International Carbon Action Partnership
ETS Detailed Information

Canada - Nova Scotia

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Nova Scotia Nova Scotia's cap-and-trade program sets a cap on the total amount of GHG emissions allowed in covered sectors in the province for the years 2019-2022 (compliance period). Final cap-and-trade program regulations were passed in November 2018 and the program launched in January 2019. The program regulates the industrial, power, heat (buildings), and transport sectors and covers approximately 80% of GHG emissions in Nova Scotia.
Year in Review	The Nova Scotia program was found to meet the federally set benchmark introduced in the Pan-Canadian Framework on Clean Growth and Climate Change (see Canada factsheet). This means that the province will not be subject to the federal carbon pricing "backstop" measure. In May 2018, Nova Scotia also became a member of the Western Climate Initiative, a collaboration of US and Canadian subnationals advancing emissions trading.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 16.1 MtCO2e MtC0_2e (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Electricity and heat generation — 7.1 Transportation — 5.0 Heat (residential) — 1.2 Industry — 1.0 Agriculture and waste — 0.9 Heat (commercial) — 0.5 Oil and gas — 0.5
Overall GHG reduction target	**BY 2020:** at least 10% reduction from 1990 GHG levels **BY 2030:** 45-50% below 2005 levels **BY 2050:** 80% overall reduction in GHG emissions
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	0.80
GHG covered	CO2, CH4, N2O, SF6, NF3, HFCs, PFCs

Sectors covered and thresholds	The program covers the industrial and electricity sectors, as well as fuel suppliers (upstream coverage of transport and heating). **INCLUSION THRESHOLDS:** For the industrial and electricity sectors, facilities generating ≥ 50,000 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 ≥ 10,000 tCO2e/year. No provisions for voluntary ("opt-in") participation.
Point of regulation	Mixed
Number of liable entities	~21 entities No information available yet.
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 period	Nova Scotia's cap-and-trade program is structured around compliance periods; trading periods are not defined separately. The first compliance period is 2019–2022.
Allocation	Allowances are distributed via free allocation and auction. Initially, most of the allowances will be distributed for free, as outlined in the regulation (and below). **FREE ALLOCATION:** **Industrial Facilities***:* Facilities will receive allowances based on production intensity benchmarks based on data from the period 2014–2016. At the beginning of the year, 75% of the eligible emissions allowances will be distributed to the entities; the remaining 25% will be provided in the following year together with production-level adjustments after the submission of a verified emissions report. The benchmark is based on historical facility emissions intensity, an assistant factor that varies between 1 (100%) for cement and 0.9 (90%) for pulp and paper and natural gas processing (the only defined industries). A cap adjustment factor is also applied, declining from 1 in 2019 to about 0.88 in 2022. This means that an entity would receive about 12% less allowances based on the output from year 1. **Fuel Suppliers and Electricity Importers***:* Receive 80% of free allocation based on verified GHG reports for previous year's emissions. **Nova Scotia Power Inc.***:* The utility will be allocated allowances based on a reduction from BAU projections; ~6.3 million allowances will be freely allocated to Nova Scotia Power Inc. in 2019, declining to just over five million in 2022. **AUCTIONING:** The province will hold auctions two to four times per calendar year, starting in 2020. Minimum price: 5% plus inflation per year. Auctioning in Nova Scotia has two particularities: **(1)***The option for regulated entities to consign allowances to auction:* minimize transaction costs for participants, regulated entities can consign their allowances to the government auctions. Allowances offered for sale through consignment are included in the government auctions and sold first, followed by emission allowances offered for sale by the province. 100% of the revenue from allowances sold on consignment is returned to the participants. **(2)***The purchase of limits to secure market functioning:* secure market functioning, bidders will be subject to purchasing limits that restrict how many allowances each participant

	can buy at any one auction. Purchasing limits are intended to mitigate the risk that one participant can manipulate the market by causing shortages and price spikes. **Purchasing Limits (for the 2019-2022 compliance period):** · Fuel suppliers: 15% of the previous year's verified GHG emissions per auction and 25% for the calendar year; · Industrial facilities: 3% of their previous year's verified GHG emissions per auction and 5% for the calendar year; and · Nova Scotia Power Inc.: 5% of the allowances available for sale at each auction.

Flexibility

Banking and borrowing	Not yet defined.
Offsets and credits	Nova Scotia's cap-and-trade legislation includes the possibility for an offset system. Further consultations will be undertaken in 2019 to consider this option.
Market Stability Provisions	**Reserve:** In the first year of the compliance period (2019), the government will place 3% of allowances available under the yearly caps into a reserve. These emission allowances may be used for: **(1) Cost containment:** Offer for sale at set prices to participants at predetermined times throughout the year to cover their compliance obligations. Up to four reserve sales can occur in a calendar year. The initial price will be CAD 50 (USD 38.05) in 2020, rising annually by 5% plus inflation. **(2) New entrants:** Accommodate new participants in the cap-and-trade program whose GHG emissions are not currently accounted for and that qualify for free allocation. **(3) Reserve for adjustments in output-based free allocation***:* Adjust to variability in year-to-year commitments to free allowances (allowances from reserve can be used as a buffer for allocation-amount uncertainty: if projections are not accurate, commitments for free allowances according to allocation rules can be fulfilled by using allowances from the reserve).

Compliance

Compliance Period	Four years (2019-2022) (see "Phases and Allocation" above)
Monitoring, Reporting, Verification (MRV)	In Nova Scotia, MRV is referred to as "Quantification, Reporting, and Verification." **REPORTING FREQUENCY:** Annually. Report for 2018 to be submitted by 1 June 2019; verification by 1 September 2019. Starting in 2020, report and verification must be submitted by 1 May of each year for the previous calendar year (1 May 2020 for 2019, 1 May 2021 for 2020, 1 May 2022 for 2021, 1 May 2023 for 2022). **VERIFICATION:** Reports must be verified by an accredited third-party organization. Lists of eligible verification bodies are available at: Standards Council of Canada and the American National Standards Institute. **FRAMEWORK:** The rules for reporting GHG emissions are outlined in Nova Scotia's 'Quantification, Reporting, and Verification of Greenhouse Gas Emissions Regulations' and 'Standards for Quantification, Reporting, and Verification of Greenhouse Gas Emissions.'
Enforcement	Participants who do not surrender enough allowances at the end of the compliance period will pay three times the latest auction settlement price per allowance they are short.

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

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Nova Scotia Environment, Climate Change Unit
Evaluation / ETS review	Annual reports on the program will be published. Nova Scotia will also have to report annually to Environment and Climate Change Canada as part of the Pan-Canadian Framework on Clean Growth and Climate Change.
Revenue	No information available yet. A Green Fund will be set up in 2019 to receive and distribute revenues. The Green Fund will support measures that mitigate GHG emissions, promote adaptation, encourage innovative technology, and reduce negative economic and social effects of mitigation action.
Implementing Legislation	Nova Scotia's Cap and Trade Program Regulatory Framework Cap-and-Trade Program Regulations, Section 112Q of the Environment Act Environment Act

Canada - Québec Cap-and-Trade System

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Québec Québec's cap-and-trade system for GHG emissions was introduced in 2012. The program's enforceable compliance obligation began on 1 January 2013. Compliance periods are three years long (two years for the initial period). Québec has been a member of the Western Climate Initiative since 2008 and formally linked its system with California on 1 January 2014 and with Ontario on 1 January 2018 (until this system's termination in mid-2018). The system covers fossil fuel combustion and industrial emissions in power, buildings, transport, and industry.
Year in Review	Québec's cap-and-trade system has met the carbon pricing requirement of Canada's national 'Pan-Canadian Framework on Clean Growth and Climate Change' (scheduled to be implemented in 2019). Québec's system linked with Ontario in January 2018 but the link was terminated six months later. Soon after, Ontario's system regulation and legislation were canceled completely.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 78.6 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Transportation — 33.8 Industry — 23.6 Buildings — 8.5 Agriculture — 7.6 Waste — 4.9 Power — 0.2
Overall GHG reduction target	**BY 2020:** 20% reduction from 1990 GHG levels **BY 2030:** 37.5% reduction from 1990 GHG levels
Carbon Price	*Current Allowance Price (per t/CO2e):* CAD 19.30 (USD 14.91) (unweighted average auction price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.8 - 0.85
GHG covered	CO2, CH4, N2O, SF6, HFCs, PFCs, NO3, and other fluorinated GHGs
Sectors covered and thresholds	**FIRST COMPLIANCE PERIOD (2013-2014):** Electricity, Industry. **SECOND COMPLIANCE PERIOD (2015-2017) AND THIRD COMPLIANCE PERIOD (2018-2020):** Sectors of first compliance period as well as distribution and importation of fuels used for consumption in the transport and building sectors, and in small- and medium-sized businesses.

	INCLUSION THRESHOLDS: >25,000 tCO2e/year. As of 2016, fuel distributors that have distributed 200L or more of fuel (in 2015) are also subject to inclusion even if the combustion of their fuel resulted in the emission of less than 25,000 tCO2e. **VOLUNTARY EMITTERS (OPT-IN COVERED ENTITIES):** Starting in 2019, emitters from capped sectors that 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 could receive free allocation.
Point of regulation	Mixed
Number of liable entities	149 (74 industrial entities, 75 fuel distributors) (2017) No information available yet.
Cap	The following caps are given in millions of allowances: **FIRST COMPLIANCE PERIOD (2013-2014):** 23.20 each year **SECOND COMPLIANCE PERIOD (2015-2017): 2015**: 65.30; **2016**: 63.19; **2017**: 61.08 **THIRD COMPLIANCE PERIOD (2018-2020):** **2018**: 58.96; **2019**: 56.85; **2020**: 54.74 **FOURTH COMPLIANCE PERIOD (2021-2023):** **2021**: 55.26; **2022**: 54.02; **2023**: 52.79 **FIFTH COMPLIANCE PERIOD (2024-2026):** **2024**: 51.55; **2025**: 50.31; **2026**: 49.08; **SIXTH COMPLIANCE PERIOD (2027-2029):** **2027**: 47.84; **2028**: 46.61; **2029**: 45.37 After a slight increase in the cap in 2021 (due to an adjustment of the global warming potential of different GHGs), the cap will reduce by about 1.24 million allowances per year. This will result in a cap of 44.14 million allowances in 2030.

Phases & Allocation

Trading period	The Québec cap-and-trade system is structured around three-year compliance periods, except for the first period (see “Compliance” below). A cap trajectory until 2030 has been set (see “Cap”). Allowances are allocated and auctioned with calendar vintage years.
Allocation	**FREE ALLOCATION:** Emission-intensive sectors subject to international competition receive a portion of free allowances. Eligible sectors include: aluminum, lime, cement, chemical and petrochemicals, metallurgy, mining and pelletizing, pulp and paper, petroleum refining, and others (manufacturers of glass food containers, electrodes, gypsum products, and some agro-food products). Free allocation is generally based on benchmarks either for inputs of raw materials or for product-based benchmarks (output-based allocation). **First compliance period (2013-2014):** Historical emission intensity adjusted for production level and by type of emission, with 100% allocation for process emissions, 80% for combustion emissions and 100% for emissions from other sources. **Second (2015-2017) and subsequent periods:** Free allocation is based on increasingly strict intensity targets (declining emissions intensity per activity) and production levels. Since production volumes can vary, increasing intensity targets does not guarantee an absolute reduction in free allocation but incentive reductions of emissions intensity. As of 2019, allocation of free allowances is made available to voluntary emitters (also known as opt-in covered entities) in alignment with what has been established for regulated entities.

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

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

As of 1 January 2019, Québec had held a total of 21 auctions, 17 held jointly with California, of which two were also held jointly with Ontario.

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

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

Flexibility

Banking and borrowing	Banking is allowed but the emitter is subject to a general holding limit. Borrowing is not allowed.
Offsets and credits	**QUANTITATIVE LIMIT:** Up to 8% of each entity´s compliance obligation. **QUALITATIVE LIMIT:** Offset credits may be generated from projects carried out according to five protocols in Québec: **(1)** 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 is currently developing an offset protocol for afforestation and reforestation projects in private lands in Québec, which will be open to public consultation at a later point. A number of new offset protocols, co-commissioned with Ontario, were also under development. With the termination of Ontario's cap-and-trade program this work was discontinued and Québec is currently assessing its priorities in terms of which protocols to keep developing. Offsets credits issued by jurisdictions linked with Québec are recognized as compliance instruments. Québec offset credits are 100% guaranteed. In cases where offset credits issued for a project were deemed illegitimate, the Minister may require the offset promoter (developer) to replace them. If credit recovery is not possible, an equivalent number of credits will be retired from the Minister's environmental integrity account. That account is filled up through a contingency reserve of 3% of issued offset credits from all offset projects.
Market Stability Provisions	**Auction Reserve Price:** Annual auction reserve prices are determined per jurisdiction, once a year, and increase annually by 5% plus inflation until 2030. For 2019, this annual minimum price is CAD 15.31 (USD 11.82) for Québec and USD 15.62 for California. For joint auction with California in 2019, the highest between Québec's or California's annual price, based on the exchange rate of the Bank of Canada the day prior to the auction, will be the auction reserve price for that particular auction.

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

Compliance

Compliance Period	**FIRST COMPLIANCE PERIOD:** 1 January 2013 - 31 December 2014. **SUBSEQUENT COMPLIANCE PERIODS:** Three calendar years as of 1 January 2015 (2015-2017, 2018-2020, and so forth) Allowances must be surrendered by 1 November following the end of the compliance period
Monitoring, Reporting, Verification (MRV)	**REPORTING FREQUENCY:** One year. Report to be submitted by 1 June of each year. **VERIFICATION:** Emitters (and voluntary emitters) participating in ETS (higher threshold than those with regulatory reporting requirement) must send a verification report carried out by an organization accredited to ISO 14065. **FRAMEWORK:** Regulation on the mandatory reporting of certain emissions of contaminants into the atmosphere is outlined in the 'Environment Quality Act.'
Enforcement	For noncompliance, entities can be fined CAD 3,000500,000 (USD 2,315-385,875) and spend up to 18 months in jail in the case of a natural person, and CAD 10,000-3,000,000 (USD 7,718-2,315,252) in the case of a legal person. Fines are doubled in the case of a second offence. In addition, the Minister of the Environment and the Fight against Climate Change may suspend the allocation to any emitter in case of noncompliance. A covered entity that fails to cover its real and verified GHG emissions with enough allowances on 1 November following the end of a compliance period must remit each missing allowance and will have to remit three additional allowances for each allowance it failed to remit to the minister. The person with legal responsibility for that entity would also be committing an infraction, subject to financial penalties, for each compliance instrument not surrendered as part of the compliance obligation.

Linking

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

Other Information

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

Evaluation / ETS review	The regulation has been adjusted almost annually to implement changes and adjustments and, when necessary, maintain harmonization with linked jurisdictions.
Revenue	Since beginning of program: CAD 2.88 billion (USD 2.23 billion) Collected in 2018: CAD 831.44 million (USD 641.84 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 measures as well as public transport initiatives.
Implementing Legislation	Regulation respecting a cap-and-trade system for greenhouse gas emission allowances Amendments are listed and linked on the site of the Québec ministry. Environment Quality Act

China - Beijing pilot ETS

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Beijing The Beijing Pilot ETS was launched in November 2013; to date, it has concluded five compliance years. Beijing is one of the few Chinese pilots with ETS regulation passed by their regional congress. The ETS covers about 45% of the city's total emissions, including both direct and indirect emissions from electricity providers, heat, cement, petrochemicals, other industrial enterprises, manufacturers, the service sector, and public transport. In cases of consecutively high or low average prices, the government can also auction or buy back extra allowances. Beijing also has pioneered cross-regional trading with its neighboring provinces. A Framework Agreement for Cooperation on the Study of Cross-regional Carbon Emissions Trading with Tianjin, Hebei, Inner Mongolia, Shaanxi, and Shandong signed in 2013 provided a basis for cooperation. As a consequence of this, several cement companies from the Hebei province and companies from both the cement and power generation sectors voluntarily participated in the Beijing ETS in 2014 and 2015. Several companies from the same sectors in Inner Mongolia also voluntarily participated in 2015.
Year in Review	The 2017 allocation plan was released by the Beijing Development and Reform Commission (DRC) in February 2018. Compared to the previous year, the plan has two important changes: the power sector will be allocated allowances using benchmarking (instead of historical emissions intensity); and the emissions reduction factor has increased for most sectors, thus requiring further abatement action. In addition, an adjustment mechanism was created to avoid overallocation as a result of plant shutdowns or reductions in production.* Much like the governance transition at the national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Beijing will be moved from the DRC to the Ecology and Environment Bureau. The process is ongoing and is expected to conclude by early 2019. *Depending on which sector they are, a threshold was set for reducing the allowance by the same ratio of the emission reduction, i.e., 20% for cement and petrochemical and 50% for manufacturing, other industrial sectors, and tertiary.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 188.1 $MtC0_2e$ (2012)
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**By 2020**: 20.5% reduction in carbon intensity compared to 2015 levels (13th Five Year Plan).
Carbon Price	*Current Allowance Price (per t/CO2e):* 37.97 CNY (USD 5.74) (weighted average trading price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.45

GHG covered	CO2
Sectors covered 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 tonnes of standard coal equivalent (tce) energy consumption/year.
Point of regulation	Downstream. Both direct and indirect emissions are covered.
Number of liable entities	943 (2017) In addition, 621 entities have mandatory reporting obligation but no surrender obligations. No information available yet.
Cap	~50 MtCO2e (2017)

Phases & Allocation

Trading period	2013-2018* *In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.
Allocation	**Free Allocation:** Mainly free allocation through grandparenting based on emissions or emissions intensity in the baseline years (for 2017 allowances, the baseline years are 2009-2012 for stationary sources and 2013-2016 for mobile sources). Benchmarking is used for new entrants and entities with expanded capacity as well for the power sector. **Auctioning:** Beijing could set aside up to 5% of allowances for regular and irregular auctions (see Market Stability Mechanisms). To date, the trigger price for auction has never been met.

Flexibility

Banking and borrowing	Banking is allowed. Borrowing is not allowed.
Offsets and credits	**Quantitative Limit:** Domestic project-based carbon offset credits—China Certified Emission Reduction (CCER) credits—are allowed. The use of CCERs is limited to 5% of the annual allocation. **Qualitative Limit:** CCERs from energy conservation projects and forestry carbon sink projects are allowed, whereas credits from hydropower, HFC, PFC, 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 22.67) for 10 consecutive days, and buy back allowances from the

	market using a special funding source from the municipal budget if the price is below CNY 20 (USD 3.02).

Compliance

Compliance Period	One year
Monitoring, Reporting, Verification (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 its reported emissions are close to 5,000 tCO2. **FRAMEWORK:** The Beijing DRC has released guidelines for monitoring and reporting for the following seven sectors: heat production and supply, thermal power generation, cement, petrochemicals, transport, other industrial enterprises, and the service sector. **OTHER:** In addition to the ETS participants, all legal entities with energy consumption of more than 2,000 tce have to report their emissions. Verification is not required.
Enforcement	Penalties for failing to submit emissions or verification reports on time can result in fines up to 50,000 CNY (USD 7,558). Furthermore, companies failing to surrender enough allowances to match their emissions are fined up to five times the average market price over the past six months for each missing allowance. Other nonfinancial penalties include negative impacts on access to bank loans and subsidy programs.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Beijing DRC (competent authority) - the responsibility is expected to be moved to the Beijing Ecology and Environment Bureau in the course of 2019; China Beijing Environment Exchange (trading platform and registry)
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	Beijing Pilot ETS Implementation Plan Interim Measures for the Management Emissions Trading in Beijing Beijing DRC – Allocation Plan for Vintage 2017

China - Chongqing pilot ETS

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Chongqing Chongqing launched its pilot ETS in June 2014 and to date has concluded five compliance years. The system covers enterprises from seven sectors: power, electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel. The 195 enterprises covered by the system in 2017 accounted for ~40% of the city's total emissions. Among the eight Chinese pilots, the Chongqing ETS is the only one that covers non-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	The 2017 allocation plan was released by the Chongqing Development and Reform Commission (DRC) in March 2018. The plan differs from other pilots in that the Chongqing ETS allowances are allocated based on entities' self-reported demand. 2017 was the first year since the launch of the pilot where the initial cap (100.5 MtCO2e) was lower than the self-declared demanded amount (103.2 MtCO2e)–indicating a potential allowance shortage for some companies in the market. ETS-related responsibilities in Chongqing were moved from the DRC to the Ecology and Environment Bureau in 2018.
Overall GHG emissions (excluding LULUCF)	**Emissions:** ~300 MtCO2e MtC0$_2$e (2018)
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**BY 2020:** 19.5% reduction in carbon intensity compared to 2015 levels (13th Five Year Plan)
Carbon Price	*Current Allowance Price (per t/CO2e):* 4.36 CNY (USD 0.66) (weighted average trading price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.5
GHG covered	CO2, CH4, N2O, HFCs, PFCs, SF6
Sectors covered and thresholds	Power, electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel. **INCLUSION THRESHOLDS:** 20,000 tCO2/year or energy consumption 10,000 tonnes coal equivalent (tce)/year.
Point of regulation	Downstream. Both direct and indirect emissions are covered.
Number of liable entities	195 (2018)

	No information available yet.
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 period	2013-2018* *In the short-term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.
Allocation	**Free Allocation:** Free allocation through grandparenting based on historic emissions (highest number in period 2008-2012). If the sum of allocation for all enterprises exceeds the cap, a reduction factor is applied. Regulated companies submit their allocation quotas on a yearly basis, forming the basis of their free allocation. Ex-post adjustments based on output data are possible.

Flexibility

Banking and borrowing	Banking is allowed. Borrowing is not allowed.
Offsets and credits	**QUANTITATIVE LIMIT:** Domestic project-based carbon offset credits—CCERs—are allowed up to 8% of the compliance obligation. **QUALITATIVE LIMIT:** Reductions have to be achieved after 2010 with the exception of carbon sink projects. Credits from hydro projects are not allowed.
Market Stability Provisions	**Exchange Intervention:** In case of market fluctuations, the Chongqing Carbon Emissions Exchange can take price stabilization measures. **Sale and Trade Limits:** Compliance entities must not sell more than 50% of their annual free allocation. In addition, the price of trading is subject to increase and decrease limits of 10% or 30% depending on types of trading.

Compliance

Compliance Period	One year
Monitoring, Reporting, Verification (MRV)	**REPORTING FREQUENCY:** Annual reporting of GHG emissions. **VERIFICATION:** Third-party verification is required. **FRAMEWORK:** The Chongqing DRC released a guiding document for monitoring and reporting that includes methods for different emissions sources, including: combustion, industrial processes, and electricity consumption.
Enforcement	There are no financial penalties for non-compliance. Non-financial penalties may include public reporting, disqualification from the energy saving and climate subsidies and associated awards for three years, and a record entered in the State Owned Enterprise performance assessment system.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Chongqing Ecology and Environment Bureau (competent authority) Chongqing Carbon Emissions Trading Center (trading platform and registry)
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	Interim Measures for Management of Emissions Trading In Chongqing Chongqing DRC – Allowance Allocation Management Rules Chongqing DRC – Notice about Allowances Allocation for Vintage 2017

China - Fujian pilot ETS

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Fujian Fujian launched its ETS in September 2016 and is the eighth regional pilot ETS in China. Unlike other pilots, which were mandated jointly by the National Development and Reform Commission (NDRC), the mandate for the Fujian ETS came from the State Council with the endorsement of the National Ecological Civilization Pilot Area (Fujian) Implementation Plan. The Haixia Equity Exchange in Fujian was approved by the NDRC as one of nine trading platforms for trading Chinese Certified Emission Reductions (CCERs), demonstrating the recognition by NDRC of the regional market. The system covers nine sectors: electricity, petrochemical, chemical, building materials, iron and steel, nonferrous metals, paper, aviation, and ceramics. Given the prominence of the forestry sector in Fujian, its ETS pilot has a special focus on carbon sinks. In 2017, the Fujian government outlined a plan to promote forestry offsets projects in the province. By 2020, the selected counties in the province are required to develop forestry projects covering two million acres of forests, achieving an expected one million tonnes of emission reductions annually.
Year in Review	The 2017 allocation plan was released by the Fujian Development and Reform Commission (DRC) in July 2018. With the same coverage threshold as the previous year, the number of covered entities fell slightly from 277 (2016) to 255. Almost 50% of the regulated entities (109) are architectural ceramics companies. Much like the governance transition at the national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Fujian will be moved from the DRC to the Ecology and Environment Bureau. The process is ongoing and is expected to conclude by early 2019.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 240 MtCO2e $MtC0_2e$ (2014)
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**BY 2020:** 19.5% reduction in carbon intensity compared to 2015 levels
Carbon Price	*Current Allowance Price (per t/CO2e):* 18.02 CNY (USD 2.72) (weighted average trading price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.60
GHG covered	CO2
Sectors covered and thresholds	Electricity, petrochemical, chemical, building materials, iron and steel, nonferrous metals, paper, aviation, and ceramics. **INCLUSION THRESHOLDS:** Energy consumption 10,000 tonnes of coal equivalent (tce)/ year for any year between 2013-2016.

	In the future, the Fujian system may extend its coverage to smaller emitters, i.e., with energy consumption of 5,000 tce or more.
Point of regulation	Downstream. Both direct and indirect emissions are covered.
Number of liable entities	255 (2017) No information available yet.
Cap	~200 MtCO2e (2017)

Phases & Allocation

Trading period	2016-2018* *In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium- to long-term, they are expected to be integrated into the national market, once it is fully operational.
Allocation	**Free Allocation:** Benchmarking is applied to electricity, cement, aluminum, and plate glass sectors. The other sectors are allocated allowances based on historical intensity. These entities can also apply for more allowances for early mitigation actions. Free allowances are also to be allocated to new entrants while they are only covered after 12 or 24 months of operation (depending on type of allocation methods). **Auctioning:** Auctioning may take place where considered appropriate by the ETS authorities (see Market Stability Provisions below) and may be introduced as a method for allowance allocation over time; up to 10% of the total cap is reserved for market intervention. In order to increase market liquidity and price discovery, the Fujian DRC organized an auction in 2016 of discriminatory (non-uniform price) allowances. 50,000 allowances from the government reserve were auctioned, with the settlement prices ranging from CNY 26.50 (USD 4.01) to around CNY 30 (USD 4.53). To date, this is the only auction held in the province.

Flexibility

Banking and borrowing	Banking is allowed. Borrowing is not allowed.
Offsets and credits	**QUANTITATIVE LIMIT:** Domestic project-based carbon offset credits (CCERs) and Fujian Forestry Certified Emission Reduction (FFCER) are allowed. The use of CCER credits is limited to 5% of the annual compliance obligation, which is increased to 10% for companies that use both FFCER and CCER credits. **QUALITATIVE LIMIT:** Eligible offsets will be restricted to those generated in Fujian province, from 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	**DRC Intervention, Reserves:** According to the (trial) "Implementation Rules of Emissions Trading Market Management in Fujian Province," in case of market fluctuations (i.e., if the

	cumulative increase or decrease of allowance prices for 10 consecutive trading days reach a certain percentage), severe imbalances between supply and demand, or liquidity issues, the Fujian Economic and Information Center under the guidance of the Fujian DRC–in consultation with an advisory committee–can buy or sell allowances in order to stabilize the market. More specifically, high prices may trigger allowance auctions from government reserves through the Haixia Equity Exchange. Low prices may trigger authorities to buy allowances from the market through governmental funds.

Compliance

Compliance Period	One year
Monitoring, Reporting, Verification (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 its 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 also jointly released a measure for the administration of third-party verifiers, which specifies criteria for the verifiers and their staff.
Enforcement	Penalties for failing to submit an emissions or verification report on time, providing false information, or disturbing the verification process range from CNY 10,000 (USD 1,512) to CNY 30,000 (USD 4,535). Companies failing to surrender enough allowances to match their emissions are fined between one to three times the average market price of the past 12 months, with the maximum limit of CNY 30,000 (USD 4,535). Twice the amount of the missing allowances can be withdrawn from the account of the company or deducted from next year's allocation. Penalties for the misconduct of trading entities and their staff, such as not publishing relevant trading information or leaking commercial secrets, could range from CNY 10,000 (USD 1,512) to CNY 30,000 (USD 4,535).

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Fujian DRC (competent authority)–the responsibility is expected to be moved to the Fujian Ecology and Environment Bureau in the course of 2019; Fujian Huaxia Equity Exchange (trading platform); Fujian Economic and Information Center (registry, market management, and MRV administration)
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	Implementation Plan of Emissions Trading Market Construction in Fujian Province Interim Measures for the Management of Emissions Trading in Fujian Province Fujian DRC – Allocation Plan for Vintage 2017

China - Guangdong pilot ETS

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Guangdong The Guangdong Pilot ETS was launched in December 2013 and is the largest of the Chinese ETS pilots. It currently covers the power, cement, steel, petrochemical, papermaking, and aviation sectors, accounting for more than 60% of the province's emissions. This is the result of an expansion of its scope back in 2016, which introduced two new sectors (domestic aviation and paper) and adjusted allocation methods. In 2017, the Guangdong Pilot ETS had 50 new entrants. The Guangdong Pilot ETS has one of the most active markets among Chinese pilots with the largest market share. Unlike other pilots, Guangdong auctions a small share of allowances.* The auctioning has been moved from mandatory (2013) to voluntary participation (since 2014) and has been held ad hoc (rather than quarterly) since 2017. Guangdong and Shenzhen are the only two Chinese pilots open to foreign investors. In November 2016, Guangdong increased the maximum position of institutional and individual investors from three to eight million allowances. Guangdong also allows unincorporated organizations, such as funds and trusts, to trade in its carbon market. As of 2018, it had 72 institutional investors. *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.
Year in Review	The 2018 allocation plan was released by the Guangdong Development and Reform Commission (DRC) in July 2018. No significant changes were implemented compared to the allocation plan of the previous year. Much like the governance transition at the national level (see China National ETS factsheet), the ETS-related responsibilities in Guangdong provincial level moved from the DRC to the Ecology and Environment Bureau in October 2018.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 610.5 $MtC0_2e$ (2012)
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**BY 2020:** 20.5% reduction in carbon intensity compared to 2015 levels
Carbon Price	*Current Allowance Price (per t/CO2e):* CNY 15.10 (USD 2.28) (weighted average trading price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.60
GHG covered	CO2
Sectors covered and thresholds	Power, iron and steel, cement, papermaking, aviation, and petrochemicals.

	INCLUSION THRESHOLDS: 20,000 tCO2/year or energy consumption 10,000 tonnes coal equivalent (tce)/year.
Point of regulation	Downstream. Both direct and indirect emissions are covered.* *The electricity market in Guangdong has undergone some changes following the national power sector reform process. In 2019, about a third of the total electricity consumption in Guangdong will be included in the electricity trading market. Guangdong also plans to launch an electricity spot market.
Number of liable entities	249 (2018), existing entities 39 (2018), new entrant entities No information available yet.
Cap	422 MtCO2e (2018), among which 23 MtCO2e are kept as government reserves for new entrants and market stability.

Phases & Allocation

Trading period	2013-2018* *In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market once it is fully operational.
Allocation	**Free Allocation:** Mainly free allocation based on grandparenting, historical intensity, or benchmarking. Benchmarking is applied to coal and gas-fired electricity generators (including heating, as well as combined heat and power), as well as to some industrial processes in the aviation, cement, paper, and steel sectors. Ex-post adjustments based on real production data of the respective compliance year are also applied. **Auctioning:** Guangdong auctions a small share of allowances as a way of allowance allocation. During the first compliance year (2013), entities were required to purchase allowances in auctions in order to become eligible to receive their freely allocated allowances. This requirement was terminated in 2014. Since 2014, free allocation percentages remain the same, i.e., 95% for the power sector and 97% for the remaining sectors. A total of two million allowances are available for auction annually. Quarterly auctions were held until the 2016 vintage while for 2017 and 2018, auctions were ad hoc. No auction took place in 2018.

Flexibility

Banking and borrowing	Banking is allowed. Borrowing is not allowed.
Offsets and credits	**QUANTITATIVE LIMIT:** Carbon offset credits (CCERs) are allowed. As a mechanism that encourages the public to reduce carbon emissions, Pu Hui Certified Emission Reductions (PHCER) are also allowed during 2017 and 2018. In 2018, entities are allowed to make use of 1.5 million offsets (CCER and PHCER) towards compliance obligations. **QUALITATIVE LIMIT:** Of the annual compliance obligation met by offsets, at least half must be from CO2 or CH4 reduction projects. At least 70% of offsets need to come from within the Guangdong province. Pre-CDM credits are not eligible. Credits from hydro and from most fossil fuel projects are also not eligible.
Market Stability Provisions	**Reserves:** The Guangdong province set aside 5% of all allowances for government reserves for new entrants and market stability. The specific rules for market stability are provided by its Trial Measures for ETS.

	Auction Floor Price: Auctions under the Guangdong Pilot ETS are subject to an auction floor price. Initially in 2013, it was set at CNY 60 (USD 9.07), and then it was lowered to CNY 25 (USD 3.78) and increased to CNY 40 (USD 6.05) in steps of CNY 5 (USD 0.76) with each quarterly auction. In 2015, the floor price was set at 80% of the weighted average price for allowances over the previous three months. In 2016, there was no restriction on the declared price, but a so-called policy reserve price was set as an effective price floor. In 2017, the policy reserve price was set at 100% of the weighted average price for allowances over the previous three months. The policy reserve prices for the four auctions for the 2016 compliance period are as follows: (21 June 2016 – 20 June 2017) were CNY 9.37 (USD 1.42), CNY 11.27 (USD 1.70), CNY 16.09 (USD 2.43), and CNY 15.15 (USD 2.29). **Offset Auctions:** Guangdong also introduced auctioning for PHCERs with an auction price floor set by the Emissions Exchange Guangzhou on behalf of the project developers. In the latest auction (19 November 2018), the floor price was set as CNY 12.32/tonne (USD 1.86) (which is set at 80% of the weighted average price for allowances over the previous three months).

Compliance

Compliance Period	One year
Monitoring, Reporting, Verification (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 re-verifications were also conducted by third parties for all compliance entities with questionable verification reports as well for randomly selected entities. These have been shifted to fourth-party assessment and verification since the 2016 compliance period. **FRAMEWORK:** The Guangdong DRC has released guidelines for monitoring and reporting for the compliance and reporting sectors. **OTHER:** In addition to the ETS participants, all legal entities with energy consumption of more than 2,000 tce have to report their emissions. Verification is not required.
Enforcement	Penalties for failing to submit emissions or verification reports on time range from CNY 10,000 (USD 1,512) to CNY 50,000 (USD 7,558). Furthermore, companies failing to surrender enough allowances to match their emissions will be deducted twice the amount of allowances from the following year's allocation and are fined CNY 50,000 (USD 7,558). Other non-financial penalties include negative impacts on access to bank loans and subsidy programs.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Guangdong Ecology and Environment Bureau (competent authority); Emissions Exchange Guangzhou (trading platform)
Evaluation / ETS review	No information available yet.
Revenue	Since beginning of program: CNY 804 million (USD 122 million) Collected in 2018: No revenue in 2018 (no auctions took place in 2018)

	Guangdong has been exploring the establishment of a Low Carbon Development Fund that would use auctioning revenues to promote further mitigation actions, carbon finance, and low-carbon industry development. The set-up and function of this fund is still under discussion between Guangdong DRC and Guangdong Finance Department. Currently, the revenue flows into the general provincial budget.
Implementing Legislation	Guangdong Pilot ETS Implementation Plan Trial Measures for Emissions Trading in Guangdong Guangdong DRC – Allocation Plan for Vintage 2018

China - Hubei pilot ETS

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Hubei The Hubei Pilot ETS was launched in April 2014; to date, it has concluded five compliance years. Hubei has been one of the most active regional markets in China in terms of trading and has the second-largest market size when considering spot trading only, after Guangdong. When spot forward trading is also considered, Hubei has the largest market share as of end 2018, with its total secondary market transaction volume and value both accounting for over 60% of the sum of all pilots together. The system initially covered 138 of the most carbon-intensive companies in the province, accounting for approximately 35% of the province's total carbon emissions. Hubei has also expanded its scope several times. In 2016, it lowered the thresholds of seven sectors from 60,000 to 10,000 tonnes coal equivalent (tce) and in 2017 further lowered the thresholds of all the other sectors to 10,000 tce. A government reserve with 8% of the total cap is available for market stabilization, and the government can also intervene in cases of market fluctuations, severe supply-demand imbalances or for liquidity reasons. According to the compliance notice by the Hubei Development and Reform Commission (DRC) in July 2017, the Hubei Pilot ETS will continue to run after the National ETS commences. However, only allowances that were traded can be banked into later years. The transition of Hubei allowances into the National ETS will be based on rules to be defined by the national competent authority. In December 2017, Hubei was selected to lead the development of the registry for the national ETS.
Year in Review	The 2017 allocation plan was released by the Hubei DRC in January 2018. The key change compared to the previous year's plan is a tighter allocation rule. By lowering thresholds for some sectors, it also increased the total number of covered entities from 126 (in 2016) to 344 (in 2017). Much like the governance transition at the national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Hubei will be moved from the DRC to the Ecology and Environment Bureau. The process is ongoing and is expected to conclude by early 2019.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 463.1 $MtC0_2e$ (2012)
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**BY 2020:** 19.5% reduction in carbon intensity compared to 2015 levels
Carbon Price	*Current Allowance Price (per t/CO2e):* CNY 21.23 (USD 3.21) (weighted average trading price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.45
GHG covered	CO2

Sectors covered and thresholds	Power and heat supply, iron and steel, nonferrous metals, petrochemicals, chemicals, textile, cement, glass and other building materials, pulp and paper, ceramics, automobile and equipment manufacturing, and food, beverage, and medicine producers. **INCLUSION THRESHOLDS:** Annual energy consumption more than 10,000 tce in any year between 2014 and 2016. **Until 2015:** Annual energy consumption more than 60,000 tce in any year between 2010 and 2011.
Point of regulation	Downstream. Both direct and indirect emissions are covered.
Number of liable entities	344 (2017) No information available yet.
Cap	257 MtCO2e (2017)

Phases & Allocation

Trading period	2014-2018* *In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.
Allocation	**Free Allocation:** Free allocation of 2017 vintage allowances through benchmarks for power, heat, co-generation, and cement (except the entities using outsourced clinker). Historical emissions intensity for glass and other building materials, pulp and paper, and ceramics sectors; grandparenting based on previous three years' historic emissions for all other sectors. Ex-post allocation adjustments are possible, especially for those sectors that use benchmarks and emissions intensity.* The total cap also includes a New Entrants Reserve, as well as a government reserve for potential market stability measures. *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.

Flexibility

Banking and borrowing	Banking is allowed, but only for allowances that were traded at least once. Borrowing is not allowed.
Offsets and credits	**QUANTITATIVE LIMIT:** The use of domestic project-based carbon offset credits (CCERs) is limited to 10% of the annual initial allocation for each entity. **QUALITATIVE LIMIT:** CCERs must come from rural biogas or forestry projects in the key counties under the national or provincial poverty alleviation plan in urban agglomeration areas of the middle reaches of the Yangtze River (within Hubei). CCERs must have been generated between 1 January 2013 and 31 December 2015.
Market Stability Provisions	**Reserve:** 8% of the total cap is kept as a government reserve for market stabilization.

	DRC Intervention: In case of market fluctuations, severe imbalances between supply and demand or liquidity issues, the Hubei DRC–in consultation with an advisory committee consisting of government institutions and other stakeholders–can buy or sell allowances in order to stabilize the market. Specifically, if the allowance price reaches a low or high point six times during a 20-day time span, the Hubei DRC takes action. **Exchange:** The exchange limits day-to-day price fluctuations to between -10% and +10% respectively; between 15 July and 25 December 2016, the limit was temporarily adjusted to between -1% and +10% as a response to the decreasing carbon price at that time.

Compliance

Compliance Period	One year
Monitoring, Reporting, Verification (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).

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Hubei DRC (competent authority)—the responsibility is expected to be moved to the Hubei Ecology and Environment Bureau in the course of 2019; China Hubei Emission Exchange (trading platform and registry)
Evaluation / ETS review	No information available yet.
Revenue	Since beginning of program: Revenue information for the 2014 auction not available.* Collected in 2018: No auctions took place in 2018. *To date, only one auction has been held in Hubei, with four million tonnes of allowances auctioned in 2014. The objective of the auction was to discover the market price and enhance market liquidity, rather than as a way of allowance allocation.

	No information available yet.
Implementing Legislation	Hubei Pilot ETS Implementation Plan Interim Measures for Management of Emissions Trading in Hubei Province Hubei DRC – Allocation Plan for Vintage 2017

China - Shanghai pilot ETS

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Shanghai 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	The 2018 allocation plan was released by the Shanghai Development and Reform Commission (DRC) in December 2018. No significant changes were implemented compared to the allocation plan of the previous year. Much like the governance transition at national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Shanghai will be moved from the DRC to the Ecology and Environment Bureau. The process is ongoing and is expected to conclude by early 2019.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 297.7 $MtC0_2e$ (2012)
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**BY 2020:** 20.5% reduction in carbon intensity compared to 2015 levels. The total CO2 emissions to be limited within 250 million tonnes
Carbon Price	*Current Allowance Price (per t/CO2e):* CNY 37.99 (USD 5.74) (weighted average trading price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.57
GHG covered	CO2
Sectors covered and thresholds	Airports, aviation, chemical fibers, chemicals, commercial, power and heat, water suppliers, hotels, financial, iron and steel, petrochemicals, ports, shipping, nonferrous metals, building materials, paper, railways, rubber, and textiles.

	INCLUSION THRESHOLDS: **For power and industry:** 20,000t CO2/year or 10,000 tonnes coal equivalent (tce)/year; and those that already participated in the 2013-2015 phase with 10,000 tCO2/year or 5,000 tce/year. **For Transport:** 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.
Point of regulation	Downstream. Both direct and indirect emissions are covered.
Number of liable entities	298 (2018) No information available yet.
Cap	158 MtCO2e (2018, including both free allocation and reserve)

Phases & Allocation

Trading period	Two trading periods: first period 2013-2015, second period 2016; no specific ending year.* *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.
Allocation	**Free Allocation:** Free allocation based on sector-specific benchmarks (power, heat, manufacturers), historic emissions intensity (industry, aviation, car glass, ports, shipping, and water suppliers, generally based on 2014-2016 data), or historic emissions (buildings, commercial sector, industry with complex products or considerable change in emission boundary, and airports, generally based on 2014-2016 data). Ex-post allocation adjustments, e.g., on the basis of production data, are applied for those with historic intensity or benchmarking allocations. **Auctioning:** A small share of the annual cap could be auctioned. The purpose of auctions is not to allocate allowance but to provide compliance entities with additional supply to meet their compliance demand. Shanghai auctioned two million tonnes from the government reserve in July 2018, with a floor price set at two times the weighted on-exchange allowance price from 18 November 2016 to 30 July 2018—CNY 41.54 (USD 6.28). The auction cleared at the floor price and a total of 305,237 tonnes (15% of total auction volume). An auction of two million allowances was held in June 2017. 2% of allowances were sold, at the floor price of CNY 38.77 (USD 5.86).

Flexibility

Banking and borrowing	Banking is allowed both within and across compliance periods, with some restrictions for the latter. For banked allowances from the first trading period (2013-2015), only one-third can be used per year between 2016 and 2018 by compliance entities; allowances are fully bankable for institutional investors, with some restrictions for OTC deals. Borrowing is not allowed.
Offsets and credits	**QUANTITATIVE LIMIT:** Domestic project-based carbon offset credits—CCERs—are allowed. Since 2016 the use of CCER credits is limited to 1% of the annual allocation. Between 2013 and 2015 the limit was 5%. **QUALITATIVE LIMIT:** Credits for reductions that were realized before January 2013 cannot be used for compliance. Credits from hydro projects are not allowed.

Market Stability Provisions	**Exchange:** Depending on transaction types, if prices vary more than 10% or 30% in one day, the Shanghai Environment and Energy Exchange can take price stabilization measures such as temporarily suspending trading or imposing holding limits. **Reserve:** In addition, a small share of annual cap could be kept in a reserve for auctioning before the end of the annual compliance cycle as a market stability measure (see Auctions section).

Compliance

Compliance Period	One year
Monitoring, Reporting, Verification (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 10 sectors: iron and steel, electricity and heat, chemicals, nonferrous metals, non-metallic mineral products, textiles and paper, aviation, shipping, large buildings (hotels, commercial, and financial), and transport stations.
Enforcement	Penalties for failing to submit an emissions report or verification report on time or providing fraudulent information range from CNY 10,000 (USD 1,512) to CNY 50,000 (USD 7,558). Between CNY 50,000 (USD 7,558) and CNY 100,000 (USD 15,115) can be imposed for non-compliance, besides surrendering the adequate amount of allowances. Further sanctions may also be imposed, such as entry into the credit record of the company, publication on the internet, cancelation of ability to access special funds for energy conservation, and emissions reduction measures.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Shanghai DRC (competent authority; the responsibility is expected to be moved to the Shanghai Ecology and Environment Bureau in the course of 2019); Shanghai Environment and Energy Exchange (trading platform); Shanghai Information Center (registry)
Evaluation / ETS review	No information available yet.
Revenue	Since beginning of programm: CNY 14.65 million (USD 2.21 million) Collected in 2018: CNY 12.68 million (USD 1.92 million) The revenues are submitted to the general municipality budget.
Implementing Legislation	Shanghai Pilot ETS Implementation Plan Trial Measures for Management of Emissions Trading in Shanghai Shanghai DRC - Allocation Plan for Vintage 2018

Shanghai DRC - Allocation Plan for Vintage 2017

China - Shenzhen pilot ETS

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Shenzhen The Shenzhen Pilot ETS, which began in June 2013, was the first of the Chinese pilot ETSs to start operation. To date, it has concluded five compliance years. It is the only Chinese pilot at the sub-province-level, and it covers a broad scope across the energy, industry, building, and transport sectors. The Shenzhen Pilot ETS covers a total of 794 entities (2017). A unique feature of the Shenzhen Pilot ETS is its legal basis. While the majority of pilots are regulated by subnational government orders by the executive body of the government, the Shenzhen Pilot ETS is regulated by a dedicated ETS bill passed by its municipal legislator, the Shenzhen People's Congress. This provides more legal stability. Shenzhen also has pioneered cross-regional cooperation. In 2014, Shenzhen and Baotou signed the 'Memorandum of Strategic Cooperation on the Construction of Carbon Trading Systems.' As a consequence of this, six companies in Baotou city of the Inner Mongolia Autonomous Region were covered in Shenzhen market on a voluntary basis as of June 2016.* *In June 2017, the companies from Baotou completed the first compliance. No further information is available on the subsequent compliance years.
Year in Review	Shenzhen is one of the most active regional markets in China, despite its relatively smaller size compared to other pilots. As of 25 July 2018, its accumulated transaction amount reached CNY 1.091 billion (USD 0.165 billion), with total volume of 35.7 million tonnes, which makes it the first pilot in China to reach CNY 1 billion (USD 0.151 billion). Shenzhen's allocation plans for 2017 and 2018 have not been made publically available. Much like the governance transition at the national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Shenzhen will be moved from the Development and Reform Commission (DRC) to the Human Settlements and Environment Commission of Shenzhen Municipality. The process is ongoing and is expected to conclude by early 2019.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 83.45 $MtC0_2e$ (2010)
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**BY 2020:** 45% reduction in carbon intensity compared to 2005, to reach 0.6 tCO2/CNY 10,000 (USD 1,512) **BY 2022:** Shenzhen has pledged to peak its GHG emissions by 2022, as one of the first group of cities in China to endorse such a peak year target
Carbon Price	*Current Allowance Price (per t/CO2e):* CNY 24.47 (USD 3.70) (weighted average trading price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.40

GHG covered	CO2
Sectors covered and thresholds	Power, water, gas, manufacturing sectors, buildings, port and subway sectors, public buses, and other nontransport 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 liable entities	794 (2017) No information available yet.
Cap	31.45 MtCO2e (excluding buildings, 2015)

Phases & Allocation

Trading period	2013-2018* *In the short term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long term, they are expected to be integrated into the national market, once it is fully operational.
Allocation	**Free Allocation:** Allowances are largely distributed for free. Benchmarking is applied to the water, power, and gas sectors based on sectoral historical emissions intensity. Grandparenting is applied to port and subway sectors, public buses, and other nontransport sectors based on the entity's historical emissions intensity. Allowance allocation is adjusted ex-post based on output data. Although the Interim Measure for the Administration of Carbon Emission Trading of Shenzhen states that at least 3% of allowances should be auctioned, this has not been implemented. So far, only one auction took place (in June 2014) in order to increase market supply.

Flexibility

Banking and borrowing	Banking is allowed. Borrowing is not allowed. Unlike other pilots, Shenzhen releases its annual allowances before the compliance date of the previous vintage but does not allow them to be used for the purpose for previous vintage compliance.
Offsets and credits	**QUANTITATIVE LIMIT:** Domestic project-based carbon offset credits (CCERs) are allowed. The use of CCER credits is limited to 10% of the annual compliance obligation. **QUALITATIVE LIMIT:** Credits from hydro projects are not eligible and additional geographic restrictions apply to the use of certain CCERs.
Market Stability Provisions	**DRC Intervention:** In case of market fluctuations, the Shenzhen DRC can sell extra allowances from a reserve at a fixed price. Such allowances can only be used for compliance and cannot be traded. The DRC can also buy back up to 10% of the total allocation.

Compliance

Compliance Period	One year
Monitoring, Reporting, Verification (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. **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.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Shenzhen DRC (competent authority)—the responsibility is expected to move to the Human Settlements and Environment Commission of Shenzhen Municipality in the course of 2019; China Shenzhen Emissions Exchange (trading Platform and Registry)
Evaluation / ETS review	No formal evaluation has been conducted. Research on improving Shenzhen ETS has been undertaken every year, funded by Shenzhen DRC.
Revenue	Since beginning of program: CNY 2.6 million in 2014* (USD 390,000) Collected in 2018: No auctions took place in 2018. *The objective of the auction was to increase market supply, and not as a means of allowance allocation. No information available yet.
Implementing Legislation	Shenzhen Special Economic Zone ETS Bill Interim Measures for Management of Emissions Trading in Shenzhen

Shenzhen DRC – Notice of Carrying Out Emissions Trading Work for Vintage 2016

China - Tianjin pilot ETS

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Tianjin Tianjin launched its pilot ETS in December 2013 and has concluded five compliance years so far. The system covers enterprises including heat and electricity production, iron and steel, petrochemicals, and chemicals, as well as oil and gas exploration. Covered entities account for 50-60% of the city's total emissions. Despite not having any financial penalties in place, Tianjin has achieved full or close to full compliance since its launch.
Year in Review	The Tianjin Development and Reform Commission (DRC) released its new "Interim Measure for Management of Emissions Trading in Tianjin" in May 2018, which was the third one since 2013, as each of them provides the legal basis for the Tianjin Pilot ETS within a specific time period. The Tianjin system has not undergone significant changes since its launch. Much like the governance transition at the national level (see China National ETS factsheet), it is expected that ETS-related responsibilities in Tianjin will be moved from the DRC to the Ecology and Environment Bureau. The process is ongoing and is expected to conclude by early 2019.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 215 $MtC0_2e$ (2012)
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**BY 2020:** 20.5% reduction in carbon intensity compared to 2015 levels (13th five-year plan)
Carbon Price	*Current Allowance Price (per t/CO2e):* 11.58 CNY (USD 1.75) (weighted average trading price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.55
GHG covered	CO2
Sectors covered and thresholds	Heat and electricity production, iron and steel, petrochemicals, chemicals, exploration for oil and gas. **INCLUSION THRESHOLDS:** 20,000t CO2/year considering both direct and indirect emissions.
Point of regulation	Downstream. Both direct and indirect emissions are covered.
Number of liable entities	109 (2017) No information available yet.
Cap	160-170 MtCO2e (2017)

Phases & Allocation

Trading period	2013-2018* *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.
Allocation	**Free Allocation:** Mainly free allocation through grandparenting based on 2009-2012 emissions or on emissions intensity. Benchmarking for new entrants and expanded capacity.

Flexibility

Banking and borrowing	Banking is allowed. Borrowing is not allowed.
Offsets and credits	**QUANTITATIVE LIMIT:** Domestic project-based carbon offset credits—CCERs—are allowed. The use of CCER credits is limited to 10% of the annual compliance obligation. **QUALITATIVE LIMIT:** Credits must stem from CO2 reduction projects, excluding hydro. They must be realized after 2013.
Market Stability Provisions	**DRC Intervention:** In case of market fluctuations, the Tianjin DRC can buy or sell allowances in order to stabilize the market.

Compliance

Compliance Period	One year
Monitoring, Reporting, Verification (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.
Enforcement	In case of noncompliance, companies are disqualified for three years for preferential financial support and other national supporting policies, i.e., on recycling economy, energy-saving measures, and emission reductions. There are no financial penalties for non-compliance.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Tianjin DRC (competent authority) —the responsibility is expected to be moved to Tianjin Ecology and Environment Bureau in the course of 2019; Tianjin Climate Exchange (trading platform and registry)
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	Tianjin Pilot ETS Implementation Plan Interim Measure for Management of Emissions Trading in Tianjin Interim Measure for Management of Emissions Trading in Tianjin (2016) Interim Measure for Management of Emissions Trading in Tianjin (2018)

EU Emissions Trading System (EU ETS)

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Member states: 28 EU Member States and three European Economic Area-European Free Trade Association (EEA-EFTA) states: Iceland, Liechtenstein and Norway The European Union Emissions Trading System (EU ETS) represents the central pillar of the EU climate change policy and is the oldest and still largest ETS for GHGs operating worldwide. Introduced in 2005 and now in its third phase, the system has gone through several reforms and will change again with the start of phase 4 in January 2021. The system covers emissions from the power, industrial, and aviation sectors, with the aviation sector being limited to flights within the European Economic Area (EEA). In 2017, the EU and Switzerland signed an agreement linking the Swiss ETS to the EU ETS—the first such agreement for the EU.
Year in Review	After more than two years of negotiations, in February 2018, the EU Council of Ministers formally approved the reform of the EU ETS for phase 4 (2021-2030). The revised EU ETS Directive entered into force in April 2018. Phase 4 will see a steeper pace of annual emissions cuts required from the covered sectors, from 1.74% to 2.2%. In addition, the Market Stability Reserve (MSR)—a mechanism to reduce the surplus of allowances in the carbon market and to improve the EU ETS's resilience to future shocks—has been strengthened: between 2019 and 2023, 24% of the surplus will be placed in the MSR instead of the regular rate of 12%, while from 2023 onwards the allowances held in the MSR exceeding the previous year's auction volume will be invalidated. Member States may also invalidate a portion of allowances to reflect additional policies in the energy sector, e.g., a coal phase out. Other changes for phase 4 include provisions to better target free allocation to address carbon leakage, as well as new financial support mechanisms to promote low-carbon innovation and to support modernization efforts in the industry and the power sectors of lower-income Member States. Steps will be taken in 2019 to ratify the Linking Agreement between Switzerland and the EU, which could see the markets linked from 1 January 2020.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 4,353 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 3391 Industrial Processes — 386 Agriculture — 436 Waste — 140
Overall GHG reduction target	**By 2020:** 20% below 1990 GHG levels **By 2030:** At least 40% below 1990 GHG levels **By 2050:** EU leaders have committed to reducing emissions by 80-95% below 1990 GHG levels
Carbon Price	*Current Allowance Price (per t/CO2e):* EUR 15.82 (USD 18.76) (average 2018 price on secondary market [EEX]; updated prices available here)

ETS Size

Emissions covered by the ETS	0.40
GHG covered	CO2, N2O, PFCs
Sectors covered and thresholds	**PHASE 1 (2005-2007):** Power stations and other combustion installations with >20MW thermal rated input (except hazardous or municipal waste installations), industry (various thresholds) including oil refineries, coke ovens, iron and steel plants, as well as production of cement, glass, lime, bricks, ceramics, pulp, paper, and board. **PHASE 2 (2008-2012):** Aviation was introduced in 2012 (>10,000 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 3 (2013-2020):** Carbon Capture and Storage installations, production of petrochemicals, ammonia, nonferrous and ferrous metals, gypsum, aluminum, as well as nitric, adipic, and glyoxylic acid (various thresholds) were introduced. **PHASE 4 (2021-2030):** No changes to the scope are envisaged for phase 4. **International Aviation:** Emissions from international aviation were included in the EU ETS in 2012. In November 2012, the EU temporarily suspended enforcement of the EU ETS requirements for flights operating from or to non-EEA countries ("stop the clock") while continuing to apply the legislation to flights within and between countries in the EEA. Exemptions for operators with low emissions have also been introduced. In light of the progress made under the International Civil Aviation Organization towards a global measure to reduce emissions from the aviation sector (the Carbon Offsetting and Reduction Scheme [CORSIA]), the EU will maintain the intra-EEA scope for the ETS Aviation until 31 December 2023. A further review and assessment will be carried out once there is clarity surrounding the content and nature of CORSIA, as well as the extent of participation by Europe's international partners.
Point of regulation	Downstream
Number of liable entities	More than 11,000 power plants and manufacturing installations. Aircraft operators are covered for all flights. However, a temporary exemption applies to flights between the EEA and a third country. No information available yet.
Cap	**PHASE 1 (2005-2008) and PHASE 2 (2009-2012):** Decentralized cap-setting – the EU cap resulted from the aggregation of the National Allocation Plans of each Member State. Phase 1 started with a cap of 2,096 MtCO2e in 2005, phase 2 with a cap of 2,049 MtCO2e in 2009. **PHASE 3 (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 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 significantly lower than the original cap. In 2017, the intra-EEA scope for aviation was prolonged until 2023. The adjusted approach for determining the annual aviation cap still applies. **PHASE 4 (2021-2030):** A linear cap reduction factor of 2.2% (48.4 million allowances) annually for both stationary sources and the aviation sector. The linear reduction factor does not have a sunset clause and the cap will continue to decline beyond 2030.

Phases & Allocation

Trading period	**Phase 1:** 3 years (2005-2007) **Phase 2:** 5 years (2008-2012) **Phase 3:** 8 years (2013-2020) **Phase 4:** 10 years (2021-2030)
Allocation	**PHASE 1 (2005-2007):** Allocation established through the Member State National Allocation Plans. Nearly 100% free allocation through grandfathering. Some Member States used auctioning and some used benchmarking. **PHASE 2 (2008-2012):** Similar to Phase 1 with ~90% of allowances allocated for free. Some benchmarking for free allocation and some auctioning in eight Member States (Germany, United Kingdom, The Netherlands, Austria, Ireland, Hungary, Czech Republic and Lithuania), constituting ~3% of total allowances. **PHASE 3 (2013-2020):** Over the entire trading period, 57% of allowances will be auctioned, while the remaining allowances are available for free allocation. **Electricity Sector:** 100% auctioning with optional derogation for the modernization of the electricity sector in certain Member States. Those Member States whose GDP per capita was below 60% of the EU average in 2013 may continue to make use of this optional free allocation in phase 4. **Manufacturing Sector:** Free allocation is based on product-based benchmarks. Benchmarks are based on activity levels in 2007-2008 and are set at the average of the 10% most efficient installations in the (sub)sector. Subsectors deemed at risk of carbon leakage receive free allocation at 100% of the predetermined benchmarks. Subsectors deemed not at risk of carbon leakage have free allocation phased out gradually from 80% of the benchmarks in 2013 to 30% by 2020. In the event that free allocation exceeds the amount reserved for free allocation, a cross-sectoral correction factor is applied. Carbon leakage risk is assessed against criteria of emissions intensity and trade exposure. **Aviation Sector:** In 2012, 85% of allowances were allocated for free, based on benchmarks. In phase 3, 15% of allowances are auctioned and 82% allocated for free, based on benchmarks. The remaining 3% constitute a special reserve for new entrants and fast-growing airlines. As a consequence of the temporary derogation applying to flights with third countries, the allocation is adjusted to the intra-EEA scope. **Backloading:** Taken as a short-term measure to address a growing surplus in the EU ETS, it was agreed to postpone the auctioning of 900 million allowances from 2014-2016 to 2019-2020. Auction volumes were reduced by 400 million allowances in 2014, 300 million in 2015, and by 200 million in 2016. In line with the decision to create an MSR, the back-loaded allowances will be placed in the MSR. **New Entrants Reserve:** 5% of the total allowances are set aside to assist new installations coming into the EU ETS or covered installations whose capacity has significantly increased since their free allocation was determined. **PHASE 4 (2021-2030):** One of the central components of the phase 4 revision package is to ensure that the declining number of free allowances is distributed in the most effective and efficient way. To this end, in phase 4: · Benchmark values will be updated twice during the phase to reflect technological progress in the different sectors.

	· Free allocation may be updated annually to mirror sustained changes in production (if the change is more than 15% compared to the initial level, on the basis of a two-year rolling average). · Carbon leakage rules will be more robust, as the number of sectors classified at risk of carbon leakage will be reduced, and the free allocation for other sectors will be discontinued by 2030 (except district heating). · Carbon leakage will be assessed against a composite indicator of trade intensity and emissions intensity. · As an additional safeguard for industry, the agreement foresees a "free allocation buffer" of over 450 million allowances initially earmarked for auctioning, to be made available if the initial free allocation is fully absorbed (thereby avoiding or reducing a correction factor). In addition, two new multi-billion Euro funds will be established to help the industry and the power sectors meet the innovation and investment challenges of the transition to a low-carbon economy (for more, see Use of Revenue).

Flexibility

Banking and borrowing	Unlimited banking has been allowed since 2008. Borrowing is not allowed.
Offsets and credits	**PHASE 1 (2005-2007):** Unlimited use of Clean Development Mechanism (CDM) credits and Joint Implementation credits (JI) was provided for in the Directive. In practice, no credits were used in phase 1. **PHASE 2 (2008-2012):** **Qualitative Limits:** Most categories of CDM/JI credits were allowed, no credits from LULUCF and nuclear power sectors. Strict requirements for large hydro projects exceeding 20 MW. **Quantitative Limits:** In phase 2 (2008-2012), operators were allowed to use JI and CDM credits up to a certain percentage limit determined in the respective country's National Allocation Plans. Unused entitlements were transferred to phase 3 (2013-2020). **PHASE 3 (2013-2020):** **Qualitative Limits:** Newly generated (post-2012) international credits may only come from projects in Least Developed Countries. Credits from CDM and JI projects from other countries are eligible only if registered and implemented before 31 December 2012. Projects from industrial gas credits (projects involving the destruction of HFC-23 and 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 2 and phase 3 may amount up to 50% of the overall reduction under the EU ETS in that period (~1.6 Gt CO2e). **PHASE 4 (2021-2030):** The use of offsets is not envisaged.
Market Stability Provisions	**Market Stability Reserve (MSR):** The MSR started operating in January 2019. It aims to neutralize the negative impacts of the existing allowance surplus and to improve the system's resilience to future shocks. Thresholds: Allowances will be added to the reserve if the total number of allowances in circulation (TNAC) is higher than 833 million allowances and reinjected to the market if the number of allowances in circulation falls below 400 million. · When the TNAC is above 833 million, 12% (24% up to 2023) of the surplus is withdrawn from future auctions and placed into the reserve over a period of 12 months. · When the TNAC is less than 400 million allowances, 100 million allowances are taken from the reserve and injected into the market. From 2023 onwards, the number of allowances held in the reserve will be limited to the auction volume of the previous year. Holdings above that amount will lose their validity.

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

Compliance

Compliance Period	From 1 January until 30 April the following year (16 months)
Monitoring, Reporting, Verification (MRV)	**REPORTING FREQUENCY:** Annual self-reporting based on harmonized electronic templates prepared by the European Commission. **VERIFICATION:** Verification by independent accredited verifiers is required before 31 March each year. **MRV FRAMEWORK:** Since phase 3, the MRV framework for the EU ETS has been further harmonized. European Commission regulations now apply for emissions monitoring and reporting, as well as verification and accreditation of verifiers. A monitoring plan is required for every installation and aircraft operator (approved by competent authority).
Enforcement	Entities must pay an "excess emissions penalty" of EUR 100/tCO2 (USD 118/tCO2) for each tCO2 emitted for which no allowance has been surrendered. The name of the noncompliant operator is also published. Different penalties exist at the national level for other forms of noncompliance.

Linking

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

Other Information

Institutions involved	The European Commission and the relevant authorities of the 28 Member States, Iceland, Liechtenstein, and Norway.
Evaluation / ETS review	The European Commission publishes annual reports on the functioning of the European carbon market (see here for the 2018 report). Two major EU ETS reviews – before phase 3 and before phase 4 – have been conducted to date, resulting in changes in system design. The directive establishing the EU ETS stipulates that the system be kept under review in light of the implementation of the Paris Agreement and the development of carbon markets in other major economies.
Revenue	**Since beginning of program:** EUR 35.9 billion (USD 42.4 billion) **Collected in 2018:** EUR 14.2 billion (USD 16.8 billion) EU ETS revenues from auctioning accrue to EU Member States. At least 50% of revenues should be used for climate- and energy-related purposes. Member States are obliged to inform the Commission about how they use the revenues. According to information submitted, they spend ~80% for domestic and international climate-related purposes.

	PHASE 3 (2013-2020): 300 million allowances were reserved for auction to fund the demonstration of environmentally safe carbon capture and storage and innovative renewable energy technologies through the NER300. **PHASE 4 (2021-2030):** Two EU-level funds fed from the sale of allowances funds will replace the NER300: **The Innovation Fund:** For the demonstration of innovative technologies to breakthrough innovation in industry, as well as carbon capture and storage/use and renewable energy. **The Modernization Fund:** Facilitating investments in modernizing the energy systems and supporting energy efficiency in 10 lower-income Member States, including investments to support a socially just transition to a low-carbon economy (such as retraining for affected workers).
Implementing Legislation	Consolidated version of Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for GHG emission allowance trading within the Community and amending Council Directive 96/61/EC (8 April 2018) Decision concerning the establishment and operation of a market stability reserve for the Union GHG emission trading scheme and amending Directive 2003/87/EU (6 October 2015) Consolidated Auctioning Regulation (25 February 2014): Commission Regulation EU No 176/2014 amending Regulation (EU) No 1031/2010 in particular to determine the volumes of GHG emission allowances to be auctioned in 2013-2020 (25 February 2014). All other legislation and documentation can be found here.

Japan - Saitama Target Setting Emissions Trading System

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Saitama Saitama's ETS was established in April 2011 as part of the Saitama Prefecture Global Warming Strategy Promotion Ordinance. Under the ETS, large buildings and factories in Saitama are required to reduce emissions by 15% or 13% in its second compliance period (FY2015-2019). Saitama's ETS is linked to Tokyo's program
Year in Review	In FY2016, the Saitama ETS achieved a 28% reduction in emissions below base-year emissions.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 36.6 $MtC0_2e$ (2016) *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.
Overall GHG emissions by sector	Sector Name — MtCO2e Industry — 11.2 Residential — 8.8 Transport — 9.4 Commercial — 4.8
Overall GHG reduction target	**BY 2020:** 21% reduction from 2005 GHG levels (demand side)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	0.18
GHG covered	CO2
Sectors covered and thresholds	Consumption of fuels, heat, and electricity in commercial and industrial buildings **INCLUSION THRESHOLDS**: Facilities that consume energy more than 1,500kL of crude oil equivalent or more per year.
Point of regulation	Downstream
Number of liable entities	~574 facilities (2016): office/commercial buildings: 166; factories: 408 No information available yet.
Cap	The Saitama-wide cap is aggregated based on emissions baselines set at the facility level. Baselines for the regulated facilities are calculated according to the following formula: Sum of base-year emissions of covered facilities x compliance factor x number of years of a compliance period (five years). **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

The higher compliance factor applies to commercial buildings, as well as to district heating and cooling (DHC) plant-facilities (excluding facilities that use a large amount of DHC). The lower compliance factor applies, among others, to commercial buildings, facilities which are heavy users of DHC plants, and factories.

Facilities demonstrating outstanding performance in emissions reduction, as well as in the introduction, use, and management of energy equipment, are certified as top-level facilities that receive lower compliance factors according to their rate of progress. The certification standards represent the highest-level energy-efficiency measures currently feasible, stipulating more than 200 different energy-saving measures.

Phases & Allocation

Trading period	**FIRST PERIOD:** 1 April 2012 to 30 September 2016 **SECOND PERIOD**: 1 April 2015 to 30 September 2021 Each of the above trading periods includes an 18-month adjustment period.
Allocation	The baselines for facilities are based on historical emissions, calculated according to the following formula: Base-year emissions x (1 - compliance factor) x compliance period (5 years). Base-year emissions for the first compliance period are based on the average emissions of three consecutive years between FY 2002-2007, as chosen by each entity. Credits are issued to facilities whose emissions fall below the baseline. Baselines for new entrants are based on past emissions or on emissions intensity standards.

Flexibility

Banking and borrowing	Banking is only allowed between two consecutive compliance periods. Borrowing is not allowed.
Offsets and credits	Credits from five offset types are allowed in the Saitama ETS. **SMALL AND MID-SIZE FACILITY CREDITS**: Emissions reductions from non-covered small- and medium-sized facilities in Saitama. **Quantitative Limits:** None. **OUTSIDE SAITAMA CREDITS**: Emission reductions achieved from large facilities outside of the Saitama prefecture. Large facilities are those with an energy consumption of 1,500kL of crude oil equivalent or more in a base-year, and with base-year emissions of 150,000t or less. **Quantitative Limits:** Credits are only issued for the reduction amount that exceeds the compliance factor. These credits can be used for compliance for up to one-third of offices' reduction obligations. Factories can use up to 50%. **RENEWABLE ENERGY CREDITS**: Credits from solar (heat, electricity), wind, geothermal, or hydro (under 1,000kW) electricity production are counted at 1.5 times the value of regular credits. Credits from biomass (biomass rate of 95% or more, black liquor is excluded) are converted with the factor 1. These credits encompass the following types: Environmental Value Equivalent, Renewable Energy Certificates, and New Energy Electricity, generated under the Renewable Portfolio Standard Law. **Quantitative Limits**: None. **TOKYO CREDITS (VIA LINKING)**: **(1)** Excess Credits: Emissions reductions from facilities with base-year emissions of 150,000 tonnes or less. Issuance of credits from FY2015.

	(2) Small- and mid-size Facility Credits: Issued by Saitama Prefecture. Issuance of credits from FY2012. **Quantitative Limits:** None. **FOREST ABSORPTION CREDITS:** Credits from forests inside the Saitama Prefecture are counted at 1.5 times the value of regular credits. Others are converted with the factor 1. **Quantitative Limits**: None. **EMISSIONS REDUCTION METHODS**: Renewable Energy: When covered facilities generate electricity from renewable sources for their own use, they can deduct this amount of electricity from the total energy usage of the facility.
Market Stability Provisions	In general, Saitama does not control carbon prices.

Compliance

Compliance Period	**FIRST PERIOD**: FY2011-2014 **SECOND PERIOD**: FY2015-2019
Monitoring, Reporting, Verification (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 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
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	Saitama Prefecture Global Warming Strategy Promotion Ordinance Regulation on Saitama Prefecture Global Warming Strategy Promotion Ordinance

Japan - Tokyo Cap-and-Trade Program

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Tokyo Metropolis Launched in April 2010, the Tokyo ETS—the cap-and-trade program of the Tokyo Metropolitan Government (TMG)—is Japan's first mandatory ETS and is linked to the Saitama ETS. Under the ETS, large offices and factories are required to reduce emissions by 15% or 17% in its second period (FY2015-FY2019). The target in the third period (FY2020-2024) is expected to be 25% or 27%.
Year in Review	In FY2016, emissions were reduced by 26% compared to base-year emissions. The introduction of high-efficiency heat sources and light fittings have been key activities in reducing emissions in the building sector. Buildings have continued to decrease emissions despite an increase in gross floor space, indicating a decrease in emissions intensity in the sector.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 66.0 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Commercial — 25.7 Residential — 16.8 Transport — 11.1 Industry — 4.8 Waste — 1.7
Overall GHG reduction target	**BY 2020:** 25% reduction from 2000 GHG levels **BY 2030:** 30% reduction from 2000 GHG levels
Carbon Price	*Current Allowance Price (per t/CO2e):* ~JPY 650 (USD 5.89) (estimated standard transaction price in 2018)

ETS Size

Emissions covered by the ETS	0.20
GHG covered	CO2
Sectors covered and thresholds	Consumption of fuels, heat, and electricity in commercial and industrial buildings. Building owners are subject to surrender obligations, but large tenants (floor space above 5000m2 or over six million kWh electricity usage per year) can assume obligations jointly or in place of building owners. **INCLUSION THRESHOLDS:** Facilities that consume energy more than 1,500kL of crude oil equivalent or more per year.
Point of regulation	Downstream
Number of liable entities	1,200 facilities: office/commercial buildings: 1000, factories: 200

	No information available yet.
Cap	A Tokyo-wide cap is aggregated from emissions baselines set at the facility level. The baselines at the facility level are calculated according to the following formula: Sum of base year emissions of covered facilities x compliance factor x number of years of a compliance period (five years). **Compliance factor:** **FIRST PERIOD (FY2010-FY2014):** 8% or 6% reduction below base-year emissions **SECOND PERIOD (FY2015-FY2019):** 17% or 15% reduction below base-year emissions **THIRD PERIOD (FY2020-FY2024):** 25% or 27% reduction below base-year emissions (expected compliance factors) The higher compliance factor applies to office buildings, as well as to district heating and cooling (DHC) plant facilities (excluding facilities that use a large amount of DHC). The lower compliance factor applies, among others, to office buildings, facilities which are heavy users of DHC plants, and factories. Facilities demonstrating outstanding performance in emissions reductions, as well as in the introduction, use, and management of energy equipment, are certified as top-level facilities that receive lower compliance factors according to their rate of progress. The certification standards represent the highest-level energy efficiency measures currently feasible, stipulating more than 200 different energy-saving measures.

Phases & Allocation

Trading period	**FIRST PERIOD:** 1 April 2011 to 30 September 2016 **SECOND PERIOD:** 1 April 2015 to 30 September 2021 **THIRD PERIOD:** 1 April 2020 to 30 September 2026 Each of the above trading periods includes an 18-month adjustment period.
Allocation	The baselines for facilities are based on historical emissions, calculated according to the following formula: Base-year emissions x (1 - compliance factor) x compliance period (5 years). Base-year emissions for the first compliance period are based on the average emissions of three consecutive years between FY2002-2007, as chosen by each entity. Credits are issued to facilities whose emissions fall below the baseline. Baselines for new entrants are based on past emissions or on emissions intensity standards.

Flexibility

Banking and borrowing	Banking is only allowed between consecutive compliance periods. Borrowing is not allowed.
Offsets and credits	Credits from four offset types are allowed in the Tokyo ETS. **SMALL AND MID-SIZE FACILITY CREDITS:** Emissions reductions from non-covered small- and medium-sized facilities in Tokyo. **Quantitative Limits:** None.

	OUTSIDE TOKYO CREDITS: Emission reductions achieved from large facilities outside of the Tokyo area. Large facilities are those with an energy consumption of 1,500kL of crude oil equivalent or more in a base-year, and with base-year emissions of 150,000t or less. **Quantitative Limits:** Credits are only issued for the reduction amount that exceeds the compliance factor. These credits can be used for compliance for up to one-third of facilities' reduction obligations. **RENEWABLE ENERGY CREDITS:** Credits from solar (heat, electricity), wind, geothermal, or hydro (under 1,000kW) electricity production are counted at 1.5 times the value of regular credits. Credits from biomass (biomass rate of 95% or more, black liquor is excluded) are converted with the factor 1. These credits encompass the following types: Environmental Value Equivalent, Renewable Energy Certificates, and New Energy Electricity, generated under the Renewable Portfolio Standard Law. **Quantitative Limits:** None. **SAITAMA CREDITS (VIA LINKING):** **(1)** Excess Credits: Emissions reductions from facilities in Saitama with base-year emissions of 150,000 tonnes or less. Issuance of credits from FY2015. **(2)** Small- and Mid-size Facility Credits issued by Saitama Prefecture. Issuance of credits from FY2012. **Quantitative Limits:** None. All offsets have to be verified by verification agencies. **EMISSIONS REDUCTION METHODS:** **(1)** Low Carbon Electricity and Heat: In order to evaluate energy efficiency efforts of the covered facilities, CO2 emission factors of supply side (electricity and others) are fixed during each compliance period. When covered facilities procure electricity or heating from TMG-certified suppliers with lower emission factors, they can reduce the difference between these emission factors from their emissions to be reported to TMG. **(2)** Renewable Energy: When covered facilities generate electricity from renewable sources for their own use, they can deduct this amount of electricity from the total energy usage of the facility.
Market Stability Provisions	In general, covered facilities trade over the counter and TMG does not control carbon prices. However, TMG offers offset credits for trading in case of excessive price development.

Compliance

Compliance Period	Five years **FIRST PERIOD:** FY2010-2014 **SECOND PERIOD:** FY2015-2019 **THIRD PERIOD:** FY2020-2024
Monitoring, Reporting, Verification (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 5000m2 or over six million kWh electricity use per year, are required to submit their own emissions reduction plan to TMG in collaboration with building owners. **VERIFICATION:** These annual reports require third-party verification. **FRAMEWORK:** These are based on 'TMG Monitoring/Reporting Guidelines' and 'TMG Verification Guidelines.'
Enforcement	In the case of noncompliance, the following measures may be taken: **FIRST STAGE:** The Governor orders the facility to reduce emissions by the amount of the reduction shortfall multiplied by 1.3.

	SECOND STAGE: Any facility that fails to carry out the order will be publicly named and subject to penalties (up to JPY 500,000 [USD 4,528]) and surcharges (1.3 times the shortfall).

Linking

Links with other Systems	Linking with the Saitama Prefecture started in April 2011 when the Saitama ETS was launched. Tokyo and Saitama credits are officially eligible for trade between the two jurisdictions. During the first compliance period, 15 credit transfers took place between the Saitama Prefecture and Tokyo (nine cases from Tokyo to Saitama, six cases from Saitama to Tokyo).

Other Information

Institutions involved	Tokyo Metropolitan Government
Evaluation / ETS review	TMG has established a committee to analyze the structure of its system post-2020. From FY2020, the program will enter into a new stage to promote continued energy-savings and expanding the utilization of low-carbon (renewable) energy to achieve the 2030 target and transition to a zero-carbon society.
Revenue	No information available yet.
Implementing Legislation	The Tokyo Metropolitan Security Ordinance and Regulation for the Enforcement of the Tokyo Metropolitan Environmental Security Ordinance Detailed documents on the Tokyo ETS can be found on the TMG website.

Kazakhstan Emissions Trading Scheme

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Republic of Kazakhstan Kazakhstan launched an ETS in January 2013. The groundwork for the ETS development was laid out in 2011 through amendments and additions to Kazakhstan's environmental legislation. The system was temporarily suspended in 2016-2017 to tackle operational issues and reform allocation rules. MRV obligations applied during the suspension time. Amendments to the Environmental Code were passed in 2016 to improve the MRV system, as well as the overall GHG emissions regulation and KAZ ETS operation. Amendments to the Environmental Code in 2017 lay the groundwork for the introduction of benchmarking. The National Allocation Plan runs through 2018-2020 with a cap of 485.9 MtCO2 (162 MtCO2 on annual average), with 225 participating installations belonging to 129 operators.
Year in Review	The KAZ ETS restarted operation on 1 January 2018 with new trading procedures and allocation methods. Participants were given a choice between allocation based on historical emissions (chosen by 76 installations) or product-based benchmarks with the possibility of updating when capacity changes (chosen by 149 installations).
Overall GHG emissions (excluding LULUCF)	**Emissions:** 337.9 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excluding Transport) — 251.50 Transport — 22.72 Industrial processes — 25.10 Agriculture — 33.18 Waste — 5.46
Overall GHG reduction target	**BY 2020:** 5% reduction from 1990 GHG levels **BY 2030:** 15% (unconditional) to 25% (conditional) reduction from 1990 GHG levels (NDC) **BY 2050:** 40% CO2 emission reduction in power sector from 2012 levels (Concept of Transition to Green Economy, 2013)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	0.50
GHG covered	CO2
Sectors covered and thresholds	Power sector and centralized heating. Extractive industries and manufacturing: oil and gas mining, metallurgy, chemical and processing industry (production of building materials: cement, lime, gypsum, and brick). **INCLUSION THRESHOLDS:** Facilities emitting more than 20,000 tCO2e/year. For Phase 3 (2018-2020), 2013-2015 emission levels are used.

	For Phase 1 (2013) and Phase 2 (2014-2015), thresholds were based on 2010 and 2012 emission levels.
Point of regulation	Downstream
Number of liable entities	**PHASE 3 (2018-2020):** 129 companies (225 installations) No information available yet.
Cap	**PHASE 1 (2013):** 147 MtCO2. This equals a stabilization of the capped entities' emissions at 2010 levels. **PHASE 2 (2014-2015):** 2014: 154.9 MtCO2; 2015: 152.8 MtCO2. This represents reduction targets of 0% and 1.5% respectively, compared to the average CO2 emissions of capped entities in 2011-2012. **PHASE3 (2018-2020):** 485.9 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 period	**Phase 1 (pilot phase):** 2013 **Phase 2:** 2014-2015 **Phase 3:** 2018-2020 In 2016 and 2017, the system was temporarily suspended.
Allocation	**Free Allocation:** **Phase 1 (2013):** 100% free allocation based on emissions data from 2010, with a reserve of 20.6 MtCO2. **Phase 2 (2014-2015):** Free allocation (0% and 1.5% below 2011/2012 average emissions), with a reserve of 18 MtCO2 in 2014 and 20.5 in 2015. **Phase 3 (2018-2020):** Free allocation based on grandfathering or product-based benchmarking (by each company's own choice). A reserve contains 35.27 million allowances to accommodate for new entrants, new stationary emission sources, and for changes in capacity in case of the choice of benchmarking.

Flexibility

Banking and borrowing	Banking is allowed within one trading period (i.e., within 2018-2020). Banking between trading periods is not possible.
Offsets and credits	**QUALITATIVE LIMIT:** The system allows domestic offsets. International credits may be allowed in the future.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	One year

Monitoring, Reporting, Verification (MRV)	**REPORTING FREQUENCY:** Reporting is required annually for businesses or financial facilities above the 20,000 tCO2/year threshold. Annual reporting 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 is also required for CH4, N2O, and PFCs emissions. **VERIFICATION:** Emissions data reports and their underlying data require accredited third-party verification.
Enforcement	The non-compliance penalty equals five monthly standard units for each tonne (approximately KZT 10,605/tCO2 [USD 31/tCO2]). In 2013 and in 2014, penalties for non-compliance were waived.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Ministry of Energy; JSC Zhasyl Damu, a state-owned joint stock company
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	Environmental Code of the Republic of Kazakhstan National GHG Emission Quota Allocation Plan for 2018-2020 Rules for the allocation of quotas for GHG emissions and formation of reserves of the established number and volume of quotas Rules of trading greenhouse gas emission quota and carbon units

Korea Emissions Trading Scheme

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Republic of Korea The Korean Emissions Trading System (KETS) was launched on 1 January 2015, becoming East Asia's first nationwide mandatory ETS and the second-largest carbon market after the EU ETS. The ETS covers 591 of the country's largest emitters, which account for ~68% of national GHG emissions. It covers direct emissions of six Kyoto gases, as well as indirect emissions from electricity consumption. The KETS was designed to play an essential role in meeting Korea's 2030 NDC target of 37% below BAU emissions. The KETS is backed up by solid legal bases. The first and highest legal base for green growth and implementation of KETS is the 'Framework Act on Low Carbon, Green Growth' (2010). The 'Act on Allocation and Trading of Greenhouse Gas Emissions Allowances' (the 'Emissions Trading Act') and its Enforcement Decree were passed in 2012; it stipulates government actions, institutions, and timelines for KETS. Further details of the KETS were outlined in 2014 in a Master Plan (a ten-year plan for 2015-2024) and Allocation Plan. A mandatory GHG and Energy Target Management System (TMS) launched in 2012 (following a two-year pilot phase started in 2010), which enabled the collection of verified emissions data and training in the MRV process of TMS entities.
Year in Review	Key changes for the second phase in 2018 include: (i) an expansion of benchmark-based allocation; (ii) the introduction of 3% auctioning (for non-EITE entities); (iii) new banking rules; and (iv) the permitted restricted use of international credits. Although auctioning was originally set to begin in 2018, this was delayed to 2019. The first regular auction of allowances took place in January 2019. Auction rules were outlined in a guidance document released in March 2018. In addition, entities can now use international offset credits that have been developed by Korean companies to meet up to 5% of their compliance obligation. Measures were taken to address liquidity concerns and increase trade activity. On 1 June 2018, 30 days before the 2017 compliance deadline, the Korean government auctioned an additional 5.5 million allowances from the market stability reserve. The Export-Import Bank, the Korea Development Bank, and the Industrial Bank of Korea are also now in consultation to participate as market makers in the KETS.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 694.1 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Fuel combustion (excl. Transport) — 502.2 Transport — 98.7 Fugitive emissions — 3.9 Industrial processes — 51.5 Agriculture — 21.2 Waste — 16.5
Overall GHG reduction target	**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 credits* may be used towards achieving this goal (2030 GHG mitigation roadmap)

	*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).
Carbon Price	*Current Allowance Price (per t/CO2e):* KRW 22,692 (USD 20.62) (average secondary market price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.7
GHG covered	CO2, CH4, N2O, PFCs, HFCs, SF6
Sectors covered and thresholds	**PHASE ONE (2015-2017):** 23 subsectors from the following six sectors: power, industry (e.g., iron and steel, petrochemical, cement, oil refinery, nonferrous metals, paper, textile, machinery, mining, glass and ceramics, etc.), building, public, waste, and transportation (i.e., aviation). **PHASE TWO (2018-2020):** According to the Allocation Plan, the public and waste sectors are disaggregated such that the KETS covers the following six sectors: heat and power, industry, building, transportation, waste sector, and public. These sectors are disaggregated into 64 subsectors. **INCLUSION THRESHOLDS:** company >125,000 tCO2/year, facility >25,000 tCO2/year
Point of regulation	Downstream Both direct and indirect emissions are covered under the KETS.
Number of liable entities	610 (2019) No information available yet.
Cap	**PHASE ONE (2015-2017):** 1,686 MtCO2e, including a reserve of 89 MtCO2e for market stabilization measures, early action, and new entrants. 84.5% of reserve (76MtCO2e) are used. 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 markers, and 134 million for new entrants and other purposes.* 2018: 548 MtCO2e; 2019: 548 MtCO2e; 2020: 548 MtCO2e. *The competent authority expects the actual cap to be 1,777 MtCO2e, considering that not all the reserves would be used.

Phases & Allocation

Trading period	**PHASE ONE:** 3 years (2015-2017) **PHASE TWO:** 3 years (2018-2020) **PHASE THREE:** 5 years (2021-2026)
Allocation	**PHASE ONE (2015-2017):** **Free Allocation:** 100% free allocation. Most sectors received free allowances based on the average GHG emissions of the base year (2011-2013). Three sectors (grey clinker, oil refinery,

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% free allowances; in some subsectors entities have an obligation to get 3% of their compliance obligation from auctions.

Auctioning: <3% auctioned. Auctioning is determined on the sub-sector level, with an obligation acquire 3% of allowances at auctions, with the exception of sub-sectors that have high trade intensity or high additional cost increases, considering international competitiveness and carbon leakage. Sectors that participate in auctions include, among others, entities from the electricity, domestic aviation, wooden product and metal foundry sectors. While auctioning was scheduled to start in 2018, it has been delayed to the beginning of 2019. Participation in auctions is subject to some limitations. Only companies that do not receive all their allowances for free will be eligible to bid, with a list of eligible bidders published by the Ministry of Environment. No one bidder can purchase more than 30% of the allowances of one auction. The auctions will be subject to a minimum price.

KETS held its first auction in January 2019. Seven companies participated with the bidding price ranging from KRW 23,100 (USD 20.99) to KRW 27,500 (USD 24.98). Four companies successfully bid for all available allowances (550,000 KAUs) for a settlement price of KRW 25,500 (USD 23.17). A total of 7.95 million tonnes are set to be auctioned on monthly basis this year, with 550,000 offered in the first, third and fourth quarters; a million tonnes per auction will be offered in the second quarter.

PHASE THREE (2021-2025):
Free Allocation: less than 90% free allowances.
Auctioning: more than 10%.

Energy-intensive and trade-exposed (EITE) sectors will receive 100% of their allowances for free in all phases. EITE sectors are defined along the following criteria:
(1) Additional production cost of >5% and trade intensity of >10%; or
(2) Additional production cost of >30%; or
(3) Trade intensity of >30%.

Flexibility

Banking and borrowing	Banking is allowed with some restrictions across phases. From Phase One to Phase Two, banking is limited for each installation to 10% of the annual average allocation and 20,000 Korean Allowance Units (KAUs). The amount that exceeds the threshold is deducted from Phase Two allocation. From Phase Two to Phase Three, banking is limited to the higher of two limits: **(1)** the net annual amount of allowances sold in Phase Two; and **(2)** company- and facility-specific limits, of 250,000 KAUs and 5,000 KAUs respectively. Borrowing is allowed only within a single trading phase. In 2015, this was limited to 10% of an entity's obligation. This limit increased to 20% in 2016 and 2017. In the first compliance year of Phase Two (2018), borrowing was limited to 15% of an entity's obligation. From 2019, the borrowing limit will be affected by how much an entity has borrowed in the past via the following formula: [Borrowing limit of previous year-("borrowing ratio" in previous year x 50%)]/entity's emission volume.
Offsets and credits	**PHASE ONE (2015-2017)** **QUALITATIVE LIMIT:** Only domestic credits from external reduction activities implemented by non-ETS entities–and that meet international standards–could be used for compliance in this phase. Domestic CDM credits (CERs), and credits from domestically certified projects (Korean Offset Credits) were allowed. These credits had to be converted to Korean Credit Units (KCUs) of a specified vintage before being used for compliance. Eligible activities included those eligible under the CDM and Carbon Capture and Storage. However, only

	activities implemented after 14 April 2010 were eligible. As of December 2017, 35 domestic and 211 CDM methodologies had been approved for use under the KETS. **QUANTITATIVE LIMIT:** Up to 10% of each entity's compliance obligation. **PHASE TWO (2018-2020)** **QUALITATIVE LIMIT:** In Phase Two, trades of CERs generated after 1 June 2016 from international CDM projects developed by domestic companies are allowed. CDM projects operated by Korean companies will be allowed when: **(1)** at least 20% of the ownership rights, operating rights, or the voting stocks are owned by a Korean company; **(2)** a Korean company sells or distributes more than 20% of the total project cost; or **(3)** the projects are funded by a Korean company with a national or regional government operating in a UN-designated Least Developed Country or a low-income economy as classified by the World Bank. Regulated entities must convert CDM credits (CERs) to KCUs in order to be used for compliance. **QUANTITATIVE LIMIT:** Up to 10% of each entity's compliance obligation (of which up to 5% for international offset credit). **PHASE THREE (2021-2025):** Rules are not yet clear.
Market Stability Provisions	**Auction Reserve Price:** Auctions for market stability will be subject to an auction reserve price that will be set by the following formula: "the average price over the previous three months + the average price of last month + the average price over the previous three days/3." **Allocation Committee:** An Allocation Committee is in place to implement market stabilization measures in particular cases: **(1)** The market allowance price of six consecutive months is at least three times higher than the average price of the two previous years. **(2)** The market allowance price of the last month is at least twice the average price of two previous years and the average trading volume of the last month is at least twice the volume of the same month of the two previous years. **(3)** The average market allowance price of a given month is smaller than 40% of the average price of the two previous years. In 2015 and 2016, the price threshold is KRW 10,000 (USD 9.09). **(4)** When it is difficult to trade allowances due to the imbalance of supply or demand. The stabilization measures may include: **(1)** Additional allocation from the reserve (up to 25%); **(2)** Establishment of an allowance retention limit: minimum (70%) or maximum (150%) of the allowance of the compliance year; **(3)** An increase or decrease of the borrowing limit; **(4)** An increase or decrease of the offsets limit; and **(5)** Temporary set-up of a price ceiling or price floor. In 2016, the Allocation Committee doubled the borrowing limit to 20% and an additional nine million allowances were auctioned at a reserve price of KRW 16,200 (USD 14.72) of which less than a third of allowances were sold. In 2018, the Committee made an additional 5.5 million allowances available from the stability reserve in an attempt to ease the market in the lead-up to the 2017 compliance deadline. The Export-Import Bank, the Korea Development Bank, and the Industrial Bank of Korea are also currently in consultation talks to participate as market makers in the KETS.

Compliance

Compliance Period	One year
Monitoring, Reporting, Verification (MRV)	**REPORTING FREQUENCY:** Annual reporting of emissions must be submitted within three months from the end of a given compliance year (by the end of March).

	VERIFICATION: Emissions must be verified by a third-party verifier. **OTHER:** Emissions reports are reviewed and certified by the Certification Committee of the Ministry of Environment (MOE) within five months from the end of a given compliance year (by the end of May). If the liable entity fails to report emissions correctly, the report will be disqualified.
Enforcement	The penalty shall not exceed three times the average market price of allowances of the given compliance year or KRW 100,000 (USD 90.85)/tonne.

Linking

Links with other Systems	Linkage is planned to be considered in Phase Three.

Other Information

Institutions involved	In 2016, overall responsibility for the KETS moved from the MOE to the Ministry of Strategy and Finance (MOST). On 1 January 2018, responsibility was transferred back to the MOE, while the MOST still chairs the Allocation Committee. Korea Exchange (Trading Platform). Greenhouse Gas Inventory and Research Center (Registry and technical support).
Evaluation / ETS review	No standardized evaluation process has been developed to date, but an analysis of the economic impact of the KETS is ongoing for the current phase.* *The method/modelling of the ongoing study is not yet open to the public.
Revenue	**Since beginning of program:** KRW 109.4 billion (USD 99.4 million) from market stability auctions.* In addition, KRW 14.03 billion (USD 12.74 million) from regular allowance auction.** **Collected in 2018:** KRW 104.9 billion (USD 95.31 million) * Auctions were held in 2016 and 2018 for reasons of market stability, rather than allocation. ** The first auction held for the purpose of allocating allowances took place in January 2019. 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 Enforcement Decree of the Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances First Master Plan for 2015-2024 Second Allocation Plan

New Zealand Emissions Trading Scheme

General Information

Summary	**Status:** ETS in force **Jurisdictions:** New Zealand The New Zealand Emissions Trading Scheme (NZ ETS) was launched in 2008. Originally designed to cover the whole economy, it has the broadest sectoral coverage of any ETS, including forestry as a source of both emissions and units. Biological emissions from agriculture, however, currently have only reporting obligations and no surrender obligations. The 'Climate Change Response Act 2002' sets the legislative framework for the NZ ETS. The NZ ETS was conceived as a nested system under the Kyoto Protocol, with full links to international carbon markets. However, as of 1 June 2015, the NZ ETS became a domestic-only system. As indicated by New Zealand's NDC, reestablishing a link to high-integrity international carbon markets will form part of New Zealand's strategy for meeting its 2030 target.
Year in Review	Based on the second review of the NZ ETS, decisions were taken in 2018 to introduce several integrated measures to cap and manage unit supply to align the supply of units in the NZ ETS with New Zealand's emission reduction targets. These decisions include introducing an auctioning mechanism, a cost containment reserve (CCR) to replace the fixed price option ceiling, limits on international units (if and when the NZ ETS reopens to international markets), and a coordinated decision-making process for setting unit supply over a rolling five-year period with annual updates. For the forestry sector, provisions for permanent forests are to be introduced, as well as other technical improvements. Further policy reforms are to be decided in 2019. Reforms under consideration include: simplified forestry-sector accounting options, a potential price floor mechanism, as well as options for the phase-down of free allocation to emissions intensive and trade exposed (EITE) industries. Options for strengthening the NZ ETS market governance framework and improving the penalties and compliance regime are also expected. Legislation amending the 'Climate Change Response Act 2002' is expected to be presented to Parliament in mid-2019, so that the reforms may be implemented in 2020. The 'Zero Carbon Bill' proposes putting in place the core building blocks to give certainty to a long-term approach to climate change. The bill is expected to be introduced in the first half of 2019. An Interim Climate Change Committee was established in 2018 to lay the groundwork on key issues, including how surrender obligations could best be arranged if agricultural CH4 and N2O emissions enter the NZ ETS.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 78.7 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Agriculture — 38.7 Energy (excluding transport) — 17.7 Road transport — 13.6 Industry — 4.8 Waste — 3.8
Overall GHG reduction target	**BY 2020:** 5% reduction from 1990 GHG levels (unconditional target) **BY 2030:** 30% reduction from 2005 GHG levels (equivalent to 11% reduction from 1990 GHG levels) (NDC)

	BY 2050: 50% reduction from 1990 GHG levels
Carbon Price	*Current Allowance Price (per t/CO2e):* NZD 22.71 (USD 15.71) (average secondary market price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.51
GHG covered	CO2, CH4, N2O, SF6, HFCs, and PFCs
Sectors covered and thresholds	Sectors were gradually phased in over time. **2008:** Forestry (mandatory: deforesting pre-1990 forest land; voluntary: post-1989 forest land). **2010:** Stationary energy (various thresholds), industrial processing (various thresholds), and liquid fossil fuels (various thresholds). **2013:** Waste (except for small and remote landfills) and synthetic GHGs (various thresholds). Synthetic GHGs not in the NZ ETS are subject to an equivalent levy. Currently, biological emissions from agriculture must be reported, but face no surrender obligations.
Point of regulation	The point of obligation is generally placed upstream. Some large businesses that purchase fossil fuels directly from mandatory NZ ETS participants can choose to opt into the NZ ETS rather than have the costs passed down from their suppliers.
Number of liable entities	2,448 entities registered, of which 2,351 have surrender obligations (as of June 2018). 221 entities with mandatory reporting and surrender obligations. 2,156 entities with voluntary reporting and surrender obligations; most for post-1989 forestry activities. 71 entities with mandatory reporting without surrender obligations; all for agricultural activities. No information available yet.
Cap	The NZ ETS was originally designed to operate without a specific domestic cap as this accommodated carbon sequestration from forestry activities and a full link to the international Kyoto Protocol carbon markets. Allowance supply was restricted to New Zealand Units (NZUs) in 2015. Potential future access to international units will be subject to quantitative limits. The NZ ETS will have its own fixed cap in the future. This would restrict the number of units supplied into the scheme, in line with New Zealand's GHG reduction targets. It is expected that a process will be established for setting unit supply over a rolling five-year period with annual updates.

Phases & Allocation

Trading period	For most sectors the NZ ETS has annual surrender obligations. For post-1989 forestry participants, annual reporting of emissions and removals is optional, with five-year mandatory reporting periods. As a result, unit entitlement transfers and surrender obligations for these participants correspond to when they choose to report their emissions.

Allocation	**Free Allocation:** **EITE Activities:** Intensity-based allocation for 26 eligible activities. Highly EITE activities (over 1,600 tCO2e/NZD 1 million of revenue [USD 0.69 million] receive 90% free allocation. Moderately EITE activities (over 800 tCO2e/NZD 1 million of revenue [USD 0.69 million] receive 60% free allocation. 6.9 million NZUs were issued from June 2017 to June 2018. **Post-1989 Forestry Sector and Other Removal Activities:** NZUs are granted to participants that voluntarily register in the scheme for removal activities, as outlined below. There is no limit on the number of units that can be granted for removal activities. **Forestry Removal Activities:** Participants are entitled to receive one NZU per tonne of CO2 removed for registered post-1989 forest land. If the forest is harvested or deforested, units must be surrendered to account for the emissions, and if the participant chooses to deregister from the scheme, NZUs equivalent to the number received must be returned. 18.3 million NZUs were issued for forest removal activities from June 2017 to June 2018. **Other Removal Activities:** Participants are entitled to receive one NZU per tonne of removal from recognized industrial processes, including export of products that embed carbon and export of HFCs and PFCs. 2.2 million NZUs were issued for other removal activities from June 2017 to June 2018. **Forestry and Fisheries Sectors:** Owners of pre-1990 forest land, as well as owners of fishing quotas, received a one-off free allocation of NZUs when the NZ ETS was implemented to partially compensate for the impact of the ETS. **Auctioning:** In 2018 the government decided to develop and introduce an auctioning mechanism, within an overall cap on non-forestry sectors. The first auctions are expected in 2020.

Flexibility

Banking and borrowing	Banking is allowed except for those units that were purchased under the fixed price option (see Price Management Provisions). Borrowing is not allowed.
Offsets and credits	**QUALITATIVE LIMIT:** Units from Kyoto Protocol flexible mechanisms were eligible for use in the system with no restrictions until 2015. As of 1 June 2015, international units are not eligible for surrender in the NZ ETS.
Market Stability Provisions	**Transitional Measures:** Two measures were implemented in 2009 to help firms adjust to the carbon cost: **(1)** One-for-two surrender obligation for non-forestry sectors (one allowance could be surrendered for every two tonnes of emissions); **(2)** A NZD 25 (USD 17.30) fixed price option, which acts as a price ceiling. After the second NZ ETS review, the one-for-two measure was phased out and entities have faced full surrender obligations since 1 January 2019. **Reserve:** The fixed price option will remain until it is replaced with a CCR incorporated into the auctioning mechanism. Allowances from the CCR will be auctioned if a predetermined trigger price is reached. The price trigger and reserve quantity are still to be determined. Any allowances released from the reserve will be backed by an equivalent tonne of removals.

Compliance

Compliance Period	One year*

	*Participants registered for post-1989 forestry have mandatory five-year compliance periods (with the option to report emissions annually).
Monitoring, Reporting, Verification (MRV)	**REPORTING FREQUENCY:** Most sectors are required to report annually. **VERIFICATION:** Self-reporting supplemented by a program of second- and third-party audits run by the regulator. Participants must seek third party verification if they apply for the use of a unique emissions factor.
Enforcement	An entity that fails to surrender emissions units when required to must surrender the units and pay a penalty of NZD 30 for each unit (USD 20.76) that was not surrendered by the due date. In certain circumstances the penalty may be reduced. Entities can be fined up to NZD 24,000 (USD 16,607) on conviction for failure to collect emissions data or other required information, calculate emissions and/or removals, keep records, register as a participant, submit an emissions return when required, or notify the administering agency or provide information when required to do so. Entities can also be fined up to NZD 50,000 (USD 34,598) on conviction for knowingly altering, falsifying, or providing incomplete or misleading information about any obligations under the scheme, including emissions return. This penalty and/or imprisonment of up to five years also apply to entities that deliberately lie about obligations under the NZ ETS to gain financial benefit or avoid financial loss. A new "infringement offence regime" is expected to be established from 2020 for minor offences. Infringement offences will result in financial penalties for offenders but not convictions.

Linking

Links with other Systems	Until 1 June 2015, the NZ ETS was indirectly linked to other systems (e.g., the EU ETS) via the international Kyoto Protocol Flexible Mechanisms. Since then, the NZ ETS has been a domestic-only system. The current reforms will make the NZ ETS more similar to ETSs in other countries, which will make it more compatible for international linking in the future.

Other Information

Institutions involved	Ministry for the Environment; Environmental Protection Authority; Ministry for Primary Industries; New Zealand Customs Service; New Zealand Transport Agency
Evaluation / ETS review	The 'Climate Change Response Act 2002' includes provisions statutory independent reviews of the operation and effectiveness of the NZ ETS every five years. The first review took place in 2011-2012, and the second review took place in 2015-2017. Public consultation on proposed amendments to the 'Climate Change Response Act' following the second review was undertaken in 2018 in order to support implementing proposed changes.
Revenue	No information available yet.
Implementing Legislation	Climate Change Response Act 2002 - Part 4 'New Zealand greenhouse gas emissions trading scheme'

Swiss ETS

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Switzerland 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 ETS applies to industrial entities, largely comprising companies from the cement, chemicals, pharmaceuticals, paper, refinery, or steel sectors. It now covers about 11% of the country's total GHG emissions. In the 2013-2020 mandatory phase, participants in the ETS are exempt from the CO2 levy.
Year in Review	In October 2018, the Swiss parliamentary Environment Commission of the National Council voted in favor of the agreement between the EU and Switzerland signed on November 2017 to link their ETSs. In December 2018 the National Council of the Swiss Parliament voted in favor of linking both systems. Following approval by the Swiss Council of States (expected early 2019) and, when all criteria within the agreement are met (for this, amendments to Swiss legislation are necessary), following ratification of the agreement by both the EU and Switzerland the link could become operational as of 1 January 2020. An optional referendum in Switzerland on the linking of the Swiss and EU ETS might delay the ratification process.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 48.29 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excl. transport) — 22.34 Transport — 15.15 Industrial processes — 4.09 Agriculture — 5.96 Others (incl. waste and solvent) — 0.76
Overall GHG reduction target	**BY 2020:** At least 20% reduction from 1990 GHG levels (unconditional, domestic target) **By 2025:** 35% reduction from 1990 GHG levels (NDC) **BY 2030:** 50% reduction from 1990 GHG levels (NDC) **BY 2050:** 70-85% reduction from 1990 GHG levels (aspirational)
Carbon Price	*Current Allowance Price (per t/CO2e):* CHF 6.58/tCO2e (USD 6.73) (average auction price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.11
GHG 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 only required for CO2, NO2, and PFCs, since there are no adequate approaches to monitor the other gases and since their share is negligible.)

Sectors covered and thresholds	**MANDATORY PARTICIPATION:** Industries listed under Annex 6 of the revised CO2 Ordinance (25 subsectors) must participate in the Swiss ETS. This includes companies from the cement, chemicals and pharmaceuticals, refineries, paper, district heating, steel, and other sectors. **INCLUSION THRESHOLDS:** Facilities pertaining to the sectors included in Annex 6 that have a total rated thermal input of >20MW. **POSSIBLE VOLUNTARY OPT-IN:** Industries a) listed under Annex 7 of the revised CO2 Ordinance (21 sub-sectors) and b) with a total rated thermal input of >10MW. A company that newly fulfils the participation conditions must submit the application no later than six months from the date of fulfilment. **POSSIBLE OPT-OUT:** Industries with a total rated thermal input of >20MW, but yearly emissions <25,000 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. **DOMESTIC AVIATION:** Coverage of domestic aviation (domestic flights within Switzerland or flights from Switzerland to member states of the European Economic Area) is a requirement of the linking agreement between Switzerland and the EU. In July 2017, to prepare for the inclusion of aviation in the Swiss ETS, Switzerland introduced the legislation for mandatory reporting of tonne-kilometer data for aircraft operators that are likely to fall within the scope of the Swiss ETS, when linked with the EU ETS. Aircraft operators submitted their monitoring plans and mandatory reporting began in January 2018. Verified monitoring reports containing tonne-kilometer data must be submitted by 31 March 2019.
Point of regulation	Downstream
Number of liable entities	54 (2017) No information available yet.
Cap	The absolute cap is set at the installation level. **VOLUNTARY PHASE (2008-2012):** Each participant received its own entity-specific reduction target. **MANDATORY PHASE (2013-2020):** Overall cap of 5.63 MtCO2e (2013), to be reduced annually by a constant linear reduction factor (currently 1.74% of 2010 emissions), to 4.9 MtCO2e in 2020. The 2019 cap amounts to 5.01 MtCO2e.

Phases & Allocation

Trading period	**VOLUNTARY PHASE:** 2008 - 2012 **MANDATORY PHASE:** 2013 - 2020
Allocation	**VOLUNTARY PHASE (2008-2012):** **Free Allocation:** Each participant was granted free allocation of allowances covering emissions up to their own entity-specific emissions target. **MANDATORY PHASE (2013-2020):** **Free allocation:** Free allocation is based on industry benchmarks using a similar methodology to the EU ETS. Free allocation for sectors not exposed to the risk of carbon leakage will be phased out gradually: in 2013, such entities received 80% free allocation whereas in 2020 the share of free allocation will be reduced to 30%. An overarching correction factor is applied given the benchmarked allocation exceeds the overall emissions cap. **Auctioning:** Allowances that are not allocated for free are auctioned. Auctions take place two or three times a year, depending on available auction volumes.

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

Flexibility

Banking and borrowing	Banking within and across phases is allowed without limits. Valid certificates (CERs, ERUs) from the 2008-2012 phase could be banked into the mandatory phase and surrendered until April 2015. Certificates from the 2008-2012 phase that were not requested to be carried over within the deadline have been canceled. Borrowing is not allowed.
Offsets and credits	**QUALITATIVE LIMIT:** Only international offsets are allowed. Exclusion criteria are listed in Annex 2 of the revised 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.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	One year (1 January to 31 December). Covered entities have until April 30 of the following year to surrender allowances.
Monitoring, Reporting, Verification (MRV)	Monitoring plans are required for every installation (approved by a competent authority) no later than three months after the registration deadline. **REPORTING FREQUENCY:** Annual monitoring report, based on self-reported information (by 31 March). **VERIFICATION:** The Federal Office for the Environment may order third-party verification of the monitoring reports.
Enforcement	The penalty for failing to surrender sufficient allowances is set at CHF 125/tCO2 (USD 127.82/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 has concluded negotiations with the EU on linking the Swiss ETS to the EU ETS and is waiting for approval of the agreement by the Swiss Parliament in 2019. The link will become operational on 1 January the year following ratification of the linking agreement.

Other Information

Institutions involved	The Federal Office of the Environment

Evaluation / ETS review	The Federal Act on the Reduction of 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.
Revenue	Since beginning of programme: CHF 26.20 million (USD 26.79 million) Collected in 2018: CHF 4.41 million (USD 4.51 million) Revenues from auctioning allowances are fed into the federal government budget.
Implementing Legislation	Federal Act on the Reduction of CO2 Emissions (CO2 Act) Ordinance on the Reduction of CO2 Emissions (CO2 Ordinance)

USA - California Cap-and-Trade Program

General Information

Summary	**Status:** ETS in force **Jurisdictions:** California Initiated in 2012, the California Cap-and-Trade Program began its compliance obligation in January 2013. California has been part of the Western Climate Initiative since 2007 and formally linked its system with Québec's in January 2014 and with Ontario's in January 2018 (until the latter's termination in mid-2018). The California program covers sources responsible for approximately 80% of the state's GHG emissions. In 2017, legislation (Assembly Bill [AB] 398) was passed to provide direction on the cap-and-trade system post-2020 to help achieve California's climate goals.
Year in Review	In 2018, two major developments took place: **(1)** A set of reforms for the post-2020 period was approved by the California Air Resources Board (CARB) in December 2018, and is scheduled to come into force in April 2019. **(2)** Ontario's cap-and-trade program, to which California and Québec had been linked since January 2018, was terminated. The termination was addressed through measures that shielded the California and Québec programs from negative effects.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 429.4 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Electricity Generation (In State) — 42.67 Electricity Generation (Imports) — 26.28 Transportation — 174.01 Industrial — 100.37 Commercial — 23.04 Residential — 28.34 Agriculture & Forestry — 33.84 Not Specified — 0.79
Overall GHG reduction target	**By 2020:** Return to 1990 GHG levels **By 2030:** 40% reduction from 1990 GHG levels **By 2050:** 80% reduction from 1990 GHG levels
Carbon Price	*Current Allowance Price (per t/CO2e):* USD 14.91 (unweighted average auction price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.80
GHG covered	CO2, CH4, N2O, SF6, HFCs, PFCs, NF3, and other fluorinated GHGs.
Sectors covered and thresholds	**FIRST COMPLIANCE PERIOD (2013-2014):** Covered sectors include those which have one or more of the following processes or operations: large industrial facilities (including cement, glass, hydrogen, iron and steel,

	lead, lime manufacturing, nitric acid, petroleum and natural gas systems, petroleum refining, pulp and paper manufacturing, including cogeneration facilities co-owned/ operated at any of these facilities), electricity generation, electricity imports, other stationary combustion, and CO2 suppliers. **SECOND COMPLIANCE PERIOD (2015-2017) AND BEYOND:** In addition to the sectors listed above, suppliers of natural gas, suppliers of reformulated blendstock for oxygenate blending and distillate fuel oil, suppliers of liquid petroleum gas in California, and suppliers of liquefied natural gas. **INCLUSION THRESHOLDS:** Facilities ≥25,000 tCO2e/data year.
Point of regulation	Mixed
Number of liable entities	~500 entities (2015-2017) No information available yet.
Cap	The caps listed below are in MtCO2e. The cap decline factor is about 3.3% between 2018 and 2019 and is rising to an average of over 4.1% in the 2021-2030 period. **FIRST COMPLIANCE PERIOD (2013-2014): 2013**: 162.8; **2014**: 159.7 **SECOND COMPLIANCE PERIOD (2015-2017): 2015**: 394.5; **2016**: 382.4; **2017**: 370.4 **THIRD COMPLIANCE PERIOD (2018-2020): 2018**: 358.3; **2019**: 346.3; **2020**: 334.2 **FROM 2021 to 2031**, every compliance period will be three years. The annual caps are: **2021**: 320.8; **2022**: 307.5; **2023**: 294.1; **2024**: 280.7; **2025**: 267.4; **2026**: 254.0; **2027**: 240.6; **2028**: 227.3; **2029**: 213.9; **2030**: 200.5; **2031**: 193.8

Phases & Allocation

Trading period	The California Cap-and-Trade Program is structured around compliance periods (see “Compliance” below). A cap trajectory until 2030 has been set (see “Cap” above). Allowances are allocated and auctioned with calendar year vintages. Some allowances from future vintages are offered at each auction and may be traded but not used for compliance until the compliance date for the vintage year.
Allocation	Allowances are distributed via auction and/or free allocation. **Free Allocation:** *Industrial facilities:* Facilities receive free allowances for transition assistance and to prevent leakage. The amount is determined by specific benchmarks, production volumes, general cap adjustment factor, and an assistance factor based on assessment of leakage risk. Leakage risk is measured through emissions intensity and trade exposure and used to define assistance factors until 2018. From 2018, assistance factors are set at 100% for all sectors receiving free allocation. For the post-2020 period, AB 398 specifies an assistance factor of 100%, meaning there will be no differentiation based on leakage risk for sectors receiving free allocation. Recent regulatory changes also set third compliance period assistance factors to 100% for all sectors. There is no cap on the total amount of industrial allocation. Free allocation is provided for transition assistance to public wholesale water entities, legacy contract generators, universities, and public service facilities. **Consignment:** *Electrical distribution utilities and natural gas suppliers:* Utilities receive allowances on behalf of their ratepayers. All natural gas and electrical utilities must use the allowance value for ratepayer benefit and for emissions reductions.

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

Flexibility

Banking and borrowing	Banking is allowed, but the emitter is subject to a general holding limit. Borrowing of future vintage allowances is not allowed.
Offsets and credits	**QUANTITATIVE LIMIT:** Up to 8% of each entity's compliance obligation. **QUALITATIVE LIMIT:** Currently, six domestic offset types are accepted as compliance units originating from projects carried out according to six "protocols": **(1)** US forest projects; **(2)** Urban forest projects; **(3)** Livestock projects (methane management); **(4)** Ozone depleting substances projects; **(5)** Mine methane capture (MMC) projects; and **(6)** Rice cultivation projects. **FROM 2021:** AB 398 lays out two significant changes to the offset program from 2021 onwards: **(1)** The share of offsets that can be used to fulfillthe compliance obligation will reduce to 4% between 2021-2025 and will remain at 6% thereafter. **(2)** At least half of the offset usage limits post-2020 would need to result in direct environmental benefits (DEBS) in the State of California. The DEBS requirement is operationalized through a performance standard, which defines DEBS eligibility by offset activity type. Offset projects implemented outside of California may still result in DEBS based on scientific evidence and project data provided. For example, afforestation projects outside California could also provide benefits within California by improving the quality of waters flowing through the state. Recent regulatory amendments specify the exact criteria that will be used for determining DEBS.
Market Stability Provisions	**Auction Reserve Price:** USD 15.62 per allowance in 2019. The auction reserve price increases annually by 5% plus inflation, as measured by the Consumer Price Index. **Reserve:** An Allowance Price Containment Reserve allocates allowances from various budgets (1% from budget years 2013-2014; 4% from budget years 2015-2017; and 7% from budget years 2018-2020). AB 398 requires two-thirds of the reserve allowances that remain on 31 December 2017 to be used to populate the two price containment points starting in 2021. The reserve sale administrator can sell accumulated allowances on a regular basis in three equal price tiers. For 2019, these prices are USD 58.34, 65.65, and 72.93. Tier prices increase by 5% plus inflation (as measured by the Consumer Price Index). Through 2020, if all the allowances in the reserve are sold, allowances from future years are transferred to the reserve and made available for sale. **Price Containment Points:** AB 398 reforms the price management provisions starting in 2021: two price containment points triggered at increasing price levels will be filled with remaining APCR allowances. A third price level will be a price ceiling. At this level, allowances (or if no allowances remain, price ceiling units) can be bought in unlimited quantities, with the revenues having to be invested in real, permanent, quantifiable, verifiable, enforceable, and additional emissions reductions on at least a metric tonne for metric tonne basis. In 2021, the two cost containment reserve trigger points and the price ceiling will be set at USD 41.40, 53.20, and 65.00, respectively.

Compliance

Compliance Period	Between two and three years. All allowances for emissions from the whole compliance period must be surrendered by 1 November (or the first business day thereafter) of the year following the last year of a compliance period. A share of allowances (usually about 30% of last year's emissions) must be surrendered annually. **FIRST COMPLIANCE PERIOD:** 2013-2014 **SECOND COMPLIANCE PERIOD:** 2015-2017 **THIRD COMPLIANCE PERIOD:** 2018-2020 **FOURTH COMPLIANCE PERIOD:** starts on 1 January 2021 and ends on 31 December 2023, and each subsequent compliance period will be three years long.
Monitoring, Reporting, Verification (MRV)	**REPORTING FREQUENCY:** One year **VERIFICATION:** Emission data reports and their underlying data require independent third-party verification annually for all entities covered by the program (generally defined as entities with emissions that equal to or exceed 25,000 tCO2e per year). **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	Penalties may be assessed pursuant to 'Health and Safety Code Section 38580' (misdemeanor, fines, and possibly imprisonment). There are separate and substantial penalties for mis- or non-reporting under the 'Mandatory Greenhouse Gas Reporting Regulation.'

Linking

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

Other Information

Institutions involved	California Air Resources Board (CARB)
Evaluation / ETS review	Pursuant to requirements in existing legislation (AB 32, AB 197, and AB 398), CARB must update the California Climate Change Scoping Plan at least every five years and must provide annual reports to various committees of the legislature and the board. These updates and reports provide opportunities for future review of the cap-and-trade Program's progress in meeting the 2030 target.
Revenue	Since beginning of program: USD 9.47 billion Collected in 2018: USD 3.02 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) AB 398 Current regulation can be found on the CARB website

USA - Massachusetts Limits on Emissions from Electricity Generators

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Massachusetts The Massachusetts system started operation in 2018 and covers the power sector. It complements RGGI to help ensure that Massachusetts achieves its mandatory mitigation targets. In 2016, a ruling by the Massachusetts Supreme Court established that the government would need to take additional action to guarantee it meets the state's climate targets–a 25% reduction in 2020 and an 80% reduction by 2050 (compared to 1990). The regulation establishing this system is in response to this ruling. The Massachusetts Limits on Emissions from Electricity Generators system exists in parallel to, but does not directly interact with, RGGI.
Year in Review	2018 saw the preparation of the auctioning of allowances. 25% of the allowances are to be distributed via auctions in 2019, increasing to full auctioning by 2021. The first auction of vintage 2019 allowances occurred in December 2018. Auction results are included in market monitoring reports posted on the program web page.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 76.3 $MtC0_2e$ (2015)
Overall GHG emissions by sector	Sector Name — MtCO2e Transportation — 29.7 Electricity — 15.6 Residential — 13.7 Commercial — 7.6 Industry — 7.9 Other — 1.9
Overall GHG reduction target	**BY 2020:** 25% reduction compared to 1990 **BY 2050:** 80% reduction compared to 1990
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	0.2
GHG covered	CO2
Sectors covered and thresholds	Large electricity generators subject to RGGI (>= 25 MWe).
Point of regulation	Downstream
Number of liable entities	21 (2018) No information available yet.
Cap	8.74 MtCO2e (2019)

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

Phases & Allocation

Trading period	The system has an annual compliance deadline of 1 March for the prior year's emissions. A linear cap trajectory until 2050 has already been set (see "Cap").
Allocation	**Auctioning:** From 2019 onwards, allowances are partially auctioned, with 25% auctioned in 2019, 50% in 2020, and 100% from 2021 onwards. One to four auctions will be held each year. The first auction took place in December 2018. **Free Allocation:** 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.
Offsets and credits	No information available yet.
Market Stability Provisions	**Auction reserve price:** The first auction of 2019 allowances had a reserve price of USD 0.50 per allowance. Future reserve prices are not yet known.

Compliance

Compliance Period	One year
Monitoring, Reporting, Verification (MRV)	**REPORTING FREQUENCY:** Regulated entities are required to submit emission reports (by 1 February) and compliance certification reports (by 1 March) indicating emissions and the holding of sufficient allowances, respectively. **VERIFICATION:** Emissions must match reports to RGGI and US EPA. Documents (i.e., emissions reports and compliance certification reports) must be certified by a designated representative identified by the facility, and MassDEP may choose to conduct audits.
Enforcement	If the MassDEP establishes that an entity is in violation of compliance, this will be presumed to constitute "a significant impact to public health, welfare, safety or the environment." In addition to penalties, the regulated entity has to submit three allowances for each tonne of noncompliance.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	The Executive Office of Energy and Environmental Affairs; Massachusetts Department of Environmental Protection (MassDEP)
Evaluation / ETS review	The first program review will be in 2021, with a review every 10 years thereafter.
Revenue	No information available yet. Auction proceeds will be paid to a segregated account and shall be used to further reduce GHG emissions.
Implementing Legislation	Electricity Generator Emissions Limits (310 CMR 7.74)

USA - Regional Greenhouse Gas Initiative (RGGI)

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, Vermont RGGI is the first mandatory GHG ETS in the United States, based on a 2005 agreement by the governors of the original signatory states (Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont) and originally outlined in the RGGI Memorandum of Understanding (MoU). In August 2006, RGGI states published a model rule, which provided a regulatory framework for the development of individual state regulatory/ statutory proposals. The system started operating in 2009 with 10 states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont), each having promulgated its own regulations covering CO2 emissions from the power sector. New Jersey withdrew from the program at the end of the first control period, December 2011. As foreseen by the MoU, a RGGI program review was conducted in 2012. According to the program review, each of the states updated their regulations so that a tighter cap and other program changes went into force on 1 January 2014. RGGI concluded its second program review in 2017 and a new model rule has been prepared. According to the rule, between 2021 and 2030 the cap will reduce by 30% compared to 2020. Furthermore, an emissions containment reserve (ECR) will be established to achieve greater emission reductions if the cost is lower than anticipated.
Year in Review	After the finalization of the 2017 Model Rule, the proposed post-2020 cap-and-trade regulations must be adopted by each RGGI state according to its own regulatory processes. The majority of the RGGI states have adopted the 2017 Model Rule, while the remaining states are on track to do so within early 2019. New Jersey is in the process of rejoining RGGI and is expected to have final legislation in place to officially reenter the RGGI program by the beginning of 2020 (see factsheet on New Jersey). Also, Virginia is in the process of establishing an ETS and linking it to the RGGI program (see factsheet on Virginia). The state started regulatory processes in 2018 and will presumably start entering the RGGI allowance market by 2020.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 462.94 $MtC0_2e$ (2014)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 397.5 Industrial Processes — 25.6 Agriculture — 9.8 Waste — 30 Bunker Fuels — 0.1
Overall GHG reduction target	**BY 2020:** RGGI states have committed to a regional cap of more than 50% reduction of CO2 emissions from electricity generation from 2005 CO2 emissions **BY 2030:** States propose to implement a reduction of 30% compared to the 2020 CO2 emissions cap, with a constant reduction of 2.275 million short tons/year between 2021 and 2030

	Note: The participating states have their own emission targets; economy-wide targets are not defined at the level of RGGI
Carbon Price	*Current Allowance Price (per t/CO2e):* USD 4.87 per tCO2e / USD 4.415 per short ton CO2e (average auctioning price in 2018; updated prices available here)

ETS Size

Emissions covered by the ETS	0.18
GHG covered	CO2
Sectors covered and thresholds	Fossil Fuel Electric Generating Units **INCLUSION THRESHOLDS**: Capacity equal to or greater than 25 MW.
Point of regulation	Downstream (at installation level)
Number of liable entities	165 entities (January 2019) No information available yet.
Cap	The cap was initially set at 165 million short tons CO2 per year in the 2009-2014 period, with a 2.5% annual reduction factor from 2015 through 2018, totaling a 10% reduction between 2015 and 2018. However, by 2012, emissions under RGGI were more than 40% below the cap. The states thus tightened the cap to 91 million short tons in 2014. The revised regulations extended the 2.5% annual reduction factor through 2020, with a 2020 cap of approximately 78 million short tons. Following the most recent program review, the proposed reduction factor between 2021 and 2030 is about 3% of the 2020 cap, resulting in a 2030 regional cap of about 55 million short tons.

Phases & Allocation

Trading period	RGGI is structured around "control" (or compliance) periods. A cap trajectory until 2030 has been set (see "Cap" above). **FIRST CONTROL PERIOD:** 2009-2011 **SECOND CONTROL PERIOD:** 2012-2014 **THIRD CONTROL PERIOD:** 2015-2017* **FOURTH CONTROL PERIOD**: 2018-2020* *RGGI introduced an interim control period with the 2014 revisions. An affected source must cover 50% of its emissions with allowances in each of the first two years of a control period. The affected source must cover 100% of the remaining emissions at the end of the three-year control period.
Allocation	**Auctioning:** CO2 allowances issued by each RGGI state are distributed through quarterly, regional CO2 allowance auctions using a "single-round, sealed-bid uniform-price" format. Auctions are open to all parties with financial security, with a maximum bid of 25% of auctioned allowances per quarterly auction.

Flexibility

Banking and borrowing	Banking of allowances is allowed without restrictions, but regulations include adjustments to the cap to address the aggregate bank by reducing the amount of allowances available

	for auctions in future years by the amount of allowances not used for compliance in previous control periods. Borrowing is not allowed.
Offsets and credits	**QUANTITATIVE LIMIT:** 3.3% of an entity's liability may be covered with offsets. This percentage share will remain equal between 2021 and 2030 according to the Model Rule. **QUALITATIVE LIMIT**: Currently the program allows offset allowances from five offset types located in RGGI states: **(1)** Landfill methane capture and destruction; **(2)** Sequestration of carbon due to reforestation, improved forest management, or avoided conversion; **(3)** Avoidance of methane emissions from agricultural manure management operations; **(4)** Reduction or avoidance of 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 has been approved under RGGI.
Market Stability Provisions	**Auction Price Floor:** USD 2.20 per short ton in 2018, increasing by 2.5% per year (to reflect inflation). **Reserves:** As of 2014, RGGI states created a cost containment reserve (CCR), where allowances are released to the market when certain trigger prices are reached. Trigger prices: USD 10 in 2017. Between 2018 and 2020, the CCR trigger price will increase annually by 2.5%. In 2021, under the model rule, the trigger price will be set at USD 13 and will increase by 7% compared to the previous year thereafter. In addition, the model rule envisages the establishment of an ECR by 2021: Allowances would be withheld from circulation (from auction) to secure emissions reductions if the emission reduction costs are lower than projected. In 2021, this trigger price will be set at USD 6, increasing by 7% compared to the previous year thereafter.

Compliance

Compliance Period	Three years (see “Phases and Allocation” above)
Monitoring, Reporting, Verification (MRV)	**REPORTING FREQUENCY:** Compliance is evaluated at the end of each three-year control period. The RGGI program is currently in its fourth three-year control period (2018-2020). **FRAMEWORK:** Emissions data for emitters are recorded in the United States Environmental Protection Agency's (US EPA) Clean Air Markets Division database in accordance with state CO2 Budget Trading Program regulations and US EPA regulations. Provisions are based on the US EPA monitoring provisions. Data are then automatically transferred to the electronic platform of the RGGI CO2 Allowance Tracking System, which is publicly available.
Enforcement	Penalties for non-compliance are set by each state; in case of excess emissions, compliance allowances for three times the amount of excess emissions have to be surrendered in future periods.

Linking

Links with other Systems	Virginia and New Jersey plan to join the RGGI allowance market by 2020.

Other Information

Institutions involved	Each RGGI state has its own statutory and/or regulatory authority; RGGI Inc. (non-profit cooperative supporting RGGI's development and implementation)
Evaluation / ETS review	The RGGI participating states periodically review the ETS program in order to consider program successes, impacts, and design elements. The first program review process (known as the 2012 Program Review) was completed in early 2013. A second review process was completed in 2017, resulting in the 2017 Model Rule. Program reviews were accompanied by stakeholder meetings to facilitate stakeholder engagement and the submission of comments from interested parties.
Revenue	**Since beginning of program**: USD 3.08 billion **Collected in 2018:** USD 239.36 million Revenues are collected from the quarterly auctions. They are returned to the RGGI states and have been primarily invested in consumer benefit programs: energy efficiency, renewable energy, direct energy bill assistance, and other greenhouse gas reduction programs.
Implementing Legislation	2017 RGGI Model Rule 2017 RGGI Model Rule Updates (Summary) RGGI States' Statutes & Regulations RGGI Program design

China National ETS

General Information

Summary	**Status:** ETS implementation scheduled **Jurisdictions:** China Building on its experience of successfully piloting carbon markets in seven regions, China launched its national ETS politically in December 2017. This launch has been a goal set in 2015 at China's highest political level, which was reaffirmed by its Nationally Determined Contribution under the Paris Agreement, and the "13th Five-Year Work Plan for Greenhouse Gas Emission Control." The provisions for the launch and incremental development of the ETS are laid out in the 'Work Plan for Construction of the National Emissions Trading System (Power Sector)' (the "Work Plan"), approved by the State Council in late 2017. The ETS' objective is to contribute to the effective control and gradual reduction of carbon emissions in China and the achievement of green and low carbon development. The ETS is expected to regulate ~1,700 companies from the power sector (including combined heat and power, as well as captive power plants of other sectors), which emit more than 26,000 tonnes GHG or consume more than 10,000 tce per year. The Chinese system would cover more than three billion tonnes of 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 (roughly one year); · **Second Phase:** foresees simulation trading (roughly another year); and · **Third Phase:** will be the deepening and expanding phase with allowances spot trading for compliance purposes (roughly starting from 2020). A gradual transition of the Chinese pilots is foreseen by the Work Plan. In the short term, the existing ETS pilots are expected to operate in parallel to the national market, covering the non-power sectors. Over the medium to long term, they are expected to be integrated into the national market once it is fully operational.
Year in Review	In March 2018, the National People's Congress of China approved the plan to restructure the State Council, including the establishment of a new Ministry of Ecology and Environment (MEE) to replace the Ministry of Environmental Protection. In addition to environmental governance, the new ministry absorbs the climate change responsibilities previously under the National Development and Reform Commission (NDRC) and takes charge of the development of the national ETS. In 2018, the government continued to advance the work on reporting and verification of the 2016-2017 emissions data from eight emission-intensive sectors of the economy. In terms of infrastructure, 2018 also saw the establishment of plans for a national registry and a trading system, as well as the development of a national enterprise GHG direct reporting system. Progress was also achieved in the technical preparation of the power sector with the establishment of a working group to: conduct research on the power industry participation in the national ETS, draft the refined allocation plan for the power sector and carbon market operation test plan, and compile training materials and technical guides on emissions trading. Work was also conducted on ETS design, including through consultation meetings and workshops, as well as through studies on the design of ETS elements such as allowance allocation and risk management.

	Looking to the future, the main tasks of national ETS development are: establishing and improving national ETS regulations, accelerating the development of market infrastructure, promoting reporting, carrying out verification and carbon management for key enterprises, and strengthening capacity-building activities. The simulation trading in the power sector is expected to start in the first half of 2019.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 10976 $MtC0_2e$ (2012)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excluding Transport) — 7,946.9 Industrial Processes — 1,296.6 Agriculture — 831.6 Transportation — 702.9 Waste — 197.6
Overall GHG reduction target	**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)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	0.30
GHG covered	CO2
Sectors covered and thresholds	Power sector (including combined heat and power, as well as captive power plants of other sectors). The scope is expected to be gradually expanded to finally cover a total of eight sectors including: petrochemical, chemical, building materials, steel, nonferrous metals, paper, and domestic aviation. There is no specific timeline for this expansion. **INCLUSION THRESHOLDS:** Entities with annual emissions of ~26,000 t/CO2 (energy consumption of more than 10,000 tce) in any year over the period 2013-2015.
Point of regulation	Downstream. In the long run, both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are expected to be included.
Number of liable entities	~1,700 No information available yet.
Cap	~3,300 MtCO2e/year

Phases & Allocation

Trading period	**First Phase (~a year as of 2018):** Development of market infrastructures **Second Phase (~another year as of 2019):** Simulation trading

	Third Phase (~from 2020 on): Expanding sectoral coverage and deepening and expanding
Allocation	The ETS competent authority will develop detailed allocation rules in cooperation with energy sector authorities. **Free Allocation:** Free allocation is expected to be based on subsector benchmarks with ex-post adjustments for changes in actual production. In 2017, draft allocation plans for power, cement, and electrolytic aluminum were developed and trial allocation work was carried out in two provinces. Further sector-based trial allocation is expected to be carried out in the first half of 2019 in order to refine and finalize the benchmarks.

Flexibility

Banking and borrowing	Expected to allow banking across compliance phases, but not to allow borrowing.
Offsets and credits	The use of China Certified Emissions Reduction (CCER) credits is expected to be allowed during the third phase. In 2012, the NDRC issued the 'Interim Measures for the Management of Voluntary GHG Emission Reduction Transactions' (the "Interim Measures"). These measures include guidelines for the issuance of CCERs. The acceptance of CCERs is expected to be regulated through a revision of the Interim Measures and through the development of an 'Administration Measure of Offset Scheme for National ETS' (upcoming) focusing on the quality and limits on the use of CCERs in the ETS. Specific timelines and detailed rules are yet to be published.
Market Stability Provisions	Adjustment mechanisms to prevent abnormal price fluctuations, as well as risk prevention and control mechanism to prevent market manipulations are to be developed.

Compliance

Compliance Period	One year
Monitoring, Reporting, Verification (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*, although details are yet to be developed. *The national credibility information sharing platform, developed in 2015, integrates credibility information provided by various departments and regions across the country. As

	of 2018, it has achieved interconnection with 44 ministries, 31 provinces and autonomous regions, and 65 market institutions.

Linking

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

Other Information

Institutions involved	The MEE, in cooperation with other relevant ministries, is responsible for policy design and rule-making for the national ETS. Local DRCs implement the policies and rules set up by the central level in their respective regions, but this is expected to be moved to local Ecology and Environment Bureaus, which are the corresponding government institutions of the MEE at the regional level, in the course of 2019.
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	Work Plan for Construction of the National Emissions Trading System (Power Sector) Notice on Key Works in Preparation for the Launch of the National ETS 24 Guidelines for GHG Monitoring and Reporting for various sectors (2013, 2014 and 2015) Interim Administrative Measures on Emissions Trading

Colombia

General Information

Summary	**Status:** ETS implementation scheduled **Jurisdictions:** Colombia In 2018, Colombia adopted a law for climate change management, which outlines provisions for the establishment of a National Program of Greenhouse Gas Tradable Emission Quotas (Programa Nacional de Cupos Transables de Emisión de Gases de Efecto Invernadero – PNCTE). Although there is no explicit reference to carbon markets or emissions trading, such a program is interpreted as providing for the establishment of a national ETS. The law outlines the basic provisions for the PNCTE. The number of quotas will be determined by the Ministry of Environment and Sustainable Development (Minambiente), in line with Colombia's national mitigation targets. Minambiente is also in charge of allocation, which will primarily take place via auctions. The PNCTE will complement other mitigation instruments, such as the country's existing USD 5 carbon tax that was adopted in 2016 and its offsetting program adopted in 2017. The law for the PNCTE states that the government may also recognize carbon tax payments as part of the compliance obligation of regulated entities. Noncompliance is to be punishable by a fine up to two times the auction price. Auction revenues will be directed to the National Environmental Fund. The bill also includes crediting provisions: voluntary actions of non-regulated entities that generate GHG emissions reductions or removals could be issued quotas if they are verified, certified, registered in the National Registry, and eligible for the program. Further regulations are yet to be developed in order to operationalize the PNCTE. The timeline for this is not yet specified.
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 214.3 $MtC0_2e$ (2014)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 82.5 Industry — 10.5 Agriculture, Forestry, and Other Land Use (net) — 106.9 Waste — 14.4
Overall GHG reduction target	**BY 2030:** Reduce GHG emissions by 20% compared to BAU emissions by 2030, or by 30% if international support is provided (NDC)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.

Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

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
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

Mexico

General Information

Summary	**Status:** ETS implementation scheduled **Jurisdictions:** Mexico Mexico's General Law on Climate Change Law (Ley General de Cambio Climatico – LGCC), as amended in July 2018, provides the framework for the establishment of an ETS in Mexico. The mandatory ETS is to be preceded by a pilot phase, which will run for three years. The Mexican government is currently working on the development of regulations for the pilot phase. A first draft regulation was released in late 2018. A final draft is under consideration within the government and should be published during the first half of 2019. It is expected that the pilot cover direct CO2 emissions from energy and industry. The latter could include, among others, the automotive, cement, chemicals, glass, steel, metallurgical, mining, and petrochemicals subsectors, as well as the pulp and paper subsector. Participation could be limited to entities with annual emissions greater than 100,000 tCO2, amounting to ~300 entities. In this configuration, the pilot would cover approximately 45% of national emissions. Allowances during the pilot phase are likely to be primarily distributed through grandparenting, based on historical emissions, sectorial goals, and the country's NDC. Auctions–which may be subject to price collars–may also apply to a small percentage of allowances. This could be complemented by reserves, e.g., for new entrants and to respond to price spikes. Offsets may be eligible for compliance under the pilot ETS, subject to quantitative limits. Offsets would likely be generated under a domestic program that is yet to be established. Participation in the pilot phase is likely mandatory, but without penalties for noncompliance. In October 2014, a mandatory reporting system (the National Emissions Register–RENE) was established for both direct and indirect GHG emissions for facilities with annual emissions above 25,000 tCO_2e. Emitters in the energy, industrial, transport, agricultural, waste, commercial, and services sectors are required to report the six GHGs identified by UNFCCC, as well as black carbon. Fossil fuel sales and imports (with the exemption of natural gas) have been subject to a USD 3.50 carbon tax since 2014. ETS regulations have also built on extensive consultation with and participation by the private sector and civil society. In addition to numerous public consultation fora, a national carbon market simulation took place between 2017 and 2018 to strengthen capacity and the readiness of Mexican businesses to participate in a future ETS. The simulation brought together more than 100 Mexican companies from numerous economic sectors, such as electric power, hydrocarbons, aviation, mining, forestry, consumer goods, and financial institutions, among many others. The companies represented two-thirds of Mexico's GHG emissions. The exercise had the objective of strengthening the capacity and readiness of Mexican businesses to participate in a future ETS. Mexico is also actively seeking to link its future ETS to markets in North America. To this end, in October 2015, Mexico signed a Memorandum of Understanding with Québec that includes cooperation on ETS. In August 2016, Mexico, Québec, and Ontario issued a joint declaration on carbon markets collaboration. Additionally, in December 2017, Mexico–together with four countries and seven subnational governments–issued the Paris Declaration on Carbon Pricing in the Americas for carbon pricing implementation, which creates a platform for cooperation among countries in the region.
Year in Review	No information available yet.

Overall GHG emissions (excluding LULUCF)	**Emissions:** 683 $MtC0_2e$ (2015)
Overall GHG emissions by sector	Sector Name: Energy, Industry, Agriculture, Waste MtCO2e: 480.9, 54.1, 102.1, 45.9
Overall GHG reduction target	**By 2030:** 22% reduction compared to BAU scenario and 36% conditional reduction, subject to a global mitigation agreement (NDC) **By 2050:** 50% reduction from 2000 GHG levels (Climate Change Law aspirational goal)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Ministry of Environment and Natural Resources; Ministry of Energy; Ministry of Finance
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

Ukraine

General Information

Summary	**Status:** ETS implementation scheduled **Jurisdictions:** Ukraine Ukraine plans to establish a national ETS in line with its obligations under the Ukraine-EU Association Agreement, which entered into force on 1 September 2017. Climate change related issues are addressed in Article 365 (c) Title V and Annex XXX to the agreement, which outlines steps for national ETS implementation, including: · Adopting national legislation and designating competent authority/ies; · Establishing a system for identifying relevant installations and identifying GHGs; · Developing a national allocation plan to distribute allowances; · Establishing a system for issuing GHG emissions permits and issue allowances to be traded domestically among installations in Ukraine; and · Establishing MRV and enforcement systems, as well as public consultations procedures. The country is developing the main elements of the national MRV system to provide a solid basis for the upcoming ETS. In autumn 2018, the Cabinet of Ministers approved a framework law on MRV, which is now under consideration in Parliament. Secondary legislation has also been drafted to establish the MRV system. To transpose other relevant EU directives and establish the ETS, the country plans to develop separate legislation based on at least three years of data from the MRV system. Ukraine is working on its MRV and ETS plans under the Ukraine-EU Association Agreement with the assistance of the PMR and the Deutsche Gesellschaft für Internationale Zusammenarbeit.
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 338.6 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excluding transport) — 193.59 Transport — 32.21 Industrial Processes, solvent and other product use — 58.00 Agriculture — 42.40 Waste — 12.40
Overall GHG reduction target	**BY 2020:** 20% voluntary reduction from 1990 GHG levels (Copenhagen Accord) **BY 2030:** GHG emissions will not exceed 60% of 1990 GHG levels, including LULUCF (NDC) **BY 2035:** 20% GHG emissions reduction from final energy consumption from 2010 levels (Energy Strategy 2035) **BY 2050:** GHG emissions from energy and industrial processes will not exceed 31-34% of 1990 GHG levels (aspirational target of the Low Emission Development Strategy 2050)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

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

Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

USA - New Jersey

General Information

Summary	**Status:** ETS implementation scheduled **Jurisdictions:** USA - New Jersey In January 2018, New Jersey's Governor directed the Department of Environmental Protection (DEP) and Board of Public Utilities (BPU) to take all necessary regulatory and administrative measures to ensure New Jersey's timely return to full participation in RGGI. After working with the other RGGI states to determine how best to re-engage in the program, New Jersey's CO2 Budget Trading Program rules were made consistent with the 2017 RGGI Model Rule. That proposal establishes New Jersey's initial emissions cap at 18 million short tonnes CO2e (16.3 MtCO2e) in 2020. The cap will decline by a set amount annually (2.5% in 2020 and then by 30% over the next 10 years through to 2030). The proposal also establishes the applicability of the RGGI program to those power plants providing 25 MW or more to the grid and commits the state to participation in RGGI's Emissions Containment Reserve (ECR) beginning in 2021 and in the Cost Containment Reserve (CCR). Simultaneously, New Jersey proposed the 'Global Warming Solutions Fund Rule' which would establish a framework, guidelines, and priority ranking system that the DEP, Economic Development Authority, and BPU will use to select eligible programs and projects to receive RGGI auction proceeds. To maximize coordination and avoid overlap between the uses of the auction proceeds, the proposal requires the three agencies to develop a multi-year strategic funding plan demonstrating that funds will advance one or more of six key objectives. Both proposals required a 60-day public comment period, which ended in February 2019. After reviewing and responding to comments, New Jersey expects to adopt both proposals by May 2019. The state anticipates participating in the first RGGI auction of 2020.
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 109 $MtC0_2e$ (2015)
Overall GHG emissions by sector	Sector Name — MtCO2e Electricity Generation — 17.7 Transportation — 45.8 Industrial — 5.1 Residential — 15.5 Commercial — 10.8 Highly Warming Gases (incl. Agriculture) — 7.9 Waste Management — 5.2
Overall GHG reduction target	**BY 2020:** GHG emissions equal to or below 1990 emissions **BY 2050:** GHG emissions equal to 80% below 2006 emissions
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

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

Other Information

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

Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

USA - Virginia

General Information

Summary	**Status:** ETS implementation scheduled **Jurisdictions:** USA - Virginia Virginia has been working on setting up an ETS since 2017. The 2017 Proposed 'Regulation for Emissions Trading' prepared by the state's Department of Environmental Quality (DEQ) and approved by the Virginia State Air Pollution Control Board proposed a system that would be in line with many of RGGI's major design features, with the aim to link with RGGI by 2020. A public comment period for the proposed carbon trading rule took place in 2018. US states participating in RGGI submitted comments to Virginia concerning the consistency of its proposed regulation with the RGGI states' 2017 Model Rule. According to the Model Rule, key design elements of the Virginia regulation would have to be harmonized with RGGI for a link to be established. In September 2018, the DEQ released a revised draft regulation taking into account the comments of the RGGI states. The updated proposal sets a cap of 28 million short tons CO2e (25.4 MtCO2e) in 2020, which would decline 3% per year to 19.6 million short tons CO2e (17.6 MtCO2e) in 2030. The revised regulation is consistent with RGGI on the issues of covering mixed fuels and retiring unsold conditional allowances. Entities will be allowed to surrender offsets issued from other jurisdictions. This revised proposal has been approved by the Virginia Air Pollution Control Board. A public comment period is due to take place in early 2019. If there are no further delays, Virginia's cap-and-trade regulation will be operational and linked to RGGI by 2020. Proposed Regulation for Emissions Trading (2017) Executive Directive 11 (2017) Report and Final Recommendations to the Governor (2017)
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 104.2 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name: MtCO2e Electric Power: 33.6 Transportation: 47.5 Industrial: 11.7 Residential: 5.7 Commercial: 5.8
Overall GHG reduction target	**BY 2025:** 30% reduction below BAU projection of GHG emissions
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.

Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

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
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

Brazil

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** 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. Brazil is currently assessing different carbon pricing instruments, including an ETS and a carbon tax. The Ministry of Economy is developing design options and conducting comprehensive economic and regulatory impact assessments for both instruments. This includes, among others, an analysis on potential interactions between carbon pricing instruments and existing policies. In addition, the Ministry of Economy has launched a strategy to strengthen the understanding of carbon pricing instruments among stakeholders through engagement, communication, and consultation. Currently, the Brazilian government is also working on the regulatory impact assessment of a national mandatory GHG emissions/removals registry with support from the German Development Agency, thus developing the fundamentals of a central building block for carbon pricing. RenovaBio, the National Policy for Biofuels, was approved in 2017 (Federal Law 13576), establishing mandatory goals for the reduction of GHG emissions by avoiding the use of fossil fuels. The policy provides for a trading mechanism for emissions reduction units generated from switching from fossil fuels to biofuels, relative to a 100% fossil fuel use scenario. Since 2013, a group of leading companies has been participating in a voluntary ETS simulation to gain experience and develop proposals for an emissions trading system in Brazil that can reduce national GHG emissions at the lowest possible cost. In 2018, 29 companies from diverse sectors of the Brazilian economy participated in this exercise. The ETS simulation is coordinated by the Centro de Estudos em Sustentabilidade da Fundação Getulio Vargas (FGVces). Trading takes place through the Rio de Janeiro Green Stock Exchange (BVRio).
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 1036 MtCO2e MtC0$_2$e (2015)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 449 Industrial processes — 95 Agriculture — 429 Waste — 63
Overall GHG reduction target	**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).
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

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

Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

Chile

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** Chile Since 2013, Chile has been conducting a series of studies on the design and implementation of carbon pricing instruments in the country. As a result, stationary emission sources over 50MW are now subject to a carbon tax–set at USD 5 per tCO2e–as well as to a tax on local pollutants (SO_2, NOx, and particulate matter). Current regulatory activities have focused on: **(1)** the further improvement of the carbon tax (a modification of the carbon tax was sent to Congress in August 2018 to change to an emissions-based threshold and include the use of offsets); and **(2)** the accompanying MRV system. However, Chile is also considering the possibility of establishing an ETS in the energy sector. An initial ETS design outline has already been developed under the PMR, and the country's MRV system has been designed to be ETS compatible. Technical work on a possible ETS continues within the government, with next steps yet to be determined.
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 111.7 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name: Energy; Agriculture; Industrial processes; Waste MtCO2e: 87.1; 11.8; 6.9; 5.8
Overall GHG reduction target	**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)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	The current MRV system serves primarily the implementation of the carbon tax. Operators of boilers and turbines of 50 MW or more of thermal capacity are required to monitor and report emissions through government-approved methodologies. **VERIFICATION:** Verification procedures are administered by the Superintendence of the Environment under the Ministry of Environment (no third-party verification is currently used). In the context of the Paris Agreement, the Ministry of Energy is working on the design and implementation of an MRV platform of mitigation actions in the energy sector, as a starting point to build a robust accounting framework under the agreement. This activity is being supported by the PMR, and it is in line with the national MRV platform that is being carried out by the Ministry of Environment.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Ministry of Energy; Ministry of the Environment; Ministry of Finance; Inter-Ministerial Committee on Climate Change; PMR Chile (Precio al carbono Chile)
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.

Implementing Legislation	No information available yet.

Indonesia

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** Indonesia Indonesia is considering market-based carbon pricing policy, including an ETS, for the power and industry sectors to help meet its NDC targets and foster low-carbon sustainable development. 'Act No. 32/2009 on Environmental Conservation and Management' provides a legal basis for environmental management and climate change policy in Indonesia. In 2017, Indonesia passed the 'Government Regulation on Environmental Economic Instruments' that provides a basis for ETS implementation; this regulation sets a mandate for an emissions and/or waste permit trading system to be implemented by 2024 (within seven years from its passage). Since early 2017, Indonesia has been developing the building blocks for a carbon market with the PMR, including a study outlining the emissions profiles and marginal abatement cost curves of the power and industry sectors. Work on the design and governance framework of an MRV system is near completion, with capacity building and stakeholder consultation ongoing. The MRV guidelines for the power sector were released in mid-2018. Following this, an online GHG reporting platform for electricity generators and a pilot MRV program for electricity generators in the Java-Madura-Bali grid (covering ~70% of Indonesia's electricity demand) were launched in late 2018. The Ministry of Industry has developed an online GHG emissions reporting system for industries in Indonesia. Pilot MRV programs in the industry sector are being conducted in the cement and fertilizer subsectors. Part of the ongoing PMR work is to develop a framework for market-based instruments (MBI) in Indonesia. A study completed in late 2018 examined and modeled four MBI options: an ETS for the power and industry sectors; energy efficiency certificates for industry; a cap-and-tax system; and a carbon offset mechanism. Based on the study, stakeholders are now being consulted about MBI implementation.
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 865 $MtC0_2e$ (2014)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excluding transport) — 461 Transport — 141 Agriculture — 113 Waste — 102 Industrial processes — 47
Overall GHG reduction target	**BY 2030:** 29% below BAU by 2030 incl. LULUCF (unconditional NDC); up to 41% below BAU by 2030 incl. LULUCF (NDC conditional on international support)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Coordinating Ministry for Economic Affairs; Ministry of Environment and Forestry; Ministry of Energy and Mineral Resources;

	Ministry of Industry; Ministry of Finance; National Development Planning Agency; PMR Indonesia Secretariat; UNDP Indonesia
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

Japan

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** 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 decarbonize the society. Based on that discussion, in March 2018 an expert committee on carbon pricing released a study assessing how carbon pricing could help Japan achieve long-term, substantial emissions reductions, as well as solve economic and social issues. In June 2018, a deliberative council—the "Subcommittee on Utilization of Carbon Pricing, Global Environmental Subcommittee, Central Environment Council"—was set up to consider how carbon pricing can encourage Japan to make the transition to a decarbonized society and to achieve economic growth. Both industry groups and academic experts participated in the council; discussions are still ongoing. In parallel, Japan operates the Advanced Technologies Promotion Subsidy Scheme with Emission Reduction Targets program, which functions as a voluntary cap-and-trade program. Entities establish a reduction target based on historical emissions and propose new technologies to implement in order to reach these targets. Japan is also implementing the Joint Crediting Mechanism, a bilateral offset crediting mechanism to incentivize low-carbon technologies in developing countries.
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 1306.7 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 1153.6 Industrial Processes & Product Use — 95.9 Agriculture — 33.5 Waste — 21.6 Indirect CO2 — 2.1
Overall GHG reduction target	**BY FY2020:** 3.8% below 2005 levels by 2020 **BY FY2030:** 26% reduction from FY2013 GHG levels (NDC) **BY FY2050:** 80% reduction (base year not stipulated)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.

Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Ministry of the Environment
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

Russia

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** The Russian Federation Russia is currently exploring policy options, including carbon pricing, to meet its GHG emissions reduction target of at least 25% below 1990 levels by 2020 and 25-30% below 1990 levels by 2030. In 2014, the Russian government adopted a plan for the development and implementation of emissions reductions activities. The plan includes the development and introduction of an MRV system at the company level, assessment of emissions reduction potentials, and the development of a mitigation concept and action plan which could potentially include emissions trading. Furthermore, a 2016 governmental order (N 2344-r) establishes a plan of measures to improve GHG regulation and prepare the ratification of the Paris Agreement. The Russian government has put in place legal elements to enable GHG monitoring at the company level. An MRV "Concept" was adopted in 2015, and methodological guidelines for corporate- and regional-level MRV were also adopted by the Ministry of Natural Resources and Ecology. At the end of 2018, a draft law—'On state regulation of GHG and on amendments to certain legislative acts of the Russian Federation'—was presented by the Ministry of the Economy. According to the timeline in the aforementioned order N 2344-r, the law is to be adopted by June 2019. According to the Concept on MRV, at the initial stage the target group for monitoring and reporting is "large industrial and energy organizations and companies with direct GHG emissions of more than 150,000 tCO2e/year, including organizations of aviation and railway transport, carrying out passenger and cargo transportation". The draft law includes provisions for economic instruments, around three main pillars: stimulating activities to reduce GHG emissions; developing market-based mechanisms for handling GHG reduction credits, e.g., from mitigation projects; and paying fees for GHG emissions that exceed established permits. The regulation of GHG emissions through emission permits could start from 2025, whereas the issuance of GHG reduction credits could begin in 2022. The draft law also establishes the legal terms and governmental competences for GHG regulation. An explanatory document that accompanies the proposed law explains that the MRV system, after four to five years, would provide the basis for further specification of system design features. Although not definite on precise instrument choice, the proposed instruments for consideration include elements typical of an emissions trading system. Ministry for Economic Development
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 2,644 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excluding Transport) — 1,919.00 Transport — 256.10 Industrial Processes, Solvent and Other Product Use — 218.50 Agriculture — 134.20 Waste — 115.80
Overall GHG reduction target	BY 2020: At least 25% reduction from 1990 GHG levels BY 2030: 70-75% reduction from 1990 GHG levels (INDC)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Ministry of Economic Development and Trade of the Russian Federation National carbon Sequestration Foundation Business group "Delovaya Rossiya"# (Business Russia)

Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

Taiwan, China

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** Taiwan In July 2015, Taiwan, China enacted the 'Greenhouse Gas Reduction and Management Act,' which legislates a 50% emissions reduction target for 2050 compared to 2005 GHG levels. The act also implements carbon reduction by setting regulatory goals in stages on a five-year basis. It further charges the Taiwanese Environmental Protection Administration (TEPA) with the development of appropriate climate change policies to reach this target. The government approved and implemented the 'National Climate Change Action Guideline' in February 2017. The guideline lays out 10 general principles on how to achieve Taiwan's climate mitigation and adaptation targets. The third principle calls for the implementation of a cap-and-trade system. Accordingly, TEPA has been conducting research on the design options and the timetable for establishing a cap-and-trade system. The act also mandated TEPA to develop the 'GHG Reduction Action Plan,' which outlines details on how to implement the mitigation policies contained in the act. It includes periodic regulatory goals for both national and sectoral net GHG emissions, as well as implementation strategies in the form of eight policy packages. The plan was approved and published in March 2018 and proposes to implement a cap-and-trade system, calculate baseline emissions, and set up regulations—albeit without a precise timeline. On this basis, the central industry competent authorities of the six major sectors (energy, manufacturing, transportation, residential and commercial, agriculture, and environment) approved the 'GHG Emissions Control Action Programs' later in 2018. A series of subsidiary regulations has been formulated in preparation for rolling out the cap-and-trade system. This includes the '2018 Regulations Governing GHG Offset Program Management,' which provide an opportunity for enterprises to acquire carbon offsets credits. Mandatory emissions reporting for entities with annual emissions above 25,000 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.
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 284.6 $MtC0_2e$ (2015)
Overall GHG emissions by sector	Sector Name — MtCO2e Industrial Processes — 22.2 Agriculture — 2.7 Waste — 4.1 Energy (excluding Transport) — 255.7
Overall GHG reduction target	**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
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (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:** Back in 2004, a voluntary GHG reporting under the Air Pollution Control Act, which became mandatory in 2013. Since 2016, GHG reporting and inventory program is mandatory under the GHG Accounting and Registration Regulations, which are authorized by the Greenhouse Gas Reduction and Management Act.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Taiwanese Environmental Protection Administration
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

Thailand

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** The '12th National Economic and Development Plan (2017-2021)' of Thailand calls for several mitigation measures, including the development of a domestic carbon market. The 'National Climate Change Master Plan (2015-2050)' also refers to carbon markets as a potential mechanism to reduce GHG emissions in the private sector. In addition, the importance of carbon markets has also been emphasized in Thailand's nationally determined contribution (NDC). From 2013-2016, the Thailand Greenhouse Gas Management Organization (public organization) (TGO) developed an MRV system for the 'Thailand Voluntary Emissions Trading Scheme' (Thailand V-ETS). In 2013-2014, MRV general guidelines for the Thailand V-ETS were developed. Between October 2014 and September 2017, the Thailand V-ETS ran its first pilot phase, aimed at testing the MRV system, developing sector-specific MRV guidelines, and setting a cap and allocating allowances for covered factories. The second pilot phase (2018-2020) tests the registry and trading platform. Under the 'National Reform Plan,' the Thai government must set up an economic instrument, such as a cap-and-trade program, to incentivize the private sector to reduce emissions. The specific instrument will be outlined in the 'Climate Change Act,' which is expected to enter into force by 2020. The TGO is working on an ETS implementation roadmap and legal framework, which will be proposed as a policy recommendation for the government to consider.
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 318.66 $MtC0_2e$ (2013)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 236.94 Industrial Processes — 18.98 Agriculture and land-use change — 50.92 Waste — 11.83
Overall GHG reduction target	**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).
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.

GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Thailand Greenhouse Gas Management Organization (TGO)
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

Turkey

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** 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. With additional funding from the PMR through 2018, Turkey has been developing draft legislation and improving technical and institutional capacity, to prepare the groundwork for piloting a suitable carbon pricing policy. Turkey is also a candidate to EU accession and thereby aims to complete the environmental obligations of the EU accession (including the EU ETS directive).
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 496.1 $MtC0_2e$ (2016)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excluding transport) — 279.2 Transport — 81.8 Industry — 62.4 Agriculture — 56.5 Waste — 16.2
Overall GHG reduction target	**BY 2030:** Up to 21% reduction from the BAU scenario (INDC)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	The Turkish MRV legislation establishes an installation-level system for CO2 emissions for roughly 900 entities. Sector coverage includes the energy sector (combustion fuels >20MW) and industry sectors (coke production, metals, cement, glass, ceramic products, insulation materials, paper and pulp, chemicals over specified threshold sizes/production levels). **MONITORING AND REPORTING:** Entities had until October 2014 to submit their first monitoring plans. **VERIFICATION:** Entities subsequently submitted verified emissions reports for 2015, 2016, and 2017 to the Ministry of Environment and Urbanization Verifiers were accredited by the Turkish Accreditation Organization in 2018. During 2016–2018, the Ministry of Environment and Urbanization provided training, examination, and licensing services. **OTHER:** Entities that fail to comply with the Turkish MRV regulation are subject to sanctions under the Turkish Environmental Law No. 2872.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Ministry of Environment and Urbanization
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

USA - New Mexico

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** New Mexico New Mexico established a Climate Change Task Force to evaluate strategies and policies to reduce GHG emissions in the state. This includes the adoption of a comprehensive market-based program that sets emissions limits to reduce CO2 and other GHG pollutants in New Mexico. Initial recommendations and a status update for the 'New Mexico Climate Strategy' are due in September 2019. Requirements on GHG emission reporting–stemming from Title V of the Clean Air Act, Prevention of Significant Deterioration, and from U.S. Environmental Protection Agency rules–apply to stationary combustion, new major stationary sources, all power plants, fuel and industrial gas suppliers, CO2 injection sites, and other large GHG emission sources, among others.
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 80.9 $MtC0_2e$ (2013)
Overall GHG emissions by sector	Sector Name: MtCO2e Electricity generation: 28.5 Residential/Commercial/Non-fossil industrial: 7.9 Transportation: 13.6 Fossil Fuel industry: 21.1 Industrial processes: 1.4 Waste Management: 1.8 Agriculture: 6.6
Overall GHG reduction target	**BY 2030:** At least 45% from 2005 GHG levels (Executive Order 2019-003)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	New Mexico Climate Change Task Force; New Mexico Energy, Minerals and Natural Resources Department; New Mexico Environment Department
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

USA - Oregon

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** USA - Oregon In January 2019, House Bill 2020 was introduced, proposing the establishment of a statewide cap-and-trade program ('Oregon Climate Action Program'). The program would start in 2021 and the allowance budget would decline in line with a proposed target of a 45% reduction in GHG emissions below 1990 levels by 2035. From 2036, allowances would decline in line with Oregon's proposed 2050 target of at least 80% reduction from the same baseline. Electricity companies would receive allowances equal to a forecast of emissions associated with serving their retail customers until 2030, and decline from that point at the rate of the overall cap. Natural gas utilities would be eligible for allowances based on the share of emissions that goes towards serving low-income residential customers. Covered entities with emissions-intensive, trade-exposed processes would initially receive an allocation based on 100% of sectoral or facility-specific production benchmarks in 2021. These shares would decline in subsequent years. Auctioning would be held at least annually with a slowly rising auction price floor and price ceiling. The program's design is closely modeled on the California and Québec programs, including similar sectoral coverage and US domestic offset programs. In addition to auction price floors and ceilings, cost containment reserves are also envisaged. The possibility of linking with other market-based compliance mechanisms in other jurisdictions is mentioned in the proposed legislation. Public hearings were held on the bill throughout February 2019. Oregon's legislature convenes until 30 June 2019. An annual GHG emissions reporting program has been in place since 2010 covering industry and waste, as well as fuel distributors and electricity suppliers.
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 65 $MtC0_2e$ (2017, preliminary)
Overall GHG emissions by sector	Sector Name — MtCO2e Transportation — 25.69 Residential and Commercial — 20.82 Industrial — 12.4 Agriculture — 5.65
Overall GHG reduction target	**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)
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

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

Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

USA - Washington

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** Washington In 2008, the State of Washington adopted GHG reduction targets for 2020, 2035, and 2050. In 2017 the Washington Department of Ecology began implementing the 'Clean Air Rule'—a baseline and credit system that reduces emissions from industrial sources, petroleum fuel producers and importers, and natural gas distributors. Those responsible for at least 100,000 metric tonnes of GHG per year are affected. Under this system, covered facilities must reduce a cumulative 1.7% of their baseline emissions annually. They can comply by reducing their own emissions, buying credits from other regulated parties or from projects that reduce emissions, or by acquiring allowances from approved ETS programs. Other carbon pricing policies, including a possible ETS, are also being considered. Recent changes to the legislature have renewed interest in putting a carbon pricing policy into law. In addition, environmental NGOs have announced their intent to put a carbon pricing policy to a vote of the people if the state legislature does not act. Clean Air Rule State of the State Address (2018)
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 95.3 $MtC0_2e$ (2014)
Overall GHG emissions by sector	Sector Name — MtCO2e Electricity — 18.3 Residential, Commerical, Industrial — 20.4 Transport — 41.2 Fossil Fuel Industry — 0.9 Industrial Processes — 4.9 Waste Management — 3.5 Agriculture — 6.1
Overall GHG reduction target	**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
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.

Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Washington Department of Ecology
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

Vietnam

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** Vietnam Vietnam's 'Green Growth Strategy' (2012) pursues the objective of a low-carbon economy and invokes the introduction of market-based instruments. Several measures lay the groundwork for implementing 'National Appropriate Mitigation Actions' (NAMAs) in the waste, steel, cement, chemical fertilizer, wind power, and biogas sectors. As part of its activities under the PMR, Vietnam is focusing on the steel and waste sectors. The planned MRV system and crediting NAMA will provide the experience for the implementation of a sector-based cap-and-trade program in the steel sector, which could start in 2020. Vietnam is also considering the use of market-based instruments for the waste sector starting in 2020. A decree on a roadmap for GHG emissions is going to be approved in 2019, which references the use of carbon credits and a carbon pricing policy system.
Year in Review	No information available yet.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 293.3 $MtC0_2e$ (2013)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 151.4 Industrial Processes — 31.8 Agriculture — 89.4 Waste — 20.7
Overall GHG reduction target	**BY 2030:** 8% below BAU and 25% conditional on international support (NDC) including 20% reduction in 2010 GHG (intensity) levels and 30% conditional on international support
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	No information available yet.
GHG covered	No information available yet.
Sectors covered and thresholds	No information available yet.
Point of regulation	No information available yet.
Number of liable entities	No information available yet.
Cap	No information available yet.

Phases & Allocation

Trading period	No information available yet.
Allocation	No information available yet.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Market Stability Provisions	No information available yet.

Compliance

Compliance Period	No information available yet.
Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	No information available yet.

Linking

Links with other Systems	No information available yet.

Other Information

Institutions involved	Ministry of Natural Resources and Environment of Vietnam
Evaluation / ETS review	No information available yet.
Revenue	No information available yet.
Implementing Legislation	No information available yet.

Disclaimer

In line with ICAP's mandate, the ICAP ETS map exclusively covers cap-and-trade systems for greenhouse gas emissions. Information displayed on the map is regularly updated by ICAP Secretariat staff based on official and public information as far as possible and subject to annual peer review by government representatives from the covered systems. Although the information contained in the map is assembled with utmost care, ICAP cannot be held liable for the timeliness, correctness and completeness of the information provided.

Please refer to the imprint on the website of the International Carbon Action Partnership regarding links to external websites, liability and privacy policy.