



International Carbon
Action Partnership

EMISSIONS TRADING WORLDWIDE

Status Report 2020

EMISSIONS TRADING WORLDWIDE

International Carbon Action Partnership (ICAP) Status Report 2020

EDITORIAL TEAM:

Stephanie La Hoz Theuer, William Acworth, Baran Doda, Christopher Kardish, Kai Kellner, Emma Krause, Ernst Kuneman, Víctor Ortiz Rivera, Martina Kehrler, Julia Groß, Tobias Bernstein, Constanze Haug.

CITE AS:

ICAP. (2020). Emissions Trading Worldwide: Status Report 2020. Berlin: International Carbon Action Partnership.

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:

Botagoz Akhmetova (Kazakhstan), Ebenezer Asamany (Nova Scotia), Thomas Ballou (Virginia), Jonathan Beaulieu (Québec), Jean-Yves Benoit (Québec), Pierre Bouchard (Québec), Mavis Chan (Canada), Satoshi Chida (Tokyo Metropolitan Government), John Cooper (Nova Scotia), Francisco Dall'Orso León (Chile), Marco Aurélio dos Santos Araujo (Brazil), Steve Doucet-Héon (Québec), Bill Drumheller (Washington), Thomas Duchaine (Québec), Víctor Hugo Escalona Gómez (Mexico), Jill Fernandez (New Zealand), Dida Gardera (Indonesia), Jason Gray (California), Qian Guoqiang (SinoCarbon), Alexander Handke (Germany), Maddy Hayden (New Mexico), Larry Hegan (Canada), Paula Hemmer (North Carolina), Lolita Jackson (New York City), Ted Jamieson (New Zealand), Hadika Jamshaid (Pakistan), Yu Jiahui (SinoCarbon), Thomas Kellerhals (Switzerland), Christine Kirby (Massachusetts), Chang hwan Lee (Republic of Korea), Jeff Lindberg (Canada), Huy Luong Quang (Vietnam), Amber MacNeil (Canada), Colin McConnaha (Oregon), Engin Mert (Turkey), Michelle Miller (Nova Scotia), Shinichiro Niihara (Institute for Global Environmental Strategies), Ana Luiza Oliveira Champloni (Brazil), Michelle Palmer (New Zealand), Pennsylvania Department of Environmental Protection, German David Romero Otalora (Colombia), Karen Sabasteanski (Virginia), Rajinder Sahota (California), Anothai Sangthong (Thailand), Yumiko Sato (Tokyo Metropolitan Government), Juan Pedro Searle (Chile), William Space (Massachusetts), Irina Stavchuk (Ukraine), William Tait (New Zealand), Anne Trudel (Québec), Andrew Webber (Nova Scotia), Sophie Wenger (Switzerland), Brittany White (Nova Scotia), Beatriz Yordi (European Commission), Olga Yukhymchuk (Ukraine), Dan Zarrilli (New York City), Chen Zhibin (SinoCarbon), Julia Ziemann (European Commission).

The ICAP Secretariat is grateful to the German Federal Ministry for Environment, Nature Conservation and Nuclear Safety (BMU) 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.

A special thanks to Lisa Storcks, Irina Mezurnishvili and Yinshuo Xu for editorial assistance.

TABLE OF CONTENTS

FOREWORD	05
EXECUTIVE SUMMARY	07
PRACTITIONER INSIGHTS	
<hr/>	
CALIFORNIA	11
<i>A portfolio approach to climate change</i>	
CHINA	13
<i>ETS as future climate policy anchor</i>	
EUROPEAN UNION	16
<i>Leveraging carbon pricing for the low-carbon transition towards climate neutrality</i>	
NEW ZEALAND	18
<i>A collaborative approach to pricing agricultural emissions</i>	
QUÉBEC	21
<i>A revitalized approach to 2030</i>	
THE TRANSPORTATION AND CLIMATE INITIATIVE	23
<i>US states look beyond electricity</i>	
INFOGRAPHICS	
<hr/>	
FROM SUPRANATIONAL TO LOCAL	26
ALLOWANCE PRICES	27
EMISSIONS TRADING WORLDWIDE	28
GLOBAL EXPANSION OF EMISSIONS TRADING	29
SECTOR COVERAGE	30
DIFFERENT SHAPES OF ETS	31
AUCTIONING REVENUE	32
THE PATH TO NET ZERO	33
FACTSHEETS	
<hr/>	
EUROPE AND CENTRAL ASIA	36
<i>European Union</i>	<i>37</i>
<i>Switzerland</i>	<i>43</i>
<i>Kazakhstan</i>	<i>47</i>
<i>Germany</i>	<i>50</i>
<i>Ukraine</i>	<i>53</i>
<i>Turkey</i>	<i>54</i>
<i>United Kingdom</i>	<i>56</i>
NORTH AMERICA	57
<i>Western Climate Initiative</i>	<i>58</i>
<i>California</i>	<i>59</i>
<i>Québec</i>	<i>64</i>

<i>Canada</i>	68
<i>Nova Scotia</i>	71
<i>Massachusetts</i>	75
<i>Regional Greenhouse Gas Initiative</i>	78
<i>Pennsylvania</i>	82
<i>Transportation and Climate Initiative</i>	83
<i>Virginia</i>	84
<i>New Mexico</i>	86
<i>New York City</i>	87
<i>North Carolina</i>	88
<i>Oregon</i>	89
<i>Washington</i>	90
LATIN AMERICA AND THE CARIBBEAN	91
<i>Mexico</i>	92
<i>Colombia</i>	96
<i>Brazil</i>	97
<i>Chile</i>	98
ASIA-PACIFIC	100
<i>Beijing</i>	101
<i>Chongqing</i>	104
<i>Fujian</i>	107
<i>Guangdong</i>	110
<i>Hubei</i>	113
<i>Shanghai</i>	116
<i>Shenzhen</i>	119
<i>Tianjin</i>	122
<i>New Zealand</i>	124
<i>Republic of Korea</i>	128
<i>Tokyo</i>	132
<i>Saitama</i>	136
<i>China</i>	139
<i>Taiwan, China</i>	142
<i>Indonesia</i>	143
<i>Japan</i>	144
<i>Pakistan</i>	145
<i>Thailand</i>	146
<i>Vietnam</i>	147

ABOUT ICAP & NOTES

ABOUT THE INTERNATIONAL CARBON ACTION PARTNERSHIP	149
NOTES ON METHODS AND SOURCES	153
LIST OF ACRONYMS	157
IMPRINT	159

FOREWORD

ETSs and companion policies on the road to net-zero emissions

Across the world, 2019 saw a surge in awareness of climate change and public pressure to limit the emissions that cause it. As the 2020s begin, this momentum must be translated into concrete climate ambition if we are to keep global temperature rises well below 2°C. We are delighted to note that several jurisdictions have risen to the challenge and put forward carbon neutrality targets. California intends to be carbon neutral by 2045 and net-negative thereafter; the European Union, under the Green Deal, will work collectively towards achieving carbon neutrality by 2050; Sweden aims to reach net-zero emissions by 2045, with France, Switzerland, and the United Kingdom aiming to do the same by 2050; and several other countries, like Chile, Costa Rica, Fiji, and the Marshall Islands are leading carbon neutrality initiatives in the Global South — building up global momentum towards reaching net zero in the second half of the century. This year's Status Report explores how different policy instruments can come together to drive the deep decarbonization needed to meet these ambitious goals.

Emissions trading systems (ETSs) are a key piece of the puzzle. The Intergovernmental Panel on Climate Change highlights that explicit carbon prices remain a necessary condition of ambitious climate policies and that other policies reflecting robust price signals are necessary to achieve cost-effective decarbonization pathways. And ETSs are already delivering. Across the world, ETSs have been strong drivers of emissions reductions in the electricity sector, notably by helping make coal less attractive: CO₂ emissions from power plants under the Regional Greenhouse Gas Initiative (RGGI) have fallen by 47% since 2008, and in the UK, coal supplied only 5% of electricity in 2018, down from 39% in 2012. In both cases, carbon pricing was the main (albeit not the only) policy driver. Similarly, in Germany, a reinforced carbon price signal in the revised European Union Emissions Trading System (EU ETS) contributed to a projected 18% year-on-year decrease in power sector emissions in 2019, bringing the German 2020 mitigation target back within reach. ETSs are also helping to decarbonize industrial sectors. In California, for example, industrial emissions went down by 4.6% between 2013 and 2017 despite a GDP growth of nearly 17%.

Yet solving the deep decarbonization puzzle will demand policies broader than carbon pricing alone. The path to net zero requires deep and progressing emissions reductions in industry, transportation, and building — sectors where innovation policies and direct regulation (such as building codes, procurement frameworks, and minimum performance standards) can also play a strong role. Carefully crafted policy packages that combine carbon pricing with other types of regulation can provide the

most certain and cost-effective path to carbon neutrality. Technology mandates and innovation policies may be crucial in driving new low-carbon investment: for example, preventing carbon lock-in through long-lived capital assets in certain jurisdictions may require technology phase-outs.

ETSs and other policies are not independent of each other, but rather interact in many ways. Auction revenues from ETSs provide important financial resources for public investment into supporting innovation and further emissions reductions. In 2018, a total of EUR 14.1 billion (USD 15.8 billion) was distributed to EU member states from the auctioning of EU ETS allowances with some 70% spent for climate- and energy-related purposes. On top of annually distributed auction revenues, the EU ETS Innovation Fund, financed from the auctioning of EU ETS allowances, will disburse up to EUR 10 billion¹ (USD 11.2 billion) over the next decade to support innovative low-carbon technologies in energy-intensive industries, construction and operation of carbon capture and storage, and innovative renewable energy generation, among others. RGGI dedicates over 50% of its revenue to energy efficiency projects such as retrofitting and insulation programs, and Québec allocates the largest share of its auction revenue to promoting clean transport. ETSs can thus generate a double dividend of driving mitigation within their covered sectors through carbon pricing and further reducing emissions by tailored spending of auction revenues.



Carefully crafted policy packages that combine carbon pricing with other types of regulation can provide the most certain and cost-effective path to carbon neutrality

¹ – Estimate based on current carbon prices in the EU ETS



ETSs can play different roles in the policy mix, and the role of an ETS may also differ from sector to sector. Continued research and policy assessments are necessary to better understand the optimal policy mix for deep decarbonization

In this context, the emission reductions achieved in ETS sectors by non-ETS policies – such as renewable energy and energy efficiency regulations – must be reflected in the cap trajectory for ETSs to remain effective. Market stability measures within ETSs are a key policy tool for this. ETSs can also act to guarantee a certain environmental outcome regardless of the performance of other policies. In California, for example, around two-thirds of forecasted emission reductions through 2030 are driven by regulations such as a low carbon fuel standard and the renewable energy portfolio standard; the California Cap-and-Trade Program is relied upon to deliver all remaining reductions necessary to achieve the 2030 target.

ETSs can therefore play different roles in the policy mix, and the role of an ETS may also differ from sector to sector. Continued research and policy assessments over a variety of jurisdictions and sectors are necessary to better understand the optimal policy mix for deep decarbonization under different circumstances, as well as the interactions between carbon pricing and other policy approaches.

The climate challenge that lies ahead is enormous. The International Carbon Action Partnership (ICAP) is a key platform for carbon market policymakers to build technical capacity as well as exchange views and best practices about designing effective carbon pricing instruments as part of cohesive and ambitious policy frameworks that can drive emissions towards net zero.



BEATRIZ YORDI

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



RAJINDER SAHOTA

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

EXECUTIVE SUMMARY

In 2019 the world saw a surge in awareness and public support for climate action. The Intergovernmental Panel on Climate Change (IPCC) special report highlighted the urgency of limiting global warming to 1.5°C and of reducing GHG emissions from all sources. Worldwide, emissions trading systems (ETS) continue to be a key piece of the mitigation puzzle, with 21 systems now operating across four continents and 24 further systems under development or under consideration.

This edition of the International Carbon Action Partnership's (ICAP) Emissions Trading Worldwide report outlines the key developments and trends in emissions trading over the past year. It presents articles by ETS practitioners from ICAP member jurisdictions, providing direct insights into their systems and policies; infographics examining and comparing key ETS facts and figures; and detailed factsheets on each system currently in force, under development, or under consideration.

TAKING A COMPREHENSIVE AND COMPLEMENTARY APPROACH

For many jurisdictions, 2019 was a year of putting forward carbon-neutrality targets. From the European Union to Fiji, from the United Kingdom to California, from New Zealand to Costa Rica – a host of jurisdictions are leading neutrality initiatives around the globe. The IPCC highlights that explicit carbon prices remain a necessary condition of ambitious climate policies, and that other policies reflecting robust price signals are necessary to achieve cost-effective decarbonization pathways.

Carbon pricing plays a central role in delivering broad-based and cost-efficient abatement, yet deep decarbonization also requires other policies. For example, driving emissions reductions in the industry, transportation, and building sectors will require complementary policies such as performance standards, building codes, and innovation support. Carbon pricing can actively support the implementation of such policies: most of the 78 billion USD collected in auction revenues to date has been invested into innovation and further emission reductions. ETSs can also act as an environmental “safety net”, helping ensure a specific environmental outcome regardless of the performance of other policies. Conversely, ETS design (such as the cap trajectory, supported by market stability instruments) must take into account the emissions reductions driven by non-ETS policies such as renewable energy and energy efficiency regulations. ETSs can also play different roles in the policy mix, and the role of an ETS can also differ across sectors. When carefully crafted, policy packages that combine carbon pricing with other types of regulation can provide the most certain and cost-effective path to carbon neutrality.

This year's ICAP Status Report features articles from policy-makers around the world that provide personal insights into how jurisdictions are crafting policy packages of ETSs and companion policies to drive deep emissions reductions. The European Union, for example, outlines how a revised and strengthened ETS will be a key instrument for delivering carbon neutrality and supporting the European Green Deal, which outlines economy-wide companion policies. New Zealand discusses how it recently established an overarching climate framework with the Climate Change Response (Zero Carbon) Amendment Act, along with reforms to the New Zealand ETS that will help achieve the framework's target of net-zero emissions by 2050.

California takes a broad portfolio approach in its climate policy strategy, relying on a range of measures – including a Renewable Portfolio Standard, energy-efficiency goals, and a Low Carbon Fuel Standard – in conjunction with the Californian cap-and-trade program to achieve GHG reduction goals. The state's Scoping Plan estimates the impact of each policy and defines how they work together, with the cap-and-trade program ultimately helping ensure that reductions occur. Québec also highlights the necessity of intertwining a series of complementary policies that focus on the wider electrification of its economy, particularly transport. The Canadian province is also considering a reform to its cap-and-trade system that would provide stronger abatement incentives for industrial facilities while directing more support for them to invest in low-carbon technologies.

Emerging systems also provide prime examples of policy packages to drive decarbonization. China offers an approach that spans various levels of government: policies such as the national ETS and low-carbon development pilot programs target CO₂ emissions nationally, and are coupled with regional carbon-intensity and energy-intensity targets enshrined in five-year plans. Other systems are examining sectoral approaches: this is the case of the Transportation Climate Initiative, a potential U.S. regional cap-and-invest program focused on reducing combustion of transportation fuels. The program would complement existing ETSs (including the Regional Greenhouse Gas Initiative and the Massachusetts Limits on Emissions from Electricity Generators), regulations that mandate the sale of zero-emissions vehicles, and programs that provide rebates or tax subsidies to electric vehicle purchasers in order to drive further emission reductions in the transportation sector.

A YEAR OF ETS DEVELOPMENTS

Over the course of the last year, emissions trading systems underwent a range of developments. Updates included broadening sectoral coverage, refining allocation methodologies, and/or linking with other ETS jurisdictions, amongst others. New systems are also in the making, as jurisdictions work on the design and operationalization of their ETs. Here we summarize updates of systems currently in force (i.e., those already operating) and those under development (i.e., jurisdictions in which a mandate for an ETS is in place, and where system rules are currently being drafted), as well as other jurisdictions with major developments in 2019.

Europe and Central Asia

- **European Union:** The EU ETS Market Stability Reserve started operating in 2019. Following the adoption of the post-2020 policy framework, regulatory activities in 2019 focused on implementing the agreed provisions ahead of the next trading phase (2021-2030) – including provisions on carbon leakage, free allocation and auctioning. Linked with the Swiss ETS (see below).
- **Switzerland:** The link with the EU ETS was ratified by both sides and took effect on 1 January 2020. In preparing for the link, Switzerland broadened sectoral coverage and expanded participation in the Swiss ETS's secondary market to noncompliance entities.
- **Kazakhstan:** The end of 2019 saw the first exchange of allowances since the KAZ ETS restarted operating in 2018. Transactions are expected to be active in 2020, as it is the last year of the current ETS phase.
- **Germany:** Will launch a national ETS for heating and transport fuels in 2021, complementing the EU ETS. Legislation was adopted in 2019 to implement the system gradually, first with a fixed annual price, increasing over the period 2021–2025. In 2026, auctions with minimum and maximum prices will be introduced.
- **Ukraine:** Adopted an MRV Law which provides a basis for the development of an ETS.
- **Montenegro:** Adopted a climate law with provisions for an ETS in the power and industry sectors. Allowances will be partly auctioned, with a minimum auction reserve price of EUR 24 (USD 27) per tonne. Auction revenues will be used for environmental measures. The system will also feature a price stabilization reserve.¹

North America

- **California–Québec:** Some regulatory amendments conforming with AB 398 went into effect in 2019, though some major changes (e.g., price ceiling, offsets-related limits) will not take effect until 2021. Québec's regulatory work in 2019 focused on a proposed reform of free allocation from 2024–2030.
- **Nova Scotia:** Started operating its system in 2019 in compliance with the 'Pan-Canadian Framework on Clean Growth and Climate Change'.
- **Massachusetts:** 2019 saw an increase in the share of allowances auctioned in its system, which covers the power sector and complements RGGI.
- **Regional Greenhouse Gas Initiative (RGGI):** The majority of RGGI participating states have adopted design changes endorsed in the 2017 Model Rule, including an increased annual reduction factor and new emissions containment reserve for the post-2020 period. New Jersey adopted ETS legislation in 2019 and rejoined RGGI at the beginning of 2020. Virginia is also in the process of establishing an ETS and could join RGGI by the end of 2020.
- **Pennsylvania:** The state's governor directed the Pennsylvania Environmental Quality Board to develop a proposal for an ETS by 31 July 2020. The system would cover CO₂ emissions from the electric power sector and could be linked to RGGI.
- **The Transportation and Climate Initiative (TCI):** A subset of the 13 jurisdictions participating in the U.S. East Coast TCI released a draft framework outlining basic design features of a regional transport sector ETS starting as early as 2022.

¹ – The Montenegrin system was announced after the editorial cut-off date for this year's ICAP Status Report and is therefore summarized here only briefly. For more information please refer to the ICAP website.

- **Oregon:** The state attempted, albeit unsuccessfully, to pass a cap-and-trade bill in 2019. In early 2020 the legislature put forth a remodeled bill, proposing to establish a cap-and-trade program starting in 2022.

Latin America and the Caribbean

- **Mexico:** The Mexican ETS pilot started operating on 1 January 2020. The program covers direct CO₂ emissions from energy and industry, representing 37% of national emissions. The full ETS is scheduled to be operational in 2023.
- **Colombia:** Work on the design of a national ETS continues.

Asia Pacific

- **China:** Continues to prepare for the full launch of its national ETS. In 2019, the Ministry of Ecology and Environment released draft interim regulations on the management of emissions trading, as well as a trial plan for allocating emissions allowances – two important steps towards adopting ETS implementing regulations. Simulation trading is expected to start in 2020.
- **Chinese Pilots:** Continue to operate with increasing levels of trading activity while preparations for the rollout of the China national ETS continue.
- **Republic of Korea:** Held its first regular auction of allowances in 2019. Korea also released the first round of expected reforms for Phase Three from 2021–2025. Reforms include i) a yet-to-be-determined stricter emissions cap, ii) an increasing share of auctioning for non-ELTE sectors, and iii) increased use of sector-specific benchmarking.
- **New Zealand:** Decided on further reforms to the system in 2019, including: phasing down industrial free allocations starting in 2021, canceling and replacing units from the first commitment period of the Kyoto Protocol, introducing new accounting methods for the forestry sector, and confirming a new repayment penalty. Also reached an agreement with the agricultural sector to foster on-farm emissions reductions and to work towards implementing farm-level pricing by 2025.
- **Tokyo and Saitama:** These city-level systems, linked since 2011, continue to drive emissions reductions in large buildings and factories.
- **Taiwan (China):** Work on the design of an ETS continues.
- **Philippines:** Currently discussing a bill that would establish a cap-and-trade system for the industrial and commercial sectors.²

ICAP AND THE YEARS AHEAD

Climate change is a defining issue of our time, and carefully crafted policy packages of ETSs and companion policies are key to driving the deep decarbonization required. ICAP is a key forum for policymakers worldwide to compare notes and share lessons learned on the design and implementation of emissions trading systems. We look forward to continuing stimulating discussions in an ever-expanding circle of peers – pioneering and fine-tuning carbon markets as a key tool on the path towards deep decarbonization.

² – The developments in the Philippines were announced after the editorial cut-off date for this year's ICAP Status Report and are therefore summarized here only briefly. For more information please refer to the ICAP website.

PRACTITIONER INSIGHTS

01

”

Adopting a portfolio approach of complementary measures provides the greatest assurance of achieving deep GHG reductions

CALIFORNIA

A portfolio approach to climate change

California Air Resources Board

THE CHALLENGE

Recent years have seen increasingly (and alarmingly) clear findings from the Intergovernmental Panel on Climate Change (IPCC) on the imperative to reduce GHG emissions from all sources for us to even have a chance at keeping climate change-induced temperature rise to 1.5° Celsius. The IPCC has pointed to programs like carbon pricing as necessary tools to utilize in this effort, but not in isolation. Adopting a portfolio approach of complementary measures provides the greatest assurance of achieving deep GHG reductions and carbon neutrality goals, with carbon pricing helping ensure a lower-cost transition to a cleaner economy. California has followed this portfolio approach for over a decade, and we will continue to do so as we make progress toward our ambitious but critical 2030, 2045, and 2050 GHG goals.

A PORTFOLIO APPROACH INCLUDING CAP-AND-TRADE

Our most recent [Climate Change Scoping Plan](#)¹, which serves as California's statewide climate action plan, was adopted by the California Air Resources Board (CARB) in December 2017. This scoping plan recommended the state to embracing an approach that uses all of the tools available to achieve California's 2030 GHG reduction goal of 40% below 1990 levels (see Figure 1). The scoping plan lays out a cost-effective and technologically feasible path to achieve our 2030 target, including how our multiple programs work together, with our cap-and-trade program ultimately helping ensure reductions occur.

For instance, our Renewable Portfolio Standard and energy efficiency goals, along with direct measures on sources such as landfills and electricity switchgear, target needed reductions in the electricity, building, and waste sectors. Additionally, the Low Carbon Fuel Standard requires an increasingly lower carbon fuel mix, while our zero-emission vehicle mandates ensure our vehicle fleet becomes cleaner and able to utilize those lower carbon fuels. Based on our economic modeling, this mix of measures, when paired with California's economy-wide cap-and-trade program, should allow us to meet the 2030 reduction target in a manner that is four times less expensive than approaches that do not include a carbon market. In fact, this portfolio approach has already helped us achieve our 2020 target four years early.

The Scoping Plan modeled policies to reduce GHG emissions. It recognized that the use of incentive programs, including through the funds from the cap-and-trade program auctions, is an important tool to implement those policies along with regulations. The Scoping Plan also identified where additional action is needed, such as in California's land sector. California's natural and working lands—our forests and wetlands, our farmlands and rangelands—are currently a net emission source rather than a sink.

We know that even while we tackle industrial, electricity, and transportation emissions as laid out in the Scoping Plan, much more effort must occur to reduce GHG losses from our forests and farmlands, while increasing their ability to sequester additional carbon. Achieving carbon neutrality mid-century will require emissions from factories, power plants, and vehicles to be as close to zero as possible, along with as much sequestration and avoided losses as possible from our lands. California continues to develop strategies and assess a similar portfolio approach of incentives, mandates, and market-based programs for our [natural and working lands](#).²

Figure 1: Climate Strategy for 2030 Target*



*In 2018, SB 100 increased the Renewables Portfolio Standard to 60% by 2030

1 - California's 2017 Climate Change Scoping Plan. Retrieved from https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf

2 - Natural and Working Lands: Meetings & Workshops. Retrieved from <https://ww2.arb.ca.gov/our-work/programs/natural-and-working-lands/meetings>

ADVANCING TROPICAL FOREST PROTECTION

We have also continued to assess how our experiences in California and through our long-standing partnerships can help address some of the largest emitting sources in the land sector. Recognizing that avoiding large-scale tropical deforestation—which accounts for upwards of 14% of global GHG emissions—must be part of the fight against climate change, CARB endorsed the [California Tropical Forest Standard](#)³ in September 2019.

CARB developed the standard following more than a decade of partnership with the 38-member Governors’ Climate and Forests (GCF) Task Force, as well as through collaborative engagement with governments such as Norway, Mexico, and organizations like the United Nations Development Program. This represents the first government-enacted standard for protecting tropical forests at the subnational jurisdiction scale by incentivizing responsible actions and investment while ensuring enhanced protections for indigenous peoples and local communities.

The standard establishes requirements for jurisdiction-scale programs to reduce emissions and sends a strong signal that values the preservation of tropical forests over continued deforestation. It includes monitoring, reporting, and verification criteria, as well as social and environmental safeguards based on international best practices and California’s GHG mitigation experience. The standard incorporates [Guiding Principles](#)⁴ for Collaboration and Partnership Between Subnational Governments, Indigenous Peoples and Local Communities that were developed by the Global Committee of Indigenous Peoples and Local Communities of the GCF Task Force. This incorporation recognizes that lands managed by indigenous peoples contain higher levels of carbon and seeks to ensure safeguards for rights recognition, consultation, and benefit sharing.

The standard is a tool to assist subnational jurisdictions demonstrate performance in reducing deforestation and attract investment in forest and community protections from donor-based payment for performance programs, supply chain initiatives, existing and emerging carbon markets, and other financing mechanisms. CARB staff will proactively monitor use of the standard and will report annually on progress being made.

GOING FORWARD

All of these efforts—from our scoping plan to our cap-and-trade program to our engagement on tropical forests—reflect the need for developing multi-pronged, complementary climate programs to achieve our GHG reduction goals. Climate change poses an increasingly evident and dangerous threat to California and to the world. Our programs are designed to address that threat here in the state and may offer support for necessary efforts elsewhere as well.



The scoping plan lays out a cost-effective and technologically feasible path to achieve our 2030 target, including how our multiple programs work together, with our cap-and-trade program ultimately helping ensure reductions occur

3 – *California Tropical Forest Standard*. Retrieved from <https://ww3.arb.ca.gov/cc/ghgsectors/tropicalforests.htm>

4 – *Guiding Principles for Collaboration and Partnership Between Subnational Governments, Indigenous Peoples and Local Communities* https://docs.wixstatic.com/ugd/cb5e0d_dc366a0654ab4429954d8eb2162cb0f4.pdf?index=true

CHINA

ETS as future climate policy anchor

Chen Zhibin, Yu Jiahui → SinoCarbon Innovation & Investment Co., Ltd

As the largest developing country and largest GHG emitter in the world, China has the ambition and the responsibility to switch to a low-carbon development pathway. Under the framework of building an “ecological civilization,” President Xi Jinping is focused on climate change cooperation, pushing for energy transformation, and cultivating China’s renewable energy sector.

Over the past decade, China has made great strides in controlling GHG emissions and moving to a low-carbon, energy-efficient economy. Green development has been raised to an unprecedented level on the policy agenda, with specific plans and targets to address climate change. The 2014 National Plan on Climate Change identifies guiding principles, main goals, and seven major actions for climate change mitigation (see Figure 1). In 2015, China submitted its nationally determined contribution (NDC) under the Paris Agreement, outlining its post-2020 climate goals and actions. Moreover, carbon-intensity and energy-intensity targets have been established via five-year plans (FYPs), thereby becoming the major high-level policy levers for controlling CO₂ emissions at the regional level.

In achieving these targets, a comprehensive and detailed policy framework has been developed to address climate change, which has been incorporated into all aspects of social and economic planning and reflected in detailed sectoral plans in the energy, industry, transport, and buildings sectors (see Figure 1). The plans and policies all aim to decouple economic growth from carbon emissions, and hence can be critical vehicles in driving the transition to a green economy.

Firstly, driven by the goals of building an ecological civilization and fostering high-quality development, China has accelerated development of a modern service industry, eliminated outdated industrial facilities, and worked to advance sectors of strategic importance such as information technology and biotech. All these sector policies have contributed to significantly less emissions-intensive growth.

Secondly, the reforms in both energy supply and the demand side are also major domains. On the supply side, growth in coal consumption is under control, while natural gas and non-fossil sources of energy are increasing rapidly. On the energy demand side, the sectoral plans in the industrial, transport, and buildings sectors all are facilitating a reduction in energy intensity. Meanwhile, standards on green products

and factories have been established to prioritize products and technologies that conserve energy and hence promote more sustainable consumption. With these energy policies, the carbon intensity in each sector is dropping gradually.

Moreover, policies targeting CO₂ emissions directly have been developed that present opportunities for cross-sectoral impact. The national ETS and low-carbon development pilot programs are two major policies incentivizing GHG abatement directly at different levels.

Despite various challenges, China is on track to achieve its long-term goals and has significant potential to further enhance its actions. Table 1 shows the country’s key targets and achievements relative to its 2030 NDC targets.

In addition, China has pledged to peak national CO₂ emissions around 2030 and make best efforts to peak early. To achieve this goal, 31 provincial administrative regions have established GHG control plans during the 13th FYP, and nine of them have proposed specific peaking targets. Moreover, at the city level, 87 cities (so-called “low-carbon pilot cities”) have set targets to peak GHG emissions before 2030.

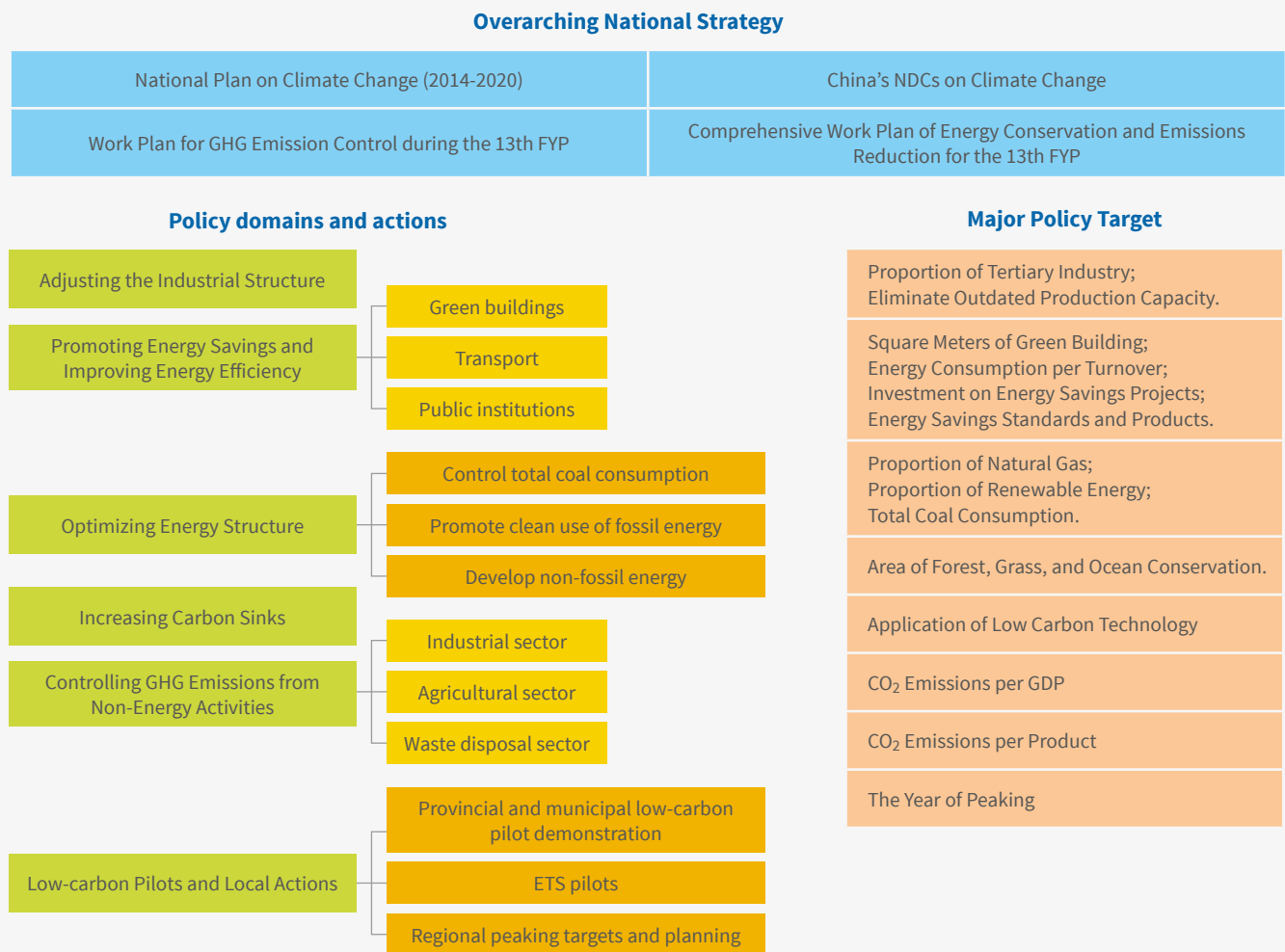
A wide range of measures have been put in place to implement these targets across sectors. While energy and industrial policies have played an extremely important role thus far, there is an increasing emphasis on market-based instruments—notably ETS—since 2010. Based on experiences from eight regional pilots, ETSs have shown unmatched potential in building a more flexible, resource-efficient, clean, and innovative industrial system in the long run.

Table 1: Climate change targets and achievements

Outcome	Target of 13th FYP (2020)	Achievement by 2019*	NDC Target (2030)
CO ₂ emissions reduction per unit of GDP relative to 2005 levels	40-45%	45.8%	60-65%
Share of non-fossil fuels in primary energy consumption	15%	14.3%	20%
Increased forest carbon stock volume relative to 2005 levels	1.3 billion cubic meters	3.9 billion cubic meters	4.5 billion cubic meters

*Ministry of Ecology and Environment (2019)

Figure 1: China's policy framework for GHG abatement



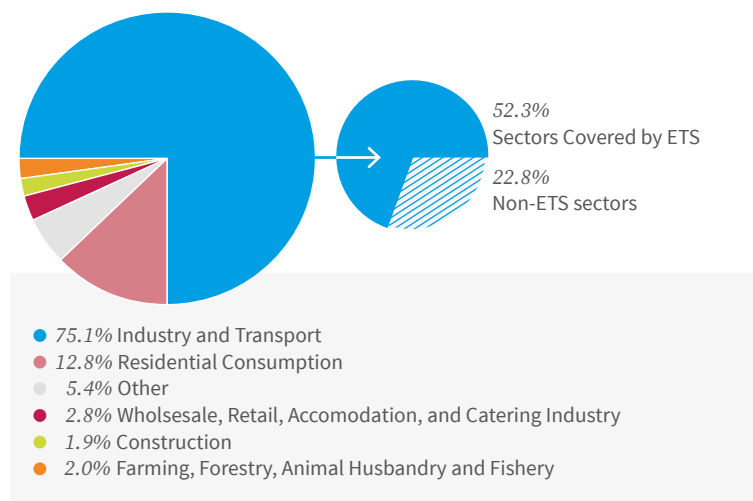
ETS AS THE TOOL FOR GHG REDUCTION AT THE CORPORATE LEVEL

Most of the climate policies in China target energy intensity and GHG intensity at the regional level relative to GDP. A national ETS expected to begin in 2020 is the first policy targeting GHG emissions directly at the corporate and facility levels. The national ETS will cover the power sector only at first and then gradually expand to seven others, including petrochemical, chemical, building materials, steel, nonferrous metals, paper, and domestic aviation. Those sectors represent the major GHG emission sources in China, together accounting for 52.3% of total energy consumption¹ (see Figure 2) and around 8 billion tonnes of CO₂ equivalent including direct and indirect emissions. While the seven additional sectors will not immediately face compliance obligations, they began reporting emissions in 2015 and internal carbon management practices.

While many policies have been implemented and proven to produce effective results in certain sectors (e.g., industrial fuel switching, renewable energy standards, fuel-economy standards, and enhanced building

codes), few measures could impose effects across sectors. ETS stands out, as it will cover all major sectors in China and has been estimated to have the strongest cross-sector abatement potential.²

Figure 2: Energy consumption by sector*



*China Energy Statistical Yearbook (2017)

1 - Calculated based on the China Energy Statistical Yearbook 2017.

2 - NCSC. (2016). Climate and energy policy solutions for China. Retrieved from https://china.energy-policy.solutions/docs/20160704_ExecutiveSummary_EN--FINAL.pdf

CHALLENGE OF SETTING LONG-TERM ABATEMENT TARGETS FOR INDIVIDUAL SECTORS

Although tackling climate change is a major policy aim of the ministries responsible for energy, environmental protection, and industry, they set targets according to their own spheres of responsibility in green development and do not typically focus on GHG emissions directly (see Figure 1). The complexity of the climate change policy system, which targets industrial abatement from energy structure, energy efficiency, and economic structure, increases the difficulty of setting sector targets for GHG abatement. Absent a clearer understanding of the GHG impact of the different policies and a more coordinated approach between them, it is difficult to determine the optimal level of additional reductions expected to come from the ETS and targets for individual sectors. The availability of emissions data from all sectors is another challenge that is being addressed and will be critical to establishing long-term targets relative to business-as-usual scenarios.

As a result, the current allocation plans for ETSs in China (both in regional pilots and the national ETS) focus primarily on basic market functioning and short-time abatement targets. If China could first determine the abatement impact of all sector policies together and then consider the additional contribution of its national ETS, it could set longer-term reduction targets for ETS sectors. These could continue to be intensity-based—as long as they are clear and quantifiable, they would serve as a long-term price signal for each sector.

The current policy design for the national ETS is a good start for carbon management at the corporate and facility levels, but in the short-term existing energy, industrial, and environmental policies will likely drive emissions reductions to a greater degree. However, with increasing integration of relevant government departments and reaching peak emissions, long-term sectorial abatement targets will come into play. These developments should allow the Ministry of Ecology and Environment to design long-term abatement targets for the national ETS, which would in turn lead to a stronger price signal to incentivize GHG abatement in the long run.



The current policy design for the national ETS is a good start for carbon management at the corporate and facility levels

EUROPEAN UNION

Leveraging carbon pricing for the low-carbon transition towards climate neutrality

Beatriz Yordi → European Commission

The European Green Deal resets the European Commission's commitment to addressing climate change and sets out a far-reaching plan for responding to one of the most pressing global challenges. It frames the ambition for the EU to become climate neutral by 2050, calling on all sectors of the economy to contribute. Equally, it identifies ways in which these sectors can modernize and innovate to adapt to the changing paradigm. The delivery of the European Green Deal will rely on a combination of mutually reinforcing, existing as well as newly developed policy measures as presented in the European Green Deal.

The long-term strategy, presented by the European Commission in 2018, has already identified strategic building blocks for the collective action required to achieve carbon neutrality by 2050. It shows how Europe can lead the way to climate neutrality by committing to a low-carbon economic outlook, investing in realistic technological solutions, supporting research and innovation, empowering citizens, and aligning action in key policy areas. The EU Member States on 12 December 2019 widely endorsed this long-term target and the effort necessary to translate it into concrete policy actions. The endorsement will allow for better coordination of policy measures and updates necessary to support delivering this target. The European Green Deal has identified the timeline and the course for this policy coordination and development. In addition to fostering far-reaching decarbonization of the economy, the European Green Deal will mobilize policies to support low-carbon industry and a sustainable, circular economy; encourage resource-efficient construction and building renovations; design environmentally-conscious food systems; accelerate the shift toward smart and sustainable transport; as well as integrate and advance climate action in a range of other areas that are critical to the low-carbon transition.

Putting a price on emissions is an integral instrument for delivering carbon neutrality and supporting the European Green Deal. Regulating emissions from the power sector, manufacturing industry, and aviation within the European Economic Area, the EU ETS is the longest established carbon pricing mechanism in the world as well as a cornerstone of the EU's strategic approach to delivering a transition to climate neutrality in the EU. It sets out a long-term emissions reduction pathway for the regulated sectors in line with the EU's overarching climate targets as well as Paris Agreement objectives, incentivizing continued, cost-effective emissions reductions. At the same time, the auctioning of EU

ETS allowances generates important revenues, available to EU Member States to further support climate action and facilitate the transition for stakeholders. In 2018, the total auctioning revenue amounted to EUR 14.1 billion (USD 15.8 billion), with Member States reporting spending 70% on climate- and energy-related purposes.

It is, thus, essential that the EU ETS framework is robust and well-functioning. In 2018, the European Commission completed a revision of the system with a view to make it fit for the next decade. The revision has considerably reinforced the carbon price signal and strengthened the system in the long-term horizon, extending protection against the risk of carbon leakage and establishing instruments dedicated to fostering low-carbon investment. The Commission is now finalizing implementing provisions stemming from the revision, for the changes to be fully in place before January 2021, at the start of the fourth trading period.

To address the supply-demand imbalance prevailing in the EU ETS from the last decade, as well as to increase the system's resilience to potential future shocks, the revision reinforced the Market Stability Reserve, a volume-based supply-adjustment mechanism. While the Market Stability Reserve only became operational in 2019, the impact of the reform has been reflected in a sustained upward carbon price trend since late 2018. At its current level, the carbon price incentivizes fuel-switching from coal to gas, as well as improving energy and process efficiency. A robust carbon price is thus becoming an increasingly pivotal aspect of investment appraisal.

The reform also extended the existing free allocation regime for the EU industry until 2030 as an effective safeguard against the risk of carbon leakage. In parallel, it created the Innovation and Modernisation Funds to support the industry and energy sectors in the low-carbon investment challenge. In the long-term economic outlook, through these funds and auction revenues distributed to EU Member States, the EU ETS will mobilize billions of euros to further climate action: fostering reduction of emissions, low-carbon innovation, and energy sector modernization, particularly in lower income Member States. Delivering a low-carbon transition in a socially fair manner is of paramount importance to the EU, and the just transition is one of the priorities of the Modernisation Fund.

Fostering a transition towards climate neutrality across the board is a complex challenge. At present, the EU ETS provides large emitters with a reinforced EU-wide framework, which offers a predictable outlook into the emissions reduction pathway as well as ensuring that emissions decline gradually. A robust carbon price, determined by the market, issues a “technology-neutral” signal for emissions’ abatement and low-carbon investment, while the possibility to trade emission allowances allows for flexibility that ensures emissions are cut where it costs least to do so.

With climate change being one of the top priorities of the European Commission, in the coming years EU climate action will be reinforced and the policies aligned with the ambition of the European Green Deal. The EU ETS will continue to play a critical role in delivering emissions’ reductions and driving sectoral transformation. As part of the European Green Deal, the Commission will present an impact-assessed plan to increase the EU’s greenhouse gas emission reductions target for 2030 to at least 50% and towards 55% compared with 1990 levels in a responsible way. To deliver this, the Commission will consider extending the scope of the EU ETS to road transport, shipping, and buildings to align the system with the increased ambition.

Effective climate action, in line with the international commitment under the Paris Agreement, remains a priority. The EU ETS embodies nearly 15 years of experience with pricing carbon in the EU, which continues to encourage and inform development of similar measures around the world. A strengthened EU ETS is central to the Commission’s international engagement on climate change, with 2019 marking the official linking of the EU ETS and the Swiss ETS and continued collaboration, including with California, China, and New Zealand. The experience of establishing, managing, and reinforcing a carbon pricing framework will prove invaluable in delivering a progressive transformation in line with the objectives of the European Green Deal.



Putting a price on emissions is an integral instrument for delivering carbon neutrality and supporting the European Green Deal

NEW ZEALAND

A collaborative approach to pricing agricultural emissions

Michelle Palmer and William Tait → New Zealand Ministry for the Environment

LEGISLATIVE BACKDROP

Since ratifying the Paris Agreement and completing a review of the New Zealand Emissions Trading Scheme (NZ ETS), New Zealand has reached significant climate action milestones.

In November 2019, New Zealand passed into law the [Climate Change Response \(Zero Carbon\) Amendment Act¹](#), which delivers a framework by which New Zealand can develop and implement clear and stable climate change policies. Notably, the act establishes new 2050 emissions reduction targets, five-year emissions budgets, and an independent Climate Change Commission.

Additionally, the Climate Change Response (Emissions Trading Reform) Amendment Bill (ETR Bill) includes a number of improvements to the functioning of the NZ ETS and measures for the pricing of GHG emissions from agriculture.

The Zero Carbon Act and the ETR Bill form just two legislative changes. Other initiatives and policies in New Zealand, such as planting one billion trees by 2028 and further investments in renewable electricity generation, further complement the Zero Carbon Act and the ETR Bill in tackling climate change.

ACTION ON AGRICULTURAL EMISSIONS

The Zero Carbon Act establishes domestic split-gas targets requiring that gross emissions of biogenic methane reduce to 24-47% below 2017 levels by 2050 (with an interim target of 10% below 2017 levels by 2030) and that net emissions of all other GHGs reduce to zero by 2050.

These targets emphasize that:

- the agriculture sector will have a key role to play as New Zealand transitions to a low-emissions economy; and
- a price signal on GHG emissions, within a package of policies, is needed to drive behavior change to meet these domestic targets.

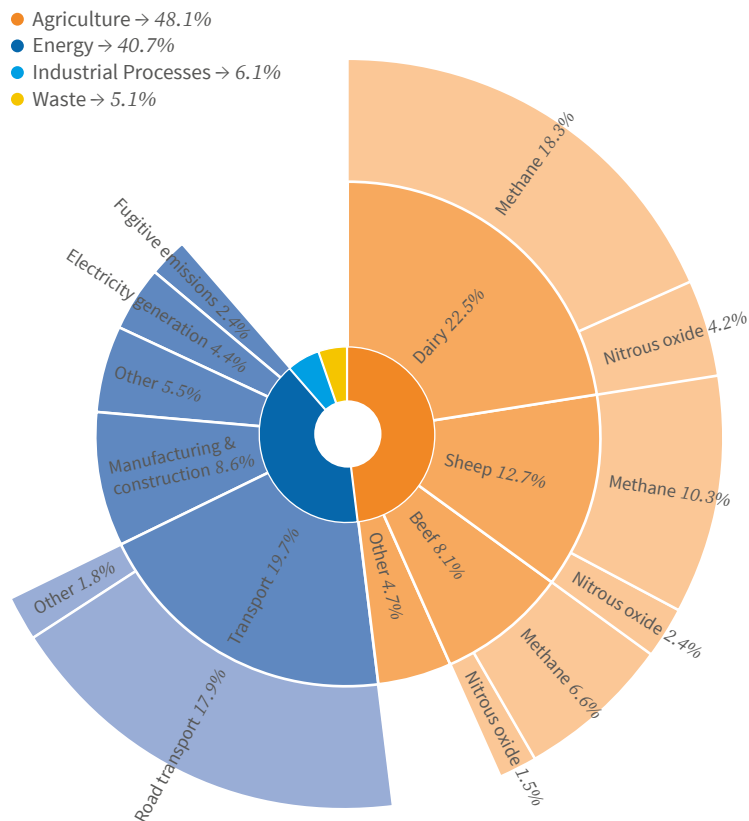
Following this and reviewing the available evidence, the New Zealand government has decided to price agricultural emissions from 2025.

2025—pricing agricultural emissions

The decision to price agricultural emissions was based on the [Interim Climate Change Committee's \(iCCC\) recommendations²](#), on the basis of ensuring greater distribution of costs and flexibility for diverse farm types relative to direct regulation or mandatory good management practices.

Considering agricultural emissions make up 48.1% of New Zealand's GHG profile, illustrated in Figure 1, this long-term goal of reducing emissions from agriculture is a key aspect of New Zealand's domestic climate action and helps to establish a precedent for pricing agricultural emissions worldwide.

Figure 1: New Zealand's greenhouse gas emissions



1 - Climate Change Response (Zero Carbon) Amendment Act. Retrieved from <https://www.mfe.govt.nz/climate-change/zero-carbon-amendment-act>
 2 - Agriculture inquiry - Final report. Retrieved from <https://www.iccc.mfe.govt.nz/what-we-do/agriculture/agriculture-inquiry-final-report>

A collaborative, farm-level approach to agricultural emissions

The iCCC recommends that pricing livestock agricultural emissions at farm level would hold several advantages over pricing at processor level, namely by:

- incentivizing farmers to take advantage of all possible opportunities to reduce emissions;
- providing farmers with flexibility regarding what solutions work best on their farms; and
- driving innovation by rewarding farmers who reduce emissions the most.

Consistent with the iCCC’s recommendations, the government determined that 2025 was the earliest feasible date to implement nationwide farm-level pricing, due to the significant scope of policy design required and implementation challenges. To ensure progress towards a workable and effective emissions pricing scheme by 2025, the government and the agriculture sector have agreed to work together with indigenous Māori landowners to develop a joint action plan, based on the Primary Sector Leader Group’s proposal [He Waka Eke Noa: A Primary Sector Climate Change Commitment](#).³

The NZ ETS and agricultural emissions

Both the government and the agriculture sector recognize that the NZ ETS currently manages fewer than three hundred mandatory participants, many of them large companies, not tens of thousands of individual ones.

Considering the relatively small scale and size of New Zealand farmers’ individual operations, the iCCC suggested that an alternative farm-level pricing scheme, such as a levy or rebate scheme, could achieve the same goal, while reducing the cost, complexity, and risk to both farmers and the government.

This does not diminish the importance of the changes on agricultural emissions incorporated into the ETR Bill, which include:

- a) pricing livestock emissions at the farm level, and fertilizer emissions at the manufacturer and importer level, from 1 January 2025;
- b) mandatory reporting of livestock emissions at the farm level from 1 January 2024;
- c) specific milestones towards establishing a farm-level emissions pricing scheme, which will be reviewed in mid-2022 by the independent Climate Change Commission;
- d) a ministerial report back to Parliament by the end of 2022 on the core design features of farm-level pricing; and
- e) a legislative backstop to price livestock emissions at the processor level at any time after 2022, if insufficient progress is made towards farm-level pricing.

Ultimately, the changes in the ETR Bill will ensure a steady legislative pathway for the agriculture sector. They provide certainty for the next five years regarding what steps are needed by both the sector and the government to create an appropriate farm-level pricing mechanism, as well as certainty for a price signal on New Zealand’s largest source of GHG emissions.



This long-term goal of reducing emissions from agriculture is a key aspect of New Zealand’s domestic climate action

HARMONY BETWEEN AGRICULTURAL EMISSIONS POLICY AND THE NZ ETS

Developing an alternative pricing scheme is favored by the agriculture sector and poses some administrative benefits. To date, the exact mechanism for pricing agricultural emissions is yet to be decided, but the design of any alternative scheme cannot occur without consideration of the NZ ETS.

Potential alternative scheme integration with NZ ETS

Originally, the iCCC recommended that any alternative pricing scheme be integrated with the NZ ETS design—specifically the same coordinated decision-making process and rules for setting the NZ ETS cap—and that an alternative rate could be set and updated each year to align with the NZ ETS price.

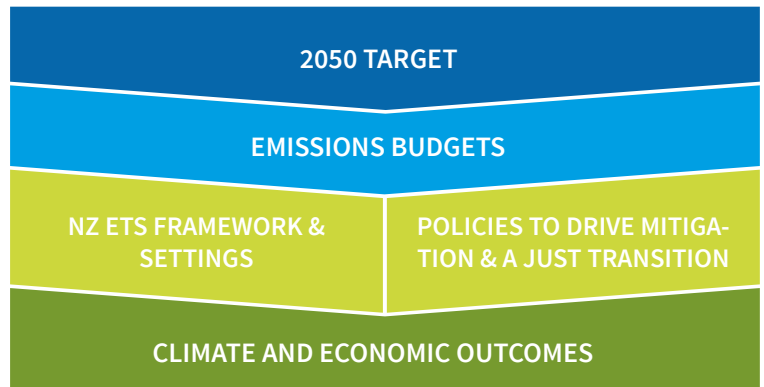
Regardless of whether agricultural emissions are priced in the ETS or an alternative scheme, the emissions budgets recommended by the Climate Change Commission and ultimately decided upon by the government will inform NZ ETS supply settings and agricultural emissions policies, as illustrated in Figure 2.

THE ROAD AHEAD

The 2025 timeframe sets the wheels in motion. Successfully implementing on-farm pricing for agricultural emissions will not be without its challenges.

Empowering the sector, and encouraging buy-in from farmers and growers on the ground, will be central to achieving the desired on-farm behavior changes and innovation. Both the collaborative approach and the proposed legislative changes will contribute to ensuring that the sector has the right tools, information, and incentives to transition to low-emissions food production.

Figure 2: Interaction between the Zero Carbon Bill and the NZ ETS



QUÉBEC

A revitalized approach to 2030

Thomas Duchaine → Québec Ministry of the Environment and the Fight against Climate Change

Québec has a unique energy structure: 99.9% of its electricity is produced from renewable sources and 47% of its total energy consumption comes from renewables.¹ Still, Québec remains a consumer of refined petroleum products and natural gas, accounting respectively for 35% and 14% of the total. Since transportation is the sector with the largest energy consumption, it's also the sector that produces the most GHGs, with 43% of total emissions in 2017. That same year, Québec had the lowest per-capita GHG emissions in Canada's provinces and territories at 9.5 metric tonnes of CO₂ equivalent (tCO₂e) per capita, nearly 50% lower than the average of 19.6 tCO₂e.²

Yet achieving net-negative emissions in the second half of the century to keep global warming well below 2° Celsius and pursue efforts to limit it to 1.5° Celsius, as set out in the Paris Agreement, requires commitment. To this end, Québec has set ambitious GHG reduction targets: 20% below 1990 levels by 2020 and 37.5% by 2030. It's also aiming for a reduction of 80-95% by 2050 as a signatory of the Under 2 MOU. To get there, Québec has developed an integrated approach built on two pillars: a carbon market and a portfolio of complementary policies.

To rally all of society and to propel Québec into the green economy of the 21st century, the government intends to make the fight against climate change a motor for economic development. To that end, it will revitalize its approach, primarily by reforming the governance of the Green Fund, by releasing an Electrification and Climate Change Policy framework and

an Action Plan for 2030 focused on the electrification of the economy, and by integrating new rules into its carbon market that will also provide additional support for decarbonization (see Figure 1). Here is an overview of Québec's current vision, crystallized in Bill 44, which was unveiled in late October 2019 and should underpin a major portion of the government's climate action for the 2021-2030 period.

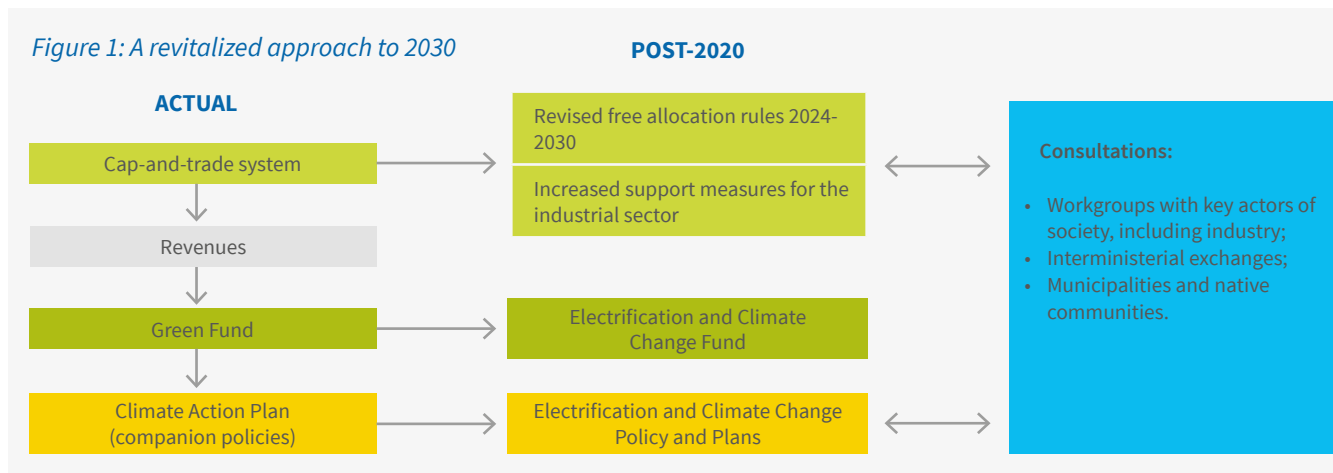
RENEWED MANAGEMENT STRUCTURE AND GREEN FUND

To send a strong signal in terms of the attention the government is paying to climate change, the Minister of the Environment and the Fight against Climate Change would become the government's advisor in all matters related to the issue and would also benefit from increased powers to ensure the coherence of governmental action.

Also, like in the United Kingdom and New Zealand, Québec's government would establish a permanent climate change advisory committee composed primarily of scientists. The committee would be tasked with advising the minister on climate change, with all of its recommendations made public.

Finally, the Green Fund, where all revenues of the carbon market go, would be replaced by the Electrification and Climate Change Fund, whose governance would be entrusted to the Minister.

Figure 1: A revitalized approach to 2030



1 - Whitmore, J. et P.-O. Pineau, 2020. État de l'énergie au Québec 2020, Chaire de gestion du secteur de l'énergie, HEC Montréal, préparé pour Transition énergétique Québec, Montréal, janvier 2020, p.8

2 - Inventaire québécois des émissions de gaz à effet de serre en 2017 et leur évolution depuis 1990, Québec, ministère de l'Environnement et de la Lutte contre les changements climatiques, Direction générale de la réglementation carbone et des données d'émission, décembre 2019, p. 8 et p. 21

THE ELECTRIFICATION OF THE ECONOMY AS A CORNERSTONE, ESPECIALLY TRANSPORTATION

Québec imports almost all of the hydrocarbons it consumes. Electrifying its transportation using locally produced renewable energy would significantly reduce its GHG emissions while also providing health and air quality benefits and considerably improving its trade balance.

Several actions have already been carried out in this sector since the launch of the 2013-2020 Climate Change Action Plan (2013-2020 CCAP), involving, among others, incentives to increase the number of zero-emission vehicles, including a zero-emission vehicles standard, as well as several programs that support intermodality in transport, including maritime, air, and rail transportation as well as energy efficiency or conversion to greener energy in buildings and industry.

With the Electrification and Climate Change Policy setting the course toward 2030 starting this year, the government will continue in this vein by reinforcing measures that, in addition to fostering the electrification of the economy, also focus on energy efficiency and the sustainable management of resources, supporting industries and companies in developing new sectors, creating jobs for the future, strengthening their competitiveness, and adapting to the impacts of climate change.

COMPLEMENTING CARBON MARKET REFORM WITH SUPPORT FOR INDUSTRIAL DECARBONIZATION

The Québec government is continuing to optimize its carbon market. It is now in the pre-consultation stage with industry on adopting new and stricter rules for the free allocation of emission units for the 2024-2030 period. The idea is to increase the speed at which free allocation declines annually and to set aside part of the associated revenues for industry to use for mitigation projects. In parallel, an industrial working group bringing together strategic government departments would be formed to guide and support industry in defining, funding, and implementing further GHG emissions-reduction measures. This reform, once adapted, would therefore decrease free allocation more rapidly while generating revenue for support measures adapted to the diverse realities of the industrial sector in order to facilitate a just transition and improve the sector's competitiveness.

Obviously, asking industry for additional contributions raises a fair number of concerns. In this regard, the Québec government has gone to great lengths to create an environment of trust so that industry can express its views and provide data. The effort has been worthwhile, since the proposals currently on the table have generally been well received.

The Québec government is convinced that the challenge of fighting climate change is also an opportunity to position Québec's economy among the world leaders in the 21st century. Its ambitious targets and the current revitalization of its approach around its carbon market and a comprehensive mix of companion policies are clear signals, not only of conviction, but also of dedication towards coherence in governmental action.



Québec has developed an integrated approach built on two pillars: a carbon market and a portfolio of complementary policies

THE TRANSPORTATION AND CLIMATE INITIATIVE

US states look beyond electricity

Christine Kirby & William Space → Massachusetts Department of Environmental Protection

In December 2019, a group of Northeast and Mid-Atlantic US states and the District of Columbia released a draft memorandum of understanding (MOU) describing a potential regional program to cap and reduce carbon emissions from the combustion of transportation fuels and invest in clean mobility options. The announcement was an important step by states in the region, working together as the Transportation and Climate Initiative (TCI), to reduce transportation emissions.¹ The effort has gained urgency over time, as transportation emissions have not fallen, in contrast to the significant reductions in the region's power sector emissions (see Figure 1).²

Since its formation in 2010, TCI has served as an ongoing forum for participating states to coordinate policy and program development that supports clean transportation. Much of this work has been directed toward policies that target particular sources or technologies, particularly electrification. These work streams are categorized by TCI as addressing clean vehicles and fuels, sustainable communities, freight efficiency, and information and communication technology.

Complementary policies: TCI states already implement programs that would complement a regional cap-and-invest program, including the following:

- Programs that reduce emissions from electricity generation, such as the Regional Greenhouse Gas Initiative cap-and-invest program for electric power plants, renewable energy standards, and energy efficiency investments. These programs complement TCI because they help ensure that electric vehicles will be powered by clean electricity.
- Regulations that mandate the sale of zero-emissions vehicles.
- Programs that provide rebates or tax subsidies to purchasers of electric vehicles.
- Other investments in clean mobility (e.g., transit, “complete streets”).

During 2018 and 2019, the states participating in TCI turned their focus decisively toward consideration of a regional cap-and-invest program for transportation emissions. As a first step, over the course of 2018 TCI states solicited and considered input from stake-

holders. The structure of the stakeholder engagement included facilitated conversations during which participants recorded ideas individually and collectively on worksheets and notepads for subsequent consideration by the states. The sessions were attended by more than 500 stakeholders and more than 100 government officials. According to the summary report, “In all listening sessions, the most frequently offered suggestion was the idea of pricing carbon and using the proceeds to invest in clean transportation options and modernizing our transportation infrastructure and transit systems.” Subsequent stakeholder engagement has confirmed stakeholder interest in this approach and identified equity and environmental justice as key stakeholder concerns.

Drawing on a statement issued in December 2018, the states participating in TCI achieved several milestones during 2019. First, in webinars held in May and August, reference case modeling results were presented, including projections of key variables such as electric vehicle sales. Then, in October, a draft program framework was released, along with updates on public input and modeling. Finally, in December, the draft MOU was released for public comment. A final MOU is planned for release in spring 2020, at which time each state will decide whether to sign the MOU and implement the program.

The draft MOU describes a cap-and-invest program modeled on the successful RGGI program, particularly with regard to flexibility mechanisms including the cost containment reserve, emissions containment reserve, compliance periods, and allowance banking. The MOU also alludes to the potential for the program to include offsets and other design features that could enable linking to other allowance trading programs if desired in the future.

In considering how to regulate emissions from the transportation sector, the states are looking “upstream” in the supply chain and have proposed that suppliers of regulated fuels be required to hold allowances equal to the emissions associated with combustion of the fuels sold into a participating state.

Another key area for stakeholder input is the level of the emissions cap. The states released modeling results for several potential cap levels covering the 2022-2032

1 – The TCI website (<https://www.transportationandclimate.org>) lists TCI participating states, and includes all documents referenced in this article. In this article, “TCI” is used generically to refer to a regional program development effort, not any particular state or group of states.

2 – Note that participating states would regulate the subset of transportation emissions that come from on-road vehicles.

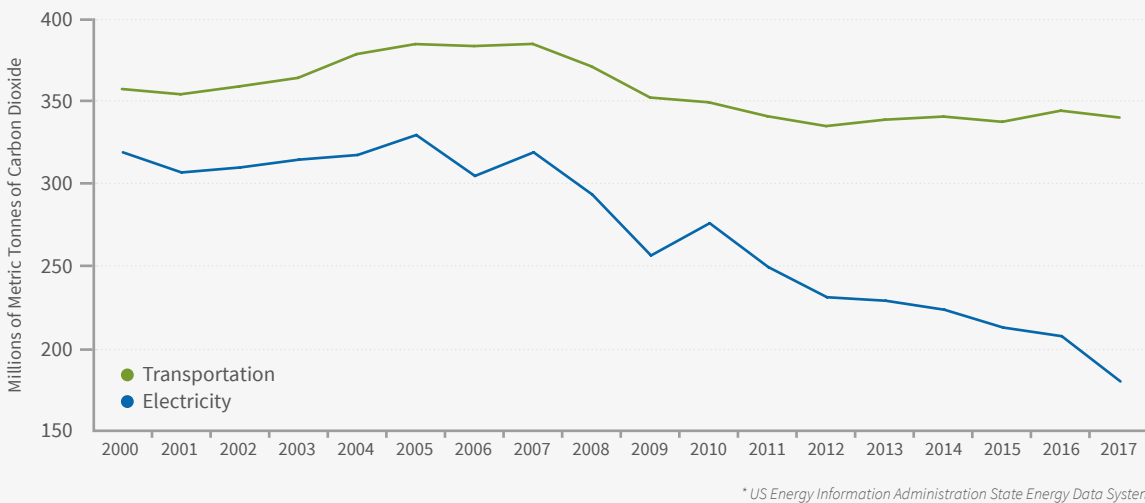


States in the Northeast and Mid-Atlantic regions of the US have long been leaders in ETS design. This experience includes RGGI, but also dates back further to the regional NO_x trading programs

time period. Stakeholders are encouraged to consider the modeling in commenting on potential cap levels. The modeled initial allowance prices of USD 6-22 per metric tonne will also inform discussions of potential cost containment mechanisms.

After the states release a final MOU specifying the key program elements discussed above (i.e., flexibility mechanisms, point of regulation, and program ambition) the participating states will develop a “model rule” covering additional details such as reporting requirements, allowance accounts, and compliance deadlines. Signatory states will then begin to incorporate the requirements into their individual regulations and statutes, and the first compliance period will begin. Consistent with the “cap-and-invest” structure,

Figure 1: Transportation and Electricity Sector Emissions in TCI States*



proceeds from allowance auctions will be invested in clean mobility options, such as vehicle electrification, transit expansion, and pedestrian and bicycle infrastructure. Because they tend to reduce emissions, these investments will help to ensure that significant emissions reductions can be achieved at moderate allowance prices and that program benefits are shared equitably.

to the regional NO_x trading programs that pioneered now-common concepts such as output-based allocation schemes and public benefit set-aside accounts. Now these states are seeking to apply their positive experiences with ETS to the challenges of reducing emissions from the transportation sector.

States in the Northeast and Mid-Atlantic regions of the US have long been leaders in ETS design. This experience includes RGGI, but also dates back further

INFOGRAPHICS

02

*Combining carbon pricing
and companion policies
in carefully crafted
packages will minimize
the cost of reaching
carbon neutrality*

”

FROM SUPRANATIONAL TO LOCAL

Emissions trading systems operate at every level of government

1 Supranational

EU Member States
+ Iceland
+ Liechtenstein
+ Norway

5 Countries

Kazakhstan
Mexico
New Zealand
Republic of Korea
Switzerland

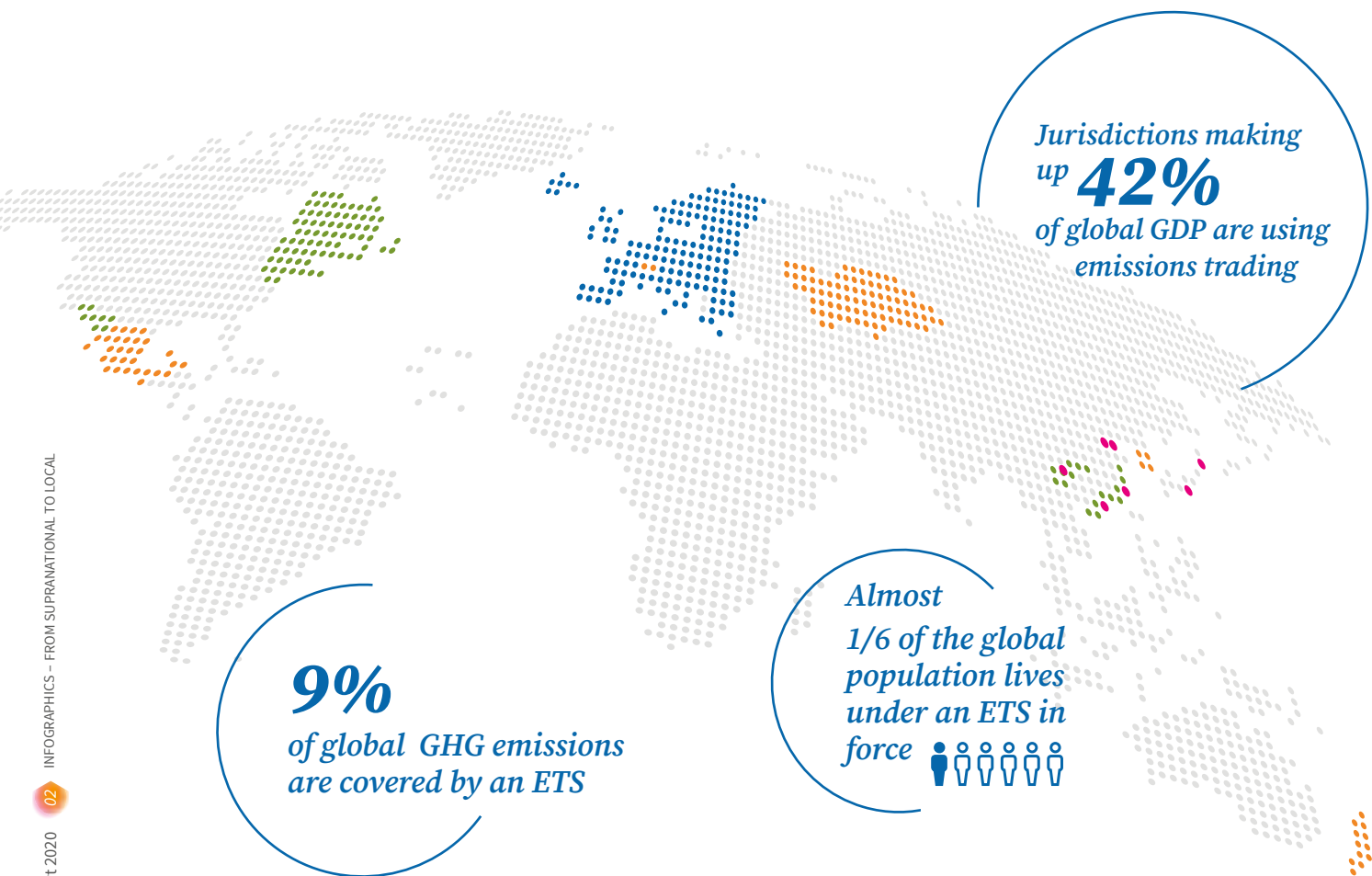
16 Provinces & States

California
Connecticut
Delaware
Fujian
Guangdong
Hubei
Maine
Maryland
Massachusetts

New Hampshire
New Jersey
New York
Nova Scotia
Québec
Rhode Island
Vermont

7 Cities

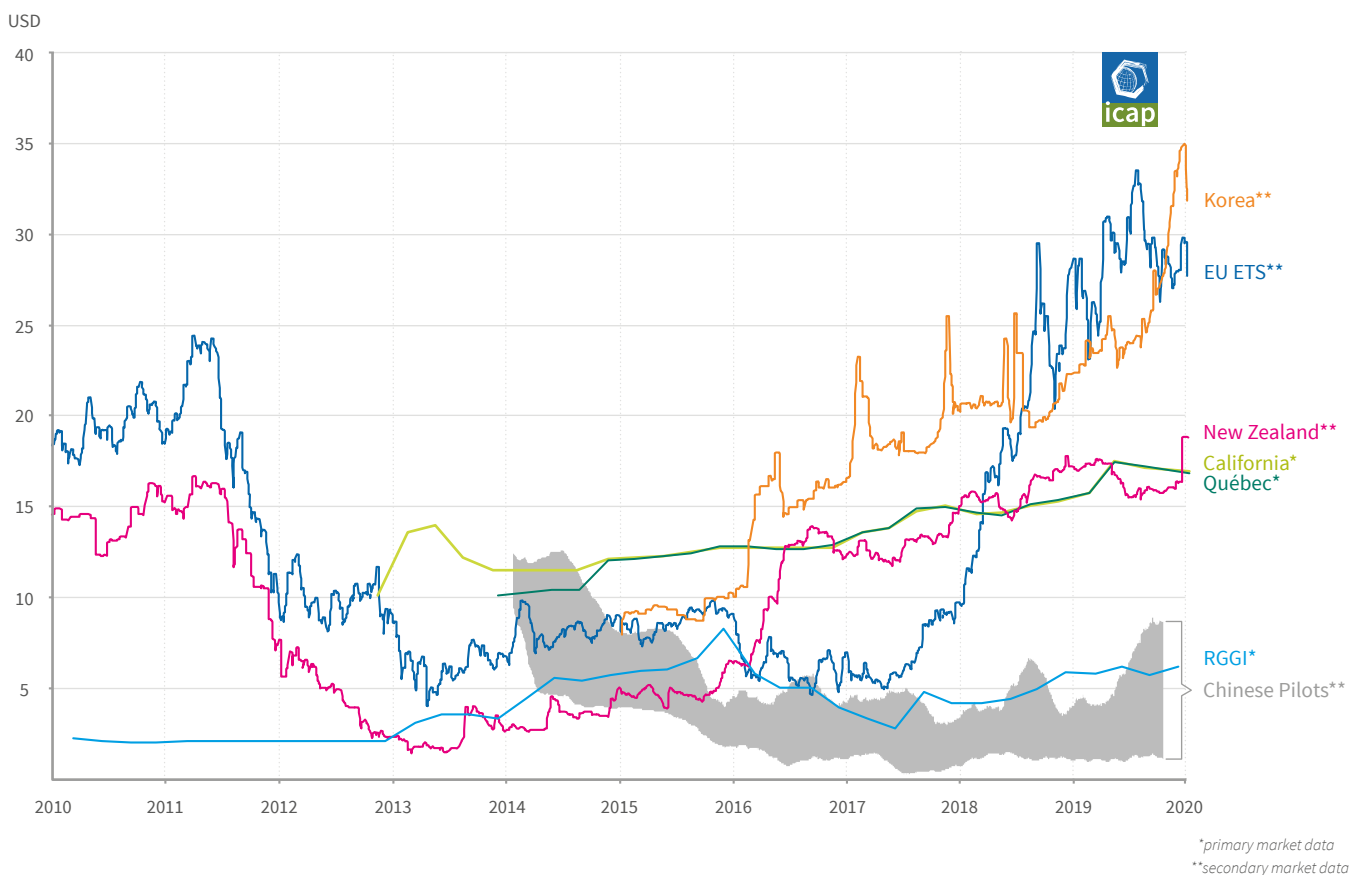
Beijing
Chongqing
Saitama
Shanghai
Shenzhen
Tianjin
Tokyo



ALLOWANCE PRICES

Evolution of primary and secondary market prices in the 2010s

The figure uses data from the ICAP Allowance Price Explorer to visualize price developments during the 2010s in selected ETSs around the world. Sustained trends and short-term volatility can be seen throughout the decade in all systems and were driven by changes in current and expected future scarcity of allowances. In turn, these changes are 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. All data are in USD and are converted using the exchange rate valid on the day. The allowance prices for RGGI, California and Québec are obtained from primary markets while for all other systems secondary market prices are used. For the Chinese pilots the minimum and maximum price data on a given day are used to compute the 90-day moving average which in turn is depicted as the grey shaded region. See the section titled “Notes on Methods and Sources” for additional details.

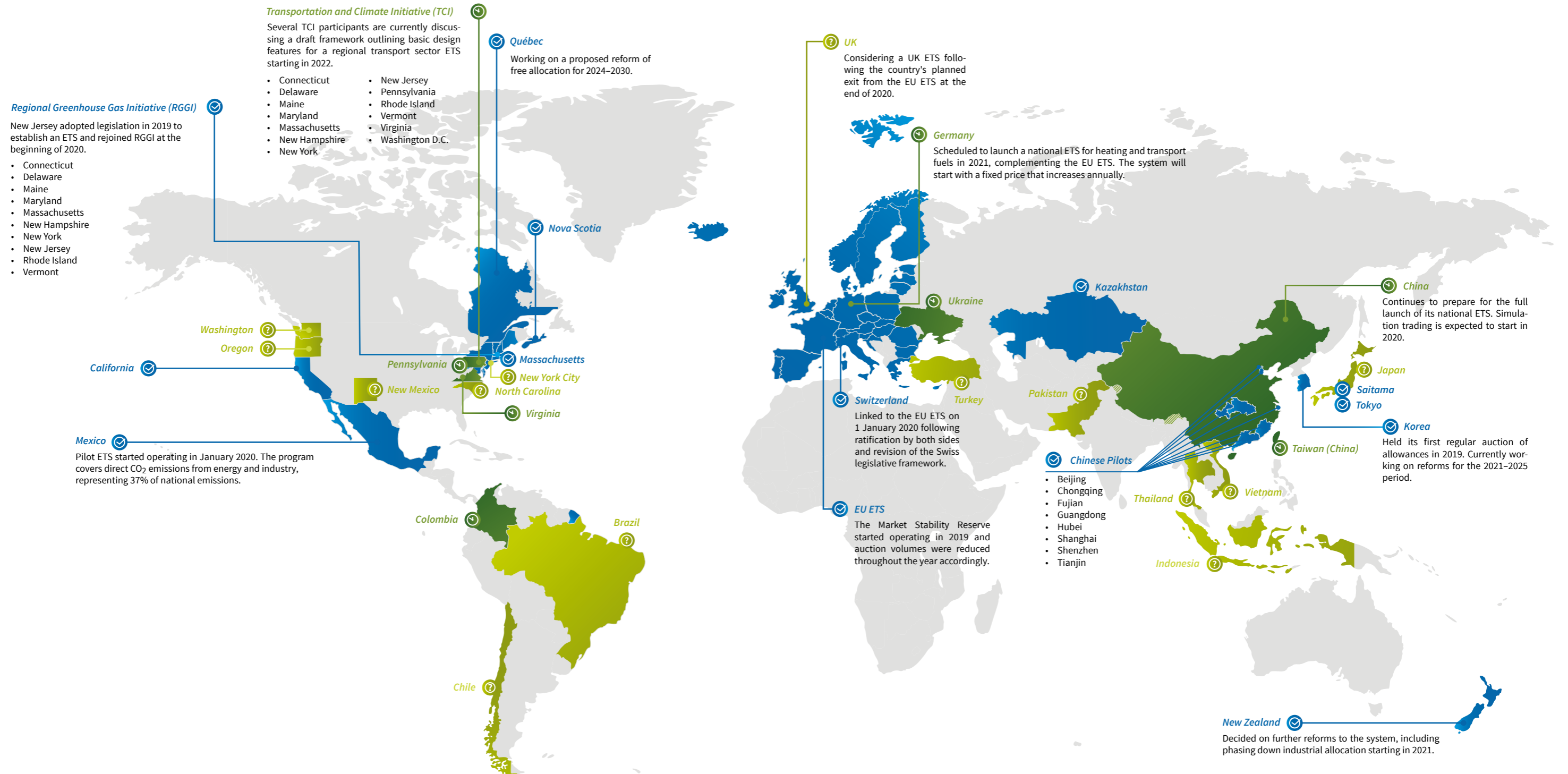


EMISSIONS TRADING WORLDWIDE

The state of play in existing and upcoming systems in 2020

The ICAP ETS world map depicts emissions trading systems currently in force, under development or under consideration. There are now 21 systems covering 29 jurisdictions with an ETS in force. Another nine jurisdictions are putting in place their systems for operation in the next few years, including China, Germany and Colombia. 15 jurisdictions including Chile, Turkey and Pakistan are also considering the role an ETS can play in their climate change policy mix. The number of systems under development and consideration includes Montenegro and the Philippines, respectively, but this is not reflected in the map below as the announcements were made after the editorial cut-off date of this report. If a jurisdiction already has a system in force and is developing or considering an additional system, it is depicted in the map as its system being in force only (i.e. in blue).

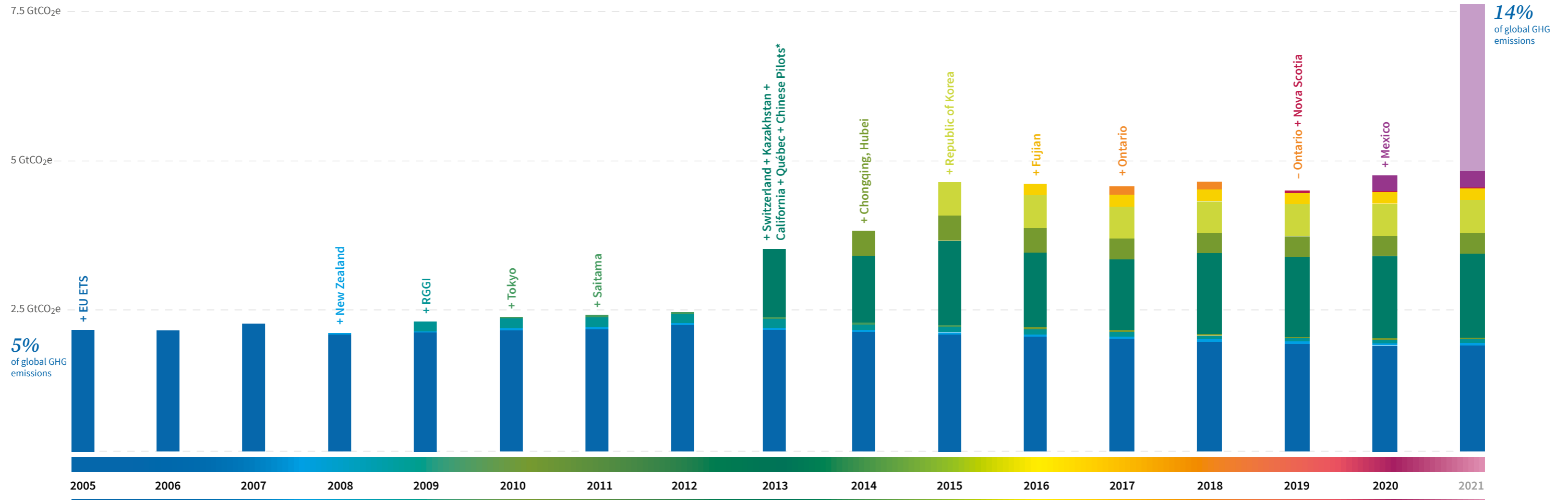
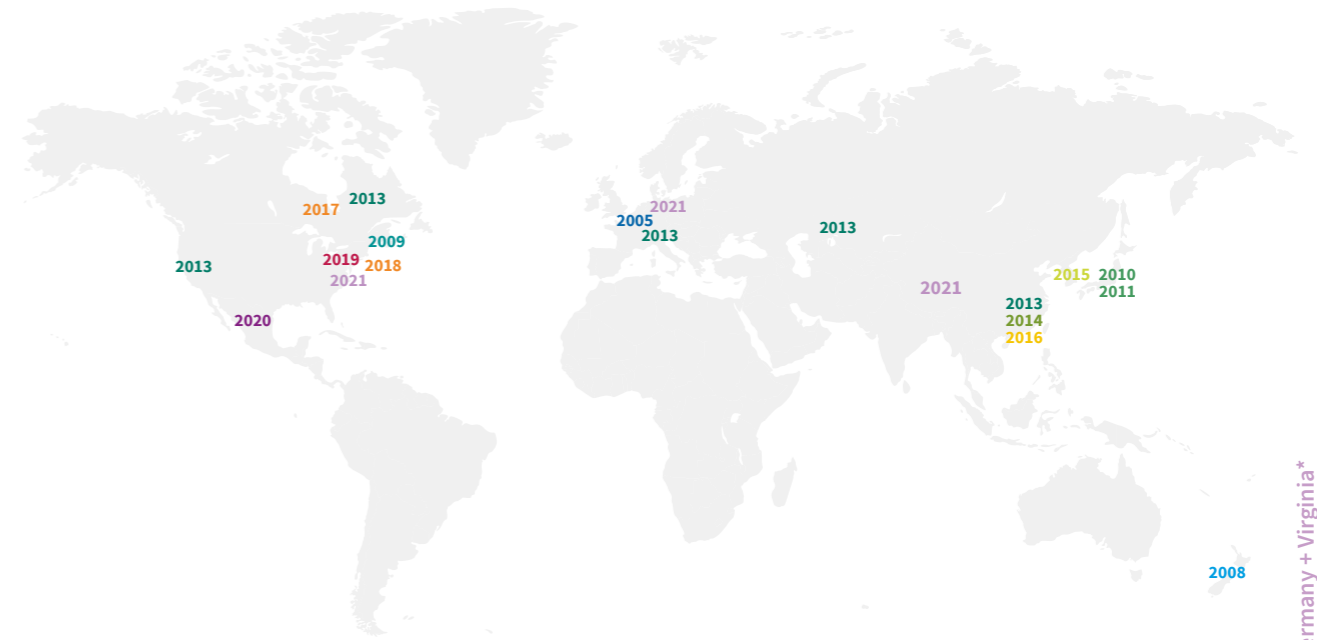
-  In force
-  Under development
-  Under consideration



GLOBAL EXPANSION OF EMISSIONS TRADING

GHG emissions under ETSs

The graphic depicts the worldwide growth of emissions trading over time. Systems are spreading around the world and new additions will soon triple the share of global GHG emissions covered by emissions trading since the launch of the EU ETS in 2005. Changes over time are driven by the addition of new sectors and systems, as well as by the counteracting trend of declining caps in many systems. See the section titled “Notes on Methods and Sources” for additional details.



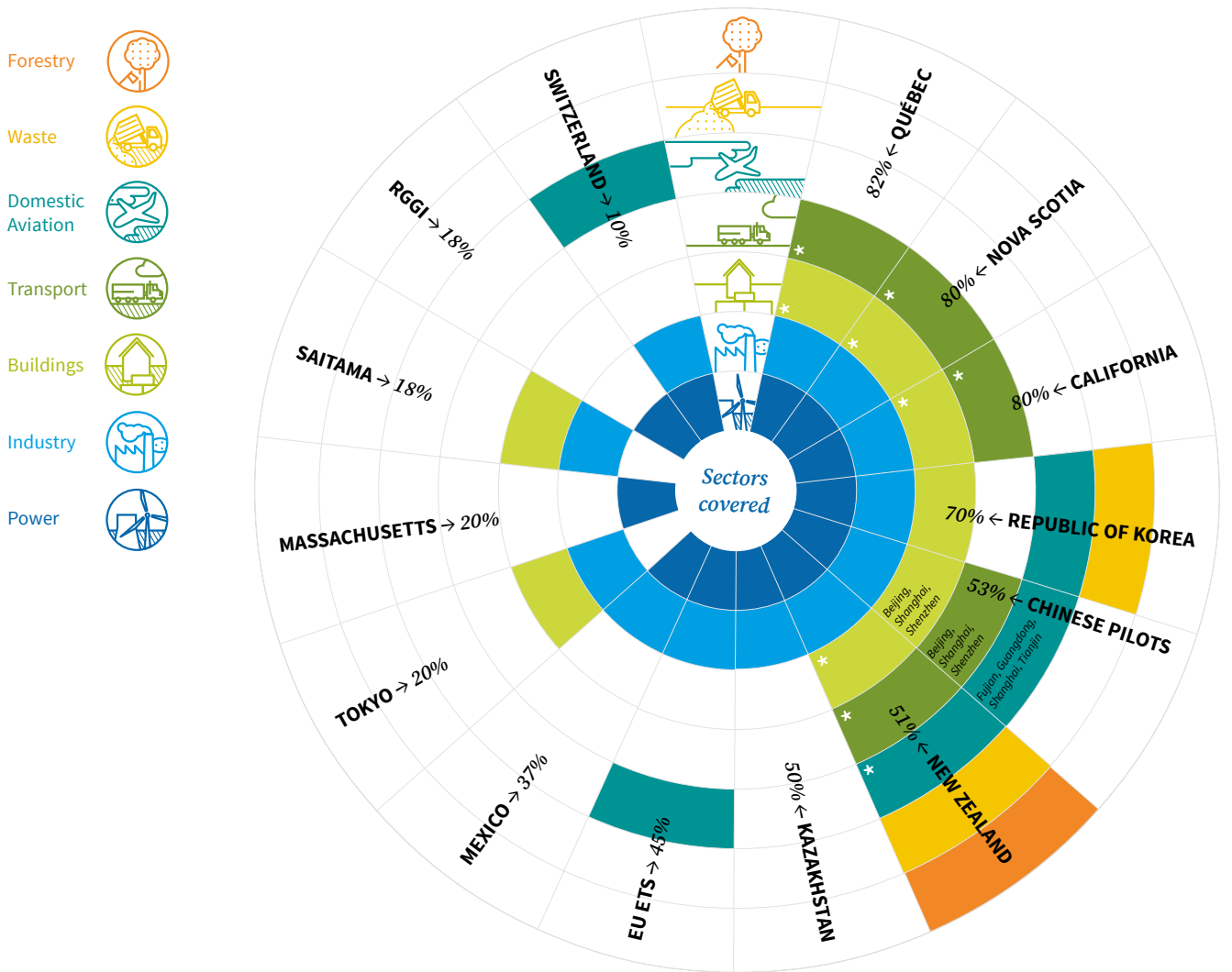
* Beijing, Guangdong, Shanghai, Shenzhen, Tianjin

*Virginia aims to join RGGI by 2021

SECTOR COVERAGE

Sectors covered by emissions trading across systems

The graphic shows sectors (types of economic activity) covered by ETSs in force, as well as whether a sector is regulated upstream. Systems are listed clockwise in decreasing order of share of aggregate emissions covered. Sectors are considered covered by a system when at least some entities in the sector have explicit compliance obligations. Typically, not all of the sector's facilities or GHG emissions are regulated because of limits like inclusion thresholds. In addition, not all sub-sectors, gases, or processes of a given sector may be covered. The jurisdictions' respective factsheets provide more information on system coverage. Only sectors covered by at least one ETS are included in the graphic. See the section titled "Notes on Methods and Sources" for additional details.



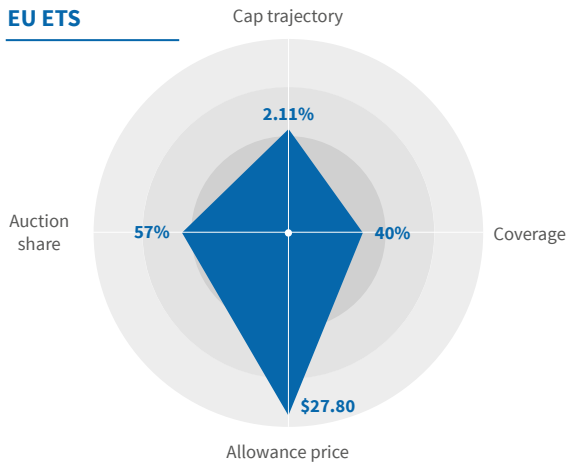
* indicates which sector represents upstream coverage
 → Emissions coverage based on the most recent data available.

DIFFERENT SHAPES OF ETS

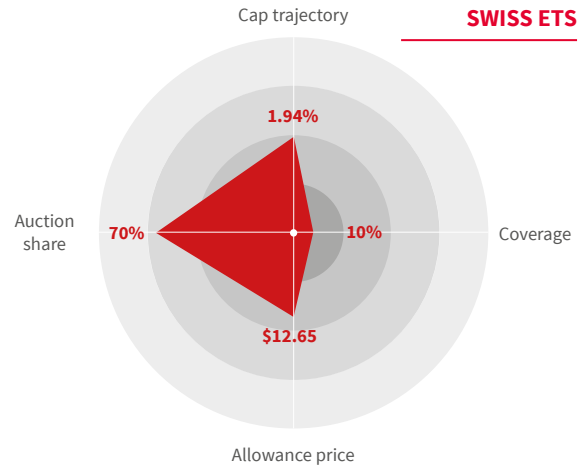
A comparative look at key metrics in six well-established systems

The axes in each graph show four key metrics. **Cap trajectory** indicates the average yearly decline rate in the system's cap between 2017 and 2020. **Coverage** shows the share of the jurisdiction's emissions that falls under the ETS. **Allowance price** is measured in USD per metric ton of CO₂e in each system and averaged over 2019. **Auction share**, expressed as a share of the 2019 cap, denotes the number of allowances that were auctioned and generated revenues for the jurisdiction's government. To aid comparison, the axes share the same scale across graphs.

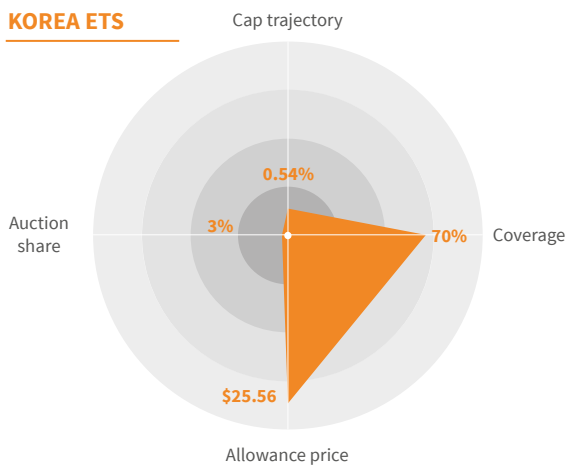
EU ETS



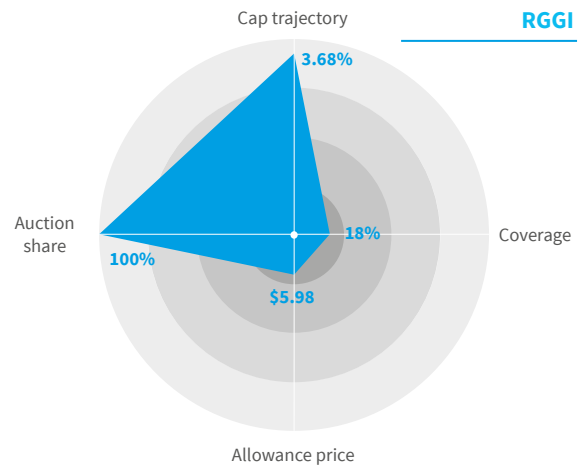
SWISS ETS



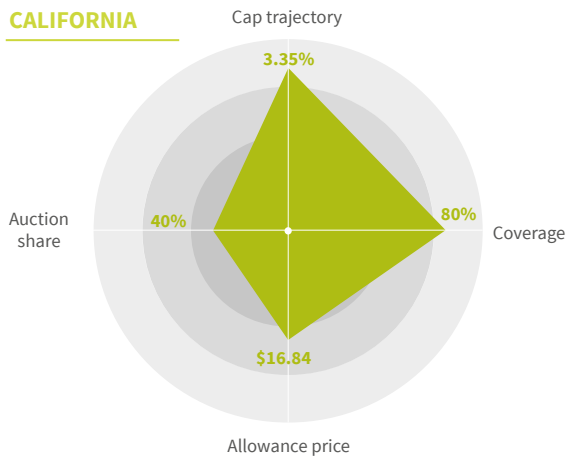
KOREA ETS



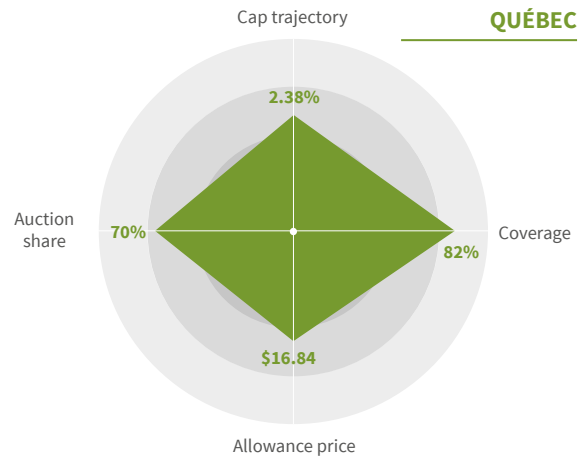
RGGI



CALIFORNIA



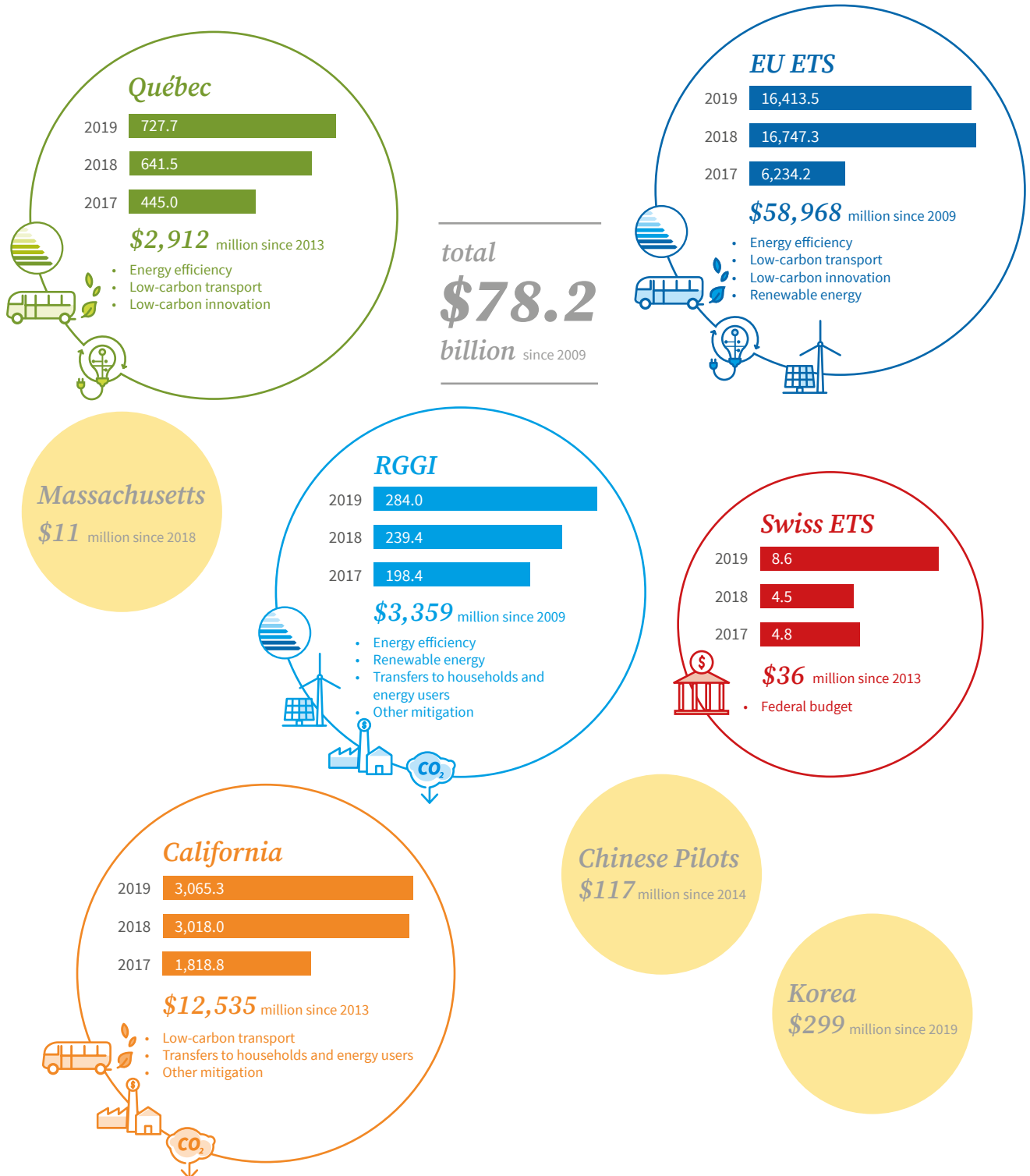
QUÉBEC



AUCTIONING REVENUE

Emissions trading as an additional source of government revenue

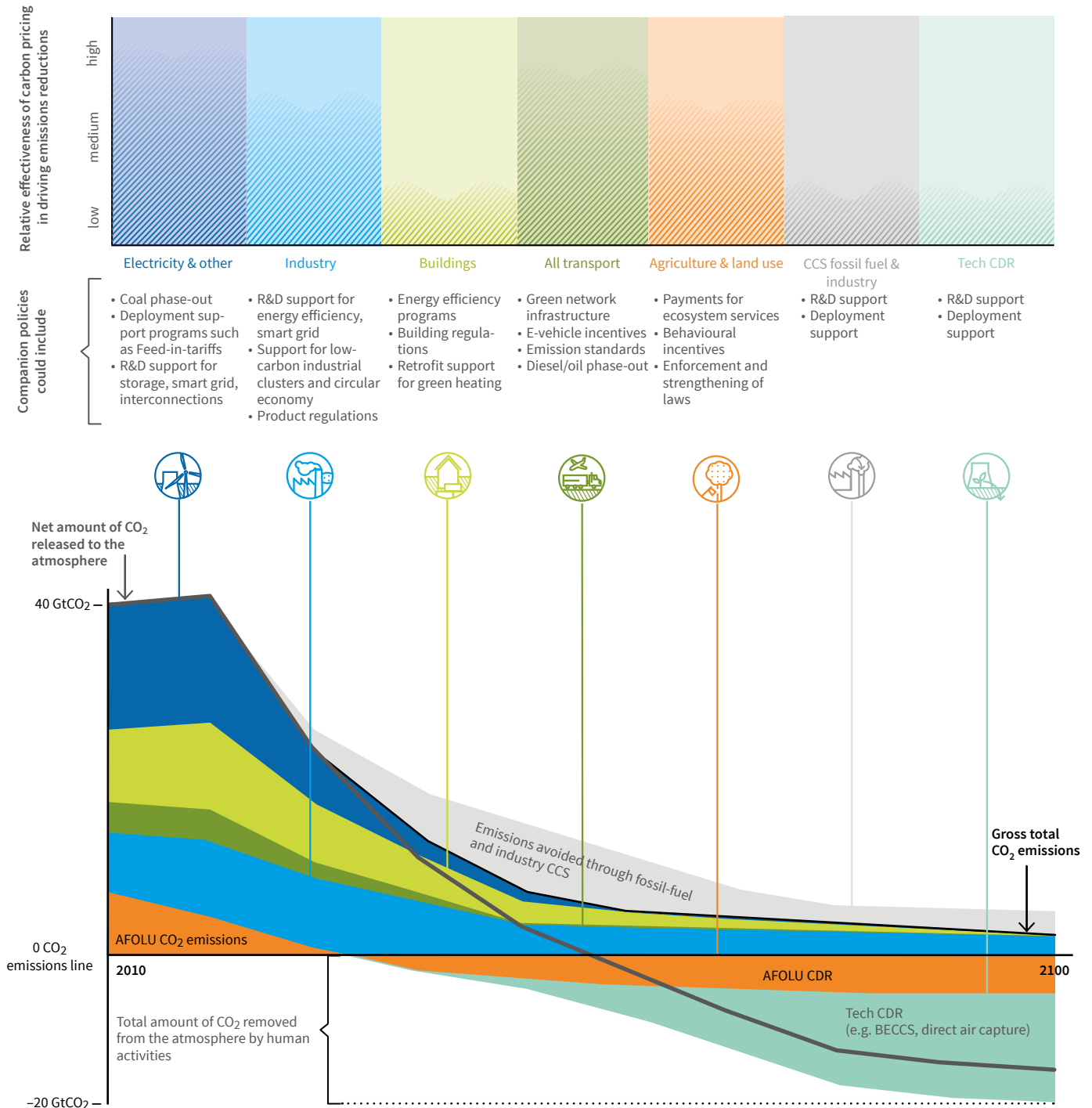
Auctioning allowances can generate public revenue that can be used in different ways depending on the priorities of the jurisdiction. Systems have tended to use auctioning revenue to fund climate programs, including on energy efficiency, low carbon transport and renewable energy. Auction revenue has also been used to support energy intensive industries, as well as to assist disadvantaged and low-income groups. The amount of revenue generated is expressed in USD and depends on the size of the jurisdiction, the ETS coverage, the number of auctioned allowances and the allowance price. By the end of 2019, systems worldwide had raised over \$78 billion cumulatively. See the section titled “Notes on Methods and Sources” for additional details.



THE PATH TO NET ZERO

The role of carbon pricing and companion policies in achieving net zero emissions

The infographic illustrates how carbon pricing and companion policies can be combined to lower the cost of emissions reductions across sectors and to incentivize negative emissions. The bottom panel replicates one of the “four illustrative 1.5°C-consistent pathway archetypes”, namely the middle-of-the-road pathway S2 in Chapter 2 of the IPCC Special Report on Global Warming of 1.5°C (IPCC, 2018). It shows the magnitude of the effort required and the time scales over which it must be applied. The top panel, which focuses on the role of carbon pricing and provides a non-exhaustive list of sector-specific companion policies, combines the conclusions in Burke et al (2019) and the analysis in the IPCC Special Report. It is deliberately stylized because the precise effectiveness of carbon pricing and companion policies is subject to academic debate and depends on the characteristics of the jurisdictions in which they are implemented. See the section titled “Notes on Methods and Sources” for additional details.





FACTSHEETS

03

EUROPE AND CENTRAL ASIA	36
<i>European Union</i>	37
<i>Switzerland</i>	43
<i>Kazakhstan</i>	47
<i>Germany</i>	50
<i>Ukraine</i>	53
<i>Turkey</i>	54
<i>United Kingdom</i>	56
NORTH AMERICA	57
<i>Western Climate Initiative</i>	58
<i>California</i>	59
<i>Québec</i>	64
<i>Canada</i>	68
<i>Nova Scotia</i>	71
<i>Massachusetts</i>	75
<i>Regional Greenhouse Gas Initiative</i>	78
<i>Pennsylvania</i>	82
<i>Transportation and Climate Initiative</i>	83
<i>Virginia</i>	84
<i>New Mexico</i>	86
<i>New York City</i>	87
<i>North Carolina</i>	88
<i>Oregon</i>	89
<i>Washington</i>	90
LATIN AMERICA AND THE CARIBBEAN	91
<i>Mexico</i>	92
<i>Colombia</i>	96
<i>Brazil</i>	97
<i>Chile</i>	98
ASIA-PACIFIC	100
<i>Beijing</i>	101
<i>Chongqing</i>	104
<i>Fujian</i>	107
<i>Guangdong</i>	110
<i>Hubei</i>	113
<i>Shanghai</i>	116
<i>Shenzhen</i>	119
<i>Tianjin</i>	122
<i>New Zealand</i>	124
<i>Republic of Korea</i>	128
<i>Tokyo</i>	132
<i>Saitama</i>	136
<i>China</i>	139
<i>Taiwan, China</i>	142
<i>Indonesia</i>	143
<i>Japan</i>	144
<i>Pakistan</i>	145
<i>Thailand</i>	146
<i>Vietnam</i>	147

EUROPE AND CENTRAL ASIA





EUROPEAN UNION

European Union Emissions Trading System

- ETS in force
- ETS scheduled
- ETS considered

SECTORS:

- POWER
- INDUSTRY
- AVIATION

MEMBERS (2019):
All EU Member States as well as Iceland, Liechtenstein, and Norway

Oldest and largest ETS in force

Became linked to the Swiss ETS in January 2020

CAP 1,816 MtCO ₂ e (2020)	GASES Several Gases	OFFSETS AND CREDITS International offsets until the end of Phase 3 (2013-2020)
ALLOCATION Free allocation (benchmark based) Auctioning	AVERAGE 2019 PRICE¹ EUR 24.84/ tCO ₂ (USD 27.81)	TOTAL REVENUE EUR 50.54 billion (USD 58.97 billion) since beginning of program, EUR 14.64 billion (USD 16.41 billion) collected in 2019

ETS DESCRIPTION

The EU ETS is a cornerstone of the EU's policy to combat climate change and a key tool for cost-effectively reducing GHG emissions from the regulated sectors. The system covers ~45% of the EU's emissions, from the power sector, manufacturing industry, and aviation limited to flights within the European Economic Area. It is the oldest and largest ETS operating worldwide. Introduced in 2005, now approaching the end of the third trading phase, the EU ETS has gone through several reforms. The revision of the system's framework, completed in 2018, will be implemented with the start of the fourth trading phase in January 2021. In January 2020, the EU ETS became linked to the Swiss ETS, the first linking of this kind for both parties.

allocation rules, the Innovation Fund, auctioning, monitoring, reporting, verification and accreditation, and on the Union Registry was adopted in the past year.

On 1 January 2019, the market stability reserve (MSR), the instrument to address the supply-demand imbalance of allowances in the EU ETS and improve its resilience against future shocks, became operational. In 2019, the MSR absorbed around 397 million allowances from auction volumes. From January to August 2020 another 265 million allowances are due to be placed in the reserve.

Following final regulatory changes in the design of the Swiss ETS in late 2019, a link between the Swiss and EU ETS took effect on 1 January 2020, allowing regulated entities in both systems to use allowances from either ETS for compliance.

YEAR IN REVIEW

Following the adoption of the revised ETS Directive setting the cornerstones of the post-2020 policy framework, in 2019, the focus shifted towards implementing the agreed provisions ahead of the next trading phase (2021-2030). New implementing legislation on the carbon leakage list, free

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 4,323.0 MtCO₂e (2017)

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

- BY 2020:** 20% below 1990 GHG levels
- BY 2030:** At least 40% below 1990 GHG levels; emissions regulated by the EU ETS 43% below 2005 levels
- BY 2050:** EU leaders have committed to reaching climate neutrality by mid-century

¹ - Average secondary market spot price from EEX exchange.

ETS Size

GHGs COVERED

CO₂, N₂O, PFCs

SECTORS AND THRESHOLDS

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

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

PHASE THREE (2013-2020): Carbon capture and storage installations, production of petrochemicals, ammonia, nonferrous and ferrous metals, gypsum, aluminum, as well as nitric, adipic, and glyoxylic acid (various thresholds) were included.

PHASE FOUR (2021-2030): Based on the current legislation, no changes to the scope have been agreed on for Phase 4.

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

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

CAPPED EMISSIONS
1,816 MtCO₂e

~45%
of EU
emissions

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

10,744 power plants and manufacturing installations.

CAP

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

PHASE THREE (2013-2020): Single EU-wide cap for stationary sources: 2,084 MtCO₂e in 2013, which is annually reduced by a constant linear reduction factor (currently 1.74% or ~38.3 million allowances). This amounts to a cap of 1,855 MtCO₂e in 2019.

Aviation Sector Cap: The aviation sector cap was originally set at 210 MtCO₂e/year. This cap was meant to reflect the initial inclusion of all flights from, to, and within the EEA in the EU ETS. However, following the “stop the clock” temporary suspension until the end of 2016, the number of aviation allowances put into circulation in 2013-2016 was reduced to 38 million allowances annually and set considerably below verified intra-EEA aviation emissions. In 2017, the intra-EEA scope for aviation was prolonged until 2023. The adjusted annual aviation cap still applies.

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

Phases & Allocation

TRADING PERIODS

PHASE ONE: 3 years (2005-2007)

PHASE TWO: 5 years (2008-2012)

PHASE THREE: 8 years (2013-2020)

PHASE FOUR: 10 years (2021-2030)

ALLOCATION

PHASE ONE (2005-2007): Allocation established through the member state national allocation plans. Allocation through grandfathering. Some member states used auctioning and some used benchmark-based allocation.

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

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

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

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

Auctioning: Authorities have the right to cancel auctions when the highest bidding price is significantly below the prevailing secondary market price to avoid market distortion. In such a situation, allowances are transferred to subsequent auctions scheduled at the same trading platform.

Power Sector: 100% auctioning with an optional derogation for the modernization of the electricity sector in certain Member States. Those Member States whose GDP per capita was below 60% of the EU average in 2013 may continue to make use of this optional free allocation (through benchmarking) in Phase Four. Some Member States chose to monetize these allowances or to use these allowances to boost their share of the Modernization Fund.

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

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

Carbon leakage risk is 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 is determined by the formula $[\text{Carbon price} \times (\text{direct emissions} \times \text{auctioning factor} + \text{electricity consumption} \times \text{electricity emission factor})] / \text{GVA}$

Trade intensity is determined by the formula $(\text{imports} + \text{exports}) / (\text{imports} + \text{production})$

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

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

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

PHASE FOUR (2021-2030): Benchmark values will be updated twice to reflect technological progress in different sectors. The first set of benchmark values will apply to the period 2021-2025; the second set of values will cover the period from 2026 to 2030. Member states are required to submit lists of incumbent installations and updated emissions data by 30 September 2019 and 30 September 2024. Based on this data, the European Commission will update Phase Three benchmarks.

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

Carbon leakage rules:

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

- Carbon leakage risk will be assessed according to the following criteria:
 - Trade Intensity* Emissions Intensity > 0.2
 - Trade intensity* Emissions Intensity > 0.15 < 0.2; qualitative assessment will follow based on abatement potential, market characteristics, and profit margins.
- Emissions intensity will be determined by: [direct emissions + (electricity consumption × electricity emission factor)]/GVA

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

Out of the allowances to be auctioned in Phase Four, 90% will be distributed to member states based on their share of verified emissions, with 10% distributed among the lower-income EU Member States.

Flexibility

BANKING AND BORROWING

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

OFFSETS AND CREDITS

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

PHASE TWO (2008-2012):

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

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

PHASE THREE (2013-2020):

Qualitative Limits: Newly generated (post-2012) international credits may only come from projects in least developed countries. Credits from CDM and JI projects from other countries are eligible only if registered and implemented before 31 December 2012. Projects from industrial gas credits (projects involving the destruction of HFC-23 and N₂O) are excluded regardless of the host country. Credits issued for emission reductions that occurred in the first commitment period of the Kyoto Protocol were no longer accepted after 31 March 2015.

Quantitative Limits: The total use of credits for Phase Two and Phase Three may amount up to 50% of the overall reduction under the EU ETS in that period (~1.6 Gt CO₂e).

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

MARKET STABILITY PROVISIONS

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

Thresholds: The European Commission publishes the total numbers of allowances in circulation (TNAC) by 15 May. Allowances will be added to the reserve if TNAC is higher than 833 million. Allowances will be reinjected into the market if the number of allowances in circulation falls below 400 million.

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

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

Between 1 January 2019 and 1 September 2020, a total of 662 million allowances will have been placed in the reserve.

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

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

Compliance

COMPLIANCE PERIOD

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

MRV

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

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

MRV FRAMEWORK: Since Phase Three, the MRV framework for the EU ETS has been further harmonized. European Commission regulations now apply for emissions monitoring and reporting, as well as verification and accreditation of

verifiers. A monitoring plan is required for every installation and aircraft operator (approved by a competent authority). In preparation for Phase Four, MRV procedures are currently under review.

ENFORCEMENT

Regulated entities must pay an excess emissions penalty of EUR 100/tCO₂ (USD 112/tCO₂) for each tonne of CO₂ emitted for which no allowance has been surrendered, next to buying and surrendering the equivalent amount of allowances. The name of the noncompliant operator is also made public. Member states may enforce different penalties for other forms of noncompliance.

Linking

LINKS WITH OTHER SYSTEMS

Following final regulatory changes in the design of the Swiss ETS, a link between the Swiss ETS and EU ETS took effect on 1 January 2020.

The link caps a 10-year process of negotiations and agreement on regulatory alignment. Formal negotiations began in December 2010, culminating in the conclusion of a linking

agreement in late 2017.² Both sides announced on 12 December 2019 that the link would become operational in January 2020, enabling covered entities in both systems to use allowances from either ETS for compliance.

Other Information

INSTITUTIONS INVOLVED

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

EVALUATION/ETS REVIEW

The European Commission publishes annual reports on the functioning of the European carbon market ([2019 report](#) can be accessed through the link in the footnote).³

Two major EU ETS reviews—before Phase Three and before Phase Four—have been conducted to date, introducing changes to the system's operational framework. The direc-

tive establishing the EU ETS stipulates that the system be kept under review in light of the implementation of the Paris Agreement and the development of carbon markets in other major economies.

USE OF REVENUES

In the EU ETS, revenues from the auctioning of allowances accrue to Member States. At least 50% of revenues should be used for climate- and energy-related purposes. Member States are obliged to inform the European Commission about how they use the revenues. In 2018, on average Member States spent ~70% of their revenues on domestic and international climate-related purposes.

² – Agreement between the European Union and the Swiss Confederation on the linking of their greenhouse gas emissions trading systems, OJ L 322, 12 December 2017, p. 3.

PHASE THREE (2013-2020): 300 million allowances were reserved for auction to fund demonstration of environmentally safe carbon capture and storage and innovative renewable energy technologies through the NER300.

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

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

Modernization Fund: Supporting investments in modernizing energy systems and improving energy efficiency in 10 lower-income Member States, including investments to support a socially just transition to a low-carbon economy (e.g., upskilling/reskilling of affected workers).

IMPLEMENTING LEGISLATION

[Directive 2003/87/EC](#) of the European Parliament and of the Council establishing a scheme for GHG emission allowance trading within the Community and amending Council Directive 96/61/EC.⁴

[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).⁵

[Consolidated Auctioning Regulation](#) (25 February 2014): Commission Regulation [EU No 176/2014](#) amending Regulation (EU) No 1031/2010 in particular to determine the volumes of GHG emission allowances to be auctioned in 2013-2020 (26 February 2014).^{6,7}

All other legislation and documentation can be found [in the footnote below](#).⁸

3 – [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52019DC0557R\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52019DC0557R(01))

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

5 – <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02015D1814-20180408>

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

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

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



SWITZERLAND

Switzerland Emissions Trading System

- ETS in force
- ETS scheduled
- ETS considered

SECTORS:

- POWER¹
- INDUSTRY
- AVIATION^{1,2}

Linked with the EU ETS in January 2020 and expanded coverage to domestic aviation

Swiss and EEA entities can participate in both EU ETS and Swiss ETS auctions

CAP 4.9 MtCO ₂ e (2019, industry only)	GASES Several Gases	OFFSETS AND CREDITS International
ALLOCATION Free allocation (benchmarking) Auctioning	AVERAGE 2019 PRICE³ CHF 12.65/ tCO ₂ (USD 12.78)	TOTAL REVENUE CHF 34.76 million (USD 36 million) since beginning of program, CHF 8.6 million (USD 8.6 million) collected in 2019

ETS DESCRIPTION

The Switzerland (Swiss) ETS started in 2008 with a five-year voluntary phase as an alternative option to the CO₂ levy on fossil fuels. Revised regulations entered into force in January 2013. The system subsequently became mandatory for large, energy-intensive entities, while medium-sized entities may join voluntarily. The Swiss ETS linked with the EU ETS on 1 January 2020 and expanded sector coverage to Swiss domestic aviation (including flights to the EEA) and fossil-thermal power plants. The ETS furthermore applies to industrial entities, largely comprising companies from the cement, chemicals, pharmaceuticals, paper, refinery, and steel sectors. It covered about 10% of the country's total GHG emissions in 2019. In the 2013-2020 mandatory phase, participants in the ETS are exempt from the CO₂ levy.

ment by the EU and Switzerland was announced on early December 2019 and followed revisions to the 'Swiss CO₂ Act' and the 'CO₂ Ordinance' that were required for the Swiss ETS to be adapted to the EU ETS legislative framework.

In March 2019 Swiss Parliament approved legal changes to the 'CO₂ Act,' the core framework of Swiss climate legislation. In November 2019, the Federal Council made the necessary amendments to the 'CO₂ Ordinance'—which specifies regulations and implementation—expanding ETS coverage to civil aviation and fossil-thermal power plants. With the linking agreement having taken effect, covered entities in the Swiss ETS will be able to use allowances from the EU ETS for compliance, and vice versa. The two systems will run separate auctions.

YEAR IN REVIEW

Capping a 10-year process of negotiations and regulatory alignment, the linking agreement between the Swiss and EU ETSs took effect on 1 January 2020. Ratification of the agree-

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 47.2 MtCO₂e (2017)⁴

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

- BY 2020:** At least 20% reduction from 1990 GHG levels (unconditional, domestic target)
- BY 2025:** 35% reduction from 1990 GHG levels (NDC)
- BY 2030:** 50% reduction from 1990 GHG levels (NDC)
- BY 2050:** Net-zero GHG emissions (aspirational)

1 - From 1 January 2020

2 - Domestic and outbound flights to the EEA - From 1 January 2020

3 - Average auction price

4 - Under the second commitment period of the Kyoto Protocol, Switzerland takes indirect CO₂ emissions into account. In 2017, these amounted 0.09 MtCO₂.

ETS Size

GHGs COVERED

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

(In principle, all these gases are covered in accordance with the 'CO₂ Ordinance.' In practice, monitoring is required only for CO₂, N₂O, and PFCs)

SECTORS AND THRESHOLDS

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

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

POSSIBLE VOLUNTARY OPT-IN: Industries—listed under Annex 7 of the revised 'CO₂ Ordinance' (21 activities)—with a total rated thermal input of ≥10MW. A company that fulfils the participation conditions must submit the application no later than six months from the date of fulfilment.

POSSIBLE OPT-OUT: Industries with a total rated thermal input of >20MW, but yearly emissions <25,000 tCO₂e/year in each of the past three years. Should their future emissions rise above the threshold during at least one year, they must start participating in the ETS the following year and cannot opt out anymore for the remainder of the compliance period. New entrants can apply for an opt-out with immediate effect if they can credibly report their emissions to be below 25,000 tCO₂e/year.

CAPPED EMISSIONS

4.9 MtCO₂e



AVIATION: Coverage of civil aviation (domestic flights within Switzerland and flights from Switzerland to member states of the EEA) is a requirement of the linking agreement between Switzerland and the EU.

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

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

53 (2019, only industrial installations)

CAP

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

MANDATORY PHASE (2013-2020): Overall cap of 5.63 MtCO₂e (2013), to be reduced annually by a constant linear reduction factor (currently 1.74% of 2010 emissions), to 4.9 MtCO₂e in 2020.

Aviation Sector Cap: 1.3 MtCO₂ (2020)

Phases & Allocation

TRADING PERIODS

VOLUNTARY PHASE: 2008-2012

MANDATORY PHASE: 2013-2020

ALLOCATION

VOLUNTARY PHASE (2008-2012):

Free Allocation: Each participant was granted free allocation of allowances covering emissions up to their own entity-specific emissions target.

MANDATORY PHASE (2013-2020):

Free Allocation: Free allocation is based on industry benchmarks using a similar methodology to the EU ETS. Free allo-

cation for sectors not exposed to the risk of carbon leakage will be phased out gradually. In 2013, such entities received 80% free allocation, whereas in 2020 the share of free allocation is reduced to 30%.

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

Free allocation for aircraft operators is 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 are not allocated for free are auctioned. Auctions take place two or three times a year, depending on available auction volumes. As of 1 January 2020, auctions are open to entities covered by the Swiss ETS and the EU ETS and noncompliance entities are allowed to place bids in the EU ETS.

In line with EU ETS legislation, the Federal Office of the Environment has the authority to cancel the auction results if the clearing price is significantly below the prevailing secondary market price. In such a situation, allowances are transferred to subsequent auctions scheduled at the same trading platform.

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

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

Flexibility

BANKING AND BORROWING

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

OFFSETS AND CREDIT

QUALITATIVE LIMIT: Only international offsets are allowed. Exclusion criteria are listed in Annex 2 of the revised 'CO₂ Ordinance.' Most categories of credits from CDM projects in least developed countries are allowed. Credits from CDM and JI projects from other countries are eligible only if registered and implemented before 31 December 2012.

QUANTITATIVE LIMIT: Industries that already participated in the voluntary phase (2008-2012): for 2013-2020, the maximum amount of offsets allowed into the scheme equals

11% of five times the average emissions allowances allocated in the voluntary phase (2008-2012) minus offset credits used in that same time period.

Industries entering the Swiss ETS in the mandatory phase and newly covered emission sources (2013-2020): 4.5% of their actual emissions in 2013-2020. For aircraft operators, the quantitative limit is 1.5% of their verified CO₂ emissions in 2020.

MARKET STABILITY PROVISIONS

As of 1 January 2020, the Swiss legislation foresees the possibility to reduce auction volumes where there is a significant increase of allowances on the market for economic reasons. In this case, unauctioned allowances will lose their validity. The Swiss ETS will not adopt the EU ETS Market Stability Reserve (see EU ETS factsheet).

Compliance

COMPLIANCE PERIOD

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

MRV

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

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

VERIFICATION: The Federal Office for the Environment may order third-party verification of the monitoring reports from installations. Aircraft operators need to have their monitoring reports verified by an accredited third-party verifier.

ENFORCEMENT

The penalty for failing to surrender sufficient allowances is set at CHF 125/tCO₂ (USD 124.23/tCO₂). In addition to the fine, entities must surrender the missing allowances and/or international credits in the following year.

Linking

LINKS WITH OTHER SYSTEMS

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

Other information

INSTITUTIONS INVOLVED

Federal Office for the Environment

EVALUATION/ETS REVIEW

The 'Federal Act on the Reduction of CO₂ Emissions,' which contains the main legislation on the Swiss ETS, is in the process of being reviewed and revised for the period of 2021-2030. Implications for the design of the ETS are possible.

USE OF REVENUES

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

IMPLEMENTING LEGISLATION

[Federal Act on the Reduction of CO₂ Emissions \(CO₂ Act\)⁵](#)
[Partial revision of the Ordinance on the Reduction of CO₂ Emissions—Explanatory report \(CO₂ Ordinance\)⁶](#)
[Ordinance on the Reduction of CO₂ Emissions \(CO₂ Ordinance\)⁷](#)

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

6 – <https://www.news.admin.ch/newsd/message/attachments/59070.pdf>

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



KAZAKHSTAN

Kazakhstan Emissions Trading Scheme

- ETS in force**
- ETS under development**
- ETS under consideration**

CAP 162.0 MtCO ₂ (2020)	GASES CO ₂ only	OFFSETS AND CREDITS domestic
ALLOCATION Free allocation (grandparenting and benchmarking)	AVERAGE 2019 PRICE 431 KZT / tCO ₂ (USD 1.14)	

SECTORS:

- POWER**
- INDUSTRY**

ETS DESCRIPTION

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

The current 'National Allocation Plan' runs through 2018-2020 with a cap of 485.9 MtCO₂ (162 MtCO₂ on annual average), with 225 participating installations belonging to 129 operators.

YEAR IN REVIEW

The end of 2019 saw the first exchange of allowances since the KAZ ETS restarted operation in 2018. Based on December 2019 trade results from the Caspian Commodity Exchange JSC, the average weighted price was at the level of 431.79 tenge (USD 1.14) per tonne of CO₂.

Introduced benchmarking

First exchange of allowances since system restart

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) **353.2 MtCO₂e (2017)**

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

- BY 2020:** 5% reduction from 1990 GHG levels
- BY 2030:** 15% (unconditional) to 25% (conditional) reduction from 1990 GHG levels (NDC submission)
- BY 2050:** 40% CO₂ emission reduction in power sector from 2012 levels (Concept of Transition to Green Economy, 2013)

ETS Size

GHGs COVERED

CO₂

CAPPED EMISSIONS
162.0 MtCO₂



SECTORS & THRESHOLDS

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

PHASE TWO (2014-2015): Same as Phase One. (2016-2017: system suspended)

PHASE THREE (2018-2020): Power sector and centralized heating, Extractive industries and manufacturing: oil and gas mining, metallurgy, chemical and processing industry (production of building materials: cement, lime, gypsum, and brick).

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

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

PHASE 3 (2018-2020): 129 companies (225 installations)

CAP

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

PHASE TWO (2014-2015): 2014: 154.9 MtCO₂ (+ a reserve of 18 MtCO₂); 2015: 152.8 MtCO₂ (+ a reserve of 20.5 MtCO₂). This represented reduction targets of 0% and 1.5% respectively, compared to the average CO₂ emissions of capped entities in 2011-2012. (2016-2017: system suspended)

PHASE THREE (2018-2020): 485.9 MtCO₂ (+ a reserve of 35.27 MtCO₂). The cap is set at a 5% reduction by 2020 from 1990 levels. The cap is allocated for the overall compliance period of 2018-2020; there is no yearly cap.

Phases & Allocation

TRADING PERIODS

PHASE ONE: 1 year (2013)

PHASE TWO: 2 years (2014-2015)

PHASE THREE: 3 years (2018-2020)
(2016-2017: System suspended)

ALLOCATION

PHASE ONE (2013):

Free allocation: grandparenting. Based on emissions data from 2010.

PHASE TWO (2014-2015):

Free allocation: grandparenting (0% and 1.5% below 2011/2012 average emissions), with a reserve of 18 MtCO₂ in 2014 and 20.5 MtCO₂ in 2015. (2016-2017: system suspended)

PHASE THREE (2018-2020):

Free allocation: grandparenting and benchmarking. Allocation based on grandparenting or product-based benchmarking by each company's own choice. A reserve contains 35.27 million allowances to accommodate for new entrants, new stationary emission sources, and changes in output in case of the choice of benchmarking.

Flexibility

BANKING AND BORROWING

Banking is allowed within one trading period (i.e., within 2018-2020).

Banking between trading periods is not possible.

OFFSETS AND CREDITS

PHASE ONE (2013): The system allowed domestic offsets.

PHASE TWO (2014-2015): Same as Phase One.

PHASE THREE (2018-2020): Same as Phase One.

Qualitative Limits: Domestic offsets.

Quantitative Limits: None.

Compliance

COMPLIANCE PERIOD

One year

MRV

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

Annual reporting also is required for operators of installations with emissions between 10,000 tCO₂/year and 20,000 tCO₂/year (so-called “subjects to administration”), even

though these operators are not required to participate in the ETS or to verify annual emission reports. Aside from CO₂, reporting also is required for CH₄, N₂O, and PFCs emissions.

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

FRAMEWORK: Environmental Code of the Republic of Kazakhstan.

Other Information

INSTITUTIONS INVOLVED

Ministry of Energy

Ministry of Ecology, Geology and Natural Resources

JSC Zhasyl Damu, a state-owned joint stock company

IMPLEMENTING LEGISLATION/REGULATION

Environmental Code of the Republic of Kazakhstan¹

National GHG Emission Quota Allocation Plan for 2018-2020²

Rules for the allocation of quotas for GHG emissions and formation of reserves of the established number and volume of quotas³

Rules of trading greenhouse gas emission quota and carbon units⁴

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

2 – <http://zan.gov.kz/client/#!/doc/117046/rus>

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

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

GERMANY

German National Emissions Trading System



Germany is scheduled to launch a national ETS for heating and transport fuels in 2021. This measure complements the EU ETS and forms part of the 'Climate Action Programme 2030,' a package of measures adopted by the German Federal Cabinet to reach Germany's 2030 climate targets and aim for climate neutrality by 2050. Since GHG emissions from Germany's energy, industry, and domestic aviation sectors are already covered by the EU ETS, the introduction of the national ETS will lead to most major sectors in Germany facing a CO₂ price from 2021 onwards.

After the release of the 'Cornerstones for the Design of a National ETS' in October 2019, the implementing legislation—'Fuel Emissions Trading Act'—was adopted by the two German federal legislative bodies in December 2019. Now that the key design features of the system are agreed upon, regulatory efforts in 2020 and 2021 will focus on the implementation of the law.

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

The current 'Fuel Emissions Trading Act' sets prices of EUR 10/tCO₂ (USD 11.19) in 2021, continuously rising to EUR 35/tCO₂ (USD 39.18) in 2025. In 2026, a price corridor between EUR 35 and EUR 60 (USD 67.17) would apply. These figures, however, are being revised as further negotiations between the two German federal legislative bodies yielded a decision to increase the fixed-price levels. The system is now to start with a higher fixed price of EUR 25/tCO₂ (USD 27.99) in 2021, which will then increase yearly to EUR 55/tCO₂ (USD 61.57) in 2025. The federal government agreed to draft a law containing these amendments and to initiate the legislative procedure beginning in 2020.¹

- ETS in force
- ETS under development
- ETS under consideration

← National ETS for heating and transport fuels starting in 2021 and regulated upstream

Fixed price per tCO₂ from 2021 to 2025

Auctions starting in 2026 with minimum and maximum price

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 906.6 MtCO₂e (2017)

OVERALL GHG EMISSIONS BY SECTOR



Energy 765.7 (84%)
Industry 64.5 (7%)
Agriculture 66.3 (7%)
Waste 10.2 (1%)

GHG REDUCTION TARGETS

- BY 2020:** 40% below 1990 GHG levels
- BY 2030:** 55% below from 1990 GHG levels
- BY 2050:** GHG neutrality

ETS Size

GHGs COVERED

CO₂

Initially, the system starts with a limited scope, e.g., coal (for heating) will be covered from 2023 onwards.

SECTORS AND THRESHOLDS

The CO₂ price will be charged to fuel distributors and suppliers and applies to all fuels used in the transport sector and for heating purposes, e.g., fuel oil, LPG, natural gas, coal, gasoline, and diesel.

POINT OF REGULATION

Upstream

¹ - <https://www.bundesregierung.de/breg-de/themen/klimaschutz/nationaler-emissionshandel-1684508>

Phases & Allocation

ALLOCATION

PHASE ONE (2021-2026): Allowances will not be allocated for free. The government will start selling and auctioning allowances with a fixed price on CO₂ emissions between 2021 and 2024.²

2021: EUR 10 (EUR 25) / USD 11.19 (USD 27.99)

2022: EUR 20 (EUR 30) / USD 22.39 (USD 33.58)

2023: EUR 25 (EUR 35) / USD 27.99 (USD 39.18)

2024: EUR 30 (EUR 45) / USD 33.58 (USD 50.38)

2025: EUR 35 (EUR 55) / USD 27.99 (USD 61.57)

In 2026 auctioning of allowances starts and a price corridor with a minimum price of EUR 35 (EUR 55) and a maximum price of EUR 60 (EUR 65) (USD 72.77) per tCO₂ will apply.

The cap will be based on Germany's reduction targets for the non-EU ETS sectors as defined by the European Effort Sharing Regulation (ESR) and decline each year. However,

in case the allocation of allowances within the national ETS exceeds the available German emissions budget set out in the ESR, allowances for emissions reductions will be acquired under the ESR flexibility mechanisms, including inter-member state trade.

PHASE TWO (FROM 2027):

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

Allowances will be allocated through auctions, and the annually declining cap will be based on Germany's reduction targets for the non-EU ETS sectors as defined in the ESR. If not decided otherwise, the cap will be fixed.

Flexibility

BANKING AND BORROWING

Banking is not allowed during the introductory phase but will be allowed in the second phase.

MARKET STABILITY PROVISIONS

Additional allowances exceeding the cap can be acquired by operators in the initial phase (fixed-price phase).

In 2026 auctions of allowances will contain a price corridor of a minimum price per tCO₂ of EUR 35 (EUR 55) and a maximum price of EUR 60; USD 67.17 (EUR 65; USD 72.77).

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

Compliance

COMPLIANCE PERIOD

From 1 January until 31 December each year.

MRV

Details are under preparation in a separate regulation.

REPORTING FREQUENCY: Annual self-reporting in form of an emissions report based on electronic templates. Emissions data are recorded in a national registry and are publicly available.

VERIFICATION: Verification by independent third-party verifiers.

ENFORCEMENT

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

surrendered, which is two times the fixed price. Mistakes in the emissions reports also lead to payments in the equivalent amount. Payment of the penalty doesn't release from the obligation to surrender allowances to cover the emissions. Entities remain obliged to purchase and surrender the outstanding allowances.

During the second phase, entities must pay an "excess emissions penalty." The excess emissions penalty will be the same as in the EU ETS, approximately EUR 100/tCO₂ (USD 112/tCO₂) for each tCO₂ emitted for which no allowance has been surrendered.

For other non-compliances—e.g., misreporting, late reporting—a fine can be imposed on an entity.

² – Figure in brackets: Fixed price level foreseen as a compromise between the legislative bodies Bundesrat und Bundestag. Corresponding amendments of the 'Fuel Emissions Trading Act' expected in the first half of 2020.

Linking

LINKS WITH OTHER SYSTEMS

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

Other Information

INSTITUTIONS INVOLVED

German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
German Emissions Trading Authority at the German Environment Agency

EVALUATION/ETS REVIEW

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

USE OF REVENUES

Revenue from selling allowances at the fixed price and from auctioning will be partly used to support measures under the climate protection program and partly redistributed to consumers.

IMPLEMENTING LEGISLATION/REGULATION

The [Cornerstones for the design of a national emissions trading scheme for heat and transport](#) were released on 16 October 2019.³

After adoption by the legislative bodies basic [implementation legislation](#)—the Fuel Emissions Trading Act—entered into force on 20 December 2019.⁴

An amendment of the Fuel Emissions Trading Act to strengthen the national ETS by increasing the fixed price in the initial phase is expected for the first half of 2020.

Further government regulations foreseen by the basic act will be drafted and adopted in 2020 and 2021.

3 – https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Klimaschutz/eckpunkte_national_emissionshandel_waerme_verkehr_bf.pdf

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



UKRAINE

- ETS in force
- ETS under development
- ETS under consideration

Adopted an MRV law to start in 2021

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

ETS DESCRIPTION

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

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

Ukraine is working on its ETS plans with the assistance of the PMR and the German Development Agency (GIZ).

YEAR IN REVIEW

The country has developed the main elements of the national MRV system to provide a solid basis for the upcoming ETS. In the third quarter of 2018, the Cabinet of Ministers approved a framework law on MRV, which was adopted by Parliament in December 2019. Secondary legislation has also been drafted to establish the MRV system. The MRV law will enter into force in spring 2020 and will be applied starting on 1 January 2021. To establish the ETS, Ukraine plans to develop separate legislation based on at least three years of data from the MRV system.

In 2019, the Ministry of Ecology and Natural Resources of Ukraine was merged with the Ministry of Energy and Coal Mining to form the new Ministry of Energy and Environment Protection. The objective was to achieve better coherence between environmental and energy policies.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 320.6 MtCO₂e (2017)

OVERALL GHG EMISSIONS BY SECTOR



Energy (excluding transport) 182.8 (57%)
 Transport 34.9 (11%)
 Industrial processes, solvent, and other product use 51.8 (16%)
 Agriculture 38.9 (12%)
 Waste 12.2 (4%)

GHG REDUCTION TARGETS

BY 2020: 20% voluntary reduction from 1990 GHG levels ('Copenhagen Accord')

BY 2030: GHG emissions will not exceed 60% of 1990 GHG levels, including LULUCF ('NDC Submission')

BY 2035: 20% GHG emissions reduction from final energy consumption from 2010 levels ('Energy Strategy 2035')

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

Other Information

INSTITUTIONS INVOLVED

Ministry of Energy and Environment Protection of Ukraine
Cabinet of Ministers of Ukraine

IMPLEMENTING LEGISLATION/REGULATION

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

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

TURKEY



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

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

A synthesis report outlining carbon market policy options for Turkey was submitted to the Climate Change and Air Management Coordination Board in November 2018. The First Phase Closure Meeting and the Second Phase Opening Meeting were held at the end of 2018. With additional funding from the PMR through 2018, Turkey has been developing draft legislation and improving technical and institutional

capacity, to prepare the groundwork for piloting a suitable carbon pricing policy. Specifically, there are five components to the country's plans during the second phase, which is expected to complete by the end of 2020:

- (1) development of the 'Climate Change Law,' ETS regulation, and institutional framework for a pilot ETS;
- (2) development of the pilot ETS cap and allocation plans for the MRV sectors;
- (3) development of Turk-SIM, an ETS simulation with gamification features;
- (4) development of a transaction registry for the pilot ETS; and
- (5) assessment of Article 6 and options for Turkey.

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

- ETS in force
- ETS under development
- ETS under consideration

← Mandatory MRV started in 2015

Developing a draft ETS legislation and infrastructure for a pilot ETS

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) **526.3 MtCO₂e (2017)**

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

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

Compliance

MRV

The Turkish MRV legislation establishes an installation-level system for CO₂ emissions for roughly 800 entities. Sector coverage includes the energy sector (combustion fuels >20MW) and industry sectors (coke production, metals, cement, glass, ceramic products, insulation materials, paper and pulp, and chemicals over specified threshold sizes/production levels).

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

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

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

Other Information

INSTITUTIONS INVOLVED

Ministry of Environment and Urbanization

UNITED KINGDOM



Following a referendum on 23 June 2016 the United Kingdom left the European Union, effective 31 January 2020. The UK participated in the EU ETS since its inception in 2005. By exiting the EU, the UK will also withdraw from the EU ETS, however, this will not happen until 2021 as the UK will stay in the EU ETS until the end of Phase III (2013-2020).

The UK government started a consultation process in May 2019 to set the stage for carbon pricing in the UK following Brexit. The government started the process by publishing "The Future of UK Carbon Pricing"¹ in which it lays out different carbon pricing options. The preferred option of the UK government contains a UK national GHG emissions trading system which would be linked to the EU ETS. Other

options include a standalone domestic ETS, a carbon tax or participating in Phase IV of the EU ETS (2021-30). According to the UK Clean Growth Strategy² the future carbon pricing approach will be at least as ambitious as the EU ETS.

In early February 2020, the European Commission published a negotiating mandate to begin talks with Britain on a deal governing post-Brexit relations. The mandate encourages the Parties to consider linking a United Kingdom national GHG emissions trading system with the EU ETS.³

UK entities currently account for about 10% of the EU ETS, consisting of 800 installations, which emit around 140 million tonnes of CO₂e annually.

-  ETS in force
-  ETS under development
-  ETS under consideration

← Started a consultation process in May 2019 to set the stage for carbon pricing in the UK following Brexit

Considering a UK ETS which may be linked with the EU ETS in Phase IV

Has a net-zero by 2050 GHG reduction target

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 461.7 MtCO₂e (2018)

OVERALL GHG EMISSIONS BY SECTOR



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

GHG REDUCTION TARGETS

BY 2030: 57% reduction from 1990 GHG levels
BY 2050: net-zero GHG emissions by 2050

Other Information

INSTITUTIONS INVOLVED

UK Department for Business, Energy and Industrial Strategy

1 - <https://www.gov.uk/government/consultations/the-future-of-uk-carbon-pricing>

2 - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf

3 - <https://ec.europa.eu/info/sites/info/files/communication-annex-negotiating-directives.pdf>

NORTH AMERICA



WESTERN CLIMATE INITIATIVE (WCI)

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

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

CALIFORNIA

California Cap-and-Trade Program



CAP 334.2 MtCO ₂ e (2020)	GASES Several Gases	OFFSETS AND CREDITS Domestic ¹
ALLOCATION Free allocation (benchmarking) Auctioning	AVERAGE 2019 PRICE USD 16.84/ tCO ₂	TOTAL REVENUE USD 12.5 billion since beginning of program, USD 3.07 billion ² collected in 2019

- ETS in force**
- ETS under development**
- ETS under consideration**

SECTORS:

- POWER**
- INDUSTRY**
- TRANSPORT***
- BUILDINGS***

* Sectors represent upstream coverage

← Covers 80% of emissions

Broadest carbon pricing system in the US

Post-2020 reforms approved

ETS DESCRIPTION

California's Cap-and-Trade Program began operation in 2012, with the opening of its tracking system for allocation, auction distribution, and trading of compliance instruments. The first compliance obligations started in January 2013. California has been part of the Western Climate Initiative since 2007 and formally linked its system with Québec's in January 2014 and with Ontario's in January 2018 (until the latter's termination in mid-2018).

The California program covers sources responsible for approximately 80% of the state's GHG emissions. In 2017, legislation (Assembly Bill [AB] 398) was passed to provide direction on the cap-and-trade program post-2020 to help achieve California's climate goals. The California Air Resources Board (CARB), which developed and regulates the program, then issued regulations in 2018 to align the future of the program with AB 398. Among the key amendments are the addition of a price ceiling, the inclusion of two allowance price containment reserve tiers below the price ceiling, and reductions in the use of offsets.

YEAR IN REVIEW

CARB did not commence any regulatory development on the California Cap-and-Trade Program in 2019. Amendments to the program pursuant to AB 398 went into effect in April 2019, though some (e.g., price ceiling, offsets-related limits) will not take effect until 2021.

CARB also commenced the solicitation process for convening the Compliance Offsets Protocol Task Force called for by AB 398. This task force is charged with providing guidance to CARB in establishing new offset protocols for the cap-and-trade program with direct environmental benefits in the state while prioritizing disadvantaged communities, Native American or tribal lands, and rural and agricultural regions. In addition, in July 2019, the California legislature passed legislation to require the task force to consider new offset protocols for enhanced management or conservation of agricultural and natural lands as well as the enhancement and restoration of wetlands.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 424.0 MtCO₂e (2017)

OVERALL GHG EMISSIONS BY SECTOR



- Electricity Generation (In State) 38.6 (9%)
- Electricity Generation (Imports) 24.0 (6%)
- Transportation 174.3 (41%)
- Industrial 101.1 (24%)
- Commercial 23.3 (5%)
- Residential 30.4 (7%)
- Agriculture & Forestry 32.4 (8%)

GHG REDUCTION TARGETS

- BY 2020:** Return to 1990 GHG levels
- BY 2030:** 40% reduction from 1990 GHG levels
- BY 2045:** Achieve carbon neutrality³

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

2 - Does not include revenue from auctioning of consigned allowances

3 - Established via executive order in 2018; an earlier executive order set the target of 80% below 1990 levels by 2050.

ETS Size

GHGs COVERED

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

SECTORS AND THRESHOLDS

FIRST COMPLIANCE PERIOD (2013-2014): Covered sectors include those that have one or more of the following processes or operations: large industrial facilities (including cement, glass, hydrogen, iron and steel, lead, lime manufacturing, nitric acid, petroleum and natural gas systems, petroleum refining, and pulp and paper manufacturing, including cogeneration facilities co-owned/operated at any of these facilities); electricity generation; electricity imports; other stationary combustion; and CO₂ suppliers.

SINCE THE SECOND COMPLIANCE PERIOD (STARTING 2015):

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

INCLUSION THRESHOLDS: Facilities $\geq 25,000$ tCO₂e/data year.

CAPPED EMISSIONS

334.2 MtCO₂e

POINT OF REGULATION

Mixed

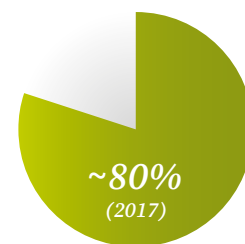
NUMBER OF ENTITIES

~500 entities (2015-2017)

CAP

The system started in 2013 with a cap of 162.8 MtCO₂e. With the program expanding to include fuel distribution, the cap rose to 394.5 MtCO₂e in 2015.

From 2015 through 2020, the cap declines by about 12 MtCO₂e each year, reaching 334.2 MtCO₂e in 2020. The cap decline factor averaged 3.1% per year in the second compliance period (2015-2017) and 3.4% in the third compliance period (2018-2020). During the period 2021-2030, the cap declines by about 13.4 MtCO₂e each year, reaching 200.5 MtCO₂e in 2030. The cap decline factor averages 5.0% during this period. The 'Cap-and-Trade Regulation' sets a formula for declining caps through 2050.



Phases & Allocation

TRADING PERIODS

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

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

ALLOCATION

Allowances are distributed via auction and free allocation.

FREE ALLOCATION:

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

Leakage risk is divided into tiers of "low," "medium," and "high" based on levels of emissions intensity and trade exposure. The 'Cap-and-Trade Regulation' as adopted in 2011 set assistance factors of 100% for the first compliance period regardless of leakage risk. For facilities with medium leakage risk, the original regulation included an assistance factor decline to 75% for the second compliance period and to 50% for the third compliance period. For facilities with low leakage risk, it included an assistance factor decline to 50% for the second compliance period and to 30% for the third compliance period. Amendments in 2013 delayed these assistance factor declines by one compliance period, and AB 398, adopted in 2017, set all assistance factors to 100% for 2021-2030, citing continued vulnerability to carbon leakage. In adjusting these factors pursuant to AB 398, CARB also set all assistance factors in the same manner for the 2018-2020 period as well.

There is no cap on the total amount of industrial allocation.

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

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

AUCTIONING: In 2019, about 65% of vintage 2019 allowances were available through auction, including both allowances owned by CARB (about 40%) and allowances consigned to auction by utilities (about 25%). The revenue from consignment allowances is mandated to benefit ratepayers or contribute to emissions reductions. The remainder of allowances was allocated for free.

Flexibility

BANKING AND BORROWING

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

Unsold allowances in past auctions are removed from circulation and will gradually be released for sale at auction after two consecutive auctions are held in which the sale price is higher than the minimum price. However, if any of these allowances remain unsold after 24 months (e.g., after eight auctions), they will be placed into CARB's reserve tiers and price ceiling. CARB has transferred to the reserve over 37 million allowances originally designated for auction that remained unsold in the Auction Holding Account for more than 24 months.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Up to 8% of each entity's compliance obligation until 2020 emissions.

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

- (1) US forest projects;
- (2) urban forest projects;
- (3) livestock projects (methane management);
- (4) ozone depleting substances projects;
- (5) Mine methane capture projects; and
- (6) rice cultivation projects.

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

- (1) The share of offsets that can be used to fulfill the compliance obligation will decrease to 4% between 2021-2025 and will remain at 6% thereafter.
- (2) No more than one half of the offsets usage limit post-2020 may come from offsets that do not provide direct environmental benefits (DEBS) in the State of California. The DEBS requirement is operationalized through a performance standard, which defines DEBS eligibility by offset activity type. Offset projects implemented outside of California may still result in DEBS based on scientific evidence and project data provided. For example, afforestation projects outside California could also provide benefits within California by

improving the quality of waters flowing through the state. Recent regulatory amendments specify the exact criteria that will be used for determining DEBS.

Offsets credits issued by jurisdictions linked with California are eligible to be used to satisfy a California entity's compliance obligation subject to the quantitative usage limit. To ensure environmental integrity, California's offset program has incorporated the principle of buyer liability. The state can invalidate an offset credit that is later determined not to meet the requirements of an offset protocol, and the entity that surrendered that offset credit for compliance must substitute a valid compliance instrument for the invalidated offset credit.

MARKET STABILITY PROVISIONS

AUCTION RESERVE PRICE: USD 16.68 per allowance in 2020. The auction reserve price, the minimum price at which allowances are available at auction, increases annually by 5% plus inflation, as measured by the Consumer Price Index.

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

The reserve sale administrator can sell accumulated allowances on a regular basis in three equal price tiers. For 2020, these prices are USD 62.29, USD 70.09, and USD 77.86. Tier prices increase by 5% plus inflation (as measured by the Consumer Price Index).

PRICE CONTAINMENT POINTS: AB 398 reforms the price containment provisions starting in 2021: two price containment points triggered at increasing price levels will be filled with remaining APCR allowances and with allowances from within the annual budgets from 2021-2030.

A third price level will be a price ceiling. 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 these sales would be used to purchase real, permanent, quan-

tifiable, verifiable, enforceable, and additional emissions reductions on at least a metric tonne for metric tonne basis.

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

Compliance

COMPLIANCE PERIOD

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

FIRST COMPLIANCE PERIOD: 2013-2014

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

MRV

REPORTING FREQUENCY: Annually

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

OTHER: Reporting is required for most operators at or above 10,000 tCO₂e per year. Operators must implement internal audits, quality assurance, and control systems for the reporting program and the data reported.

ENFORCEMENT

A covered entity that fails to surrender sufficient compliance instruments to cover its verified GHG emissions on either an annual surrender deadline or at the end of a compliance period must surrender each missing compliance instrument and will have to surrender three additional compliance instruments for each compliance instrument it failed to surrender.

Failure to surrender any additional compliance instruments as described above would subject the entity to substantial financial penalties for its noncompliance.

Penalties may be assessed pursuant to 'California Health and Safety Code' Section 38580 (e.g., monetary fines and/or imprisonment).

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

Linking

LINKS WITH OTHER SYSTEMS

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

Other Information

INSTITUTIONS INVOLVED

California Air Resources Board (CARB)

EVALUATION/ETS REVIEW

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

USE OF REVENUES

SINCE BEGINNING OF PROGRAM: USD 12.5 billion

COLLECTED IN 2019: USD 3.065 billion

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

REVENUE FROM AUCTION OF UTILITY-OWNED ALLOWANCES: Electric and natural gas utilities are allocated allowances, a portion of which must be consigned to auction. Auction proceeds must be used for ratepayer benefit and for emissions reductions.

IMPLEMENTING LEGISLATION

Global Warming Solutions Act of 2006 ([AB 32](#))⁴; [AB 398](#)⁵
2018 amendments to the [2021-2030 period](#)⁶; Current regulation can be found on the [CARB website](#)⁷

4 – <https://www.arb.ca.gov/cc/docs/ab32text.pdf>

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

6 – https://www3.arb.ca.gov/regact/2018/capandtrade18/ct18fro.pdf?_ga=2.68405201.1545648372.1576533466-747824352.1574948884

7 – <https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>



QUÉBEC

Québec Cap-and-Trade System

- ETS in force**
- ETS under development**
- ETS under consideration**

CAP 54.7 MtCO ₂ e (2020)	GASES Several Gases	OFFSETS AND CREDITS Domestic ¹
ALLOCATION Free allocation (benchmarking) Auctioning	AVERAGE 2019 PRICE² CAD 22.40 /tCO ₂ (USD 16.48)	TOTAL REVENUE CAD 3.85 billion (USD 2.97 billion) since beginning of program, CAD 968 million (USD 727.7 million) collected in 2019

SECTORS:



POWER



INDUSTRY



TRANSPORT*
(excluding maritime and aviation)



BUILDINGS*

* Sectors represent upstream coverage

ETS DESCRIPTION

Québec's Cap-and-Trade System for GHG emissions became operational in 2013. Québec has been a member of the Western Climate Initiative since 2008 and formally linked its system with California on 1 January 2014 and with Ontario on 1 January 2018 (until Ontario's termination in mid-2018). The system covers fossil fuel combustion and industrial emissions in power, buildings, transport, and industry.

YEAR IN REVIEW

One of the focuses of regulatory work on ETS in Québec in 2019 was a proposed reform to free allocation from 2024-2030. The plan would gradually reduce free allocation and

auction a portion of those allowances setting aside the revenue on a per-facility basis to support investments in projects to reduce emissions. This proposed reform is expected to be introduced via regulation in 2020.

During COP 25 in Madrid in December 2019, the Gouvernement du Québec and the Government of the Republic of Chile signed a declaration of collaboration announcing their intention to collaborate on carbon markets, energy transition, and other means to address climate change.

ETS covers ~80% of emissions

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

Linked with California since 2014

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 78.7 MtCO₂e (2017)

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

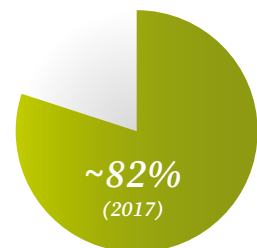
- BY 2020:** 20% reduction from 1990 GHG levels
- BY 2030:** 37.5% reduction from 1990 GHG levels

ETS Size

GHGs COVERED

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

CAPPED EMISSIONS
78.7 MtCO₂e



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

2 - Average 2019 auction settlement price

SECTORS AND THRESHOLDS

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

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

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

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

POINT OF REGULATION

Mixed

NUMBER OF ENTITIES

126 (74 industrial facilities, 52 fuel distributors) (2018)

CAP

The system started in 2013 with a cap of 23.2 MtCO₂e. With the program expanding to include fuel distribution, the cap rose to 65.3 MtCO₂e in 2015.

During the 2015-2020 period, the cap annually declined by about 2.11 MtCO₂e per year (about 3.47 percent on average annually).

After a slight nominal increase in the cap in 2021 due to an adjustment of the global warming potential of different GHGs, the cap will reduce annually by about 1.24 MtCO₂e (about 2.47% on average annually) until 2030. This will result in a cap of 44.14 million tCO₂e in 2030.

Phases & Allocation

TRADING PERIODS

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

ALLOCATION

Allowances are distributed via auction and free allocation.

FREE ALLOCATION: Emission-intensive, trade-exposed (EITE) sectors receive a portion of free allowances because they are considered vulnerable to carbon leakage. Eligible sectors include aluminum, lime, cement, chemical and petrochemicals, metallurgy, mining and pelletizing, pulp and paper, petroleum refining, and others (manufacturers of glass containers, gypsum products, and some agro-food products). The amount of free allocation issued is generally determined based on historical emissions intensity and therefore depends on the amount of reference units produced or consumed, an assistance factor, and an annual decline rate depending on the type of emissions (e.g., fixed process, combustion, and other, mainly fugitive emissions).

Until 2020 the assistance factors (AFs) for all EITE sectors are set at 100%. For the 2021-2023 period, AFs for industrial activities will be determined based on trade exposure and emissions intensity. These metrics will be used to group the industrial sector's carbon leakage risk into three categories

(low, medium, and high) with AFs of 90%, 95%, and 100% respectively. An AF of 60% will apply for electricity and steam production.

The rules used to determine the amount of free allowances issued to entities that are eligible to voluntarily opt in since 2019 are in alignment with what has been established for regulated entities.

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

Unsold allowances in past auctions are removed and will gradually be released for sale at auction after two consecutive auctions are held in which the settlement price is higher than the minimum price.

In 2019, almost 75% of allowances were allocated by auction or directed to reserves. About 25% of allowances were allocated for free. Some allowances from future vintages are offered at each auction and may be traded but not used for compliance until the compliance date for the vintage year.

Flexibility

BANKING AND BORROWING

Banking is allowed but the emitter is subject to a general holding limit.

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.

Borrowing is not allowed.

OFFSETS CREDITS

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

QUALITATIVE LIMIT: Currently, there are five offset protocols in Québec's offset program:

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

Québec has developed an offset protocol for afforestation and reforestation projects in private lands in Québec, and it is expected to be open for public consultation in 2020. In addition, Québec is working to assess or develop other new protocols in order to increase offset supply, including substitution of fuels in the maritime transport sector and improvements in the application of agricultural fertilizer.

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

Québec offset credits are 100% guaranteed. In cases where offset credits issued for a project were deemed illegitimate, the minister requires the offset promoter (developer) to replace them. If credit recovery is not possible, an equivalent number of credits will be retired from the minister's environmental integrity account. That account is populated by the automatic withholding of 3% of issued offset credits from all offset projects.

MARKET STABILITY PROVISIONS

AUCTION RESERVE PRICE: CAD 16.34 (USD 12.39) for Québec and USD 16.68 for California in 2020. For joint auctions with California in 2020, the highest value in USD between Québec's or California's auction reserve prices, based on the exchange rate of the Bank of Canada the day prior to the auction, will be the auction reserve price for that particular auction.

The auction reserve price, the minimum price at which allowances are available at auction, increases annually by 5% plus inflation until 2030.

ALLOWANCE PRICE CONTAINMENT RESERVE: Reserve emission units held in the allowance price containment reserve account may be sold as "sales by mutual agreement" by the minister in three tiers at CAD 60.79, CAD 68.38, and CAD 75.97 in 2020 (USD 45.71, USD 51.41, and USD 57.87) respectively. Only covered entities in Québec are eligible to purchase allowances from the reserve, if they do not have valid compliance instruments for the current period in their general account. Reserve prices increase annually by 5% plus inflation.

Compliance

COMPLIANCE PERIOD

FIRST COMPLIANCE PERIOD: 2013-2014

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

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

MRV

REPORTING FREQUENCY: Annually

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

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

ENFORCEMENT

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

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

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

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

Linking

LINKS WITH OTHER SYSTEMS

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

Other Information

INSTITUTIONS INVOLVED

Ministère de l'Environnement et de la Lutte contre les changements climatiques (Ministry of the Environment and the Fight Against Climate Change)

Direction générale de la Réglementation carbone et des données d'émission (Carbon Market Directorate)

EVALUATION/ETS REVIEW

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

USE OF REVENUES

Since the beginning of the program:

CAD 3.85 billion (USD 2.91 billion)

Collected in 2019:

CAD 968 million (USD 727.7 million)

All auction revenues go to the Québec Green Fund, which is dedicated to the fight against climate change through Québec's 2013-2020 Climate Action Plan. Examples for spending include energy efficiency, electrification measures (Québec's electricity is 99.7% renewable), and public transport initiatives. The electrification of domestic transport is another example.

IMPLEMENTING LEGISLATION

Regulation respecting a [cap-and-trade system for greenhouse gas emission allowances](#)³

Amendments are listed and linked on the site of the [Ministry of the Environment and the Fight Against Climate Change](#)⁴ [Environment Quality Act](#)⁵

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

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

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



CANADA

→
Committed to pricing carbon across Canada

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

Federal backstop measures for provinces and territories available in part or in full

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

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

The 'Pan-Canadian Approach to Pricing Carbon Pollution,' released in October 2016, set a federal benchmark requiring all provinces and territories to implement carbon pollution pricing systems with a certain minimum level of stringency. To operationalize this level of stringency, a federal backstop carbon pollution pricing system would apply in any jurisdiction that requested it or that did not implement its own system that meets the federal stringency requirements.

Multiple options are available to comply with the federal benchmark. The 'Pan-Canadian Approach to Pricing Carbon Pollution' and associated guidance outline three main options:

- (1)** A carbon tax covering a scope comparable to that of British Columbia's carbon tax, i.e., covering fuels combusted for electricity, heating, transport, and industry. For this option, the carbon price has to increase by CAD 10 (USD 7.54) per year to reach CAD 50 (USD 37.68) per tCO₂e by 2022 in order to meet the benchmark stringency.
- (2)** A combination ("hybrid") of a carbon tax for fuels delivered to consumers and an intensity-based baseline-and-credit system for industrial emitters, with the same price trajectory as above. For the baseline-and-credit systems, benchmarks can be set based on provincial/territorial circumstances but should also reflect best-in-class performance.
- (3)** A broad cap-and-trade system, with coverage comparable to British Columbia's carbon tax—including large industry. For these systems, modeling has to demonstrate that expected emissions reductions are at least equal to those that would have resulted from a carbon tax with the above-described price trajectory. In addition, the provincial/territorial emission reduction target must be set equal to or greater than the federal reduction target (30% below 2005 levels by 2030).

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

In provinces and territories that do not have a carbon pollution pricing system that meets the federal benchmark stringency requirements, or in cases in which they request the federal system, the federal backstop measures are applied, in part or in full.

FEDERAL CARBON POLLUTION PRICING "BACKSTOP":

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

- A regulatory charge on fuel that has been applied since April 2019 in Ontario, Saskatchewan, Manitoba, and New Brunswick (note that New Brunswick's own fuel charge is expected to go into effect on 1 April 2020); and since July 2019 in the Yukon and Nunavut. The federal fuel charge took effect in Alberta starting 1 January 2020.
- A regulatory trading system for large industrial facilities—the federal Output-Based Pricing System (OBPS)—applied starting 1 January 2019 in Ontario; Manitoba; Prince Edward Island; New Brunswick; partially in Saskatchewan; and in Yukon and Nunavut in July 2019. Final regulations for the OBPS¹ were released on 28 June 2019. A discussion paper² was published at the same time to seek input on a national carbon offset program. Final regulations for the national carbon offset program are targeted for 2020.

Both parts of the act have a carbon price equivalent to CAD 20 (USD 15.07) in 2019 increasing by CAD 10 (USD 7.54) per year until reaching CAD 50 (USD 37.68) in 2022. The OBPS sets sectoral intensity benchmarks and allows facilities to generate tradable credits if they emit less than the benchmark. While the carbon price will have to be paid only for emissions above the benchmark for a given product or activity, the potential to generate credits ensures the price signal applies to all facility emissions.

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

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

2 – <https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/pricing-pollution/Options-GHG-Offset-System.pdf>

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

RECENT DECISIONS ON THE BACKSTOP MEASURES IN THE CANADIAN PROVINCES AND TERRITORIES:

In May 2019, **Alberta** canceled the province's carbon levy. Therefore, the federal backstop's fuel charge of CAD 20 per tonne (USD 15.24) took effect in Alberta on 1 January 2020. On 1 April 2020 this levy will rise to CAD 30 per tonne (USD 22.61).

In December 2019, the federal government confirmed that Alberta's 'Technology Innovation and Emissions Reductions Regulation' (TIER) aligned with the federal benchmark. TIER took effect on 1 January 2020. The regulation sets a price of CAD 30 per tonne (USD 22.61) on emissions from industrial sectors such as oil and gas, electricity, cement, agriculture, and others. The system replaces the previous 'Carbon Competitiveness Incentive Regulation' (CCIR). The federal carbon backstop's OBPS therefore will not be imposed in the province. Alberta has challenged the constitutionality of the 'Greenhouse Gas Pollution Pricing Act.' The Alberta Court of Appeal hearing took place 16-18 December 2019, but the court ruling was not available at the time of writing.

Saskatchewan's system for large emitters took effect in January 2019. The federal output-based pricing system applies to electricity generation and to natural gas transmission pipeline sectors, which are not covered by Saskatchewan's system. The federal fuel charge has been applied in the province since 1 April 2019. Saskatchewan put forward a legal challenge to the federal carbon backstop system, but in May 2019, Saskatchewan's Court of Appeal ruled that the carbon tax imposed on the province by the federal government is constitutional. The Saskatchewan government has appealed this decision to the Supreme Court of Canada, which is expected to hear the case in March 2020.

Prince Edward Island implemented a carbon levy on fuel in April 2019. The federal output-based pricing system applies in the province for larger emitting industrial facilities.

Both parts of the federal system (fuel charge and OBPS) are in effect in **New Brunswick**. However, in December 2019, New Brunswick proposed to implement its own carbon tax on fossil fuels beginning on 1 April 2020, starting at a rate of CAD 30 per tonne (USD 22.61). This plan has been approved by the Canadian federal government. New Brunswick's proposal for its own OBPS for large industrial emitters is still under review and the federal backstop OBPS remains in effect.

Manitoba currently does not have its own carbon pricing system; the federal backstop fully applies. Manitoba filed for judicial review in the federal court, challenging the validity of the government's decision to add the province to the schedule of the act. This case should be heard in late spring 2020.

Both components of the federal backstop system are currently in place in **Ontario**. Ontario has proposed its own OBPS for large industrial emitters and the system is currently under review by the federal government.

Like Saskatchewan, Ontario put forward a legal challenge to the 'Greenhouse Gas Pollution Pricing Act,' but in June 2019, the Ontario Court of Appeal rejected that challenge, and ruled the federal system constitutional. The Ontario government has appealed this decision to the Supreme Court of Canada, which is expected to hear the case in March 2020.

The Northwest Territories introduced a territorial carbon tax in September 2019. In **Yukon** and **Nunavut**, the federal backstop has applied since July 2019, with some exemptions for fuels for aviation and electricity for remote communities, reflecting their unique circumstances.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 716.0 MtCO₂e (2017)

OVERALL GHG EMISSIONS BY SECTOR



Oil and Gas 195.0 (27%)
 Transportation 174.0 (24%)
 Electricity 74.0 (10%)
 Buildings 85.0 (12%)
 Heavy industry 73.0 (10%)
 Agriculture 72.0 (10%)
 Waste and Others 42.0 (6%)

GHG REDUCTION TARGETS

BY 2020: 17% below 2005 levels
BY 2030: 30% below 2005 levels (NDC)
BY 2050: 80% below 2005 levels

Other Information

INSTITUTIONS INVOLVED

Environment and Climate Change Canada
Finance Canada
Canadian provinces and territories

IMPLEMENTING LEGISLATION

Pan-Canadian Framework on Clean Growth and Climate Change (PCF)³
Output-Based Pricing System Regulations⁴
Greenhouse Gas Pollution Pricing Act⁵

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

4 – <http://www.gazette.gc.ca/rp-pr/p2/2019/2019-07-10/html/sor-dors266-eng.html>

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

NOVA SCOTIA

Nova Scotia Cap-and-Trade Program



CAP 12.7 MtCO ₂ e (2020)	GASES Several Gases	ALLOCATION Free allocation: benchmarking (industrial facilities), BAU (Nova Scotia Power Inc.), grandparenting (fuel suppliers) Auctioning will start in 2020
---	-------------------------------	--

- ETS in force**
- ETS under development**
- ETS under consideration**

ETS DESCRIPTION

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

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

Nova Scotia is not linked to any other jurisdictions.

YEAR IN REVIEW

2019 saw the first year of operation of the Nova Scotia Cap-and-Trade Program. The first allocation of allowances occurred in April 2019 with auctioning set to begin in 2020.

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

In October 2019, Nova Scotia introduced the 'Sustainable Development Goals Act,' which sets new targets to fight climate change, including 53% below 2005 levels by 2030 and net-zero emissions by 2050.

SECTORS:

- POWER**
- INDUSTRY**
- TRANSPORT***
- BUILDINGS***

* Sectors represent upstream coverage

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 15.9 MtCO₂e (2017)

OVERALL GHG EMISSIONS BY SECTOR



Electricity and heat generation 6.7 (42%)
 Transportation 5.0 (31%)
 Heat (residential) 1.3 (8%)
 Industry 1.0 (6%)
 Agriculture and waste 1.0 (6%)
 Heat (commercial) 0.6 (4%)
 Oil and gas sector 0.3 (2%)

GHG REDUCTION TARGETS

- BY 2020:** At least 10% reduction from 1990 GHG levels
- BY 2030:** 53% below 2005 levels
- BY 2050:** Net-zero emissions

← Started operating in 2019; first auctions in 2020

Covers ~80% of emissions

In compliance with the Pan-Canadian carbon pricing framework

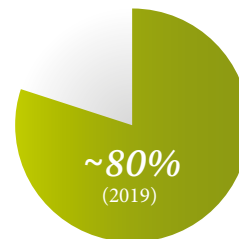
ETS Size

GHGs COVERED

CO₂, CH₄, N₂O, SF₆, NF₃, HFCs, PFCs

CAPPED EMISSIONS

12.7 MtCO₂e



1 - Figures may not sum due to rounding

SECTORS AND THRESHOLDS

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

INCLUSION THRESHOLDS: For the industrial and electricity sectors, facilities generating $\geq 50,000$ tCO₂e/year. Electricity importers responsible for $> 10,000$ tCO₂e/year are also included. For fuel suppliers, the following thresholds apply: petroleum product suppliers selling ≥ 200 liters of fuel into the Nova Scotia market and natural gas distributors producing $\geq 10,000$ tCO₂e/year.

No provisions for voluntary (“opt-in”) participation.

POINT OF REGULATION

Mixed

NUMBER OF ENTITIES

~26 entities (December 2019)

CAP

FIRST COMPLIANCE PERIOD (2019-2022):

2019: 13.68 MtCO₂e; **2020:** 12.72 MtCO₂e

2021: 12.26 MtCO₂e; **2022:** 12.14 MtCO₂e

Phases & Allocation

TRADING PERIODS

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

ALLOCATION

FREE ALLOCATION, OUTPUT-BASED BENCHMARKS:

Industrial Facilities: Facilities receive allowances based on production intensity benchmarks determined using data from the period 2014-2016. At the beginning of the year, 75% of eligible emissions allowances are distributed to participating entities. 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 assistant factor that varies between 1 (100%) for cement and 0.9 (90%) for pulp and paper and natural gas processing (the only defined industries).

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

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

Nova Scotia Power Inc.: Allowances for the utility are allocated based on a reduction from BAU projections; ~6.3 million allowances were freely allocated to Nova Scotia Power Inc. in 2019. In 2020, ~5.5 million allowances will be allocated, declining to just over five million in 2022.

AUCTIONING: The province will hold auctions two to four times per calendar year, starting in 2020. Minimum price: CAD 20 (USD 15.07) for auctions held in 2020; each subsequent year: minimum price will increase by 5% plus inflation.

Auctioning in Nova Scotia has two particularities:

- (1) The option for regulated entities to consign allowances to auction. To minimize transaction costs for participants, regulated entities can consign their allowances to the government auctions. Allowances offered for sale through consignment are included in the government auctions and sold first, followed by allowances offered for sale by the province. 100% of the revenue from allowances sold on consignment is returned to the participants.
- (2) The purchase limits to secure market functioning. To secure market functioning, bidders will be subject to purchasing limits that restrict how many allowances each participant can buy at any one auction. Purchasing limits are intended to mitigate the risk that one participant can manipulate the market by causing shortages and price spikes.

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

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

Flexibility

BANKING AND BORROWING

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

OFFSETS AND CREDITS

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

MARKET STABILITY PROVISIONS

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

(1) Cost containment: Offering them at auctions for sale at set prices to participants at predetermined times throughout the year to cover their compliance obligations. Up to four reserve sales can occur in a calendar year. The initial price will be CAD 50 (USD 37.68) 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: Adjusting to variability in year-to-year commitments to free allowances (allowances from reserve can be used as a buffer for allocation-amount uncertainty; if projections are not accurate, commitments for free allowances according to allocation rules can be fulfilled by using allowances from the reserve).

Compliance

COMPLIANCE PERIOD

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

MRV

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

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

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

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

ENFORCEMENT

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

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

All revenue from administrative penalties will go into the Nova Scotia Green Fund.

Other Information

INSTITUTIONS INVOLVED

Nova Scotia Environment, Climate Change Unit

EVALUATION/ETS REVIEW

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

USE OF REVENUES

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

Estimated revenue for 2020: CAD 24 million (USD 18.1 million), increasing to CAD 28 million (USD 21.1 million) in 2023.

IMPLEMENTING LEGISLATION/REGULATION

Nova Scotia's Cap and Trade Program Regulatory Framework¹

Cap-and-Trade Program Regulations, Section 112Q of the Environment Act²

Quantification, Reporting, and Verification of Greenhouse Gas Emissions Regulations³

Standards for Quantification, Reporting, and Verification of Greenhouse Gas Emissions⁴

Sustainable Development Goals Act⁵

Environment Act⁶

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

2 - <https://www.novascotia.ca/just/regulations/regs/envcapandtrade.htm>

3 - <https://www.novascotia.ca/just/regulations/regs/envqrv.htm>

4 - https://climatechange.novascotia.ca/sites/default/files/uploads/QRV_Standards.pdf

5 - <https://nsllegislature.ca/sites/default/files/legc/PDFs/annual%20statutes/2019%20Fall/c026.pdf>

6 - <https://nsllegislature.ca/sites/default/files/legc/PDFs/annual%20statutes/2017%20Fall/c010.pdf>

MASSACHUSETTS

Massachusetts Limits on Emissions from Electricity Generators



CAP 8.5 MtCO ₂ (2020)	GASES CO ₂ only	
ALLOCATION Free allocation (grandparenting) Auctioning	AVERAGE 2019 PRICE USD 6.71	TOTAL REVENUE USD 11,127,878 since beginning of program, USD 8,198,567 collected in 2019

- ETS in force**
- ETS under development**
- ETS under consideration**

SECTORS:



ETS DESCRIPTION

The Massachusetts Limits on Emissions from Electricity Generators launched in 2018 and covers CO₂ emissions from the power sector. It complements RGGI to help ensure that Massachusetts achieves its mandatory mitigation targets.

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

In 2016, a ruling by the Massachusetts Supreme Court established that the government would need to take additional action to guarantee it meets the state's climate targets—a 25% reduction in 2020 and an 80% reduction by 2050 (compared to 1990). The regulation establishing this system, '310 CMR 7.74,' is one of the responses to this ruling. The regulation is intended to ensure that emission reductions associated with other clean energy programs occur in Massachusetts.

YEAR IN REVIEW

2019 saw the reduction of the share of allowances distributed through free allocation from 100% to 75%. The remainder, after an adjustment to account for banked allowances, were distributed via auctions. The system is expected to increase to full auctioning by 2021. Auction results are included in market monitoring reports posted on the program web page.

- ← **Launched in 2018 for power sector**
- Complements RGGI to achieve targets locally**
- Started auctioning in 2018**

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) **73.3 MtCO₂e (2017)**

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

BY 2020: 25% reduction compared to 1990

BY 2050: 80% reduction compared to 1990

ETS Size

GHGs COVERED

CO₂

CAPPED EMISSIONS

8.5 MtCO₂



SECTORS AND THRESHOLDS

Large electricity generators subject to RGGI (≥ 25 MWe)

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

24 (2019)

CAP

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

ANNUAL CAPS

2019: 8.74 MtCO₂e

2020: 8.50 MtCO₂e

Phases & Allocation

TRADING PERIODS

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

100% from 2021 onwards. One to four auctions will be held each year. The first auction took place in December 2018. The second auction took place in December 2019.

ALLOCATION

AUCTIONING: From 2019 onwards, allowances are partially auctioned, with 25% auctioned in 2019, 50% in 2020, and

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

Flexibility

BANKING AND BORROWING

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

MARKET STABILITY PROVISIONS

AUCTION RESERVE PRICE: The first two auctions had a reserve price of USD 0.50 per allowance.

Compliance

COMPLIANCE PERIOD

One year

MRV

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

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

ENFORCEMENT

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

Other Information

INSTITUTIONS INVOLVED

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

EVALUATION/ETS REVIEW

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

USE OF REVENUES

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

IMPLEMENTING LEGISLATION/REGULATION

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

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



REGIONAL GREENHOUSE GAS INITIATIVE (RGGI)

- ETS in force**
- ETS under development**
- ETS under consideration**

SECTORS:



POWER

MEMBER STATES:

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

→ *First mandatory GHG ETS in the US*

Since 2012 two program reviews tightened cap

New Jersey rejoined RGGI in 2020, Virginia and Pennsylvania to join by end of 2020 and 2022

CAP 96.4 million short tons CO ₂ ¹ / 87.4 MtCO ₂ (2020)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic (within RGGI states only)
ALLOCATION Auctioning	AVERAGE 2019 PRICE USD 5.98	TOTAL REVENUE USD 3.4 billion since beginning of program, USD 284 million collected in 2019

ETS DESCRIPTION

RGGI is the first mandatory GHG ETS in the United States and covers emissions from the power sector. The system started operating in 2009 with 10 states. Its development was based on the '2005 RGGI Memorandum of Understanding' (MoU) and the '2006 RGGI Model Rule'. Through statutes or regulations based on the Model Rule, each state then established individual CO₂ budget trading programs. New Jersey withdrew from the program at the end of 2011, but rejoined RGGI in January 2020.

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

YEAR IN REVIEW

After the finalization of the '2017 Model Rule', the proposed post-2020 cap-and-trade regulations must be adopted by each RGGI state according to its own regulatory processes. New Jersey rejoined RGGI as of January 2020 after final legislation for establishing an ETS in the state and reentering RGGI was adopted 17 June 2019. New Jersey's first auction as a rejoined member was in March 2020.

Virginia is also in the process of establishing an ETS and linking it to the RGGI program. The state started regulatory processes in 2018 and adopted final regulations in April 2019 which entered into force in June 2019. The implementation of the ETS and the linkage to RGGI is planned for the end of 2020 (see factsheet on Virginia).

Pennsylvania is considering an ETS and linking to RGGI. In October 2019, Pennsylvania Governor Tom Wolf issued an executive order for the state to draft ETS legislation for RGGI linkage. A final proposal could be presented later in 2021, while the earliest start date for Pennsylvania's ETS and its linkage to RGGI would be 2022 (see factsheet on Pennsylvania).

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 463.6 MtCO₂e (2014)

OVERALL GHG EMISSIONS BY SECTOR



Energy 223.5 (48%)
 Transportation 174.6 (38%)
 Industrial Processes 25.6 (6%)
 Agriculture 9.8 (2%)
 Waste 30.0 (6%)
 Bunker Fuels 0.1 (0%)

GHG REDUCTION TARGETS²

BY 2020: By adopting the '2013 Model Rule' RGGI states committed to a regional cap of more than 50% reduction of CO₂ emissions from electricity generation from 2005 CO₂ emissions.

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

1 - The RGGI states adjusted the caps between 2014 and 2020 to account for banked CO₂ allowances accumulated in the first and second control periods. The adjusted cap for 2020 comprises 74 million short tons.

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

ETS Size

GHGs COVERED

CO₂

SECTORS & THRESHOLDS

Fossil Fuel Electric Generating Units

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

POINT OF REGULATION

Downstream (at installation level)

NUMBER OF ENTITIES

168 sources (December 2019)

CAP

The RGGI cap was 188 million short tons CO₂ per year in the 2009-2011 period. It was then set to 165 million short tons CO₂ per year for the 2012-2014 period, with a 2.5% annual reduction factor from 2015 through 2018, totaling a 10% reduction between 2015 and 2018. However, by 2012, emissions under RGGI were more than 40% below the cap. The states thus tightened the cap to 91 million short tons in 2014.

CAPPED EMISSIONS

96.4 MtCO₂



The revised regulations extended the 2.5% annual reduction factor through 2020, with a 2020 cap of approximately 96 million short tons including the 18 million short tons cap of new RGGI entrant New Jersey. The RGGI states adjusted the caps between 2014 and 2020 to account for banked CO₂ allowances accumulated in the first and second control periods. The adjusted cap for 2020 comprises 74 million short tons.

The reduction factor between 2021 and 2030 as set out in the '2017 Model Rule' is about 3% of the 2020 cap, resulting in a 2030 regional cap (unadjusted) of about 68 million short tons.

Phases & Allocation

TRADING PERIODS

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

FIRST CONTROL PERIOD: 2009-2011

SECOND CONTROL PERIOD: 2012-2014

THIRD CONTROL PERIOD: 2015-2017

FOURTH CONTROL PERIOD: 2018-2020

FIFTH CONTROL PERIOD: 2021-2023

Since the third control period, RGGI operates with interim control periods. Regulated entities must cover 50% of their emissions with allowances in each of the first two years of a control period. They must cover 100% of the remaining emissions at the end of the three-year control period.

ALLOCATION

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

Flexibility

BANKING AND BORROWING

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

OFFSETS AND CREDITS

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

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

- (1) landfill methane capture and destruction;
- (2) sequestration of carbon due to reforestation, improved forest management, or avoided conversion;
- (3) avoidance of methane emissions from agricultural manure management operations;
- (4) reduction or avoidance of CO₂ emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency; and
- (5) reduction in SF₆ emissions.

According to the Model Rule, offset Protocols 4 and 5 will be discontinued from 2021. Some states have discontinued other protocols, but all states accept offset allowances issued by any participating state. To date, only one offset project (on landfill methane capture and destruction) has been approved under RGGI.

MARKET STABILITY PROVISIONS

AUCTION PRICE FLOOR: USD 2.3 per short ton in 2020, increasing by 2.5% per year (to reflect inflation).

RESERVES: Since 2014, RGGI has operated with a cost containment reserve (CCR), where allowances are released to the market when certain trigger prices are reached. Trigger price: USD 10.77 in 2020 (having increased at 2.5% annually from USD 10 in 2017).

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

In addition, an emissions containment reserve (ECR) will be added in 2021. Under the ECR, allowances will be withheld from circulation (from auction) if certain trigger prices are reached, up to an annual withholding limit of 10% of the budgets of participating states. Allowances withheld will not be re-offered for sale, effectively adjusting the cap downward. In 2021, the trigger price will be set at USD 6, increasing by 7% compared to the previous year thereafter.

Compliance

COMPLIANCE PERIOD

Three years (see “Phases and Allocation” above)

MRV

REPORTING FREQUENCY: Compliance is evaluated at the end of each three-year control period. From the third control period, covered entities have been required to hold allowances equal to 50% of their emissions during each interim control period (the first two calendar years of each control period).

FRAMEWORK: Emissions data for emitters are recorded in the United States Environmental Protection Agency’s (US EPA) Clean Air Markets Division database in accordance with state CO₂ Budget Trading Program regulations and US EPA regulations. Provisions are based on the US EPA moni-

toring provisions. Data are then automatically transferred to the electronic platform of the RGGI CO₂ Allowance Tracking System, which is publicly available.

ENFORCEMENT

In case of excess emissions, compliance allowances for three times the amount of excess emissions have to be surrendered in future periods. Furthermore, covered entities may also be subject to specific penalties imposed by the RGGI state where the entity is located.

Linking

LINKS WITH OTHER SYSTEMS

New Jersey rejoined RGGI as of 2020. Virginia plans to link to RGGI in late 2020.

Pennsylvania plans to link to RGGI as of 2022.

Other Information

INSTITUTIONS INVOLVED

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

EVALUATION/ETS REVIEW

The RGGI participating states periodically review the ETS program in order to consider program successes, impacts, and design elements. The first program review process (known as the 2012 Program Review) was completed in early 2013. A second review process was completed in 2017, resulting in the '2017 Model Rule.' Program reviews were accompanied by stakeholder meetings to facilitate stakeholder engagement and the submission of comments from interested parties. The next program review is scheduled to begin no later than 2021.

USE OF REVENUES

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

IMPLEMENTING LEGISLATION/REGULATION

[2017 RGGI Model Rule](#)³

[2017 RGGI Model Rule Updates \(Summary\)](#)⁴

[RGGI States' Statutes & Regulations](#)⁵

[RGGI Program Design](#)⁶

3 - https://www.rggi.org/sites/default/files/Uploads/Program-Review/12-19-2017/Model_Rule_2017_12_19.pdf

4 - https://www.rggi.org/sites/default/files/Uploads/Program-Review/12-19-2017/Summary_Model_Rule_Updates.pdf

5 - <https://www.rggi.org/program-overview-and-design/state-regulations>

6 - <https://www.rggi.org/program-overview-and-design/elements>



PENNSYLVANIA

- ETS in force
- ETS under development
- ETS under consideration

Executive order for power sector ETS and RGGI linkage

Draft ETS regulation by mid 2020

Plan to join RGGI by earliest 2022

ETS DESCRIPTION

On 3 October 2019 Pennsylvania’s Democratic Governor Tom Wolf signed an executive order directing the Pennsylvania Environmental Quality Board (EQB) to develop a proposal for an ETS covering CO₂ emissions from the electric power sector and its linkage to the Regional Greenhouse Gas Initiative (RGGI) by 31 July 2020.

According to the executive order, the legal basis for developing an ETS is the state’s ‘Air Pollution Control Act,’ which regulates air resources necessary for the protection of public health. The executive order comes after Pennsylvania’s Department of Environmental Protection (DEP) recommended the implementation of an ETS for the power sector in April 2019 and the EQB directed the DEP to study a petition of over 200 businesses, organizations, and individuals to introduce an economy-wide cap-and-trade program in the state.

After the release of a draft regulation by mid-2020, it must go through the state’s regulatory review process, including through state boards and legislative committees, for comment. A final proposal could be presented in the third quarter of 2021, while the earliest start date for Pennsylvania’s ETS and its linkage to RGGI would be 2022.

Joining RGGI would require negotiations between Pennsylvania and the current RGGI member states to adjust the program’s emissions cap. With Pennsylvania joining RGGI, the initiative’s carbon market would increase significantly, as Pennsylvania’s power sector emissions are higher than the collective emissions output of all current RGGI states.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 264.4 MtCO₂e (2016)



GHG REDUCTION TARGETS

BY 2025: 26% below 2005 levels

BY 2050: 80% below 2005 levels

- Energy 80.5 (30%)
- Transportation 61.1 (23%)
- Industrial 81.4 (31%)
- Residential 18.5 (7%)
- Commercial 10.6 (4%)
- Agriculture 8.0 (3%)
- Waste 4.3 (2%)

Other Information

INSTITUTIONS INVOLVED

Pennsylvania Department of Environmental Protection (DEP)

IMPLEMENTING LEGISLATION/REGULATION

Executive Order 2019-07¹

¹ - <https://www.governor.pa.gov/newsroom/executive-order-2019-07-commonwealth-leadership-in-addressing-climate-change-through-electric-sector-emissions-reductions/>

TRANSPORTATION AND CLIMATE INITIATIVE

Transportation and Climate Initiative (TCI) Cap-and-Invest Program



The Transportation and Climate Initiative (TCI) is a regional collaboration of 13 northeastern and mid-Atlantic US jurisdictions (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and Washington DC) pursuing a goal of reducing GHG emissions from the transportation sector and minimizing the transportation system's reliance on high-carbon fuels. In December 2018, a subset of the participating TCI jurisdictions announced the future design of a regional low-carbon transportation policy proposal, which aims to establish a carbon pricing mechanism. The mechanism is the result of several years of consultations and negotiations amongst TCI members.

Over the course of 2019, the participating TCI jurisdictions have engaged in expert and public stakeholder consultations, as well as technical, environmental, and economic analyses of the benefits and costs of a regional transportation carbon pricing mechanism. As a result of this design process, on 1 October 2019 the jurisdictions released a draft framework outlining basic design features of a regional transport sector ETS starting as early as 2022.

The program will cap CO₂ emissions from the combustion of gasoline and on-road diesel fuel in the participating states. Compliance obligations fall to suppliers that produce the covered fuels within these states, as well as suppliers that import them to the states. Point of regulation is upstream. The program intends to auction nearly 100% of its allowances with revenues being returned to participating TCI states. Each state can invest the revenue as determined

appropriate to achieve TCI program goals, with a key feature of the draft framework being a commitment to address equity concerns. The program will implement a minimum reserve price and include a Cost Containment Reserve (CCR) as well as an Emissions Containment Reserve (ECR). Banking of allowances will be allowed without restrictions.

On 17 December 2019, the jurisdictions released a draft memorandum of understanding (MOU) consistent with the policy design elements from the draft framework and announced modeling results for different cap reduction factors. Furthermore, the MOU introduced further design elements such as three-year compliance periods and interim compliance obligations and a program evaluation three years after program launch and regularly thereafter. The final MOU will include a decision surrounding the cap-and-decline trajectory and whether the program will accept limited use of offsets.

The current timeline foresees that the MOU is finalized in the spring of 2020 after considering further public input in January and February 2020. At this point each jurisdiction will decide whether to sign the final MOU and participate in the regional program. Other states would also be able to join the effort at any time. As a next step, the participating jurisdictions will develop a model rule, which will be released by 31 December 2020. Finally, over the course of 2021 jurisdictions will conduct rulemaking processes to adopt regulations on the state level and start implementing the program as early as 2022.

- ETS in force
- ETS under development
- ETS under consideration

MEMBER STATES:

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

Regional collaboration to reduce transport GHG emissions

Release of draft memorandum of understanding on design elements for ETS starting as early as 2022

Developing cap and finalizing memorandum of understanding in 2020

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 1,034.8 MtCO₂e (2014)

OVERALL GHG EMISSIONS BY SECTOR



Energy 555.6
 Transportation 346.8
 Industrial Processes 52.4
 Agriculture 23.3
 Waste:56.6

IMPLEMENTING LEGISLATION/REGULATIONS

Framework for a Draft Regional Policy Proposal¹
 Draft Memorandum of Understanding²

1 - https://www.transportationandclimate.org/sites/default/files/TCI-Framework_10-01-2019.pdf

2 - https://www.transportationandclimate.org/sites/default/files/FINAL%20TCI_draft-MOU_20191217.pdf



VIRGINIA

-  **ETS in force**
-  **ETS under development**
-  **ETS under consideration**

Aims to link to RGGI by end of 2020

Proposed ETS in line with RGGI Model Rule

Proposal includes 2020 cap of 28 million short tons

Virginia has been working on establishing an ETS since 2017. This is based on Executive Directive (ED) 11, which was issued by then-Governor McAuliffe. ED 11 directed the Department of Environmental Quality (DEQ) and the Secretary of Natural Resources to develop a proposed regulation for the State Air Pollution Control Board's consideration to control CO₂ from electric power facilities that (a) includes provisions to ensure that Virginia's regulation is "trading-ready" to allow for the use of market-based mechanisms and the trading of CO₂ allowances through a multi-state trading program; and (b) establishes abatement mechanisms providing for a corresponding level of stringency to limits on CO₂ emissions imposed in other states with such limits. As a result, the DEQ proposed and the board approved a proposed 'CO₂ Budget Trading Program' regulation for public comment that would be in line with many of RGGI's major design features, with the aim to link with RGGI by 2020.

In September 2018, the DEQ released a revised proposed regulation taking into account comments from the general public as well as from the RGGI states concerning the consistency of its proposed regulation with the RGGI states' '2017 Model Rule.' The updated proposal sets a cap of 28 million short tons CO₂e (25.4 MtCO₂e) in 2020, which would decline 3% per year to 19.6 million short tons CO₂e (17.6 MtCO₂e) in 2030. CO₂ offset allowances generated by other RGGI states will be recognized by Virginia. This revised proposal, which is consistent with the '2017 RGGI Model Rule,' was approved by the board to be released for additional public comments.

Following the second public comment period, on 19 April 2019, the board approved the final regulation for the ETS. The regulation is based on the September 2018 revised proposed regulation from the DEQ and in addition includes a minimum reserve price, a cost containment reserve (CCR) and an emissions containment reserve (ECR). In contrast to RGGI, Virginia intends to distribute its allowances through consignment auctions.

On 26 June 2019, Virginia's 'ETS Regulation' became effective. However, on 2 May 2019, Virginia's Democratic Governor Northam approved a '2019 Budget Act' adopted by the Republican legislative majority, which contained provisions that would prevent Virginia's ETS from joining RGGI in 2020. Nonetheless, Democrats won a majority in the state's House of Representatives and Senate during the November 2019 general election.

As a consequence, on 11 December 2019, Northam announced that the ETS-preventing budget provisions will be removed from the upcoming budget bill, and additional cap-and-trade legislation will be introduced in 2020. If passed, this would allow Virginia to link to RGGI by the fourth quarter of 2020. As of the beginning of 2020, a number of RGGI-related legislative proposals are being considered by the legislature, which may affect the form of the auction and other program details.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 136.0 MtCO₂e (2017)



GHG REDUCTION TARGETS

BY 2025: 23.80% reduction below BAU projection of GHG emissions

- Electric power and energy production 40.4 (30%)
- Transportation 48.0 (35%)
- Industrial 20.6 (15%)
- Residential 5.3 (4%)
- Commercial 5.9 (4%)
- Agriculture 3.2 (2%)
- Waste 12.6 (9%)

Linking

LINKS WITH OTHER SYSTEMS

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

Other Information

INSTITUTIONS INVOLVED

Virginia Department of Environmental Quality (DEQ)

IMPLEMENTING LEGISLATION/REGULATION

[Regulation for Emissions Trading Programs¹](#)

¹ – <https://www.townhall.virginia.gov/L/ViewStage.cfm?stageid=8608>



NEW MEXICO

- ETS in force
- ETS under development
- ETS under consideration

Has established an interagency Climate Change Task Force

Evaluating ETS to achieve reduction targets

New Mexico established an interagency Climate Change Task Force in January 2019 to evaluate strategies and policies to reduce GHG emissions in the state. This includes the adoption of a comprehensive market-based program that sets emissions limits to reduce CO₂ and other GHG pollutants in New Mexico. The task force released initial recommendations and a status update in November 2019 that determined “even with current and planned policies to reduce our emissions, we will likely fall short of our goals without a broader market-based program to reduce carbon usage and

emissions.” State agencies will continue to evaluate options for a future ETS that would result in the most cost-effective approach, including through cooperation with states that already operate cap-and-trade programs, with the next report from the task force due in September 2020.

The Climate Change Task Force also announced in its November 2019 update that the state will complete its first-ever comprehensive inventory of GHGs that includes small emitters in 2021.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 66.7 MtCO₂e (2018)



GHG REDUCTION TARGETS

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

- Electricity generation 12.0 (18%)
- Residential / Commercial 4.0 (6%)
- Transportation 14.7 (22%)
- Oil & gas industry 16.0 (24%)
- Agriculture 7.3 (11%)
- Other industry 12.0 (18%)

Other Information

INSTITUTIONS INVOLVED

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

NEW YORK CITY



As part of a local law setting emissions-intensity limits for most large buildings starting in 2024, the New York City (NYC) government is required to study the feasibility of a citywide ETS for the buildings sector and release its findings by 2021.

‘Local Law 97,’ part of the broader ‘Climate Mobilization Act of 2019,’ requires most buildings over 25,000 square feet to meet annual emissions-intensity limits based on occupancy type. Buildings with rent regulated housing have an alternate compliance pathway under the law, which includes implementing a list of prescriptive energy conservation

measures. The requirement set in ‘Local Law 97’ to study the feasibility of a future citywide ETS specifies that it shall “include methods to ensure equitable investment in environmental justice communities that preserve a minimum level of benefits for all covered buildings [and]...an approach to a marketplace for credit trading, pricing mechanisms, credit verification, and mechanisms for regular improvement of the scheme.”

The trading system being studied would serve as a compliance mechanism under the existing law.

- ETS in force
- ETS under development
- ETS under consideration

← Established emissions-intensity targets for large buildings

Studying city-wide ETS to achieve building intensity targets

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 50.7 MtCO₂e (2017)

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

BY 2030: 40% below 2005 levels citywide

BY 2050: Zero net emissions citywide

Other Information

INSTITUTIONS INVOLVED

NYC Mayor’s Office of Sustainability
NYC Office of Climate Policy and Programs

IMPLEMENTING LEGISLATION

Local Law 97¹

¹ – https://www1.nyc.gov/assets/buildings/local_laws/ll97of2019.pdf



NORTH CAROLINA

-  **ETS in force**
-  **ETS under development**
-  **ETS under consideration**

Executive order to develop policy options for reducing power sector emissions

Evaluation report on potential market-based carbon reduction program expected by end of 2020

On 29 October 2018, North Carolina’s Governor Roy Cooper issued an executive order (EO No. 80) demanding stronger commitment to address climate change and a transition to a clean energy economy by reducing statewide GHG emissions to 40% below 2005 levels. As directed by the EO, on 27 September 2019 North Carolina’s Department of Environmental Quality (DEQ) released the ‘Clean Energy Plan’ (CEP) to outline policy and action recommendations to reach the announced GHG reduction target. A core component of the CEP is to reduce electric power sector GHG emissions by 70% below 2005 levels by 2030 and attain carbon neutrality by 2050. However, the list of policy options being considered to reach the GHG reduction targets is not final at this point.

designs for a market-based carbon reduction program, a coal phase-out, clean energy policies, and hybrid approaches that will be delivered by 31 December 2020.

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

To assess the most cost-effective options to achieve CO₂ emissions reductions in the power sector, the DEQ will commission an academic report that will evaluate policy

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 150.1 MtCO₂e (2017)



GHG REDUCTION TARGETS

BY 2025: 40% reduction compared to 2005 levels

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

Other Information

INSTITUTIONS INVOLVED

North Carolina Department of Environmental Quality

IMPLEMENTING LEGISLATION /REGULATION

- Executive Order No. 80¹
- Clean Energy Plan²

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

OREGON



Oregon proposed a statewide cap-and-trade program during its 2019 state legislative session. House Bill 2020 (HB2020) was developed by a joint legislative committee and approved by the House, but it failed to win the support of the Senate before the end of the legislative session. State lawmakers unveiled a revised draft in January 2020 for consideration during the 2020 legislative session.

The 'Oregon Greenhouse Gas Initiative' outlined in the January 2020 draft retains much of HB2020's structure but with some notable changes for the industry and transport sectors. Starting in 2022, it would set an allowance budget that declines in line with a target of a 45% reduction in GHG emissions below 1990 levels by 2035. From 2036, allowances would decline in line with Oregon's proposed 2050 target of at least 80% below 1990 levels.

Electricity companies would receive allowances equal to a forecast of emissions associated with serving their retail customers until 2030, declining annually each year to a floor of 20% in 2050. Natural gas utilities would be eligible for allowances based on the share of emissions that goes towards serving low-income residential customers as well as a share of consignment allowances based on emissions attributable to businesses. Entities that are deemed emis-

sions intensive and trade-exposed would receive allowances based on 100% of product-specific benchmarks, excluding emissions attributable to natural gas combustion. These shares would decline in subsequent years proportionate to the decline in the cap. Auctioning would be held at least annually with a rising auction price floor and price ceiling.

Notable changes between HB2020 and the revised draft bill include an exclusion of emissions from natural gas consumption for industrial entities when determining if they meet the threshold of 25,000 tCO₂e to be regulated by the program and a phase-in for transport fuels that first targets urban areas.

The bill contains similar elements as California and Québec's programs with regards to sectoral coverage and US domestic offset programs, as well as the use of auction price floors, price ceilings, and cost containment reserves. The possibility of linking with other market-based compliance mechanisms in other jurisdictions was mentioned in HB2020.

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

- ETS in force
- ETS under development
- ETS under consideration

← GHG reporting since 2009

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 62.0 MtCO₂e (2016)

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

- BY 2020:** 10% reduction from 1990 GHG levels
- BY 2035:** 45% reduction from 1990 GHG levels (proposed target)
- BY 2050:** At least 80% reduction from 1990 GHG levels (proposed target)

Other Information

INSTITUTIONS INVOLVED

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

IMPLEMENTING LEGISLATION/REGULATION

Oregon Greenhouse Gas Initiative (LC19)¹
House Bill 2020 (HB2020)²

1 - <https://olis.oregonlegislature.gov/liz/2019R1/Downloads/CommitteeMeetingDocument/208874>
2 - <https://olis.leg.state.or.us/liz/2019R1/Measures/Overview/HB2020>



WASHINGTON

- ETS in force
- ETS under development
- ETS under consideration

Baseline and credit system partially upheld by court

Other carbon pricing policies being considered in legislature

The State of Washington continues to pursue carbon pricing policies through its legislature and executive agencies.

In 2016, the Washington Department of Ecology adopted the 'Clean Air Rule' (CAR), a baseline and credit system that reduces emissions from industrial sources, petroleum fuel producers and importers, and natural gas distributors. The CAR would apply to emitters responsible for at least 100,000 tonnes of GHGs per year, requiring covered facilities to reduce a cumulative 1.7% of their baseline emissions annually. They could comply by reducing their own emissions, buying credits from other regulated parties or from projects that reduce emissions, or by acquiring allowances from approved ETS programs.

However, the CAR was suspended before it could be enforced, pending a legal challenge. The Washington Supreme Court partially upheld the CAR in January 2020, ruling that it could apply to stationary sources of emissions but not fuel suppliers and natural gas distributors that contribute to emissions from combustion farther downstream.

Carbon pricing policies, including a proposed ETS, have repeatedly come before the legislature and in two unsuccessful state referenda. Laws forcing steep emissions reductions successfully passed in the 2019 session, but no carbon pricing measures were approved. The most recent ETS proposal, Senate Bill 5981, would establish a WCI-modeled ETS. Further debate on that bill and other carbon pricing measures is expected in the 2020 session.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 97.4 MtCO₂e (2017)



GHG REDUCTION TARGETS

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

- Electricity 16.2 (17%)
- Transport 43.5 (45%)
- Industrial processes 4.9 (5%)
- Residential / Commercial / Industrial 23.1 (24%)
- Fossil fuel industry 0.8 (1%)
- Agriculture 6.5 (7%)
- Waste 2.4 (2%)

Other Information

INSTITUTIONS INVOLVED

Washington Department of Ecology

LATIN AMERICA AND THE CARIBBEAN





MEXICO

Mexican Emissions Trading System Pilot Program

- ETS in force
- ETS under development
- ETS under consideration

CAP 271.3 MtCO ₂ (2020)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic ¹
ALLOCATION Free allocation: grandfathering		

SECTORS:



POWER



INDUSTRY

First year of pilot implementation

Covers power and industry

Mandatory GHG reporting in place since 2014

ETS DESCRIPTION

The Mexican ETS pilot started operating on 1 January 2020. Mandated by Provisional Article 2 of the July 2018 reform to the 'General Law of Climate Change' and implemented through its 2019 regulation, the pilot ETS will help test system design and will run for two years, plus one year of transition to the full operational ETS. It aims to enhance the quality of emissions data and build capacity in emissions trading for covered entities, ultimately improving the design of the operational period of the ETS, which will commence in 2023. The rules for the transitional phase in 2022 are yet to be announced. Together, the pilot phase (2020-2021) and the transition phase (2022) constitute the test program of the Mexican system.

The pilot covers direct CO₂ emissions from entities in the energy and industry sectors generating at least 100,000 tCO₂ per year. Around 300 entities are covered by the pilot, corresponding to ~37% of national emissions.

The Mexican pilot is designed to pose no economic impact on regulated entities during the pilot years; however, in case of noncompliance, entities lose the opportunity to bank unused allowances into the next compliance periods within the pilot. Moreover, noncompliant entities will receive fewer allowances during the operational period of the national ETS (two fewer allowances for each nondelivered allowance during the pilot).

YEAR IN REVIEW

After a process of public consultation, the Ministry of Environment and Natural Resources (SEMARNAT) published in October 2019 the implementing regulation of the Mexican pilot, which specified the system requirements such as scope, existence and use of reserves, allocation process, MRV process, compliance cycle, and existence of flexibility instruments (offsets and early action credits). The regulation also includes a mechanism of stakeholder engagement, the Consultative Committee, which is a consolidation of the stakeholder engagement process initiated between SEMARNAT and the private sector for the development of the ETS pilot rules.

In November 2019, SEMARNAT published the caps for 2020 and 2021, as well as allowance allocations for the different sectors.

Parallel to this process, SEMARNAT has been working on different infrastructure elements needed for the ETS: the system's registry, which is expected to be completed by the end of June of 2020, offset protocols, and the auction platform. SEMARNAT is considering having auctions during the pilot years, and expects to have the offsets registry ready within the next two years.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 733.8 MtCO₂e (2017)

OVERALL GHG EMISSIONS BY SECTOR



Energy 522.4 (71%)
Industrial processes 58.0 (8%)
Agriculture, forestry, and other land use 106.7 (15%)
Waste 46.7 (6%)

GHG REDUCTION TARGETS

BY 2020: 30% below BAU GHG emissions baseline (aspirational, included in the 'General Law of Climate Change')

BY 2030: 22% below BAU GHG emissions baseline (NDC, included in the 'General Law of Climate Change')

BY 2050: 50% below 2000 GHG levels (aspirational, included in the 'General Law of Climate Change')

¹ - The Ministry of Environment and Natural Resources is in the process of establishing a domestic offsetting program.

ETS Size

GHGs COVERED

CO₂

SECTORS AND THRESHOLDS

The pilot ETS will cover the energy and industrial sectors. The energy sector encompasses electricity generation, transmission, and distribution, as well as fossil fuel extraction, production, transport, and distribution.

The industry sector includes automobiles, cement, lime, chemical industry, food and beverages, glass, iron and steel, metallurgical, mining, petrochemicals, and pulp and paper, as well as other industrial subsectors generating direct CO₂ emissions from stationary sources at or above the threshold.

The pilot ETS covers installations whose annual direct emissions from stationary sources amount to at least 100,000 tCO₂.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

~300. The broader mandatory National Emissions Register (RENE) requires mandatory reporting of direct and indirect GHG emissions for facilities with annual emissions at or above 25,000 tCO₂e. Under RENE, emitters in the energy, industrial, transport, agricultural, waste, commercial, and

CAPPED EMISSIONS

271.3 MtCO₂

~37%
(2017)

services sectors are required to report the six GHGs identified by UNFCCC, as well as black carbon, CFCs, HCFCs, halogenated ethers, halocarbons, and their mixes.

CAP

Year 2020: 271.3 MtCO₂

Year 2021: 273.1 MtCO₂²

Three reserves will be filled each year with allowances additional to the cap:

- auctions reserve (equivalent to 5% of the cap);
- new entrants reserve (equivalent to 10% of the cap, for new entrants as well as increases in production among existing regulated entities); and
- general reserve (equivalent to 5% of the cap, for ex post adjustment allocation for entities with higher emissions relative to their baselines).

The reserves serve as safeguards to avoid any impact to competitiveness during the pilot phase, as required by the '2018 General Law on Climate Change'.

Phases & Allocation

TRADING PERIODS

Pilot phase (2020-2021); and transition phase to the operational period of the ETS (2022).

The schedule of implementation as contained in Annex I to the ETS pilot regulation contains compliance and allocation dates for the compliance cycle of 2020 and 2021. Emissions for 2022 will be covered by the operational period of the ETS.

SEMARNAT is expected to publish the regulation of the operational period of the ETS in 2022.

ALLOCATION

The pilot will use free allocation with the following specifications.

INITIAL ALLOCATION: Entities will receive free allowances based on historical emissions. New entrants will receive free allowances based on their reported emissions in the year in which they first crossed the 100,000 tCO₂ threshold.

EX-POST ADJUSTMENT: An adjustment allocation will be carried out from the general reserve for those participants whose verified emissions in that year are higher than the free allocation received. The regulation does not specify how adjustments will be made in the event that demand for additional allowances exceeds reserves.

When an installation closes permanently, the installation may have to surrender the allowances that it has for the compliance period of the year before its closure. Additionally, it may need to return the free allowances received for the compliance period in which it closes. Whether the installation has to only surrender allowances, only return allowances, or both depends on the date of the year in which it closes. These allowances are then cancelled by SEMARNAT.

With regards to auctions, starting from the second year of the pilot and depending on market behavior, SEMARNAT may auction allowances from the auction reserve.

2 - The increase in the cap between 2020 and 2021 is due to an increase in the sectoral allocation for regulated entities categorized as "others."

Flexibility

BANKING AND BORROWING

If participants are in compliance with their surrender obligations, then their remaining allowances may be banked for use in subsequent compliance periods within the pilot. Allowances issued in the pilot will be valid only for the pilot, although SEMARNAT is tasked to also assess the viability of allowing a share of pilot allowances to be banked into the national ETS. Although the possibility of borrowing is not explicitly stated, surrender of allowances for a given compliance period is done after allocation of allowances for the subsequent compliance period takes place.

OFFSETS AND CREDITS

QUALITATIVE LIMIT: Two types of flexibility instruments are foreseen, both of which will generate “offsets credits” eligible for use under the pilot.

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 are domestic projects that have been validated and verified

under internationally or domestically recognized protocols (as yet unspecified). Emission reductions related to all GHGs will be eligible, though the pilot ETS regulates only CO₂.

Early action: For those projects or mitigation activities operating under recognized protocols that receive offsets before the pilot comes into force, SEMARNAT may issue offsets credits if a certificate of cancellation is presented. These projects will be allowed to continue generating offsets during the pilot.

QUANTITATIVE LIMIT: Participants will be able to meet up to 10% of their compliance obligations with offset or early action credits.

Compliance

COMPLIANCE PERIOD

From 1 January to 31 December

MRV

REPORTING FREQUENCY: Annual self-reporting based on electronic templates prepared by SEMARNAT.

VERIFICATION: Verification by independent accredited verifiers is required by 30 June each year.

FRAMEWORK: A monitoring plan is required from all regulated entities, but noncompliance has no effects on free allocation or ex post adjustments. Report of verified annual CO₂ emissions is made both to the RENE (on top of other obligations that regulated entities have to report to the RENE) and to the ETS registry.

ENFORCEMENT

The system is designed to pose no economic impact on regulated entities; however, in case of noncompliance, entities lose the opportunity to bank unused allowances for the next compliance periods within the pilot. Moreover, noncompliant entities will receive fewer allowances during the operational period of the national ETS (two fewer allowances for each nondelivered allowance during the pilot).

Linking

LINKS WITH OTHER SYSTEMS

The ‘General Law on Climate Change’ foresees possible linkages between the Mexican ETS and ETSS in other countries. Various cooperation activities have taken place in recent years. Mexico signed a Memorandum of Understanding with California in 2014 and with Québec in 2015 that includes cooperation on ETS. In August 2016, Mexico, Québec, and Ontario

issued a joint declaration on carbon markets collaboration. Additionally, in December 2017, Mexico—together with four countries and seven subnational governments—issued the Paris Declaration on Carbon Pricing in the Americas for carbon pricing implementation, which creates a platform for cooperation among countries in the region.

Other Information

INSTITUTIONS INVOLVED

SEMARNAT

National Institute for Ecology and Climate Change (INECC)

EVALUATION/ETS REVIEW

SEMARNAT will annually review the pilot, publishing reports on topics such as price behavior and emissions reductions achieved. An evaluation of the pilot, supported by the INECC and by the Consultative Committee, will also be conducted to determine if adjustments to the ETS design are necessary before the start of the operational period of the program. This evaluation process may involve consultations with civil society and academia. Regulations for the operational period of the Mexican ETS are to be published in 2022.

IMPLEMENTING LEGISLATION

General Law of Climate Change³

Agreement on the establishment of the preliminary basis of the Pilot Program of the Emissions Trading System (implementing regulation of the pilot)⁴

Notice on the cap for the years 2020 and 2021⁵

Notice on the reserve and sectoral allocation of allowances for the years 2020 and 2021⁶

3 - http://www.diputados.gob.mx/LeyesBiblio/pdf/LGCC_130718.pdf

4 - https://www.dof.gob.mx/nota_detalle.php?codigo=5573934&fecha=01/10/2019

5 - https://www.gob.mx/cms/uploads/attachment/file/513702/Aviso_Tope.pdf

6 - https://www.gob.mx/cms/uploads/attachment/file/513701/Aviso_Asignacion_Sectorial.pdf



COLOMBIA

-  **ETS in force**
-  **ETS under development**
-  **ETS under consideration**

Adopted a law outlining provisions for a potential national ETS

Possible connection with the carbon tax

In 2018, Colombia adopted a law for climate change management which outlines provisions for the establishment of a 'National Program of Greenhouse Gas Tradable Emission Quotas' (Programa Nacional de Cupos Transables de Emisión de Gases de Efecto Invernadero [PNCTE]).

The law outlines the basic provisions for the PNCTE. The number of allowances will be determined by the Ministry of Environment and Sustainable Development (Minambiente), in line with Colombia's national mitigation targets. Minambiente is also in charge of allocation, which will take place primarily via auctions. Noncompliance is to be punishable by a fine up to two times the auction price. Auction revenues will be directed to the National Environmental Fund and will be used for GHG reductions and mitigation projects, as well as to manage the information needed for the implementation of the law. The bill also includes crediting provisions: voluntary actions of non-regulated entities that generate GHG emissions reductions or removals could be issued

allowances if they are verified, certified, registered in the National Emission Reductions Registry (Registro nacional de reducción de emisiones de GEI - Renare), and eligible for the program.

Further regulations are yet to be developed in order to operationalize the PNCTE. With support from the Partnership for Market Readiness, Colombia has tasked several teams to provide technical support on the design of the system; these studies are ongoing and more details on the ETS are expected in the course of 2020. Public discussions on the policy will then follow.

The PNCTE will complement other mitigation instruments, such as the country's existing USD 5 carbon tax and its offsetting program, both of which have been in place since 2017. The 2018 Climate Change Law states that the government may also recognize carbon tax payments as part of the compliance obligation of regulated entities.

Background Information

OVERALL GHG EMISSIONS (excl. removals from AFOLU) 237.0 MtCO₂e (2014)

OVERALL GHG EMISSIONS BY SECTOR



Energy 82.5 (35%)
 Industrial processes 10.5 (4%)
 Agriculture, forestry, and other land use 129.5 (55%)
 Waste 14.4 (6%)

GHG REDUCTION TARGETS

BY 2020: Accumulated reduction of GHG emissions of 36 MtCO₂e, with respect to the national reference scenario, between 2018 and 2022 (aspirational)

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

Other Information

INSTITUTIONS INVOLVED

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

BRAZIL



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

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

The Brazilian Business Council for Sustainable Development presented a proposal for a carbon market regulating the industrial sector in Brazil to the former Ministry of Finance (now Ministry of Economy), and the team working on the

Market Readiness Project in Brazil has engaged in talks with representatives of the private sector that support the carbon pricing agenda in Brazil. These activities are intended to spur higher level governmental attention.

Since 2013, a group of leading companies has been participating in a voluntary ETS simulation to gain experience and develop proposals for an ETS in Brazil. In 2019, 26 companies from diverse sectors of the Brazilian economy participated in this exercise. The ETS simulation is coordinated by the Centro de Estudos em Sustentabilidade da Fundação Getulio Vargas. Trading takes place through the Rio de Janeiro Green Stock Exchange.

RenovaBio, the National Policy for Biofuels, was approved in 2017 (Federal Law 13,576), establishing mandatory goals for the reduction of GHG emissions by avoiding the use of fossil fuels. The policy provides for a trading mechanism for emissions reduction units generated from switching from fossil fuels to biofuels, relative to a 100% fossil fuel use scenario. The program should be fully implemented by 2020.

- ETS in force
- ETS under development
- ETS under consideration

← Considering the design of an ETS

RenovaBio provides for trading in emission reductions

Voluntary ETS simulation for some companies

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) **1,036.3 MtCO₂e (2015)**

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

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

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

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

Other Information

INSTITUTIONS INVOLVED

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



CHILE

- ETS in force
- ETS under development
- ETS under consideration

USD 5 carbon tax

Reformed carbon tax to amend the threshold and allow offsets

Considering a market mechanism to trade certified emission reductions

Since 2013, Chile has been conducting a series of studies and discussions on the design and implementation of carbon pricing instruments in the country.

In the tax reform of 2014, a green tax for some fixed sources was introduced. In this context, stationary emission sources over 50MW of installed thermal capacity (MW_t) are subject to a carbon tax—set at USD 5 per tCO₂— as well as to a tax on local pollutants (SO₂, NO_x, and particulate matter).

In 2019, regulatory activities on carbon pricing focused primarily on two elements:

- the further improvement of the carbon tax. A modification of the carbon and local pollutants tax was sent to Congress in 2018 (in the context of a second revision of the tax reform) to change to an emissions-based threshold and include the use of offsets in the tax. The tax reform was approved in January 2020, with offset provisions still under elaboration; and
- the accompanying MRV system (see “MRV” section below).

In addition, the Chilean Ministry of Environment is leading the development of a ‘Framework Law on Climate Change.’ The draft underwent a public consultation process and high-level approval by the Council of Ministers for Sustainability. It sets a carbon neutrality goal by 2050, alongside a detailed governance framework to reach it. Also, the draft law defines a system in which the Ministry of Environment would estab-

lish GHG emissions limits to individual or groups of emitting sources; the surplus in the fulfilment of the emission limits would be certified as an emission reduction by the Ministry of the Environment, and regulated entities would in turn be able to sell this surplus. The law also allows those regulated entities to implement mitigation projects and use the certified reductions to either achieve the standard or transfer those reductions to third parties. A dedicated registry would track the projects and the transfers. The law was sent for Congress’s approval in January of 2020.

Chile will continue its cooperation with the PMR in 2020. Work is expected to focus on a roadmap for implementing the changes to the carbon tax, as well as on deepening the understanding of the role of carbon pricing in carbon neutrality, including the development of the system contained in the draft climate change law.

With regards to offsets and emissions reductions, Chile joined the Warehouse Initiative of the World Bank with the aim of developing a GHG mitigation portfolio of energy projects. These outcomes could potentially be transferred in the context of Article 6 of the Paris Agreement. MRV protocols and third-party verification procedures are part of this Article 6 piloting endeavor. The certification and verification of mitigation results has been piloted using block-chain technology of 10 installations of the public PV roof program.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 111.7 MtCO₂e (2016)



GHG REDUCTION TARGETS

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

BY 2030: 30% reduction of emissions intensity compared to 2007, in terms of CO₂/unit of GDP. Conditional to international funding, 35–45% reduction of emissions intensity compared to 2007, in terms of CO₂/unit of GDP (NDC). An update to the 2030 NDC is currently being considered and is undergoing public consultation.

Compliance

MRV

The current GHG MRV system serves primarily the implementation of the carbon tax. Current regulations determine that operators of boilers and turbines of 50 MW or more of thermal capacity are required to monitor and report emissions through government-approved methodologies. Participation thresholds have been changed by the approved tax reform. With these changes, the carbon tax will apply to entities that emit more than with 25,000 tCO₂ and/or 100 tonnes of particulate matter due to combustion processes per year.

The Chilean government is currently developing a new mandatory air pollutants report under the Pollutant Release and Transfer Register for entities regulated under the tax and other norms. This would unify the various reporting needs and improve the quality of the information provided. This new system, developed with support from the PMR, covers four GHGs and local pollutants, among others. The registry infrastructure is expected to enter operation around March 2020.

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

Other Information

INSTITUTIONS INVOLVED

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

ASIA-PACIFIC





BEIJING

Beijing Pilot Emissions Trading System

- ETS in force
- ETS under development
- ETS under consideration

CAP ~50 MtCO ₂ (2017) ¹	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation	AVERAGE 2019 PRICE CNY 78.60 (USD 11.37)	

SECTORS:



POWER



INDUSTRY



TRANSPORT



BUILDINGS

ETS DESCRIPTION

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

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

YEAR IN REVIEW

Following changes in responsibility at the national level for China's ETS, 2019 saw revisions to the administration of the Beijing ETS. Specifically, the Beijing Municipal Ecology and Environments Bureau released the '2018 Carbon Emission Management and Trading Plan,' which contained updates to implementing legislation.

As part of the revisions to the 'The carbon allowance verification methods of enterprises (units) in Beijing,' the Beijing EEP adjusted the benchmark values of different unit types of power generation enterprises (combined heat and power), increasing their stringency.

Changes to the governance structure and implementing regulation also resulted in slight delays to allowance verification as well as allowance allocation, to varying degrees.

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

Using price floor and ceiling as price stability mechanism

Pioneered cross-regional trading

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) **188.1 MtCO₂e (2012)**

GHG REDUCTION TARGETS

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

¹ - It is estimated to be around this value also in 2018 and 2019, but exact numbers are not available.

ETS Size

GHGs COVERED

CO₂

SECTORS AND THRESHOLDS

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

INCLUSION THRESHOLDS: 5,000 tCO₂/year, considering both direct and indirect emissions.

MANDATORY REPORTING: 2,000 tce energy consumption/year.

POINT OF REGULATION

Downstream. Both direct and indirect emissions are covered.

CAPPED EMISSIONS

~50 MtCO₂

NUMBER OF ENTITIES

903 (2018). In addition, 624 entities have mandatory reporting obligation but no surrender obligations.

CAP

~50 MtCO₂ (2017)



Phases & Allocation

TRADING PERIODS

2013-2019²

ALLOCATION

FREE ALLOCATION: Mainly free allocation through grandparenting based on emissions or emissions intensity in the baseline years (for 2018 allowances, the baseline years are 2009-2012 for stationary sources and 2013-2016 for mobile sources).

Benchmarking is used for new entrants and entities with expanded capacity, as well for the power sector.

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

Flexibility

BANKING AND BORROWING

Banking is allowed. Borrowing is not allowed.

OFFSETS AND CREDITS

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

QUALITATIVE LIMIT: CCERs from energy conservation projects and forestry carbon sink projects are allowed, whereas credits from hydropower, HFC, PFC, N₂O, and SF₆ projects are not eligible. CCERs must come from projects that began operation after the beginning of 2013 (with exceptions for carbon sink projects, for which the date is February 2005).

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

MARKET STABILITY PROVISIONS

The competent authority can auction extra allowances if the weighted average price exceeds CNY 150 (USD 21.34) for 10 consecutive days, and buy-back allowances from the market using a special funding source from the municipal budget if the price is below CNY 20 (USD 2.85).

² – In the short term, the existing Chinese regional carbon markets are expected to operate in parallel with the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions.

VERIFICATION: Third-party verification is required. In addition, further validation is carried out by government-assigned experts and random checks are conducted by fourth-party verifiers. Also, special attention is given to those only with mandatory reporting obligation while their reported emissions are close to 5,000 tCO₂.

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

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

ENFORCEMENT

Penalties for failing to submit emissions or verification reports on time can result in fines up to CNY 50,000 (USD 7,113). Furthermore, companies failing to surrender enough allowances to match their emissions are fined up to five times the average market price over the previous six months for each missing allowance. Other nonfinancial penalties include negative impacts on access to bank loans and subsidy programs.

Other Information

INSTITUTIONS INVOLVED

Beijing Ecology and Environment Bureau
China Beijing Environment Exchange (trading platform and registry)

IMPLEMENTING LEGISLATION

[Beijing Pilot ETS Implementation Plan³](#)
[Interim Measures for the Management Emissions Trading in Beijing⁴](#)

3 – <https://www.bjets.com.cn/article/zcfg/201408/20140800000296.shtml>

4 – http://www.beijing.gov.cn/zhengce/zfwj/zfwj/szfwj/201905/t20190523_72655.html

CHONGQING

Chongqing Pilot Emissions Trading System



CAP ~100 MtCO ₂ e (2018)	GASES Several gases	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation	AVERAGE 2019 PRICE CNY 9.74 (USD 1.41)	

- ETS in force**
- ETS under development**
- ETS under consideration**

ETS DESCRIPTION

Chongqing launched its pilot ETS in June 2014 and to date has concluded five compliance years. The system covers enterprises from seven sectors: power, electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel. The 195 enterprises covered by the system in 2018 accounted for ~50% of the city's total emissions. Among the eight Chinese pilots, the Chongqing ETS is the only one that covers non-CO₂ gases.

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

YEAR IN REVIEW

2019 saw the competition of the transition of ETS-related responsibilities in Chongqing from the Development and Reform Commission (DRC) to the Ecology and Environment Bureau (EEB).

The 2017 allocation plan was released by the Chongqing DRC in March 2018. The plan differs from other pilots in that the Chongqing ETS allowances are allocated based on entities' self-reported demand. 2017 was the first year since the launch of the pilot where the initial cap (100.5 MtCO₂e) was lower than the self-declared demanded amount (103.2 MtCO₂e), indicating a potential allowance shortage for some companies in the market.

SECTORS:



POWER



INDUSTRY

← Only Chinese pilot to cover non-CO₂ gases

Has annual cap reduction rate

Allocation based on entities' self-reported demand

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) ~300 MtCO₂e (2018)

GHG REDUCTION TARGETS

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

ETS Size

GHGs COVERED

CO₂, CH₄, N₂O, HFCs, PFCs, SF₆

CAPPED EMISSIONS

~100 MtCO₂e

50%
(2018)

SECTORS AND THRESHOLDS

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

INCLUSION THRESHOLDS:

20,000 tCO₂/year or energy consumption 10, tce/year

POINT OF REGULATION

Downstream. Both direct and indirect emissions are covered.

NUMBER OF ENTITIES

195 (2018)

CAP

~100 MtCO₂e (2018)

From 2013 to 2015, the annual reduction rate of the cap was 4.13% and afterwards 4.85%.

Phases & Allocation

TRADING PERIODS

2013-2019¹

ALLOCATION

FREE ALLOCATION: Free allocation through grandparenting based on historic emissions (highest number in period 2008-2012). If the sum of allocation for all enterprises exceeds

the cap, a reduction factor is applied. Regulated companies submit their allocation quotas on a yearly basis, forming the basis of their free allocation. Ex-post adjustments based on output data are possible.

Flexibility

BANKING AND BORROWING

Banking is allowed. Borrowing is not allowed.

OFFSETS AND CREDITS

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

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

MARKET STABILITY PROVISIONS

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

SALE AND TRADE LIMITS: Compliance entities must not sell more than 50% of their annual free allocation.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of GHG emissions.

VERIFICATION: Third-party verification is required.

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

ENFORCEMENT

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

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

Other Information

INSTITUTIONS INVOLVED

Chongqing Ecology and Environment Bureau (competent authority)

Chongqing Carbon Emissions Trading Center (trading platform and registry)

IMPLEMENTING LEGISLATION

Interim Measures for Management of Emissions Trading In Chongqing²

Chongqing DRC—Allowance Allocation Management Rules³

Chongqing DRC—Notice about Allowances Allocation for Vintage 2017⁴

2 – <https://tpf.cqggzy.com/news/objects/76.html>

3 – <https://tpf.cqggzy.com/news/objects/77.html>

4 – <https://tpf.cqggzy.com/news/notice/147.html>



FUJIAN

Fujian Pilot Emissions Trading System

- ETS in force**
- ETS under development**
- ETS under consideration**

CAP ~200 MtCO ₂ (2017)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation	AVERAGE 2019 PRICE CNY 16.25 (USD 2.35)	

SECTORS:

- POWER**
- INDUSTRY**
- DOMESTIC AVIATION**

ETS DESCRIPTION

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

By 2020, the selected counties in the province are required to develop forestry projects covering two million acres of forests, achieving an expected one million tonnes of emission reductions annually.

YEAR IN REVIEW

In early 2019, the ETS-related responsibilities in Fujian completed the transition from DRC to the Ecology and Environment Bureau, as a result of the governance restructuring across China.

The system covers nine sectors: electricity, petrochemical, chemical, building materials, iron and steel, nonferrous metals, paper, aviation, and ceramics. Given the prominence of the forestry sector in Fujian, its ETS pilot has a special focus on carbon sinks. In 2017, the Fujian government outlined a plan to promote forestry offsets projects in the province.

The 2018 and 2019 allocation plan was released by the Fujian Provincial Department of Ecology and Environment in June 2019. It includes the same coverage threshold and number of entities as the previous year (255). Almost 50% of the regulated entities (109) are architectural ceramics companies.

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

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

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) **240 MtCO₂e (2014)**

GHG REDUCTION TARGETS

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

ETS Size

GHGs COVERED

CO₂

CAPPED EMISSIONS

~200 MtCO₂



SECTORS AND THRESHOLDS

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

INCLUSION THRESHOLDS:

Energy consumption 10,000 tce/year for any year between 2013-2016.

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

POINT OF REGULATION

Downstream. Both direct and indirect emissions are covered.

NUMBER OF ENTITIES

255 (2018)

CAP

~200 MtCO₂ (2017)

Phases & Allocation

TRADING PERIODS

2016-2019¹

ALLOCATION

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

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

A pre-allocation method is adopted for allowance allocation. At first, entities will receive 70% of the allowances, which are calculated based on their production levels in 2018. Allocation will be adjusted ex post to reflect the actual production in 2019.

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

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

Flexibility

BANKING AND BORROWING

Banking is allowed. Borrowing is not allowed.

OFFSETS AND CREDITS

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

QUALITATIVE LIMIT: Eligible offsets will be restricted to those generated in Fujian province, from CO₂ or CH₄ projects. Hydropower-related credits are not eligible. FFCER projects, with three project types (afforestation, forest management, and bamboo management), need to start implementation after 16 February 2005 and the project developers need to have independent legal personality.

MARKET STABILITY PROVISIONS

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

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

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions.

VERIFICATION: Third-party verification is required. In addition, further validation is carried out by government-assigned experts and random checks are conducted by fourth-party verifiers. Special attention is also given to those only with mandatory reporting obligation while their reported emissions are close to 5,000 tCO₂.

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

ENFORCEMENT

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

Other Information

INSTITUTIONS INVOLVED

Fujian Provincial Department of Ecology and Environment (competent authority)

Fujian Haixia Equity Exchange (trading platform)

Fujian Economic and Information Center (registry, market management, and MRV administration)

IMPLEMENTING LEGISLATION

[Implementation Plan of Emissions Trading Market Construction in Fujian Province²](#)

[Interim Measures for the Management of Emissions Trading in Fujian Province³](#)

[Fujian Provincial Department of Ecology and Environment—Allocation Plan for Vintage 2018 and 2019 \(Chinese\)⁴](#)

2 – gxt.fujian.gov.cn/xw/jxyw/201610/t20161008_2106701.htm

3 – http://www.fujian.gov.cn/zc/zfxxgk/gkml/jgzz/fgfz/201610/t20161002_1135886.htm

4 – http://sthjt.fujian.gov.cn/zwgk/gsgg/qtgkgs/201906/t20190617_4901198.htm

GUANGDONG

Guangdong Pilot Emissions Trading System



CAP ~465 MtCO ₂ (2019)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation Auctioning	AVERAGE 2019 PRICE CNY 23.20 (USD 3.36)	TOTAL REVENUE Since beginning of program: CNY 804 million (USD 114 million) No revenue in 2019 (no auctions took place in 2019)

- ETS in force**
- ETS under development**
- ETS under consideration**

SECTORS:

- POWER**
- INDUSTRY**
- DOMESTIC AVIATION**

ETS DESCRIPTION

The Guangdong Pilot ETS was launched in December 2013 and is the largest of the Chinese ETS pilots. Following a scope expansion in 2016 the ETS now covers the power, cement, steel, petrochemical, papermaking, and domestic aviation sectors, accounting for more than 60% of the province's emissions.

The Guangdong Pilot ETS has one of the most active markets among Chinese pilots with the largest market share. Unlike other pilots, Guangdong auctions a small share of allowances.¹ The auctioning has been moved from mandatory (2013) to voluntary participation (since 2014) and has been held ad hoc (rather than quarterly) since 2017. Guangdong and Shenzhen are the only two Chinese pilots open to foreign investors. In November 2016, Guangdong increased the maximum position of institutional and individual investors from three million to eight million allowances.

Guangdong also allows unincorporated organizations, such as funds and trusts, to trade in its carbon market. As of 2019, it had 87 institutional investors.

YEAR IN REVIEW

The 2019 allocation plan was released by the Department of Ecology and Environment of Guangdong in November. The plan includes revisions to the allocation methodology, including expansion of benchmarking to co-generation as well as refinements to the benchmarks for the iron and steel sector. In addition, the number of allowances available for auction increased from two million tonnes in 2018 to five million tonnes in 2019.

← *Largest Chinese pilot*

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

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) **610.5 MtCO₂e (2012)**

GHG REDUCTION TARGETS

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

ETS Size

GHGs COVERED

CO₂

CAPPED EMISSIONS

~465 MtCO₂



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

SECTORS AND THRESHOLDS

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

INCLUSION THRESHOLDS:

20,000 tCO₂/year or energy consumption 10,000 tce/year.

POINT OF REGULATION

Downstream. Both direct and indirect emissions are covered.²

NUMBER OF ENTITIES

242 existing entities (2019)

37 new entrant entities (2019)

CAP

465 MtCO₂ (2019), among which 27 MtCO₂e are kept as government reserves for new entrants and market stability.

Phases & Allocation

TRADING PERIODS

2013-2019³

ALLOCATION

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

AUCTIONING: Guangdong auctions a small share of allowances as a form of allowance allocation. During the first compliance year (2013), entities were required to purchase allowances in auctions in order to become eligible to receive their freely allocated allowances. This requirement was terminated in 2014. Since 2014, free allocation percentages remain the same, i.e., 95% for the power sector and 97% for the remaining sectors. In 2019, the government auction allowance was adjusted from two million allowances in previous years to five million allowances in 2019. Quarterly auctions were held until 2016, while in 2017 and 2018 auctions were ad hoc. No auction took place in 2018 or 2019.

Flexibility

BANKING AND BORROWING

Banking is allowed. Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Chinese Carbon Offset Credits (CCERs) are allowed. As a mechanism that encourages the public to reduce carbon emissions, Pu Hui Certified Emission Reductions (PHCER) were also allowed during 2017 and 2018. In 2018, entities were allowed to make use of 1.5 million offsets (CCER and PHCER) towards compliance obligations. The number of 2019 has not yet been announced.

QUALITATIVE LIMIT: Of the annual compliance obligation met by offsets, at least half must be from CO₂ or CH₄ reduction projects. At least 70% of offsets need to come from within Guangdong province. Pre-CDM credits are not eligible. Credits from hydro and from most fossil fuel projects are also not eligible.

MARKET STABILITY PROVISIONS

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

AUCTION FLOOR PRICE: Auctions under the Guangdong Pilot ETS are subject to an auction floor price. Initially in 2013, it was set at CNY 60 (USD 8.54), and then it was lowered to CNY 25 (USD 3.56) and increased to CNY 40 (USD 5.69) in steps of CNY 5 (USD 0.71) with each quarterly auction. In 2015, the floor price was set at 80% of the weighted average price for allowances over the previous three months. In 2016, there was no restriction on the declared price, but a so-called policy reserve price was set as an effective price floor. In 2017, the policy reserve price was set at 100% of the weighted average price for allowances over the previous three months. The policy reserve prices for the four auctions for the 2016 compliance period are as follows: (21 June 2016–20 June 2017) were CNY 9.37 (USD 1.33), CNY 11.27 (USD 1.60), CNY 16.09 (USD 2.29), and CNY 15.15 (USD 2.16).

OFFSET AUCTIONS: Guangdong also introduced auctioning for PHCERs with an auction reserve price set by the Emissions Exchange Guangzhou on behalf of offset project developers. In the latest auction (28 November 2019), the reserve price for one offset project was set as CNY 19.61/tonne (USD 2.79) (80% of the weighted average price for allowances over the previous three months). For the other two, it was set as CNY 24.51/tonne (USD 3.49) (100% of the weighted average price for allowances over the previous three months).

² – The electricity market in Guangdong has undergone some changes following the national power sector reform process. Guangdong's electricity spot market was officially launched at the end of 2018, and it is planned that by 2020, the electricity trading volume in the market will account for no less than 60% of the power generation in Guangdong province.

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

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions.

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

FRAMEWORK: The Department of Ecology and Environment of Guangdong has released guidelines for monitoring and reporting for the compliance and reporting sectors.

OTHER: Industrial enterprises with annual carbon emission of more than 5,000 tonnes and less than 10,000 tonnes are required to report. Verification is not required.

ENFORCEMENT

Penalties for failing to submit emissions or verification reports on time range from CNY 10,000 (USD 1,423) to CNY 50,000 (USD 7,113). Furthermore, companies failing to surrender enough allowances to match their emissions will be deducted twice the amount of allowances from the following year's allocation and are fined CNY 50,000 (USD 7,113). Other nonfinancial penalties include negative impacts on access to bank loans and subsidy programs.

Other Information

INSTITUTIONS INVOLVED

Guangdong Ecology and Environment Bureau (competent authority)

Emissions Exchange Guangzhou (trading platform)

USE OF REVENUES

Guangdong has been exploring the establishment of a Low Carbon Development Fund that would use auctioning revenues to promote further mitigation actions, carbon finance, and low-carbon industry development. However, due to the change of competent authority, further information regarding the project has not been released.

IMPLEMENTING LEGISLATION

[Guangdong Pilot ETS Implementation Plan](#)⁴

[Trial Measures for Emissions Trading in Guangdong](#)⁵

[Department of Ecology and Environment of Guangdong—Allocation Plan for Vintage 2019](#)⁶

4 – http://zwgk.gd.gov.cn/006939748/201209/t20120914_343489.html

5 – http://zwgk.gd.gov.cn/006939748/201401/t20140117_462131.html

6 – http://gdee.gd.gov.cn/shbtwj/content/post_2675260.html



HUBEI

Hubei Pilot Emissions Trading System

- ETS in force**
- ETS under development**
- ETS under consideration**

SECTORS:



POWER



INDUSTRY

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

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

Leading development of national ETS registry

CAP 256 MtCO ₂ (2018)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation	AVERAGE 2019 PRICE CNY 32.05 (USD 4.64)	TOTAL REVENUE Since beginning of program: CNY 122.74 million (USD 17.45 million) ¹ Collected in 2019: CNY 122.74 million (USD 17.45 million)

ETS DESCRIPTION

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

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

According to the compliance notice by the Hubei Development and Reform Commission (DRC) in July 2017, the Hubei Pilot ETS will continue to run after the National ETS commences. However, only allowances that were traded can be banked into later years. The transition of Hubei allow-

ances into the National ETS will be based on rules to be defined by the national competent authority. In December 2017, Hubei was selected to lead the development of the registry for the national ETS.

YEAR IN REVIEW

In early 2019, the ETS-related responsibilities in Hubei completed the transition from DRC to the Department of Ecology and Environment (DEE) of Hubei, as a result of the governance restructuring across China.

The 2018 allocation plan was released by the Department of Ecology Environment of Hubei in July 2019. The key changes compared to the previous year's plan include a tighter allocation rule, expanding coverage to the water supply sector, and change of the allocation method of heat and cogeneration from a benchmark approach to one based on historical intensity.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 463.1 MtCO₂e (2012)

GHG REDUCTION TARGETS

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

¹ – One auction of four millions allowances took place in 2014 for which information surrounding the revenue is not available. The objective of the auction was to discover the market price and enhance market liquidity, rather than as a way of allowance allocation.

ETS Size

GHGs COVERED

CO₂

SECTORS AND THRESHOLDS

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

INCLUSION THRESHOLDS: Annual energy consumption more than 10,000 tce in any year between 2015 and 2017.

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

CAPPED EMISSIONS

~256 MtCO₂



45%
(2018)

POINT OF REGULATION

Downstream. Both direct and indirect emissions are covered.

NUMBER OF ENTITIES

338 (2018)

CAP

~256 MtCO₂ (2018)

Phases & Allocation

TRADING PERIODS

2014-2019²

ALLOCATION

FREE ALLOCATION: Free allocation of 2018 vintage allowances through benchmarks for power and cement (except the entities using outsourced clinker).

Historical emissions intensity for heat, co-generation, glass and other building materials, and the pulp and papers sectors; grandparenting based on previous three years' historic emissions for all other sectors.

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

The total cap also includes a new entrants reserve, as well as a government reserve for potential market stability measures.

AUCTIONING: In November 2019, through two separate auctions 5 million allowances were made available from the government reserve. The auctions operated with a reserve price set at the weighted spot market price from 30 October 2017 to 30 October 2019.

The first auction was restricted to compliance entities. Two million allowances were offered with 1.49 million sold at an average price of CNY 24.65 (USD 3.50). Remaining allowances were made available to covered entities as well as other market participants. The total auction volume was 3.51 million tonnes, including 0.51 million that was left from the first auction. The average price was CNY 24.49 (USD 3.48).

Flexibility

BANKING AND BORROWING

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

OFFSETS AND CREDITS

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

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

² - In the short term, the existing Chinese regional carbon markets are expected to operate parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.

³ - In this case, entities first receive half of the total allowance based on the previous year's actual emission data or historical emission baseline; the actual production data is then used to update allocation ex-post.

MARKET STABILITY PROVISIONS

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

INTERVENTION: In case of market fluctuations, severe imbalances between supply and demand, or liquidity issues, the Hubei EEB—in consultation with an advisory committee consisting of government institutions and other stakeholders – can buy or sell allowances in order to stabilize the market.

Specifically, if the allowance price reaches a low or high point six times during a 20-day time span, the Hubei EEB takes action.

EXCHANGE: The exchange limits day-to-day price fluctuations to between -10% and +10% respectively.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions.

VERIFICATION: Third-party verification is required. In addition, further validation is carried by government-assigned experts and random checks are conducted by fourth-party verifiers. Special attention is also given to those only with mandatory reporting obligation while its reported emissions are close to 26,000 tCO₂.

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

ENFORCEMENT

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

Other Information

INSTITUTIONS INVOLVED

Department of Ecology Environment of Hubei Province (competent authority)

China Hubei Emission Exchange (trading platform and registry)

IMPLEMENTING LEGISLATION

[Hubei Pilot ETS Implementation Plan⁴](#)

[Interim Measures for Management of Emissions Trading in Hubei Province⁵](#)

[Department of Ecology Environment of Hubei Province—Allocation Plan for Vintage 2018⁶](#)

4 – http://www.hubei.gov.cn/zfwj/ezbf/201302/t20130227_1713131.shtml

5 – http://www.hubei.gov.cn/zfwj/szfl/201404/t20140422_1711157.shtml

6 – http://211.136.65.167/cache/www.hbets.cn/wcs/Upload/201908/5d47d1d5414cf.pdf?ch_arg2=117-05155803001365_31221d91f125d70c273650886f209d73_10001002_9c896329d2c0f3d69632518939a83798_46321fb8caf1bae8a39f083d49622407

SHANGHAI

Shanghai Pilot Emissions Trading System



CAP ~158 MtCO ₂ (2018)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation Auctioning	AVERAGE 2019 PRICE CNY 40.46 (USD 5.86)	TOTAL REVENUE Since beginning of program: CNY 18.17 million (USD 2.58 million) Collected in 2019: CNY 3.52 million (USD 0.50million)

- ETS in force**
- ETS under development**
- ETS under consideration**

SECTORS:

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

ETS DESCRIPTION

Shanghai was the second Chinese region, after Shenzhen, to start its pilot ETS in November 2013 and has concluded five compliance years so far. The pilot covers more than half of the city's emissions, including power, industry, and non-industrial sectors such as building, aviation, and shipping. It is the only pilot that has achieved almost 100% compliance rate continuously since its launch. In 2016 Shanghai expanded its ETS coverage by adding the shipping sector, as well as lowering the threshold of exiting power and industries (which were included in the 2013–2015 phase) to 10,000 tCO₂/year.

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

In December 2017, Shanghai was selected to lead the development of the trading platform for the national ETS.

YEAR IN REVIEW

In early 2019, the ETS-related responsibilities in Shanghai completed the transition from the Development and Reform Commission (DRC) to the Ecology and Environment Bureau (EEB), as a result of the governance restructuring across China.

The 2018 allocation plan was released by the Shanghai DRC in December 2018. No significant changes were implemented compared to the allocation plan of the previous year.

← *Broad sector coverage with 100% compliance rate since launch*

Active offset trading market, pioneered spot forward trading

Leading development of national trading platform

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) **297.7 MtCO₂e (2012)**

GHG REDUCTION TARGETS

BY 2020: 20.5% reduction in carbon intensity compared to 2015 levels. The total CO₂ emissions to be limited within 250 million tonnes.

ETS Size

GHGs COVERED

CO₂

SECTORS AND THRESHOLDS

Airports, domestic aviation, chemical fibers, chemicals, commercial, power and heat, water suppliers, hotels, financial, iron and steel, petrochemicals, ports, shipping, nonferrous metals, building materials, paper, railways, rubber, and textiles.

INCLUSION THRESHOLDS:

For power and industry: 20,000t CO₂/year or 10,000 tonnes tce/year; and those that already participated in the 2013-2015 phase with 10,000 tCO₂/year or 5,000 tce/year.

For Transport: 10,000t CO₂/year or 5,000 tce/year (aviation and ports), 100,000t CO₂/year or 50,000 tce/year (shipping), considering both direct and indirect emissions.

For Buildings: 10,000t CO₂/year or 5,000 tce/year.

CAPPED EMISSIONS

~158 MtCO₂



57%
(2018)

POINT OF REGULATION

Downstream. Both direct and indirect emissions are covered.

NUMBER OF ENTITIES

298 (2018)

CAP

158 MtCO₂e (2018, including both free allocation and reserve)

Phases & Allocation

TRADING PERIODS

Two trading periods: first period 2013-2015, second period 2016; no specific ending year.¹

ALLOCATION

FREE ALLOCATION: Free allocation based on sector-specific benchmarks (power, heat, manufacturers); historic emissions intensity (industry, aviation, car glass, ports, shipping, and water suppliers, generally based on 2015-2017 data); or historic emissions (buildings, commercial sector, industry with complex products or considerable change in emission boundary, and airports, generally based on 2015-2017 data). Ex-post allocation adjustments, e.g., on the basis of production data, are applied for those with historic intensity or benchmarking allocations.

AUCTIONING: A small share of the annual cap could be auctioned. The purpose of auctions is to provide compliance entities with additional supply to meet their compliance demand. Shanghai auctioned two million tonnes from the government reserve in November 2019, with a floor price set at 1.2 times the weighted on-exchange allowance price from 1 August 2018 to 28 November 2019—CNY 48 (USD 6.83). The auction cleared at the floor price and a total of 73,421 allowances were sold (3.7% of total auction volume). An auction of two million allowances was held in July 2018. 15% of allowances were sold, at the floor price of CNY 41.54 (USD 6.28).

Flexibility

BANKING AND BORROWING

Banking is allowed both within and across compliance periods, with some restrictions for the latter. For banked allowances from the first trading period (2013-2015), only one-third can be used per year between 2016 and 2018 by compliance entities; allowances are fully bankable for institutional investors, with some restrictions for OTC deals. Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Domestic project-based carbon offset credits—CCERs—are allowed. Since 2016 the use of CCER credits is limited to 1% of the annual allocation. Between 2013 and 2015 the limit was 5%.

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

QUALITATIVE LIMIT: Credits for reductions that were realized before January 2013 cannot be used for compliance. Credits from hydro projects are not allowed.

RESERVE: In addition, a small share of annual cap could be kept in a reserve for auctioning before the end of the annual compliance cycle as a market stability measure (see “Auctions” section).

MARKET STABILITY PROVISIONS

EXCHANGE: Depending on transaction types, if prices vary more than 10% or 30% in one day, the Shanghai Environment and Energy Exchange can take price stabilization measures such as temporarily suspending trading or imposing holding limits.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions.

VERIFICATION: Third-party verification is required. Besides this, the government also conducts quality checks.

FRAMEWORK: The Shanghai DRC has released monitoring and reporting guidelines for the following sectors: iron and steel, electricity and heat, chemicals, nonferrous metals, non-metallic mineral products, textiles and paper, aviation, shipping, large buildings (hotels, commercial, and financial), and transport stations.

ENFORCEMENT

Penalties for failing to submit an emissions report or verification report on time or providing fraudulent information range from CNY 10,000 (USD 1,512) to CNY 50,000 (USD 7,558). Between CNY 50,000 (USD 7,558) and CNY 100,000 (USD 15,115) can be imposed for noncompliance, besides surrendering the adequate amount of allowances. Further sanctions may also be imposed, such as entry into the credit record of the company, publication on the internet, cancellation of ability to access special funds for energy conservation, and emissions reduction measures.

Other Information

INSTITUTIONS INVOLVED

Shanghai Ecology and Environment Bureau (competent authority)
Shanghai Environment and Energy Exchange (trading platform)
Shanghai Information Center (registry)

USE OF REVENUES

The revenues are submitted to the general municipality budget.

IMPLEMENTING LEGISLATION

Shanghai Pilot ETS Implementation Plan²
Trial Measures for Management of Emissions Trading in Shanghai³
Shanghai DRC—Allocation Plan for Vintage 2018⁴
Shanghai DRC—Allocation Plan for Vintage 2017⁵

2 – <http://www.shanghai.gov.cn/nw2/nw2314/nw2319/nw12344/u26aw32789.html?date=2012-07-31>

3 – <http://www.shanghai.gov.cn/nw2/nw2314/nw2319/nw2407/nw31294/u26aw37414.html>

4 – <http://www.shanghai.gov.cn/nw2/nw2314/nw2319/nw12344/u26aw57621.html?date=2018-12-18>

5 – <http://www.shanghai.gov.cn/nw2/nw2314/nw2319/nw12344/u26aw54538.html?date=2017-12-28>



SHENZHEN

Shenzhen Pilot Emissions Trading System

- ETS in force**
- ETS under development**
- ETS under consideration**

SECTORS:

- POWER**
- INDUSTRY**
- TRANSPORT**
- BUILDINGS**

First Chinese pilot to launch

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

Total trading volume more than CNY 1 billion

CAP ~31.45 MtCO ₂ (excluding buildings, 2015) ¹	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation	AVERAGE 2019 PRICE CNY 13.70 (USD 1.98)	TOTAL REVENUE Since beginning of program: CNY 2.6 million in 2014 ² (USD 390,000) Collected in 2018: No auctions took place in 2018.

ETS DESCRIPTION

The Shenzhen Pilot ETS, which began in June 2013, was the first of the Chinese pilot ETSs to start operation. It is the only Chinese pilot at the sub-province level, and it covers a broad scope across the energy, industry, building, and transport sectors. The Shenzhen Pilot ETS covers a total of 794 entities (2017). A unique feature of the Shenzhen Pilot ETS is its legal basis. While the majority of pilots are regulated by subnational government orders by the executive body of the government, the Shenzhen Pilot ETS is regulated by a dedicated ETS bill passed by its municipal legislator, the Shenzhen People's Congress. This provides more legal stability.

Shenzhen also has pioneered cross-regional cooperation. In 2014, Shenzhen and Baotou signed the 'Memorandum of Strategic Cooperation on the Construction of Carbon Trading Systems.'

As a consequence of this, six companies in Baotou city of the Inner Mongolia Autonomous Region were covered in Shenzhen market on a voluntary basis as of June 2016.³

YEAR IN REVIEW

In early 2019, the ETS-related responsibilities in Shenzhen completed the transition from DRC to the Ecology and Environment Bureau (EEB), as a result of the governance restructuring across China.

Shenzhen is one of the most active regional markets in China, despite its relatively small size compared to other pilots. As of 25 July 2018, its accumulated transaction amount reached CNY 1.091 billion (USD 0.165 billion), with total volume of 35.7 million tonnes, which makes it the first pilot in China to reach CNY 1 billion (USD 0.151 billion). Shenzhen's allocation plans for 2017 and 2018 have not been made publicly available.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF)	83.45 MtCO₂e (2010)
---	---------------------------------------

GHG REDUCTION TARGETS

- BY 2020:** 45% reduction in carbon intensity compared to 2005
- BY 2022:** Shenzhen has pledged to peak its GHG emissions by 2022, as one of the first group of cities in China to endorse such a peak year target

ETS Size

GHGs COVERED
CO₂

CAPPED EMISSIONS
~31.45 MtCO₂



1 - No more recent data has been made public by the competent authority.
2 - The objective of the auction was to increase market supply, and not as a means of allowance allocation.
3 - In June 2017, the companies from Baotou completed the first compliance. No further information is available on the subsequent compliance years.

SECTORS AND THRESHOLDS

Power, water, gas, manufacturing sectors, buildings, port and subway sectors, public buses, and other non-transport sectors.

INCLUSION THRESHOLDS: Annual emissions of 3,000 tCO₂e/year for enterprises; large public buildings and 10,000m² for government buildings.

POINT OF REGULATION

Downstream. Both direct and indirect emissions are covered.

NUMBER OF ENTITIES

794 (2017)

CAP

31.45 MtCO₂ (excluding buildings, 2015)

Phases & Allocation

TRADING PERIODS

2013-2019⁴

ALLOCATION

FREE ALLOCATION: Allowances are largely distributed for free. Benchmarking is applied to the water, power, and gas sectors based on sectoral historical emissions intensity.

Grandparenting is applied to port and subway sectors, public buses, and other non-transport sectors based on the entity's historical emissions intensity. Allowance allocation is adjusted ex post based on output data.

Although the 'Interim Measure for the Administration of Carbon Emission Trading of Shenzhen' states that at least 3% of allowances should be auctioned, this has not been implemented. So far, only one auction took place (in June 2014) in order to increase market supply.

Flexibility

BANKING AND BORROWING

Banking is allowed. Borrowing is not allowed. Unlike other pilots, Shenzhen releases its annual allowances before the compliance date of the previous vintage but does not allow them to be used for the purpose for previous vintage compliance.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Domestic project-based carbon offset credits (CCERs) are allowed. The use of CCER credits is limited to 10% of the annual compliance obligation.

QUALITATIVE LIMIT: Credits from hydro projects are not eligible and additional geographic restrictions apply to the use of certain CCERs.

MARKET STABILITY PROVISIONS

INTERVENTION: In case of market fluctuations, the Shenzhen EEB can sell extra allowances from a reserve at a fixed price. Such allowances can be used only for compliance and cannot be traded. The EEB can also buy back up to 10% of the total allocation.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions with a tiered approach taking into account the size of the company. A quarterly emissions report is also submitted. In addition, covered industrial entities must annually submit a statistical indicator data report.

VERIFICATION: Third-party verification of the emissions report is required. Covered entities cannot use the same verifiers for three consecutive years. For the statistical indicator data report, the municipal statistical department may entrust the statistical indicator data verification agency to verify. In addition, further random checks of emission reports and verification reports are conducted by the government. The proportion of these checks shall not be less than 10% of the total number of covered entities. The competent authority may assign this inspection work to a specialized agency.

⁴ - In the short term, the existing Chinese regional carbon markets are expected to operate parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.

FRAMEWORK: The Shenzhen DRC has released a guiding document on monitoring and reporting that includes sector-specific guidance for the covered sectors.

ENFORCEMENT

Institutes providing false information can be fined for the difference between reported and actual emissions at three times the average allowance price of the past six months. Penalties for disturbing the market order can cost up to CNY 100,000 (USD 15,115). Companies failing to surrender enough allowances to match their emissions are fined three times the average market price of the past six months.

The missing allowances can be withdrawn from the account of the company or deducted from next year's allocation. Other nonfinancial penalties include public reporting, reporting to relevant credit information of public banks, disqualification from financial subsidies (for five years), and a record entered in the State-Owned Enterprise performance assessment system.

Other Information

INSTITUTIONS INVOLVED

Shenzhen DRC (competent authority)—the responsibility is expected to move to the Human Settlements and Environment Commission of Shenzhen Municipality in the course of 2020

China Shenzhen Emissions Exchange (trading Platform and Registry)

EVALUATION/ETS REVIEW

No formal evaluation has been conducted. Research on improving Shenzhen ETS has been undertaken every year, funded by Shenzhen DRC.

IMPLEMENTING LEGISLATION

[Shenzhen Special Economic Zone ETS Bill⁵](#)

[Interim Measures for Management of Emissions Trading in Shenzhen⁶](#)

Shenzhen DRC—Notice of Carrying Out Emissions Trading Work for Vintage 2016

5 - <http://www.cerx.cn/szPolicy/377.htm>

6 - <http://www.cerx.cn/szPolicy/385.htm>

TIANJIN

Tianjin Pilot Emissions Trading System



CAP ~160–170 MtCO ₂ (2017)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation Auctioning	AVERAGE 2019 PRICE CNY 13.69 (USD 1.98)	REVENUE COLLECTED IN 2019 CNY 15.7 million (USD 2.23 million)

- ETS in force**
- ETS under development**
- ETS under consideration**

ETS DESCRIPTION

Tianjin launched its pilot ETS in December 2013 and has concluded six compliance years so far. The system covers heat and electricity production; iron and steel; petrochemicals; chemicals; and oil and gas exploration. The papermaking, aviation, and building materials sectors were also added in 2019. Covered entities account for 50-60% of the city's total emissions. Despite not having any financial penalties in place, Tianjin has achieved full or close to full compliance since its launch.

YEAR IN REVIEW

2019 saw changes to the governance of the Tianjin ETS as well as to the design of the system. With regards to gover-

nance, responsibility for the Tianjin ETS was moved from the Tianjin Development and Reform Commission (DRC) to the Ecology and Environment Bureau (EEB). With regards to design, the Tianjin ETS was expanded to also cover enterprises from the building materials, papermaking, and aviation sectors that previously only reported. Furthermore, allowance auctions were also held for the first time in 2019.

Changes to the governance and design of the system are outlined in the 'Interim Measure for Management of Emissions Trading in Tianjin (Revised Draft)' that was published in November.

SECTORS:

- POWER
- INDUSTRY
- DOMESTIC AVIATION

← Despite small number of regulated entities, covers more than half city's emissions due to high concentration of GHG in industrial sectors

High rates of compliance despite no financial penalties in place

Covers the aviation sector since 2019

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) ~215 MtCO₂e (2012)

GHG REDUCTION TARGETS

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

ETS Size

GHGs COVERED

CO₂

SECTORS AND THRESHOLDS

Heat and electricity production, iron and steel, petrochemicals, chemicals, and exploration for oil and gas. Papermaking, aviation, and building materials from 2019.

INCLUSION THRESHOLDS: 20,000t CO₂/year considering both direct and indirect emissions.

POINT OF REGULATION

Downstream. Both direct and indirect emissions are covered.

CAPPED EMISSIONS

~160–170 MtCO₂

NUMBER OF ENTITIES

107 in 2018. 113 in 2019.

CAP

160-170 MtCO₂ (2017)



Phases & Allocation

TRADING PERIODS

2013-2019¹

ALLOCATION

FREE ALLOCATION: Mainly free allocation through grandparenting based on 2009–2012 emissions or on emissions intensity. Benchmarking for new entrants and expanded capacity.

AUCTIONING: Tianjin EEB held its first allowance auction in June 2019. Two million tonnes were on offer with the auction clearing at CNY 14.63/tonne (USD 2.08).

Flexibility

BANKING AND BORROWING

Banking is allowed. Borrowing is not allowed.

OFFSETS AND CREDITS

QUANTITATIVE LIMIT: Domestic project-based China Carbon Offset Credits—CCERs—are allowed. The use of CCER credits is limited to 10% of the annual compliance obligation.

QUALITATIVE LIMIT: Credits must stem from CO₂ reduction projects, excluding hydro. They must be realized after 2013.

MARKET STABILITY PROVISIONS

INTERVENTION: In case of market fluctuations, the Tianjin EEB can buy or sell allowances in order to stabilize the market.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of CO₂ emissions.

VERIFICATION: Third-party verification is required. Covered entities cannot use the same verifiers for three consecutive years.

FRAMEWORK: The Tianjin DRC has released a guiding document on monitoring and reporting that includes sector-specific guidance for the covered sectors, which EEB, as the competent authority since 2019, is continuing to improve.

ENFORCEMENT

In case of noncompliance, companies are disqualified for three years for preferential financial support and other national supporting policies, e.g., on recycling economy, energy-saving measures, and emission reductions. There are no financial penalties for noncompliance.

Other Information

INSTITUTIONS INVOLVED

Tianjin Ecology and Environment Bureau
Tianjin Climate Exchange (trading platform and registry)

IMPLEMENTING LEGISLATION

[Tianjin Pilot ETS Implementation Plan](#)²
[Interim Measure for Management of Emissions Trading in Tianjin](#)³
[Interim Measure for Management of Emissions Trading in Tianjin \(2016\)](#)⁴
[Interim Measure for Management of Emissions Trading in Tianjin \(2018\)](#)⁵

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

2 – http://gk.tj.gov.cn/gkml/000125022/201303/t20130305_8506.shtml

3 – http://gk.tj.gov.cn/gkml/000125022/201312/t20131223_8606.shtml

4 – http://gk.tj.gov.cn/gkml/000125022/201604/t20160406_8866.shtml

5 – http://www.tj.gov.cn/zw/zfgb/qk/2018/11_3412/201811/t20181108_3635676.html

NEW ZEALAND

The New Zealand Emissions Trading Scheme (NZ ETS)



COVERAGE 38.1 MtCO ₂ e	GASES Several gases	OFFSETS AND CREDITS International (Prior to 1 June 2015)
ALLOCATION Free allocation: benchmarking Auctioning (expected as of late 2020)	AVERAGE 2019 PRICE¹ NZD 24.82 (USD 16.33)	REVENUE COLLECTED IN 2019 NZD 434, 659,647 (USD 285,960,294) (money paid to meet surrender obligations)

- ETS in force
- ETS under development
- ETS under consideration

ETS DESCRIPTION

The NZ ETS was launched in 2008. Originally designed to cover the whole economy, it has broad sectoral coverage, including forestry as a source of both emissions and units. Biological emissions from agriculture currently have only reporting obligations and no surrender obligations. However, the government is proposing that biological emissions will be priced at the farm level from 2025. The 'Climate Change Response Act 2002' sets the legislative framework for the NZ ETS.

The NZ ETS was conceived as a nested system under the Kyoto Protocol, with full links to international carbon markets. However, as of 1 June 2015, the NZ ETS became a domestic-only system. Following its second statutory review, the government is proposing legislative reform of the NZ ETS to improve its design and operation, and its alignment with New Zealand's Paris Agreement commitments. A link to high-integrity international carbon markets could form part of New Zealand's strategy for meeting its NDC and its 2030 target.

YEAR IN REVIEW

Following the second review process of the NZ ETS, the government decided on further reforms to the system in 2019. These include phasing down industrial allocation starting in 2021, canceling and replacing units from the first commitment period of the Kyoto Protocol, introducing averaging accounting for the forestry sector, and confirming a new repayment penalty.

The New Zealand government also reached an agreement with the agricultural sector to foster on-farm emissions reductions and work towards implementing farm-level pricing by 2025. These changes, as well as additional changes decided on throughout 2018, have been incorporated into an amendment to the 'Climate Change Response Act 2002' titled the 'Climate Change Response (Emissions Trading Reform) Amendment Bill.' While some amendments to the 'Climate Change Response Act' passed into law in October 2019, the Climate Change Response (Emissions Trading Reform) Amendment Bill is currently being reviewed by the Environmental Select Committee and is expected to be enacted in mid-2020.

SECTORS:

- POWER
- INDUSTRY
- DOMESTIC AVIATION*
- TRANSPORT*
- BUILDINGS*
- WASTE
- FORESTRY
- AGRICULTURE (reporting obligations only)

* Sector covered upstream

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 81.0 MtCO₂e (2017)



GHG REDUCTION TARGETS

- BY 2020:** 5% reduction from 1990 GHG levels
- BY 2030:** Reduce emissions 30% below 2005 levels (NDC)

CLIMATE CHANGE RESPONSE (ZERO CARBON) AMENDMENT

- ACT 2019: BY 2050:** Reduce net emissions of all greenhouse gases (except biogenic methane) to zero
- BIOGENIC METHANE TARGET: BY 2030:** Reduce biogenic methane emissions 10% below 2017 levels, and by 24%–47% by 2050

Energy (road transport and electricity production) 32.9 (41%)
Industrial Processes and Product Use 5.1 (6%)
Agriculture 39.0 (48%)
Waste 4.1 (5%)

← Broad ETS sectoral coverage, including forestry

Implementing market stability measures

Considering how agriculture could enter ETS

¹ – Average secondary market price

ETS Size

GHGs COVERED

CO₂, CH₄, N₂O, SF₆, HFCs, and PFCs

SECTORS AND THRESHOLDS

Sectors were gradually phased in over time.

2008: Forestry (mandatory: deforesting pre-1990 forest land; voluntary: post-1989 forest land).

2010: Stationary energy (various thresholds), industrial processing (various thresholds), and liquid fossil fuels (various thresholds).

2013: Waste (except for small and remote landfills) and synthetic GHGs (various thresholds). Synthetic GHGs not in the NZ ETS are subject to an equivalent levy.

Biological emissions from agriculture must be reported but face no surrender obligations. By 2025, a carbon price will be levied on agricultural emissions, at farm-level for livestock, and at processor level for fertilizer.

POINT OF REGULATION

The point of obligation is generally placed upstream.

Some large businesses that purchase fossil fuels directly from mandatory NZ ETS participants can choose to opt into the NZ ETS rather than have the costs passed down from their suppliers.

NUMBER OF ENTITIES

2,409 entities registered, of which 2,334 have surrender obligations (as of June 2019).

200 entities with mandatory reporting and surrender obligations (as of June 2019).

COVERED EMISSIONS

38.1 MtCO₂e

~51%²

2,134 entities with voluntary reporting and surrender obligations; most for post-1989 forestry activities (as of June 2018). 75 entities with mandatory reporting without surrender obligations; all for agricultural activities.

CAP

The NZ ETS was originally designed to operate without a specific domestic cap as this accommodated carbon sequestration from forestry activities and a full link to the international Kyoto Protocol carbon markets. Allowance supply was restricted to New Zealand Units (NZUs) in 2015. Potential future access to international units will be subject to quantitative limits.

It is expected that the NZ ETS will have its own fixed cap in the future. This would restrict the number of units supplied into the scheme, in line with New Zealand's GHG reduction targets. The 'Climate Change Response (Emissions Trading Reform) Amendment Bill' outlines a process for setting unit supply over a rolling five-year period with annual updates. It will set the number of allowances that can be released to the market from auctioning and the new Cost Containment Reserve (CCR), as well as from any international units. There will be no limit on NZUs generated from removals from forestry.

Phases & Allocation

TRADING PERIODS

There are no fixed trading periods or phases under the NZ ETS.

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 when they choose to report their emissions.

ALLOCATION

FREE ALLOCATION, BENCHMARKING: Free allocation is provided based on output and intensity-based benchmarks for 26 eligible activities. Eligibility is based on emissions-intensive, trade-exposed (EITE) criteria.

Highly EITE activities (over 1,600 tCO₂e/ NZD 1 million of revenue [USD 0.66 million]) receive 90% free allocation. Moderately EITE activities (over 800 tCO₂e/NZD 1 million of revenue [USD 0.66 million]) receive 60% free allocation. Trade exposure is qualitative and based on the existence of transoceanic trade in the good in question.

As a part of the 'Climate Change Response (Emissions Trading Reform) Amendment Bill', the government plans to phase down industrial free allocation from 2021. A minimum annual phase-down rate of 1% across all industrial activities will apply from 2021-2030. That rate will increase to 2% for the years 2031-2040, and to 3% for 2041-2050. The minimum phase-down rate will be complemented by further phase-down rates for activities that are considered at lower risk of carbon leakage.

² - with surrender obligations

Post-1989 Forestry Sector and Other Removal Activities: NZUs are granted to participants that voluntarily register in the scheme for removal activities, as outlined below. There is no limit on the number of units that can be granted for removal activities.

Forestry Removal Activities: Participants are entitled to receive one NZU per tCO₂ removed for registered post-1989 forest land. If the forest is harvested or deforested, units must be surrendered to account for the emissions, and if the participant chooses to deregister from the scheme, NZUs equivalent to the number received must be returned. 10.5 million NZUs were issued for forest removal activities from 1 July 2018 and 30 June 2019.

Other Removal Activities: Participants are entitled to receive one NZU per tonne of removal from the export of products that embed carbon and export of HFCs and PFCs. 2.7 million NZUs were issued for other removal activities for the 2018/2019 financial year.

Forestry and Fisheries Sectors: Owners of pre-1990 forest land, as well as owners of fishing quotas, received a one-off free allocation of NZUs when the NZ ETS was implemented to partially compensate for the impact of the ETS.

AUCTIONING: Following the second review, the government plans to introduce an auctioning mechanism. Auctioning is expected to begin in late 2020.

Flexibility

BANKING AND BORROWING

Banking is allowed except for those units that were purchased under the fixed price option (see “Market Stability Provisions” below). Borrowing is not allowed.

OFFSETS AND CREDITS

Units from Kyoto Protocol flexible mechanisms were eligible for use in the system with no restrictions until 2015. As of 1 June 2015, international units are not eligible for surrender in the NZ ETS.

A link to high-integrity international carbon markets is likely to form part of New Zealand’s strategy for meeting its 2030 target.

MARKET STABILITY PROVISIONS

TRANSITIONAL MEASURES: Two measures were implemented in 2009 to help firms adjust to the carbon cost:

- (1) One-for-two surrender obligation (one allowance could be surrendered for every two tonnes of emissions);
- (2) A fixed price option of NZD 25 (USD 16.45), which acts as a price ceiling.

After the second NZ ETS review, the one-for-two measure was phased out and entities have faced full surrender obligations since 1 January 2019.

NEW ZEALAND ETS REVIEW PROPOSALS: As a part of the second stage of the second mandatory review of the New Zealand ETS, several market stability measures have been proposed, and are encompassed in the ‘Climate Change Response (Emissions Trading Reform) Amendment Bill.’ The bill is currently being reviewed by the Environmental Select Committee and is expected to pass into law in mid-2020. Proposed changes are listed below.

COST CONTAINMENT RESERVE: The fixed price option will remain until it is replaced with a CCR incorporated into the auctioning mechanism. Allowances from the CCR will be auctioned if a predetermined trigger price—currently proposed at NZD 50 (USD 32.94) for the period 2020-2025—is reached. Allowances released from the reserve will come from outside of the domestic emissions budget and would therefore need to be backed by an equivalent tonne of removals.

PRICE FLOOR: The government is proposing to introduce a price floor of NZD 20 (USD 13.16) for the period 2020-2025. The price floor would operate through a reserve price below which NZUs would not be sold at auction.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Most sectors are required to report annually; deadline of 31 March to submit emissions return.

VERIFICATION: Self-reporting supplemented by a program of second- and third-party audits run by the regulator. Participants must seek third- party verification if they apply for the use of a unique emissions factor.

ENFORCEMENT

Currently, an entity that fails to surrender emissions units when required to must surrender the units and pay a penalty of NZD 30 (USD 19.73) for each unit that was not surrendered by the due date. In certain circumstances the penalty may be reduced. As a part of the review and reform process, the government plans to introduce a new surrender penalty consisting of a cash penalty set at three times the allowance price.

Entities can be fined up to NZD 24,000 (USD 15,789) on conviction for failure to collect emissions data or other required information, calculate emissions and/or removals, keep records, register as a participant, submit an emissions return when required, or notify the administering agency or provide information when required to do so.

Entities can also be fined up to NZD 50,000 (USD 32,894) on conviction for knowingly altering, falsifying, or providing incomplete or misleading information about any obligations under the scheme, including emissions return. This penalty and/or imprisonment of up to five years also apply to entities that deliberately lie about obligations under the NZ ETS to gain financial benefit or avoid financial loss.

Linking

LINKS WITH OTHER SYSTEMS

Until 1 June 2015, the NZ ETS was indirectly linked to other systems (e.g., the EU ETS) via the international Kyoto Protocol flexible mechanisms. Since then, the NZ ETS has been a domestic-only system.

The current reforms will make the NZ ETS more similar to ETSs in other countries, which will make it more compatible for international linking in the future.

Other Information

INSTITUTIONS INVOLVED

Ministry for the Environment
Environmental Protection Authority
Ministry for Primary Industries
New Zealand Customs Service
New Zealand Transport Agency

EVALUATION/ETS REVIEW

The 'Climate Change Response Act 2002' includes provisions for statutory independent reviews of the operation and effectiveness of the NZ ETS—originally required every five years, but the timing is now discretionary. The first review took place in 2011-2012, and the second review took place in 2015-2017.

Public consultation on proposed amendments to the 'Climate Change Response Act' following the second review was undertaken in 2018 in order to support implementing proposed changes.

USE OF REVENUES

Revenues are assigned to the general budget; no earmarking for specific purposes.

IMPLEMENTING LEGISLATION

[Climate Change Response Act 2002—Part 4 New Zealand greenhouse gas emissions trading scheme](#)³

Note the act now incorporates the provisions of the 2019 Zero Carbon Bill, which includes domestic targets and the process of setting and meeting five-year national emission budgets.

3 – <http://www.legislation.govt.nz/act/public/2002/0040/latest/DLM1662481.html>

REPUBLIC OF KOREA

Korean Emissions Trading System (KETS)



CAP 548 MtCO ₂ e (2020)	GASES Several gases	OFFSETS AND CREDITS Domestic International
ALLOCATION Free allocation: benchmarking, grandparenting Auctioning	AVERAGE 2019 PRICE¹ KRW 29,821.54 (USD 25.59)	TOTAL REVENUE USD 199.4 million ² Collected in 2019: USD 199.4 million

- ETS in force
- ETS under development
- ETS under consideration

ETS DESCRIPTION

The KETS was launched on 1 January 2015, becoming East Asia's first nationwide mandatory ETS and the second-largest carbon market after the EU ETS. The ETS covers 610 of the country's largest emitters, which account for ~70% of national GHG emissions. It covers direct emissions of six Kyoto gases, as well as indirect emissions from electricity consumption. The KETS was designed to play an essential role in meeting Korea's 2030 NDC target of 37% below BAU emissions.

The first and highest legal base for green growth and implementation of the KETS is the 'Framework Act on Low Carbon, Green Growth' (2010). The 'Act on Allocation and Trading of Greenhouse Gas Emissions Allowances' ("Emissions Trading Act") and its Enforcement Decree were passed in 2012; it stipulates government actions, institutions, and timelines for the KETS. Further details of the KETS were outlined in a Master Plan (January 2014; February 2017) and Allocation Plan (January 2014; February 2017).

The KETS was preceded by a mandatory GHG and Energy Target Management System (TMS) that was launched in 2012 (following a two-year pilot phase started in 2010). The TMS enabled the collection of verified emissions data and training in the MRV process of TMS entities.

YEAR IN REVIEW

2019 saw the implementation of key design changes as specified for the second phase (2018-2020) of the KETS, including (i) an expansion of benchmark-based allocation; (ii) the introduction of 3% auctioning; (iii) new banking rules; and (iv) the restricted use of international credits.

The first regular auction of allowances took place in January 2019. Auction rules were outlined in a guidance document released in March 2018. During 2019, new rules were introduced that reduce the maximum amount of allowances a single entity can purchase at auction. In addition, to enhance liquidity, two market makers were named, specifically the Korea Development Bank and the Industrial Bank of Korea.

2019 furthermore saw the first release of expected reforms for Phase 3, which is set to run from 2021 to 2025. Key changes for the third phase will include (i) a to-be-determined stricter emissions cap; (ii) an increasing share of auctioning (for nonenergy-intensive and trade-exposed (EITE) entities) to at least 10%; and (iii) increasing use of sector-specific benchmarking to 70%.

SECTORS:

- POWER
- INDUSTRY
- DOMESTIC AVIATION
- BUILDINGS
- WASTE

← East Asia's first national ETS

Ratcheting up ambition through new rules released for Phase 3.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 709.1 MtCO₂e (2017)

OVERALL GHG EMISSIONS BY SECTOR



Fuel combustion (including transport) 615.9 (87%)
 Industrial processes 56.0 (8%)
 Agriculture 20.4 (3%)
 Waste 16.8 (2%)

GHG REDUCTION TARGETS

BY 2020: 30% below BAU (Copenhagen Accord target)
BY 2030: 37% below BAU (536 MtCO₂e), which represents a 22% reduction below 2012 GHG levels (NDC); 38 million international credits³ may be used towards achieving this goal (2030 GHG mitigation roadmap)

¹ - Average secondary market price from KRX.

² - The regular auction schedule began in 2019. Allowances were also auctioned in 2016 and 2018 by the Allocation Committee from the reserve for market stability measures. Revenues from these auctions totalled USD 99.6 million and are not included in the total auction revenue figure above.

³ - This includes international credits through the KETS, as well as alternative options, including LULUCF and other international credits (i.e., Article 6 under the Paris Agreement).

ETS Size

GHGs COVERED

CO₂, CH₄, N₂O, PFCs, HFCs, SF₆

SECTORS AND THRESHOLDS

PHASE ONE (2015-2017): 23 subsectors from the following five sectors: power, industry (e.g., iron and steel, petrochemical, cement, oil refinery, nonferrous metals, paper, textile, machinery, mining, glass, and ceramics), buildings, waste, and transportation (domestic aviation).

PHASE TWO (2018-2020): According to the Allocation Plan, the public and waste sectors are disaggregated such that the KETS covers the following six sectors: heat and power, industry, building, transportation, waste sector, and public. These sectors are disaggregated into 64 subsectors.

PHASE THREE (2021-2025): No changes to sectors and thresholds are currently foreseen for Phase three.

INCLUSION THRESHOLDS: company >125,000 tCO₂/year, facility >25,000 tCO₂/year

POINT OF REGULATION

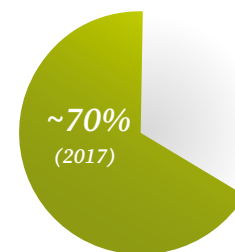
Downstream. Next to direct emission coverage, the KETS covers indirect emissions from electricity consumption.

NUMBER OF ENTITIES

610 (2019)

CAPPED EMISSIONS

~548 MtCO₂e



CAP

PHASE ONE (2015-2017): 1,686 MtCO₂e, including a reserve of 88 MtCO₂e for market stabilization measures, early action, and new entrants. 84.5% of reserve was used.

Annual Caps in Phase One

2015: 540 MtCO₂e; **2016:** 560 MtCO₂e; **2017:** 567 (including early reduction and additional allowances) MtCO₂e.

PHASE TWO (2018-2020): 1,796 MtCO₂e, including 14 million allowances for market stabilization, five million for market makers, and 134 million for new entrants and other purposes.⁴

Annual Caps in Phase Two

2018: 548 MtCO₂e; **2019:** 548 MtCO₂e; **2020:** 548 MtCO₂e.

PHASE THREE (2021-2025): Expected stricter annual caps, the levels of which have yet to be determined.

Phases & Allocation

TRADING PERIODS

PHASE ONE: 3 years (2015-2017)

PHASE TWO: 3 years (2018-2020)

PHASE THREE: 5 years (2021-2025)

ALLOCATION

PHASE ONE: (2015-2017)

Free Allocation: 100% free allocation. Most sectors received free allowances based on the average GHG emissions of the base year (2011-2013). Three sectors (grey clinker, oil refinery, and aviation) were allocated free allowances following benchmarks based on previous activity data from the base year (2011-2013).

During Phase One, ~5% of total allowances were retained in a reserve for market stabilization measures (14 MtCO₂e), early action (41 MtCO₂e), and other purposes including new entrants (33 MtCO₂e). In addition, unallocated allowances and withdrawn allowances were transferred to the reserve.

PHASE TWO (2018-2020)

Free Allocation: 97% of total allowance supply. Toward the end of Phase Two, the share of sector-specific benchmarking is set to reach 50%.

Auctioning: 3% auctioned. Auctioning is determined on the subsector level. These include, among others, entities from the electricity, domestic aviation, wooden product, and metal foundry sectors. Although auctioning was scheduled to start in 2018, it was delayed to the beginning of 2019. In 2019 authorities auctioned a total of 7.95 million allowances.

Participation in auctions is subject to some limitations. Only companies that do not receive all their allowances for free are eligible to bid, with a list of eligible bidders published by the Ministry of Environment. No one bidder can purchase more than 30% of the allowances of one auction. The auctions are subject to a minimum price that will be set by the following formula:

“the average price over the previous three months + the average price of last month + the average price over the previous three days/3.”

In 2020, 8.25 million allowances are set to be auctioned.⁵

PHASE THREE (2021-2025)

Free Allocation: Less than 90% free allowances. The share of sector-specific benchmarking is to reach 70%.

⁴ – The competent authority expects the actual cap to be 1,777 MtCO₂e, considering that not all the reserves would be used.

Auctioning: More than 10%.

EITE sectors will receive 100% of their allowances for free in all phases. EITE sectors are defined along the following criteria:

- (1) additional production cost of >5% and trade intensity of >10%; or
- (2) additional production cost of >30%; or
- (3) trade intensity of >30%.

Flexibility

BANKING AND BORROWING

Banking is allowed with some restrictions across phases. From Phase One to Phase Two, banking is limited for each installation to 10% of the annual average allocation and 20,000 Korean Allowance Units (KAUs). The amount that exceeds the threshold is deducted from the Phase Two allocation. From Phase Two to Phase Three, banking is limited to the higher of two limits:

- (1) the net annual amount of allowances sold in Phase Two; or
- (2) company- and facility-specific limits of 250,000 KAUs and
- (3) 5,000 KAUs, respectively.

Borrowing is allowed only within a single trading phase. In 2015, this was limited to 10% of an entity's obligation. This limit was increased to 20% in 2016 and 2017. In the first compliance year of Phase Two (2018), borrowing was limited to 15% of an entity's obligation. From 2019, the borrowing limit will be affected by how much an entity has borrowed in the past via the following formula: [Borrowing limit of previous year - ("borrowing ratio" in previous year x 50%)]/entity's emission volume.

OFFSETS AND CREDITS

PHASE ONE (2015-2017)

Qualitative Limit: Only domestic credits from external reduction activities implemented by non-ETS entities—and that meet international standards—could be used for compliance in this phase. Domestic CDM credits (CERs), and credits from domestically certified projects (Korean Offset Credits) were allowed. These credits had to be converted to Korean Credit Units (KCU) of a specified vintage before being used for compliance. Eligible activities included those eligible under the CDM and Carbon Capture and Storage. However, only activities implemented after 14 April 2010 were eligible. As of December 2017, 35 domestic and 211 CDM methodologies had been approved for use under the KETS.

Quantitative Limit: Up to 10% of each entity's compliance obligation.

PHASE TWO (2018-2020)

Qualitative Limit: In Phase Two, trades of CERs generated after 1 June 2016 from international CDM projects developed by domestic companies are allowed. CDM projects operated by Korean companies will be allowed when:

- (1) at least 20% of the ownership rights, operating rights, or the voting stocks are owned by a Korean company;
- (2) a Korean company sells or distributes more than 20% of the total project cost; or

- (3) the projects are funded by a Korean company with a national or regional government operating in a UN-designated Least Developed Country or a low-income economy as classified by the World Bank.

Regulated entities must convert CDM credits (CERs) to KCUs for them to be used for compliance.

Quantitative Limit: Up to 10% of each entity's compliance obligation (of which up to 5% can be international offset credits).

PHASE THREE (2021-2025): Offsets will continue to be allowed in limited fashion. Further rules and conditions have yet to be released.

MARKET STABILITY PROVISIONS

AUCTION RESERVE PRICE: Regular auctions and auctions for market stability are subject to an auction reserve price set by the following formula:

"the average price over the previous three months + the average price of last month + the average price over the previous three days/3."

ALLOCATION COMMITTEE: An Allocation Committee is in place to implement market stabilization measures in particular cases:

- (1) the market allowance price of six consecutive months is at least three times higher than the average price of the two previous years;
- (2) the market allowance price of the last month is at least twice the average price of 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;
- (3) the average market allowance price of a given month is smaller than 40% of the average price of the two previous years. In 2015 and 2016, the price threshold is KRW 10,000 (USD 9.09); or
- (4) it is difficult to trade allowances due to the imbalance of supply or demand.

The stabilization measures may include:

- (1) additional allocation from the reserve (up to 25%);
- (2) establishment of an allowance retention limit: minimum (70%) or maximum (150%) of the allowance of the compliance year;
- (3) an increase or decrease of the borrowing limit;
- (4) an increase or decrease of the offsets limit; and
- (5) temporary setup of a price ceiling or price floor.

In 2016, the Allocation Committee doubled the borrowing limit to 20% and an additional nine million allowances were auctioned at a reserve price of KRW 16,200 (USD 13.96) of which less than a third of allowances were sold. In 2018, the Allocation Committee made an additional 5.5 million allowances available from the stability reserve in an attempt to ease the market in the lead-up to the 2017 compliance deadline.

On 10 June 2019, the Korea Development Bank and the Industrial Bank of Korea were officially designated as market makers. These institutions can draw on a government-held reserve of five million allowances in a bid to increase liquidity in the market. Both banks, along with the Korean Export-Import Bank, have been allowed to trade in the market.

Phase Three is likely to see an expansion of the market maker system.

Compliance

COMPLIANCE PERIOD

One year

MRV

REPORTING FREQUENCY: Annual reporting of emissions must be submitted within three months from the end of a given compliance year (by the end of March).

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

OTHER: Emissions reports are reviewed and certified by the Certification Committee of the Ministry of Environment

(MOE) within five months from the end of a given compliance year (by the end of May).

If the liable entity fails to report emissions correctly, the report will be disqualified.

ENFORCEMENT

The penalty shall not exceed three times the average market price of allowances of the given compliance year or KRW 100,000 (USD 85.8)/tonne.

Linking

LINKS WITH OTHER SYSTEMS

No linkage is currently considered.

Other Information

INSTITUTIONS INVOLVED

In 2016, overall responsibility for the KETS moved from the MOE to the Ministry of Economy and Finance (MOEF). On 1 January 2018, responsibility was transferred back to the MOE, while the MOEF still chairs the Allocation Committee; Korea Exchange (Trading Platform); Greenhouse Gas Inventory and Research Center (Registry and technical support).

EVALUATION/ETS REVIEW

No standardized evaluation process has been developed to date, but an analysis of the economic impact of the KETS is ongoing for the current phase.⁶

USE OF REVENUES

The government has put forward possible options for the use of the revenues—such as supporting mitigation equipment projects, innovation, and technology development of ETS-covered entities. Specific rules on the use of revenues are yet to be decided.

IMPLEMENTING LEGISLATION

[Framework Act on Low Carbon, Green Growth](#)⁷
[Enforcement Decree of the Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances](#)⁸
[Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances](#)⁹
[First Master Plan for 2015-2024](#)¹⁰
[Second Master Plan for 2017-2026](#)¹¹
[First Allocation Plan](#)¹²
[Second Allocation Plan](#)¹³

6 – The method/modeling of the ongoing study is not yet open to the public.

7 – <http://extwprlegs1.fao.org/docs/pdf/kor100522.pdf>

8 – https://elaw.klri.re.kr/eng_mobile/viewer.do?hseq=46598&type=sogan&key=60

9 – <http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/laws/1647.pdf>

10 ; 11 – http://www.moef.go.kr/nw/nes/detailNesDtaView.do?menuNo=4010100&searchNttId=OLD_4020294&searchBbsId1=MOSFBBS_000000000028

12 – <http://www.me.go.kr/home/web/index.do?menuId=10262>

13 – <http://www.me.go.kr/home/web/board/read.do?pagerOffset=10&maxPageItems=10&maxIndexPages=10&searchKey=&searchValue=&menuId=286&orgCd=&boardId=883200&boardMasterId=1&boardCategoryId=&decorator=>

TOKYO

Tokyo Cap-and-Trade Program



COVERAGE 11.93 MtCO ₂ (2017)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation	AVERAGE 2019 PRICE¹ ~JPY 600 (USD 5.50)	

- ETS in force
- ETS under development
- ETS under consideration

ETS DESCRIPTION

Launched in April 2010, the Tokyo ETS—the cap-and-trade program of the Tokyo Metropolitan Government (TMG)—is Japan’s first mandatory ETS and is linked to the Saitama ETS. Under the ETS, large buildings, factories, heat suppliers, and other facilities that consume large quantities of fossil fuels are required to reduce emissions below a facility-specific benchmark. Entities covered under the program are assigned a higher or lower target depending on factors such as expected energy efficiency gains and the extent to which they consume energy supplied by other facilities.

overall among covered entities compared to base-year emissions. The introduction of high-efficiency heat sources, light fittings, and other equipment has been key to reducing emissions in the buildings sector. Buildings have continued to decrease emissions despite an increase in gross floor space, indicating a decrease in emissions intensity in the sector.

YEAR IN REVIEW

In FY2017—the most recent year for which data has been released by the TMG—emissions were reduced by 27%

In March 2019, the TMG announced the targets for the third compliance period (FY2020-FY2024), which will require facilities to reduce emissions by 25% or 27% depending on their category. The third period also aims to expand the use and production of low-carbon and renewable energy through additional incentives for covered entities to reduce their compliance obligations by switching to cleaner electricity.

SECTORS:

- INDUSTRY
- BUILDINGS

← First city-wide ETS

Energy efficiency improvements key to emissions reductions

ETS covers commercial and industrial buildings

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 64.8 MtCO₂e (2017)²

OVERALL CO₂ EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

- BY 2020:** 25% reduction from 2000 GHG levels
- BY 2030:** 30% reduction from 2000 GHG levels
- BY 2050:** Net zero CO₂ emissions (“TMG Zero Emissions Strategy”)

ETS Size

GHGs COVERED

CO₂

CAPPED EMISSIONS
~11.93 MtCO₂

20%
(2017)

¹ – Estimated standard transaction price

² – The overall emissions figure for Tokyo is higher than the total of the emissions by sector because the former includes all GHGs in Tokyo, whereas the emissions by sector only measures CO₂ emissions.

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 energy equivalent to at least 1,500kL of crude oil per year.

POINT OF REGULATION

Downstream

NUMBER OF ENTITIES

1,123 facilities (2019):

- Office/commercial buildings: 954
- Factories: 169

CAP

A Tokyo-wide cap is aggregated from emissions baselines set at the facility level.

COMPLIANCE FACTOR:

First period (FY2010-FY2014): 8% or 6% reduction below base-year emissions

Second period (FY2015-FY2019): 17% or 15% reduction below base-year emissions

Third period (FY2020-FY2024): 27% or 25% reduction below base-year emissions

The higher compliance factor applies to office buildings, as well as to district heating and cooling (DHC) plants (excluding facilities that use a large amount of DHC). The lower compliance factor applies to factories and office buildings that use DHC for more than 20% of their entire energy consumption.

Facilities demonstrating outstanding performance in emissions reductions, as well as in the introduction, use, and management of energy equipment, are certified as top-level facilities that receive lower compliance factors according to their rate of progress. The certification standards represent the highest-level energy efficiency measures currently feasible, stipulating more than 200 different energy-saving measures.

Phases & Allocation

TRADING PERIODS

FIRST PERIOD: 1 April 2011 to 30 September 2016

SECOND PERIOD: 1 April 2015 to 30 September 2021

THIRD PERIOD: 1 April 2020 to 30 September 2026

Each of the above trading periods includes an 18-month adjustment period.

ALLOCATION

The baselines for facilities are set according to the following formula: base-year emissions x (1-compliance factor) x compliance period (5 years).

Base-year emissions are based on the average emissions of three consecutive years between FY2002 and 2007, as chosen by each entity. Credits are issued to facilities whose emissions fall below their baselines.

Baselines for new entrants are based on past emissions or on emissions intensity standards.

Flexibility

BANKING AND BORROWING

Banking is allowed only between consecutive compliance periods. Borrowing is not allowed.

OFFSETS AND CREDITS

Credits from four offset types are allowed in the Tokyo ETS.

SMALL AND MID-SIZE FACILITY CREDITS: Emissions reductions from non-covered small and medium-sized facilities in Tokyo.

Quantitative limits: None.

OUTSIDE TOKYO CREDITS: Emissions reductions achieved from large facilities outside of the Tokyo area. Large facilities are those with an energy consumption equivalent to at least 1,500kL of crude oil in a base year and with base-year emissions of 150,000 tonnes or less.

Quantitative limits: Credits are issued only for the reduction amount that exceeds the compliance factor. These credits can be used for compliance for up to one-third of facilities' reduction obligations.

RENEWABLE ENERGY CREDITS: Credits from solar (heat, electricity), wind, geothermal, or hydro (under 1,000kW) electricity production are converted to 1.5 times the value of standard credits until the end of the second compliance period and will be converted on a 1 to 1 basis from the third compliance period. Credits from biomass (biomass rate of 95% or more, black liquor excluded) are converted with the factor 1. These credits encompass the following types: Environmental Value Equivalent, Renewable Energy Certificates, and New Energy Electricity, generated under the Renewable Portfolio Standard Law.

Quantitative limits: None.

SAITAMA CREDITS (VIA LINKING):

(1) Excess Credits: Emissions reductions from facilities in Saitama with base-year emissions of 150,000 tonnes or less. Issuance of credits from FY2015.

(2) Small and Mid-Size Facility Credits issued by Saitama Prefecture. Issuance of credits from FY2012.

Quantitative limits: None.

All offsets have to be verified by verification agencies.

EMISSIONS REDUCTION METHODS:

(1) Low Carbon Electricity and Heat: In order to evaluate energy efficiency efforts of the covered facilities, CO₂ emission factors of the supply side (electricity and others) are fixed during each compliance period. When covered facilities procure electricity or heating from TMG-certified suppliers with lower emission factors, they can reduce the difference between these emission factors from their emissions to be reported to the TMG.

(2) Renewable Energy: When covered facilities generate electricity from renewable sources for their own use, they can deduct this amount of electricity from the total energy usage of the facility. During the third compliance period, covered entities can also purchase “non-fossil value” (renewable energy) certificates generated through the Japanese feed-in-tariff program.

MARKET STABILITY PROVISIONS

In general, covered facilities trade over the counter and the TMG does not control carbon prices. However, the TMG sells its own offset credits for trading in case of excessive price development.

Compliance

COMPLIANCE PERIOD

Five years

FIRST PERIOD: FY2010-2014

SECOND PERIOD: FY2015-2019

THIRD PERIOD: FY2020-2024

MRV

REPORTING FREQUENCY: Annual emissions reporting, including emission reduction plans. All seven GHGs have to be monitored and reported: CO₂, CH₄, N₂O, PFCs, HFCs, SF₆, and NF₃. Large tenants, i.e., those with a floor space above 5,000m² or over six million kWh electricity use per year, are required to submit their own emissions reduction plans to the TMG in collaboration with building owners.

VERIFICATION: These annual reports require third-party verification.

FRAMEWORK: These are based on ‘TMG Monitoring/Reporting Guidelines’ and ‘TMG Verification Guidelines.’

ENFORCEMENT

In the case of noncompliance, the following measures may be taken:

FIRST STAGE: The governor orders the facility to reduce emissions by the amount of the reduction shortfall multiplied by 1.3.

SECOND STAGE: Any facility that fails to carry out the order will be publicly named and subject to penalties (up to JPY 500,000 [USD 4,587]) and surcharges (1.3 times the shortfall).

Linking

LINKS WITH OTHER SYSTEMS

Linking with the Saitama Prefecture started in April 2011 when the Saitama ETS was launched. Tokyo and Saitama credits are officially eligible for trade between the two jurisdictions. During the first compliance period, 15 credit transfers took place between the Saitama Prefecture and Tokyo (nine cases from Tokyo to Saitama, six cases from Saitama to Tokyo).

Other Information

INSTITUTIONS INVOLVED

Tokyo Metropolitan Government

EVALUATION/ETS REVIEW

TMG established a committee of experts to analyze the structure of the Tokyo Cap-and-Trade Program post-2020 and finalized the third compliance period's caps in March 2019. From FY2020, the program will enter a new stage to achieve the 2030 target and transition to a net zero-carbon society, promoting continued energy savings and expanding the utilization of low-carbon (renewable) energy.

IMPLEMENTING LEGISLATION

The Tokyo Metropolitan Security Ordinance and Regulation for the Enforcement of the Tokyo Metropolitan Environmental Security Ordinance³

Detailed documents on the Tokyo ETS can be found on the TMG website.⁴

TMG Zero Emissions Strategy⁵

3 - https://www.kankyo.metro.tokyo.lg.jp/basic/guide/security_ordinance/index.html

4 - https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap_and_trade/index.files/TokyoCaT_detailed_documents.pdf

5 - http://www.kankyo.metro.tokyo.jp/en/about_us/zero_emission_tokyo/strategy.html

SAITAMA

Target Setting Emissions Trading System in Saitama



COVERAGE 6.6 MtCO ₂ (2016)	GASES CO ₂ only	OFFSETS AND CREDITS Domestic
ALLOCATION Free allocation		

- ETS in force
- ETS under development
- ETS under consideration

ETS DESCRIPTION

Saitama's ETS was established in April 2011 as part of the 'Saitama Prefecture Global Warming Strategy Promotion Ordinance.' Under the ETS, large buildings and factories in Saitama are required to reduce emissions by 15% or 13% in its second compliance period (FY2015-2019), depending on characteristics such as potential energy efficiency gains. Saitama's ETS is linked to Tokyo's program.

YEAR IN REVIEW

In FY2017, the Saitama ETS achieved a 28% reduction in emissions below base-year emissions.

In August 2019, Saitama announced the targets for the third compliance period (FY2020-2024), which will require facilities to reduce emissions by 20% or 22% depending on their category.

SECTORS:

- INDUSTRY
- BUILDINGS

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 36.6 MtCO₂e (2016)¹

OVERALL CO₂ EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

BY 2020: 21% reduction from 2005 GHG levels (demand side)

← Covers large buildings and factories

Linked to Tokyo since launch

ETS Size

GHGs COVERED

CO₂

CAPPED EMISSIONS

~6.6 MtCO₂

18%

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 per year.

POINT OF REGULATION

Downstream

CAP

The Saitama-wide cap is aggregated based on emissions baselines set at the facility level.

NUMBER OF ENTITIES

~580 facilities (2017): office/commercial buildings: 169; factories: 411

¹ - The overall emissions figure for Saitama is higher than the total of the emissions by sector because the former includes all GHGs in Saitama, whereas the emissions by sector only measures CO₂ emissions.

COMPLIANCE FACTOR:

First period (FY2010-FY2014): 8% or 6% reduction below base-year emissions.

Second period (FY2015-FY2019): 15% or 13% reduction below base-year emissions

Third period (FY2020-FY2024): 22% or 20% reduction below base-year emissions

The higher compliance factor applies to commercial buildings, as well as to district heating and cooling (DHC) plant facilities (excluding facilities that use a large amount of DHC). 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.

Facilities demonstrating outstanding performance in emissions reduction, as well as in the introduction, use, and management of energy equipment, are certified as top-level facilities that receive lower compliance factors according to their rate of progress. The certification standards represent the highest-level energy-efficiency measures currently feasible, stipulating more than 200 different energy-saving measures.

Phases & Allocation

TRADING PERIODS

FIRST PERIOD: 1 April 2011 to 30 September 2016

SECOND PERIOD: 1 April 2015 to 30 September 2021

THIRD PERIOD: 1 April 2020 to 30 September 2026

Each of the above trading periods includes an 18-month adjustment period.

Base-year emissions are based on the average emissions of three consecutive years between FY 2002 and 2007, as chosen by each entity. Credits are issued to facilities whose emissions fall below the baseline.

Baselines for new entrants are based on past emissions or on emissions intensity standards.

ALLOCATION

The baselines for facilities are set according to the following formula: Base-year emissions x (1 - compliance factor) x compliance period (5 years).

Flexibility

BANKING AND BORROWING

Banking is allowed only between two consecutive compliance periods. Borrowing is not allowed.

OFFSETS AND CREDITS

Credits from five offset types are allowed in the Saitama ETS.

SMALL AND MID-SIZE FACILITY CREDITS: Emissions reductions from non-covered small and medium-sized facilities in Saitama.

Quantitative limits: None.

OUTSIDE SAITAMA CREDITS: Emission reductions achieved from large facilities outside of the Saitama prefecture. Large facilities are those with an energy consumption of 1,500kL of crude oil equivalent or more in a base year, and with base-year emissions of 150,000t or less.

Quantitative Limits: Credits are issued only for the reduction amount that exceeds the compliance factor. These credits can be used for compliance for up to one-third of offices' reduction obligations. Factories can use up to 50%.

RENEWABLE ENERGY CREDITS: Credits from solar (heat, electricity), wind, geothermal, or hydro (under 1,000kW) electricity production are converted to 1.5 times the value of regular credits until the second compliance period and will be converted on a 1 to 1 basis from the third compliance period. Credits from biomass (biomass rate of 95% or more, black liquor is excluded) are converted with the factor 1. These credits encompass the following types: Environmental Value Equivalent, Renewable Energy Certificates, and New Energy Electricity, generated under the Renewable Portfolio Standard Law.

Quantitative limits: None.

TOKYO CREDITS (VIA LINKING):

(1) Excess Credits: Emissions reductions from facilities with base-year emissions of 150,000 tonnes or less. Issuance of credits from FY2015.

(2) Small and mid-size Facility Credits: Issued by Saitama Prefecture. Issuance of credits from FY2012.

Quantitative limits: None.

FOREST ABSORPTION CREDITS: Credits from forests inside the Saitama Prefecture are counted at 1.5 times the value of regular credits. Others are converted with the factor 1.

Quantitative limits: None.

All offsets have to be verified by verification agencies.

EMISSIONS REDUCTION METHODS:

(1) Renewable energy: When covered facilities generate electricity from renewable sources for their own use, they can deduct this amount of electricity from the total energy usage of the facility.

(2) Low carbon electricity: In order to evaluate energy efficiency efforts of the covered facilities, CO₂ emissions factors of electricity suppliers are fixed during each compliance period. When covered facilities procure electricity from suppliers with lower emissions factors, they can reduce the difference between these emission factors from their emissions to be reported to Saitama from the third compliance period.

MARKET STABILITY PROVISIONS

In general, Saitama does not use market stability provisions.

Compliance

COMPLIANCE PERIOD

Five years

FIRST PERIOD: FY2011-2014

SECOND PERIOD: FY2015-2019

THIRD PERIOD: FY2020-2024

MRV

REPORTING FREQUENCY: Annual emissions reporting, including emission reduction plans. All seven GHGs must be monitored and reported: CO₂, CH₄, N₂O, PFCs, HFCs, SF₆, and NF₃.

VERIFICATION: These reports require third-party verification by the end of the adjustment period.

FRAMEWORK: These are based on 'Saitama Monitoring/Reporting Guidelines' and 'Saitama Verification Guidelines.'

ENFORCEMENT

None

Linking

LINKS WITH OTHER SYSTEMS

Linking with Tokyo started in April 2011. Tokyo and Saitama credits are officially eligible for trade between the two jurisdictions. During the first compliance period, 15 credit transfers took place between the Saitama Prefecture and Tokyo (nine cases from Tokyo to Saitama, six cases from Saitama to Tokyo).

Other Information

INSTITUTIONS INVOLVED

Saitama Prefectural Government

IMPLEMENTING LEGISLATION

Saitama Prefecture Global Warming Strategy Promotion Ordinance²

Regulation on Saitama Prefecture Global Warming Strategy Promotion Ordinance³

2 - http://www3.e-reikinet.jp/saitama-pref/d1w_reiki/42190101000900000000/42190101000900000000/42190101000900000000.html

3 - http://www3.e-reikinet.jp/saitama-pref/d1w_reiki/42190210001900000000/42190210001900000000/42190210001900000000.html



CHINA

China National Emissions Trading System

- ETS in force
- ETS under development
- ETS under consideration

SECTORS:



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

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

Currently developing national market infrastructure and preparing power market simulation trading

EXPECTED COVERAGE	GASES	OFFSETS AND CREDITS
~3,300 MtCO ₂ (2020)	CO ₂ only	Domestic
ALLOCATION		
Free allocation		

ETS DESCRIPTION

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

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

The objective of the ETS is to contribute to the effective control and gradual reduction of carbon emissions in China and the achievement of green and low-carbon development. The ETS is expected to regulate ~1,700 companies from the power sector (including combined heat and power, as well as captive power plants of other sectors), which emit more than 26,000 tonnes GHG or consume more than 10,000 tce per year. The Chinese system would cover more than three billion tonnes of CO₂e in its initial phase, accounting for about 30% of national emissions. The scope is to be further expanded in the future.

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

- **First Phase:** will focus on the development of market infrastructures;
- **Second Phase:** foresees simulation trading; and
- **Third Phase:** will be the deepening and expanding phase with allowances spot trading for compliance purposes.

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

YEAR IN REVIEW

2019 saw the final stages of the transition of ETS-related responsibilities from the National Development and Reform Commission (NDRC) to the newly created Ministry for Ecology and Environment (MEE), particularly at the provisional level.

In addition, the government continued to advance the work on reporting and verification of the 2018 emissions data from eight emission-intensive sectors of the economy.

MEE also continued to improve the establishment of plans for a national registry and a trading system, as well as the development of a national enterprise GHG direct reporting system. In March, the MEE published a draft of the 'Interim Regulation on Carbon Emission Trading' for public consultation, marking progress towards the adoption of ETS implementing legislation.

In 2019, MEE also conducted a China-ETS Allowance Allocation and Management Training Series in more than 15 cities. The aim of the training was to enhance the capacity and readiness of various stakeholders for the national ETS. Further, MEE released the information regarding the allocation plan through the 'Implementation plan of carbon emission allowance allocation for key emitters in power generation industry (including captive power plant and co-generation) in 2019 (trial version).' The training plan was used in capacity-building activities and further tested the rationality and operability of the benchmarks for the power sector.

Looking to the future, the main tasks of national ETS development are legislating national ETS regulations, accelerating the development of market infrastructure, promoting reporting, carrying out verification and carbon management for key enterprises, and strengthening capacity-building activities. The simulation trading in the power sector is expected to start in 2020.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 10,976.0 MtCO₂e (2012)

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

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

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

By 2030: Peak CO₂ emissions around 2030, with best efforts to peak earlier; China also has committed to lowering CO₂ emissions per unit of GDP by 60–65% from 2005 levels (NDC)

ETS Size

GHGs COVERED

CO₂

SECTORS AND THRESHOLDS

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

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

INCLUSION THRESHOLDS: Entities with annual emissions of ~26,000 t/CO₂ (energy consumption of more than 10,000 tce) in any year over the period 2013–2015.

POINT OF REGULATION

Downstream

CAPPED EMISSIONS

~3,300 MtCO₂

~30%

NUMBER OF ENTITIES

~1,700

CAP

~3,300 MtCO₂/year

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

Phases & Allocation

TRADING PERIODS

FIRST PHASE: Development of market infrastructures

SECOND PHASE: Simulation trading

THIRD PHASE: Expanding sectoral coverage and deepening and expanding the system.

ALLOCATION

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

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

In 2017, draft allocation plans for power, cement, and electrolytic aluminum were developed and trial allocation work was carried out in two provinces. In 2019, MEE released the 'Implementation plan of carbon emission allowance allocation for key emitters in power generation industry (including captive power plant and co-generation) in 2019 (trial version),' which provided further information on the approach to benchmarks for the power sector.

Flexibility

BANKING AND BORROWING

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

OFFSETS AND CREDITS

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

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

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

MARKET STABILITY PROVISIONS

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

Compliance

COMPLIANCE PERIOD

One year

MRV

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

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

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

From 2013 to 2015, the NDRC released a series of MRV guidelines covering a total of 24 sectors. Supplementary MRV data sheets for the eight sectors expected to be covered under

the national ETS, as well as 'Reference Guidance on Third-party Verification of China ETS' and 'Reference Qualification on Third-party Verification Body and Verifiers of China ETS,' were all released in 2016. In 2017, new requirements on data collection, categorization, and verification were added.

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

ENFORCEMENT

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

Other Information

INSTITUTIONS INVOLVED

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

Prior to 2019, provisional DRCs implemented the policies and rules set up by the central level in their respective regions. Post 2019, responsibilities for the ETS was moved to local Ecology and Environment Bureaus, which are the corresponding government institutions of the MEE at the regional level.

IMPLEMENTING LEGISLATION

[Work Plan for Construction of the National Emissions Trading System \(Power Sector\)](#)²

[Notice on Key Works in Preparation for the Launch of the National ETS](#)³

[24 Guidelines for GHG Monitoring and Reporting for various sectors \(2013, 2014, and 2015\)](#)⁴

[Interim Administrative Measures on Emissions Trading](#)⁵

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

2 - https://www.ndrc.gov.cn/xxgk/zcfb/ghxwj/201712/t20171220_960930.html

3 - https://www.ndrc.gov.cn/xxgk/zcfb/tz/201601/t20160122_963576.html

4 - http://www.gov.cn/zwgk/2013-11/04/content_2520743.htm & https://www.ndrc.gov.cn/xxgk/zcfb/tz/201502/t20150209_963759.html & https://www.ndrc.gov.cn/xxgk/zcfb/tz/201511/t20151111_963496.html

5 - http://www.gov.cn/gongbao/content/2015/content_2818456.htm

TAIWAN, CHINA



In July 2015, Taiwan, China enacted the ‘Greenhouse Gas Reduction and Management Act,’ which legislates a 50% emissions reduction target for 2050 compared to 2005 GHG levels. The act also implements carbon reduction by setting regulatory goals in stages on a five-year basis. It further charges the Taiwanese Environmental Protection Administration (TEPA) with the development of appropriate climate change policies to reach this target. The government approved and implemented the ‘National Climate Change Action Guideline’ in February 2017. The guideline lays out 10 general principles on how to achieve Taiwan’s climate mitigation and adaptation targets. The third principle calls for the implementation of a cap-and-trade system. Accordingly, TEPA has been conducting research on the design options and the timetable for establishing a cap-and-trade system.

The act also mandated TEPA to develop the ‘GHG Reduction Action Plan,’ which outlines details on how to implement the mitigation policies contained in the act. It includes periodic regulatory goals for both national and sectoral net GHG emissions, as well as implementation strategies in the form of eight policy packages. The plan was approved

and published in March 2018 and proposes to implement a cap-and-trade system, calculate baseline emissions, and set up regulations—albeit without a precise timeline. On this basis, the central industry competent authorities of the six major sectors (energy, manufacturing, transportation, residential and commercial, agriculture, and environment) approved the ‘GHG Emissions Control Action Programs’ in October 2018. In the next step, the 22 municipalities will each submit an implementation plan adapted to their local conditions.

A series of subsidiary regulations has been formulated in preparation for rolling out the cap-and-trade system. This includes the ‘2018 Regulations Governing GHG Offset Program Management,’ which provide an opportunity for enterprises to acquire carbon offsets credits. Mandatory emissions reporting for entities with annual emissions above 25,000 tCO₂e from certain sectors has been ongoing since 2013. A crediting program for intensity-based early action and offset projects, promulgated by TEPA in 2010, will evolve into a reward program based on performance standards, which is currently under design.

- ETS in force
- ETS under development
- ETS under consideration

← Climate Change Action Guideline calls for ETS implementation

2018 proposal to establish ETS but no precise timeline

Mandatory GHG reporting and offsets program in place

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 293.1 MtCO₂e (2016)

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

- BY 2020:** 2% below 2005 GHG levels
- BY 2025:** 10% below 2005 GHG levels

- BY 2030:** 20% below 2005 GHG levels
- BY 2050:** 50% below 2005 GHG levels

Other Information

MRV

Reporting frequency: Annual reporting of GHGs (CO₂, CH₄, N₂O, SF₆, NF₃, PFCs, HFCs, and NF₃) for entities from certain sectors with annual emissions greater than 25,000 tCO₂e.

VERIFICATION: Third-party verification is required.

FRAMEWORK: GHG reporting under the ‘Air Pollution Control Act’ has been possible on a voluntary basis since 2004 and

became mandatory in 2013. Since 2016, GHG reporting and the inventory program is mandatory under the ‘GHG Accounting and Registration Regulations,’ which are authorized by the ‘Greenhouse Gas Reduction and Management Act.’

INSTITUTIONS INVOLVED

Taiwanese Environmental Protection Administration



INDONESIA

- ETS in force
- ETS under development
- ETS under consideration

MRV pilot system in operation for industry and power sectors

Regulations for a pilot ETS in drafting phase. Legal basis for national ETS by 2024

In 2017, Indonesia passed the 'Government Regulation on Environmental Economic Instruments' that provides a basis for ETS implementation; this regulation sets a mandate for an emissions and/or waste permit trading system to be implemented by 2024 (within seven years from its passage).

In 2018 Indonesia completed a study outlining the emissions profiles and marginal abatement cost curves of the power and industry sectors, next to completing the design and governance framework of an MRV system. The MRV guidelines for the power sector were released in mid-2018. Following this, an online GHG reporting platform for electricity generators and a pilot MRV program for electricity generators in the Java-Madura-Bali grid (covering ~70% of Indonesia's electricity demand) were launched in late 2018.

The Ministry of Industry has developed an online GHG emissions reporting system for industries in Indonesia. Pilot MRV programs are being conducted in the cement and fertilizer sectors.

A study completed in late 2018 examined four market-based instrument (MBI) options: an ETS for the power and industry sectors; energy efficiency certificates for industry; a cap-and-tax system; and a carbon offset mechanism. Based on the study and stakeholder consultation a pilot ETS was selected for further development.

The Ministry of Environment and Forestry (MoEF) is currently drafting regulations for the pilot system.

Background Information

OVERALL GHG EMISSIONS (including AFOLU and peat fire) 1,457.0 MtCO₂e (2016)

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

BY 2030: 29% below BAU by 2030 including LULUCF (unconditional NDC); up to 41% below BAU by 2030 including LULUCF (NDC conditional on international support)

Other Information

INSTITUTIONS INVOLVED

- Coordinating Ministry for Economic Affairs
- Ministry of Environment and Forestry
- Ministry of Energy and Mineral Resources
- Ministry of Industry
- Ministry of Finance
- Environment Fund Agency
- National Development Planning Agency
- PMR Indonesia Secretariat
- UNDP Indonesia

IMPLEMENTING LEGISLATION/REGULATION

- GR 46/2017 on Government Regulation on Environmental Economic Instruments¹
- Act No. 32/2009 on Environmental Conservation and Management²

1 - <https://sipuu.setkab.go.id/PUUdoc/175354/PP%20Nomor%2046%20Tahun%202017.pdf>
 2 - <http://extwprlegs1.fao.org/docs/pdf/ins97643.pdf>

JAPAN



In March 2017, the Global Environment Committee of the Central Environment Council of Japan formulated the “Long-term Low-Carbon Vision” of the country. The document refers to carbon pricing as essential to decarbonizing the society. Based on that discussion, in March 2018 an expert committee on carbon pricing released a study assessing how carbon pricing could help Japan achieve long-term, substantial emissions reductions, as well as solve economic and social issues. In June 2018, a deliberative council—the Subcommittee on Utilization of Carbon Pricing, Global Environmental Subcommittee, Central Environment Council—was set up to consider how carbon pricing can encourage Japan to make the transition to a decarbonized society and to achieve economic growth. Both industry groups and academic experts participated in the council. The subcommittee published an interim summary report of the discussion in August 2019. Discussions on the shape a future carbon pricing mechanism may take are still ongoing within the Ministry of Environment and with various stakeholders.

In parallel, Japan operates the Advanced Technologies Promotion Subsidy Scheme with Emission Reduction Targets Program, which functions as a voluntary cap-and-trade program. Entities establish a reduction target based on historical emissions and propose new technologies to implement in reaching these targets.

Japan also is implementing the Joint Crediting Mechanism (JCM), a bilateral offset crediting mechanism to incentivize low-carbon technologies in 17 JCM partner countries (Mongolia, Bangladesh, Kenya, Ethiopia, Indonesia, Vietnam, Lao PDR, Cambodia, Maldives, Palau, Costa Rica, Mexico, Chile, Saudi Arabia, Myanmar, Thailand, and the Philippines).

- ETS in force
- ETS under development
- ETS under consideration

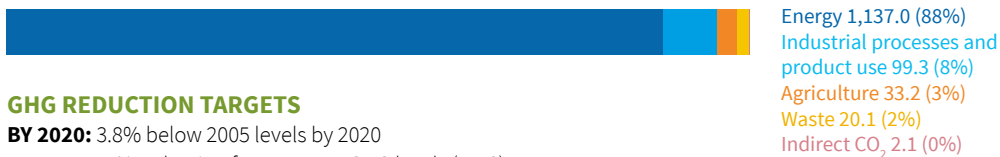
← Expert committee discussing carbon pricing options

Operating voluntary ETS

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) **1,291.7 MtCO₂e (2017)**

OVERALL GHG EMISSIONS BY SECTOR



GHG REDUCTION TARGETS

- BY 2020:** 3.8% below 2005 levels by 2020
- BY 2030:** 26% reduction from FY2013 GHG levels (NDC)
- BY 2050:** 80% reduction (base year not stipulated)

Other Information

INSTITUTIONS INVOLVED

Ministry of the Environment, which manages the Subcommittee on Utilization of Carbon Pricing, Global Environmental Subcommittee, Central Environment Council.



PAKISTAN



ETS in force



ETS under development



ETS under consideration

Launched a national committee in 2019 tasked with assessing the opportunities for an ETS

Pakistan is considering market-based climate policy instruments, including an ETS, to tap into low-cost abatement opportunities and leverage low-carbon investments.

The 'Pakistan Climate Change Act, 2017'¹ 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 and the Pakistan Climate Change Authority tasked with coordinating climate policy development and implementation. The act furthermore delegates responsibility to the authority on designing and establishing a national registry and database on GHG emissions.

In 2019 the Pakistani Ministry of Climate Change, in cooperation with the United Nations Framework Convention on Climate Change and the Institute for Global Environmental Strategies, published a study on carbon pricing underlining the potential for emissions trading in Pakistan in the power and industry sectors.

Following the outcomes of the study, Pakistan launched the National Committee on Establishment of Carbon Markets in December 2019. The committee will be tasked with assessing the role and scope of carbon markets in delivering Pakistan's NDC and identifying opportunities and challenges to improving emissions data. Among other objectives, it will review existing carbon market designs, deliberate with national stakeholders, draft reports, and coordinate information-sharing and capacity-building activities.

The ongoing work is focused on developing recommendations for the government on the development of a domestic ETS and credit-based trading mechanisms linked to international carbon markets, which would enable Pakistan to supply offsets to partner countries.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 394.7 MtCO₂e (2015)²

OVERALL GHG EMISSIONS BY SECTOR



Energy 186.0 (47%)
Industrial Processes 21.9 (6%)
Agriculture 174.6 (44%)
Waste 12.3 (3%)

GHG REDUCTION TARGETS

BY 2030: 20% below BAU including LULUCF (NDC conditional on international support)

Other Information

INSTITUTIONS INVOLVED

Ministry of Climate Change
Pakistan Climate Change Council
Pakistan Climate Change Authority
National Committee on Establishment of Carbon Markets

IMPLEMENTING LEGISLATION/REGULATION

Pakistan Climate Change Act 2017³

1 - http://www.na.gov.pk/uploads/documents/1485513841_966.pdf

2 - <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Pakistan%20First/Pak-INDC.pdf>

3 - http://www.na.gov.pk/uploads/documents/1485513841_966.pdf

THAILAND



- ETS in force
- ETS under development
- ETS under consideration

← National Economic and Development Plan includes domestic ETS

Operating voluntary ETS to test registry and trading platform

Developing legal framework and roadmap for ETS

The '12th National Economic and Social Development Plan (2017-2021)' of Thailand calls for several mitigation measures, including the development of a domestic carbon market. The 'National Climate Change Master Plan (2015-2050)' also refers to carbon markets as a potential mechanism to reduce GHG emissions in the private sector. According to the 'National Reform Plan (2018),' the Thai government must set up an economic instrument, such as a cap-and-trade program, to incentivize the private sector to reduce emissions. The specific instrument will be outlined in the 'Climate Change Act,' which is expected to be proposed for cabinet consideration in 2021.

Since 2013, the Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) has developed an MRV system for the 'Thailand Voluntary Emissions Trading Scheme.'" (Thailand V-ETS). The first 3-year pilot phase

(2015-2017) aimed at testing the MRV system for four industrial sectors, including cement, pulp and paper, iron and steel, and petrochemical, setting a cap for facilities' Scope 1 and 2 emissions, and allocating allowances for covered facilities. The second pilot phase (2018-2020) has tested the MRV, the registry and trading platform for an additional five industrial sectors, including petroleum refinery, glass, plastic, food and feed, and ceramics. In 2020, MRV for another three industrial sectors will be developed, and many seminars and meetings will be held to introduce the ETS concept to various stakeholders.

In addition, as part of the Thailand PMR Program, TGO has conducted a study on the appropriate formulation of the legislation on the ETS and is currently in the process of developing draft laws for GHG reporting and establishment of the ETS for consideration at the policy level.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) **318.7 MtCO₂e (2013)**

OVERALL GHG EMISSIONS BY SECTOR (2013)



GHG REDUCTION TARGETS

BY 2020: In its 'Nationally Appropriate Mitigation Action (2014),' Thailand committed to a voluntary 7% reduction compared to BAU in the energy and transport sectors. The reduction target can be up to 20% with international support.

BY 2030: 20% reduction compared to BAU with a 25% reduction contingent on adequate and enhanced access to technology development and transfer, financial resources, and capacity-building support through a balanced and ambitious global agreement under the UNFCCC (NDC).

Other Information

INSTITUTIONS INVOLVED

Thailand Greenhouse Gas Management Organization (Public Organization)

IMPLEMENTING LEGISLATION / REGULATION

12th National Economic and Social Development Plan (2017-2021)¹

¹ - http://www.nesdc.go.th/ewt_w3c/ewt_dl_link.php?filename=EvaluationDriven&nid=9640



VIETNAM



ETS in force



ETS under development



ETS under consideration

Exploring potential for market-based instruments for the steel and waste sectors post 2020

ETS DESCRIPTION

Vietnam's 'Green Growth Strategy' (2012) pursues the objective of a low-carbon economy and citing the use of market-based instruments as an avenue to achieve the strategy.

Several measures lay the groundwork for implementing 'National Appropriate Mitigation Actions' (NAMAs) in the waste, industry (steel, cement, chemical), and power sectors. As part of its activities under the PMR, Vietnam is currently working on a roadmap that lays out policy proposals for implementing carbon pricing and market-based instruments in the country next to developing MRV and accreditation systems.

The planned MRV system and NAMAs will provide the experience for the implementation of sector-based carbon pricing instruments after 2020, centering around the steel sector and solid waste sectors.

Background Information

OVERALL GHG EMISSIONS (excl. LULUCF) 321.5 MtCO₂e (2014)

OVERALL GHG EMISSIONS BY SECTOR



Energy 171.6 (53%)
Industrial Processes 38.6 (12%)
Agriculture 89.8 (28%)
Waste 21.5 (7%)

GHG REDUCTION TARGETS

BY 2030: 8% below BAU, or up to 25% below BAU conditional on international support (NDC). The target includes a 20% reduction in 2010 emission intensity levels, or 30% conditional on international support.

Other Information

INSTITUTIONS INVOLVED

Ministry of Natural Resources and Environment of Vietnam



**ABOUT ICAP &
NOTES**

04

ABOUT THE INTERNATIONAL CARBON ACTION PARTNERSHIP

Founded in 2007, ICAP is an international government forum that brings together policymakers from all levels of government that have or are interested in introducing an ETS. It provides a unique platform for governments to discuss the latest research and practical experiences with emissions trading. Since its formation, ICAP has established itself as an ETS knowledge hub and its membership has grown to include 31 members and five observers.

Objectives

- Share best practices and learn from each other's experience of ETS
- Help policymakers recognize ETS design compatibility issues and opportunities for the establishment of an ETS at an early stage
- Facilitate the future linking of trading programs
- Highlight the key role of emissions trading as an effective climate policy response
- Build and strengthen partnerships among governments

Members (as of March 2020)

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, Ontario, Oregon, Portugal, Québec, Spain, Switzerland, the Tokyo Metropolitan Government, Vermont, the United Kingdom and the state of Washington.

Observers

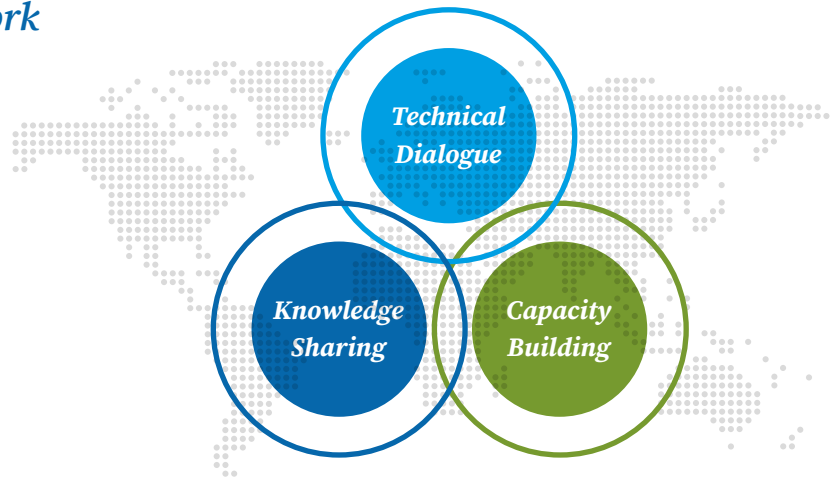
Japan, Kazakhstan, the Republic of Korea, Mexico and Ukraine



The three pillars of ICAP's Work

KNOWLEDGE SHARING, TECHNICAL DIALOGUE, AND CAPACITY BUILDING

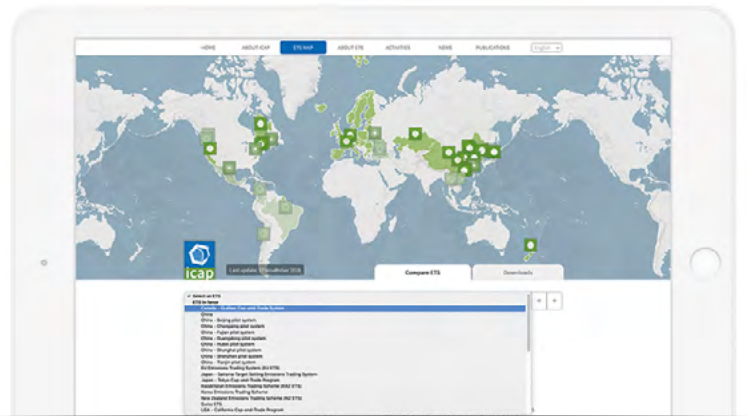
Through these three pillars, ICAP creates a holistic approach to delivering meaningful ETS support. This ranges from ICAP's role as a knowledge hub through the knowledge sharing tools and activities, to ICAP's capacity building courses around the world, to the ongoing technical dialogues on pertinent design topics.



Knowledge Sharing

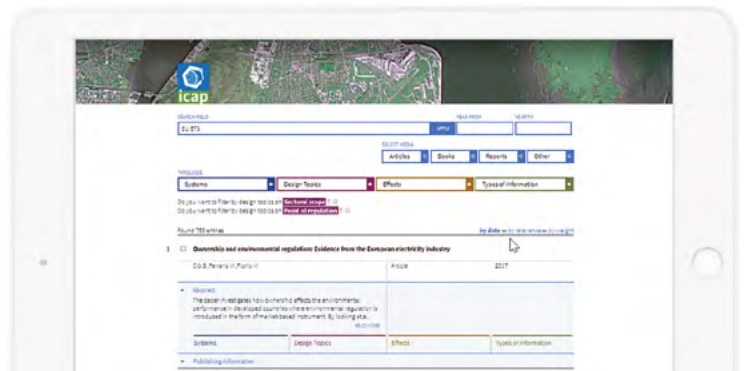
ETS MAP

The ICAP ETS Map provides up to date information on ETSs around the world - including systems that are implemented, under development and under consideration. The interactive map features downloadable factsheets and gives granular information on individual design aspects.



ETS LIBRARY

Combining sources from legislation, academic articles, grey literature, books, and more, the ETS Library uses specific search terms to deliver optimized search results to everyone from ETS practitioners, policy-makers, students, and more.



ICAP ALLOWANCE PRICE EXPLORER

The quarterly updated Allowance Price Explorer is an interactive tool which lets the user compare price developments between ETSs. Full data download as well as deep diving on market stability mechanisms, allows the user to create individualized charts.



Technical Dialogue

WEALTH OF ETS RESEARCH

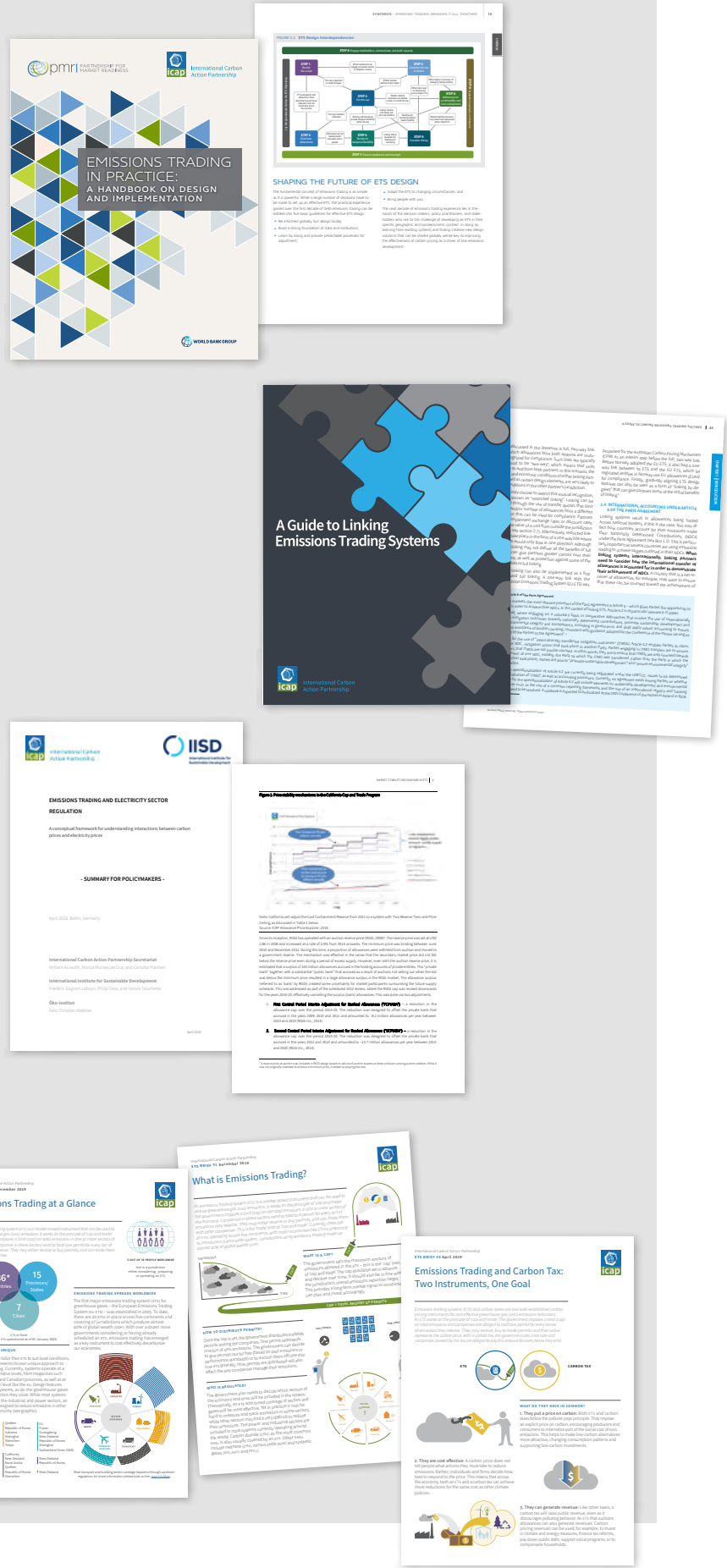
Through its technical dialogue activities, the ICAP Secretariat periodically publishes research on various topics of ETS design and implementation, drawing on the rich experience of all ICAP jurisdictions.

Among many others, examples include:

- The **PMR-ICAP ETS Handbook**, which provides a step by step guide on ETS design and implementation;
- The **ICAP Guide to Linking**, which consolidates the literature and latest experiences from ICAP Members on the operation of linked markets; and
- The study on **Emissions Trading and Electricity Sector Regulation**, which explores the interaction between allowance prices and electricity prices under different forms of power sector regulation.

The **ICAP Briefs** on ETS basics provide simple explainers on what ETSs are and how they operate.

Stay tuned to the ICAP website for the latest publications!



Capacity Building

ICAP ETS COURSES

ICAP delivers ETS capacity building courses ranging from a few days to several weeks. Since 2009, ICAP has delivered 19 courses with over 450 participants from 45 countries. The courses have drawn on the teachings of over 230 speakers from 32 countries. ICAP is consistently expanding its training scope, with an increasing focus on south-south cooperation. Thanks to funding from the European Commission, more courses are planned in 2020.



IN-COUNTRY TRAININGS

In cooperation with various partners, ICAP has delivered training to relevant stakeholders in countries establishing an ETS or in the early stages of their ETS implementation. Past examples include Ukraine, Turkey, Chile and China. The most recent in-country training brought together policy-makers and private sector participants in Mexico in preparation for the pilot phase of their ETS, which launched in January of this year.



NOTES ON METHODS AND SOURCES

GENERAL NOTES

1. The report draws on a range of sources, including official ETS information and statements from governments and public authorities, data submitted to the UNFCCC, or where available, other official reporting, and information provided by ICAP members and observers, contributing authors or in-country/native experts from our network. Information on emitting sectors is based on jurisdiction-specific data sources; therefore, categories are not necessarily consistent across jurisdictions.
2. Data in the report represents the current situation as of 31 January 2020.
3. Where 2020 data is not yet available, we use the most recent available data.
4. For the purpose of this report, emissions trading systems (ETS) include mandatory cap-and-trade systems for GHGs. Systems that regulate other gases (e.g., other air pollutants) or trade other units (e.g., energy-efficiency certificates), other market-based instruments (e.g., carbon taxes, baseline-and-crediting systems) and voluntary programs do not fall under the scope of this report.
5. We use metric tonnes throughout the report, unless otherwise indicated.
6. Emissions coverage as reported in the factsheets refers to the emissions cap data for systems with a cap. For systems without a cap it refers to estimates of the emissions covered under the particular emissions trading system.
7. 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 Québec, carbon prices and revenues are calculated with exchange rates provided on the day of auction by the WCI. For monetary values that are fixed over multiple years the value reported in USD uses the 2019 exchange rates.
8. Overall GHG emissions and the sum of the sectoral emissions reported in the factsheets may not add up due to rounding.
9. The following criteria are used to determine the three ETS status categories:
 - a. In force: ETS is in force with implementation established in the relevant regulation or legislation.
 - b. Under development: A mandate for ETS is established and ETS rules are currently being drafted.
 - c. Under consideration: ETS is being considered as a potential mitigation instrument and the government or other relevant authorities have publicly sent signals towards the development of an ETS.
10. The foreword draws on:
 - a. Chapter 4 (p. 377) and Technical Summary (p. 33) for references from IPCC (2018): Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press. URL: <https://www.ipcc.ch/sr15/>
 - b. Acadia Center (2019) for RGGI related references: The Regional Greenhouse Gas Initiative. 10 Years in Review. URL: <https://acadiacenter.org/document/the-regional-greenhouse-gas-initiative-ten-years-in-review/>.
 - c. Carbon Brief (2019) for UK related references: Analysis: UK electricity generation in 2018 falls to lowest level since 1994 [Evans, S.]. URL: <https://www.carbonbrief.org/analysis-uk-electricity-generation-2018-falls-to-lowest-since-1994>.
 - d. Agora Energiewende (2020) for Germany related references: Die Energiewende im Stromsektor: Stand der Dinge 2019. Rückblick auf die wesentlichen Entwicklungen sowie Ausblick auf 2020. URL: <https://www.agora-energiewende.de/veroeffentlichungen/die-energiewende-im-stromsektor-stand-der-dinge-2019/>.
 - e. European Commission (2018) for the EU ETS related references: Report from the Commission to the European Parliament and the Council. Report on the functioning of the European carbon market. URL: https://ec.europa.eu/clima/sites/clima/files/ets/docs/com_2018_842_final_en.pdf.
 - f. European Commission website for Innovation Fund related references: https://ec.europa.eu/clima/policies/innovation-fund_en
 - g. Tvinnereim & Mehling (2018) for references related to carbon lock in and long-lived capital assets: Tvinnereim, E., & Mehling, M., 2018: Carbon pricing and deep decarbonisation. Energy Policy, 121(May), 185–189.

NOTES ON INFOGRAPHICS

For the infographics “From Supranational to Local”, “Emissions Trading Worldwide” and “Sector Coverage”, we draw on data contained in the factsheets, the online version of the ICAP ETS Map (<https://icapcarbonaction.com/en/ets-map>), as well as news articles from the ICAP secretariat. For infographics involving quantitative data the following sources and methods were used.:

FROM SUPRANATIONAL TO LOCAL

1. Jurisdictions’ shares of global GDP and world population are calculated based on the latest annual data available before the Status Report’s editorial cut-off date. They cover 2016, 2018 or 2019 data. The population of jurisdictions with an ETS in force and the cumulative GDP of their respective economies are calculated as a share of world population and global GDP. The share of global GHG emissions covered by an ETS in force is calculated using the latest available data for the jurisdictions’ official cap. In cases where the 2019 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.

ALLOWANCE PRICES

1. The infographic displays the allowance prices between 1 January 2010 and 31 December 2019.
2. An allowance represents the right to emit one tonne of CO₂e in the jurisdiction(s) that accept it for compliance. However, allowances from different systems cannot be treated as a single commodity because of differences in system design and allowance prices are not directly comparable across systems.
3. Price series for California, Quebec and RGGI are obtained from the primary market and are reported at the same frequency as the respective auctions in these systems. All other price series are obtained from the secondary market and are reported for each trading day for which data are available.
4. Where allowance prices reflect auction settlement prices, the observations from two successive auctions are connected linearly.
5. Secondary market prices reflect settlement prices and do not capture intra-day trade variation.
6. RGGI allowance prices are in short tons and have been converted to metric tonnes for the purposes of this infographic.
7. Where allowances have a limited vintage, the time series data compiles these vintages in a way that reflects the compliance cycle.
8. A 90-day moving average was used to smooth out the variability in calculating the price range for the Chinese pilots. Note that the variability may be driven by changes in market fundamentals as well as missing price data from a given system on a given day.
9. For information on sources for allowance prices and exchange rates see <https://icapcarbonaction.com/en/documentation-allowance-price-explorer>.

GLOBAL EXPANSION OF EMISSIONS TRADING








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 emissions covered by the sectors are used instead.
2. We exclude emissions covered under the aviation sector cap of the EU ETS. In light of international developments of a global market-based regulation for aircraft emissions, the EU adjusted its treatment of the aviation sector, not applying the previously set cap to flights operating from or to non-EEA countries while continuing to apply the legislation to flights within and between countries in the EEA. (See the EU ETS Factsheet for details). Excluding the aviation sector of the EU ETS thus leads to a more conservative estimate of the total global emissions covered by an ETS.
3. The expected start for the Chinese national ETS is based on the ‘Work Plan for Construction of the National Emissions Trading System (Power Sector)’ approved by the State Council in late 2017. Uncertainties remain and the start date may be subject to further change or delays.
4. There are two cases where an existing and a scheduled system regulate the same emissions. In those cases, we made the following assumptions to avoid double-counting:
 - a. **Massachusetts & RGGI:** Massachusetts’ system covers the same emissions as RGGI does, so it is excluded from the infographic to avoid double counting.
 - b. **China & Chinese Pilots:** Both the Chinese pilots and national ETS cover the power sector. To calculate the total emissions covered by the scheduled national ETS, we estimated the degree of power sector overlap between the national system and the pilots. For the provincial power sector data, we relied on Qu Shen, Sai Liang, and Ming Xu. "CO₂ Emissions Embodied in Interprovincial Electricity Transmissions in China" *Environmental Science & Technology* 51, no. 18 (2017): 10893-10902. The study aggregates official power generation statistics

and combines them with emission intensities for 2013 data yielding province-level estimates. It indicates that in 2013, approximately 1/6 of Chinese power sector emissions came from provinces that now have a pilot system also covering the power sector. Assuming this share has remained constant since, we adjusted the estimated total coverage of the Chinese national ETS (3.3 Gt CO₂e – power sector only), meaning we assume that the Chinese national ETS will bring an additional 2.75 Gt CO₂e (= 5/6 * 3.3) under ETS regulation in China.

5. Global emissions data refer to CO₂e excluding LULUCF. The values for 2019 and subsequent years are calculated based on the observation in 2018 and assuming a constant 1.28% growth rate, which is the average growth rate of global GHG emissions between 2015 and 2018. Global GHG emissions data are from Olivier and Peters (2019): Trends in Global CO₂ and Total Greenhouse Gas Emissions, 2019 Report. PBL Netherlands Environmental Assessment Agency, The Hague. URL: https://www.pbl.nl/sites/default/files/downloads/pbl-2020-trends-in-global-co2-and-total-greenhouse-gas-emissions-2019-report_4068.pdf
6. Percentages of global emissions covered are rounded to the nearest full percentage. They are slightly above 5% and 14% in 2005 and 2021, respectively.
7. Forecasts of 2021 emissions coverage are made based on systems' future caps. In cases where no future cap data are available, the most recent cap is used. For the German National ETS, we assume that the cap will approximately equal the sum of emissions from transport, residential and commercial/institutional sectors in 2018 from Umweltbundesamt (2020): Nationale Trendtabellen für die deutsche Berichterstattung atmosphärischer Emissionen 1990-2018. URL: <https://www.umweltbundesamt.de/themen/klima-energie/treibhausgas-emissionen>.

SECTOR COVERAGE

1. For the purposes of this infographic, the following sector definitions are used:

SECTOR	DEFINITIONS
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).
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.
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).
Power 	Emissions from the combustion of fossil fuels for electricity generation, as well as large-scale centralized heat production.

2. Emissions coverage of the different systems corresponds to the value that is reported in the corresponding factsheets. In the case of the Chinese pilots, the coverage was calculated by adding the most recently reported caps of all the pilots and dividing that number by the addition of the most recently reported GHG emissions of all the pilots. Note that other than power and industry, which are always covered, sector coverage differs across Chinese pilots and this is indicated in the relevant slice of the infographic.

DIFFERENT SHAPES OF ETS

1. Cap trajectory: The rate of decline in the cap is calculated for the period between 2017 and 2020 to minimize the effect of idiosyncratic and transitory factors. The difference between the 2020 and 2017 caps is expressed as the average percentage reduction over this time period. The data reflect annual caps and is thus not a direct measure of allowances distributed in this year, given that the latter measure can be affected by vintage years, reserves and other instruments.
2. Coverage: The figures for coverage indicate the percentage of the respective economy's total emissions that is covered by the ETS. The data is retrieved from the factsheets published in this report and refers to the latest emissions coverage figures available for each system.
3. Allowance Price: For the EU ETS, the price is the average of all 2019 spot prices (settlement prices) at the European Energy Exchange. The price for Switzerland represents an average of the "hammer price" from the biannual competitive auctions. For RGGI, Québec and California, the clearing prices of all auctions conducted in 2019 are averaged. In the case of RGGI where short tons are the standard unit, the price is converted to the price per metric tonne. For the Korean system, the price is based on average end-of-day trading prices on the secondary-market exchange in 2019. All prices are expressed in USD.
4. Auction share: This figure indicates the share of auctioned allowances in the cap. The consignment auctions in California are not included in calculating the auction share.

AUCTIONING REVENUE FROM EMISSIONS TRADING SYSTEMS

1. Auctioning revenues for the 15 systems (including the 8 Chinese pilots) were calculated using data from the European Commission; California Air Resources Board; Québec Ministry of Sustainable Development, Environment, and Fight Against Climate Change; Regional Greenhouse Gas Initiative; European Energy Exchange; the Intercontinental Exchange and Swiss Emissions Registry; Massachusetts Department of Environmental Protection; the website of the Korea Exchange (KRX) as well as from the factsheets of the Chinese pilot systems (links available upon request, info@icapcarbonaction.com).
2. Auctioning revenue for the EU ETS includes revenue from the domestic aviation sector.
3. For the California cap-and-trade system, the proceeds from consignment auctions are excluded.
4. For the Québec cap-and-trade system, joint auctions involve currency conversion for part of the proceeds. The rate and transaction fees on the date of conversion can affect the amount deposited to the Green Fund. As a result, the product of the number of permits sold and the settlement price may slightly differ from the actual amount deposited.
5. The estimated percentage of auctioned allowances for the California and Québec cap-and-trade systems are calculated based on the vintage year, not by the year when allowances were or would actually be auctioned.
6. The Massachusetts quarterly reports are published by Potomac Economics, which is the official market monitor for the Massachusetts Department of Environmental Protection.

THE PATH TO NET ZERO

1. The evolution of emissions during the 21st century is highly uncertain and depends on assumptions regarding a host of interrelated economic, social and technological variables. The emissions pathway depicted in the bottom panel takes a middle-of-the-road position regarding these assumptions and is merely illustrative. It corresponds to the pathway S2 in the IPCC Special Report on Global Warming of 1.5°C (IPCC, 2018). Section 2.3 of the report provides a detailed exposition of S2 and other possible pathways. See also Figure SPM.3b in the Summary for Policy Makers of the same report for a concise overview of these pathways, noting that S2 is referred to as P3.
2. The top panel on the role of carbon pricing and companion policies draws on the conclusions of and the literature reviewed in Burke et al (2019): Burke J, Byrnes R and Fankhauser S (2019) How to price carbon to reach net-zero emissions in the UK. London: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science. URL: http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2019/05/GRI_POLICY-REPORT_How-to-price-carbon-to-reach-net-zero-emissions-in-the-UK.pdf. The non-exhaustive list of companion policies and measures also draws on Table 2.SM.13 of the IPCC Special Report on Global Warming of 1.5°C (IPCC, 2018).

LIST OF ACRONYMS

AB	Assembly Bill	FGV	Fundação Getúlio Vargas
AFOLU	Agriculture, Forestry and other Land Use	FY	Fiscal Year
AIC	Allowances in Circulation	FYP	Five Year Plan
ANSI	American National Standards Institute	GDP	Gross Domestic Product
APCR	Allowance Price Containment Reserve	GHG	Greenhouse Gas
BAU	Business as Usual	GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Development Agency)
BPU	Board of Public Utilities	GVCes	Centro de Estudos em Sustentabilidade da Fundação Getúlio Vargas (Center for Sustainability Studies)
BVRio	Rio de Janeiro Green Stock Exchange	HFCs	Hydrofluorocarbon
CAD	Canadian Dollar	HFC-23	Fluoroform
CARB	California Air Resources Board	ICAO	International Civil Aviation Organization
CCIR	Carbon Competitiveness Incentive Regulation	ICAP	International Carbon Action Partnership
CCER	Chinese Certified Emission Reduction	INECC	National Institute for Ecology and Climate Change
CCR	Cost Containment Reserve	INDC	Intended Nationally Determined Contribution
CCS	Carbon Capture and Storage	KCUs	Korean Credit Units
CDM	Clean Development Mechanism	KETS	Korean Emissions Trading Scheme
CER	Certified Emission Reductions	KRW	South Korean Won
CH₄	Methane	LDCs	Least Developed Countries
CHF	Swiss Franc	LGCC	Ley General de Cambio Climatico (Mexico's General Law on Climate Change)
CMEA	Coordinating Ministry for Economic Affairs	LNG	Liquefied Natural Gas
CNY	Chinese Yuan Renminbi	LULUCF	Land Use, Land-Use Change and Forestry
CO₂	Carbon Dioxide	JI	Joint Implementation
CORSIA	Carbon Offsetting and Reduction Scheme	MASS DEP	Massachusetts Department of Environmental Protection
CPA	Carbon Pricing in the Americas	MBI	Market-based Instrument
DEB	Direct Environmental Benefits	MEE	Ministry of Ecology and Environment
DEP	Department of Environmental Protection	MEP	Ministry of Environmental Protection
DEQ	Oregon Department of Environmental Quality	MMC	Mine Methane Capture
DHC	District Heat and Cooling	MOE	Ministry of Environment
DRC	Development and Reform Commission	MOU	Memorandum of Understanding
ECCC	Environment and Climate Change Canada	MOST	Ministry of Strategy and Finance
ECR	Emissions Containment Reserve	MRV	Monitoring, Reporting and Verification
EEA	European Economic Area	MSR	Market Stability Reserve
EEB	Ecology and Environment Bureau	MtCO_{2e}	Million Metric Tons of Carbon Dioxide Equivalent
EITE	Energy-Intensive and Trade-Exposed	MW	Megawatt
ERU	Emissions Reduction Units	MWe	Megawatt Equivalent
EQB	Environmental Quality Board	N₂O	Nitrous Oxide
ETS	Emissions Trading System or Emissions Trading Scheme	NO_x	Nitrogen Oxide
EU	European Union		
EUR	Euro		
FFCER	Fujian Forestry Certified Emission Reduction		

NAMA	Nationally Appropriate Mitigation Actions
NDC	Nationally Determined Contribution
NDRC	National Development Reform Commission
NF₃	Nitrogen Trifluoride
NOX	Nitrogen Dioxide
NZ	New Zealand
NZD	New Zealand Dollar
NZUs	New Zealand Units
NYC	New York City
OBPS	Output Based Pricing System
OTC	Over the Counter
PCF	Pan-Canadian Framework on Green Growth and Climate Change
PFCs	Perfluorocarbon
PHCER	Pu Hui Certified Emission Reductions
PMR	Partnership for Market Readiness
PNCTE	Programa Nacional de Cupos Transables de Emisión de Gases de Efecto Invernadero (National Program of Greenhouse Gas Tradable Emission Quotas)
RBOB	Reformulated Blendstock for Oxygenate Blending
RENE	Mexico National Emissions Register
RGGI	Regional Greenhouse Gas Initiative
SCC	Standards Council of Canada
SEMARNAT	Ministry of Environment and Natural Resources of Mexico
SF₆	Sulfur Fluoride
SHEAF	Shanghai Emission Allowance Forward
SO₂	Sulfur Dioxide
SOE	State Owned Enterprise
tce	Tonne of Coal Equivalent
TCI	Transportation and Climate Initiative
tCO₂	Tonne of Carbon Dioxide
tCO₂e	Tonne of Carbon Dioxide Equivalent
TEPA	Taiwanese Environmental Protection Administration
TGO	Thailand Greenhouse Gas Management Organization
TIER	Technology Innovation and Emissions Reduction Regulation
TMG	Tokyo Metropolitan Government
TMS	Target Management Scheme
UNFCCC	United Nations Framework Convention on Climate Change
USD	US Dollar
US EPA	US Environment Protection Agency
V-ETS	Thailand Voluntary Emissions Trading Scheme
WCI	Western Climate Initiative

IMPRINT

Publication Date

March 2020

Design

Simpelplus
www.simpelplus.de

Printing

Ruksaldruck

Photos

Cover: iStock, content in order of appearance: p.10 iStock, p.25 Red Zeppelin on unsplash, p.34,35 iStock, p.148 Chuttersnap on unsplash, p.149-152 ICAP

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 2020. 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.

Rights and permissions

All rights reserved. The content of the work created by the ICAP Secretariat and the work itself are subject to German copyright law. Third party contributions are marked as such. Duplication, revision, distribution and any kind of use beyond the limits of copyright require the written consent of the authors. The duplication of parts of the work is only permitted if the source is mentioned.

Attribution

Please cite the work as follows: ICAP. (2020). Emissions Trading Worldwide: Status Report 2020. Berlin: 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

www.icapcarbonaction.com
info@icapcarbonaction.com



International Carbon
Action Partnership

www.icapcarbonaction.com