Environment Trading Center: Responsible for the registry.

EVALUATION/ETS REVIEW

No public information about the evaluation or review system. However, the Chongqing EEB is revising all the major managements rules since 2021.

REGULATORY FRAMEWORK

- Interim Measures for Management of Emissions Trading in Chongqing 2014
- Chongqing Allowance Allocation Management Rules (2014)
- Chongqing EEB Notice on Carrying out ETS Work for Compliance Year 2019
- Chongqing EEB Notice on Carrying out ETS Work for Compliance Year 2020
- Chongqing Work Program for Auctioning Allowances for 2019 and 2020 Compliance (2021)
- Management rules of Emissions Trading in Chongqing (draft for comments) (2021)
- Chong Working Guidance For Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy (2021)
- Management Rules of Allowance in Chongqing (draft for comments) (2022)
- Management Rules of Registry in Chongqing (draft for comments) (2022)
- Measures for Management of Verification agency in Chongqing (draft for comments) (2022)
- MRV Guidelines for Chongqing ETS (draft for comments) (2022)

FUJIAN

FUJIAN PILOT EMISSIONS TRADING SYSTEM

- **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 six consecutive years**

ETS DESCRIPTION

The province of Fujian launched its ETS in September 2016. It covers around half of the province's emissions and nearly 300 entities in 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. Allowances are distributed for free, using benchmarking or grandparenting based on production levels. Auctioning may take place when considered appropriate by the ETS authorities. The Fujian 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 forestry offset credits had traded in the Fujian ETS.

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". In the short term, it will operate in parallel with the national carbon market. Over the longer term, it is expected to be integrated into the national market.

YEAR IN REVIEW

The Fujian Provincial Ecology and Environment Bureau (EEB) released the 2021 allocation plan for public consultation in November 2022. The plan introduces benchmarking as the allocation method for the power grid company. The EEB also revived the market stability reserve in the 2021 allocation plan, which equals 5% of the sum of existing entities' allowances and new entrants' allowances.

In January 2023, the Fujian EEB announced full compliance for 2021, with all 296 covered entities having submitted allowances as required on time.

The Fujian Province Communist Party Committee and the Provincial Government published "Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy" (hereafter, "Carbon Working Guidance") in August. It set up the carbon neutrality roadmap for Fujian Province (see 'GHG Reduction Targets' section).

In force
Under development
Under consideration

SECTORS

INDUSTRY

DOMESTIC AVIATION

CAP

~132 $MtCO_2$ (2021)

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

National
Provincial

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average secondary market price: CNY 22.74 (USD 3.37)

TOTAL REVENUE

CNY 1.25 million (USD 185,460) since beginning of program*

* 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. The exchange did not disclose the final volume and price. The calculation here assumes that all allowances were sold at the floor price.

EMISSIONS & TARGETS OF FUJIAN

OVERALL GHG EMISSIONS (EXCLUDING LULUCF)

245.4 $MtCO_2$ (2020)[1]

GHG REDUCTION TARGETS

By 2025: MEE determined the carbon intensity reduction target (Carbon Working Guidance)
By 2030: Peak CO_2 emissions (Carbon Working Guidance)
By 2060: Achieve carbon neutrality (Carbon Working Guidance)

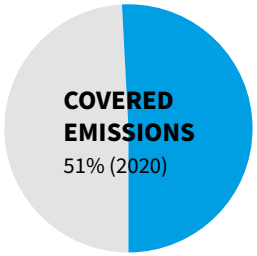
ETS SIZE & PHASES

PHASES

2016-ongoing[2]

CAP

2016-2018: ~200 $MtCO_2$
2019: ~220 $MtCO_2$[3]
2020: ~126 $MtCO_2$
2021: ~132 $MtCO_2$



The cap comprises 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 Chinese 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

Point source (industry); downstream (indirect emissions from electricity and heat consumption)

NUMBER OF ENTITIES

296 (2021)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

Allowances are 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 each year, 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 grid, 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 3.93) to ~CNY 30 (USD 4.45). No further auctions have taken place to date.

1 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 sources in the launch year of the ETS is 240.0 $MtCO_2$ (2014).
2 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.
3 There is no public data on the total cap or its elements. This number is based on an estimate by experts. The cap for 2019 was estimated to cover 87% of carbon emissions.

USE OF REVENUES
Revenues are attributed to the provincial general budget.

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, and from CO_2 or CH_4 reduction 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.

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.[4]

MRV
REPORTING FREQUENCY: Annual reporting of CO_2 emissions to the competent authority before the end of February of the following year.[5]

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 1,484) to CNY 30,000 (USD 4,451). 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 4,451). Additionally, twice the amount of the missing allowances can be withdrawn from the account of the company or deducted from the following 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 1,484) to CNY 30,000 (USD 4,451).

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 1,484) to CNY 30,000 (USD 4,451).

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: Compliance entities and institutional investors (domestic only) that meet the requirements of the emissions trading rules set up by Fujian EEB.

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.

4 This is according to the "Interim Measures of the Fujian ETS". In practice, the provincial government releases executive notices to guide the timeline of the annual compliance circle.
5 In recent years, the deadline has been postponed.

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

MARKET STABILTY PROVISIONS

RESERVE: 5% 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 Ecology and Environment Bureau: Authority responsible for establishing the Fujian ETS after governmental restructure in 2019.
Fujian Haixia Equity Exchange: Responsible for operating the trading platform.
Fujian Economic and Information Center: Responsible for operating the 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

→ 2020 Amendments to the Interim Measures
→ Fujian Provincial Ecology and Environment Bureau – Allocation Plan for Vintage 2018 and 2019
→ Fujian Provincial Ecology and Environment Bureau – Allocation Plan for Vintage 2020
→ Fujian Provincial Ecology and Environment Bureau – Allocation Plan for Vintage 2021

GUANGDONG

GUANGDONG PILOT EMISSIONS TRADING SYSTEM

- **Largest market with ongoing scope expansion and highest spot trading volume among pilots**
- **Diverse market participants, including foreign investors, and pioneered auctioning**
- **First pilot to introduce Tan Pu Hui Offset Mechanism for compliance[1]**

ETS DESCRIPTION

The Guangdong ETS was launched in December 2013. It covers around 40% of the province's emissions. With broad sectoral coverage, the Guangdong ETS is the largest of the Chinese ETS pilots in terms of market size and spot trading volume.

The Guangdong ETS covers emissions from around 180 entities in the cement, steel, petrochemicals, paper, and domestic aviation sectors. Since its launch, its scope has expanded to include ceramics, textiles, and data centers. The ETS has an absolute cap that is announced annually. Allowances are primarily allocated for free, although ad hoc auctions have been held since 2017. In recent years, it has introduced new measures to enhance market liquidity and is one of the regional pioneers for allowance forward trading in China.[2]

The Guangdong ETS was the fourth largest ETS in the world before the power sector was transferred to the Chinese national ETS in 2020. The Guangdong pilot's longer-term outlook is to integrate fully into the national carbon market.

YEAR IN REVIEW

In February, the Guangdong provincial Ecology and Environment Bureau (EEB) issued a notice requiring covered entities to complete the verification of emissions reports as well as allowance compliance for the 2021 compliance year. In this notice, the Guangdong EEB also released two revised guidelines on reporting and verification for entities and third-party verifiers. Another set of working guidelines on the use of Chinese Certified Emissions Reductions (CCERs) and Tan Pu Hui (PHCER) offsets were also issued (see 'Offsets and Credits' section).

In April, the Guangdong EEB released regulations regarding the trading management of PHCERs and clarified the methodology. These regulations strengthen the voluntary emissions reduction mechanism for the Guangdong ETS and is aimed at mobilizing society towards emissions reductions and carbon neutrality. In May, the EEB issued a notice to delay the compliance deadline to August and announced in October that only one of 176 entities had not fulfilled their compliance obligations for 2021.

In December, the Guangdong EEB released the 2022 allocation plan. The threshold was lowered from 20,000 tCO_2 per year or energy consumption of 10,000 tce (tonne of coal equivalent)/year to 10,000 tCO_2/year or energy consumption of 5,000 tce/year.

In force

Under development

Under consideration

SECTORS

INDUSTRY

DOMESTIC AVIATION

CAP

265 $MtCO_2$ (2021)

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

Domestic (national and provincial)

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average secondary market price: CNY 76.53 (USD 11.35)

TOTAL REVENUE

~CNY 815.5 million (USD 121 million) since the beginning of the program

1 A local voluntary offset scheme with credits generated via mitigation projects or low-carbon behaviors.
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 GUANGDONG

OVERALL GHG EMISSIONS (EXCLUDING LULUCF)

693.5 $MtCO_2$[3]

GHG REDUCTION TARGETS

By 2025: CO_2 intensity reduction meets the requirement of central government (20.5%, compared to the CO_2 intensity in 2020); (Guangdong Province 14th Five-Year-Plan for Tacking Climate Change)

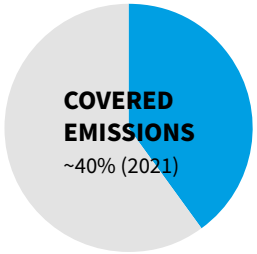
By 2030: Peak carbon emissions (Guangdong Province Implementation Opinions on Implementing the New Development Concept and Promoting Carbon Neutrality)

By 2060: Climate neutrality (Guangdong Province Implementation Opinions on Implementing the New Development Concept and Promoting Carbon Neutrality)

ETS SIZE & PHASES

COVERED EMISSIONS

~40% (2021)[4]



PHASES

PHASE ONE: 3 years (2013-2015)
PHASE TWO: 5 years (2016-2020)
PHASE THREE: Ongoing (2021-present)[5]

CAP

Guangdong is one of few pilots in China that announces its annual emissions cap. Within the annual cap, the government also keeps a certain amount as a reserve 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)[6]
2022: 266 $MtCO_2$ (including 13 $MtCO_2$ reserves)

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

Point source (industry); downstream (indirect emissions from electricity and heat consumption)

NUMBER OF ENTITIES

200 existing entities, 17 new entrants (2022)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

FREE ALLOCATION: Primarily 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.

3 As there is no publicly available data for the most recent years, the data here is provided by local experts. Previously reported data was based on public sources from the launch year of the ETS: 610.5 $MtCO_2$ (2012).
4 There is no publicly available data for recent years; data here is estimated by local experts. For 2020 (power generation entities still covered by Guangdong ETS) the coverage is estimated to be 65%.
5 In the short term, the Chinese regional carbon markets are expected to operate in parallel with the Chinese national ETS. Over the medium to long term, they are expected to be integrated into the national market.
6 The drop is mainly due to the transfer of the power sector into national ETS.

Grandparenting on the basis of total historical emissions is applied to some processes in the cement and steel industries and the whole petrochemicals 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 and 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. In the first compliance year, entities were required to purchase allowances at auction to be 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 2 million allowances (until 2018) to 5 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 3.84). Only 400,000 allowances were sold at CNY 28.20 (USD 4.19).

The auction volume for the 2022 compliance year was reduced to 0.5 million. These allowances are expected to be sold at the beginning of 2023 and April 2023.

USE OF REVENUES
Revenues are attributed to the provincial treasury.[7]

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 Reductions (PHCER), a local offset program introduced in 2017, are allowed.

In addition to the quantitative limit applied to individual entities, Guangdong sets an upper limit on the total volume of offsets allowed. In 2020, entities could use up to 1.5 million offsets (CCERs and PHCERs) towards compliance obligations, with priority given to CCERs and PHCERs from projects within Guangdong. In 2021, entities could use up to 1 million offsets for compliance. The maximum amount for 2022 is not published yet.

QUALITATIVE LIMIT: At least 70% of offsets used by each covered entity must come from within Guangdong province. Pre-CDM credits are not eligible. Credits from hydropower 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 employs auctioning for PHCERs in addition to the existing secondary market trading, with an auction reserve price set by the local exchange and offset project developers. In 2021, six PHCER auctions were held. No auctions were held in 2022.

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 a plan are not yet available.[8]

7 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.
8 Guangdong and Hubei also explored linking their pilot markets in 2012/2013, but this did not materialize.

COMPLIANCE

COMPLIANCE PERIOD

One calendar year; covered entities have until June/August of the following year to surrender allowances.

MRV

REPORTING FREQUENCY: Annual

VERIFICATION: Third-party verification is required. In addition, further verification was initially carried out by government-assigned expert groups in the first three compliance years. Onsite cross re-verification was conducted for entities with questionable verification reports, as well as for randomly selected entities.

A "fourth-party independent evaluation system" has been in place since the 2016 compliance period. "Technical evaluation organizations" selected by the government carry out technical review and evaluation of annual emissions and verification reports and undertake further onsite review and random inspection tasks. These organizations do not undertake regular third-party verification tasks. The government also conducts random checks on emissions reports.

FRAMEWORK: Guangdong EEB revised reporting and verification guidelines for the compliance entities and third-agency verification sectors in 2022.

OTHER: Industrial enterprises with annual CO_2 emissions of 5,000-10,000 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 1,484) to CNY 50,000 (USD 7,418). Furthermore, companies failing to surrender sufficient allowances are deducted twice the number of allowances from the following year's allocation and fined CNY 50,000 (USD 7,418). 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 failing to establish and implement a risk management system range from CNY 10,000 (USD 1,484) to CNY 50,000 (USD 7,418).

THIRD-PARTY VERIFIERS: Third-party agencies are fined between CNY 30,000 (USD 4,451) and CNY 50,000 (USD 7,418) for issuing false verification reports, material errors in verification reports, or for unauthorized use or publication of confidential corporate and emissions information.

MARKET REGULATION

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities; domestic and international institutional investors that meet the requirement of the carbon emission trading rules set by China Emissions Exchange (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. The 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 2020 to organize auctions for covered entities to enhance market efficiency for the secondary market. CCERs and PHCERs are also traded in the secondary market. All products are traded on the CEEX.

Due to the financial market regulations in China, no standardized forward markets or derivatives are allowed. However, with the April 2021 establishment of the Guangzhou Futures Exchange, Guangdong is seeing new momentum to study and explore the launch of carbon futures and other innovative financial products.

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

MARKET STABILTY PROVISIONS

RESERVES: 5% of allowances are set aside as government reserves for new entrants and market stability. The specific rules for market stability are provided by its "Trial Measures for ETS".

AUCTION RESERVE PRICE: Auctions under the Guangdong Pilot ETS are subject to an auction reserve price.

In 2015, a "policy reserve price" was set as an effective reserve price, which links the auction reserve price with the secondary market price. In 2016, the policy reserve price was set at 100% of the weighted average price for allowances over the previous three months. When auctions 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 impact of the COVID-19 pandemic. No auctions were held in 2021 or 2022.

OTHER INFORMATION

INSTITUTIONS INVOLVED

Guangdong EEB Province (EEB): Authority responsible for ETS affairs, including MRV.
China Emissions Exchange (Guangzhou): Responsible for operating the trading platform.
Guangdong Research Center for Climate Change: Responsible for administrating the registry.

EVALUATION/ETS REVIEW

No public information about the evaluation or review system is available. However, the Guangdong Research Center for Climate Change has published a biannual/annual report of the Guangdong ETS with an overview of its performance from 2013-2018. 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)
- → Trial Measures for Carbon Emissions Trading in Guangdong (2014)
- → Guangdong EEB—Allocation Plan for Vintage 2019 (including list of covered entities)
- → Guangdong EEB—Allocation Plan for Vintage 2020 (including list of covered entities)
- → Guangdong EEB—Allocation Plan for Vintage 2021(including list of covered entities)
- → Guangdong EEB—Allocation Plan for Vintage 2022 (including list of covered entities)
- → Guangdong EEB—Regulations of PHCER trading management

HUBEI

HUBEI PILOT EMISSIONS TRADING SYSTEM

- **One of the largest pilot markets, with diversified participants and an established market stability mechanism**
- **Leading in the operation of the national ETS registry**
- **Sets a threshold which applies to all industrial sectors**

ETS DESCRIPTION

The Hubei Pilot ETS was launched in April 2014 and covers around a quarter of the province's emissions.

Hubei's system covers more than 300 entities in a broad range of industrial sub-sectors. Unlike the other Chinese pilots, Hubei does not pre-define which sectors are covered under its ETS; rather, it sets a threshold which applies to all industrial sectors. Allowances have primarily been freely allocated, through both grandparenting and benchmarking, although several ad hoc auctions have been held since 2014.

Hubei has been one of the most active regional markets in China in terms of trading and has the second largest market in terms of spot trading volume, after Guangdong. It is also one of the regional pioneers for allowance forward trading in China. Hubei has also played 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 the China Hubei Emission Exchange has operated since the national ETS began. In 2022, Hubei established the China Carbon Emissions Registration and Clearing Co., Ltd. in Wuhan to manage the registry and clearing system for the national ETS.

The Hubei ETS will operate in parallel with the Chinese national carbon market, with a long-term outlook to integrate into it.

YEAR IN REVIEW

In May, the Hubei provincial Ecology and Environment Bureau (EEB) released the "Management rules of third-party verification agency", which provides guidelines for accreditation and monitoring third-party verification agencies. In October, the EEB released Hubei's 14th Five-Year Plan on Climate Change, which requires the ETS to undergo improvements. These include a revision of the "Interim Measures for Management of Emissions Trading in Hubei Province", lowering the inclusion threshold, and expanding ETS coverage.

In November, the Hubei EEB released the 2021 allocation plan, where it applied similar allocation methods as it did for 2020. Key changes compared to the previous year include an adjustment of the reduction rate in historical methods and updating the base year emissions from 2017-2019 to 2018-2020.

In December 2022, Hubei organized two auctions, which raised revenues of CNY 68.22 million (USD 10.12 million) and CNY 18.47 million (USD 2.74 million).

In force
Under development
Under consideration

SECTORS

INDUSTRY

CAP

182 $MtCO_2$ (2021)

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

Domestic (provincial)

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average auction price: CNY 43.35 (USD 6.43)
Average secondary market price: CNY 46.86 (USD 6.95)

TOTAL REVENUE

CNY 385.74 million (USD 57.23 million) since the beginning of the program
CNY 86.69 million (USD 12.86 million) in 2022

EMISSIONS & TARGETS OF HUBEI

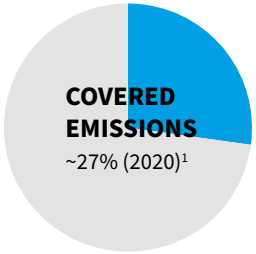
OVERALL GHG EMISSIONS (EXCLUDING LULUCF)
463.1 $MtCO_2$

GHG REDUCTION TARGETS
By 2025: Carbon intensity reduction target (Set by national government). (Outline of the 14th Five Year Plan and 2035 Vision for Economic and Social Development of Hubei Province)

ETS SIZE & PHASES

PHASES
2014 and ongoing

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 $MtCO_2$[2]
2021: 182 $MtCO_2$



SECTORS AND THRESHOLDS
Unlike other Chinese pilots, Hubei does not pre-define which sectors are covered under its ETS; rather, it sets a threshold which applies to all industrial sectors. Sub-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, medicine producers, and water supply. Until 2019 power generation was also covered, after which it was integrated into the national ETS.

INCLUSION THRESHOLDS:
Until 2015: Annual energy consumption more than 60,000 tonnes of coal equivalent (tce) in any year between 2010 and 2011, applying to all energy and industrial sectors.

From 2016 till 2019: Annual energy consumption more than 10,000 tce in any year of recent two years, applying to all energy and industrial sectors.

From 2020 onwards: Annual energy consumption more than 10,000 tce in any year of recent two years, applying to all industrial sectors.

POINT OF REGULATION
Point source (industry); downstream (indirect emissions from electricity and heat consumption)

NUMBER OF ENTITIES
339 (2021)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION
FREE ALLOCATION, BENCHMARKING: Free allocation of allowances through benchmarks for 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' historical emissions for all other sectors.

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

Hubei also uses a "market adjustment factor", which is applied to all covered entities to reduce overall allocation. It is determined based on the previous year's supply-demand balance, while taking the province's overall economic development and the achievement of its climate mitigation targets and strategies into consideration. For the 2021 compliance year, it was set at 0.99 (as compared to 0.98 for 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,

1 There is no official data, so emissions coverage given here is an estimate. Coverage for 2019 was estimated at ~45%.
2 This decrease is mainly due to the transfer of the power sector into the national ETS.
3 In this case, entities first receive half of their total allowances based on the previous year's actual emissions or historical emissions baseline; actual production data are then used to update allocation ex-post.

2019, 2020, 2021 and 2022. 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.

USE OF REVENUES

Revenues are attributed to the provincial treasury.

FLEXIBILITY & LINKING

BANKING AND BORROWING

Banking is allowed, but only for allowances that have been 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, with reductions achieved between these dates.

LINKS WITH OTHER SYSTEMS

Though Hubei explored linking with the Guangdong ETS pilot in 2012/2013, this did not materialize and there are no further plans for linkage.

COMPLIANCE

COMPLIANCE PERIOD

One calendar year; covered entities have until the last working day of May of the following year to surrender allowances. 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, "fourth-party verification" is carried out by government-assigned experts to further enhance accuracy.

FRAMEWORK: The Hubei government has released general rules on monitoring and reporting guiding for all sectors as well as sector-specific guidance for the following 11 sectors: power, glass, aluminum, calcium carbide, pulp and paper, automobile manufacturing, iron and steel, ferroalloys, ammonia, cement, and petroleum processing. Hubei also uses national-level guidelines on MRV, especially for the sectors outside these 11, as a reference.

ENFORCEMENT

REGULATED ENTITIES: Hubei uses a capping mechanism for 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), allowances will be accordingly added to or deducted from the cap to balance out the surplus or deficit.[4]

Penalties for failing to submit an emissions or verification report on time range from CNY 10,000 (USD 1,484) to CNY 30,000 (USD 4,451). Trade participants who manipulate the market face up to CNY 150,000 (USD 22,255) 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, up to CNY 150,000 (USD 22,255).

Other non-financial penalties include disqualification from the national or provincial energy-saving program and blacklisting for carbon emission and credit records.

TRADING INSTITUTIONS: Penalties for publishing false information or manipulating the market range from CNY 10,000 (USD 1,484) to CNY 50,000 (USD 7,418). Institutions involved in illegal payments are fined one to three times the amount of the payment, up to CNY 150,000 (USD 22,255).

THIRD-PARTY VERIFIERS: Penalties for submitting false verification reports range from CNY 10,000 (USD 1,484) to CNY 50,000 (USD 7,418). Verifiers involved in illegal payments in addition to submitting false verification reports are fined one to three times the value of the payment, up to CNY 150,000 (USD 22,255).

4 Two limits, as opposed to only one, are set based on the consideration that 20% may suit smaller entities better while 200,000 tonnes may suit larger ones.

MARKET REGULATION

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities; non-compliance entities such as domestic and international institutional investors; 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 in each compliance year.

Secondary: Spot products include Hubei Emission Allowances (HBEAs) and CCERs. The HBEA spot forward product was introduced in 2016 but has not been traded since May 2017. The China Hubei Emission Exchange manages trading of all products.

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

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 Hubei EEB – in consultation with an advisory committee consisting of government institutions and other stakeholders – can buy or sell allowances in order to stabilize the market. Specifically, the Hubei EEB takes action if the allowance price reaches a low or high point six times during a 20-day period.

EXCHANGE: The exchange limits day-to-day price fluctuations to a 10% move in either direction.

OTHER INFORMATION

INSTITUTIONS INVOLVED

Hubei EEB: Authority responsible for establishment and overseeing the Hubei ETS after governmental restructure in 2019.

China Hubei Emission Exchange: Responsible for operating the trading platform and registry.

EVALUATION/ETS REVIEW

No information is publicly available regarding 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)
- → Interim Measures for Management of Emissions Trading in Hubei Province (2014)
- → Allocation Plan for Vintage 2019 (including list of covered entities)
- → Allocation Plan for Vintage 2020 (including list of covered entities)
- → Allocation Plan for Vintage 2021 (including list of covered entities)

INDIA

- **Indian parliament established legal basis for issuing carbon credits**
- **Current plans foresee a voluntary offset market and a compliance market**
- **Planned compliance scheme will be intensity-based**

In force

Under development

Under consideration

DESCRIPTION

In 2021, India's Bureau of Energy Efficiency (BEE) – a state agency under the Ministry of Power – presented a draft blueprint for the phased introduction of a national carbon market. The blueprint proposed establishing two mechanisms: in the first phase, a voluntary market supported by a domestic project-based offset scheme ("Carbon Offset Mechanism"); in the second phase, a compliance market with mandatory participation for regulated entities ("Carbon Credit Trading Mechanism").

In July 2022, the Indian Lower House of Parliament (Lok Sabha) adopted an amendment bill to the 2001 "Energy Conservation Act". The bill provides the legal basis to establish a domestic carbon market and grants the power to issue carbon credit certificates for the reduction of carbon emissions. In December 2022, the Upper House of Parliament (Rajya Sabha) adopted the amendment bill.

According to a draft paper for stakeholder consultation that the BEE issued in October 2022, the Indian "Perform, Achieve and Trade" (PAT) scheme – a mandatory energy efficiency scheme covering more than 1,000 entities from 13 sectors – should be gradually transitioned into a compliance carbon market. The carbon market would utilize existing MRV guidelines and administrative infrastructure. Like the PAT scheme, the compliance carbon market would be intensity-based.

The voluntary market is expected to enter into force by July 2023, followed by the compliance market. According to current plans, the first compliance cycle would begin in 2024. The BEE is preparing a framework document on the Indian carbon market with further details which is expected to be published in the first quarter of 2023.

On the state level, in May 2022 the government of Gujarat declared its intention to implement a cap-and-trade scheme. The proposed subnational carbon market is set to cover emissions from large industrial and power sector sources in the state. Details are currently being developed by the Gujarat authorities, with assistance from researchers from the University of Chicago, Yale University, and Abdul Latif Jameel Poverty Action Lab.

EMISSIONS & TARGETS OF INDIA

GHG EMISSIONS (EXCL. LULUCF), 2016

(in $MtCO_2e$, share of total in %)

Energy	2,129.7	(75%)
Industrial processes	226.4	(8%)
Agriculture	407.9	(14%)
Waste	75.3	(2.6%)
Total	**2,839.4**	

Energy industries	1,206.7	(42%)
Manufacturing industries and construction	397.9	(14%)
Transport	274.6	(10%)
Commercial, institutional, and residential	213.5	(7%)
Other energy	37	(1%)

GHG REDUCTION TARGETS

By 2030: achieve emissions intensity of 45% below 2005 levels by 2030 (Updated NDC, 2022)
By 2070: carbon neutrality (Updated NDC, 2022)

OTHER INFORMATION

INSTITUTIONS INVOLVED

Ministry of Environment, Forest and Climate Change: responsible for the national climate strategy.
Ministry of Power: responsible ministry for national energy policy and the national carbon market.
Bureau of Energy Efficiency (BEE): Government agency responsible for the administration and implementation of the planned carbon market as well as the existing PAT scheme.

REGULATORY FRAMEWORK

→ **The Energy Conservation (Amendment) Bill (2022)**
→ **The Energy Conservation Act (2001)**
→ **The Environment Protection Act (1986)**

INDONESIA

- **Intensity-based ETS to be implemented in the power sector generation sub-sector in 2023**
- **ETS will build on the successful pilot of a similar scheme in 2021**
- **Hybrid "cap-tax-and-trade" system to start in 2023, or 2025 at the latest**

In force

Under development

Under consideration

DESCRIPTION

In January 2023, the Ministry of Energy and Mineral Resources (MEMR) announced that a mandatory, intensity-based ETS for the power sector would launch in February. The ETS will consist of three phases: 2023-2024 (covering coal-fired power plants), 2025-2027, and 2028-2030. As of November 2022, 99 coal-fired power plants, accounting for 81.4% of generation capacity, will be covered. MEMR expects to see a reduction of 500,000 tCO_2 in the sector through the ETS in 2023.

The announcement followed years of preparation. In 2021, the "Presidential Regulation No. 98 on the Instrument for the Economic Value of Carbon" was issued, providing a national framework for carbon pricing instruments (CPI), including an ETS. This regulation extends the 2017 "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. The new ETS will eventually work as a hybrid "cap-tax-and-trade" system alongside a carbon tax that was established in the 2021 "Law of the Harmonization of Tax Regulations". Facilities that fail to meet their obligations under the system will be subject to the tax, the rate of which will eventually be linked to the price of the domestic carbon market. Initially to be introduced in April 2022, the carbon tax has now been postponed likely until 2025.

In 2021, a voluntary intensity-based pilot was conducted in the power generation sub-sector. The pilot involved 32 generators, representing more than 75% of energy sector emissions, with an average carbon price of USD 2 per tonne of CO_2. The pilot familiarized stakeholders with ETS compliance and offset mechanisms, and informed the development of the mandatory national ETS.

In October 2022, the Ministry of Environment and Forestry released Regulation 21/2022 "Guidelines for Carbon Economic Value Implementation", providing the legal basis for the implementation of a cross-sectoral ETS in Indonesia and covering details on offsets, sector-specific carbon trade roadmaps, MRV procedures, and institutional arrangements. This was followed in December by MEMR's Regulation 16/2022 "Guidelines for Carbon Economic Value Implementation for the Power Generation Sub-sector", which provides the legal basis for implementing the ETS for power generators.

An MRV system is currently in operation in the industrial sector and the power generation sub-sector. Pilot MRV programs are being conducted also in cement and fertilizer sectors.

EMISSIONS & TARGETS OF INDONESIA

GHG EMISSIONS (EXCL. LULUCF), 2019

(in $MtCO_2e$, share of total in %)

Energy	636.5	(69%)
Industrial processes	58.1	(6%)
Agriculture	105.3	(11%)
Waste	120.3	(13%)
Total	**920.2**	

Energy industries	289.0	(31%)
Manufacturing industries and construction	136.2	(15%)
Transport	157.8	(17%)
Commercial, institutional, and residential	27.9	(3%)
Other energy	25.6	(3%)

GHG REDUCTION TARGETS

By 2030: 31.9% below BAU including LULUCF (unconditional, Enhanced NDC, September 2022); up to 43.2% below BAU including LULUCF (Enhanced NDC, conditional on international support)
By 2060: Climate neutrality (Long-Term Strategy for Low Carbon and Climate Resilience, July 2021)

OTHER INFORMATION

INSTITUTIONS INVOLVED

Coordinating Ministry for Maritime and Investment Affairs and Coordinating Ministry for Economic Affairs: Chair and Vice Chair of the National Steering Committee for Carbon Pricing Implementation; coordinates ministries/agencies in developing the national carbon pricing framework.
Ministry of Environment and Forestry (MoEF): National focal point for UNFCCC; leads NDC development and implementation, including national mitigation and adaptation and implementation of carbon pricing (including providing authorization for national and international emission trading, and overseeing offsetting; oversees MRV; operates the National Registry System (SRN).
Ministry of Energy and Mineral Resources (MEMR): Coordinates ETS implementation in the power sector, including oversight of an integrated MRV system with the SRN; responsible for preparing and implementing the 2021 voluntary pilot carbon market.
Ministry of Industry: Coordinates implementation of CPIs on the Industrial Processes and Product Use (IPPU) sector, including an emissions reporting system to be integrated with the SRN.
Ministry of Finance: Leads the development and implementation of the carbon tax.
The Indonesian Environment Fund (Badan Pengelola Dana Lingkungan Hidup/BPDLH): Handles climate funding; manages ETS revenues, including any international carbon credit trading.

REGULATORY FRAMEWORK

- → Regulation 46/2017 on Environmental Economic Instruments
- → Law 7/2021 Concerning Harmonization of Tax Regulations
- → Presidential Regulation 98/2021 on the Instrument for the Economic Value of Carbon for Achievement of the NDC and Control of Carbon Emissions in Development
- → MoEF Regulation 21/2022 on Guidelines for Carbon Economic Value Implementation
- → MEMR Regulation 16/2022 on Guidelines for Carbon Economic Value Implementation for the Power Generation Sub-sector

JAPAN

- New voluntary ETS to become operational in 2023
- Cabinet passed 10-year road map including initial plans for transition to mandatory ETS
- Relevant ministries preparing to scale up carbon pricing from 2026

In force

Under development

Under consideration

DESCRIPTION

The expansion of carbon pricing beyond Japan's existing carbon tax has been considered for several years. After the country set its 2050 net zero target, the Ministry of the Environment (MoE) and the Ministry of Economy, Trade and Industry (METI) established working groups to outline plans for carbon pricing. The MoE's 2021 interim report proposed a carbon tax with an eventual rate sufficient to trigger abatement across the economy and raise revenue for supporting innovation, and an ETS, which would introduce auctioning in the early 2030s and have access to offsets. METI recommended a voluntary baseline-and-credit scheme, including domestic credits and international offsets from the Joint Crediting Mechanism (JCM) (see below).

METI's proposal has since been chosen as Japan's immediate carbon pricing approach. In February 2022, it announced the basic concept of the Green Transformation (GX) League, a baseline-and-credit system. Participation is voluntary, although compliance for participants is mandatory. The government is currently working on the rules for the GX League, which will become fully operational in April 2023. In February 2023, Japan's Cabinet passed the GX Basic Plan, a ten-year roamap for carbon pricing. It includes initial arrangements for a mandatory ETS from 2026, which introduces auctioning from 2033.

Japan also operates the voluntary Support for High-efficiency Installations for Facilities with Targets (SHIFT) Program. Participating entities establish a reduction target and propose new technologies to reach them. Those that implement the technologies and achieve their target are granted a SHIFT subsidy equal to one-third of the cost of the technology.

Entities unable to meet their target can purchase credits from other participating entities or 'J-Credits'. The government-administered J-Credit Scheme produces credits from energy saving, renewable energy, and domestic forest management activities. During a trial period between September 2022 and April 2023, J-Credits were traded on the Tokyo Stock Exchange in preparation for the GX League.

Japan is actively participating in international carbon markets. Its JCM is a bilateral offset crediting mechanism to incentivize leading decarbonizing technologies in 25 partner countries.[1] At COP27 in late 2022, Japan established the Article 6 Implementation Partnership, a global effort to build capacity for Article 6 implementation. More than 70 countries and organizations have signed up.

1 Mongolia, Bangladesh, Kenya, Ethiopia, Indonesia, Vietnam, Lao PDR, Cambodia, Maldives, Palau, Costa Rica, Mexico, Chile, Saudi Arabia, Myanmar, Thailand, the Philippines, Senegal, Tunisia, Azerbaijan, Moldova, Georgia, Sri Lanka, Uzbekistan, and Papua New Guinea.

EMISSIONS & TARGETS OF JAPAN

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	994.4	(87%)
Industrial processes	101.4	(9%)
Agriculture	32.2	(3%)
Waste	20.2	(2%)
Total	**1,150.1**	

Energy industries	438.6	(38%)
Manufacturing industries and construction	235.9	(21%)
Transport	179.2	(16%)
Commercial, institutional, and residential	122.7	(11%)
Other energy	18.0	(2%)

GHG REDUCTION TARGETS

By FY2030: 46% reduction from FY2013 GHG levels including LULUCF credits; and continue efforts to cut emissions by 50% (NDC)

By 2050: Net zero GHG emissions (updated NDC)

OTHER INFORMATION

INSTITUTIONS INVOLVED

Ministry of the Environment: Supports the implementation of JCM projects; manages the Subcommittee on the Utilization of Carbon Pricing and the Global Environmental Subcommittee; oversees the SHIFT program; tasked with developing carbon pricing in Japan.

Ministry of Trade, Economy, and Industry: Responsible for the GX League; tasked with developing carbon pricing in Japan.

Central Environment Council: Advisory body to the Japanese Cabinet.

REGULATORY FRAMEWORK

→ GX Basic Plan

MALAYSIA

In force

Under development

Under consideration

- **Government published a policy document in 2021 including plans for a domestic ETS**
- **Voluntary carbon market trading platform launched in December 2022 creating infrastructure for domestic ETS**

DESCRIPTION

The "National Guidance on International Voluntary Market Mechanisms" published by the Malaysian Ministry of Environment and Water (KASA) in September 2021 indicates the Ministry's intent to implement a domestic ETS. It also provides guidance to entities that intend to participate in international voluntary carbon markets (VCM). The Cabinet has since agreed with KASA's policy document, proposing to introduce a carbon trading platform by starting first with a VCM exchange and potentially complementing this with a domestic ETS at a later stage.

Bursa Carbon Exchange (BCX), the world's first Shariah-compliant VCM platform, was launched in December 2022. It features continuous spot trading, off-market transactions, auctions, and pre-trade conditions, which allow cash and carbon credits to be held in trusts. Both nature-based and technology-based activities accredited by Verra are traded, with vintages from 2016 onwards. Trading is expected to commence in March 2023 and will facilitate price discovery.

Malaysia's ETS plans are also fueled by the country's NDC commitments and net zero aspirations. Moreover, they should prepare industry players for international trade related instruments, such as the EU's carbon border adjustment mechanism (CBAM), and support Malaysia's low-carbon transition in the corporate sector.

Since 2021, the Malaysian government has been engaging with state governments and the corporate sector with the aim of aligning relevant policies and regulation. As part of this process, the Ministry of Natural Resources, Environment, and Climate Change (NRECC) will conduct a study under the 12th Malaysia Plan to develop a policy and design framework for the domestic ETS. The study is looking into ETS market design frameworks, registration, and alignment with international standards and is expected to commence in 2023.

EMISSIONS & TARGETS OF MALAYSIA

GHG EMISSIONS (EXCL. LULUCF), 2019

(in $MtCO_2e$, share of total in %)

Energy	259.4	(79%)
Industrial processes	32.9	(10%)
Agriculture	9.9	(3%)
Waste	28.3	(9%)
Total	**330.4**	

Energy industries	131.7	(40%)
Manufacturing industries and construction	33.6	(10%)
Transport	65.0	(20%)
Commercial, institutional, and residential	3.4	(1%)
Other energy	25.7	(8%)

GHG REDUCTION TARGETS

By 2030: 45% reduction of economy-wide carbon intensity compared to 2005 levels (unconditional target in updated NDC in 2021)

By 2050: Climate neutrality (Prime Ministerial speech in 2021)

OTHER INFORMATION

INSTITUTIONS INVOLVED

Ministry of Natural Resources, Environment and Climate Change (NRECC): Responsible for overseeing the implementation of national climate policy, including the national carbon market mechanisms.

Ministry of Finance: Jointly responsible with NRECC and Bursa Malaysia for the voluntary carbon credit exchange.

Bursa Malaysia: Operates Bursa Carbon Exchange.

REGULATORY FRAMEWORK

→ **National Guidance on Voluntary Carbon Market Mechanisms (2021)**

NEW ZEALAND

NEW ZEALAND EMISSIONS TRADING SCHEME

- **Broad ETS sectoral coverage, including forestry**
- **Auctioning continues with consistently robust prices**
- **Pricing mechanism for the agricultural sector scheduled**

ETS DESCRIPTION

The New Zealand Emissions Trading Scheme (NZ ETS) was launched in 2008 and is a central policy for climate change mitigation in the country. It covers roughly half of New Zealand's GHG emissions. The "Climate Change Response Act 2002" sets the legislative framework for the NZ ETS and incorporates all New Zealand's key climate legislation under one Act.

The NZ ETS has broad sectoral coverage, including forestry, stationary energy, industrial processing, liquid fossil fuels, waste, and synthetic GHGs. Free allocation is granted only for emissions-intensive and trade-exposed (EITE) activities and is based on output- and intensity-based benchmarks. Auctioning of allowances began in March 2021. Uniquely to the NZ ETS, the forestry sector has both emissions surrender obligations and the opportunity to earn units for emissions removals. Currently, biological emissions from agriculture have reporting obligations without surrender obligations. A carbon price will be levied on agricultural emissions by 2025, either through the NZ ETS or a separate pricing mechanism.

Extensive legislative reforms of the NZ ETS were implemented in 2020 to improve its design and operation and enable it to better support New Zealand's international and domestic emissions reduction obligations.

YEAR IN REVIEW

After the major reforms of the previous years, in 2022 the New Zealand government continued to make incremental improvements to the operation of the NZ ETS. Changes coming into effect for the forestry sector in 2023 include a shift to averaging accounting and a new "permanent forest" category. Decisions were taken to tighten the eligibility and accounting rules for industrial allocation, while consultations on an improved market governance framework are ongoing.

2022 was the second year for auctioning under the NZ ETS. The cost containment reserve (CCR) was triggered during the first two quarterly auctions and the full reserve quantity was released. In May, the Climate Emergency Response Fund (CERF) was established to administer NZ ETS revenues with an initial funding of NZD 4.5 billion (USD 2.9 billion). Revenues will be used to finance immediate and future mitigation and adaptation efforts as per New Zealand's National Emissions Reduction Plan and National Adaptation Plan.

Throughout last year, the government and agricultural sector stakeholders have consulted on a carbon pricing mechanism for biogenic emissions from agriculture. A decision on the mechanism is expected in early 2023. Public debate has also centered on the NZ ETS forestry provisions, perceived as incentivizing the encroachment of exotic forests onto agricultural land. Following public consultation, further changes for forestry are also expected in 2023.

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 19.0 $MtCO_2e$ in 2023, mainly from forestry activities.
2 International offsets were allowed until June 2015.
3 Comprises auction revenues of NZD 2 billion (USD 1.3 billion) and money paid to meet surrender obligations under the "fixed price option" in 2022.

In force
Under development
Under consideration

SECTORS

POWER
BUILDINGS
INDUSTRY
FORESTRY
AVIATION
WASTE
TRANSPORT

CAP

32.2 $MtCO_2e$ (2023)[1]

GREENHOUSE GASES

CO_2, CH_4, N_2O, SF_6, HFCs, PFCs

OFFSETS AND CREDITS

None[2]

ALLOCATION

Free allocation: Benchmarking
Auctioning
Allowances granted for forestry and other removal activities

AVERAGE 2022 ALLOWANCE PRICE

Average auction price: NZD 75.88 (USD 48.11)
Average secondary market price: NZD 78.97 (USD 50.07)

TOTAL REVENUE

NZD 5.1 billion (USD 3.4 billion) since beginning of program
NZD 2 billion (USD 1.3 billion) in 2022[3]

EMISSIONS & TARGETS OF NEW ZEALAND

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	31.5	(40%)
Industrial processes	4.6	(6%)
Agriculture	39.4	(50%)
Waste	3.3	(4%)
Total	**78.8**	

Energy industries	5.6	(7%)
Manufacturing industries and construction	6.7	(9%)
Transport	13.2	(17%)
Commercial, institutional, and residential	3.0	(4%)
Other energy	3.0	(4%)

GHG REDUCTION TARGETS

By 2030: 50% reduction of net emissions below gross 2005 levels (NDC); 10% reduction of biogenic methane emissions below 2017 levels (Climate Change Response (Zero Carbon) Amendment Act 2019)

By 2050: Reduce net emissions of all GHGs (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

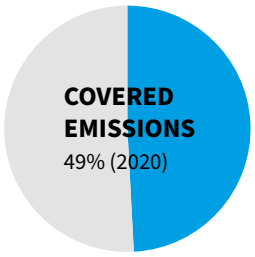
COVERED EMISSIONS

Verified ETS emissions[4]

39.0 $MtCO_2e$ (2020/2021)

CAP

32.2 $MtCO_2e$ (2023)



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 December 2022, setting the annual cap for the years 2023-2027. 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 unit supply from removal activities.

There is no limit on New Zealand Units (NZUs) generated from removal activities. These are forecast to be 19 million units in 2023, 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 covered by 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 mechanism.

A partnership between the government and the agricultural sector, called "He Waka Eke Noa", has been established to prepare for this new pricing mechanism, including the development of on-farm accounting and reporting systems for GHG sources and sinks. Final decisions on the design of the mechanism are expected by Cabinet in early 2023.

4 With surrender obligations

POINT OF REGULATION

Upstream (power, aviation, buildings, forestry, transport); point source (industry, waste).

For all fossil fuels, the point of obligation is generally 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]

2,887 entities registered, of which 2,809 have surrender obligations:

- 281 entities with mandatory reporting and surrender obligations
- 2,606 entities with voluntary reporting and surrender obligations, most of which are for post-1989 forestry activities
- 78 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 [USD 643,000] EITE criteria are met. Highly emissions-intensive activities (over 1,600 tCO_2e per NZD 1 million (USD 634,000) of revenue) receive 90% free allocation. Moderately emissions-intensive activities (over 800 tCO_2e per NZD 1 million [USD 634,000] of revenue) receive 60% free allocation. An activity is deemed to be trade-exposed if there is transoceanic trade in the good produced.

5.8 million NZUs were allocated for industrial EITE activities in the 2021/2022 reporting year (1 July 2021 to 30 June 2022).

Industrial free allocation is being phased down. A minimum annual phase-down rate of 1% across all industrial activities applies 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' section). The annual quantity is split between the quarterly auctions. In 2022, 19.3 million allowances were made available through 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' section). 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. If the participant chooses to deregister from the scheme, NZUs equivalent to the number received must be returned. 7.9 million NZUs were issued for forest removal activities for the 2021/2022 reporting year.

Other removal activities: 3.1 million allowances were granted for other removal activities, such as producing a product with embedded GHGs, for the 2021/2022 reporting year.

USE OF REVENUES

NZ ETS revenues are to be administered via the newly established CERF, which was founded in May 2022 with an initial funding of NZD 4.5 billion (USD 2.9 billion). The fund shall be used to support immediate emissions reductions, lay the foundations for future reductions and removals, and support climate change adaptation. Planned activities are outlined in New Zealand's first National Emissions Reduction Plan and National Adaptation Plan, which were published in 2022.

FLEXIBILITY & LINKING

BANKING AND BORROWING

Banking is allowed, except for those units that were purchased under the fixed price option (see 'Market Stability Provisions' section 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

5 All figures as of June 2022

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.

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 like systems 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 the end of March to submit an Annual Emissions Return (emissions report).

VERIFICATION: MRV follows a system of self-reporting supplemented by a program of official government audits. Each year a sample of NZ ETS participants are selected for compliance review. Third-party verification is not typically required for emissions reports. However, participants must seek third-party verification if they apply for the use of a unique emissions factor, as opposed to using the default factors supplied by the government.

ENFORCEMENT

An entity that fails to submit an emissions report by the due date must pay a fine equal to the number of units involved, multiplied by the current unit price and a "culpability factor".

An entity that fails to surrender or repay emissions units when required must surrender the units and pay a cash penalty of three times the current market price for each unit that was not surrendered by the due date. Entities can be fined up to NZD 24,000 (USD 15,200) 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 Annual 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 31,700) 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 the 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, such as the NZX. 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 continued consultations in 2022 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 15.82) per tCO_2e, which acted as a form of price ceiling, was introduced in 2009 and raised to NZD 35 (USD 22.15) 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 31.65) in 2021 and scheduled to rise by 2% per year in line with projected inflation. Based on advice from the Climate Change Commission, each year the government updates the CCR trigger price, together with other auction supply settings (see 'Cap' section). The latest update made in December 2022, for the years 2023-2027, raised the CCR trigger price to NZD 80.64 (USD 51.13) for auctions in 2023, and to NZD 129.97 (USD 82.42) in 2027.

In 2022, the volume of the CCR was set at 7 million allowances. These were released to the market and sold during the first and second quarterly auctions in March and June 2022 after the CCR was triggered. Currently, the annual volume of the reserve is set at 8 million in 2023, dropping annually to 5.9 million in 2027.

PRICE FLOOR: With the start of auctioning, the government introduced a price floor of NZD 20 (USD 12.68) 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. At the latest update, the price floor was set at NZD 33.06 (USD 20.96) for 2023, rising to NZD 44.35 (USD 28.12) by 2027.

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: Responsible for establishing the regulatory framework of the NZ ETS
Environmental Protection Authority: Competent authority responsible for the registry and compliance
Ministry for Primary Industries: Responsible for the forestry sector under the NZ ETS

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]

7 To keep New Zealand's key climate change legislation under one act, the Climate Change Response 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.

PAKISTAN

- Launched a national committee in 2019 to assess the role and scope of an ETS
- MRV system is under development
- Launched readiness activities for international and domestic carbon pricing policy

In force

Under development

Under consideration

DESCRIPTION

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 and the World Bank 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. The MoCC is also currently developing 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 (NCEC) 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 under the World Bank’s PMI programme and with funding provided by the German government’s International Climate Initiative (IKI).

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 of the Paris Agreement.

EMISSIONS & TARGETS OF PAKISTAN

GHG EMISSIONS (EXCL. LULUCF), 2018

(in $MtCO_2e$, share of total in %)

Energy	218.9	(45%)
Industrial processes	25.8	(5%)
Agriculture	223.5	(46%)
Waste	21.7	(4%)
Total	**489.9**	

Energy industries	53.4	(11%)
Manufacturing industries and construction	66.2	(14%)
Transport	51.3	(10%)
Commercial, institutional, and residential	44.1	(9%)
Other energy	3.9	(1%)

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 submitted in 2021)

OTHER INFORMATION

INSTITUTIONS INVOLVED

Ministry of Climate Change: Responsible for national climate mitigation and adaptation policy
Pakistan Climate Change Council: Responsible for the country's overall climate strategy
Pakistan Climate Change Authority: Tasked with coordinating climate policy development and implementation

REGULATORY FRAMEWORK

→ Pakistan Climate Change Act 2017

REPUBLIC OF KOREA

KOREA EMISSIONS TRADING SCHEME

- East Asia's first national ETS
- Phase 3 commenced in 2021 with a stricter cap, updated allocation provisions, and third-party participation
- Currently undergoing major reform process

ETS DESCRIPTION

The Korea Emissions Trading Scheme (K-ETS) launched in 2015 as East Asia's first nationwide, mandatory ETS. It covers around 74% of South Korea's national GHG emissions and will help the country in its objective to become carbon neutral by 2050, a target embedded in the "Carbon Neutral Framework Act" of 2021.

The K-ETS covers 684 of the country's largest emitters in the power, industrial, buildings, waste, transport, and domestic aviation sectors. At least 10% of allowances must be auctioned. Free allocation is provided for EITE sectors based on production cost and trade intensity benchmarks. Since 2021, domestic financial intermediaries and other third parties have been able to participate in exchange.

The K-ETS was established by the "Framework Act on Low Carbon, Green Growth" (2010). It was preceded by a mandatory Target Management System (TMS) which launched in 2012, following a two-year pilot phase. 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

From August, the government met regularly with relevant ministries, enterprises, associations, and experts as part of a major stakeholder consultation process. The first set of near-term changes were announced in November, and included:

1. Increasing incentives to reduce emissions and facilitate low-carbon investment by issuing more free allowances to the top 10% most efficient covered entities per sector and to those which implement new energy efficiency measures.
2. Encouraging trading and mitigating price volatility by opening up the ETS to more financial firms and increasing the current Korean Allowance Unit (KAU) holding limit. Consignment trades will also be permitted.
3. Facilitating the conversion of international offset credits to Korean Credit Units (KCUs).
4. Strengthening the MRV system.
5. Increasing support for small businesses and new entrants.

Longer-term changes – including the development of a roadmap to better align the cap with the country's updated NDC – will be implemented with the establishment of new rules for Phase 4, which begins in 2026. The government also intends to increase the share of auctioning, a pre-emptive response to potential upcoming trade requirements, e.g., the EU's carbon border adjustment mechanism.

In force
Under development
Under consideration

SECTORS

POWER
BUILDINGS
INDUSTRY
AVIATION
TRANSPORT
WASTE

CAP

589.3 $MtCO_2e$ (2023)

GREENHOUSE GASES

CO_2, CH_4, N_2O, HFCs, PFCs, SF_6

OFFSETS AND CREDITS

Domestic
International

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE ALLOWANCE PRICE IN 2022

Average auction price: KRW 23,243 (USD 17.99)
Average secondary market price: KRW 20,633 (USD 15.97)

TOTAL REVENUE

KRW 1,092.6 billion (USD 845.2 million) since the beginning of the program
KRW 317.1 billion (USD 245.4 million) in 2022

EMISSIONS & TARGETS OF THE REPUBLIC OF KOREA

GHG EMISSIONS (EXCL. LULUCF), 2018

(in $MtCO_2e$, share of total in %)

Energy	632.6	(87%)
Industrial processes	55.8	(8%)
Agriculture	21.1	(3%)
Waste	17.4	(2%)
Total	**727**	

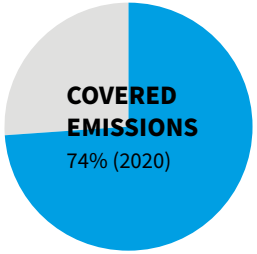
GHG REDUCTION TARGETS

By 2030: At least a 35% reduction below 2018 emissions (Carbon Neutral Framework Act); 40% reduction below 2018 levels (updated NDC)
By 2050: Carbon neutrality (Carbon Neutral Framework Act)

ETS SIZE & PHASES

COVERED EMISSIONS

Verified ETS emissions
554 $MtCO_2e$ (2020)



PHASES

PHASE ONE: 3 years (2015-2017)
PHASE TWO: 3 years (2018-2020)
PHASE THREE: 5 years (2021-2025)

CAP

PHASE ONE (2015-2017): 1,689.2 $MtCO_2e$, including a reserve of 89.4 $MtCO_2e$ for early action and new entrants. 84.5% of the reserve was used within the phase. 14.3 million allowances were set aside in a reserve for market stabilization (see 'Market Stability Provisions' section), bringing the total number of allowances in Phase 1 to 1,704.2 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 Design' 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 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 $MtCO_2e$

SECTORS AND THRESHOLDS

PHASE ONE (2015-2017): 23 sub-sectors from the following five sectors: power, industry (e.g., iron and steel, petrochemicals, cement, oil refining, nonferrous metals, paper, textiles, 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 were disaggregated such that the K-ETS covered the following six sectors: heat and power, industry, buildings, transportation, waste, and the public sector. These were divided into 62 sub-sectors.

PHASE THREE (2021-2025): Coverage within the transport sector was widened to include freight, rail, passenger, and shipping. 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 per year, and facility emissions in excess of 25,000 tCO_2 per year.

Next to direct emissions coverage, the K-ETS also covers indirect emissions from electricity consumption. The same inclusion thresholds apply.

POINT OF REGULATION

Point source (power, industry, buildings, transport, domestic aviation, waste, public/other); downstream (buildings).

NUMBER OF ENTITIES

684 (2021, at the start of the Phase 3)

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 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:[1]

- Additional Production Cost of >5% and Trade Intensity of >10%; or
- Additional Production Cost of >30%; or
- Trade Intensity of >30%.[2]

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. Bidders can purchase 15-30% of the allowances on offer. The auctions are subject to a minimum price.

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.

EITE sectors receive 100% free allocation if they meet the following criteria:
*Production cost*Trade Intensity≥0.2%*

Allocation is calculated using the following formulas:

- Benchmark allocation: *Benchmark value (tCO_2e/t) x historical activity level (t) x correction factor x carbon leakage factor*
- Grandparenting allocation: *Average GHG emissions of base year x correction factor x carbon leakage factor*

The carbon leakage factor is 1.0 for sectors exposed to significant risk; for non-EITE sectors, it is 0.9.

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, excluding EITE sectors, can participate in auctions. The same auction provisions as for Phase 2 apply. The government is expected to increase the share of auctioned allowances in the coming years.

As per the 2023 Auction Allocation Plan, total auction volume for the year is planned to be 20.6 $MtCO_2e$, which represents around 3% of the 589.3 $MtCO_2e$ 2023 cap (excluding reserves).

USE OF REVENUES

Climate response fund including support for mitigation equipment, low-carbon innovation, and technology development for small- and mid-sized companies covered by the K-ETS.

FLEXIBILITY & LINKING

BANKING AND BORROWING

Banking is allowed with restrictions across and within phases.
Borrowing is allowed within a single trading phase.

1 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*
2 Trade Intensity is calculated relative to the base year: *(annual average exports + annual average imports)/(annual average sales + annual average imports)*

PHASE ONE (2015-2017): Borrowing was limited to 20% of an entity's obligation.

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 could 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 (KCUs) sold on the secondary market (excluding swaps and auctions).
- In the third and fourth compliance years (2023-2024), entities' banking limits are 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 must be converted to KCUs 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 KOCs were allowed. Eligible activities included those eligible under the CDM plus carbon capture and storage, and had to have been implemented after mid-April 2010.

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 Korean companies were allowed if:
- At least 20% of the ownership rights, operating rights, or the voting stocks were owned by a Korean company; or
- A Korean company supplies the low-carbon technology worth at least 20% of the total project cost.

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 are allowed according to the same qualitative criteria outlined for Phase 2. However, limitations have been introduced on the issuance and conversion of credits:
- GHG reduction projects (according to reduction period coverage) to KOC conversion: 1) April 2010-December 2020: within two years (2021-2022); 2) January 2021 onwards: within three years (2022-2024).
- KOC to KCU conversion: within two years of KOC issuance.

As of December 2022, there were 272 registered methodologies (211 for CDM and 61 for domestic offsets).

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 must surrender allowances for the previous emissions year by the end of June.

MRV

REPORTING FREQUENCY: Annual reporting of emissions from the previous year must be submitted by 31 March.

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

FRAMEWORK: Emissions reports are reviewed and certified by the Certification Committee of the Ministry of Environment by the end of May.

If the liable entity fails to report emissions correctly, the entity is required to revise it so that it estimates emissions correctly.

ENFORCEMENT

The penalty shall not exceed either three times the average market price of allowances of the given compliance year or KRW 100,000 (USD 77.40) per tonne.

MARKET REGULATION

MARKET DESIGN

MARKET PARTICIPATION:

Compliance entities. Limited participation for non-compliance entities.

Initially limited to compliance entities, the "market maker" system was introduced in Phase 2 to improve market liquidity. This involved the appointment of three new financial firms in 2021, in addition to the two market makers that had been appointed in 2019. In December 2022, the government announced a further two market makers to begin operating from 2023.

From Phase 3, as per the "Emissions Trading Act" and the Presidential Decree, non-compliance entities in the form of other non-market maker domestic financial intermediaries can participate in the secondary market and trade allowances as well as converted carbon offsets on the Korea Exchange (KRX). In line with this, 20 financial intermediaries were approved for participation in the carbon market from 2021 (the total as of February 2023 is 21 financial intermediaries). Though, they initially could only hold up to 200,000 allowances each, to avoid excessive market share, this number was increased to 500,000 in December 2022.

MARKET TYPES:

Primary: Although allowances were occasionally auctioned in 2016 and 2018 for market stabilization, monthly auctions only began in 2019. Sectors that receive 100% free allocation are not allowed to participate in auctions. 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 on 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

TRIGGERS: An Allocation Committee is in place to implement market stabilization measures if:

- 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 60% of the average price of the two previous years; or
- it is difficult to trade allowances due to an imbalance of supply or demand.

INSTRUMENTS: Stabilization measures include:

- additional auctioning of up to 25% of allowances from the market stabilization reserve, which contains 14.3 million allowances;
- the 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 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. No more such cases have occurred since.

In 2021, the Allocation Committee set a price floor of KRW 12,900 (USD 9.98) per tonne in April and KRW 9,450 (USD 7.31) per tonne in June.

As of the start of 2023, there are seven 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.[3]

3 The government lends allowances to the market makers that provide services for market making.

OTHER INFORMATION

INSTITUTIONS INVOLVED

Ministry of Environment: Holds overall responsibility for the K-ETS.
Ministry of Economy and Finance: Chairs the Allocation Committee; briefly held overall responsibility for the K-ETS between June 2016 and January 2018.
Korea Exchange (KRX): Trading and auctioning platform.
Greenhouse Gas Inventory and Research Center (GIR): Responsible for the 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
- → Enforcement Decree of the Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances
- → Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances
- → First Basic Plan for 2015-2024
- → Second Basic Plan for 2017-2026
- → Third Basic Plan of the ETS
- → First Allocation Plan
- → Second Allocation Plan
- → Greenhouse Gas Emissions Allocation and Trade Act (amended in June 2020)
- → Third Allocation Plan

SAITAMA PREFECTURE

TARGET SETTING EMISSIONS TRADING SYSTEM IN SAITAMA

- **Covers large buildings and factories**
- **Linked to Tokyo Cap-and-Trade Program since 2011 launch**

ETS DESCRIPTION

Saitama Prefecture's ETS was launched in April 2011. It covers around 20% of the prefecture's 2019 emissions.

Saitama's system covers about 600 entities in the industrial and commercial building sectors. The cap is determined bottom up based on facility-level baselines. These baselines are calculated using base-year emissions and a compliance factor, which is set for each period based on regulations established by the Governor of Saitama and expert consultation. Regulated entities must reduce emissions below a facility-specific baseline. The baseline depends on factors such as expected energy efficiency gains and the extent to which they consume energy supplied by other facilities. Credits are issued to facilities where emissions fall below the baseline.

The ETS was instituted as part of the "Saitama Prefecture Global Warming Strategy Promotion Ordinance", with the aim of eventually establishing a common system with other prefectures in the metropolitan area. Saitama's ETS is linked to Tokyo's Cap-and-Trade Program, with credits mutually exchangeable between the two jurisdictions.

YEAR IN REVIEW

In June, the Prefectural Government announced that in fiscal year 2020, the Saitama ETS achieved a 35% reduction in emissions below base-year levels (see 'Allowance Allocation' section for base-year calculation).

Saitama's system 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. In September, it was announced that 618 of the 630 covered facilities (98%) achieved their targets. 507 (80%) were able to do this only by reducing their own emissions in the second compliance period, while 20 facilities (3%) achieved their targets by both reducing their own emissions in the second compliance period and surrendering credits banked from the first compliance period. A further 91 (14%) traded credits to reach their targets.

In force
Under development
Under consideration

SECTORS

INDUSTRY

BUILDINGS

COVERAGE

6.9 $MtCO_2$ (2020)

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

Domestic (national and prefectural)

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking

AVERAGE 2022 ALLOWANCE PRICE

Average price (second compliance period): JPY 144 (USD 1.06)

EMISSIONS & TARGETS OF SAITAMA PREFECTURE

GHG EMISSIONS (EXCL. LULUCF), FY 2019

(in $MtCO_2e$, share of total in %)

Energy	32.8	(83%)
Industrial processes	2.3	(6%)
Waste	1.1	(3%)
Other[1]	3.3	(8%)
Total	**39.6**	

Manufacturing industries and construction	7.9	(20%)
Transport	8.9	(22%)
Commercial and residential	16.0	(40%)

GHG REDUCTION TARGETS

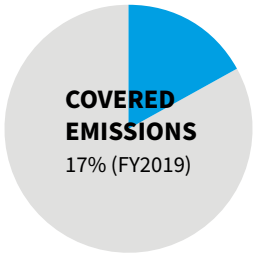
By 2030: 26% reduction from FY2013 levels (Saitama Prefecture Global Warming Countermeasures Action Plan Second Phase)

ETS SIZE & PHASES

COVERED EMISSIONS

Verified ETS emissions

6.9 $MtCO_2$ (FY2019)



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, during which facilities may continue to trade credits in order to reach their targets for the corresponding compliance period.

By exception, an additional four months to the usual 18-month adjustment period applied for the second period due to impacts of the COVID-19 pandemic.

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 (industry, buildings)

NUMBER OF ENTITIES

587 facilities (FY2020):

- Offices/commercial buildings: 166
- Factories: 421

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 (average annual emissions for three consecutive fiscal years of the four fiscal years immediately preceding the compliance period) or on emissions intensity standards provided by the government.

1 “Other” here includes GHGs not just limited to CO_2, e.g., CH_4.

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 the categories described in the previous paragraph. Similarly, in medical facilities where electricity is vital to preserve life and health, the compliance factor is two percentage points lower.

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 efficient 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 best available energy efficiency measures, covering 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 1,500kL 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 one-to-one basis. Credits from biomass (biomass rate of 95% or more, black liquor is excluded) are also converted with a factor of one.
- **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 a factor of one.

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

Since its launch in 2011, the Saitama ETS has been linked with the Tokyo Cap-and-Trade Program. Tokyo and Saitama credits are fungible in the two jurisdictions. More than 50 credit transfers have taken place so far between Saitama and Tokyo.

COMPLIANCE

COMPLIANCE PERIOD

Four or five years.

FIRST COMPLIANCE PERIOD: FY2011-FY2014
SECOND COMPLIANCE PERIOD: FY2015-FY2019
THIRD COMPLIANCE PERIOD: FY2020-FY2024

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 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 deadline for meeting the targets under the second compliance period was postponed to the end of January 2022, due to the impacts of the COVID-19 pandemic.

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: Compliance entities, 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: Oversees the Target Setting Emissions Trading System in Saitama.

REGULATORY FRAMEWORK

→ Saitama Prefecture Global Warming Strategy Promotion Ordinance
→ Regulation on Saitama Prefecture Global Warming Strategy Promotion Ordinance

SHANGHAI

SHANGHAI PILOT EMISSIONS TRADING SYSTEM

- **Broad sectoral coverage with 100% compliance rate for eight consecutive years**
- **Active offset trading market, pioneered allowance spot forward trading**
- **Scope expansion through lowering threshold and covering additional sectors**

ETS DESCRIPTION

The Shanghai was launched in November 2013 and was the second region to start its pilot ETS. It covers around 36% of the city's emissions.

The ETS covers more than 300 entities in the industrial, buildings, transport, and aviation sectors. In 2016, Shanghai expanded its ETS coverage by adding shipping and more industrial sectors and lowering the participation threshold to 10,000 tCO_2 per year. Allowances are allocated both freely and through auctioning. Ad hoc auctions were held between 2014 and 2019, after which there have been two auctions held per year.

The Shanghai ETS is the only pilot that has achieved a 100% compliance rate since its launch. It is also one of the most active in terms of offset credit trading. Shanghai has been a center for carbon finance innovations in China, including repurchases, carbon funds, carbon trusts, CCER pledge loans, green bonds, and carbon margin trading. Since July 2021, the Shanghai Environmental and Energy Exchange (SEEE) has operated a trading platform for the national ETS.

The Shanghai ETS operates in parallel with the national Chinese carbon market, into which it will be integrated in the longer term.

YEAR IN REVIEW

The Shanghai Ecology and Environment (EEB) released the 2021 allocation plan in February 2022. No significant changes were implemented, compared to the allocation plan for the previous year. The Shanghai EEB reduced the emissions factors of power and heat consumption, reflecting emissions reductions already achieved.

In December, the Shanghai EEB released a roadmap to establish a Tan Pu Hui voluntary emissions reduction crediting system. According to the roadmap, credits from the Tan Pu hui system would be used to offset emissions in the Shanghai ETS to encourage low-carbon behavior in individuals. Shanghai will explore cooperation in the Tan Pu hui system with other cities in the Yangtze Delta. Pilot projects are expected to start in 2023.

In July, the Shanghai Municipal Government issued the "Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy in Shanghai" and the "Shanghai Carbon Peaking Implementation Plan", which sets the goal to peak emissions by 2030 and achieve climate neutrality by 2060. As part of these plans, the government also requires the relevant departments to improve the design and implementation of the Shanghai ETS.

In September, the first auction for the 2021 compliance period was held. It raised CNY 52.56 million (USD 7.80 million). In December, a second auction was held, raising CNY 88.13 million (USD 13.08 million).

In force
Under development
Under consideration

SECTORS

INDUSTRY
TRANSPORT
BUILDINGS
DOMESTIC AVIATION

CAP

109 $MtCO_2$ (2021)

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

Domestic (provincial)

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average auction price: CNY 39.76 (USD 5.90)
Average secondary market price: CNY 40.16 (USD 5.96)

TOTAL REVENUE

CNY 264.90 million (USD 43.75 million) since the beginning of the program
CNY 140.69 million (USD 20.87 million) in 2022

EMISSIONS & TARGETS OF SHANGHAI

OVERALL GHG EMISSIONS (EXCLUDING LULUCF)

297.7 $MtCO_2e$[1]

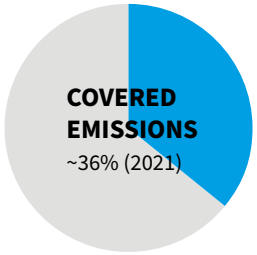
GHG REDUCTION TARGETS

By 2025: Peak total and per capita CO_2 emissions (pledge in "Shanghai Urban Master Plan 2017-2035" and 14th Five-Year Plan); achieve carbon intensity reduction rate to be specified by the central government (14th Five-Year Plan)
By 2035: ~5% reduction in CO_2 emissions compared to peak levels ("Shanghai Urban Master Plan 2017-2035")
By 2060: Climate neutrality ("Shanghai Carbon Peaking Implementation Plan")

ETS SIZE & PHASES

PHASES

PHASE ONE: 2013-2015, also known as the "trial phase"
PHASE TWO: 2016-present



CAP

All including reserves:
PHASE ONE (2013-2015):
~150 $MtCO_2$/year

PHASE TWO (2016-present):
2016: 155 $MtCO_2$
2017: 156 $MtCO_2$
2018: 158 $MtCO_2$
2019: 158 $MtCO_2$
2020: 105 $MtCO_2$[2]
2021: 109 $MtCO_2$

SECTORS AND THRESHOLDS

PHASE ONE: 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:
- Power and industry: 20,000 tCO_2/year
- Other sectors: 10,000 tCO_2/year

PHASE TWO: Previous sectors plus shipping, electronic materials, pharmaceuticals, automotive manufacturing, food manufacturing, and minting. Power plants were transferred to the national ETS from 2020, while some special captive power plants and heat generation entities remain in the Shanghai carbon market.

Inclusion thresholds:
- Power and industry: either 20,000 tCO_2/year or 10,000 tonnes of coal equivalent (tce)/year; 10,000 tCO_2/year or 5,000 tce/year for those that participated in the 2013-2015 phase.
- 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).
- Buildings: either 10,000t CO_2/year or 5,000 tce/year.

POINT OF REGULATION

Point source (industry); downstream (indirect emissions from electricity and heat consumption)

NUMBER OF ENTITIES

323 (2021)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

In Phase 1, entities received allowances for the whole period at once. In Phase 2, allowances are allocated on an annual basis. In addition, allocation methods have been progressively improved, including increased 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 historical emissions intensity for some industrial sectors, aviation, ports, shipping, and water suppliers, generally based on the previous three years' data.

Grandparenting based on historical emissions for airports, buildings, the commercial, and some industrial sectors with complex products or a considerable change in emissions boundaries, 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

1 Due to the lack of publicly available data, the data reported here is estimated based on public sources from the launch year of the ETS.
2 The reduction is primarily due to the transfer of power plants into the national ETS

historical intensity or benchmarking allocations.

AUCTIONING: A small share of the annual cap may be auctioned. The main purpose of auctions is to provide 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 2022, auctions were held in September and December. In the September sale, the floor price was set at the weighted average price of all trading days between June and August of 2021. The auction offered 1,000,000 allowances, 100% of which were sold at the floor price of CNY 52.56 (USD 7.80) per tonne. In December, the floor price was set at the weighted average price of all trading days between October of 2021 and December 2022. The auction offered 3,000,000 allowances, 49% of which were sold at the floor price of CNY 60.38 (USD 8.96) to per tonne, (USD8.96) per tonne.

USE OF REVENUES

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 per year could be used by compliance entities between 2016 and 2018. Allowances are bankable for institutional investors without such an 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 verified emissions.

Phase Two: In 2016-2018, the use of CCERs was limited to 1% of the annual allocation. For the compliance years 2019 and 2020, the use of CCERs was limited to 3% of verified emissions. In 2019, only 2% was allowed for credits generated outside the Yangtze River Delta region, and 1% must have stemmed from within the region. This limitation was lifted in 2020.

QUALITATIVE LIMIT:
Phase One: Credits for reductions that were realized before January 2013 could not be used for compliance.
Phase Two: Same restriction as in Phase 1. Additionally, credits from hydro projects are not allowed.

LINKS WITH OTHER SYSTEMS

Although the SEEE operates the trading systems for both the national ETS and the Shanghai regional pilot, the two markets are separate. The Shanghai ETS is also not linked with any other systems.

COMPLIANCE

COMPLIANCE PERIOD

One calendar year. Covered entities must surrender allowances in June of the following year.

MRV

REPORTING FREQUENCY: Annual, to Shanghai EEB before the end of March.

VERIFICATION: Third-party verification is required. The Shanghai EEB commissions an independent third-party to carry out verification. In addition, "fourth-party verification" is carried out by government-assigned experts. The government also assesses verifiers' performance through a performance evaluation mechanism.

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, power and heat, chemicals, nonferrous metals, non-metallic mineral products, textiles and paper, aviation, shipping, large buildings (hotels, commercial, and financial), and transportation (e.g., ports).

Third-party verification rules have been strengthened in recent years. In December 2020, the Shanghai EEB amended the interim measures for managing third-party verifiers. In October 2021, it released a new policy on the supervision and assessment of verifiers.

ENFORCEMENT

REGULATED ENTITIES: Penalties for failing to submit an emission or verification report on time or for providing fraudulent information range from CNY 10,000 (USD 1,483) to CNY 50,000 (USD 7,418).

Between CNY 50,000 (USD 7,418) and CNY 100,000 (USD 14,836) can be imposed for non-compliance, in addition to the obligation to surrender the missing number of allowances. Further sanctions may also be imposed, such as entry into the credit record of the company, being added to a publicly available online list, loss of access special funds for energy conservation and emissions reduction measures.

THIRD-PARTY VERIFIERS: Third-party verifiers shall be penalized with a fine of between CNY 10,000 (USD 1,483) to CNY 50,000 (USD 7,418) for issuing false verification reports, material errors in verification reports, and for unauthorized use or publication of confidential corporate or emissions information.

MARKET REGULATION

MARKET DESIGN

MARKET PARTICIPATION: Compliance entities; non-compliance entities (domestic institutional investors that meet the requirement of the carbon emission trading rules set up by the SEEE).

MARKET TYPES:

Primary: No set percentage of allowances are allocated via auctioning, though the Shanghai ETS regulations state that auctioning is to be introduced gradually. Ad hoc auctions have been held since 2014 to provide compliance entities with additional supply. In addition, further auctions have also been held since 2020 where institutional investors have also been allowed to participate.

Secondary: Products include Shanghai Emission Allowances (SHEA), Shanghai Emission Allowance Forwards, and CCERs. SHEAs and CCERs are spot products. SHEAF is the standardized spot forward product.

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

MARKET STABILTY PROVISIONS

EXCHANGE: Depending on transaction type, if prices vary by either 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 'Allowance Allocation' section).

OTHER INFORMATION

INSTITUTIONS INVOLVED

Shanghai Ecology and Environment Bureau: Acts as the competent authority setting the rules and overseeing the system.

Shanghai Environment and Energy Exchange: Responsible for operating the trading platform.

Shanghai Information Center: Responsible for overseeing the registry. Responsible for operating the registry platform.

EVALUATION/ETS REVIEW

No information is publicly available about the evaluation or review system. However, the local carbon exchange has published annual reports on the Shanghai ETS with an overview of its performance in 2013-2020. Research on improving the ETS has been undertaken every year, funded by the local government.

REGULATORY FRAMEWORK

- → Shanghai Pilot ETS Implementation Plan TrialMeasures for Management of Emissions Trading in Shanghai
- → Shanghai EEB- Allocation Plan for Vintage 2019 (including list of covered entities)
- → Shanghai EEB- Allocation Plan for Vintage 2020 (including list of covered entities)
- → Shanghai EEB- Allocation Plan for Vintage 2021 (including list of covered entities)

SHENZHEN

SHENZHEN PILOT EMISSIONS TRADING SYSTEM

- One of two Chinese pilots with ETS bill passed by regional congress
- Active trading market with diverse participants including foreign investors
- Pioneered sectoral expansion and cross-regional trading

ETS DESCRIPTION

The Shenzhen Pilot ETS began in June 2013 and was the first of the Chinese pilots to start operation. It covers around 30% of the city's emissions. As a city of Guangdong province with its own separate ETS, Shenzhen is the only Chinese pilot at the sub-provincial level.

The Shenzhen ETS covers emissions from over 750 entities in industry, building, and transport sectors. Except for two auctions held in 2014 and 2022, allowances have been allocated freely using both benchmarking and grandparenting. In addition to the national offset program (CCER), the Shenzhen ETS also implements local offset programs, including the Tan Pu Hui system. Shenzhen's market has the highest liquidity in China, despite its relatively small size. In contrast to most pilot systems in China, which are regulated by subnational government orders from the executive body of the government, Shenzhen's is regulated by a dedicated ETS bill passed by its municipal legislator, the Shenzhen People's Congress.

As of the end of 2020, the average emissions intensity of covered entities in the manufacturing sectors had dropped by 40.3%, while industrial value-added has increased by 61.6% on average.

The Shenzhen ETS currently operates in parallel with the Chinese national carbon market, with a long-term outlook to integrate into it fully.

YEAR IN REVIEW

In 2022, the Shenzhen government issued its economic and social development plan as well as a climate target for the 14th Five Year Plan (2021-2025). The plans foresee further development of the ETS, including strengthening the trading and GHG verification systems, expanding the sectoral coverage, developing innovative carbon trading products and broadening participation of financial institutions. It also encourages cooperation with other ETSs, such as exploring a carbon market for the Guangdong-Hong Kong-Macao Greater Bay Area.

The Shenzhen Ecology and Environment Bureau (EEB) published several documents throughout the year. The amended "Provisional Regulation of the Shenzhen Emission Trading Pilot Scheme" included gradually moving to an absolute cap, increasing the proportion of allowance auctioning, enhancing market oversight and modifying non-compliance punishment measures. The "Allocation Plan for Vintage 2021" established an updated list of covered entities and the addition of entities from the waste management sector. The "Shenzhen Municipal Measures for the Administration of Tan Pu Hui" clarified the management of the local offset program.

In August, the China Emission Exchange (Shenzhen) held its first auction since 2014. All allowances were auctioned successfully, at an average price of CNY 43.49 (USD 6.45) per tonne and a total revenue of CNY 25.26 million (USD 3.75 million).

In force
Under development
Under consideration

SECTORS

INDUSTRY

TRANSPORT

CAP

25 $MtCO_2$ (2021)

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

Domestic (national and provincial)

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average auction price: CNY 43.49 (USD 6.45)
Average secondary market price: CNY 42.52 (USD 6.31)

TOTAL REVENUE

~CNY 27.9 million (USD 4.1 million) since the beginning of the program
~CNY 25.2 million (USD 3.74 million) in 2022

EMISSIONS & TARGETS OF SHENZHEN

OVERALL GHG EMISSIONS (EXCLUDING LULUCF)

83.45 $MtCO_2e$[1]

GHG REDUCTION TARGETS

By 2025: Achieve carbon intensity reduction rate to be specified by the central government (Outline of the 14th Five-Year Plan and 2035 Vision)
By 2030: Peak carbon emissions (Outline of the 14th Five-Year Plan and 2035 Vision)
By 2035: Decoupled GHG emissions from economic and social development (Shenzhen's 14th Five-Year Plan for Climate Change)

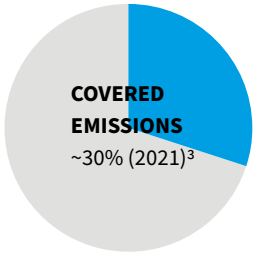
ETS SIZE & PHASES

PHASES

Ongoing (2013-present)

CAP

2015-2019: ~31$MtCO_2$ (excluding buildings)
2020: 22 $MtCO_2$
2021: 25 $MtCO_2$



In addition, the government sets aside reserves for new entrants (2%) and market stability measures (2%).

SECTORS AND THRESHOLDS

Water, gas, heat, manufacturing sectors, electronic equipment, waste management, ports, subways, public buses, and other non-transport sectors. Electricity production was covered until 2019, after which it transitioned to the national ETS. According to the latest publicly available information, 33 sectors were covered in 2022.

INCLUSION THRESHOLDS: Annual emissions over 3,000 tCO_2/year for enterprises; entities confirmed by local EEB.

POINT OF REGULATION

Point source (direct emissions), downstream (indirect emissions from electricity and heat consumption)

NUMBER OF ENTITIES

750 (2021)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

Allowances are largely distributed for free, and allocation is adjusted ex-post based on output data.

FREE ALLOCATION:
Benchmarking: Applied to the water, power grid, and gas sectors based on sectoral historical emissions intensity.
Grandparenting: Applied to the manufacturing and waste management sectors, ports, subways, public buses, and other non-transport sectors based on historical emissions intensity.

AUCTIONING: The latest "Provisional Regulation of the Shenzhen Emission Trading Pilot Scheme", published in 2022, states that allowances can be sold at auction or at a fixed price. At least 3% of allowances should be auctioned. So far, two auctions have been held, in June 2014 and August 2022.

For the 2014 auction, the floor price was set at CNY 35.43 (USD 5.26) per tonne; 0.8 $MtCO_2$ worth of allowances were successfully auctioned, with a total revenue of CNY 2.65 million (USD 0.39 million). Its purpose was to increase market supply and price stability. For the 2022 auction, the floor price was set at CNY 29.64 (USD 4.40) per tonne. More than 0.5 $MtCO_2$ worth of allowances were successfully auctioned, at an average price of CNY 43.49 (USD 6.45) per tonne and a total revenue of CNY 25.26 million (USD 3.75 million).

USE OF REVENUES

According to the 2014 Shenzhen ETS regulation, auctioning revenues are attributed to the city treasury.[3] However, the 2022 revision states that the city will enhance the transparency of revenue use and establish a new Carbon Emissions Trading Fund to support the ETS and other GHG reduction programs.

FLEXIBILITY & LINKING

BANKING AND BORROWING

Banking is allowed.

1 Due to the lack of publicly available data, the data reported here is estimated based on public sources from the launch year of the ETS.
2 Coverage would reduce significantly in 2020 given the transfer of the power sector to the national ETS; however, there is no publicly available data.
3 The 2014 Shenzhen ETS regulation stipulated that the city government would set up a market stability fund, dedicated to market stabilization measures, supporting companies' mitigation activities, the promotion of market service institutions, capacity building, and ETS management, funded by auction revenues, donations and other channels.

Borrowing is not allowed. Unlike some other pilots, Shenzhen releases its annual allowances before the compliance date of the previous vintage. Nevertheless, entities may not use allowances of the following year for previous vintage compliance.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: The use of offset credits is limited to 20% of the annual compliance obligation.

QUALITATIVE LIMIT: Domestic project-based carbon offset credits (CCERs), Tan Pu Hui local offset credits, and other offset credits authorized by the local government are allowed. Credits from hydropower projects are not eligible, and additional geographical restrictions apply to the use of certain CCERs and local offset programs.

LINKS WITH OTHER SYSTEMS

There is currently no link with other carbon markets. The 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 Shenzhen's local green finance legislation, financial institutions will in the future be encouraged to participate in cross-border trading in this market.

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". Six Baotou companies of the Inner Mongolia Autonomous Region were voluntarily covered by Shenzhen's Pilot ETS for one compliance year, from June 2016.

COMPLIANCE

COMPLIANCE PERIOD

One calendar year: covered entities have until the end of August of the following year to surrender allowances.

MRV

REPORTING FREQUENCY: Annual reporting of CO_2 emissions to the ETS competent authority by the end of March of the following year, using tiered emissions factors depending on different emission sources. Covered industrial entities must also annually submit a statistical indicator report covering their production data to the municipality's statistics department by the end of March of the following year. Entities should surrender allowances or offsets by the end of August.

VERIFICATION: Third-party verification of the annual emissions report is required (deadline for submission is the end of March of the following year). The competent authority may assign this 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 for the buildings sector.

ENFORCEMENT

Covered entities providing false information can be fined CNY 50,000-100,000 (USD 7,418-14,837).

Penalties for disturbing the market order can rise to CNY 100,000 (USD 14,837). Covered entities failing to surrender sufficient allowances to match their emissions are fined three times the average market price of the preceding six months. The missing allowances can be withdrawn from the company's account or deducted from the next year's allocation.

CNY 50,000-100,000 (USD 7,418-14,837) may be imposed if a third-party agency falsifies reports.

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; non-compliance entities (institutional investors); individuals (both domestic and international), subject to meeting the requirements of the carbon emission trading rules set by the China Emissions Exchange (Shenzhen).

MARKET TYPES:

Primary: Shenzhen so far has very limited experience with auctioning: two auctions have been held, in 2014 and 2022. Only compliance entities and member institutions authorized by the China Emission Exchange (Shenzhen) may participate.

Secondary: CCERs, Shenzhen Allowances (SZAs) and local Tan Pu Hui offset credits are the main spot trading products in the secondary market. The China Emissions Exchange (Shenzhen) is the trading platform for all products.

Due to financial market regulations in China, no forward markets or derivatives are allowed. However, with the regional green finance legislation that entered into force in March 2021, Shenzhen sees new momentum to explore the development of innovative carbon financial products.

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

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 also be used in the market stability auctions.

OTHER INFORMATION

INSTITUTIONS INVOLVED

Ecology Environment Bureau of Shenzhen Municipality: Authority responsible for ETS affairs, including registry and MRV.
China Emissions Exchange (Shenzhen): Responsible for operating 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)
- → Measures for Management of Emissions Trading in Shenzhen (2022)
- → Shenzhen DRC—Notice of Carrying Out Emissions Trading Work for Vintage 2016 (with allocation plan and list of covered entities)
- → Shenzhen EEB—Notice on Carrying out ETS Work for Compliance Year 2019 (with list of covered entities)
- → Shenzhen EEB—Notice on Carrying out ETS Work for Compliance Year 2020 (with list of covered entities)
- → Shenzhen EEB—Regulations on Tan Pu Hui Management
- → Shenzhen EEB—Allocation Plan for Vintage 2021

TAIWAN, CHINA

In force

Under development

Under consideration

- **The 2015 "GHG Reduction and Management Act" calls for ETS implementation.**
- **The Act was amended in 2023 calls for a carbon fee to be implemented before the ETS**
- **Mandatory GHG reporting program and domestic offset program in place**

DESCRIPTION

Taiwan, China, enacted the "Greenhouse Gas Reduction and Management Act" (the Act) in 2015, which legislates a 50% emissions reduction target for 2050 compared to 2005 GHG levels. The Act also mandates regulatory mitigation goals to be set in stages. Against this backdrop, 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 mandates TEPA to develop a "GHG Reduction Action Plan", which outlines how to implement mitigation policies. It includes five-year regulatory goals for both national and sectoral GHG emissions and 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 – though 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 are also in place. Mandatory emissions reporting for entities with annual emissions above 25,000 tCO2e from certain sectors has been ongoing since 2014. The "2018 Regulations Governing GHG Offset Program Management" allow enterprises to acquire carbon offset credits.

TEPA has been revising the Act since early 2021. In July of the same year, it established a new internal climate change office to accelerate the relevant legal amendments to keep pace with EU and international carbon reduction trends. In October 2021, the draft amendment 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 both direct and indirect emissions, with revenues to be used to support domestic climate mitigation and adaptation. The carbon fee would allow the use of domestic offsets. In response to international developments on carbon border adjustment mechanisms to avoid carbon leakage, it would also propose levying carbon fees on imported products with high carbon content.

After public consultation, the "Climate Change Response Act" was submitted to the Legislative Yuan in April 2022 for further review and finalization. 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, timeline of implementation, and on how the carbon fee could be transitioned to the ETS in the future and/or co-exist as a complementary mechanism. The draft amendment passed the third reading in the Legislative Yuan in January 2023 and will be promulgated in soon.

TEPA will manage both the carbon fee and ETS, determining the targets, rate, and percentage of domestic offsets allowed for the former. The agency will also design and implement the ETS in consultation with other relevant central competent authorities.

EMISSIONS & TARGETS OF TAIWAN, CHINA

GHG EMISSIONS (EXCL. LULUCF), 2020

(in $MtCO_2e$, share of total in %)

Energy	259.4	(91%)
Industrial processes	19.8	(7%)
Agriculture	3.3	(1%)
Waste	2.6	(1%)
Total	**285.1**	

Energy industries	181.3	(64%)
Manufacturing industries and construction	31.8	(11%)
Transport	36.5	(13%)
Other energy	9.5	(3%)

GHG REDUCTION TARGETS

By 2025: 10% below 2005 GHG levels (TEPA)
By 2030: 20% reduction from BAU levels (TEPA)
By 2050: Net-zero emissions (Climate Change Response Act)

FLEXIBILITY & LINKING

OFFSETS AND CREDITS

The amended Act stipulates that domestic early action and offset credits can be used to meet carbon fee and ETS obligations. TEPA, in consultation with relevant central competent authorities, will also recognize international offsets with the standards and cap to be decided later.

LINKING

The amended Act added the stipulation that the ETS can be implemented in conjunction with foreign governments and international agreements.

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 semi-conductors and flat panel displays) with annual emissions greater than 25,000 tCO_2e. Currently, 297 entities are covered by the mandatory reporting scheme.

VERIFICATION: Third-party verification is required.

FRAMEWORK: GHG reporting under the "Air Pollution Control Act" was on a voluntary basis from 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

Taiwanese Environmental Protection Administration (TEPA): Central authority responsible for establishing the regulations for the carbon fee and ETS.
Ministry of Economic Affairs: Central authority to be consulted by TEPA for regulations on ETS, in particular for allocation, leakage and international credits.
The Financial Supervisory Commission: Central authority responsible for setting up a carbon exchange, and to be consulted by TEPA for regulations on trading of credits.

REGULATORY FRAMEWORK

→ Greenhouse Gas Reduction and Management Act (2015)
→ Climate Change Response Act draft for the first reading (amendment of the Act)
→ Climate Change Action Guidelines

THAILAND

- **Pilot emissions trading project established in the Thai Eastern Economic Corridor (EEC)**
- **Carbon credit trading rules and guidelines released in early 2022**
- **Capacity building for voluntary ETS expanding to key industries**

In force

Under development

Under consideration

DESCRIPTION

Thailand has been considering economic instruments to incentivize GHG emissions reductions for several years. The 2018 "National Reform Plan" mandated the Thai government to begin developing such instruments. The decision on which economic instruments to implement shall be detailed in the policy and legislative process following the formulation of the "Climate Change Act" framework. The draft Act is currently under review by the Office for Natural Resources and Policy (ONEP) and will be tabled for cabinet and parliamentary approval in 2023.

In 2013, the Thailand Greenhouse Gas Management Organization (TGO) began developing an MRV system and basic trading infrastructures for the Thailand Voluntary Emissions Trading Scheme (Thailand V-ETS). This voluntary pilot project aims to develop and test MRV systems, cap-setting and allocation procedures, and trading infrastructure for 12 GHG-intensive sectors. Targets are set for each sector based on their average emissions intensity in the base years of 2012-2013. Both direct and indirect emissions are covered. As a voluntary system, allowances are provided for free based on MRV reporting. Offsets from the domestic crediting mechanism, Thailand Voluntary Emission Reduction (T-VER), may also be used to meet targets. Supporting these initiatives, TGO regularly conducts capacity building activities to engage key stakeholders across Thailand.

In February 2022, TGO and the Eastern Economic Corridor (EEC) Initiative collaborated to extend the T-VETS pilot project to the EEC area, a key industrial region of Thailand. The pilot project has so far engaged 12 organizations in the region, building capabilities in ETS design and operation among the participants, and providing technical assistance in T-VER project development.

In early 2022, the government also published rules and guidelines for carbon credit trading. Following these guidelines, the Federation of Thai Industries (FTI), in collaboration with TGO, launched the carbon credit trading platform FTIX in September. Trading is currently limited to domestic T-VER credits but may be expanded to international markets in the future.

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: Unconditional 30% reduction compared to BAU; 40% reduction compared to BAU conditional on adequate and enhanced support (Updated NDC, 2022)

By 2050: Aspirational target of climate neutrality by 2050 and net-zero emissions by 2065 (Updated NDC, 2022)

OTHER INFORMATION

INSTITUTIONS INVOLVED

Thailand Greenhouse Gas Management Organization (Public Organization): Autonomous public agency responsible for developing, implementing, and managing Thailand's climate change mitigation programs and projects.

REGULATORY FRAMEWORK

→ National Reform Plan (2018)

TIANJIN

TIANJIN PILOT EMISSIONS TRADING SYSTEM

- **System design strengthened recently by introducing financial penalties and auctioning**
- **Tightened cap setting and allowance allocation rules**
- **Sectoral expansion to building materials, pulp & paper, aviation and other manufactures.**

ETS DESCRIPTION

Tianjin launched its pilot ETS in December 2013. It covers around 55% of the city's emissions.

The Tianjin Pilot ETS covers emissions from around 140 entities in iron and steel, petrochemicals, chemicals, oil and gas exploration, papermaking, aviation, building materials sectors, food and beverage, non-ferrous metals, machinery and equipment manufacturing, mining, agricultural and food processing, pharmaceutical manufacturing, and electronic equipment manufacturing. Allowances are primarily allocated through grandparenting based on either base year total emissions or on emissions intensity. Auctions are also held, with the main purpose of providing compliance entities with additional supply to meet their compliance demand. Two auctions took place in both 2020 and 2021.

Having been extended until the end of June 2025, a number of measures have been introduced to strengthen compliance: companies that fail to surrender enough allowances 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.

The Tianjin ETS operates in parallel with the national Chinese carbon market, with a long-term outlook to integrate into the national market.

YEAR IN REVIEW

In August, the Tianjin pilot completed the compliance process for 2021 with a 100% reported compliance rate. In December, the Tianjin Ecology and Environment Bureau (EEB) published the 2022 allocation plan. The allocation method is the same as the 2021 allocation plan, with 2021 as the updated base year for historical intensity and grandfathering.

In July, Tianjin published a draft roadmap to establish a Tan Pu Hui system, which is a local voluntary reduction scheme to encourage small-scale emissions reduction projects and personal low-carbon behavior. Credits from the system could be used for compliance Tianjin ETS. The scheme is expected to start in 2025.

In August, the Tianjin Municipal Government issued the "Tianjin Carbon Peaking Implementation Plan", which establishes the target of peaking emissions by 2030 and outlines the policies to achieve that. The plan requires relevant government departments to improve the design and implementation of the Tianjin ETS.

1 Cap data for 2021, which excludes the power sector.

In force
Under development
Under consideration

SECTORS

INDUSTRY

CAP

75 $MtCO_2$ (2021)[1]

GREENHOUSE GASES

CO_2 only

OFFSETS AND CREDITS

Provincial

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking
Auctioning

AVERAGE 2022 ALLOWANCE PRICE

Average secondary market price: CNY 34.36 (USD 5.10)

TOTAL REVENUE

CNY 148.2 million (USD 22 million) since the beginning of the program

EMISSIONS & TARGETS OF TIANJIN

OVERALL GHG EMISSIONS (EXCLUDING LULUCF)

215 $MtCO_2$[2]

GHG REDUCTION TARGETS

By 2025: Central government determined the carbon intensity reduction and energy intensity reduction target; 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)

By 2030: Reduce carbon intensity by 65% compared to 2005; achieve carbon peaking. (Tianjin Carbon Peak Implementation Plan)

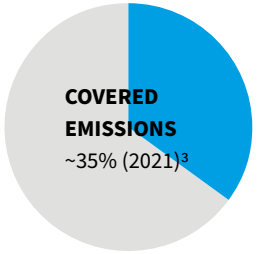
ETS SIZE & PHASES

PHASES

2014-present

CAP

75 $MtCO_2$ (2021)



SECTORS AND THRESHOLDS

Iron and steel, petrochemicals, chemicals, oil and gas exploration, papermaking, aviation, and building materials. Electricity production was covered until 2020, after which it transitioned to the national ETS.

From 2021, Tianjin expanded its ETS to entities above the inclusion threshold from all industrial sectors (without pre-selection of specific sectors).

INCLUSION THRESHOLDS: 20,000 tCO_2/year, considering both direct and indirect emissions.

POINT OF REGULATION

Point source (industry); downstream (indirect emissions from electricity and heat consumption)

NUMBER OF ENTITIES

139 (2021)

ALLOWANCE ALLOCATION & REVENUE

ALLOWANCE ALLOCATION

FREE ALLOCATION: Allowances are allocated through grandparenting for all sectors other than papermaking and building materials. For 2022, allocation is determined using emissions from 2021 as a base year. For the papermaking and building materials sectors, an emissions intensity method is used.

From the 2021 compliance year, an emission reduction factor for all sectors was set at 0.98. Benchmarking applies for new entrants and for entities expanding their capacity.

Pre-allocation is equal to 50% of the previous year's emissions. Ex-post allocation adjustments based on actual production levels are applied to determine the final allocation for those sectors that use emissions intensity benchmarks.

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.

USE OF REVENUES

Revenues are deposited into the city treasury. The main purpose of revenue usage is to support 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 Certified Emission Reductions (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 projects in 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.

2 There is no publicly available data, the data reported here is estimated based on public sources in the launch year of the ETS.
3 There is no official data, so emissions coverage given here is an estimate. Coverage for 2020 was estimated at ~55%.

COMPLIANCE

COMPLIANCE PERIOD

One calendar year. Covered entities have until the end of June of the following year to surrender allowances.[4]

MRV

REPORTING FREQUENCY: Annual

VERIFICATION: Third-party verification is required. Covered entities cannot use the same verifiers for three consecutive years.

FRAMEWORK: The Tianjin Development and Reform Commission has released a guiding document on monitoring and reporting. The document includes sector-specific guidance for the covered sectors, which EEB – as the competent authority since 2019 – is continuing to improve.

ENFORCEMENT

REGULATED ENTITIES: The "Tianjin Carbon Peaking and Neutrality Promotion Regulations", which took effect in November 2021, further introduce financial penalties for failing to submit emission reports as required, ranging from CNY 20,000 (USD 2,967) to CNY 200,000 (USD 29,673). 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.

In addition, according to Interim Measure for Management of Emissions Trading in Tianjin, which was published in July 2020, companies failing to surrender enough allowances to match their emissions face a deduction of double the amount of the gap in the next year's allocation. This rule is valid until June 2025.

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. Between 2019 and 2021, it held five auctions.

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

In case of market fluctuations, the Tianjin EEB can buy or sell allowances (for a fixed price or through auctioning) to stabilize the market.

OTHER INFORMATION

INSTITUTIONS INVOLVED

Tianjin Ecology and Environment Bureau: Authority responsible for establishing the Tianjin ETS after a governmental restructure in 2019.
Tianjin Climate Exchange: Responsible for operating the trading platform and registry system.

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)
- → Interim Measure for Management of Emissions Trading in Tianjin (2013)
- → Interim Measure for Management of Emissions Trading in Tianjin (2016)
- → Interim Measure for Management of Emissions Trading in Tianjin (2018)
- → Interim Measure for Management of Emissions Trading in Tianjin (2020)
- → Allocation Plan for Vintage 2020
- → Tianjin Carbon Peaking and Neutrality Promotion Regulations (2021)
- → Allocation Plan for Vintage 2021 (2021)
- → Allocation Plan for Vintage 2022 (2022)

4 In some years, the compliance deadlines have been postponed to later dates, for reasons such as the COVID-19 pandemic and other factors.

TOKYO

TOKYO CAP-AND-TRADE PROGRAM

- First city-wide ETS
- Covers commercial and industrial buildings
- In its third compliance period, where facilities must reduce emissions by 25% or 27% below base-year emissions

ETS DESCRIPTION

The Cap-and-Trade Program of the Tokyo Metropolitan Government (TMG) was launched in April 2010 and is Japan's first mandatory ETS. It covers around 20% of the metropolitan area's emissions.

The Tokyo ETS covers CO_2 emissions from large buildings, factories, heat suppliers, and other facilities that consume large quantities of fossil fuels. The cap is aggregated bottom-up from facility-level baselines. Regulated entities must reduce emissions below a facility-specific baseline, with credits issued to those where emissions fall below their baseline. Facility-level targets are determined based on the type of facility and factors such as expected energy efficiency gains and the extent to which they consume energy supplied by other facilities.

Tokyo's ETS is linked to the Saitama Prefecture ETS, with credits mutually exchangeable between the two jurisdictions.

YEAR IN REVIEW

In March, the TMG announced that all facilities covered by the Tokyo program had met their targets for the second compliance period (FY2015-FY2019), achieving a 15-17% reduction below base-year emissions. Covered facilities had reduced emissions to 33% below base-year emissions in FY2020.

The program is currently in 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 aims to expand the use and production of low-carbon and renewable energy and for covered facilities to reduce their compliance obligations by switching to cleaner electricity or heat.

For every new compliance period, the TMG establishes a committee of experts to discuss and determine compliance factors and other design elements for the next compliance period. The committee meeting for the fourth compliance period began in 2022.

In force
Under development
Under consideration

SECTORS

INDUSTRY
BUILDINGS

COVERAGE

11 $MtCO_2$ (2020)

GREENHOUSE GASES

CO_2

OFFSETS AND CREDITS

Domestic (national and prefectural)

ALLOCATION

Free Allocation: Grandparenting
Free Allocation: Benchmarking

AVERAGE 2022 ALLOWANCE PRICE

Average price: ~JPY 650 (USD 4.94)[1]

1 Estimated standard transaction price provided by TMG.

EMISSIONS & TARGETS OF TOKYO

GHG EMISSIONS (EXCL. LULUCF), 2020: 59.9 $MtCO_2e^2$

(in $MtCO_2e$, share of total in %)

Transport	8.7	(17%)
Manufacturing	3.5	(7%)
Business	21.7	(41%)
Residential	17.1	(32%)
Waste	1.8	(3%)
Total	**52.8**	

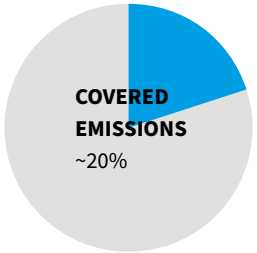
GHG REDUCTION TARGETS

By 2030: 50% reduction from 2000 GHG levels (Tokyo Environmental Master Plan)
By 2050: Climate neutrality (Tokyo Environmental Master Plan)

ETS SIZE & PHASES

COVERED EMISSIONS

Verified ETS emissions
11 $MtCO_2$ (2020)



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 bottom up from facility-level baselines, which are calculated using base-year emissions and a compliance factor (see 'Allowance 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 5,000m² 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 (industry, buildings)

NUMBER OF ENTITIES

~1,200 facilities:
- Office/commercial buildings: ~1000
- 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 average emissions of any three consecutive years between FY2002 and FY2007.

Baselines for new entrants are calculated using either historical emissions (average annual emissions for three consecutive fiscal years of the four fiscal years immediately preceding the compliance period) or an emission intensity standard provided by the government.

Credits are issued to facilities whose emissions fall below their baselines. Credits may also be issued through the use of renewable electricity (see 'Offsets and Credits' section).

2 The overall emissions figure for Tokyo is higher than the total of the emissions by sector because the former includes all GHGs, whereas the emissions by sector only measures CO_2 emissions.

COMPLIANCE FACTOR:
First period (FY2010-FY2014): 8% or 6% reduction below base-year emissions.
Second period (FY2015-FY2019): 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 whichever category they would otherwise belong.

Facilities demonstrating outstanding performance in emissions reductions, as well as in the introduction, use, and management of energy efficient equipment, are certified as top-level facilities that receive either 25% or 50% lower compliance factors, according to their rate of progress. The certification standards represent the best available energy efficiency measures, covering more than 200 different energy-saving measures.

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 purchased electricity. 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.

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, based on certification criteria, 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.

LINKS WITH OTHER SYSTEMS

Tokyo linked its program with the Saitama Prefecture ETS in April 2011. Tokyo and Saitama credits are officially eligible for trade between the two jurisdictions. More than 50 credit transfers have taken place between Saitama and Tokyo so far.

COMPLIANCE

COMPLIANCE PERIOD

Five years.

Facilities must submit a "GHG Emissions Reduction Plan" and an 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.

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 5,000m² or over six million kWh of 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 3,802]) 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); non-compliance entities (trading account holders). 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 entities who hold trading accounts trade credits 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, in the event of excessive price increase, TMG can sell its own offset credits on a discretionary basis.

OTHER INFORMATION

INSTITUTIONS INVOLVED

Tokyo Metropolitan Government: Oversees the Tokyo Cap-and-Trade Program, via the Bureau of Environment

EVALUATION/ETS REVIEW

For every new compliance period, the TMG establishes a committee of experts to discuss and determine compliance factors and other important issues for the next compliance period. The committee meeting for the fourth compliance period began in FY2022.

REGULATORY FRAMEWORK

- → Tokyo Metropolitan Security Ordinance and Regulation for the Enforcement of the Tokyo Metropolitan Environmental Security Ordinance
- → Outline documents and detailed documents on the Tokyo ETS
- → Tokyo Environmental Master Plan

VIETNAM

- **Established legal mandate to design domestic ETS and national crediting mechanism (NCM)**
- **Pilot NCM expected by 2023; pilot ETS by 2026; ETS fully operational by 2028**
- **Draft regulation for NCM and ETS under development**

In force

Under development

Under consideration

DESCRIPTION

In November 2021, Vietnam's government issued its revised "Law on Environmental Protection". The Law establishes a mandate for the Ministry of Natural Resources and Environment (MONRE) and 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. It allows for the inclusion of domestic and international offsets in the ETS.

In July 2022, Vietnam issued an official decision to approve a National Strategy for Addressing Climate Change through 2050 "Decision 896/QD-TTg" in which the country commits to achieving net-zero GHG emissions by 2050, with a mid-term target of 43.5% below BAU levels by 2030. This decision follows "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 (i.e., in 2025 facilities 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.

Decree 06 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 ETS states that regulations and a trading platform should be in place by 2025. A pilot voluntary ETS is planned for 2026-2027. The mandatory ETS should be implemented from 2028 onwards and provisions will allow for participation under Article 6 of the Paris Agreement.

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 should take place in 2023-2024, 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.

EMISSIONS & TARGETS OF VIETNAM

GHG EMISSIONS (EXCL. LULUCF), 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	91.1	(26%)
Manufacturing industries and construction	38.2	(11%)
Transport	35.8	(10%)
Other energy	40.7	(11%)

GHG REDUCTION TARGETS

By 2030: 43.5% below BAU levels (National Strategy for Addressing Climate Change through 2050 [Decision No. 896/QD-TTg])

By 2050: Net-zero domestic GHG emissions (National Strategy for Addressing Climate Change through 2050 [Decision No. 896/QD-TTg])

OTHER INFORMATION

INSTITUTIONS INVOLVED

Ministry of Natural Resources and Environment: Regulatory and implementing authority responsible for rulemaking for the VCM and ETS markets; organizing the pilot and official operation of the carbon trading floor; allowance allocation, exchange, and surrender; monitoring and supervision of the carbon market; and national GHG inventory.

Ministry of Finance: Responsible for developing and establishing a carbon trading floor and promulgating a financial management mechanism for the operation of the carbon market.

REGULATORY FRAMEWORK

- → Law No. 72/2020/QH14 on Environmental Protection, 133-139'20/OG
- → Decision No. 896/QD-TTg dated July 26, 2022
- → Decision 01/2022/QD-TTg
- → Decree 06/2022/ND-CP

1 Vietnam uses the sectors defined in the latest IPCC guidelines (2006 IPCC Guidelines for National Greenhouse Gas Inventories) for its inventory, in which the agricultural 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."

04

ABOUT ICAP

ABOUT

THE INTERNATIONAL CARBON ACTION PARTNERSHIP

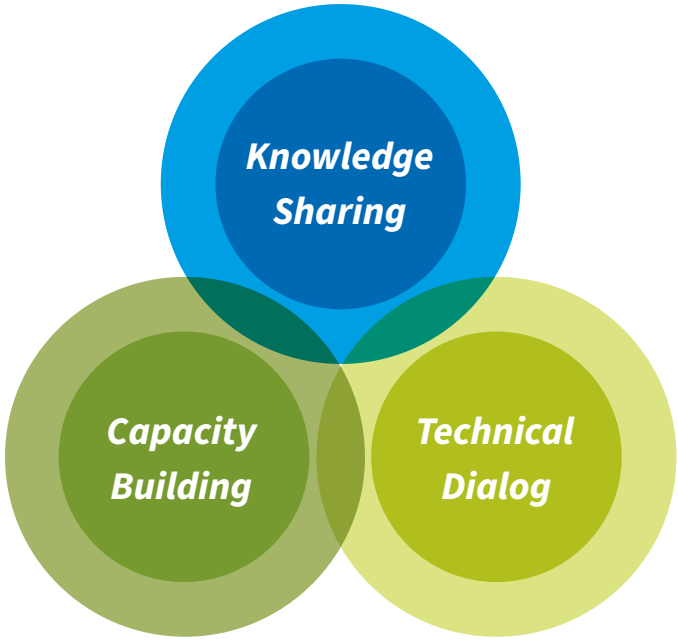
Founded in 2007, the International Carbon Action Partnership (ICAP) brings together policy-makers from all levels of government that are operating an emissions trading system (ETS) or are taking steps to introduce one. ICAP provides a unique platform for governments to share their practical experiences of emissions trading and the latest ETS knowledge. ICAP membership currently counts 33 members and 7 observers. ICAP celebrated its 15-year anniversary in October 2022.

ICAP'S OBJECTIVES

- Highlight emissions trading as a key policy tool to address climate change.
- Facilitate the development, implementation, and refinement of ETSs around the world.
- Build and strengthen partnerships amongst governments to share best practices and lessons learned.

MEMBERS (AS OF MARCH 2023)

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

Japan, Canada, Kazakhstan, the Republic of Korea, Mexico, Singapore, and Ukraine

THREE PILLARS OF ICAP'S WORK

Technical Dialog: ICAP provides a platform for its Members and Observers to exchange knowledge on and discuss ETS design and implementation. This workstream focuses on key aspects of emissions trading, drawing on the rich experience of ICAP jurisdictions and facilitating dialog on ETS issues among experts and others interested in carbon markets.

Knowledge Sharing: ICAP acts as a unique repository of information on emissions trading, promoting it as an important policy instrument to address climate change. ICAP is the main knowledge hub for those who want to learn more about emissions trading and access information about the latest ETS developments worldwide.

Capacity Building: ICAP builds capacity on the design, implementation, and operation of ETSs around the world by offering training courses to policymakers and other stakeholders on all aspects of emissions trading. Almost 1,000 participants from over 70 countries have participated in these courses over the years.

THE STORY OF ICAP

HOW ICAP BEGAN: THE INITIAL YEARS

The **International Carbon Action Partnership** was born in 2007, with a view to help foster cooperation on international climate change issues and related foreign policy. A group of governments quickly got behind the idea and a political declaration was signed among founding members in Lisbon in the same year.

ICAP quickly began to garner attention and soon welcomed additional memberships from governments around the world. ICAP's first steps were taken in the Kyoto era – where linking seemed a conceivable way to build a global carbon market "under the Kyoto cap" and where an organization like ICAP could facilitate and accelerate this effort. For this reason, ICAP's Technical Dialog work began with a particular focus on any and every technical aspect of ETS that might facilitate alignment among systems and future linkages, such as MRV, allocation, scope, and coverage.

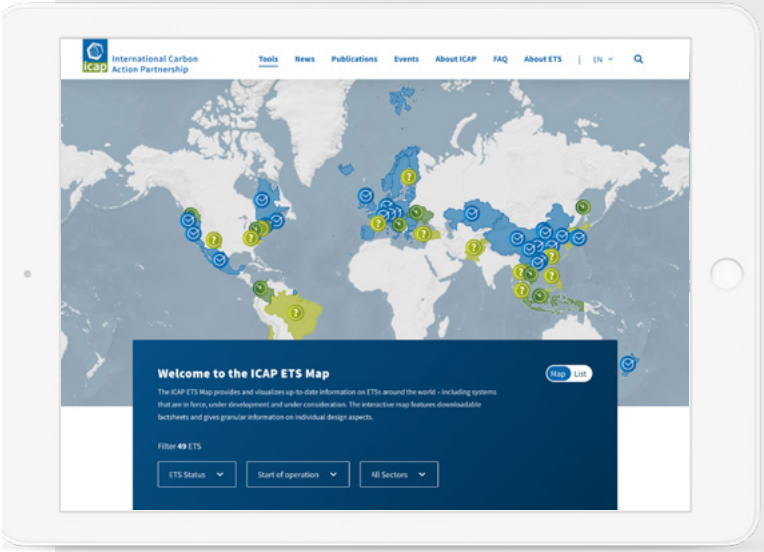
In this period, ICAP engaged with jurisdictions in the Asia-Pacific region – notably from South Korea, Australia, New Zealand, Kazakhstan, China, and national and subnational systems in Japan. Early dialog with these regional frontrunners at the time was an important signal of true international cooperation and laid the foundations for the diverse set of members and observers that make up ICAP today.

Since 2009, Capacity Building and outreach on the fundamental features of ETS have been a core workstream for ICAP. The first editions of the ETS Summer Academy – an initiative that continues to this day – also took place that year. It is now one of ICAP's most coveted capacity building courses and over time has helped foster a global community of ETS practitioners: the ICAP alumni. After 2011, Technical Dialog and Knowledge Sharing beyond ICAP's membership became increasingly important. An initial version of ICAP's **ETS Map** that visualizes up-to-date information on global ETSs was launched in 2012. Today, it is an interactive tool that features downloadable factsheets and granular information on all existing ETSs. This first knowledge product provided an important basis to later expand ICAP's role as a unique repository of information on emissions trading. All publications, ETS news, events, and other materials are available on the **ICAP website**.

NEXT: AN ERA OF GROWTH

In 2013-2020, ICAP grew and changed significantly, along with the number of ETSs worldwide. More systems sprang up and existing systems leapt forward, implementing reforms, and deepening their markets. Discussions and exchange on the technical elements of ETS became much more tangible, as theory turned to practice, and systems went from design to implementation. ICAP's Technical Dialog workstream thus grew in prominence and is now made up of workshops, webinars, and reports.

At the same time, there arose an appetite for ETS in emerging economies. This brought with it new questions, such as how an ETS might work in **jurisdictions with a regulated power sector**. The realization of the practical challenges of **linking**, with system designs strongly rooted in domestic economy considerations, also meant that previous hopes of transatlantic linking and the construction of a single, global carbon market became less feasible.



ETS Map

Allowance Price Explorer

But global cooperation and exchange remained all the more relevant in a world where models of ETS implementation – with view to scope, allocation, and cap-setting – varied significantly from continent to continent. Renewed vigor around the potential of emissions trading as a key instrument to tackle climate change meant that those in the field relished the opportunity to learn from their peers. ICAP's Capacity Building programs and training courses also began to reflect the accumulation of practical experiences. ICAP responded to the growing need not just for conveying ETS basics but for opening a channel for seasoned ETS practitioners to pass on their knowledge to a new generation of ETS designers working to launch systems in the Global South. The ICAP alumni from these training courses, both in person and virtual, now comprise almost 1,000 practitioners from over 70 countries – keeping in touch, working together, and exchanging when they meet at international climate events.

ICAP's role as an ETS knowledge hub also began to evolve in this time. In 2014, the first edition of the annual **Emissions Trading Worldwide Status Report** was published. This has become a critical market resource and our flagship publication. In 2015, together with the World Bank's Partnership for Market Readiness, ICAP brought together practical lessons on ETS design and implementation in an **ETS Handbook**, sparked by demand from policymakers. Our series of **ETS Briefs** was also initiated in 2015 and provide simple, up-to-date explainers on the basics of emissions trading. We also expanded our **ETS News** reporting in this time, and in 2019 launched our **Allowance Price Explorer**.

To this day, ICAP remains a safe and neutral forum for governments to openly exchange on ETS design and engage in advanced Technical Dialog. ICAP continues to forge collaborations with other carbon pricing initiatives around the world.

THE CURRENT ERA AND A VIEW AHEAD

Now, 15 years since ICAP's inception, we find ourselves once again at a crossroads. Established systems from the last decade are maturing. They are largely stable and reliable, and have shown resilience to financial crises, a pandemic, and now a global energy crisis. At the same time, new systems are coming online, especially in the Latin American and Asia-Pacific regions.

The objectives of policymakers have shifted towards aligning these policy instruments with long-term, ambitious climate targets. We look towards the future and ask such questions as: **how will ETS work in a net zero scenario**? What role will removals play? Other important topics include dialogs on **competitiveness and carbon leakage**, emissions trading and international cooperation, **offsetting**, and ETS and Article 6.

The EU's plans for a carbon border adjustment mechanism also provides a sharp impetus for ETS and other carbon pricing instruments, which have become more diverse. Among the jurisdictions currently considering an ETS, very few are designing 'traditional' cap-and-trade like the first wave of systems. The next generation of ETSs, predominantly implemented in developing countries, will feature alternative design elements or will be a hybrid of various mechanisms. These will need to be carefully crafted to be able to help jurisdictions meet objectives in their own unique situations. The world is increasingly complex, and emissions trading is flexible enough to meet this complexity. Looking ahead, ICAP will continue to delve into these dynamic topics to affirm the role of ETSs in achieving net zero emissions.

The ICAP Secretariat is deeply committed to its mission to help governments across the globe engage with each other and create robust and effective ETSs that can spur us along the road to climate neutrality. We want to thank all the members, observers, partner organizations, and individuals that have supported ICAP's work over the last 15 years – we truly look forward to the next 15.

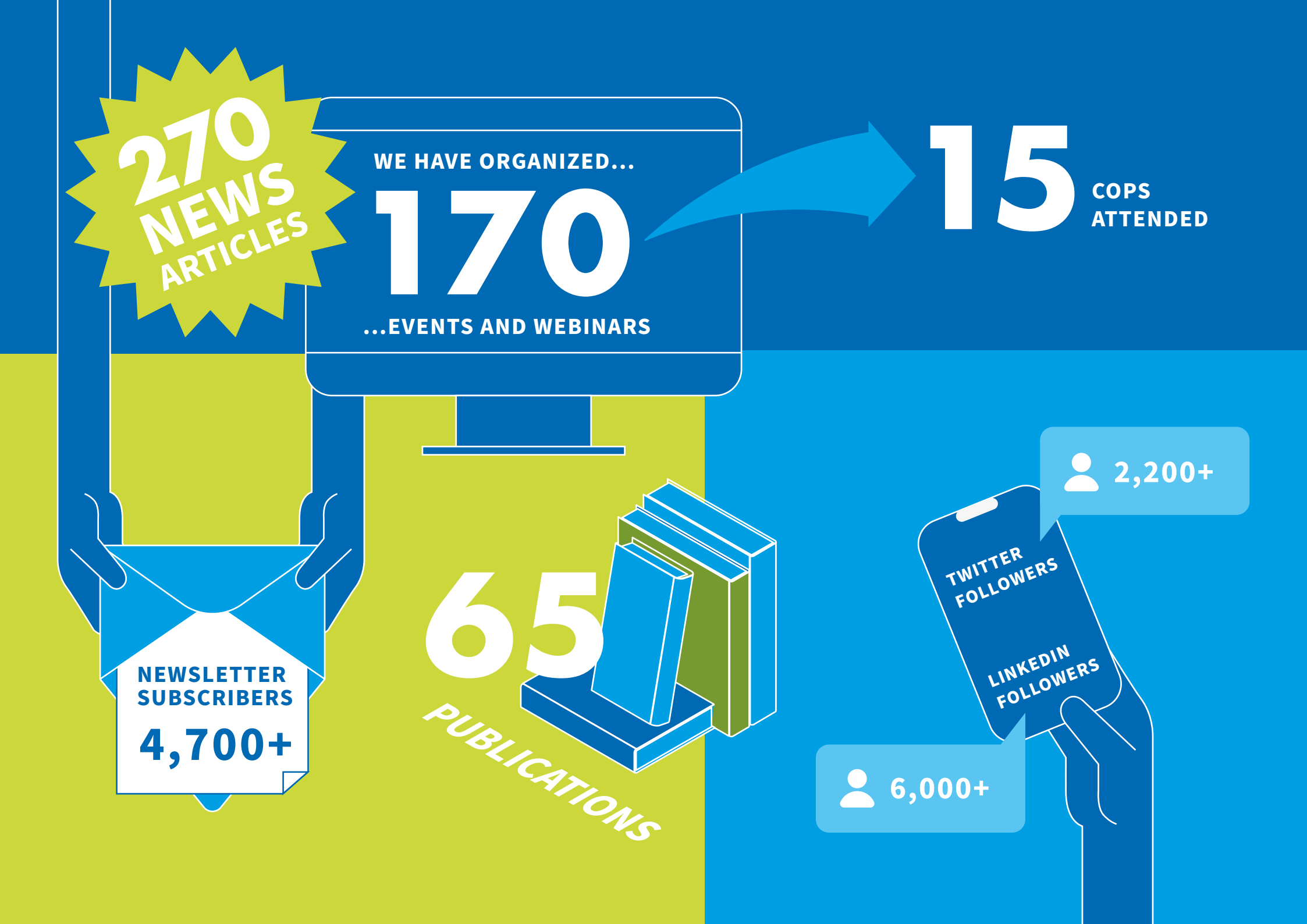
15 YEARS of ICAP

40 MEMBERS & OBSERVERS

22 Countries
16 Provinces and States
1 Union
1 City

AROUND 1,000 PARTICIPANTS

to ICAP capacity building activities


270
NEWS
ARTICLES
WE HAVE ORGANIZED...
170
...EVENTS AND WEBINARS
15
COPS
ATTENDED
NEWSLETTER
SUBSCRIBERS
4,700+
65
PUBLICATIONS
2,200+
TWITTER
FOLLOWERS
LINKEDIN
FOLLOWERS
6,000+

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/local experts from our network. Information on emitting sectors is based on jurisdiction-specific data sources; therefore, categories are not necessarily consistent across jurisdictions.

2. Data in the report represents the current situation as of January 2023.

3. Where 2023 data is not yet available, we use the most recent 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 correspond to the following:

    a. For systems with a primary market for allowances, they are the weighted average of either settlement prices at auctions that took place during the year or, in some cases, of allowances with that year's vintage, which may have been auctioned before the calendar year.
    b. For systems without a primary market of allowances, they are the arithmetic mean of settlement prices over the year, as recorded by the exchange.
    c. For a limited number of systems, they are the values provided directly by the jurisdiction or by local experts.

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. For national jurisdictions, the data in the "GHG emissions excl. LULUCF" section of the factsheets are drawn from the latest Annex 1 national inventory and non-Annex 1 Biennial Update Report submissions to the UNFCCC. For sub-national jurisdictions, domestic inventory data are used unless stated otherwise. Wherever possible, emissions are presented in line with standard IPCC sectoral categorization: "Energy", "Industrial Processes and Product Use", "Agriculture", and "Waste". Neither data from LULUCF nor "Memo items" is included unless stated otherwise. For jurisdictions that use the "Agriculture, Forestry and Land Use Change" (AFOLU) IPCC sector in their inventories, emissions data excludes emissions and removals from categories "3B Land" and "3D Products of collected wood" but includes the categories "3A Livestock" and "3C Aggregate sources and non-CO2 emissions sources on land". Emissions from "Energy" are further disaggregated as follows:

    a. For Annex I countries and for jurisdictions where this information is available:

        i. "Energy industries": CRF Code 1.A.1 "Energy industries".
        ii. "Manufacturing Industries and construction": CRF Code 1.A.2 "Manufacturing Industries and construction".
        iii. "Transport": CRF Code 1.A.3 "Transport".
        iv. "Commercial, Institutional and Residential": CRF Codes 1.A.4.a "Commercial/institutional" and 1.A.4.b "Residential".
        v. "Other energy": All other CRF codes in the "Energy" IPCC sector.

    b. For other jurisdictions, emissions are presented consistent with their inventory-specific categories.

11. The following criteria are used to determine the three ETS status categories:

    a. In force: ETS is in force with implementation established in the relevant regulation or legislation.
    b. Under development: A mandate for ETS is established, ETS rules are currently being developed and are not yet in force.
    c. Under consideration: ETS is being considered as a mitigation instrument, the government or other relevant authorities have sent signals from past three years that refer to an ETS that is mandatory for regulated entities. A local contact point verified the initial information contained in the factsheet.

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

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 at the end of January 2023. They typically cover 2020 or 2021 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. The 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. For more details, see the EU ETS factsheet.

3. The 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. The caps of the Chinese Pilots in the infographic have been adjusted down to reflect the transition of coverage of power sector entities from the regional to the national system.

5. As the Massachusetts' system covers the same emissions as those covered by RGGI in Massachusetts the Massachusetts system is excluded from the infographic to avoid double counting.

6. Global emissions data refer to GHG emissions in CO_2e excluding LULUCF and are obtained from Olivier J.G.J (2022) for 2005-2020 which is available at **https://www.pbl.nl/sites/default/files/downloads/pbl-2022-trends-in-global-co2-and_total-greenhouse-gas-emissions-2021-summary-report_4758.pdf** To obtain estimates of global GHG emissions in 2021, 2022 and 2023, 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, 2022 and 2023. Percentages of global emissions covered are rounded to the nearest full percentage. They are slightly above 5% and 17% in 2005 and 2022, respectively.

7. For the Austrian National ETS, we assume that the cap will approximately equal the sum of emissions from transport, residential, and commercial/institutional sectors in 2020 from Umweltbundesamt (2022): Austria's National Inventory Report. URL: **https://unfccc.int/documents/461938**.

SECTOR COVERAGE

1. For the purposes of this infographic, the following sector definitions are used:

SECTOR	DEFINITIONS
Power	Emissions from the combustion of fossil fuels for electricity generation, as well as large-scale centralized heat production.
Industry	Emissions from industrial activity, typically covering both energy emissions (e.g. from burning fossil fuels in furnaces), as well as process emissions (e.g. in the case of cement production). In the case of Kazakhstan, this also comprises extractive industries such as oil and gas mining.
Domestic Aviation	Emissions from fossil fuel combustion for flights arriving and departing within the jurisdiction ('domestic') which are not regulated by the International Civil Aviation Organization (ICAO).
Transport	Emissions from fossil fuel combustion for transport with the exception of aviation (domestic and international) and international maritime transport. Coverage usually is upstream with fuel distributors facing compliance obligations.
Buildings	Emissions originating from buildings. With upstream coverage, distributors of heating fuels face compliance obligations and all consumers are exposed to the carbon price. With downstream coverage, emissions of large buildings are regulated. In this case, emissions originating from other sectors (e.g. power production) may also be attributed to buildings to incentivize demand reduction and shifting towards cleaner sources of supply.
Forestry	Emissions and removals resulting from forest land use, including forest management/harvest, deforestation and re/afforestation activities.
Waste	Emissions from waste disposal and management (e.g. methane from anaerobic decomposition in landfills).
Agriculture	Emissions from fossil fuel use in the agriculture sector, typically covered upstream.

2. The agriculture sector is also a major source of biological emissions. 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 the 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 is a jurisdiction provided estimate, which is likely to be conservative.

4. In the case of RGGI, emissions coverage is the result of comparing the emissions covered by the ETS with the aggregate emissions in RGGI states. Aggregate emissions data for the RGGI states are taken from the "Inventory of U.S. Greenhouse Gas Emissions and Sinks by State" by the Environmental Protection Agency (EPA 2023. URL: **https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals**). While each state publishes official inventory data and the values published by the EPA should not be viewed as official state data, the EPA estimates are presented here to ensure the methodological consistency of data collection and aggregation for inventory categories across RGGI states, as well as to ensure a common reporting year in the data. There may be differences between the EPA estimates and the official state inventories.

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. In the case of China National ETS the coverage figure 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 USD price over 2022 per tonne of CO2e. 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. For most systems (Switzerland ETS, California C&T, Québec C&T, RGGI, Nova Scotia C&T, New Zealand ETS, Republic of Korea ETS, United Kingdom ETS), this value is obtained by dividing the allowances offered for auction over all the auctions for the most recent year for which data is available and dividing that value by the cap of that year.

Otherwise, this value is obtained from the corresponding factsheet. The consignment auctions in California are not included in calculating the auction share. Allowances from the Cost Containment Reserve in RGGI are not included in calculating the auction share. Until 2026 German ETS allowances are sold at a fixed price rather than in an auction. The estimated percentage of auctioned allowances for RGGI, and 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.

ALLOWANCE PRICES AND REVENUES

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 right panel on the first page of the infographic displays the daily allowance prices in 2022, while the left panel on the first page presents the monthly average allowance prices between March 2008 and December 2022 using data from the ICAP Allowance Price Explorer. Prices in the right panel on the first page 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 left panel on the first page, daily observations are averaged over the calendar month. For additional information on sources of allowance prices and exchange rates see **https://icapcarbonaction.com/en/documentation-allowance-price-explorer**.

3. 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 2022, the fixed price in the German ETS is equal to EUR 30 so the variation in the series reflect the changes in the EUR-USD exchange rate.

4. RGGI allowance prices are in short tons and have been converted to metric tonnes for the purposes of this infographic.

5. Where allowances have a limited vintage, the time series data compile these vintages in a way that reflects the compliance cycle.

6. 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.

7. 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; the website of the Korea Exchange (KRX) as well as from the factsheets of the Chinese pilot systems (links available upon request, **info@icapcarbonaction.com**).

8. Auction revenue for the EU ETS includes revenue from the domestic aviation sector, but does not include revenues from auctions held before 2012.

9. For the California cap-and-trade system, the proceeds from consignment auctions are excluded.

10. 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.

11. The Massachusetts quarterly reports are published by Potomac Economics, which is the official market monitor for the Massachusetts Department of Environmental Protection.

12. All allowance price data are in USD and are converted using the average exchange rate of the corresponding month as reported by the IMF. Revenue data are in USD and are converted using the average exchange rate of the corresponding year as reported by the IMF.

CONSUMER, ENERGY AND ALLOWANCE PRICES IN 2021 AND 2022

1. Data on the monthly consumer price and the energy component of the consumer price indices has been taken from the following sources:

    a. For national and supranational jurisdictions, from the OECD Data on Inflation (CPI). Data retrieved on 20 January 2023. URL: **https://data.oecd.org/price/inflation-cpi.htm**
    b. Fur subnational jurisdictions in the US, from the U.S. Bureau of Labor Statistics. Data retrieved on 20 January 2023. URL: **https://www.bls.gov/cpi/regional-resources.htm**

2. Data on allowance prices is taken from the following sources:

    a. For the EU, Germany, California and South Korea, from the ICAP Allowance Price Explorer. URL: **https://icapcarbonaction.com/en/ets-prices**
    b. For RGGI, from the RGGI CO_2 Allowance Tracking System, recording allowance transfers, both exchange settlement transactions and non-exchange settlement transactions. Prices correspond to the weighted average allowance prices for all transactions of the corresponding month.
    c. For the UK, from Ember's EU Carbon Price Tracker. URL: **https://ember-climate.org/data/data-tools/carbon-price-viewer/**

3. Allowance prices for California are the settlement prices of current vintage allowances in the primary market. Observations from two successive auctions are assumed to be connected linearly.

4. For RGGI, the CPI and the energy component of CPI correspond to values in the Northeast urban region. For California, they correspond to values in the West urban region.

PRICES OF COVERED EMISSIONS

1. The infographic only shows ETSs in force where there is available information on the two dimensions that are shown, as of the Status Report's editorial cut-off date at the end of January 2023.

2. The infographic does not include the China regional pilots.

3. Data on average allowance prices and on the cap/coverage are taken from the respective factsheet.

4. For the average allowance prices, the values correspond to the values provided by the jurisdiction. Otherwise, it is the weighted average allowance price in the primary market. When this information is not available, the value corresponds to the arithmetic average of settlement prices in the secondary market throughout 2022.

5. For the systems without an absolute cap, the infographic shows an estimate of the absolute emissions coverage of the system.

ETS IN PERSPECTIVE

1. The infographic only shows ETSs in force where there is available information on the three dimensions that are shown, as of the Status Report's editorial cut-off date at the end of January 2023.

2. The infographic does not include the China regional pilots.

3. Data on the share of jurisdiction's emissions covered by the ETS, on the average allowance price and on the cap of the system are taken from the respective factsheet.

4. For the systems without an absolute cap, the infographic shows an estimate of the absolute emissions coverage of the system.

5. For the average allowance prices, the values correspond to the values provided by the jurisdiction. Otherwise, it is the weighted average allowance price in the primary market. When this information is not available, the value corresponds to the arithmetic average of settlement prices in the secondary market throughout 2022.

LIST OF ACRONYMS

AFOLU	Agriculture, Forestry and Land Use Change
APCR	Allowance Price Containment Reserve
API	Allowance Price Index
ARP	Auction Reserve Price
BAU	Business-as-Usual
BEA	Beijing Carbon Emission Allowances
BEIS	Department for Business, Energy and Industrial Strategy
BMF	Austrian Federal Ministry of Finance
BMWK	German Federal Ministry for Economic Affairs and Climate Action
BPDLH	Badan Pengelola Dana Lingkungan Hidup (the Indonesian Environment Fund)
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
CEEX	China Emissions Exchange
CEP	Clean Energy Plan
CERF	Climate Emergency Response Fund
CFC	Chlorofluorocarbon
CHF	Swiss Franc
CH_4	Methane
CITSS	Compliance Instrument Tracking System Service
CLEF	Carbon Leakage Exposure Factor
CNY	Chinese Yuan Renminbi
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
COATS	CO_2 Allowance Tracking System
COCOSCE	Mexico Consultative Committee
COP	Conference of the Parties
CORSIA	Carbon Offsetting and Reduction Scheme
COVID-19	2019 Novel Coronavirus
CPI	Consumer Price Index/Carbon Pricing Instrument
CPP	Climate Protection Program
CPS	Carbon Price Support
CQCER	Chongqing Certified Emissions Reduction
CRF	Common Reporting Format
C&T	Cap-and-Trade
DACS	Direct Air Capture and Storage
DEBS	Direct Environmental Benefits for the State
DEC	Department of Environmental Conservation
DEHSt	German Emissions Trading Authority
DEP	Department of Environmental Protection
DEQ	Department of Environmental Quality
DHC	District Heating and Cooling
DNP	Department of National Planning
DOB	Department of Buildings
DRC	Development and Reform Commission
EBRS	Energy Bill Relief Scheme
EBSS	Energy Bills Support Scheme
ECR	Emissions Containment Reserve
EEA	European Economic Area
EEB	Ecology and Environment Bureau
EEC	Eastern Economic Corridor
EEX	European Exchange
EIB	European Investment Bank
EII	Energy-Intensive Industries
EITE	Emission-Intensive and Trade-Exposed
EMC	Environmental Management Commission
ENVI	Committee on the Environment, Public Health and Food Safety
EPA	Environmental Protection Agency
EPE	Empresa de Pesquisa Energética (Energy Research Corporation)
EPS	Emissions Performance Standards
EQB	Environmental Quality Board
EQC	Environmental Quality Commission
ESMA	European Securities and Markets Authority
ESR	European Effort Sharing Regulation
ETD	Energy Taxation Directive
ETS	Emissions Trading System/Emissions Trading Scheme
EU	European Union
EU ETS	European Union Emissions Trading System
EUR	Euro
FCER	Forest Certified Emission Reductions
FECC	Québec's Electrification and Climate Change Fund
FFCER	Fujian Forestry Certified Emission Reduction
FJEA	Spot trading of Fujian Emission Allowances
FOEN	Federal Office for the Environment
FTI	Federation of Thai Industries
FY	Fiscal Year
GBP	British Pound Sterling
GDEA	Guangdong Emission Allowance
GDP	Gross Domestic Product
GEI	Gases de Efecto Invernadero
GGPPA	Greenhouse Gas Pollution Pricing Act
GHG	Greenhouse Gas
GIR	Greenhouse Gas Inventory and Research Center of Korea
Gt	Gigatonne
HB	House Bill
HBEA	Hubei Emission Allowance
HCFC	Hydrochlorofluorocarbons

HFCs	Hydrofluorocarbons
HFC-23	Fluoroform
HGWP gases	High Global Warming Potential Gases
ICAO	International Civil Aviation Organization
ICAP	International Carbon Action Partnership
ICE	Intercontinental Exchange
IEA	International Energy Agency
IKI	German government's International Climate Initiative
IMF	International Monetary Fund
IPA	Instrument for Pre-Accession Assistance
IPCC	Intergovernmental Panel on Climate Change
IT	Information technology
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	Korean Allowance Unit
KAZ ETS	Kazakhstan Emissions Trading Scheme
KCU	Korean Credit Unit
K-ETS	Korean Emissions Trading System
kg	Kilogram
kL	Kiloliter
KOC	Korean Offset Credit
KRW	South Korean Won
KRX	Korea Exchange
KTF	Climate and Transformation Fund
kWh	Kilowatt hour
KZT	Kazakhstani Tenge
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LULUCF	Land Use, Land-Use Change and Forestry
m^2	Square Meter
m^3	Cubic Meter
MassDEP	Massachusetts Department of Environmental Protection
MEE	Ministry of Ecology and Environment
MEMR	Ministry of Energy and Mineral Resources
METI	Ministry of Economy, Trade and Industry
MoCC	Ministry of Climate Change
MoE	Ministry of Environment
MoEF	Ministry of Economy and Finance
MoEUCC	Ministry of Environment, Urbanization and Climate Change
MONRE	Ministry of Natural Resources and Environment
MOS	Mayor Office of Sustainability
MOU	Memorandum Of Understanding
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
NCCC	National Council for Climate Change
NCEC	National Committee on Establishment of Carbon Markets
NCM	National Crediting Mechanism
NCUC	North Carolina Utilities Commission
NDC	Nationally Determined Contribution
NDRC	National Development Reform Commission
NEHG	Nationales Emissionszertifikatehandelsgesetz (National Emissions Trading Act)
NETs	Negative Emissions Technologies
NER	New Entrants' Reserve
NF_3	Nitrogen Trifluoride
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxide
NRECC	Ministry of Natural Resources, Environment, and Climate Change
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
OECD	Organization for Economic Co-operation and Development
ONEP	Office for Natural Resources and Policy
OTC	Over-the-Counter
PAT	Perform, Achieve and Trade
PCER	Green Transport Certified Emission Reductions
PDR	People's Democratic Republic
PFC	Perfluorocarbon
PGE	Plan for a Green Economy
PHCER	Pu Hui Certified Emission Reductions
PL	Projecto de Lei
PNCTE	Programa Nacional de Cupos Transables de Emisión de Gases de Efecto Invernadero
PNMC	Política Nacional sobre Mudança do Clima
PMI	Partnership for Market Implementation
PMR	Partnership for Market Readiness
PV	Photovoltaic
PNCTE	Programa Nacional de Cupos Transables de Emisión de Gases de Efecto Invernadero (National Program of Greenhouse Gas Tradable Emission Quotas)
REC	Renewable Energy Credits
RENAMI	Registro Nacional de Acciones de Mitigación

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
SCF	Social Climate Fund
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 Hexafluoride
SHEA	Shanghai Emission Allowance
SHEAF	Shanghai Emission Allowance Forward
SHIFT	Support for High-efficiency Installations for Facilities with Targets
SISCLIMA	Colombia National Climate Change System
SO_2	Sulfur Dioxide
SRN	Indonesia National Registry System
SZA	Shenzhen Allowances
tce	Tonne of Coal Equivalent
tCO_2	Tonne of Carbon Dioxide
tCO_2e	Tonne of Carbon Dioxide Equivalent
TEPA	Taiwanese Environmental Protection Administration
TGO	Thailand Greenhouse Gas Management Organization
TIER	Technology Innovation and Emissions Reductions Regulation
TMG	Tokyo Metropolitan Government
TMS	Target Management System
TNAC	Total Number of Allowances in Circulation
T-VER	Thailand Voluntary Emission Reduction
T-VETS	Thailand Voluntary Emissions Trading Scheme
UBA	German Environment Agency
UK	United Kingdom
UKA	UK Allowance
UK ETS	UK Emissions Trading Scheme
UN	United Nations
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

International Carbon Action Partnership

All queries on rights and permissions should be addressed to:

International Carbon Action Partnership (ICAP)
Köthener Strasse 2
10963 Berlin, Germany

info@icapcarbonaction.com

www.icapcarbonaction.com

IMPRINT

Publication date
March 2023

Design
Simpelplus
www.simpelplus.de

Photos
Cover: Myriams-Fotos, Pixabay; Illustrations: Freepik

Disclaimer
This report was prepared by the ICAP Secretariat. The findings and opinions expressed in this report are the sole responsibility of the authors. They do not necessarily reflect the views of ICAP or its members.

The data used in this report reflects the global state of play at the time of writing in January 2023. Although the information contained in the report was assembled with the utmost care, updated and/or additional information may have been released by the time of printing. The ICAP Secretariat cannot be held liable for the timeliness, correctness, or completeness of the information provided. For any corrections, additions, or other comments on the content of this report, including relevant citations, please contact the ICAP Secretariat at info@icapcarbonaction.com.

Attribution: Please cite the work as follows: ICAP (2023). Emissions Trading Worldwide: Status Report 2023. Berlin: International Carbon Action Partnership.