International Carbon Action Partnership
ETS Detailed Information

Canada - Ontario Cap-and-Trade Program

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Ontario On 18 May 2016, Ontario passed legislation introducing a cap-and-trade program with a first compliance period of 2017-2020. The program covers facilities generating more than 25,000 tons of GHG, as well as natural gas distributors, fuel suppliers and electricity importers. Ontario has been a member of the Western Climate Initiative (WCI) since 2008. The WCI is an initiative of American State and Canadian Provincial governments that aim to develop a joint strategy to reduce GHG emissions through a regional cap-and-trade program. Ontario intends to link its program with the Californian and Québec carbon market in 2018. Climate Change Mitigation and Low-carbon Economy Act, 2016, S.O. 2016, c. 7 - Bill 172 Ontario Ministry of the Environment Website Western Climate Initiative Inc. Archive of past WCI materials
Overall GHG emissions (excluding LULUCF)	**Emissions:** 170.2 $MtC0_2e$ (2014) Note: sector specific data is from 2012 and therefore does not sum to total GHG emissions which is 2014 data.
Overall GHG emissions by sector	Sector Name — MtCO2e Electricity generation (without imports) — 6 Transport — 59 Industry — 51 Buildings — 35 Agriculture — 10 Waste — 9
Overall GHG reduction target	**By 2020:** 15% reduction from 1990 GHG levels. **By 2030:** 37% reduction from 1990 GHG Levels. **By 2050:** 80% reduction from 1990 GHG levels.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute **First Compliance Period (2017-2020):** **2017:** 142m tCO2e, set to decline by 4.17% per year until 2020. **2018:** 136m tCO2e

	2019: 131m tCO2e **2020:** 125m tCO2e
Carbon Price	*Current Allowance Price (per t/CO2e):* CAD 18.72 at second auction in June 2017

ETS Size

Emissions covered by the ETS	85
GHG covered	CO2, CH4, SF6, N2O, NF3 and other fluorinated GHGs.
Sectors covered and thresholds	**Phase I (2017-2020):** Industrial and large commercial operators including manufacturing, base metal processing, steel, pulp and paper, food processing and facilities, with annual emissions > 25,000 tCO2e. Electricity: domestic electricity generation based on fuel combustion covered at the fuel distribution level, while the compliance obligation for electricity imports rests with the importer. Transportation fuel distributors (including propane and fuel oil) for those entities that first place more than 200L of fuel annually into the Ontario market. Natural gas distributors with annual emissions greater than 25,000 tCO2e and operating at the point where the gas is moved from the pipeline into the distribution network for Ontario consumers. Institutions: Entities with annual emissions > 25,000 tCO2e. Facilities emitting between 10,000-25,000 tCO2e per year may voluntarily opt-in.
Number of liable entities	No information available yet.
Point of regulation	Mixed

Phases & Allocation

Compliance period	**First compliance period:** 2017-2020. **Subsequent compliance periods:** Three calendar years. Allowances must be surrendered by 1 November (or the first business day thereafter) following the end of the compliance period.
Trading period	Not applicable; details for post-2020 period not determined yet.
Allocation	**Electricity sector** (electricity generators, or those involved in electricity importation and transmission), petroleum producers and suppliers, and natural gas distributors: Electricity and fuel distributors have to buy 100% of their allowances at auctions or on the secondary market. Allowances are auctioned quarterly. **Other sectors** (industry, institutions as defined above (Sectors)): Emitters outside the electricity, natural gas and fuel sectors can apply to receive free allowances in Phase I.

Flexibility

Banking and borrowing	Banking is allowed but the emitter will be subject to a general holding limit.
Offsets and credits	**Phase I (2017-2020):** In the first phase, offset credits and early reduction credits will be available for use. Early reduction credits are offered to facilities who have taken early mitigation action in the four years preceding approval of the final cap-and-trade regulation. The regulations do not currently provide details on the creation and distribution of Early Reduction Credits, but Ontario has indicated intent to amend the regulation to do so. Ontario is in the process of finalizing offset protocols in conjunction with Québec. The protocols will be consistent with offset project criteria developed together with Québec, California and other Western Climate Initiative members in 2010. The following project protocols will be prioritized for development: Ozone Depleting Substances, Landfill Gas Capture and Coal Mine Methane Destruction. This will be followed by additional protocols, mostly for forestry and agriculture. **Quantitative Limits:** Offset credits can be used to meet up to 8% of an entity's compliance obligation.
Provisions for price management	**Reserve price at auction:** The minimum price at Ontario auctions will be the higher of the annual action reserve prices in either Québec or California (USD 13.57 (CA) or 13.56 (QC) in 2017) adjusted to CAD based on the exchange rate on the day prior to the auction. The reserve price increases annually by 5% plus inflation, as measured by the Consumer Price Index). **Cost Containment Reserve:** Ontario also has a strategic allowance reserve for Ontario entities. Allowances released from this reserve can only be used for compliance. Ontario's prices are closely aligned with Québec's.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting frequency:** Annually Facilities and natural gas distributors emitting more than 10,000t CO2e, fuel suppliers that sell more than 200L of fuel annually, and electricity importers must report their emissions. **Verification:** Third party verification is required for capped emitters.
Enforcement	If an entity fails to surrender sufficient allowances to cover their emissions, they must surrender four times the number of missing allowances (three times the shortfall plus the original shortfall, i.e., four times the number of the shortfall). Failure to surrender allowances also renders the entity liable to a minimum fine of CAD 25,000/day until the remaining allowances are surrendered (with a maximum fine of CAD 6 million). Subsequent offences attract higher fines. Individuals (persons) are liable for at least CAD 5,000/day with a maximum fine of CAD 4 million and imprisonment for up to five years. Subsequent offences attract higher fines. Penalties apply for other violations.

Other Information

Institutions involved	Ontario Ministry of Environment and Climate Change Western Climate Initiative

Linkage with other schemes	Ontario intends to link its system with California and Québec in 2018.

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 with a transition year in which emitters could prepare and familiarize themselves with the program without mandatory compliance. The program's enforceable compliance obligation began on 1 January 2013. The first compliance period ended on 31 December 2014. On 2 November 2015, all covered entities in the first compliance period had to surrender sufficient allowances to cover their 2013 and 2014 GHG emissions. All of Québec's covered entities complied with this requirement. The second compliance period began on 1 January 2015 and will end on 31 December 2017. Future compliance periods will be three years long. Québec has been a member of the Western Climate Initiative (WCI) since 2008 and formally linked its system with that of California on 1 January 2014. Ministry of Sustainable Development, Environment, Wildlife and Parks Website Regulation respecting a cap-and-trade system for greenhouse gas emission allowances (as at 1 February 2013) Technical description of Québec's cap-and-trade program (SPEDE) Western Climate Initiative Inc. Archive of past WCI materials
Overall GHG emissions (excluding LULUCF)	**Emissions:** 81.2 $MtC0_2e$ (2013) Quebec's 2012 GHG inventory. The Québec inventory generally follows UNFCCC guidelines and draws some of its data from the Canadian GHG inventory.
Overall GHG emissions by sector	Sector Name — MtCO2e Transport — 34.9 Industry — 25.0 Residential & Commercial — 7.7 Agriculture — 7.5 Waste — 5.9 Electricity — 0.2
Overall GHG reduction target	**By 2020:**20% reduction from 1990 GHG levels. **By 2030:**37.5% reduction from 1990 GHG levels. **By 2050:** 80-95% reduction from 1990 GHG levels.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute 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

Carbon Price	*Current Allowance Price (per t/CO2e):* CAD 18.82 (USD 13.80); Clearing price at joint CAL-QC auction 24 May 2017.

ETS Size

Emissions covered by the ETS	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 (>25,000 CO2e/year). **Second compliance period (2015-2017) and third compliance period (2018-2020):** Sectors of first compliance period alongside the distribution and importation of fuels used for consumption in the transport and building sectors, as well as 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 has resulted in the emission of less than 25,000 tCO2e.
Number of liable entities	132 (2017) In Québec's cap-and-trade program, an emitter is any person or municipality operating a business in a sector of activity covered by the regulation. Entities emitting 25 kt CO2e or more are subject to the system.
Point of regulation	**First compliance period (2013-2014):** Downstream **Second compliance period (2015-2017):** Mixed, downstream and upstream (fuel distribution)

Phases & Allocation

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), although rules pertaining to the free allocation of allowances are only set by regulation until 2020. Allowances must be surrendered by 1 November following the end of the compliance period.
Trading period	In Québec's cap-and-trade system, a trading period is referred to as a "compliance period" (see below). Allowances are allocated and auctioned with calendar vintage years.
Allocation	**Auctions:** Generally, electricity and fuel distributors have to buy 100% of their allowances at auction (or on the market). Allowances are auctioned quarterly. As of May 2017, Québec had held a total of fifteen auctions, eleven jointly with California. All auction revenues go to the Québec Green Fund and are dedicated to the fight against climate change through Québec's 2013-2020 Climate Action Plan. 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. **Free allocation:** Sectors subject to international competition receive a portion of free allowances. These 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). **First compliance period (2013-2014):** Free allocation based on historical levels, production level and intensity target of GHG emissions attributable to the activity, with 100% allocation for process emissions, 80% for combustion emissions and 100% for emissions from other sources. **Second compliance period (2015-17):** Free allocation diminishes by approximately 1-2% on a yearly basis. 75% of free allowances issued on 14 January of each year (year x) (except in 2013 when they were issued on 1 May). The remaining 25% are to be issued in September of the following year (year x+1) after the Minister´s verification of emission reports (for year x). Free allocation is based on real output. No free allocation for fuel distributors.

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:** Currently five domestic (non-Kyoto) offset types are accepted as compliance units originating from projects carried out according to five "protocols" in Québec: 1) CH4 destruction as part of projects to cover manure storage facilities; 2) Capture of gas from specified landfill sites; 3) Destruction of certain ozone depleting substances contained in insulating foam and of certain refrigerant gases recovered from domestic appliances in Canada; 4) Capture and destruction of CH4 from a CH4 drainage system at an active underground or surface coal mine, except a mountaintop removal mine; 5) Capture and destruction of CH4 from the ventilation system of an active underground coal mine. Additional offset types may be approved by the authority. Offsets issued by jurisdictions linked with Québec are recognized for compliance. The Minister may require the promoter to replace any offset credit issued to the buyer for a project, in the event that: 1. Due to omissions, inaccuracies or false information in the documents provided by the promoter, the GHG emissions reductions for which the offset credits were issued were not eligible; 2. Offset credits were applied for under another program for the same reductions as those covered by the application for credits under this regulation. In the instance that credit recovery is not possible; an equivalent number of credits will be retired from the Minister's environmental integrity account. The Minister takes 3% of issued offset credits as a contingency reserve to fill that account.
Provisions for price management	Minimum auction (reserve) price for joint auction with California in 2017: the higher of CAD 18.51 or USD 13.57; increasing annually by 5% and inflation until 2020. Reserve emission units held in the Allowance Price Containment Reserve account may be sold at ca. CAD 44.96, 50.58, 56.2/t CO2e (2015 values, the latest for which data was accessible). 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% and inflation.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting frequency:** Once a year. Report to be submitted by 1 June of each year. **Verification:** 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. More information: Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere
Enforcement	For non-compliance, entities can be fined CAD 3,000-500,000 (EUR 2,145-357,564) and spend up to 18 months in jail in the case of a natural person, and CAD 10,000-3,000,000 (EUR 7,151-214,538) in the case of a legal person. Fines are doubled in the case of a second offense. In addition, the Minister of Sustainable Development, the Environment and the Fight against Climate Change may suspend the allocation to any emitter in case of non-compliance. 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 emitter responsible 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.

Other Information

Institutions involved	Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs (Ministry of Sustainable Development, Environment, Wildlife and Parks) Office of Climate Change, Carbon Market Directorate
Linkage with other schemes	On 1 January 2014, Québec linked with California. Together with California, Québec is reviewing Ontario's ETS provisions for future linking.

China - Beijing pilot system

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Beijing The Beijing pilot ETS was launched on 28 November 2013 and has finished three compliance years so far. It covers about 45% of the city's total emissions, including both direct and indirect emissions from electricity providers, the heating sector, cement, petrochemicals, other industrial enterprises, manufacturers, the service sector and public transport. To test interregional cooperation, several cement companies from Hebei province and Inner Mongolia were included in the pilot system in 2015 and 2016. Beijing DRC (Chinese)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 188.1 $MtC0_2e$ (2012) 2010 carbon emission: n.a. 2010 energy intensity: 0.493 ton SCE/10,000 CNY
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**By 2020** (13th Five Year Plan): 20.5% reduction in carbon intensity compared to 2015 levels.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute 46 MtCO2e (2016, existing facilities only)
Carbon Price	*Current Allowance Price (per t/CO2e):* CNY 53.66 (approx. USD 8.14) (secondary market price as of 20 June 2016)

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:**5,000t CO2/year, considering both direct and indirect emissions. **Mandatory reporting:** 2,000 tons of standard coal equivalent energy consumption/year.
Number of liable entities	947 (2016, Beijing) 26 (Inner Mongolia) 6 (Hebei) Mandatory Reporting: 582 (2016, Beijing)

	The accounting boundary for emissions is set at the company-level (legal person).
Point of regulation	Mixed: Both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are included in the scheme. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass-through of carbon costs via the electricity price, and would not incentivize demand-side management of electricity. The system therefore covers emissions from the power sector upstream and other sectors downstream.

Phases & Allocation

Compliance period	One year (15 June)
Trading period	Four years (2013-2016)* *Initially, the seven Chinese pilot ETS were scheduled to end after three compliance years and be replaced by the national ETS in 2016. However, as the national ETS will start in the second half of 2017, the pilots will continue operating until then and probably also beyond.
Allocation	Mainly free allocation through grandfathering based on emissions or emissions intensity in the years 2009-2012 (stationary sources) or 2011-2014 (mobile sources). Benchmarking for new entrants and entities with expanded capacity.

Flexibility

Banking and borrowing	Banking is allowed during the pilot phase. 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 CCER credits is limited to 5% of the annual allocation. **Qualitative Limit:** Out of the 5% annual allocation limit, at least 50% must come from projects within the jurisdiction of the city of Beijing. Credits from hydropower, HFC, PFC, N2O and SF6 projects are not eligible and all reductions have to be achieved after the beginning of 2013. Verified carbon emission reductions from energy saving projects and forest carbon sink projects from within the city of Beijing are also allowed.
Provisions for price management	The Beijing Development and Reform Commission (DRC) can auction extra allowances if the weighted average price exceeds CNY 150 (EUR 20.30) for ten consecutive days, and buy back allowances from the market if the price is below CNY 20 (EUR 2.70).

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Annual reporting of CO2 emissions. **Verification:** Third-party verification is required. **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 tons of standard coal equivalent 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 (EUR 7,34). Furthermore, companies failing to surrender enough allowances to match their emissions are fined three to five times the average market price over the past six months for each missing allowance.

Other Information

Institutions involved	Beijing Development and Reform Commission (Competent authority) China Beijing Environment Exchange (Trading platform)
Linkage with other schemes	To test interregional cooperation, several cement companies from Hebei province and Inner Mongolia were included in the pilot system in 2015 and 2016.

China - Chongqing pilot system

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Chongqing Chongqing was the latest of the seven Chinese region to start its pilot ETS on 19 June 2014. The system covers enterprises from seven sectors: power, electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel. The 230 enterprises covered by the system account for around 40% of the city's total emissions. Chongqing DRC (Chinese)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 250 $MtC0_2e$ (2014)
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**By 2020** (13th Five Year Plan): 19.5% reduction in carbon intensity compared to 2015 levels.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute 100.4 MtCO2e (2016)
Carbon Price	*Current Allowance Price (per t/CO2e):* CNY 10.00 (approx. USD 1.52) (secondary market price as of 20 June 2016)

ETS Size

Emissions covered by the ETS	0.4
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 threshold:** 20,000t CO2e/year.
Number of liable entities	230 (2015) The accounting boundary for emissions is set at the company-level (legal person).
Point of regulation	Mixed: Both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are included in the scheme. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass-through of carbon costs via the electricity price, and would not incentivize demand-side management of electricity. The system therefore covers emissions from the power sector upstream and other sectors downstream.

Phases & Allocation

Compliance period	Due to the late start of the Chongqing pilot ETS, compliance for 2013 and 2014 were combined in one phase. A one year compliance period is in place since 2015 (20 June).
Trading period	Four years (2013-2016)* *Initially, the seven Chinese pilot ETS were scheduled to end after three compliance years and be replaced by the national ETS in 2016. However, as the national ETS will start in the second half of 2017, the pilots will continue operating until then and probably also beyond.
Allocation	Free allocation through grandfathering 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. Ex-post adjustments based on production data are also possible.

Flexibility

Banking and borrowing	Banking is allowed during the pilot phase. Borrowing is not allowed.
Offsets and credits	**Quantitative Limit:** Domestic project-based carbon offset credits — China Certified Emission Reductions (CCERs) — are allowed with a maximum amount of 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.
Provisions for price management	In case of market fluctuations, the Chongqing Carbon Emissions Exchange can take price stabilization measures. Compliance entities must not sell more than 50% of their free allocation.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Annual reporting of GHG emissions. **Verification:** Third-party verification is required. **Framework:** The Chongqing Development and Reform Commission (DRC) released a guiding document for monitoring and reporting that includes methods for different emissions sources: combustion, industrial processes and electricity consumption.
Enforcement	According to the 'Interim Administrative Measures for the Chongqing ETS' published in May 2014, there are no financial penalties for non-compliance. The punishments may include media reporting and public exposure of the non-compliance; disqualification from the energy saving and climate subsidies and associated awards for three years; and a record entered on the State Owned Enterprise (SOE) performance assessment system.

Other Information

Institutions involved	Chongqing Development and Reform Commission (Competent authority) Chongqing Carbon Emissions Exchange (Trading platform)
Linkage with other schemes	No information available yet.

China - Fujian pilot system

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Fujian On 30 September 2016, the Fujian Province government released the Interim Measures for the Management of Emissions Trading in Fujian Province and the Implementation Plan of Emissions Trading Market in Fujian Province, to introduce a one-year pilot ETS. The aim is to allow local firms to gain some experience before they are brought into the national cap-and-trade program in the second half of next year. This makes Fujian the eighth carbon market pilot in China besides the seven existing regional pilots already operating since 2013. The mandate for the pilot ETS came from the National Ecological Civilization Pilot Area (Fujian) Implementation Plan endorsed by the State Council on 22 August. Given the prominence of the forestry sector in Fujian, its ETS pilot has a special focus on carbon sinks. At the beginning of December 2016, further regulatory rules and guidelines were released regarding GHG emissions reporting, carbon offset projects, market stability management, administration of the third-party verifiers and allowance allocation. This was followed by the first auction for vintage 2016 allowances on 15 December 2016 with a volume of 50,000 allowances. In addition, the Haixia Equity Exchange in Fujian was approved in July 2016 by the National Development and Reform Commission to be one of the nine dedicated trading platforms for trading China's domestic project-based carbon offset credits.
Overall GHG emissions (excluding LULUCF)	No information available yet.
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**By 2020** (13th Five Year Plan): 19.5% reduction in carbon intensity compared to 2015 levels.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute Around 200 MtCO2e (unofficial estimation). Because allocation is based on actual production data, the 2016 cap will be determined after the verification on April 2017.
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	>60% (unofficial estimate)
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 tons of coal equivalent (tce)/year for any year between 2013-2015

Number of liable entities	277 (2016) No information available yet.
Point of regulation	Mixed: Both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are included in the scheme. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass-through of carbon costs via the electricity price, and would not incentivize demand-side management of electricity. The system therefore covers emissions from the power sector upstream and other sectors downstream.

Phases & Allocation

Compliance period	One year (30 June)
Trading period	One year (2016)* *Similar to the other seven Chinese pilots, the Fujian pilot will operate until the start of the national ETS in the second half of 2017 and probably also beyond. The pilot may then extend its coverage to smaller emitters, who will not be covered under the national scheme.
Allocation	Allocation: Mainly free allocation on annual basis, with a view to introducing auctioning over time as appropriate. 10% of the total cap will be reserved for capacity extension and market intervention (when necessary). Free allowances to be allocated to new entrants. In order to increase market liquidity and facilitate price discovery among market participants, Fujian DRC organized a first allowance auction on December 15, 2016. 50,000 allowances from the government reserve were sold during the auction.

Flexibility

Banking and borrowing	Banking is allowed during the pilot phase. Borrowing is not allowed.
Offsets and credits	**Quantitative Limit:** Domestic project-based carbon offset credits — China Certified Emission Reduction (CCER) and Fujian Forestry Certified Emission Reduction (FFCER)— allowed. The use of CCER credits is limited to 5% of the annual compliance obligation and to increase to 10% for companies that use FFCER credits. **Qualitative Limit:** Eligible offsets will be restricted to those generated in Fujian province, from CO2 or CH4 projects. Hydro power related credits are not eligible. FFCERs projects need to start implementation after 16 February 2005 and the project developers need to have independent legal personality.
Provisions for price management	Provisions for price management: 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 exceeds a certain percentage), severe imbalances between supply and demand, or liquidity issues, the Fujian Economic and Information Center under the guidance of the Fujian Development and Reform Commission (DRC) - in consultation with an advisory committee - can buy or sell allowances in order to stabilize the market. More specifically, when the price is too high, the Center may sell allowances from government reserves via auction through the Haixia Equity Exchange; and when the price is too low, the Center may buy allowances back using special funds from the government.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Annual reporting of CO2 emissions before end of February and submission the verified report by end of April. **Verification:** Third-party verification is required. **Framework:** The Fujian DRC and 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 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 fake information, or disturbing the verification process range from CNY 10,000 to CNY 30,000 (EUR 1,35 to EUR 4,04). Companies failing to surrender enough allowances to match their emissions are fined one to three times the average market price of the past 12 months, with the maximum limit of CNY 30,000. 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 info or leaking commercial secrets, could range from CNY 10,000 to CNY 30,000.

Other Information

Institutions involved	Fujian DRC (Competent authority, hosting the Provincial ETS Coordination Group Office) Fujian Provincial Forestry Department (FFCER project management) Fujian Haixia Equity Exchange (Trading platform) Fujian Economic and Information Center (Registry, market management, MRV administration)
Linkage with other schemes	No information available yet.

China - Guangdong pilot system

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Guangdong On 19 December 2013, Guangdong was the fourth Chinese region, after Shenzhen, Shanghai and Beijing, to start its pilot ETS. Guangdong is the largest of the Chinese ETS pilots. Covered sectors account for more than half of the province's emissions. The third compliance period was completed on 20 June 2016 (with 100% compliance rate) for 2015 vintage. The Guangdong ETS covers a total of 218 entities, including 29 new entrants in 2016. As well as introducing new sectors, Guangdong ETS also partially adjusted its allocation methods in 2016. Guangdong ETS is one of the most active markets among the Chinese pilots. Guangdong and Shenzhen are the only two markets open to foreign investors. In November 2016 Guangdong further increased the maximum position of institutional and individual investors from 3 to 8 million allowances. Guangdong also allows unincorporated organizations such as funds and trusts to trade in its carbon market. Guangdong DRC - ETS pilot Implementation Plan (Chinese) Interim Measures for Emissions Trading in Guangdong (Chinese)
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** (13th Five Year Plan): 20.5% reduction in carbon intensity compared to 2015 levels.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute **Total** (2016): 422 MtCO2e (excl. white cement) **Existing sectors**: 386 MtCO2e (2016), of which 365 MtCO2e is allocated to compliance entities and the remaining 21 MtCO2e is reserved (for new entrants and market stability). Compared to 2015, the cap was reduced by 22 MtCO2e in 2016 (with a 5 MtCO2e reduction for compliance entities). **New sectors**: 12 MtCO2e (2016) for aviation, of which 11.45 MtCO2e is for compliance entities; 24 MtCO2e (2016) for paper, of which 22.7 MtCO2e is for compliance entities; unknown for the white cement sector.
Carbon Price	*Current Allowance Price (per t/CO2e):* CNY 13.18 (approx. USD 2.00) (secondary market price as of 20 June 2016)

ETS Size

Emissions covered by the ETS	0.60
GHG covered	CO2

Sectors covered and thresholds	Four existing compliance sectors: power, iron and steel, cement, and petrochemicals Three new compliance sectors added in 2016: aviation, paper and white cement Reporting sectors: ceramics, textiles, non-ferrous metals, and chemicals **Inclusion thresholds:** 20,000 t CO2/year or energy consumption 10,000 tons coal equivalent (tce)/year
Number of liable entities	**Total** (2016): 280 (excl. white cement) **Existing sectors** (2016): 218; 189 compliance entities and 29 new entrants **New sectors** (2016): ~62; Aviation: 4; Paper: 58; White cement unknown. The accounting boundary for emissions is set at the company-level (organizational and operational boundary).
Point of regulation	Mixed: Both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are included in the scheme. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass-through of carbon costs via the electricity price, and would not incentivize demand-side management of electricity. The system therefore covers emissions from the power sector upstream and other sectors downstream.

Phases & Allocation

Compliance period	One year (20 June)
Trading period	Four years (2013-2016)* *Initially, the seven Chinese pilot ETS were scheduled to end after three compliance years and be replaced by the national ETS in 2016. However, as the national ETS will start in the second half of 2017, the pilots will continue operating until then and probably also beyond.
Allocation	Mainly free allocation through grandfathering based on 2013-2015 emissions. Annual emissions reduction factor of 0.99 is applied to sectors using grandfathering for 2016 vintage. Benchmarking is applied for coal or gas fired electricity generators (including heating, combined heat and power), certain cement and iron and steel industrial processes and relevant new entrants. For those using benchmarking, pre-issuance of allowance is based on 2015 production, and the final number will be updated based on 2016 production. New entrants need to first buy enough allowances on the market and formally transfer into compliance entities; afterwards they receive new allowances. In 2016, the proportion of free allocation (95% for Power sector and 97% for remaining sectors) remained the same as in 2015. The allowance auction plan was also the same as for the 2015 compliance year. A total of 2 million tonnes of allowances were auctioned in four quarters, i.e. September, December, March and June. During the first compliance year participation in auctions was mandatory for entities to be able to receive or trade their freely allocated allowances.

Flexibility

Banking and borrowing	Banking is allowed during the pilot phase. Borrowing is not allowed.
Offsets and credits	**Quantitative Limit:** Domestic project-based carbon offset credits — China Certified Emission Reduction (CCER) — are allowed. The use of CCER credits is limited to 10% of the actual emissions of the compliance entities.

	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 CCERs have to come from within Guangdong. Pre-CDM credits are not eligible, as are credits from hydropower or most fossil fuel projects. CCERs from the other pilot markets or regions that already have launched carbon markets are not allowed.
Provisions for price management	Guangdong has an auction floor price. Initially in 2013, it was set at CNY 60 (EUR 8.81), and then lowered to CNY 25 (EUR 3.67) and increased in steps of CNY 5 (EUR 0.73) with each quarterly auction, up to CNY 40 (EUR 5.87) at the end of the second compliance period. In the third compliance period, the floor price was set at 80% of the weighted average price for allowances over the previous three months. Since 2016, a so-called policy reserve price effectively served as a price floor. During the first auction for vintage 2016 allowances, Half a million allowances were on offer and cleared above the policy reserve price of 9.37 CNY/ton (EUR 1.35) with a settlement price of 9.88 CNY/ton (EUR 1.42).

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Annual reporting of CO2 emissions. **Verification:** Third-party verification is required. **Framework:** The Guangdong Development and Reform Commission (DRC) has released guidelines for monitoring and reporting for the compliance and reporting sectors.
Enforcement	Penalties for failing to submit emissions or verification reports on time range from CNY 10,000 (EUR 1,309) to CNY 50,000 (EUR 6,544). Furthermore, companies failing to surrender enough allowances to match their emissions will have twice the amount of allowances deducted from their allocation for the following year and be fined CNY 50,000 (EUR 6,544).

Other Information

Institutions involved	Guangdong Development and Reform Commission (Competent authority) China Emissions Exchange Guangzhou (Trading platform)
Linkage with other schemes	No information available yet.

China - Hubei pilot system

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Hubei On 2 April 2014, Hubei was the sixth pilot ETS in China to start trading. 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. Until now, Hubei has been the most active market among the pilot ETSs in terms of trading. On 3 January 2017, the Hubei Development and Reform Commission (Hubei DRC) issued its allowance allocation plan for 2016 vintage compliance. The inclusion threshold has been lowered for some sectors and allocation methods have been adjusted using historical carbon intensity rather than grandfathering and stricter benchmarks for several sectors. In addition, companies covered by both the Hubei ETS and the upcoming national ETS will be pre-allocated with a certain amount (equivalent to 10% of their 2016 initial allocation) of National Emissions Allowances, which can only be used for forwards trading rather than 2016 compliance. Interim Measures for Emissions Trading in Hubei (Chinese) Hubei DRC - Pilot ETS Implementation Plan (Chinese)
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** (13th Five Year Plan): 19.5% reduction in carbon intensity compared to 2015 levels.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute 253 MtCO2e (2016)
Carbon Price	*Current Allowance Price (per t/CO2e):* CNY 16.39 (approx. USD 2.49) (secondary market price as of 20 June 2016)

ETS Size

Emissions covered by the ETS	0.35
GHG covered	CO2
Sectors covered and thresholds	Power and heat supply, iron and steel, non-ferrous metals, petrochemicals, chemicals, chemical fiber, cement, glass and other building materials, pulp and paper, ceramics, automobile and general equipment manufacturing, food, beverage and medicine producers. **Inclusion threshold:** Annual energy consumption more than 10,000 tons coal equivalent (tce) in any year between 2013 and 2015 for the power, steel, non-ferrous, chemicals, petrochemicals, building materials and pulp and paper sectors and 60,000 tce for the rest of the sectors.

Number of liable entities	236 (2016) The accounting boundary for emissions is set at the company-level (legal person).
Point of regulation	Mixed: Both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are included in the scheme. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass-through of carbon costs via the electricity price, and would not incentivize demand-side management of electricity. The system therefore covers emissions from the power sector upstream and other sectors downstream.

Phases & Allocation

Compliance period	Due to the late start, compliance for 2013 and 2014 were combined in one phase. A one year compliance period is put in place since 2015 (30 May).
Trading period	Four years (2013-2016)* *Initially, the seven Chinese pilot ETS were scheduled to end after three compliance years and be replaced by the national ETS in 2016. However, as the national ETS will start in second half of 2017, the pilots will continue operating until then and probably also beyond.
Allocation	Free allocation of 2016 vintage allowances through benchmarks for power, heat, co-generation and cement (except the entities using outsourced clinker); historical carbon intensity method for glass and other building material, and ceramics sectors; grandfathering based on 2013-2015 historic emissions for all other sectors. Ex-post allocation adjustments are possible, especially for those sectors that use benchmarks and historical intensity (first receive half of the total allowance based on 2015 production data and then using 2016 actual production data to update allocation). The total cap also includes a reserve for new entrants.

Flexibility

Banking and borrowing	Banking is allowed during the pilot phase, but only for allowances that were traded at least once. Borrowing is not allowed.
Offsets and credits	**Quantitative Limit:** Domestic project-based carbon offset credits — China Certified Emission Reduction (CCER) — is limited to 10% of the annual allocation. **Qualitative Limit:** CCERs must come from rural biogas or forestry projects in the province of Hubei or from provinces and regions that have signed agreements with Hubei and that were generated after 1 January 2015 are allowed.
Provisions for price management	8% of the total cap is kept as government reserve for price management. In case of market fluctuations, severe imbalances between supply and demand or liquidity issues, the Hubei Development and Reform Commission (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 shall take action. Furthermore, the exchange limits day-to-day price fluctuations to ±10%.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Annual reporting of CO2 emissions. **Verification:** Third-party verification is required.

	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 (EUR 1,354) to CNY 30,000 (EUR 4060). Trade participants that manipulate the market face up to CNY 150,000 (EUR 20,306) 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 (EUR 20,306).

Other Information

Institutions involved	Hubei Development and Reform Commission (Competent authority) Hubei Carbon Emissions Exchange (Trading platform)
Linkage with other schemes	No information available yet.

China - Shanghai pilot system

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Shanghai Shanghai was the second Chinese region, after Shenzhen, to start its pilot ETS on 26 November 2013. The pilot covers more than half of the city's emissions, including power, industrial and non-industrial sectors like building, aviation and shipping. Shanghai completed its third compliance period in June 2016 for the 2015 vintage, achieving full compliance for three years in a row. In 2016 Shanghai further expanded its ETS coverage. Shanghai is one of the most active markets among the pilots, with regards to the cumulative trade volume and transaction amount. On 12 January 2017, Shanghai Environmental and Energy Exchange and Shanghai Clearing House (SHCH) jointly launched Over-the-Counter Shanghai Emission Allowance Forward (SHEAF) with Central Counterparty (CCP) clearing, as an innovative financial product that serves a similar purpose to carbon financial derivatives. Shanghai DRC - ETS pilot Implementation Plan (Chinese) Interim Measures for Emissions Trading in Shanghai (Chinese)
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** (13th Five Year Plan): 20.5% reduction in carbon intensity compared to 2015.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute 155 MtCO2e (2016)
Carbon Price	*Current Allowance Price (per t/CO2e):* CNY 7.14 (approx. USD 1.08) (secondary market price as of 20 June 2016)

ETS Size

Emissions covered by the ETS	0.57
GHG covered	CO2
Sectors covered and thresholds	The following sectors are covered: airports, aviation, chemical fiber, chemicals, commercial, power and heat, water suppliers, commercial, hotels, financial, iron and steel, petrochemicals, ports, shipping, non-ferrous metals, building materials, paper, railways, rubber, and textiles. **Inclusion thresholds:** **For power and industry:** 20,000t CO2/year or 10,000 tons coal equivalent (tce)/year; and those already participated in 2013-2015 phase with 10,000 CO2/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:** 10,000 CO2/year or 5,000 tce/year.
Number of liable entities	368 (2016) The accounting boundary for emissions is set at the company-level (legal person).
Point of regulation	Mixed: Both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are included in the scheme. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass-through of carbon costs via the electricity price, and would not incentivize demand-side management of electricity. The system therefore covers emissions from the power sector upstream and other sectors downstream.

Phases & Allocation

Compliance period	One year (30 June)
Trading period	Three years (2013-2015 formal, 2016-2018 indicative)* *Initially, the seven Chinese pilot ETS were scheduled to end after three compliance years and be replaced by the national ETS in 2016. However, as the national ETS will start in second half of 2017, the pilots will continue operating until then and probably also beyond. Shanghai has indicated a second 3-year phase to run until 2018 with the announcement of the transition plan for the Shanghai Emissions Allowances (2013–2015) to be banked to Phase II 2016–2018.
Allocation	Free allocation based on sector-specific benchmarks (power, heat, car glass manufacturers), historic emissions intensity (industry, aviation, ports, shipping, and water suppliers, generally based on 2013-2015 data) or historic emissions (buildings and commercial sector, generally based on 2013-2015 data). Ex-post allocation adjustments, e.g., on the basis of production data, are possible. A smaller share of the annual cap will be auctioned.

Flexibility

Banking and borrowing	Within the pilot phase, banking is allowed across compliance periods. For banked allowances from the first trading period (2013-2015), only one third can be used per year between 2016 and 2018 for compliance entities; fully bankable for institutional investors without limit (except for OTC deals after 9 May 2016 with one third of the SHEA to be exchanged per year between 2016 and 2018). Borrowing is not allowed.
Offsets and credits	**Quantitative Limit:** Domestic project-based carbon offset credits — China Certified Emission Reduction (CCER) — are allowed. The use of CCER credits is limited to 1% of the annual allocation. **Qualitative Limit:** Credits for reductions that were realized before January 2013 cannot be used for compliance. Credits from hydro projects are not allowed.
Provisions for price management	If prices vary more than 10% in one day, the Shanghai Environment and Energy Exchange can take price stabilization measures, temporarily suspend trading or impose holding limits.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Annual reporting of CO2 emissions. **Verification:** Third-party verification is required. **Framework:** The Shanghai Development and Reform Commission (DRC) has released guidelines for monitoring and reporting for the following ten sectors: Iron and steel, electricity and heat, chemicals, non-ferrous 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 emission report or verification report on time or providing fraudulent information range from CNY 10,000 (EUR 1,309) to CNY 50,000 (EUR 6,544). Between CNY 50,000 (EUR 6,544) – CNY 100,000 (EUR 13,088) can be imposed for non-compliance, besides surrendering the adequate amount of allowances. On top of the financial sanctions, further sanctions may be imposed, e.g., 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.

Other Information

Institutions involved	Shanghai Development and Reform Commission (Competent authority) Shanghai Environment and Energy Exchange (Trading platform)
Linkage with other schemes	No information available yet.

China - Shenzhen pilot system

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Shenzhen Shenzhen was the first of the Chinese pilot ETSs to start operation on 18 June 2013. In June 2016, Shenzhen finished its third compliance period (with a 99.8% compliance rate). On 18 September 2016, the Shenzhen Development and Reform Commission (DRC) released its working plan for the 2016 vintage, including a list of new companies and the 2016 allocation plan. The Shenzhen ETS covers a total of 824 entities, including 246 new entrants. These new entrants come from industry sectors, as well as the public transport and port sectors. Shenzhen ETS bill (Chinese) Interim Measures for Emissions Trading in Shenzhen (Chinese) Shenzhen ETS press conference September 2012 (Chinese)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 153 $MtC0_2e$ (2012)
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	**By 2020** (13th Five Year Plan): 45% reduction in carbon intensity compared to 2005, to reach 0.81 tCO2/ CNY 10000. Shenzhen has also pledged to peak its GHG emissions by 2022, as one of the first group of cities in China to endorse such peak year target.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute 31.45 MtCO2e (excluding buildings, 2015)
Carbon Price	*Current Allowance Price (per t/CO2e):* CNY 36.00 (approx. USD 5.46) (secondary market price as of 20 June 2016)

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 non-transport sectors. **Inclusion thresholds:** 3,000t CO2e/year for enterprises; 20,000m2 for public buildings and 10,000m2 for government buildings.
Number of liable entities	824 The accounting boundary for emissions is set at the company-level (organizational and operational boundary).

Point of regulation	Mixed: Both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are included in the scheme. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass-through of carbon costs via the electricity price, and would not incentivize demand-side management of electricity. The system therefore covers emissions from the power sector upstream and other sectors downstream.

Phases & Allocation

Compliance period	One year (30 June)
Trading period	Four years (2013-2016)* *Initially, the seven Chinese pilot ETS were scheduled to end after three compliance years and be replaced by the national ETS in 2016. However, as the national ETS will start in the second half of 2017, the pilots will continue operating until then and probably also beyond.
Allocation	Allowances are largely distributed for free. Benchmarking is applied to the water, power and gas sectors based on sectoral historical carbon intensity; while grandfathering based on the entity's historical carbon intensity is applied to port and subway sectors, public buses and other non-transport sectors. For those using benchmarking and historical carbon intensity, the final number of allowances will be updated based on 2016 output. The Interim Measure for the Administration of Carbon Emission Trading of Shenzhen indicated that at least 3% of allowances are ought to be auctioned. As of November 2016, only one auction has taken place (June 2014).

Flexibility

Banking and borrowing	Banking is allowed during the pilot phase. Borrowing not allowed. Different from other pilots, Shenzhen releases its annual allowances before the compliance date of previous vintage but doesn't allow them to be used for the purpose for previous vintage compliance.
Offsets and credits	**Quantitative Limit:** Domestic project-based carbon offset credits — China Certified Emission Reduction (CCER) —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 there are further geographic restrictions for the use of certain CCERs.
Provisions for price management	In case of market fluctuations, the Shenzhen Development and Reform Commission (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

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Annual reporting of CO2 emissions with a tier approach taking into account the size of the company. **Verification:** Third-party verification is required.
Enforcement	Institutes providing fake information can be fined for the difference between reported and actual emissions at the price three times of the average of the past six months. Penalties for disturbing the market order can cost up to CNY 100,000 (EUR 13,088). 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 Information

Institutions involved	Shenzhen Development and Reform Commission (Competent authority) China Shenzhen Emissions Exchange (Trading platform)
Linkage with other schemes	No information available yet.

China - Tianjin pilot system

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Tianjin The Tianjin pilot ETS started operation on 26 December 2013 and has finished three compliance years thus far. The system covers enterprises from five sectors: heat and electricity production, iron and steel, petrochemicals, chemicals, as well as oil and gas exploration. These industries account for around 55% of the city's total emissions. Tianjin DRC - ETS Pilot Implementation Plan (Chinese) Interim Measures for Emissions Trading in Tianjin (Chinese)
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** (13th Five Year Plan): 20.5% reduction in carbon intensity compared to 2015 levels.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute 160-170 MtCO2e
Carbon Price	*Current Allowance Price (per t/CO2e):* CNY 19.00 (approx. USD 2.88) (secondary market price of 20 June 2016)

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 of oil and gas. **Inclusion threshold:** 20,000t CO2/year considering both direct and indirect emissions.
Number of liable entities	109 (2015) The accounting boundary for emissions is set at the company-level (legal person).
Point of regulation	Mixed: Both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are included in the scheme. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass-through of carbon costs via the electricity price, and would not incentivize demand-side management of electricity. The system therefore covers emissions from the power sector upstream and other sectors downstream.

Phases & Allocation

Compliance period	One year (31 May) according to the Interim Measure for the Administration of Carbon Emission Trading of Tianjin; in practice 30 June 2016 for 2015 vintage, 10 July 2015 for 2014 vintage, and 25 July 2014 for 2013 vintage.
Trading period	Four years (2013-2016)* * Initially, the seven Chinese pilot ETS were scheduled to end after three compliance years and be replaced by the national ETS in 2016. However, as the national ETS will start in the second half of 2017, the pilots will continue operating until then and probably also beyond.
Allocation	Mainly free allocation through grandfathering based on 2009-2012 emissions or emissions intensity. Benchmarking for new entrants and expanded capacity.

Flexibility

Banking and borrowing	Banking is allowed during the pilot phase. Borrowing is not allowed.
Offsets and credits	**Quantitative Limit:** Domestic project-based carbon offset credits — China Certified Emission Reduction (CCER) — are allowed. The use of CCER credits is limited to 10% of the annual compliance obligation. **Qualitative Limit:** Credits have to stem from CO2 reduction projects, excluding hydro and have to be realized after 2013.
Provisions for price management	In case of market fluctuations, the Tianjin Development and Reform Commission (DRC) can buy or sell allowances in order to stabilize the market.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Annual reporting of CO2 emissions. **Verification:** Third-party verification is required.
Enforcement	In case of non-compliance, companies are disqualified for preferential financial support and policies for three years. There are no financial penalties for non-compliance.

Other Information

Institutions involved	Tianjin DRC (Competent authority) Tianjin Climate Exchange (Trading platform)
Linkage with other schemes	No information available yet.

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) is the world's first and, until implementation of the Chinese national ETS, remains the largest GHG trading system. The EU ETS represents the central pillar of the European Union's (EU) climate change policy. In 2016, the focus has been on the European Commission's proposed amendments for revision of the EU ETS for its fourth phase (2021-2030). The proposed amendments aim to align the cap with the EU's 2030 target to reduce GHG emissions by at least 40% domestically by 2030, provide for better targeted free allocation rules and to further support low-carbon innovation and energy sector modernization. The proposal is still under discussion in the European Parliament and the Council. In 2015, a Decision to create a Market Stability Reserve (MSR) was adopted, a structural measure addressing the large accumulated allowance surplus, which depressed the allowance price in recent years. The MSR, which will start operating in January 2019, aims at neutralizing the negative impacts of the existing allowance surplus and improving the system's resilience to future shocks. Allowances will be added to the reserve if the total number of allowances in circulation is higher than 833 million allowances. As part of the decision, the 900 million back-loaded allowances, which were withdrawn from auctions from 2014-2016, and for the time being an unknown amount of unallocated allowances, will be placed directly into the reserve. European Commission Website on the EU ETS Official EU ETS Fact Sheet 2013 Consolidated version of the EU ETS Directive Information on the EU ETS in the previous phases (2005-2012)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 4336.1 $MtC0_2e$ (2014) Aggregation of data from the National Inventory Reports (NIRs) 2013 submitted to the UNFCCC and accessed via the EEA Greenhouse Gas Data Viewer: 27 EU Member States (4,550 MtCo2e), Croatia (28.256 MtCO2e), Iceland (4.413 MtCO2e), Lichtenstein (0.22 MtCO2e) and Norway (53.4 MtCO2e). Data bases mostly on 1996 IPCC guidelines and on the IPCC Good Practice Guidances. Please refer to the respective NIRs for detailed information on methodologies used for emissions reporting.
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 3342.4 Industrial Processes — 402.6 Solvent & other product use — 4.3 Agriculture — 440.9 Waste — 145.8
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
Type of ETS	Mandatory

Cap and trajectory	**Type of Cap:** Absolute **Phases one and two (2005-2012):**Decentralized cap-setting, the EU cap resulted from the aggregation of the National Allocation Plans of each Member State. **Phase three (2013-2020):**Single EU-wide cap for stationary sources: 2,084 MtCO2e in 2013, which will be annually reduced by a constant linear reduction factor (currently 1.74% of the midpoint of the cap in phase 2 or around 38.3 million tons). Aviation sector cap: 210 MtCO2e/year for 2013-2020 (not decreasing). However, following the temporary derogation of obligations related to flights to and from third countries until the end of 2016, the issuance of allowances has been adjusted accordingly. **Phase four (2021-2030):**According to the European Commission's proposal for the revision of the EU ETS (see above), the annual linear reduction factor to reduce the cap on the maximum permitted emissions is proposed to be changed from 1.74% to 2.2% (48 million tons) from 2021. The linear reduction factor does not have a sunset clause and as such the cap will continue to decline beyond 2030.
Carbon Price	*Current Allowance Price (per t/CO2e):* EUR 5.76 (approx. USD 6.49) (clearing price at aution as of 20 June 2016)

ETS Size

Emissions covered by the ETS	0.45
GHG covered	CO2, N2O, PFCs
Sectors covered and thresholds	**Phase one (2005-2007):**Power stations and other combustion installations with >20MW thermal rated input (except hazardous or municipal waste installations), industry (various thresholds) including oil refineries, coke ovens, iron and steel plants and production of cement, glass, lime, bricks, ceramics, pulp, paper and board. **Phase two (2008-2012):**In addition to Phase one sectors, aviation was introduced in 2012 (>10,000 t CO2/year for commercial aviation; >1,000 t CO2/year for non -commercial aviation since 2013) (see below). **Phase three (2013-2020):** In addition to Phase two sectors, CCS installations, production of petrochemicals, ammonia, non-ferrous and ferrous metals, gypsum, aluminum, nitric, adipic and glyoxylic acid (various thresholds) were included – see Annex I of the EU ETS Directive. **International Aviation:** Emissions from international aviation have been included in the EU ETS since 2012. In November 2012, the EU temporarily suspended enforcement of the EU ETS requirements for extra-EU flights operating from or to non-European countries (so-called 'stop the clock'), while continuing to apply the legislation to flights within and between countries in the European Economic Area (EEA). Exemptions for operators with low emissions have also been introduced. The EU will decide on how to regulate extra-EU aviation emissions within the EU ETS after 2016 based on a report from the European Commission regarding the Carbon Offsetting and Reduction Scheme (CORSIA) of the International Civil Aviation Organization (ICAO), passed at the 39th Assembly Session in October 2016.
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. In the EU ETS, liable entities are defined at the installation level. Installation is defined in the EU ETS Directive as: "a stationary technical unit where one or more activities listed in Annex I are carried out and any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution". (Article 3 (e)) In addition, liable entities in the aviation sector are defined at the level of aircraft operator as: "person who operates an aircraft at the time it performs an aviation activity listed in

	Annex I or, where that person is not known or is not identified by the owner of the aircraft, the owner of the aircraft" (Article 3 (o))
Point of regulation	Downstream

Phases & Allocation

Compliance period	From 1 January until 30 April the following year (16 months)
Trading period	**Phase one:** Three years (2005-2007) **Phase two:** Five years (2008-2012) **Phase three:** Eight years (2013-2020) **Phase four:** Ten years (2021-2030)
Allocation	**Phase one (2005-2007):** Nearly 100% free allocation through grandfathering. Some Member States used auctioning and some used benchmarking. **Phase two (2008-2012):** Similar to Phase one with some benchmarking for free allocation and some auctioning in eight EU Member States (about 3% of total allowances). **Phase three (2013-2020):** In 2013, about 40% of total allowances were auctioned, with different allocation rules for the electricity, manufacturing and aviation sectors. **Electricity sector:**100% auctioning with optional derogation for the modernization of the electricity sector in certain Member States. In line with the 2030 framework for climate and energy, Member States with a GDP per capita in 2013 below 60% of the EU average may continue to make use of this optional free allocation in Phase four. **Manufacturing sector:** Free allocation is based on benchmarks. Sub-sectors deemed at risk of carbon leakage will receive free allocations at 100% of the pre-determined benchmarks. Sub-sectors deemed not at risk of carbon leakage will have free allocation phased out gradually from 80% of the benchmarks in 2013 to 30% by 2020. **Aviation sector:** In 2012, 85% of allowances were allocated for free based on benchmarks. For Phase three (2012-2020): 15% of allowances are auctioned and 82% allocated for free based on benchmarks. The remaining 3% constitutes a special reserve for new entrants and fast growing airlines. **Back-loading:** 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 until 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 not be auctioned but be placed directly 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 four (2021-2030):** On 15 July 2015, the European Commission proposed amendments to the EU ETS directive to enhance cost-effective emissions reductions and low-carbon investments. A central component of the proposed amendments refers to the continuation of transitory measures to address the risk of carbon leakage and a revision of the free allocation of allowances. According to the European Commission, the limited and declining number of allowances requires that the current system of free allocation be revised in order to distribute allowances in the most effective and efficient way. To this end, changes are proposed to: On 15 July 2015, the European Commission proposed amendments to the EU ETS directive to enhance cost-effective emissions reductions and low-carbon investments. A central component of the proposed amendments refers to the continuation of transitory

measures to address the risk of carbon leakage and a revision of the free allocation of allowances. According to the European Commission, the limited and declining number of allowances requires that the current system of free allocation be revised in order to distribute allowances in the most effective and efficient way. To this end, changes are proposed to:

· Benchmark values, which will be updated to reflect technological progress in the different sectors.

· Production data to better take into account production increases or decreases and to adjust the amount of free allocation accordingly. This should also make the EU ETS more flexible.

· Make carbon leakage rules more targeted. The number of sectors receiving 100% of the benchmark-based free allocation will be reduced.

In addition, the European Commission proposed to transfer 250 million unused allowances from 2013-2020 to establish a reserve for new and growing installations. Amendments to the Commission's proposal are currently discussed within the European Parliament and in the Council.

Flexibility

Banking and borrowing	Unlimited banking is allowed since 2008. Borrowing is not allowed.
Offsets and credits	**Phase one (2005-2007):** Unlimited use of Clean Development Mechanism (CDM) and Joint Implementation (JI) credits. **Phases two (2008-2012) and three (2013-2020):** **Qualitative limit:** Most categories of CDM/JI credits are allowed (restrictions vary across different EU Member States), no credits from the land use, land-use change and forestry (LULUCF) and nuclear power sectors. Strict requirements apply for large hydro projects exceeding 20 MW. Since the start of Phase three (1 January 2013), additional restrictions apply for CDM: newly generated (post-2012) international credits may only come from projects in Least Developed Countries (LDCs). 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 are no longer accepted as of 31 March 2015.ommitment period of the Kyoto Protocol are no longer accepted as of 31 March 2015. **Quantitative limit:** In Phase two (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 three (2013-2020). The total use of credits for Phase two and three may amount up to 50% of the overall reduction under the EU ETS in that period (approximately 1.6 billion tons CO2e). **Phase four (2021-2030):** Currently no international offsets are envisaged.
Provisions for price management	The EU ETS Directive provides for measures in the event of excessive price fluctuations. In 2015, a Decision to create a Market Stability Reserve (MSR) was adopted, a structural measure addressing the large accumulated allowance surplus, which depressed the allowance price in recent years. The MSR, which will start operating in January 2019, aims at neutralizing the negative impacts of the existing allowance surplus and improving the system's resilience to future shocks. Allowances will be added to the reserve if the total number of allowances in circulation is higher than 833 million allowances. As part of the decision, the 900 million back-loaded allowances, which were withdrawn from auctions from 2014-2016, and for the time being an unknown amount of unallocated allowances, will be placed directly into the reserve.

Compliance

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. **Framework:** For Phase three onwards, European Commission Regulations have been published for monitoring and reporting, and for 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 emitted for which no allowance has been surrendered in due time. The name of the non-compliant operator is also published. Different penalties exist at the national level for other forms of non-compliances.

Other Information

Institutions involved	The European Commission and the relevant authorities of the 28 Member States, Iceland, Liechtenstein, and Norway.
Linkage with other schemes	The European Commission has concluded negotiations with Switzerland on linking the EU ETS with the Swiss ETS. However, the link will only become operational once the agreement will have been signed and enter into force.

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. Saitama's ETS is bilaterally linked to that of Tokyo. In FY2014, the Saitama ETS had achieved a 24% reduction below base-year emissions.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 38.5 $MtC0_2e$ (FY2014 (demand side)) *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 — 10.6 Residential — 7.7 Transport — 9.7 Commercial — 4.8
Overall GHG reduction target	**By 2020:** 21% reduction from 2005 GHG levels (demand side).
Type of ETS	mandatory
Cap and trajectory	**Type of Cap:** Absolute An absolute cap is set at the facility level, which aggregates to a Saitama-wide cap. This is calculated according to the following formula: Sum of base year emissions of covered facilities x compliance factor (8%/6%) x number of years of a compliance period. (First Period: four years, Second Period: five years). **Compliance factor:** First Period (FY2011-FY2014): 8% or 6% reduction below base-year emissions. Second Period (FY2015-FY2019): 15% or 13% reduction below base-year emissions.
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	Commercial and industrial sectors. **Inclusion Threshold:** Facilities that consume energy more than 1,500kL of crude oil equivalent or more per year.
Number of liable entities	568 facilities (as of 31 March 2015)

	No information available yet.
Point of regulation	Downstream

Phases & Allocation

Compliance period	Four or Five years. **First Period:** FY2011-FY2014 **Second Period:** FY2015-FY2019 The fiscal year runs from 1 April to 31 March.
Trading period	**First Period:** 1 April 2012 to 30 September 2016 (compliance period and adjustment year). **Second Period:** 1 April 2015 - 30 September 2021 (compliance period and adjustment year).
Allocation	Grandfathering based on historical emissions is calculated according to the following formula: Base year emissions x (1-compliance factor) x compliance period. Base year emissions for the first compliance period are based on the average emissions of three consecutive fiscal years between 2002 and 2007. Allocation to new entrants is based on past emissions or on emissions intensity standards: Emissions activity (floor area) x emission intensity standard.

Flexibility

Banking and borrowing	Banking is allowed between two consecutive compliance periods (e.g. banking from first to second compliance period is allowed. Banking from first to third is not). Borrowing is not allowed.
Offsets and credits	Currently credits from five offset types are allowed in the Saitama scheme. **Small and Mid-size Facility Credits:** Total amount of emission reductions achieved by implementing emission reduction measures from non-covered small and medium sized facilities in Saitama since FY2011. Issuance of credits from FY2012. Small and Mid-size Facility Credits can be used for compliance without limit. **Outside Saitama Credits:** Emission reductions achieved from large facilities outside the Saitama Prefecture. Large facilities: energy consumption of 1,500kL of crude oil equivalent or more in a base-year, and with base-year emissions of 150,000 tonnes or less. Credits only issued for the reduction amount that exceeds the compliance factor of 8%. Issuance of credits from FY2015. Outside Saitama Credits can be used for compliance for up to one-third, in the case of offices, or to half, in the case of factories, for the facilities' reduction targets. **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) and hydro power (1,000kW to 10,000kW) are converted with the factor 1. Types of Credits: Environmental Value Equivalent, Renewable Energy Certificates, New Energy Electricity generated under the Renewable Portfolio Standard Law. Renewable Energy Credits can be used for compliance without limit. **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. Forest absorption Credits can be used for compliance without limit.

	Tokyo Credits (via linking), two types: 1) Excess Credits from TMG ETS: Emission reductions from facilities with base-year emissions of 150,000t or less. Issuance of credits from FY2015. 2) Small and mid-size Facility Credits issued by TMG ETS: Issuance of credits from FY2012. Tokyo Credits can be used for compliance without a limit. All offsets have to be verified by verification agencies.
Provisions for price management	In general, the Saitama Prefectural Government does not control carbon prices. However, the supply of credits available for trading may be increased in case of excessive price evolution.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Annual reporting. All seven GHGs have to be monitored and reported: CO2 (non-energy related), CH4, N2O, PFCs, HFCs, SF6 and NF3. **Verification:** Verification is required only when it is used for compliance. **Framework:** Participants are required to report their verified emissions based on the Saitama Prefectural Government Monitoring/Reporting Guidelines and the Saitama Prefectural Government Verification Guidelines. **Other:** Verified reduction amounts can be used for compliance, but cannot be traded with other facilities except for energy-related CO2.
Enforcement	None

Other Information

Institutions involved	Saitama Prefectural Government
Linkage with other schemes	Linking with Tokyo started in April 2011. Credits from excess emission reductions and Small- and Mid-size Facility Credits (offsets) are officially eligible for trade between the two jurisdictions. During the first compliance period, 14 credit transfers took place between the Saitama Prefecture and Tokyo (8 cases from Tokyo to Saitama, 6 cases from Saitama to Tokyo).

Japan - Tokyo Cap-and-Trade Program

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Tokyo Metropolis The Tokyo Metropolitan Government Cap-and-Trade Program (TMG ETS), launched in April 2010, is Japan's first mandatory ETS. Under the TMG ETS, large offices and factories are required to reduce emissions by 6%-8% in the first period (FY 2010-2014). Now in its second period, the target has increased to 15%-17%. In FY2014, emissions by covered entities went down 25% compared to base-year emissions. This amounts to a 14 million ton reduction in the first compliance period. TMG Bureau of Environment Website on Tokyo Cap and Trade Official Documents on the Toyko Cap and Trade Program
Overall GHG emissions (excluding LULUCF)	**Emissions:** 67.3 $MtC0_2e$ (2014) The overall emissions figure for Tokyo is higher than the total of the emissions by sector because the former includes all GHGs in Tokyo, whereas the emissions by sector only measures CO2 emissions.
Overall GHG emissions by sector	Sector Name: MtCO2e Commercial: 24.7 Transport: 11.6 Residential: 19.7 Industry: 4.7 Waste: 1.6
Overall GHG reduction target	**By 2020:** 25% reduction from 2000 GHG levels. **By 2030:** 30% reduction from 2000 GHG levels.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute The absolute cap is set at the facility level that aggregates to a Tokyo-wide cap. This is 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. The higher compliance factors (8% and 17%) apply to office buildings, and district and cooling plant facilities (excluding facilities which use a large amount of district heating and cooling). The lower compliance factors (6% and 15%) apply among others to office buildings, facilities which are heavy users of district and cooling plants, and factories. Highly energy efficient facilities that have already made significant progress with regards to climate change measures are subject to half or three-quarters of the compliance factor.
Carbon Price	*Current Allowance Price (per t/CO2e):* No information available yet.

ETS Size

Emissions covered by the ETS	0.20
GHG covered	CO2
Sectors covered and thresholds	Commercial and Industrial Sectors. **Inclusion Thresholds:** Facilities that consume energy more than 1,500kL of crude oil equivalent or more per year.
Number of liable entities	Approximately 1300 facilities In general a liable entity is defined as a single facility (installation). There are two exceptional cases where multiple facilities are regarded as a single facility: 1) multiple facilities with integrated energy management are regarded as a single facility as a whole. 2) Close or adjacent facilities owned by a common owner are regarded as a single facility. For buildings, case" 2)" applies only if the major users of the buildings are identical.
Point of regulation	Downstream

Phases & Allocation

Compliance period	Five years. **First Period:** FY2010-FY2014 **Second Period:** FY2015-FY2019 Fiscal year runs from 1 April to 31 March.
Trading period	**First Period:** 1 April 2011 to 30 September 2016 (compliance period and adjustment year) **Second Period:** 1 April 2015 to 30 September 2021 (compliance period and adjustment year)
Allocation	Grandfathering 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-FY2007. Allocation to new entrants is based on past emissions or on emissions intensity standards: emissions activity (floor area) x emission intensity standard.

Flexibility

Banking and borrowing	Banking is allowed between two compliance periods (e.g. banking from first to second compliance period is allowed. Banking from first to third is not). Borrowing is not allowed.
Offsets and credits	Currently credits from four offset types are allowed in the TMG ETS. **Small and Mid-size Facility Credits:** Total amount of emission reductions achieved by implementing emission reduction measures from non-covered small- and medium-sized facilities in Tokyo since FY2010. Issuance of credits from FY2011. Small and Mid-size Facility Credits can be used for compliance without limit.

	Outside Tokyo Credits: Emission reductions achieved from large facilities outside of the Tokyo area. Large facilities: energy consumption of 1,500 kL of crude oil equivalent or more in a base-year, and with base-year emissions of 150,000t or less. Credits are only issued for the reduction amount that exceeds the compliance factor of 8%. Issuance of credits from FY2015. Outside Tokyo 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 1,000 kW) 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. Types of Credits: Environmental Value Equivalent, Renewable Energy Certificates and New Energy Electricity, generated under the Renewable Portfolio Standard Law. Renewable Energy Credits can be used for compliance without a limit. **Saitama Credits (via linking), two types:** 1) Excess Credits of the Saitama Scheme: Emission reductions from facilities with base-year emissions of 150,000 tons or less. Issuance of credits from FY2015. 2) Small and mid-size Facility Credits issued by Saitama Prefecture. Issuance of credits from FY2012. Saitama Credits can be used for compliance without a limit. All offsets have to be verified by verification agencies.
Provisions for price management	In general, TMG does not control carbon prices. However, the supply of credits available for trading may be increased in case of excessive price evolution.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Participants are required to annually submit (fiscal year) their emission reduction plans and emissions reports. Seven GHG gases have to be monitored and reported: CO2 (non-energy related), CH4, N2O, PFCs, HFCs, SF6 and NF3. **Verification:** These reports also require third-party verification. **Framework:** These are based on "TMG Monitoring/Reporting Guidelines" and "TMG Verification Guidelines". **Other:** CO2 emission factors are fixed during the five year compliance period. Verified reduction amounts can be used for compliance, but cannot be traded with other facilities except energy-related CO2. Verification is required only when it is used for compliance.
Enforcement	In case of non-compliance, the following measures may be taken in two stages: 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 [EUR 4, 113]) and surcharges (1.3 times the shortfall).

Other Information

Institutions involved	TMG Bureau of Environment
Linkage with other schemes	Linking with the Saitama Prefecture started in April 2011 when the Saitama ETS was launched. Credits from excess emission reductions and Small- and Mid-size Facility Credits (offsets) are officially eligible for trade between the two jurisdictions. During the first compliance period, 14 credit transfers took place between the Saitama Prefecture and Tokyo (8 cases from Tokyo to Saitama, 6 cases from Saitama to Tokyo).

Korea Emissions Trading Scheme

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Republic of Korea On 1 January 2015, the Republic of Korea launched its national ETS (KETS), the first nation-wide Cap-and-Trade program in operation in East Asia. The ETS covers approximately 525 of the country's largest emitters, which account for around 68% of national GHG emissions. The KETS covers direct emissions of six Kyoto gases, as well as indirect emissions from electricity consumption. The KETS will play an essential role in meeting Korea's 2030 NDC target of 37% below BAU emissions. In the first two years of operation, trade under the KETS has been limited. In 2016, efforts have been made to increase the supply of allowances in the Korean market to ease the pressure on market participants. Firstly, the share of allowances companies can borrow for compliance was doubled (from 10% to 20%). Secondly, an additional 900,000 allowances were offered from the Allowance Reserve at a floor price of around EUR 12. Finally, 2.3 million Korean Offset Credits were also added to the market. Website of the Korean Ministry of Environment Presentation by the Korea Environment Corporation at the ICAP Side Event at the UNFCCC COP19 (November 2013)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 694.5 $MtC0_2e$ (2013) Official data of the Greenhouse Gas Inventory & Research Center of Korea (GIR)
Overall GHG emissions by sector	Sector Name — MtCO2e Fuel combustion (excl. Transport) — 513.4 Transport — 88.3 Fugitive emissions — 4.6 Industrial processes — 52.6 Agriculture — 20.7 Waste — 14.9
Overall GHG reduction target	**BY 2020:** 30% below BAU. **By 2030:** 37% below BAU (536 MtCO2e, NDC pledge). This represents a 22% reduction below 2012 GHG levels.
Type of ETS	Mandatory with voluntary opt-in
Cap and trajectory	**Type of Cap:** **Phase one (2015-2017):** 1,687 MtCO2e, including a reserve of 89 million tCO2e for market stabilization measures, early action and new entrants. 2015: 573 MtCO2e, 2016: 562 MtCO2e, 2017: 551 MtCO2e Caps for phase two and three have not yet been announced.
Carbon Price	*Current Allowance Price (per t/CO2e):* KRW 17,000 (approx. USD 14.34) (secondary market price of 20 June 2016)

ETS Size

Emissions covered by the ETS	0.68
GHG covered	CO2, CH4, N2O, PFCs, HFCs, SF6
Sectors covered and thresholds	**Phase one (2015-2017):** 23 sub-sectors from steel, cement, petro-chemistry, refinery, power, buildings, waste and aviation sectors. **Inclusion thresholds:** Company >125,000 tCO2/year, facility >25,000 tCO2/year
Number of liable entities	525 business entities including 5 domestic airlines. Business entities eligible for the allocation of emissions allowances specified in the relevant allocation plan under Article 5 (1) 3.
Point of regulation	Downstream

Phases & Allocation

Compliance period	One year
Trading period	**Phase one:** Three years (2015-2017) **Phase two:** Three years (2018-2020) **Phase three:** Five years (2021-2025)
Allocation	**Phase one (2015-2017):** 100% free allocation, no auctioning. Most sectors will receive free allowances based on the average GHG emissions of the base year (2011-2013). Three sectors (grey clinker, oil refinery, aviation) will be allocated free allowances following benchmarks based on previous activity data from the base year (2011-2013). During Phase one about 5% of total allowances are retained in a reserve for market stabilization measures (14 MtCO2e), early action (41 MtCO2e), and other purposes including new entrants (33 MtCO2e). In addition, any unallocated allowances and withdrawn allowances will be transferred to the reserve. **Phase two (2018-2020):**97% free allowances, 3% auctioned. **Phase three (2021-2025):**Less than 90% free allowances, more than 10% auctioned. 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 without any restrictions. Borrowing is allowed only within a single trading phase (maximum of 10% of entity's obligation in 2015. Increased to 20% in 2016 and 2017), but not across phases.
Offsets and credits	**Phase one (2015-2017) and Phase two (2018-2020):**

	Qualitative limit: Only domestic credits from external reduction activities implemented by non-ETS entities - that meet international standards - may be used for compliance. Domestic CDM credits (CERs) are allowed in the scheme. Eligible activities include those eligible under the CDM and Carbon Capture and Storage (CCS). However, only activities implemented after 14 April 2010 are eligible. **Quantitative limit:**Up to 10% of each entity's compliance obligation. **Phase three (2021-2025):** Up to 10% of each entity's compliance obligation with a maximum of 5% coming from international offsets.
Provisions for price management	The Allocation Committee may decide to implement market stabilization measures in the following 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 (EUR 7). 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 (currently up to 20%). 4. An increase or decrease of the offsets limit (currently up to 10%). 5. Temporary establishment of a price ceiling or price floor. In 2016, the Allocation Committee increased the borrowing limit from 10% to 20%. Furthermore, an additional nine million allowances were made available from auction at a reserve price of 16,200 KRW (EUR 12). Less than a third of allowances were sold.

Compliance

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 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/ton (EUR 70).

Other Information

Institutions involved	In 2016, responsibility for the Korean Emissions Trading Scheme (KETS) moved from the Ministry of Environment to the Ministry of Strategy and Finance.
Linkage with other schemes	No information available yet.

New Zealand Emissions Trading Scheme (NZ ETS)

General Information

Summary	**Status:** ETS in force **Jurisdictions:** New Zealand The NZ ETS was launched in 2008, and has since evolved to cover all sectors of the economy, including forestry as a source of both emissions and units, and agriculture, which currently has reporting without surrender obligations. The first statutory review was completed in 2011 and the NZ ETS was amended in 2012. A second review of the NZ ETS began in 2015, and is currently underway in two stages. Based on stage one consultation, the decision was taken to phase out the 'one-for-two' transitional measure from the beginning of 2017, effectively increasing surrender obligations over the next three years. The ongoing second stage of the review covers issues relating to unit supply, such as auctioning, price stability measures, and forestry sector accounting. Further policy decisions are expected in mid-2017. The NZ ETS was originally designed to be fully linked to international carbon markets under the UNFCCC. However, the use of Kyoto Protocol credits was restricted as of 1 June 2015, effectively making the NZ ETS a domestic-only system. As indicated by New Zealand's NDC, reestablishing a link to high-integrity international carbon markets is a priority under the Paris Agreement. Official Climate Change Information on the NZ ETS Climate Change Response Act 2002 (as at 1 January 2013) Climate Change Response (Emissions Trading and Other Matters) Amendment Bill (2012)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 81.1 $MtCO_2e$ (2014)

Overall GHG emissions by sector	Sector Name	MtCO2e
	Agriculture	39.6
	Energy (excl. transport)	18.1
	Transport	14.1
	Industrial processes and other product use	5.2
	Waste	4.1

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 of New Zealand). **By 2050:** 50% reduction from 1990 GHG levels.
Type of ETS	Mandatory with voluntary opt-in
Cap and trajectory	**Type of Cap:** If auctioning is introduced, then a cap on the supply of NZUs, which will include those units allocated and auctioned, will be set. The NZ ETS was originally designed to operate without a fixed cap, in order to accommodate carbon sequestration from forestry activities and to enable the full use of international carbon markets. However, as allowance supply is now restricted to domestic units (NZUs), the NZ ETS is effectively moving closer to a fixed cap. NZUs are issued either as free allocation to Emissions Intensive Trade Exposed (EITE) activities or for domestic removal activities (i.e. forestry). This means that as long as NZU prices remain below the fixed price offer level ($25/NZU [EUR 17/NZU]), the annual cap is equivalent to the quantity of free allowances and removal units issued (see Allocation).

	The NZ ETS legislation includes provisions to introduce auctioning of New Zealand Units (NZUs) within an overall cap on non-forestry sectors.
Carbon Price	*Current Allowance Price (per t/CO2e):* NZD 17.80 (approx. USD 12.54) (secondary market price of 20 June 2016)

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. Biological emissions from agriculture must be reported, but face no surrender obligations.
Number of liable entities	2,364 entities registered, of which 2,295 have surrender obligations (as of June 2015): 159 entities with mandatory reporting and surrender obligations. 2,136 entities with voluntary reporting and surrender obligations; mostly for forestry activities. 69 entities with mandatory reporting without surrender obligations; mostly for agricultural activities. A liable entity in the NZ ETS is defined as a person carrying out an activity that falls under the scope of the ETS.
Point of regulation	The point of obligation is generally placed upstream. Some large businesses that purchase directly from mandatory NZ ETS participants can choose to opt into the NZ ETS rather than have the costs passed down from their suppliers.

Phases & Allocation

Compliance period	One year for most sectors. Participants registered for post-1989 forestry have mandatory five year compliance periods; however they may choose to report emissions and removals more frequently.
Trading period	For most sectors the NZ ETS has year-on-year allocations and 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	**Industrial sector:** Intensity-based allocation for 26 eligible activities: 90% free allocation for highly for highly EITE activities activities (1,600 tCO2e/NZD 1 million of revenue

	[EUR 652,740]); 60% free allocation for moderately for highly EITE activities activities (800 tCO2e/NZD 1 million of revenue [EUR 652,740]). **Post-1989 forestry sector and other removal activities:** See 'offsets and credits'. In the year to June 2016, 4.6 million NZUs were allocated to industrial participants, and 8.5 million NZUs were granted for removal activities, compared to a total of 20.4 million certificates surrendered in this period. **Forestry and fisheries sectors:** Owners of pre-1990 forest land received a one-off free allocation of NZUs to partially compensate for the impact of the introduction of the NZ ETS on land use flexibility. Fishing quota owners were also compensated for rising fuel costs with a one-off free allocation. In 2012, the NZ ETS legislation was amended to allow the introduction of auctioning of NZUs within an overall cap on non-forestry sectors. However, no decision to implement auctioning has been taken.

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:** As of 1 June 2015, international units are not eligible for surrender in the NZ ETS. NZUs are granted to participants that voluntarily register in the scheme for removal activities. **Forestry Removal Activities:** Participants are entitled to receive one NZU per ton of removals 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. **Other Removal Activities:** participants are currently entitled to receive one NZU per two tons of removals. This is set to increase over the next three years in line with the phase-out of the one-for-two surrender obligation measure (see Price Management Provisions). In the year to June 2016, 8.5 million NZUs were transferred to participants for removal activities (forestry removal activities - 7.1 million, and other removal activities - 1.4 million). Since January 2013, pre-1990 forest landowners have the option to offset deforestation on their land by planting an equivalent new forest elsewhere in New Zealand (under given conditions).
Provisions for price management	Transitional measures were implemented in 2009 to help firms adjust to a carbon price signal. These include: (a) one-for-two surrender obligation for non-forestry sectors (one allowance may be surrendered for every two tons of emissions); and (b) a NZD 25 (EUR 16.32) fixed price option, which effectively acts as a price ceiling. These measures are the focus of phase one of the current ETS review and the government has confirmed that the one-for-two measure is to be phased out over the next three years. The one-for-two measure, effectively a 50% surrender obligation, has been increased to 67% from 1 January 2017, and will increase to 83% from 1 January 2018 and to full surrender obligations from 1 January 2019.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting frequency:** Most sectors are required to report annually.

	Verification: Self-reporting supplemented by audits (methodology is consistent with NZ income tax auditing procedures). Third party verification is only required when participants apply for the use of a unique emissions factor. **Other:** Post-1989 forestry participants are required to report emissions at the end of each five year 'mandatory emissions reporting period', with the option to report annually as well.
Enforcement	An entity that fails to surrender emission units when required to, will have to surrender units and pay a penalty of NZD 30 (EUR 19.58) for each unit. Entities can be fined up to NZD 24,000 (EUR 15,67) 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 (EUR 32,64) 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.

Other Information

Institutions involved	Ministry for the Environment Environmental Protection Authority Ministry for Primary Industries
Linkage with other schemes	No information available yet.

Swiss ETS

General Information

Summary	**Status:** ETS in force **Jurisdictions:** Switzerland The 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 on 1 January 2013. The scheme subsequently became mandatory for large, energy-intensive entities, while medium-sized entities may join voluntarily. It now covers about 10% of the country's total GHG emissions. In the 2013-2020 mandatory phase, participants in the ETS are exempt from the CO2 levy. In January 2016, Switzerland and the EU concluded negotiations on linking their ETSs. Through the bilateral agreement, the two systems will mutually recognize each other's emissions allowances. Once the link is operational, prices should converge resulting in a level playing field for Swiss and EU based industry. While many elements of the Swiss ETS were designed to match provisions in the EU ETS (e.g. allocation benchmarks), the linked Swiss ETS will now also cover aviation as a result of the negotiations. Switzerland has identified lower cost emission reductions, enhanced liquidity, clearer price formation and price stability as expected benefits from the link. Federal Office for the Evironment (FOEN)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 48.6 $MtC0_2e$ (2014)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excl. transport) — 21.4 Transport — 16.0 Industrial processes — 4.1 Agriculture — 6.2 Others (incl. waste and solvent) — 0.9
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 of Switzerland). **By 2030:** 50% reduction from 1990 GHG levels (NDC of Switzerland).
Type of ETS	Mandatory with voluntary opt-in
Cap and trajectory	**Type of Cap:** Absolute **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%), to 4.9 MtCO2e in 2020.
Carbon Price	*Current Allowance Price (per t/CO2e):* CHF 9.00 (approx. USD 9.37) (clearing price at 8 March 2016 aution)

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.)
Sectors covered and thresholds	**Mandatory participation:** Industries listed under Annex 6 of the revised CO2 Ordinance (25 sub-sectors) must participate in the Swiss ETS. **Inclusion Thresholds:** Industries in Annex 6 generally have a total rated thermal input of >20MW. **Possible voluntary opt-in:** Industries a) listed under Annex 7 of the revised CO2 Ordinance (20 sub-sectors) and b) with a total rated thermal input of >10MW. One-time binding notification must be given before 1 June 2013 for industries currently above the threshold. Industries that may become eligible for participation in the future must then register within six months after they have reached the threshold. **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.
Number of liable entities	55 (2015) In the Swiss ETS, liable entities are defined at the installation level.
Point of regulation	Downstream

Phases & Allocation

Compliance period	One year from (31 December). Covered entities have until April 30 of the following year to surrender allowances.
Trading period	**Voluntary phase:** 2008 - 2012 **Mandatory phase:** 2013 - 2020
Allocation	**Voluntary phase (2008-2012):** Each participant was granted free allocation of allowances covering emissions up to their own entity-specific emissions target. **Mandatory phase (2013-2020):**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, 80% free allocation and in 2020 this will be reduced to 30% free allocation. An overarching correction factor is applied given the benchmarked allocation exceeds the overall emissions cap. 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 the New Entrants Reserve (NER).

Flexibility

Banking and borrowing	Banking within compliance periods is allowed. Banking from one compliance period to the next is also allowed without limit. Valid certificates (CERs, ERUs) from the 2008-2012 commitment period may be carried over and surrendered until 30 April 2015. Valid certificates from the 2008-2012 commitment period that have not been requested to be carried over within the deadline will be canceled.
Offsets and credits	**Qualitative limit:** Exclusion criteria are listed in Annex 2 of the revised CO2 Ordinance. Most categories of credits from CDM projects in LDCs 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. In exceptional cases, companies may submit a request to the Federal Office of the Environment to increase this limit. They must prove that they would otherwise not be able to comply with their liability without major economic impairment and commit to acquire as many European allowances as the additional international ones. This provision is limited until 31 December 2018.
Provisions for price management	No information available yet.

Compliance

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 125 CHF/tCO2 (103.89 EUR/tCO2). In addition to the fine, entities must surrender the missing allowances and/or international credits in the following year.

Other Information

Institutions involved	The Federal Office of the Environment
Linkage with other schemes	Switzerland has concluded negotiations with the European Commission on linking the Swiss ETS to the EU ETS. An agreement has been initialed in January 2016. For the agreement to enter into force, it must be signed and ratified by both sides. The timetable for this is open.

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 on 1 January 2013. California has been part of the Western Climate Initiative (WCI) since 2007 and formally linked its system with Québec's on 1 January 2014. In July 2017, California passed legislation extending the cap-and-trade program to 2030. The cap-and-trade program covers sources responsible for approximately 85% of California's GHG emissions. In 2016, California passed legislation to reduce emissions by 40% compared to 1990 levels by 2030. Regulation for the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms California Air Resources Board Website on the Cap-and-Trade Program
Overall GHG emissions (excluding LULUCF)	**Emissions:** 441.5 $MtC0_2e$ (2014) Estimations generally follow a top down-approach. Bottom-up data from the Mandatory Reporting Program is used exclusively in the case of cement plants and refineries and as a complement to top-down sources for in-state electricity generation and imported electricity. All methods are consistent with IPCC 2006 guidelines.
Overall GHG emissions by sector	Sector Name — MtCO2e Transportation — 163.0 Electric Power — 88.4 Commercial and Residential — 49.0 Industrial — 104.2 Agriculture and Forestry — 36.1 Other — 0.8
Overall GHG reduction target	**By 2020:** Return to 1990 GHG levels. **By 2040:** 40% reduction from 1990 GHG levels. **By 2050:** 80% reduction from 1990 GHG levels.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute The caps are listed below in MtCO2e allowances. **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.
Carbon Price	*Current Allowance Price (per t/CO2e):* USD 13.80 (clearing price of May 2017 auction)

ETS Size

Emissions covered by the ETS	0.85
GHG covered	CO2, CH4, and N2O
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 production, glass production, hydrogen production, iron and steel production, lead production, lime manufacturing, nitric acid production, 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 (RBOB) and distillate fuel oil, suppliers of liquid petroleum gas in California and suppliers of liquefied natural gas. **Inclusion Thresholds:** Facilities ≥25,000 tCO2e (metric) per data year.
Number of liable entities	Approximately 450 entities (2015-2017) “Covered Entity” means an entity within California that has one or more of the processes or operations and has a compliance obligation as specified in subarticle 7 of the Cap-and-Trade Regulation; and that has emitted, produced, imported, manufactured, or delivered in 2008 or any subsequent year more than the applicable threshold level specified in section 95812 (a) of the Regulation. General threshold for compliance is 25,000 mtCO2.
Point of regulation	Mixed

Phases & Allocation

Compliance period	Three calendar years (after first compliance period of two years). Allowances for emissions of 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. Note: California's trading period is referred to as 'compliance period’, though a portion (30%) of allowances must be submitted for each year's emissions depending on the year of the trading/compliance period. **First compliance period:** 2013-2014 **Second compliance period:** 2015-2017 **Third compliance period:** 2018-2020
Trading period	California's trading period is referred to as a "compliance period" (see “compliance period”). Allowances are allocated and auctioned with calendar year vintages. Some allowances from future vintages are offered for sale at each auction and may be traded but not used for compliance until the compliance date for the vintage year.
Allocation	Allowances are distributed either via auction or free allocation. **Electrical distribution utilities and natural gas suppliers:** receive allowances on behalf of their ratepayers. Investor-owned electrical utilities must consign the allowances they receive to state-run auctions. Publicly owned electrical utilities may either deposit allowances into a compliance account or consign the allowances to auction. Natural

	gas suppliers must consign an increasing percentage of allowances to auction each year (25% of allowances in 2015, 30% in 2016, and so on); the remainder of allowances must be placed into the natural gas supplier's compliance account. All natural gas and electrical utilities must use the allowance value for ratepayer benefit and for emissions reductions. **Industrial facilities:** Receive free allowances for transition assistance and to prevent leakage. Starting in 2018, transition assistance declines. The amount of free allocation is determined by leakage risk (measured through emissions intensity and trade exposure) and sector-specific benchmarks. Each entity's allocation reduces each year in proportion to the cap. The majority of industrial allocation is based on production benchmarks and is updated annually based on verified production data. There is no cap on the total amount of industrial allocation. **Other allocation:** Other categories of transition assistance are provided for public wholesale water entities, legacy contract generators, universities, and public service facilities. The remainder of allowances is auctioned. This was about 6% of current-vintage allowances in the first compliance period, and increases in subsequent compliance periods.

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. U.S. forest projects 2. Urban forest projects 3. Livestock projects (methane management) 4. Ozone depleting substances projects 5. Mine methane capture (MMC) projects 6. Rice cultivation projects
Provisions for price management	Auction Reserve Price: USD 13.57 in 2017 per allowance. The auction reserve price increases annually by 5% plus inflation, as measured by the Consumer Price Index. An Allowance Price Containment Reserve will be allocated allowances from various budgets (1% from budget years 2013-2014; 4% from budget years 2015-2017; and 7% from budget years 2018-2020). The reserve sale administrator can sell accumulated allowances on a regular basis in three equal price tiers. For 2017, these prices are USD 50.69, 57.04, and 63.37. Tier prices increase by 5% plus inflation (as measured by the Consumer Price Index). If the allowances in the reserve are all sold, allowances from future years are transferred to the reserve and made available for sale.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting frequency:** Once a 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 or exceed 25,000 tCO2e (metric) per year).

	Other: Reporting is required for most operators at or above 10,000 tCO2e (metric) per year. Operators must implement internal audits, quality assurance and control systems for the reporting program and the data reported. More information: Mandatory Greenhouse Gas Reporting Regulation - Overview
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 GHG Reporting Regulation. Under the Cap-and-Trade Regulation, if an entity fails to surrender a sufficient number of compliance instruments to meet its compliance obligation, there is a separate violation of this article for each required compliance instrument that has not been surrendered, or otherwise obtained by the Executive Officer. A separate violation accrues every 45 days after the end of the Untimely Surrender Period for each required compliance instrument that has not been surrendered. Adjustment to Compliance Obligation: Outside of enforcement, there is also an automatic adjustment to the compliance obligation due equal to the number of allowances short for that compliance surrender deadline multiplied by four. A quarter of that amount is retired and the remaining amount is auctioned by the state.

Other Information

Institutions involved	California Air Resources Board (CARB)
Linkage with other schemes	California linked with Québec's ETS on 1 January 2014. Current amendments propose to link the California program with Ontario's emerging ETS beginning in 2018.

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. As foreseen by the original Memorandum of Understanding between the participating states, a RGGI program review was conducted in 2012. Based on 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 is currently undergoing a second program review. RGGI Model Rule RGGI Website RGGI Website - Program design RGGI Website - Regulations
Overall GHG emissions (excluding LULUCF)	**Emissions:** 460.0 $MtC0_2e$ (2012) CAIT-US GHG data are derived by the World Resources Institute from the State Inventory Tool (SIT) of the U.S. Environmental Protection Agency's (EPA's) Emissions Inventory Improvement Program (EIIP).
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 388.5 Industrial Processes — 23.8 Agriculture — 9.4 Waste — 24.2 Bunker Fuels — 0.1
Overall GHG reduction target	**By 2020:** RGGI states have committed to a regional target of a more than 50% reduction of CO2 emissions from electricity generation from 2005 GHG levels.
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute The original cap was stabilized at 149.7 Mt (165 million short tons) CO2 (2009-2014) with a 2.5% annual reduction factor from 2015 through 2018, totaling 10%. However, by 2012, RGGI had experienced more than a 40% reduction in emissions from the original cap. Because of these reduced emissions, the states lowered the cap to 91 million short tons in 2014 as part of the 2012 program review. The revised regulations extend the 2.5% annual reduction factor through 2020, with a 2020 cap of approximately 78 million short tons.
Carbon Price	*Current Allowance Price (per t/CO2e):* USD 2.53 (clearing price at June 2017 auction; short tons)

ETS Size

Emissions covered by the ETS	0.20
GHG covered	CO2
Sectors covered and thresholds	Fossil fuel electric generating units **Inclusion thresholds:** equal to or greater than 25MW.
Number of liable entities	164 entities (as of October 2016) In the RGGI program, liable entities are defined at the level of power plants.
Point of regulation	Downstream (at installation level)

Phases & Allocation

Compliance period	RGGI's compliance and trading period is referred to as a control period. **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.
Trading period	RGGI's trading period is referred to as a control period. **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	The vast majority of 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 is allowed without restrictions.

	An annual reduction in the number of allowances offered by states at auction accounts for the large surplus of banked allowances currently in the market. Borrowing is not allowed.
Offsets and credits	**Quantitative limit:**3.3% of an entity's liability may be covered with offsets. **Qualitative limit:** Offset allowances from five offset types located in RGGI states are allowed: 1. Landfill methane capture and destruction; 2. Reduction in SF6 emissions; 3. Sequestration of carbon due to reforestation, improved forest management, or avoided conversion; 4. Reduction or avoidance of CO2 emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency; and 5. Avoided methane emissions from agricultural manure management operations.
Provisions for price management	Minimum auction price: USD 2.15 in 2017, increasing by 2.5% per year (to reflect inflation). As of 2014, RGGI states created a Cost Containment Reserve (CCR). Trigger Prices: USD 8 in 2016, and USD 10 in 2017. After this year (2017), the CCR trigger price will increase annually by 2.5%.

Compliance

Monitoring, Reporting, Verification (MRV)	**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.

Other Information

Institutions involved	Each RGGI State has its own statutory and/or regulatory authority. In addition, RGGI's development and implementation is supported by RGGI Inc., a non-profit cooperative.
Linkage with other schemes	No information available yet.

Canada - Nova Scotia

General Information

Summary	**Status:** ETS implementation scheduled **Jurisdictions:** Nova Scotia On 21 November 2016, Nova Scotia Premier Stephen McNeil announced the implementation of a cap-and-trade program in 2018, in line with Canada's federal carbon pricing policy. According to the Premier's announcement, Nova Scotia's cap-and-trade program will be focused on the power, transport and building sectors. While details for the system will be developed in 2017, the province did announce that it will not be linked to other jurisdictions and allowances under the cap will be issued for free. The potential to use offsets for compliance will also be examined. Nova Scotia will also adopt an emissions target that meets or even exceeds Canada's 2030 target of reducing emissions 30% compared to 2005 levels. Nova Scotia's Action on Climate Change
Overall GHG emissions (excluding LULUCF)	**Emissions:** 16.6 MtCO2e MtC0_2e (2014)
Overall GHG emissions by sector	Sector Name — MtCO2e Electricity and Steam — 7.3 Oil and Gas — 0.8 EITE — 0.4 Transportation — 4.3 Buildings — 2.2 Agriculture — 0.5 Waste and Other — 1.0
Overall GHG reduction target	**By 2020:** At least 10% reduction from 1990 GHG levels. **By 2050:** Goal to achieve up to 80% reduction below current GHG levels.
Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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.
Number of liable entities	No information available yet.
Point of regulation	No information available yet.

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

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

Other Information

Institutions involved	No information available yet.
Linkage with other schemes	No information available yet.

China

General Information

Summary	**Status:** ETS implementation scheduled **Jurisdictions:** China 2016 marked a year of intensive preparation work on the path towards the launch of China's national ETS by 2017, a goal set in the previous year by China's highest political level. This timeline has been reaffirmed in China's NDC under the Paris Agreement and the '13th Five-Year Work Plan for Greenhouse Gas Emission Control' released on 27 October 2016. The Work Plan outlines China's climate and energy related measures and targets between 2016 and 2020, with binding provincial level targets. Overseen by the National Development and Reform Commission (NDRC), the national system would expand on the existing ETS pilots that are already operating in Chinese cities and provinces. Between 2013-2015, the NDRC developed interim administrative ETS measures, as well as sector-specific monitoring and reporting guidelines. Building on this, current work is focused on developing the National ETS Legislation, as well as rules around emissions reporting, verification entities, allocation and offsetting. These regulations are under consultation and are expected to come into force in the first half of 2017. The allowance allocation is also expected to be completed by then. National Development and Reform Commission (NDRC) (Chinese) Interim Measures for Carbon Emissions Trading (NDRC) (Chinese) Activities of China under the Partnership for Market Readiness (PMR) China's Intended Nationally Determined Contribution (INDC)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 10976 $MtC0_2e$ (2012)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excl. Transport) — 7946.9 Industrial Processes — 1296.6 Agriculture — 831.6 Waste — 197.6 Transportation — 702.9
Overall GHG reduction target	**By 2020:** 40-45% reductions in carbon intensity compared to 2005 levels (voluntary commitment under the Copenhagen Accord of 2009). Further detailed target for 2016-2020: reduction in carbon emissions per unit GDP by 18% compared to 2015 level (13th Five-year plan). **By 2030:** Peak CO2 emissions around 2030, with best efforts to peak earlier. China has also committed to lowering CO2 emissions per unit of GDP by 60-65% from 2005 levels and increasing the share of non-fossil fuels in primary energy consumption to around 20% (NDC of China).
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Phase I (2017-2019): 3-5 GtCO2e/year (projection only)
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	CO2
Sectors covered and thresholds	The National ETS will cover eight sectors: petrochemicals, chemicals, building materials, iron and steel, non-ferrous metals, paper making, power (including power generation and grid) and aviation, which are further divided into subsectors. **Inclusion Thresholds:** Entities with an annual energy consumption of more than 10,000 tons of standard coal equivalent (emissions of ~26,000 t CO2) in any year over 2013–2015 were asked to report their historical emissions and expect to be enrolled into the National ETS (see 13th FYP).
Number of liable entities	Expected to be at least 7,000 No information available yet.
Point of regulation	Mixed: Both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are included in the scheme. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass-through of carbon costs via the electricity price, and would not incentivize demand-side management of electricity. The system therefore covers emissions from the power sector upstream and other sectors downstream.

Phases & Allocation

Compliance period	One year
Trading period	**Phase I:** Three years (2017-2019)
Allocation	**Phase I** (2017-2019): Expected to be free allocation in the beginning based on either benchmarking or historical emissions intensity. NDRC expresses a willingness to introduce and gradually increase the share of auctioning, but there are no details as of yet on the starting date and share of auctioning.

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	**Phase I** (2017-2019): Using CCER (China Certified Emission Reduction) credits. In 2012, the NDRC issued the 'Interim Measures for the Management of Voluntary GHG Emission Reduction Transactions'. These measures include guidelines for the issuance of domestically-produced offsets, known as CCERs. CCERs are expected to be used in the national ETS. The revised Interim Regulation and upcoming regulation on administrative measures for the offset scheme will impose quantitative and qualitative limits on the use of CCERs.
Provisions for price management	No information available yet.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Annual **Verification:** The NDRC is currently drafting regulation for third-party verification for the national ETS. Before this is finalized, local DRCs are asked to select suitable institutions and personnel to carry out the verification tasks according to suggested requirements by the NDRC. **Framework:** From 2013-2015, the NDRC has released a series of MRV guidelines covering a total of 24 sectors. In 2015, the NDRC further provided supplementary data sheets on GHG MR for the 8 ETS covered sectors 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'. To support the NDRC drafting of the national allocation plan in 2016, local DRCs collected emissions reports from entities in their regions for 2013-2015 in accordance with the MRV sector guidelines. Companies were also required to report production and other industry-specific data that may be used for benchmark allocation. The reports had to be verified by third-party verifiers. Both the emissions and verification reports had to be checked by local DRCs and were sent to the NDRC before the end of June 2016.
Enforcement	No information available yet.

Other Information

Institutions involved	National Development and Reform Commission (NDRC) Provincial/autonomous regional/municipal Development and Reform Commissions (DRCs), and Civil Aviation Administration of China (CAAC) Overall, NDRC is in charge of policy design and rule making while the local DRCs and CAAC are in charge of policy and rule implementation. Market oversight is to be at the central level. Nine exchanges have been approved by NDRC to act as official trading platforms for the national ETS, which are the seven in the original pilot regions and two in Sichuan province and Fujian province.
Linkage with other schemes	No information available yet.

Kazakhstan Emissions Trading Scheme (KAZ ETS)

General Information

Summary	**Status:** ETS implementation scheduled **Jurisdictions:** Republic of Kazakhstan Kazakhstan launched an ETS in January 2013. The groundwork for the development of an ETS was laid out in 2011 through amendments and additions to Kazakhstan's environmental legislation. The system is temporarily suspended until 2018. Corresponding amendments to the Environmental Code were passed and came into force on 22 April. The amendments aim to improve the monitoring, reporting and verification (MRV) system, as well as the overall greenhouse gas emissions regulation and KAZ ETS operation. The KAZ ETS will restart in 2018 with new allocation methods and trading procedures for all market participants. Soft MRV obligations apply until 2018.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 284.3 $MtC0_2e$ (2012) Data submitted to the UNFCCC. Submissions to the UNFCCC must be made in accordance with the reporting requirements adopted under the Convention, such as The UNFCCC Reporting Guidelines on Annex I Inventories (document FCCC/SBSTA/2004/8) for Annex I Parties and Guidelines for the preparation of national communications for non-Annex I Parites (decision 17/CP.8)
Overall GHG emissions by sector	Sector Name: MtCO2e Energy (excl. Transport): 215 Transport: 26.2 Industrial processes: 16.7 Agriculture: 21.5 Waste: 4.9
Overall GHG reduction target	**By 2020:** 5% reduction from 1990 GHG levels. **By 2030:** 15-25% reduction from 1990 GHG levels (NDC of Kazakhstan).
Type of ETS	Mandatory
Cap and trajectory	**Type of Cap:** Absolute **Phase I (2013):** 147 MtCO2 (plus a reserve of 20.6 MtCO2). This equals a stabilization of the capped entities' emissions at 2010 levels. **Phase II (2014-2015):**2014: 155.4 MtCO2; 2015: 153.0 MtCO2. This represents reduction targets of 0% and 1.5% respectively, compared to the average CO2 emissions of capped entities in 2011-2012. [**Phase III (2016-2020):** 746.5 MtCO2 (plus a reserve of 21.9 MtCO2).]
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	Energy sector (including oil and gas,) mining and chemical industry (>20,000tCO2/year). **Inclusion thresholds:** For Phase I (2013) and Phase II (2014-2015), thresholds are based on 2010 and 2012 emission levels. For Phase III, 2014 emission levels are used.
Number of liable entities	**Phase I (2013):** 178 companies **Phase II (2014-2015):** 166 companies [**Phase III (2016-2020):** 140 companies] No information available yet.
Point of regulation	Downstream

Phases & Allocation

Compliance period	One year
Trading period	**Phase I (Pilot phase):** 2013 **Phase II:** 2014-2015 [**Phase III:** 2016-2020]
Allocation	**Phase I (2013):**100% free allocation based on emissions data from 2010. **Phase II (2014-2015):** Free allocation (0% and 1.5% below 2011/2012 average emissions). [**Phase III (2016-2020):** Free allocation based on grandfathering.]

Flexibility

Banking and borrowing	Banking is provided for by the legislation.
Offsets and credits	**Qualitative Limit:** The system allows domestic offsets. International credits may be allowed in the future.
Provisions for price management	Current legislation does not contain any carbon price control measures.

Compliance

Monitoring, Reporting, Verification (MRV)	Reporting is required for businesses or financial facilities above the 20,000 tCO2/year threshold. Aside from CO2, reporting is also required for CH4, N2O and PFCs emissions. **Reporting Frequency:**Annually, with reporting due on 1 April. **Verification:** Emission data reports and their underlying data require accredited third-party verification. **Other:** Installations below the compliance threshold must submit non-verified inventory reports.
Enforcement	In 2013, penalties for non-compliance were waived. The current non-compliance penalty is approximately EUR 30/tCO2.

Other Information

Institutions involved	Ministry of Energy JSC Zhasyl Damu, a state-owned joint stock company, is also involved.
Linkage with other schemes	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, signed and ratified by the country on September 16, 2014. Climate change-related issues addressed in Article 365 (c) Title V and Annex XXX to the Agreement fall under the provisional application. Therefore, the country has to prepare for ETS implementation, e.g.: · Adopt national legislation and designate competent authority/ies; · Establish a system for identifying relevant installations and for identifying greenhouse gases (Annexes I and II); · Develop a national allocation plan to distribute allowances to installations (art. 9); · Establish a system for issuing greenhouse gas emission permits and issuance of allowances to be traded domestically among installations in Ukraine (art. 4 and 11 - 13); · Establish monitoring, reporting, verification and enforcement systems and public consultations procedures (art. 9, 14 – 17, 19 and 21). As a first step, an MRV system would be developed and put into practice to provide for a solid basis for the upcoming market-based mechanism. Separate legislation would be prepared and submitted to the Parliament to establish the MRV system, and going further, transpose the relevant EU Directives, regulate GHG emissions and establish the ETS. Ukraine is working on its MRV framework and the plans for further ETS development under the Ukraine-EU Association Agreement with the assistance of the PMR, the European Bank for Reconstruction and Development (EBRD), the United States Agency for International Development (USAID), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and other institutions. Ministry of Ecology and Natural Resources of Ukraine (Ukrainian) Activities of Ukraine under the Partnership for Market Readiness (PMR)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 402.7 $MtC0_2e$ (2012)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excl. transport) — 275.6 Transport — 33.5 Industrial Processes, solvent and other product use — 46.2 Agriculture — 36 Waste — 36 Waste — 11.4
Overall GHG reduction target	**By 2020:**Voluntary target of 20% reduction from 1990 GHG levels. **By 2030:**GHG emissions will not exceed 60% of 1990 GHG levels (NDC). **By 2050:** Voluntary target of 50% reduction from 1990 GHG levels.
Type of ETS	No information available yet.

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

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

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

Other Information

Institutions involved	Ministry of Ecology and Natural Resources Cabinet of Ministers of Ukraine
Linkage with other schemes	No information available yet.

Brazil

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** Brazil Brazil's National Climate Change Policy (PNMC), which was 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 voluntary GHG reduction commitment and reduce overall mitigation costs. Brazil is currently assessing different carbon pricing instruments including an ETS and a carbon tax. The Ministry of Finance is developing design options and conducting comprehensive economic and regulatory impact assessments for both instruments. Depending on the impact assessment, the work stream is expected to culminate in a White Paper with design recommendations for a carbon pricing instrument for Brazil. In addition, the Ministry of Finance has launched a strategy to strengthen the understanding of carbon pricing instruments among stakeholders through engagement, communication, and consultation. Since 2013 a group of leading companies have been participating in a voluntary ETS simulation. The initiative offers a platform to gain experience and develop proposals for a wide-ranging and robust approach towards the cap-and-trade market in Brazil with the purpose of promoting the reduction of national GHG emissions at the lowest possible cost. In 2015, 23 companies from diverse sectors of the Brazilian economy took part in this exercise. The allocation process and trading is managed by the Rio de Janeiro Green Stock Exchange (BVRio) and the ETS design is coordinated by the Centro de Estudos em Sustentabilidade da Fundação Getúlio Vargas (GVCes/FGV). Brazilian states are also actively engaging in climate policy. In 2012, both Rio de Janeiro and São Paulo had considered the implementation of a state-wide ETS. Lei sobre Mudança do Clima Activities of Brazil under the Partnership for Market Readiness (PMR) Plataforma Empresas pelo Clima – Simulação de Sistema de Comércio de Emissões Registro Público de Emissões
Overall GHG emissions (excluding LULUCF)	**Emissions:** 1071.9 $MtC0_2e$ (2014)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 479.1 Industrial processes — 101.2 Agriculture — 423.2 Waste — 68.4
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 of Brazil). **By 2030:** Indicative contribution of 43% reduction from 2005 GHG levels (NDC of Brazil).

Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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.
Number of liable entities	No information available yet.
Point of regulation	No information available yet.

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

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

Other Information

Institutions involved	Ministry of Environment, Ministry of Finance (General Coordination of Environment and Climate Change)
Linkage with other schemes	No information available yet.

Chile

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** Chile Under the PMR, Chile received funding to develop a roadmap for the design and eventual implementation of an ETS for GHG mitigation in the energy sector in March 2013. However, it subsequently shifted policy priorities towards the implementation of a carbon tax. The roadmap includes necessary institutional arrangements, regulatory options, economic impacts and technical requirements for an MRV framework to track GHG emissions that would fit both a carbon tax and an ETS. In September 2014, as part of a broader fiscal reform, Chile approved the implementation of a carbon tax for thermal power generators with a thermal input equal to or above 50 MW (exempting biomass power plants). From 2018, emitters will have to pay USD 5 (EUR 4) for related CO2 emissions, as well as a tax on local pollutants (SO2, NOx and particulate matter). A tax for particulate matter and NOx has been operating since 2015 as a one-time payment for the purchase of new vehicles based on the purchase price, combustible consumption, and NOx emissions/km. In the longer run, Chile is considering deepening the tax or transitioning to an ETS. Chile also has a track record of voluntary carbon market activities. Established in 2009, the Santiago Climate Exchange provides a local platform for trading voluntary GHG reductions. In addition, the Chilean government established a “Platform for the Generation and Trading of Carbon Credits from the Forestry Sector in Chile" in January 2013. The platform works in cooperation with Verified Carbon Standards, a major GHG program in the global voluntary carbon market. Ley Reforma Tributaria (incl.Impuesto al Carbono) Ministerio de Energía Activities of Chile under the Partnership for Market Readiness (PMR) Ministerio del Medio Ambiente
Overall GHG emissions (excluding LULUCF)	**Emissions:** 109.9 $MtC0_2e$ (2013)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 85.0 Agriculture — 13.7 Industrial Processes — 6.6 Waste — 4.5
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 (INDC Submission).
Type of ETS	No information available yet.
Cap and trajectory	**Type of Cap:** Further research on the appropriate nature of cap is part of the Chilean Market Readiness Proposal (MRP) In line with 20% reduction in 2020 pledge.

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

Phases & Allocation

Compliance period	No information available yet.
Trading period	No information available yet.
Allocation	Further research on appropriate allocation method is part of the Chilean Market Readiness Proposal (MRP)

Flexibility

Banking and borrowing	No information available yet.
Offsets and credits	No information available yet.
Provisions for price management	No information available yet.

Compliance

Monitoring, Reporting, Verification (MRV)	Design and implement of an MRV framework and Registry that allows the recording and tracking of emissions and emission permit transactions is part of the Chilean Market Readiness Proposal (MRP).
Enforcement	No information available yet.

Other Information

Institutions involved	Ministry of Energy Ministry of the Environment Ministry of Finance Inter-Ministerial Committee on Climate Change
Linkage with other schemes	No information available yet.

Japan

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** Japan In December 2010, the Ministerial Committee on Climate Change stipulated government directions for the future development of the three main policies against global warming. The government decided to reconsider an ETS, taking into consideration the burden on domestic industry and associated impacts on employment; the ongoing development of ETS overseas; an evaluation of existing, major climate change policy measures (such as voluntary actions implemented by the industry sector); and progress towards the establishment of a fair and effective international framework where all major emitters participate. In February 2016, an Expert Panel advising the Ministry of Environment Japan on long-term climate action proposed carbon pricing as an effective measure for achieving Japan's 2050 emissions reduction target, provided it has a sufficient impact on people's and companies' activities. Japanese companies can familiarize themselves with a voluntary Cap-and-Trade scheme: the Advanced Technologies Promotion Subsidy Scheme with Emission Reduction Targets (ASSET). In parallel, Japan is implementing the Joint Crediting Mechanism (JCM) for the post-2012 era. Ministry of the Environment Website on Market Mechanisms
Overall GHG emissions (excluding LULUCF)	**Emissions:** 1364 $MtC0_2e$ (FY2014)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 1214.7 Industrial Processes — 89.6 Agriculture — 38.4 Waste — 21.1
Overall GHG reduction target	**By FY 2020:**3.8% or more reduction from FY 2005 GHG levels. **By FY 2030:** 26% reduction from FY2013 GHG levels. In addition, the amount of GHG emissions reductions and removals by the JCM is estimated to be 50-100 million tCO2 (NDC of Japan). **BY FY 2050:** 80% reduction (base year not stipulated).
Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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.
Number of liable entities	No information available yet.
Point of regulation	No information available yet.

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

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

Other Information

Institutions involved	No information available yet.
Linkage with other schemes	No information available yet.

Mexico

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** Mexico The General Climate Change Law of April 2012 provides the basic framework for the establishment of a voluntary ETS in Mexico. Subsequently, in June 2013, the government released its National Strategy on Climate Change, outlining the country's transition to a low-carbon economy. In April 2014, the Special Climate Change Program (2014-2018) was released. In 2014, Mexico introduced a USD 3.50 (EUR 3.19) carbon tax on fossil fuel sales and imports (natural gas exempted). Firms may use offset credits from domestic projects to fulfill their tax liability; exact details of this are pending official regulation. In parallel, several legislative attempts to introduce an ETS for the electricity sector have been made. In October 2014, a mandatory reporting system (the National Emissions Register) for both direct and indirect GHG emissions for facilities with annual emissions above 25,000 tCO2e was established. Emitters in the energy, industrial, transport, agricultural, waste, commercial, and services sectors are required to report the six GHGs identified by the UNFCCC and black carbon. The National Emissions Register also includes the voluntary registration of mitigation or reduction certificates obtained from projects and activities carried out in Mexico. In October 2015, Mexico signed an MOU with Québec that includes cooperation on ETS. Later, in August 2016, Mexico, Québec, and Ontario issued a joint declaration on carbon markets collaboration. In August 2016, the Ministry of Environment and Natural Resources (SEMARNAT), the Mexican stock exchange (Grupo BMV), and MÉXICO2 (the voluntary carbon platform at the BMV) signed a cooperation agreement to implement a voluntary ETS Simulation for 60 major entities in the power generation, manufacturing, and transport sector. The simulation aims to make stakeholders familiar with the concept of emissions trading and to improve corporate readiness. Together with the development of a registry for national emissions, the ETS simulation is consistent with Mexico's objective to implement a national ETS by 2018. Ley General de Cambio Climático Ley del Impuesto Especial sobre Producción y Servicios (incl. Combustibles Fósiles) Activities of Mexico under the Partnership for Market Readiness (PMR) Registro Nacional de Emisiones
Overall GHG emissions (excluding LULUCF)	**Emissions:** 633 $MtCO_2e$ (2013) Emissions Trading Scheme Simulation
Overall GHG emissions by sector	

Sector Name	MtCO2e
Electricity Generation	127
Industrial processes	115
Gas and Petroleum	80
Agriculture	80
Transport	174
Residential and Commercial	26
Waste	31

Overall GHG reduction target	**By 2030:** 22% reduction compared to BAU scenario and 36% conditional reduction, subject to a global mitigation agreement (NDC of Mexico). **By 2050:** 50% reduction from 2000 GHG levels (Climate Change Law aspirational goal).
Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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.
Number of liable entities	No information available yet.
Point of regulation	No information available yet.

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

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

Other Information

Institutions involved	Ministry of Environment and Natural Resources (SERMANAT), Ministry of Energy (SENER), Ministry of Finance (SHCP)

Linkage with other schemes	No information available yet.

Russia

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** The Russian Federation Russia is currently exploring policy options 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 concept and action plan to reach the emissions reduction targets by 2020 and 2030, which could potentially include emissions trading. Building on this, Russia has started to build the legal basis to enable GHG monitoring at the company level. In 2015, the Government adopted the Concept on MRV. Methodological guidelines for GHG emissions monitoring at corporate and regional level were also adopted by the Ministry of Natural Resources and Ecology. The draft amendment of the Law on Environmental Protection was also published and made available for public comment. The revised law will be submitted to the Parliament for consideration. It would create a legal basis for the government to list the types of GHG that will be regulated in the future and set rules for MRV of GHG emissions at company level. Ministry for Economic Development Webseite of GFA Consulting Group on their Cabon Market Scoping Study for the Russian Federation
Overall GHG emissions (excluding LULUCF)	**Emissions:** 2812 $MtC0_2e$ (2014)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excl. Transport) — 2107 Transport — 247.8 Industrial processes, solvent and other product use — 212.7 Agriculture — 132.5 Waste — 112.3
Overall GHG reduction target	**By 2020:** at least 25% reduction from 1990 GHG levels. **By 2030:** 70-75% reduction from 1990 GHG levels (INDC Submission).
Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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.

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

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

Monitoring, Reporting, Verification (MRV)	No information available yet.
Enforcement	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)
Linkage with other schemes	No information available yet.

Taiwan

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** Taiwan On 1 July 2015, Taiwan enacted the Greenhouse Gas Reduction and Management Act, which sets a 50% emissions reduction target for 2050 compared to 2005 GHG levels. The Act charges the Taiwanese Environmental Protection Administration (TEPA) with the development of appropriate climate change policies to reach this target. An ETS is mentioned as a key option in the law, although no precise timeline is given for its implementation. The Act also outlines options for ETS design elements including: allocation, provisions for offsets and which considerations must be taken into account when setting the cap. Currently, preparations are focussing on mandatory reporting for entities from certain sectors with annual emissions above 25,000 tCO2e. Reporting has been ongoing since 2013. Taiwan is also encouraging voluntary emission reduction efforts. Greenhouse Gas Reduction and Management Act (Chinese)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 284.5 $MtC0_2e$ (2013)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (incl. Transport) — 250.8 Industrial Processes — 26.4 Agriculture — 2.8 Waste — 4.4
Overall GHG reduction target	**By 2030:** 50% below BAU **By 2050:** 50% below 2005 GHG levels
Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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.
Number of liable entities	No information available yet.
Point of regulation	No information available yet.

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

Monitoring, Reporting, Verification (MRV)	**Reporting Frequency:** Annual reporting of GHGs (CO2, CH4, N2O, SF6, NF3, PFCs and HFCs) for entities from certain sectors with annual emissions greater than 25,000 tCO2e. **Verification:** Third-party verification is required. **Framework:** As of 2004, Taiwan introduced voluntary GHG reporting under the Air Pollution Control Act. This became mandatory in 2013 and is continued under the Greenhouse Gas Reduction and Management Act.
Enforcement	No information available yet.

Other Information

Institutions involved	Taiwanese Environmental Protection Administration (TEPA)
Linkage with other schemes	No information available yet.

Thailand

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** The 11th National Economic and Development Plan (2012-2016) of Thailand calls for several measures related to 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. The importance of carbon markets has also been emphasized in Thailand's NDC. From 2013 - 2016, the Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) developed an MRV system for the Thailand Voluntary ETS (Thailand V-ETS). In 2013, general guidelines for the Thailand V-ETS were finalized. In October 2014, the Thailand V-ETS started its pilot phase, which will last until September 2017, in order to test the MRV system, develop sector-specific MRV guidelines, as well as to set a cap and allocate allowances for covered factories during the pilot phase. TGO is also developing a Low Carbon City (LCC) Program as part of the World Bank's PMR to help Thai provinces, cities, and municipalities build a GHG inventory along with an MRV system for city-wide emissions and set reduction targets. The TGO will translate these mitigation actions into emissions reduction certificates ("Certificates") under the Thailand Voluntary Emission Reduction Program. Activities of Thailand under the Partnership for Market Readiness (PMR) Thailand Greenhouse Gas Management Organization
Overall GHG emissions (excluding LULUCF)	**Emissions:** 344.35 $MtC0_2e$ (2013)
Overall GHG emissions by sector	Sector Name — MtCO2e Energy — 258.8 Industrial Processes — 36.1 Agriculture and Land Use Change — 44.3 Waste — 5.1
Overall GHG reduction target	**By 2020:** In its Nationally Appropriate Mitigation Action (2014), Thailand committed to a voluntary 7% emissions reduction compared to BAU in the energy and transport sectors. The reduction target can be increased 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 (Thailand's NDC).
Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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.
Number of liable entities	No information available yet.
Point of regulation	No information available yet.

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

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

Other Information

Institutions involved	Thailand Greenhouse Gas Management Organization (TGO)
Linkage with other schemes	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) will begin in 2017. As an implementing country under the PMR, Turkey received funding in May 2013 to enhance the implementation of the MRV regulation through pilot studies in the energy, cement and refinery sectors, and to explore options for market-based instruments. This includes a series of analytical reports on using emissions trading and other market-based instruments for the MRV sectors. A synthesis report outlining carbon market policy options for Turkey will be submitted to the Climate Change and Air Management Coordination Board by March 2017. 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). Department of Climate Change, Ministry of Environment and Urbanization (Turkish) Activities of Turkey under the Partnership for Market Readiness (PMR) Roadmap for the consideration of establishment and operation of a Greenhouse Gas Emissions Trading System in Turkey Emission Trading in Turkey – Guidance for plant operators
Overall GHG emissions (excluding LULUCF)	**Emissions:** 459.1 $MtC0_2e$ (2013) National Inventory Report 2013 submitted to the UNFCCC.
Overall GHG emissions by sector	Sector Name — MtCO2e Energy (excluding transport) — 311.2 Industrial processes — 72.0 Agriculture — 49.8 Waste — 26
Overall GHG reduction target	Turkey is not listed in Annex B of the Kyoto Protocol and has no mandatory GHG reduction target under the UNFCCC. **By 2030:** Up to 21% reduction below the BAU scenario (INDC Submission).
Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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	ETS coverage has not been set yet. However, the Turkish MRV regulation, which is based on the MRV regulation in the EU Emissions Trading Scheme, establishes an installation-

	level MRV system. The system covers all major sources of GHG emissions from the energy (combustion of fuels with output of 20MW thermal or more) and industry sectors (coke production, metals, cement, glass, ceramic products, insulation materials, paper and pulp, chemicals over specified threshold sizes/production levels). Possibility of voluntary opt-in of additional sectors into the MRV system.
Number of liable entities	1,500 (covered by the Turkish MRV regulation) No information available yet.
Point of regulation	Downstream

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

Monitoring, Reporting, Verification (MRV)	The Turkish MRV legislation establishes an installation-level system for CO2 emissions for roughly 1,000 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). Entities had until October 2014 to submit their first monitoring plans and will submit verified emissions reports for 2015 and 2016 to the Ministry of Environment and Urbanization by 30 April 2017. Verifiers will be accredited by the Turkish Accreditation Organization by 2019. During 2016-2018, the Ministry of Environment and Urbanization will provide training, examination and licensing services.
Enforcement	Entities that fail to comply with the Turkish MRV regulation are subject to the generic data reporting requirements and related sanctions under the Turkish Environmental Law No. 2872.

Other Information

Institutions involved	Ministry of Environment and Urbanization and further ministries.
Linkage with other schemes	No information available yet.

USA - Oregon

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** USA - Oregon In February 2017, the Oregon Department of Environmental Quality (DEQ) published a study on designing a Cap-and-trade program in Oregon that would be compatible to link with Western Climate Initiative (WCI) jurisdictions. The study was mandated by Senate Budget Bill 5701.The study provides considerations for implementing a market-based greenhouse gas (GHG) reduction program in Oregon. It focuses on the methods to minimize any negative effects on business, disadvantaged communities and rural areas. DEQ also considered how a Cap-and-trade program would interact with Oregon's existing climate policies. Oregon is reconsidering an emissions trading system (ETS), after a Bill (SB 1574) was rejected in the 2016 legislative session. In January 2017, a Bill (SB 557) was introduced in the Senate to require DEQ to adopt a GHG Cap-and-invest program, as well as to set statewide GHG emissions goals for 2025, and limits for 2035 and 2050. An annual GHG emissions reporting program is in place since 2008, mainly covering industry and waste, as well as fuel distributors and electricity suppliers. Oregon has been a member of the Pacific Coast Collaborative (PCC) since 2008. In 2013 Oregon has signed a non-binding agreement with the other members of the PCC (i.e. the Federal States of Washington and California, and the Canadian province of British Columbia) to work together for climate protection. Oregon has expressed its intention to raise a price on CO_2 based on existing programs and to link its system with the other signatories, if possible. DEQ Report – Considerations for Designing a Cap-and-Trade Program in Oregon (2017) Senate Bill 1574 (2016) Senate Bill 557 (Introduced in January2017) Greenhouse Gas reporting Homepage - DEQ
Overall GHG emissions (excluding LULUCF)	**Emissions:** 63* MtCO2e (million metric tons) Mt$C0_2$e (2015) Pacific Coast Action Plan on Climate Energy **preliminary data*
Overall GHG emissions by sector	Sector Name — MtCO2e Transportation — 23.2* Electricity use — 18.7* Natural gas use — 7.8* Residential and Commercial — 4.1* Industrial — 4.3* Agriculture — 5.2*
Overall GHG reduction target	**By 2020**: 10% reduction from 1990 GHG levels. **By 2050**: at least 75% reduction from 1990 GHG levels.
Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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.
Number of liable entities	No information available yet.
Point of regulation	No information available yet.

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

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

Other Information

Institutions involved	Oregon Department of Environmental Quality
Linkage with other schemes	No information available yet.

USA - Virginia

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** USA - Virginia In May 2017, the Governor issued an Executive Directive, which instructs the Department of Environmental Quality (DEQ) to formulate a regulation for the State Air Pollution Control Board to limit CO2 emissions from power plants. The proposed regulation would allow for the use of market-based mechanisms and the trading of allowances through a multi-state trading program. The stringency of the regulation should also be comparable to relevant regulations in place in other states in order to lead to a 'trading-ready' emissions reduction program that would be compatible to link to similar jurisdictions. The Directive is based on the recommendations of an inter-ministerial working group established in June 2016. The study provides considerations for implementing a market-based greenhouse gas (GHG) reduction program in Virginia. Similar recommendations were issued in 2008 by the Commission on Climate Change. Executive Directive 11 (2017) Report and Final Recommendations to the Governor (2017)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 104 MtCO2e (million metric tons) $MtC0_2e$ (2014)
Overall GHG emissions by sector	Sector Name — MtCO2e Transport — 48.9 Electric Power — 30.3 Industrial — 12.6 Residential — 5.9 Commercial — 5.3
Overall GHG reduction target	By 2025: 30% reduction below business-as-usual projection of GHG emissions.
Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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.
Number of liable entities	No information available yet.
Point of regulation	No information available yet.

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

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

Other Information

Institutions involved	No information available yet.
Linkage with other schemes	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 September 2016, the Washington Department of Ecology published the Clean Air Rule to reduce emissions from industrial sources, petroleum fuel producers and importers, as well as natural gas distributors responsible for more than 100,000 metric tons of GHG per year, starting in 2017. Under the proposed rule, regulated businesses would be able to comply by reducing their own emissions, buying or trading credits with other regulated parties, funding projects that reduce emissions or acquiring emissions reductions from external carbon markets. Covered facilities must reduce emissions by 1.7% annually. On 8 November, Washington State voters rejected Initiative 732, which would impose a USD 15/tCO2e (EUR 14.01) tax on all fossil fuels consumed in the state starting in 2017. The tax would have increased to USD 25/tCO2e (EUR 23.35) in 2018, rising annually by 3.5% plus inflation for each following year.
Overall GHG emissions (excluding LULUCF)	**Emissions:** 92.5 $MtC0_2e$ (2012)
Overall GHG emissions by sector	Sector Name — MtCO2e Electricity — 15.2 Residencial, commerical, transport — 20.5 Transport — 42.5 Fossil fuel industry — 0.7 Industrial process — 4.6 Waste Management — 3.5 Agriculture — 5.5
Overall GHG reduction target	**By 2020:** reduce emissions to 1990 levels. **By 2035:** reduce emissions 25% below 1990 levels. **By 2050:** reduce emissions 50% below 1990 levels or 70% below state's expected emissions for that year.
Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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.

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

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

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

Other Information

Institutions involved	Washington Department of Ecology
Linkage with other schemes	No information available yet.

Vietnam

General Information

Summary	**Status:** ETS under consideration **Jurisdictions:** 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 experiences for the implementation of a sector-based cap-and-trade program in the steel sector, which could start in 2020. Green Growth Strategy Vietnam Activities of Vietnam under the Partnership for Market Readiness (PMR)
Overall GHG emissions (excluding LULUCF)	**Emissions:** 266 $MtC0_2e$ (2010)
Overall GHG emissions by sector	Sector Name: Energy; Industrial Processes; Agriculture; Waste MtCO2e: 141.1; 21.2; 88.3; 15.4
Overall GHG reduction target	**By 2030:** 8% below BAU and 25% conditional on international support (NDC of Vietnam) including 20% reduction in 2010 GHG (intensity) levels and 30% conditional on international support.
Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
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.
Number of liable entities	No information available yet.
Point of regulation	No information available yet.

Phases & Allocation

Compliance period	No information available yet.
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.
Provisions for price management	No information available yet.

Compliance

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

Other Information

Institutions involved	Ministry of Natural Resources and Environment of Vietnam
Linkage with other schemes	No information available yet.

Disclaimer

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The initial data as of December 2012 was compiled by the ICAP Secretariat for ICAP jurisdictions and by Ecofys for non-ICAP jurisdictions. Since then, the ICAP Secretariat has continuously updated the data for the ICAP and non-ICAP jurisdictions. Information compiled in the ICAP ETS Map is based on official and public information, as much as possible, and focuses on cap-and-trade systems for greenhouse gas emissions. The ETS map thus does not aspire to monitor all climate policy instruments. This website presents interim results of a continuous working process. Although the information contained therein is assembled with utmost care, ICAP and Ecofys cannot be held liable for the timeliness, correctness and completeness of the information provided.

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