

Canada - Ontario Cap-and-Trade Program

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Ontario</p> <p>On 18 May 2016, Ontario passed legislation and introduced regulations establishing 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. Facilities with emissions between 10,000–25,000 tons may opt in to the program.</p> <p>Ontario has been a member of the Western Climate Initiative (WCI) since 2008. In 2017, Ontario signed an agreement linking its carbon market with California and Québec starting in 2018, forming a three-jurisdictional carbon market.</p> <p>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</p>														
Overall GHG emissions (excluding LULUCF)	<p>Emissions: 166.2 MtCO₂e (2015)</p>														
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Electricity generation</td> <td>5.2</td> </tr> <tr> <td>Transport</td> <td>55.0</td> </tr> <tr> <td>Industry</td> <td>48.3</td> </tr> <tr> <td>Buildings</td> <td>36.8</td> </tr> <tr> <td>Agriculture</td> <td>12.3</td> </tr> <tr> <td>Waste</td> <td>8.6</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Electricity generation	5.2	Transport	55.0	Industry	48.3	Buildings	36.8	Agriculture	12.3	Waste	8.6
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Electricity generation	5.2														
Transport	55.0														
Industry	48.3														
Buildings	36.8														
Agriculture	12.3														
Waste	8.6														
Overall GHG reduction target	<p>By 2020: 15% reduction from 1990 GHG levels.</p> <p>By 2030: 37% reduction from 1990 GHG Levels.</p> <p>By 2050: 80% reduction from 1990 GHG levels.</p>														
Type of ETS	Mandatory														
Cap and trajectory	<p>Type of Cap: Absolute</p> <p>First Compliance Period (2017-2020):</p> <p>2017: 142m tCO₂e, set to decline by 4.17% per year until 2020.</p> <p>2018: 136m tCO₂e</p> <p>2019: 131m tCO₂e</p>														

	<p>2020: 125m tCO₂e</p> <p>Future compliance periods (2021-2030): Cap declines by 3.6 Mt (2.9%) annually to 88.5 Mt in 2030.</p>
Carbon Price	<p><i>Current Allowance Price (per t/CO₂e):</i> CAD 17.38 (USD 13.69) clearing price at November 2017 auction.</p>

ETS Size

Emissions covered by the ETS	0.85
GHG covered	All major greenhouse gases such as CO ₂ , CH ₄ , SF ₆ , N ₂ O, NF ₃ and other fluorinated GHGs.
Sectors covered and thresholds	<p>Phase I (2017-2020):</p> <p>Industrial and large commercial operators including manufacturing, base metal processing, steel, pulp and paper, food processing and facilities, with annual emissions > 25,000 tCO₂e.</p> <p>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.</p> <p>Transportation fuel distributors (including propane and fuel oil) for those entities that first place more than 200L of fuel annually into the Ontario market.</p> <p>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.</p> <p>Other large emitters with annual emissions > 25,000 tCO₂e. Facilities emitting between 10,000–25,000 tCO₂e per year may voluntarily opt in.</p>
Number of liable entities	<p>247, including voluntary opt-ins (in December 2017).</p> <p>No information available yet.</p>
Point of regulation	Mixed

Phases & Allocation

Compliance period	<p>First compliance period: 2017-2020.</p> <p>Subsequent compliance periods: Three calendar years.</p> <p>Allowances must be surrendered by 1 November (or the first business day thereafter) following the end of the compliance period.</p>
Trading period	<p>After the first compliance period (2017–2020), compliance periods are three years long; 2021–2023 is the first 3-year compliance period.</p>
Allocation	<p>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.</p> <p>Other sectors (industry, institutions as defined above (Sectors)): Emitters outside the electricity, natural gas and fuel sectors are eligible to receive free allowances in Phase I.</p>

Flexibility

Banking and borrowing	Banking is allowed but the emitter is subject to a general holding limit.
Offsets and credits	<p>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.</p> <p>Ontario finalized its first offset protocol (Landfill Gas Capture and Destruction) at the end of 2017. Ontario is working to finalize additional offset protocols together with Québec by the end of 2018. The protocols are consistent with offset project criteria developed together with Québec, California and other WCI members in 2010.</p> <p>Quantitative Limits: Offset credits can be used to meet up to 8% of an entity's compliance obligation.</p>
Provisions for price management	<p>Reserve price at auction: In 2017, the minimum price at Ontario auctions was the higher of the annual action reserve prices in either Québec or California (USD 13.57 (CAL) or 13.56 (QC)) adjusted to CAD based on the exchange rate on the day prior to the auction. In 2018, Ontario's reserve price will be CAD14.68 (USD 11.31), increasing annually by 5% plus inflation, as measured by the Consumer Price Index for Ontario.</p> <p>Starting in February 2018, Ontario has been holding joint auctions with California and Québec where the auction reserve price will be the highest of the three jurisdictions.</p> <p>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 trigger prices at which allowances will be released from the reserve closely align with Québec's.</p>

Compliance

Monitoring, Reporting, Verification (MRV)	<p>Reporting frequency: Annually.</p> <p>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.</p> <p>Verification: Third party verification is required for covered entities.</p>
Enforcement	<p>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).</p> <p>Failure to surrender allowances also renders the entity liable to a minimum fine of CAD 25,000/day (USD 19,260/day) until the remaining allowances are surrendered (with a maximum fine of CAD 6 million [USD 4.62m]). Subsequent offences attract higher fines.</p> <p>Individuals (persons) are liable for at least CAD 5,000/day (USD 3,852) with a maximum fine of CAD 4 million (USD 3.08m) and imprisonment for up to five years. Subsequent offences attract higher fines.</p> <p>Penalties apply for other violations.</p>

Other Information

Institutions involved	Ontario Ministry of Environment and Climate Change Western Climate Initiative
Linkage with other schemes	Ontario linked its system with California and Québec in 2018.

Canada - Québec Cap-and-Trade System

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Québec</p> <p>Québec's Cap-and-Trade System for GHG emissions was introduced in 2012. The program's enforceable compliance obligation began on 1 January 2013. Compliance periods are three years long.</p> <p>Québec has been a member of the Western Climate Initiative (WCI) since 2008 and formally linked its system with California on 1 January 2014 and with Ontario on 1 January 2018.</p> <p>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</p>														
Overall GHG emissions (excluding LULUCF)	Emissions: 82.1 MtCO ₂ e (2014)														
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Transport</td> <td>33.7</td> </tr> <tr> <td>Industry</td> <td>25.8</td> </tr> <tr> <td>Residential & Commercial</td> <td>8.5</td> </tr> <tr> <td>Agriculture</td> <td>7.7</td> </tr> <tr> <td>Waste</td> <td>6.2</td> </tr> <tr> <td>Electricity</td> <td>0.2</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Transport	33.7	Industry	25.8	Residential & Commercial	8.5	Agriculture	7.7	Waste	6.2	Electricity	0.2
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Industry	25.8														
Residential & Commercial	8.5														
Agriculture	7.7														
Waste	6.2														
Electricity	0.2														
Overall GHG reduction target	<p>By 2020:20% reduction from 1990 GHG levels.</p> <p>By 2030:37.5% reduction from 1990 GHG levels.</p> <p>By 2050: 80-95% reduction from 1990 GHG levels.</p>														
Type of ETS	Mandatory														
Cap and trajectory	<p>Type of Cap: Absolute</p> <p>The following caps are given in millions of allowances:</p> <p>First compliance period (2013-2014): 23.20 each year</p> <p>Second compliance period (2015-2017): 2015: 65.30; 2016: 63.19; 2017: 61.08</p> <p>Third compliance period (2018-2020): 2018: 58.96; 2019: 56.85; 2020: 54.74</p> <p>Fourth compliance period(2021-2023): 2021: 55.26; 2022: 54.02; 2023: 52.79</p> <p>Fifth copliance period(2024-2026): 2024: 51.55; 2025: 50.31; 2026: 49.08</p> <p>Sixth compliance period (2027-2029): 2027: 47.84; 2028: 46.61; 2029: 45.37</p>														

	After a slight increase in the cap in 2021 (due to an adjustment of the global warming potential of different GHGs), the cap will reduce by about 1.24 million allowances per year. This will result in a cap of 44.14 million allowances in 2030.
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> CAD 19.10 (USD 15.06); Clearing price at joint CAL-QC auction in November 2017.

ETS Size

Emissions covered by the ETS	0.85
GHG covered	CO ₂ , CH ₄ , N ₂ O, SF ₆ , HFCs, PFCs, NO ₃ and other fluorinated GHGs.
Sectors covered and thresholds	<p>First compliance period (2013-2014): Electricity, Industry (>25,000 CO₂e/year).</p> <p>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.</p> <p>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.</p> <p>Voluntary emitters (opt-in entities): Starting in 2019, emitters from capped sectors that reported emissions between 10,000 tCO₂e/year and 25,000 tCO₂e/year may voluntarily register to the Cap-and-Trade System as a covered entity.</p>
Number of liable entities	<p>132 (2017)</p> <p>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.</p>
Point of regulation	<p>First compliance period (2013-2014): Downstream</p> <p>Second compliance period (2015-2017): Mixed, downstream and upstream (fuel distribution)</p>

Phases & Allocation

Compliance period	<p>First compliance period: 1 January 2013 - 31 December 2014.</p> <p>Subsequent compliance periods: Three calendar years as of 1 January 2015 (2015-2017, 2018-2020, and so forth).</p> <p>Allowances must be surrendered by 1 November following the end of the compliance period.</p>
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	<p>Auctions: Generally, electricity and fuel distributors have to buy 100% of their allowances at auction (or on the market). Allowances are auctioned quarterly.</p> <p>As of 1 January 2018, Québec had held a total of 17 auctions, 13 held jointly with California. All auction revenues go to the Québec Green Fund, which is dedicated to the fight against climate change through Québec's 2013–2020 Climate Action Plan.</p>

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: Emission-intensive 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):

Historical emission intensity adjusted for production level and by type of emission, with 100% allocation for process emissions, 80% for combustion emissions and 100% for emissions from other sources.

Second (2015–2017) and subsequent periods: Allocation of free allowances is based on increasingly strict intensity targets (declining emissions intensity per activity) and production levels. Since production volumes can vary, increasing intensity targets do not guarantee an absolute reduction in free allocation.

As of 2019, allocation of free allowances is made available to voluntary emitters (also known as opt-in covered entities) in alignment with what has been established for regulated entities.

Flexibility

Banking and borrowing	Banking is allowed but the emitter is subject to a general holding limit. Borrowing is not allowed.
Offsets and credits	<p>Quantitative limit: Up to 8% of each entity’s compliance obligation.</p> <p>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:</p> <ol style="list-style-type: none"> 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. <p>A number of new offset-protocols, co-commissioned with Ontario, are under development. Information on the timing of their adoption is not yet available. Offsets issued by jurisdictions linked with Québec are recognized for compliance.</p> <p>The Minister may require the promoter to replace any offset credit issued to the buyer for a project, in the event that:</p> <ol style="list-style-type: none"> 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. <p>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.</p>
Provisions for price management	Auction Reserve Price: Minimum auction (reserve) price for joint auction with California and Ontario in 2018: The highest of Québec’s (CAD

14.35; USD 18.63), Ontario's (CAD 14.68; USD 19.05) or California's (USD 14.53) annual price; increasing annually by 5% plus inflation until 2030.

Reserve emission units held in the Allowance Price Containment Reserve account may be sold at CAD 53.37 (USD 69.27), 60.04 (USD 77.93), 66.71 (USD 86.59)/t CO₂e in 2018.

Only covered entities in Québec are eligible to purchase allowances from the Reserve, as long as they do not have valid compliance instruments for the current period in their general account. Reserve prices increase annually by 5% plus inflation.

Compliance

Monitoring, Reporting, Verification (MRV)	<p>Reporting frequency: One year. Report to be submitted by 1 June of each year.</p> <p>Verification: Emitters (and voluntary emitters) participating in ETS (higher threshold than those with regulatory reporting requirement) must send a verification report carried out by an organization accredited to ISO 14065.</p> <p>Framework: Regulation on the mandatory reporting of certain emissions of contaminants into the atmosphere is outlined in the Environment Quality Act.</p> <p>More information: Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere</p>
Enforcement	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>

Other Information

Institutions involved	<p>Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (Ministry of Sustainable Development, the Environment and the Fight Against Climate Change); Direction générale de la Réglementation carbone et des données d'émission (Carbon Market Directorate).</p>
Linkage with other schemes	<p>On 1 January 2014, Québec linked with California. On 1 January 2018, Québec and California linked with Ontario.</p>

China

General Information

Summary

Status: ETS in force

Jurisdictions: China

Through a video conference call on 19 December 2017, including both national ministries and provincial governments, China launched its much-anticipated national ETS, which is now the world's largest carbon market. The provisions for the launch and incremental development of the ETS are laid out in the Work Plan for Construction of the National Emissions Trading System (Power Sector), (hereinafter referred to as the "Work Plan"), which was approved by the State Council late in 2017.

The ETS regulates around 1,700 companies from the power sector (including combined heat and power as well as captive power plants of other sectors), which emit more than 26,000 tons GHG per year, or consume more than 10,000 tons of standard coal equivalent (tce) per year. The Chinese system covers more than three billion tons of CO₂e in its initial phases, accounting for about 30% of national emissions.

A three-phase roadmap has been adopted (Article 3, Work Plan). Phase one is on the development of market infrastructures (roughly one year); phase two foresees simulation trading (roughly another year); and phase three will be the deepening and expanding phase with allowances spot trading for compliance purposes (roughly starting from 2020).

Supplementary technical rules on MRV, allowance management, and market trading will be further developed (Article 10-12, Work Plan). So too will the market infrastructure and supporting systems (Article 15-18, Work Plan) e.g. national registry (led by Hubei) and trading platform (led by Shanghai). While detailed allocation rules are yet to be published, allowances are expected to be initially handed out for free based on sub-sector benchmarks with ex-post adjustments that reflect actual production volumes (based on the draft allocation methods for the trial allocation in 2017). Domestic offsets that have also been used by the ETS pilots, known as Chinese Certified Emission Reductions (CCERs), are also expected to be available in the national carbon market post-2020 (Article 3, Work Plan).

While a uniform rule will be in place for all provinces, provincial governments may be able to extend the scope of the ETS and apply stricter allocation methods within their regions (Article 2, Work Plan).

Under the oversight of the National Development and Reform Commission (NDRC), which will operate the national carbon market jointly with the provincial governments (Article 8, Work Plan), the Chinese carbon market is expected to see continuous improvement over the coming years, such as strengthening domestic capacity and improving data quality. The market will also gradually expand to cover additional sectors (Article 7, Work Plan).

This step-wise approach is also reflected by a notice by NDRC in December 2017 requiring all local DRCs to begin the MRV process for 2016 and 2017 emissions from eight sectors of the economy (including heat and power, petrochemical, chemical, building materials, steel, nonferrous metals, paper and aviation). The notice also includes new data collection, categorization and verification requirements. These sectors had previously submitted their historical data for 2013-2015 emissions.

The launch of China's national ETS in 2017 has been a goal set in 2015 at China's highest political level, which were reaffirmed by its Nationally Determined Contribution under the Paris Agreement, and the "13th Five-Year Work Plan for Greenhouse Gas Emission Control". Other key documents throughout the preparation phase are "Interim Administrative Measures on Emissions Trading" (December 2014), the 24 "Guidelines for GHG Monitoring and Reporting" for various sectors (2013, 2014, 2015), and the "Notice on Key Works in Preparation for the Launch of the National ETS" (NDRC 2016 No. 57, January 2016).

[National Development and Reform Commission \(NDRC\) \(Chinese\)](#)

	<p>Work Plan for Construction of the National Emissions Trading System (Power Sector) (NDRC) (Chinese) Interim Measures for Carbon Emissions Trading (NDRC) (Chinese) Activities of China under the Partnership for Market Readiness (PMR)</p> <p>China's Intended Nationally Determined Contribution (INDC)</p>												
Overall GHG emissions (excluding LULUCF)	Emissions: 10976 MtCO ₂ e (2012)												
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Energy (excl. Transport)</td> <td>7946.9</td> </tr> <tr> <td>Industrial Processes</td> <td>1296.6</td> </tr> <tr> <td>Agriculture</td> <td>831.6</td> </tr> <tr> <td>Waste</td> <td>197.6</td> </tr> <tr> <td>Transportation</td> <td>702.9</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Energy (excl. Transport)	7946.9	Industrial Processes	1296.6	Agriculture	831.6	Waste	197.6	Transportation	702.9
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Transportation	702.9												
Overall GHG reduction target	<p>By 2020: 40-45% reductions in carbon intensity compared to 2005 levels (voluntary commitment under the Copenhagen Accord of 2009).</p> <p>Further detailed target for 2016-2020: reduction in carbon emissions per unit GDP by 18% compared to 2015 level (13th Five-year plan).</p> <p>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).</p>												
Type of ETS	Mandatory												
Cap and trajectory	Type of Cap: ~3300 MtCO ₂ e/year												
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> No information available yet.												

ETS Size

Emissions covered by the ETS	0.30
GHG covered	CO ₂
Sectors covered and thresholds	<p>Power sector (including combined heat and power as well as captive power plants of other sectors).</p> <p>Scope is expected to be gradually expanded to finally cover eight sectors including: petrochemical, chemical, building materials, steel, nonferrous metals, paper and aviation.</p> <p>Inclusion Thresholds: Entities with annual emissions of ~26,000 t/CO₂ (energy consumption of more than 10,000 tce) in any year over the period 2013–2015.</p>
Number of liable entities	<p>Approximately 1,700 entities</p> <p>No information available yet.</p>
Point of regulation	<p>Downstream</p> <p>In the Long Run: Mixed. Both direct emissions from the power sector and indirect emissions from electricity (and heat) consumption are expected to be included.</p>

Phases & Allocation

Compliance period	One year
Trading period	<p>Phase one (roughly a year): Development of market infrastructure</p> <p>Phase two (roughly another year): Simulation trading</p> <p>Phase three (roughly from 2020 on): Deepening and expanding</p> <p>The following trading periods are to be further defined.</p>
Allocation	<p>Detailed allocation rules are yet to be developed by NDRC in cooperation with energy sector authorities (Article 13, Work Plan). However, based on officially released documents during trial allocation, free allocation is expected based on sub-sector benchmarks with ex-post adjustments for changes in actual production.</p> <p>Based on the national cap setting and allocation framework approved by the State Council in December 2016, draft allocation plan for three sectors (power, cement and electrolytic aluminum) were developed and trial allocation work carried out in two provinces in May 2017, which will feed into the finalization of the allocation rules.</p>

Flexibility

Banking and borrowing	Expected to allow banking across compliance phases but not borrowing (Article 3, Work Plan).
Offsets and credits	<p>The use of CCER credits is expected to be allowed at certain time during the third phase (Article 3, Work Plan).</p> <p>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 CCER. They are expected to be used in national ETS with revision of the Interim Regulation and development of “Administration Measure of Offset Scheme for National ETS” (incoming), to regulate the quality and limit the use of CCER for compliance market. Specific timeline and detailed rules are yet to be published.</p>
Provisions for price management	NDRC in cooperation with other ministries are to develop adjustment mechanism to prevent abnormal price fluctuations as well as risk prevention and control mechanism to prevent market manipulations (Article 12, Work Plan).

Compliance

Monitoring, Reporting, Verification (MRV)	<p>Reporting Frequency: Annual</p> <p>The NDRC is currently drafting MRV regulations for the national ETS (Article 10, Work Plan). 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.</p> <p>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 MRV for the 8 ETS covered sectors as well as “Reference Guidance on Third-party</p>
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	<p>Verification of China ETS” and “Reference Qualification on Third-party Verification Body and Verifiers of China ETS”.</p> <p>In December 2017, NDRC published another notice, requiring all local DRCs to begin the MRV process for 2016 and 2017 emissions from eight sectors of the economy (power, petrochemical, chemical, building materials, steel, nonferrous metals, paper and aviation). The notice also includes new data collection, categorization and verification requirements.</p>
Enforcement	<p>Non-compliance will result in punishment (details are yet to be developed); relevant information will also be included in the national credibility information sharing platform (Article 11, Work Plan).</p>

Other Information

Institutions involved	<p>National Development and Reform Commission (NDRC)</p> <p>Provincial/autonomous regional/municipal Development and Reform Commissions (DRCs)</p> <p>Overall, NDRC, in cooperation with other relevant ministries, is in charge of policy design and rule making while the local DRCs are in charge of policy and rule implementation (Article 8, Work Plan).</p>
Linkage with other schemes	<p>No information available yet.</p>

China - Beijing pilot system

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Beijing</p> <p>The Beijing pilot ETS was launched on 28 November 2013 and has finished four compliance years so far. It covers about 45% of the city's total emissions, including both direct and indirect emissions from electricity providers, heat, cement, petrochemicals, other industrial enterprises, manufacturers, the service sector and public transport.</p> <p>On 28 November 2013, Beijing signed the Framework Agreement for Cooperation on the Study of Cross-regional Carbon Emissions Trading with Tianjin, Hebei, Inner Mongolia, Shaanxi and Shandong. To test interregional cooperation, several cement companies from Hebei province and Inner Mongolia were included voluntarily in the Beijing pilot system in 2015 and 2016 but not for vintage 2016 compliance in 2017 and beyond.</p> <p>Beijing Pilot ETS Implementation Plan (Chinese)</p> <p>Interim Measures for the Management Emissions Trading in Beijing (Chinese)</p> <p>Beijing DRC - Allocation Plan for Vintage 2017 (Chinese)</p>
Overall GHG emissions (excluding LULUCF)	<p>Emissions: 188.1 MtCO_{2e} (2012)</p> <p>2010 carbon emission: n.a. 2010 energy intensity: 0.493 ton SCE/10,000 CNY</p>
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	<p>Type of Cap: Absolute</p> <p>46 MtCO_{2e} (2016, existing facilities only)</p>
Carbon Price	<i>Current Allowance Price (per t/CO_{2e}):</i> CNY 51.58 (USD 8.01) (secondary market price as of 16 January 2018)

ETS Size

Emissions covered by the ETS	0.45
GHG covered	CO ₂
Sectors covered and thresholds	<p>Industrial and non-industrial companies and entities, including electricity providers, heating sector, cement, petrochemicals, other industrial enterprises, manufacturers, service sector, and public transport.</p> <p>Inclusion thresholds: 5,000t CO₂/year, considering both direct and indirect emissions.</p> <p>Mandatory reporting: 2,000 tons of standard coal equivalent energy consumption/year.</p>

Number of liable entities	<p>Mandatory reporting and compliance entities: 943 (2017)</p> <p>Mandatory reporting (only) entities: 582 (2016)</p> <p>The accounting boundary for emissions is set at the company-level (legal person).</p>
Point of regulation	<p>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.</p>

Phases & Allocation

Compliance period	<p>One year (15 June)</p> <p>For 2017 Vintage, compliance deadline has been postponed to 31 July 2018.</p>
Trading period	<p>Five years (2013-2017)*</p> <p>*In the short-term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long-term, they are expected to be integrated into the national market, once it is fully operational.</p>
Allocation	<p>Mainly free allocation through grandfathering based on emissions or emissions intensity in the years 2009-2012 (stationary sources) or 2013-2016 (mobile sources). For 2017 vintage, benchmarking has been introduced for electricity (including co-generation) sector. For new entrants and entities with expanded capacity an advanced sector based emissions intensity benchmark is applied.</p>

Flexibility

Banking and borrowing	<p>Banking is allowed during the pilot phase. Borrowing is not allowed.</p>
Offsets and credits	<p>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.</p> <p>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.</p> <p>Verified carbon emission reductions from energy saving projects and forest carbon sink projects from within the city of Beijing are also allowed.</p>
Provisions for price management	<p>The Beijing Development and Reform Commission (DRC) can auction extra allowances if the weighted average price exceeds CNY 150 (USD 22) for ten consecutive days, and buy back allowances from the market if the price is below CNY 20 (USD 3).</p>

Compliance

Monitoring, Reporting, Verification (MRV)	<p>Reporting Frequency: Annual reporting of CO2 emissions.</p> <p>Verification: Third-party verification is required.</p>
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	<p>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.</p> <p>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.</p>
Enforcement	Penalties for failing to submit emissions or verification reports on time can result in fines up to 50,000 CNY (USD 7,398). 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 and registry)
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	<p>Status: ETS in force</p> <p>Jurisdictions: Chongqing</p> <p>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 237 enterprises covered by the system account for around 40% of the city's total emissions.</p> <p>Interim Measures for Management of Emissions Trading In Chongqing (Chinese) Chongqing DRC – Allowance Allocation Management Rules (Chinese)</p>
Overall GHG emissions (excluding LULUCF)	Emissions: 250 MtCO ₂ e (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	<p>Type of Cap: Absolute</p> <p>100.4 MtCO₂e (2016)</p>
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> CNY 19.50 (USD 3.03) (secondary market price as of 16 January 2018)

ETS Size

Emissions covered by the ETS	0.4
GHG covered	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆
Sectors covered and thresholds	<p>Power, electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel.</p> <p>Inclusion threshold: 20,000t CO₂e/year.</p>
Number of liable entities	<p>237 (2016)</p> <p>The accounting boundary for emissions is set at the company-level (legal person).</p>
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 theoretically while in practice there have been some delays). For vintage 2015, the compliance deadline was postponed to 18 November 2016 and for vintage 2016 the verification deadline has been set as 31 October 2017.
Trading period	Five years (2013-2017)* *In the short-term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long-term, they are expected to be integrated into the national market, once it is fully operational
Allocation	Free allocation 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. Different from other pilots, the covered companies are asked to submit their allocation quotas on a yearly basis of which free allocation is based on. 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)
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	Chongqing Carbon Emissions Exchange (Trading platform and registry)
Linkage with other schemes	No information available yet.

China - Fujian pilot system

General Information

<p>Summary</p>	<p>Status: ETS in force</p> <p>Jurisdictions: Fujian</p> <p>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 the eighth regional ETS in China (besides the seven existing regional pilots already operating since 2013). The mandate for Fujian ETS came from the National Ecological Civilization Pilot Area (Fujian) Implementation Plan endorsed by the State Council in August 2016.</p> <p>Further regulatory rules and guidelines were released late in 2016 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 the volume of 50,000 allowances.</p> <p>The Haixia Equity Exchange in Fujian was approved in July 2016 by the National Development and Reform Commission (NDRC) to be one of the nine dedicated trading platforms for trading China’s domestic project-based carbon offset credits.</p> <p>Given the prominence of the forestry sector in Fujian, its ETS pilot has a special focus on carbon sinks. On 25 May 2017, Fujian provincial government released a notice on its forestry emission reduction and trading piloting, outlining the types and targets of promoting forestry offsets projects in Fujian. By the end of 2017, each of the 20 selected counties is required to develop at least one project, altogether covering more than 500,000 acres of forests and producing more than one million tons of emission reduction; by 2020 to develop forestry projects covering two million Acres.</p> <p>Implementation Plan of Emissions Trading Market Construction in Fujian Province (Chinese) Interim Measures for the Management of Emissions Trading in Fujian Province (Chinese) Fujian DRC - Allocation Plan for Vintage 2016 (Chinese)</p>
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Emissions: 240 MtCO_{2e} MtCO_{2e} (2016)</p>
<p>Overall GHG emissions by sector</p>	<p>No information available yet.</p>
<p>Overall GHG reduction target</p>	<p>By 2020 (13th Five Year Plan): 19.5% reduction in carbon intensity compared to 2015 levels.</p>
<p>Type of ETS</p>	<p>Mandatory</p>
<p>Cap and trajectory</p>	<p>Type of Cap: Absolute</p> <p>Around 200 MtCO_{2e}</p>
<p>Carbon Price</p>	<p><i>Current Allowance Price (per t/CO_{2e}):</i> CNY 16.50 (USD 2.56) (secondary market price as of 16 January 2018)</p>

ETS Size

<p>Emissions covered by the ETS</p>	<p>0.60</p>
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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).* Fujian may also extend its coverage to smaller Emitters who would continue trading after the national ETS to be fully operational. * In the short-term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long-term, they are expected to be integrated into the national market, once it is fully operational.
Allocation	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, on 15 December 2016, Fujian DRC organized a discriminatory (non-uniform price) allowance auction. The 50,000 allowances from the government reserve were auctioned, with the Settlement Prices ranging from CNY 26.5 (USD 3.9) to around CNY 30 (USD 4.4). No further auctions are currently planned.

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)— are allowed. The use of CCER credits is limited to 5% of the annual compliance obligation, which is increased to 10% for companies that use both FFCER and CCER credits. Qualitative Limit: Eligible offsets will be restricted to those generated in Fujian province, from CO2 or CH4 projects. Hydro power related credits are not eligible. FFCERs projects, with three project types (afforestation, forest management, and bamboo management) need to start implementation after 16 February 2005 and the project developers need to have independent legal personality.
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)	<p>Reporting Frequency: Annual reporting of CO2 emissions before end of February and submission the verified report by end of April.</p> <p>Verification: Third-party verification is required.</p> <p>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.</p>
Enforcement	<p>Penalties for failing to submit an emissions or verification report on time, providing false information, or disturbing the verification process range from CNY 10,000 (USD 1,480) to CNY 30,000 (USD 4,439). Companies failing to surrender enough allowances to match their emissions are fined between one to three times the average market price of the past 12 months, with the maximum limit of CNY 30,000 (USD 4,439). 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 (USD 1,480) to CNY 30,000 (USD 4,439).</p>

Other Information

Institutions involved	<p>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)</p>
Linkage with other schemes	No information available yet.

China - Guangdong pilot system

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Guangdong</p> <p>On 19 December 2013, Guangdong was the fourth Chinese region, after Shenzhen, Shanghai and Beijing, to start its pilot ETS.</p> <p>Guangdong is the largest of the Chinese ETS pilots, and its covered sectors account for more than half of the province's emissions.</p> <p>Guangdong expanded its scope for the first time since implementation in 2016. As well as introducing three new sectors (aviation, paper and white cement), allocation methods were also further adjusted. In 2017, it saw further inclusion of 50 new entrants. The fourth compliance period was completed in June 2017 (with 100% compliance rate) for 2016 vintage.</p> <p>Being the only pilot (among the seven NDRC mandated pilots) with regular auctioning, Guangdong ETS has 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 three to eight million allowances. Guangdong also allows unincorporated organizations such as funds and trusts to trade in its carbon market.</p> <p>Guangdong Pilot ETS Implementation Plan (Chinese) Trial Measures for Emissions Trading in Guangdong (Chinese) Guangdong DRC – Allocation Plan for Vintage 2017 (Chinese)</p>
Overall GHG emissions (excluding LULUCF)	Emissions: 610.5 MtCO _{2e} MtCO _{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	<p>Type of Cap: Absolute</p> <p>422 MtCO_{2e} (2017 including 23 MtCO_{2e} kept as government reserves for new entrants and market stability)</p>
Carbon Price	<i>Current Allowance Price (per t/CO_{2e}):</i> CNY 13.90 (USD 2.16 (secondary market price as of 16 January 2018)

ETS Size

Emissions covered by the ETS	0.60
GHG covered	CO ₂
Sectors covered and thresholds	Six sectors: Power, iron and steel, cement, papermaking, aviation and petrochemicals.

	<p>Reporting sectors: Ceramics, textiles, non-ferrous metals, and chemicals.</p> <p>Inclusion thresholds: 20,000 t CO₂/year or energy consumption 10,000 tons coal equivalent (tce)/year</p> <p>Guangdong plans to expand its coverage while taking the developments of the local and national carbon markets into consideration.</p>
Number of liable entities	<p>Total (2017): 296 Existing Entities (2017): 246 New Entrants (2017): 50</p> <p>The accounting boundary for emissions is set at the company-level (organizational and operational boundary).</p>
Point of regulation	<p>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.</p>

Phases & Allocation

Compliance period	One year (20 June)
Trading period	<p>Five years (2013-2017) before the national carbon market is launched in 2017*</p> <p>*In the short-term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long-term, they are expected to be integrated into the national market, once it is fully operational.</p>
Allocation	<p>Mainly free allocation through grandfathering or historical intensity reduction method based on 2014-2016 emissions for 2017 vintage allocation. Annual emissions reduction factor of one is applied to sectors using grandfathering (the reduction factor was 0.99 in 2016). Benchmarking is applied for coal or gas fired electricity generators (including heating, combined heat and power), aviation, cement, paper and steel industrial processes. For those using benchmarking, the pre-issuance of allowance is based on 2016 production, and the final number will be updated based on 2017 production.</p> <p>In 2016 and 2017, the proportion of free allocation (95% for the power sector and 97% for remaining sectors) remained the same as in 2015. The allowance auction plan was also the same as for the vintage 2015, with a total of two million allowances available for auction. Different from 2015 and 2016 where auctions were held on quarterly basis, for vintage 2017 auctions will be ad hoc. During the first compliance year (2013) participation in auctions i.e. purchasing allowances was mandatory for entities to be eligible to receive or trade their freely allocated allowances. This requirement has been terminated since 2014.</p>

Flexibility

Banking and borrowing	Banking is allowed during the pilot phase. Borrowing is not allowed.
Offsets and credits	<p>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. As a mechanism that encourages the public to reduce carbon emissions, Pu Hui Certified Emission Reduction (PHCER) is also allowed for offsets. For 2017 a general limit of 1.5m tons has been set.</p> <p>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</p>

	<p>Guangdong. Pre-CDM credits are not eligible, as are credits from hydropower or most fossil fuel projects.</p> <p>Guangdong also indicated the potential for further CCER restrictions depending on the fundamental supply/demand situation of the market and further national restrictions – details have yet to be released.</p>
Provisions for price management	<p>Guangdong has an auction floor price. Initially in 2013, it was set at CNY 60 (USD 9), and then it was lowered to CNY 25 (USD 4) and increased to CNY 40 (USD 6) in steps of CNY 5 (USD 1) with each quarterly auction. In the third year, the floor price is set at 80% of the weighted average price for allowances over the previous three months.</p> <p>In 2016, there was no restriction on the declared price, but a so-called policy reserve price was set, as an effective price floor. During the first auction for vintage 2016 allowances, half a million allowances were on offer and cleared above the floor price of 9.37 CNY/ton (USD 1.39) with a settlement price of 9.88 CNY/ton (USD 1.46).</p>

Compliance

Monitoring, Reporting, Verification (MRV)	<p>Reporting Frequency: Annual reporting of CO2 emissions.</p> <p>Verification: Third-party verification is required.</p> <p>Framework: The Guangdong Development and Reform Commission (DRC) has released guidelines for monitoring and reporting for the compliance and reporting sectors.</p>
Enforcement	<p>Penalties for failing to submit emissions or verification reports on time range from CNY 10,000 (USD 1,480) to CNY 50,000 (USD 7,398). Furthermore, companies failing to surrender enough allowances to match their emissions will be deducted twice the amount of allowances from the following year's allocation and are fined CNY 50,000 (USD 7,398).</p>

Other Information

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

China - Hubei pilot system

General Information

<p>Summary</p>	<p>Status: ETS in force</p> <p>Jurisdictions: Hubei</p> <p>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 one of the most active markets among the pilot ETSs in terms of trading.</p> <p>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.</p> <p>In addition, companies covered by both Hubei ETS and the upcoming national ETS will be pre-allocated with a certain amount (equivalent to ten percent of their 2016 initial allocation) of National Emissions Allowances, which can only be used for future trading rather than 2016 compliance.</p> <p>According to the 2016 compliance notice by Hubei DRC on 6 July 2017, Hubei ETS will continue to run after the National ETS commences, and the valid Hubei allowance surplus from previous years can be traded and used for compliance in Hubei ETS in later years. The Hubei allowance transition to the National ETS will be based on rules to be defined by the National Development and Reform Commission (NDRC).</p> <p>In December 2017, Hubei was selected to lead the development of the registry for the National ETS.</p> <p>In January 2018, Hubei DRC announced the allocation plan for 2017 vintage. It expands the coverage, from 236 (2016) to 344 entities, by reducing the threshold for some industrial sectors to 10,000 tons coal equivalent (tce), thus equating the threshold across all covered sectors.</p> <p>Hubei Pilot ETS Implementation Plan (Chinese) Interim Measures for Management of Emissions Trading in Hubei Province (Chinese) Hubei DRC -Allocation Plan for Vintage 2017 (Chinese)</p>
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Emissions: 463.1 MtCO_{2e} (2012)</p>
<p>Overall GHG emissions by sector</p>	<p>No information available yet.</p>
<p>Overall GHG reduction target</p>	<p>By 2020 (13th Five Year Plan): 19.5% reduction in carbon intensity compared to 2015 levels.</p>
<p>Type of ETS</p>	<p>Mandatory</p>
<p>Cap and trajectory</p>	<p>Type of Cap: Absolute</p> <p>257 MtCO_{2e} (2017)</p>
<p>Carbon Price</p>	<p><i>Current Allowance Price (per t/CO_{2e}):</i> CNY 15.34 (USD 2.38) (secondary market price as of 16 January 2018)</p>

ETS Size

Emissions covered by the ETS	35%
GHG covered	CO ₂
Sectors covered and thresholds	<p>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.</p> <p>Inclusion threshold: Annual energy consumption more than 10,000 tce in any year between 2014 and 2016 for all sectors while in vintage 2016 it was only for the power, steel, non-ferrous, chemicals, petrochemicals, building materials and pulp and paper sectors and a higher level, 60,000 tce, was set for other sectors.</p>
Number of liable entities	<p>344 (2017)</p> <p>The accounting boundary for emissions is set at the company-level (legal person).</p>
Point of regulation	<p>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.</p>

Phases & Allocation

Compliance period	<p>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 (by 30 May each year theoretically while in practice there have been some delays). For vintage 2016, the compliance deadline was postponed for two months to 31 July 2017.</p>
Trading period	<p>Five years (2013-2017)*</p> <p>*In the short-term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long-term, they are expected to be integrated into the national market, once it is fully operational.</p>
Allocation	<p>Free allocation of 2017 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, pulp and paper, and ceramics sectors; grandfathering based on previous three years' historic emissions for all other sectors. Ex-post allocation adjustments are possible, especially for those sectors that use benchmarks and historical intensity (first receive half of the total allowance based on previous year's actual emission data or historical emission baseline and then using the actual production data to update allocation). The total cap also includes a new entrants reserve as well as government reserve for potential market adjustment.</p>

Flexibility

Banking and borrowing	<p>Banking is allowed during the pilot phase, but only for allowances that were traded at least once. Borrowing is not allowed.</p>
Offsets and credits	<p>Quantitative Limit: Domestic project-based carbon offset credits — China Certified Emission Reduction (CCER) — are limited to 10% of the annual allocation.</p>

	<p>Qualitative Limit: CCERs must come from rural biogas or forestry projects in the key counties under the national poverty alleviation plan in urban agglomeration areas of the middle reaches of the Yangtze River (within Hubei) and that were generated between 1 January 2013 and 31 December 2015.</p>
Provisions for price management	<p>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 between -10% and +10% respectively (between 15 July and 25 December 2016 the limit was temporarily adjusted to between -1% and +10% as a response to the decreasing carbon price at that time).</p>

Compliance

Monitoring, Reporting, Verification (MRV)	<p>Reporting Frequency: Annual reporting of CO2 emissions.</p> <p>Verification: Third-party verification is required.</p> <p>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.</p>
Enforcement	<p>Penalties for failing to submit an emissions or verification report on time range from CNY 10,000 (USD 1,480) to CNY 30,000 (USD 4,439). Trade participants that manipulate the market face up to CNY 150,000 (USD 22,195) in fines. Furthermore, companies that fail to surrender enough allowances to match their emissions will be deducted twice the amount of allowances from next year's allocation and are fined one to three times the average market price for every allowance, with a maximum limit of CNY 150,000 (USD 22,195).</p>

Other Information

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

China - Shanghai pilot system

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Shanghai</p> <p>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.</p> <p>Shanghai is one of the most active markets among the pilot systems with regards to the cumulative trade volume and transaction amount.</p> <p>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.</p> <p>In December 2017, Shanghai was selected to lead the development of the trading platform for the national ETS.</p> <p>Shanghai Pilot ETS Implementation Plan (Chinese) Trial Measures for Management of Emission Trading in Shanghai (Chinese) Shanghai DRC – Allocation Plan for Vintage 2017 (Chinese)</p>
Overall GHG emissions (excluding LULUCF)	Emissions: 297.7 MtCO ₂ e MtCO ₂ e (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	<p>Type of Cap: Absolute</p> <p>156 MtCO₂e (2017)</p>
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> CNY 35.49 (USD 5.51) (secondary market price as of 16 January 2018)

ETS Size

Emissions covered by the ETS	0.57
GHG covered	CO ₂
Sectors covered and thresholds	<p>The following sectors and entities are covered: Airports, aviation, chemical fiber, chemicals, commercial, power and heat, water suppliers, hotels, financial, iron and steel, petrochemicals, ports, shipping, non-ferrous metals, building materials, paper, railways, rubber, and textiles.</p> <p>Inclusion thresholds:</p>

	<p>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.</p> <p>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.</p> <p>For buildings: 10,000 CO₂/year or 5,000 tce/year.</p>
Number of liable entities	<p>298 (2017)</p> <p>The accounting boundary for emissions is set at the company-level (legal person).</p>
Point of regulation	<p>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.</p>

Phases & Allocation

Compliance period	One year (30 June)
Trading period	<p>Three years (2013-2015; 2016-2018)*</p> <p>*In the short-term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long-term, they are expected to be integrated into the national market, once it is fully operational.</p>
Allocation	<p>Free allocation based on sector-specific benchmarks (power, heat, manufacturers), historic emissions intensity (industry, aviation, car glass, ports, shipping, and water suppliers, generally based on 2014-2016 data) or historic emissions (buildings, commercial sector, industry with complex products or considerable change in emission boundary, and airport, generally based on 2014-2016 data).</p> <p>Ex-post allocation adjustments, e.g., on the basis of production data, are possible.</p> <p>A smaller share of the annual cap (from the government reserve) could be auctioned. Shanghai held its allowance auction of 2m tons on 30 June 2017, with floor price of CNY 38.77 (USD 5.74), to increase the market supply. A total of 41,855 tons (2.1% of total auction volume) of allowances were sold at the floor price. Similarly, another auction was held in 2014. Both auctions were for covered entities that were in need of allowances for their compliance.</p>

Flexibility

Banking and borrowing	<p>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 Shanghai Emissions Allowances (SHEA) to be exchanged per year between 2016 and 2018.</p> <p>Borrowing is not allowed.</p>
Offsets and credits	<p>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.</p> <p>Qualitative Limit: Credits for reductions that were realized before January 2013 cannot be used for compliance. Credits from hydro projects are not allowed.</p>

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.
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Compliance

Monitoring, Reporting, Verification (MRV)	<p>Reporting Frequency: Annual reporting of CO2 emissions.</p> <p>Verification: Third-party verification is required.</p> <p>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.</p>
Enforcement	<p>Penalties for failing to submit an emissions report or verification report on time or providing fraudulent information range from CNY 10,000 (USD 1,480) to CNY 50,000 (USD 7,398).</p> <p>Between CNY 50,000 (USD 7,398) – CNY 100,000 (USD 14,797) 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.</p>

Other Information

Institutions involved	<p>Shanghai Development and Reform Commission (Competent authority)</p> <p>Shanghai Environment and Energy Exchange (Trading platform)</p> <p>Shanghai Information Center (Registry)</p>
Linkage with other schemes	No information available yet.

China - Shenzhen pilot system

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Shenzhen</p> <p>Shenzhen was the first of the Chinese pilot ETSs to start operation on 18 June 2013. In June 2017, Shenzhen finished its fourth compliance period (with a 99% 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. At the time of writing, Shenzhen had not released allocation plans for the 2017 vintage. The Shenzhen ETS covers a total of 824 entities, including 246 new entrants for the 2016 vintage. These new entrants come from industry sectors, as well as from the public transport and port sectors.</p> <p>In addition to Shenzhen-based entities, thirteen companies in Baotou, the Inner Mongolia Autonomous Region, have been covered in Shenzhen market since June 2016 and completed compliance for 2016 vintage as of 30 June 2017. However, their participation is on a voluntary basis and coverage for the 2017 vintage is not foreseen.</p> <p>Shenzhen Special Economic Zone ETS Bill (Chinese)</p> <p>Interim Measures for Management of Emissions Trading in Shenzhen (Chinese)</p> <p>Shenzhen DRC – Notice of Carrying Out Emissions Trading Work for Vintage 2016 (Chinese)</p>
Overall GHG emissions (excluding LULUCF)	Emissions: 83.45 MtCO _{2e} (2010)
Overall GHG emissions by sector	No information available yet.
Overall GHG reduction target	<p>By 2020 (13th Five Year Plan): 45% reduction in carbon intensity compared to 2005, to reach 0.81 tCO₂/ CNY 10000.</p> <p>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.</p>
Type of ETS	Mandatory
Cap and trajectory	<p>Type of Cap: Absolute</p> <p>31.45 MtCO_{2e} (excluding buildings, 2015)</p>
Carbon Price	<i>Current Allowance Price (per t/CO_{2e}):</i> CNY 25.21 (USD 3.91) (secondary market price as of 16 January 2018)

ETS Size

Emissions covered by the ETS	0.40
GHG covered	CO ₂

Sectors covered and thresholds	<p>Power, water, gas, manufacturing sectors, buildings, port and subway sectors, public buses and other non-transport sectors.</p> <p>Inclusion thresholds: 3,000t CO₂e/year for enterprises; 20,000m² for public buildings and 10,000m² for government buildings.</p>
Number of liable entities	<p>824 (2016)</p> <p>The accounting boundary for emissions is set at the company-level (organizational and operational boundary).</p>
Point of regulation	<p>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.</p>

Phases & Allocation

Compliance period	One year (30 June)
Trading period	<p>Five years (2013-2017)*</p> <p>*In the short-term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long-term, they are expected to be integrated into the national market, once it is fully operational.</p>
Allocation	<p>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 actual Output.</p> <p>The Interim Measure for the Administration of Carbon Emission Trading of Shenzhen indicated that at least 3% of allowances are ought to be auctioned. This provision on auction hasn't been implemented in practice yet. So far, only one auction has taken place (in June 2014).</p>

Flexibility

Banking and borrowing	<p>Banking is allowed during the pilot phase. Borrowing not allowed.</p> <p>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.</p>
Offsets and credits	<p>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.</p> <p>Qualitative Limit: Credits from hydro projects are not eligible and there are further geographic restrictions for the use of certain CCERs.</p>
Provisions for price management	<p>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.</p>

Compliance

Monitoring, Reporting, Verification (MRV)	<p>Reporting Frequency: Annual reporting of CO2 emissions with a tier approach taking into account the size of the company.</p> <p>Verification: Third-party verification is required.</p>
Enforcement	<p>Institutes providing false information can be fined for the difference between reported and actual emissions at the price three times the average price of the past six months. Penalties for disturbing the market order can cost up to CNY 100,000 (USD 14,797). 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.</p>

Other Information

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

China - Tianjin pilot system

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Tianjin</p> <p>The Tianjin pilot ETS started operation on 26 December 2013 and has finished four compliance years so 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 50-60% of the city's total emissions.</p> <p>Tianjin Pilot ETS Implementation Plan (Chinese)</p> <p>Interim Measure for Management of Emissions Trading in Tianjin</p>
Overall GHG emissions (excluding LULUCF)	Emissions: 215 MtCO ₂ e (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 MtCO ₂ e
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> CNY 8.51 (USD 1.32) (secondary market price of 16 January 2018)

ETS Size

Emissions covered by the ETS	0.55
GHG covered	CO ₂
Sectors covered and thresholds	Heat and electricity production, iron and steel, petrochemicals, chemicals, exploration of oil and gas. Inclusion threshold: 20,000t CO ₂ /year considering both direct and indirect emissions.
Number of liable entities	109 (2017) 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	Five years (2013-2017)* * In the short-term, the existing Chinese regional carbon markets are expected to operate in parallel to the national Chinese carbon market. Over the medium to long-term, they are expected to be integrated into the national market, once it is fully operational.
Allocation	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 and registry)
Linkage with other schemes	No information available yet.

EU Emissions Trading System (EU ETS)

General Information

<p>Summary</p>	<p>Status: ETS in force</p> <p>Jurisdictions: Member states: 28 EU Member States and three European Economic Area-European Free Trade Association (EEA-EFTA) states: Iceland, Liechtenstein and Norway</p> <p>The European Union Emissions Trading System (EU ETS) is the world's first GHG ETS and represents the central pillar of the European Union's (EU) climate change policy.</p> <p>After more than two years of negotiations on the legislative proposal to revise the EU ETS for Phase four (2021-2030), a deal has been reached by the EU co-legislators (Council and European Parliament). The revisions include a faster annual decrease of the cap (2.2%, compared to 1.74% currently), in order to contribute to the EU's 2030 target to reduce GHG emissions by at least 40% domestically by 2030. Furthermore, the agreed changes will further strengthen the EU ETS, by doubling the pace at which surplus allowances are removed from the market and placed in the Market Stability Reserve (MSR) until 2023; provide free allowances to industries at risk of carbon leakage under robust rules; and strongly support low-carbon innovation, as well as modernization of the energy sector in lower-income EU countries.</p> <p>Alongside the Phase four negotiations, the EU ETS Directive has also been amended to maintain limitations to the geographic scope of aviation coverage to flights within the European Economic Area (EEA) until 2023, while the rules for a global deal on mitigation from the aviation sector are drafted under the International Civil Aviation Organization (ICAO). A new review should take place in the light of the international developments, with a view to implement the global scheme in Union Law.</p> <p>Furthermore amendments were made to the EU ETS Registry Regulation to ensure the stability of the EU ETS, should the United Kingdom exit the EU without an agreement (so-called "Hard Brexit").</p> <p>In late 2017, the EU and Switzerland came closer to linking their carbon markets. In November, an agreement was signed between the EU and Switzerland. The link will be operational once the linking agreement has been ratified by both sides, and all criteria of the linking agreement have been met. This is likely to be by 1 January 2020.</p> <p>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)</p>										
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Emissions: 4,367 MtCO₂e (2015)</p> <p>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), Liechtenstein (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.</p>										
<p>Overall GHG emissions by sector</p>	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Energy</td> <td>3399.4</td> </tr> <tr> <td>Industrial Processes</td> <td>384.4</td> </tr> <tr> <td>Agriculture</td> <td>441.9</td> </tr> <tr> <td>Waste</td> <td>140.8</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Energy	3399.4	Industrial Processes	384.4	Agriculture	441.9	Waste	140.8
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Overall GHG reduction target	<p>By 2020: -20% below 1990 GHG levels</p> <p>By 2030: at least -40% below 1990 GHG levels</p> <p>By 2050: EU leaders have committed to reducing emissions by 80-95% below 1990 GHG levels</p>
Type of ETS	Mandatory
Cap and trajectory	<p>Type of Cap: Absolute</p> <p>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.</p> <p>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.</p> <p>Phase four (2021-2030):A Linear Reduction Factor of 2.2% annually for both stationary sources and the aviation sector. The linear reduction factor does not have a sunset clause and as such the cap will continue to decline beyond 2030.</p>
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> EUR 9.68 (approx. USD 11.92) (clearing price at auction as of 23 February 2018)

ETS Size

Emissions covered by the ETS	0.45
GHG covered	CO ₂ , N ₂ O, PFCs
Sectors covered and thresholds	<p>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.</p> <p>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).</p> <p>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.</p> <p>Phase four (2021-30):No changes to the scope are envisaged for Phase four compared to Phase three.</p> <p>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 EEA. Exemptions for operators with low emissions have also been introduced.</p> <p>In light of the progress made under ICAO towards a global measure to reduce emissions from the aviation sector (the Carbon Offsetting and Reduction Scheme (CORSIA)), the EU has maintained the intra-EEA scope for the ETS Aviation until 31 December 2023. A further review and assessment will be carried out once there is clarity surrounding the content and nature of CORSIA as well as the extent of participation by Europe’s international partners.</p>

Number of liable entities	<p>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.</p> <p>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))</p> <p>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))</p>
Point of regulation	Downstream

Phases & Allocation

Compliance period	From 1 January until 30 April the following year (16 months)
Trading period	<p>Phase one: Three years (2005-2007)</p> <p>Phase two: Five years (2008-2012)</p> <p>Phase three: Eight years (2013-2020)</p> <p>Phase four: Ten years (2021-2030)</p>
Allocation	<p>Phase one (2005-2007): Nearly 100% free allocation through grandfathering. Some Member States used auctioning and some used benchmarking.</p> <p>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).</p> <p>Phase three (2013-2020): Over the entire trading period (2013-2020), 57% of allowances will be auctioned, while the remaining allowances are available for free allocation.</p> <p>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.</p> <p>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.</p> <p>Aviation sector: In 2012, 85% of allowances were allocated for free based on benchmarks. For Phase three: 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. As a consequence of the temporary derogation applying to flights with third countries, the allocation is adjusted to the intra-EEA scope.</p> <p>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.</p> <p>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.</p>

Phase four (2021-2030): One of the central components of the Phase four revision package is to ensure the declining number of free allowances is distributed in the most effective and efficient way. To this end, in Phase four:

- Benchmark values will be updated twice during the phase to reflect technological progress in the different sectors.
- Free allocation may be updated annually to mirror sustained changes in production (if the change is more than 15% compared to the initial level, on the basis of a two-year rolling average).
- Carbon leakage rules will be more robust, as the number of sectors classified at risk of carbon leakage will be reduced, and the free allocation for other sectors will be discontinued by 2030 (except district heating).
- As an additional safeguard for industry, the agreement foresees a “free allocation buffer” of over 450 million allowances initially earmarked for auctioning, to be made available if the initial free allocation is fully absorbed (thereby avoiding or reducing a correction factor).

In addition, two new multi-billion Euro funds will be established to help the industry and the power sectors meet the innovation and investment challenges of the transition to a low-carbon economy.

The Innovation Fund: For the demonstration of innovative technologies to breakthrough innovation in industry, as well as carbon capture and storage/use and renewable energy.

The Modernization Fund: Facilitating investments in modernizing the energy systems and supporting energy efficiency in ten lower-income Member States, including investments to support a socially just transition to a low-carbon economy (such as retraining for affected workers).

Flexibility

Banking and borrowing	Unlimited banking is allowed since 2008. Borrowing is not allowed.
Offsets and credits	<p>Phase one (2005-2007): Unlimited use of Clean Development Mechanism (CDM) credits and Joint Implementation Credits (JI) was provided for in the Directive. In practice, no credits were used in Phase One.</p> <p>Phases two (2008-2012) and three (2013-2020):</p> <p>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.</p> <p>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.</p> <p>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. Commitment period of the Kyoto Protocol are no longer accepted as of 31 March 2015.</p> <p>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).</p> <p>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).</p> <p>Phase four (2021-2030): Currently no international offsets are envisaged.</p>

Provisions for price management	<p>The EU ETS Directive provides for measures in the event of excessive price fluctuations. In 2015, a decision to create a 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 to neutralize the negative impacts of the existing allowance surplus and to improve 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 and re-injected to the market if the number of allowances in circulation falls below 400 million. 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.</p> <p>Revisions to the MSR have also been agreed as part of the Phase four reform. Specifically, the feeding rate will increase from 12% to 24% for the first five years of operation. Additionally, the number of allowances that can accrue in the MSR will be limited to the previous year's auction volume from 2023 onwards.</p>
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Compliance

Monitoring, Reporting, Verification (MRV)	<p>Reporting frequency: Annual self-reporting based on harmonized electronic templates prepared by the European Commission.</p> <p>Verification: Verification by independent accredited verifiers is required before 31 March each year.</p> <p>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).</p>
Enforcement	<p>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.</p>

Other Information

Institutions involved	<p>The European Commission and the relevant authorities of the 28 Member States, Iceland, Liechtenstein, and Norway.</p>
Linkage with other schemes	<p>The European Commission has concluded negotiations with Switzerland on linking the EU ETS with the Swiss ETS. In November 2017, the European Union and Switzerland signed the Agreement to link their ETS. The link will become operational on 1 January of the year following ratification and completion of all requirements under the linking agreement.</p>

Japan - Saitama Target Setting Emissions Trading System

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Saitama</p> <p>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 Tokyo's. In FY2015, the Saitama ETS had achieved a 27% reduction in emissions below base-year emissions.</p>										
Overall GHG emissions (excluding LULUCF)	<p>Emissions: 37.2 MtCO₂e (FY2015 (demand side))</p> <p>*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.</p>										
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Industry</td> <td>12.3</td> </tr> <tr> <td>Residential</td> <td>7.6</td> </tr> <tr> <td>Transport</td> <td>9.4</td> </tr> <tr> <td>Commercial</td> <td>4.5</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Industry	12.3	Residential	7.6	Transport	9.4	Commercial	4.5
Sector Name	MtCO ₂ e										
Industry	12.3										
Residential	7.6										
Transport	9.4										
Commercial	4.5										
Overall GHG reduction target	By 2020: 21% reduction from 2005 GHG levels (demand side).										
Type of ETS	mandatory										
Cap and trajectory	<p>Type of Cap: Absolute</p> <p>An absolute cap is set at the facility level, which aggregates to a Saitama-wide cap.</p> <p>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).</p> <p>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.</p>										
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> No information available yet.										

ETS Size

Emissions covered by the ETS	0.18
GHG covered	CO ₂
Sectors covered and thresholds	<p>Commercial and industrial sectors.</p> <p>Inclusion Threshold: Facilities that consume energy more than 1,500kL of crude oil equivalent or more per year.</p>
Number of liable entities	600 facilities (as of 1 February 2018)

	No information available yet.
Point of regulation	Downstream

Phases & Allocation

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

Flexibility

Banking and borrowing	<p>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.</p>
Offsets and credits	<p>Currently credits from five offset types are allowed in the Saitama scheme.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>

	<p>Tokyo Credits (via linking), two types:</p> <p>1) Excess Credits from TMG ETS: Emission reductions from facilities with base-year emissions of 150,000t or less. Issuance of credits from FY2015.</p> <p>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.</p> <p>All offsets have to be verified by verification agencies.</p>
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)	<p>Reporting Frequency: Annual reporting. All seven GHGs have to be monitored and reported: CO2 (non-energy related), CH4, N2O, PFCs, HFCs, SF6 and NF3.</p> <p>Verification: Verification is required only when it is used for compliance.</p> <p>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.</p> <p>Other: Verified reduction amounts can be used for compliance, but cannot be traded with other facilities except for energy-related CO2.</p>
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	<p>Status: ETS in force</p> <p>Jurisdictions: Tokyo Metropolis</p> <p>Launched in April 2010, the Tokyo Metropolitan Government's Cap-and-Trade Program (Tokyo ETS) is Japan's first mandatory ETS. Under the Tokyo ETS, large offices and factories are required to reduce emissions by 6% or 8% in the first period (FY 2010-2014). Now in its second period, the target has increased to 15% or 17%.</p> <p>In FY2015, emissions were reduced by 26% compared to base-year emissions. The introduction of high efficiency heat sources and light fittings have been key activities in generating emission reductions. Emission reductions have continued alongside increases to gross floor space, indicating a decrease in emissions intensity of the building sector in Tokyo.</p> <p>TMG Bureau of Environment Website on Tokyo Cap and Trade</p> <p>Official Documents on the Tokyo Cap and Trade Program</p>												
Overall GHG emissions (excluding LULUCF)	<p>Emissions: 65.9 MtCO_{2e} (2015)</p> <p>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.</p>												
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO_{2e}</th> </tr> </thead> <tbody> <tr> <td>Commercial</td> <td>24.2</td> </tr> <tr> <td>Transport</td> <td>11.3</td> </tr> <tr> <td>Residential</td> <td>18.8</td> </tr> <tr> <td>Industry</td> <td>4.6</td> </tr> <tr> <td>Waste</td> <td>1.6</td> </tr> </tbody> </table>	Sector Name	MtCO _{2e}	Commercial	24.2	Transport	11.3	Residential	18.8	Industry	4.6	Waste	1.6
Sector Name	MtCO _{2e}												
Commercial	24.2												
Transport	11.3												
Residential	18.8												
Industry	4.6												
Waste	1.6												
Overall GHG reduction target	<p>By 2020: 25% reduction from 2000 GHG levels.</p> <p>By 2030: 30% reduction from 2000 GHG levels.</p>												
Type of ETS	Mandatory												
Cap and trajectory	<p>Type of Cap: Absolute</p> <p>The absolute cap is set at the facility level that aggregates to a Tokyo-wide cap.</p> <p>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).</p> <p>Base-year emissions are the average emissions of three consecutive fiscal years selected by facilities between FY2002-FY2007.</p> <p>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.</p> <p>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.</p>												

	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	<i>Current Allowance Price (per t/CO₂e)</i> : No information available yet.

ETS Size

Emissions covered by the ETS	0.20
GHG covered	CO ₂
Sectors covered and thresholds	<p>Commercial and Industrial Sectors.</p> <p>Building owners are subject to surrender obligations but large tenants, those with a floor space above 5000m² or over 6 million kWh electricity usage per year, can assume obligations jointly or in place of building owners</p> <p>Inclusion Thresholds: Facilities that consume energy more than 1,500kL of crude oil equivalent or more per year.</p>
Number of liable entities	<p>Approximately 1300 facilities</p> <p>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.</p>
Point of regulation	Downstream

Phases & Allocation

Compliance period	<p>Five years.</p> <p>First Period: FY2010-FY2014</p> <p>Second Period: FY2015-FY2019</p> <p>Fiscal year runs from 1 April to 31 March.</p>
Trading period	<p>First Period: 1 April 2011 to 30 September 2016 (compliance period and adjustment year)</p> <p>Second Period: 1 April 2015 to 30 September 2021 (compliance period and adjustment year)</p>
Allocation	<p>Grandfathering based on historical emissions calculated according to the following formula: base year emissions x (1-compliance factor) x compliance period (5 years).</p> <p>Base-year emissions for the first compliance period are based on the average emissions of three consecutive years between FY2002-FY2007.</p> <p>Allocation to new entrants is based on past emissions or on emissions intensity standards: emissions activity (floor area) x emission intensity standard.</p>

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	<p>Currently credits from four offset types are allowed in the TMG ETS.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Saitama Credits (via linking), two types:</p> <ol style="list-style-type: none"> 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. <p>All offsets have to be verified by verification agencies.</p> <p>Mechanism for Selecting Low Carbon Electricity: from FY2015, TMG has certified low carbon electricity producers with lower than average CO2 emissions factors. Covered entities that purchase electricity from low carbon suppliers will have their compliance obligation reduced accordingly.</p>
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)	<p>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. Large tenants, those with a floor space above 5000m2 or over 6 million kWh electricity use per year, are required to submit their own emission reduction plan to TMG in collaboration with building owners.</p> <p>Verification: These reports also require third-party verification.</p> <p>Framework: These are based on "TMG Monitoring/Reporting Guidelines" and "TMG Verification Guidelines".</p> <p>Other: CO2 emission factors are fixed during the five year compliance period.</p>
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	Verified reduction amounts can be used for compliance, but cannot be traded with other facilities except energy-related CO ₂ . Verification is required only when it is used for compliance.
Enforcement	<p>In case of non-compliance, the following measures may be taken in two stages:</p> <p>First stage: The Governor orders the facility to reduce emissions by the amount of the reduction shortfall multiplied by 1.3.</p> <p>Second stage: Any facility that fails to carry out the order will be publicly named and subject to penalties (up to JPY 500,000 [USD 4,460]) and surcharges (1.3 times the shortfall).</p>

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).

Kazakhstan Emissions Trading Scheme (KAZ ETS)

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Republic of Kazakhstan</p> <p>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 was temporarily suspended in 2016. Soft MRV obligations applied during the suspension time. Amendments to the Environmental Code were passed in 2016 to improve the monitoring, reporting and verification (MRV) system, as well as the overall greenhouse gas emissions regulation and KAZ ETS operation. Further amendments to the Environmental Code, which came into force in 2017, lay the groundwork for the introduction of benchmarking as one of the allocation methods. The KAZ ETS restarted operation on 1 January 2018 with new allocation methods and trading procedures for all market participants.</p>												
Overall GHG emissions (excluding LULUCF)	<p>Emissions: 298.06 MtCO₂e (2015)</p> <p>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 Parties (decision 17/CP.8).</p>												
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Energy (excl. Transport)</td> <td>220.77</td> </tr> <tr> <td>Transport</td> <td>22.29</td> </tr> <tr> <td>Industrial processes</td> <td>19.0</td> </tr> <tr> <td>Agriculture</td> <td>29.89</td> </tr> <tr> <td>Waste</td> <td>6.11</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Energy (excl. Transport)	220.77	Transport	22.29	Industrial processes	19.0	Agriculture	29.89	Waste	6.11
Sector Name	MtCO ₂ e												
Energy (excl. Transport)	220.77												
Transport	22.29												
Industrial processes	19.0												
Agriculture	29.89												
Waste	6.11												
Overall GHG reduction target	<p>By 2020: 5% reduction from 1990 GHG levels.</p> <p>By 2030: 15% (unconditional)-25% (conditional) reduction from 1990 GHG levels (NDC of Kazakhstan).</p>												
Type of ETS	Mandatory												
Cap and trajectory	<p>Type of Cap: Absolute</p> <p>Phase I (2013): 147 MtCO₂ (plus a reserve of 20.6 MtCO₂). This equals a stabilization of the capped entities' emissions at 2010 levels.</p> <p>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.</p> <p>Phase III (2018-2020): 485.9 MtCO₂ (161.9 MtCO₂ for each year). The cap is set at a 5% reduction by 2020 from 1990 levels.</p>												
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> No information available yet.												

ETS Size

Emissions covered by the ETS	0.50
GHG covered	CO ₂
Sectors covered and thresholds	<p>Energy sector (including oil and gas), mining, metallurgy and chemical industry, processing (production of building materials: cement, lime, gypsum and brick) (>20,000 tCO₂/year).</p> <p>Inclusion thresholds: For Phase I (2013) and Phase II (2014-2015), thresholds were based on 2010 and 2012 emission levels. For Phase III (2018-2020), 2013-2015 emission levels are used.</p>
Number of liable entities	<p>Phase I (2013): 178 companies</p> <p>Phase II (2014-2015): 166 companies</p> <p>Phase III (2018-2020): 129 companies (225 installations)</p> <p>No information available yet.</p>
Point of regulation	Downstream

Phases & Allocation

Compliance period	One year
Trading period	<p>Phase I (Pilot phase): 2013</p> <p>Phase II: 2014-2015</p> <p>Phase III: 2018-2020</p> <p>In 2016 and 2017, the system was temporarily suspended.</p>
Allocation	<p>Phase I (2013): 100% free allocation based on emissions data from 2010.</p> <p>Phase II (2014-2015): Free allocation (0% and 1.5% below 2011/2012 average emissions).</p> <p>Phase III (2018-2020): Free allocation based on grandfathering and benchmarking. A new entrants reserve of 35.27 million allowances over the three-year period was created.</p>

Flexibility

Banking and borrowing	Banking is allowed within one trading period; banking between trading periods is prohibited.
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)	<p>Reporting is required for businesses or financial facilities above the 20,000 tCO₂/year threshold.</p> <p>Aside from CO₂, reporting is also required for CH₄, N₂O and PFCs emissions.</p> <p>Reporting Frequency: Annually, with reporting due on 1 April.</p> <p>Verification: Emission data reports and their underlying data require accredited third-party verification.</p> <p>Other: Installations below the compliance threshold must submit non-verified inventory reports.</p>
Enforcement	<p>In 2013, penalties for non-compliance were waived. The current non-compliance penalty is approximately EUR 30/tCO₂.</p>

Other Information

Institutions involved	<p>Ministry of Energy JSC Zhasyl Damu, a state-owned joint stock Company.</p>
Linkage with other schemes	<p>No information available yet.</p>

Korea Emissions Trading Scheme

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Republic of Korea</p> <p>On 1 January 2015, the Republic of Korea launched its national ETS (KETS), the first nationwide Cap-and-Trade program in operation in East Asia. The ETS covers approximately 599 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.</p> <p>The end of 2017 marked the completion of the first phase of the KETS. The second phase will run from 2018-2020 and will see some key changes. Auctioning will be introduced and benchmark-based free allocation will be expanded from three sectors (cement, oil refining and domestic aviation) to between seven to nine sectors. Following limited trade of allowances in phase one, a market maker will be introduced in an effort to enhance trade activity and market liquidity. Finally, offsets from international credits which are developed by domestic companies will be allowed at a maximum of five percent and there will be an increased number of approved offset project methodologies.</p> <p>Website of the Korean Ministry of Environment Presentation by the Korea Environment Corporation at the ICAP Side Event at the UNFCCC COP19 (November 2013)</p>														
Overall GHG emissions (excluding LULUCF)	<p>Emissions: 690.6 MtCO_{2e} (2014)</p> <p>Official data of the Greenhouse Gas Inventory & Research Center of Korea (GIR)</p>														
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO_{2e}</th> </tr> </thead> <tbody> <tr> <td>Fuel combustion (excl. Transport)</td> <td>506.4</td> </tr> <tr> <td>Transport</td> <td>88.7</td> </tr> <tr> <td>Fugitive emissions</td> <td>4.2</td> </tr> <tr> <td>Industrial processes</td> <td>54.6</td> </tr> <tr> <td>Agriculture</td> <td>21.2</td> </tr> <tr> <td>Waste</td> <td>15.4</td> </tr> </tbody> </table>	Sector Name	MtCO _{2e}	Fuel combustion (excl. Transport)	506.4	Transport	88.7	Fugitive emissions	4.2	Industrial processes	54.6	Agriculture	21.2	Waste	15.4
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Transport	88.7														
Fugitive emissions	4.2														
Industrial processes	54.6														
Agriculture	21.2														
Waste	15.4														
Overall GHG reduction target	<p>BY 2020: 30% below BAU.</p> <p>By 2030: 37% below BAU (536 MtCO_{2e}). This represents a 22% reduction below 2012 GHG levels.</p>														
Type of ETS	Mandatory with voluntary opt-in														
Cap and trajectory	<p>Type of Cap:</p> <p>Phase one (2015-2017): 1,687 MtCO_{2e}, including a reserve of 89 million tCO_{2e} for market stabilization measures, early action and new entrants.</p> <p>2015: 573 MtCO_{2e}, 2016: 562 MtCO_{2e}, 2017: 551 MtCO_{2e}</p> <p>Phase two (2018-20): 2018: 538.5MtCO_{2e}. Caps for 2019 and 2020 will be announced in 2018.</p>														
Carbon Price	<p><i>Current Allowance Price (per t/CO_{2e}):</i> KRW 22,000 (approx. USD 20.66) (secondary market price of 1 January 2018)</p>														

ETS Size

Emissions covered by the ETS	0.68
GHG covered	CO ₂ , CH ₄ , N ₂ O, PFCs, HFCs, SF ₆
Sectors covered and thresholds	<p>Phase one (2015-2017): 23 sub-sectors from steel, cement, petro-chemistry, refinery, power, buildings, waste and aviation sectors.</p> <p>Inclusion thresholds: Company >125,000 tCO₂/year, facility >25,000 tCO₂/year</p>
Number of liable entities	<p>599 business entities including 5 domestic airlines as of November 2017.</p> <p>Business entities eligible for the allocation of emissions allowances specified in the relevant allocation plan under Article 5 (1) 3.</p>
Point of regulation	Downstream

Phases & Allocation

Compliance period	One year
Trading period	<p>Phase one: Three years (2015-2017)</p> <p>Phase two: Three years (2018-2020)</p> <p>Phase three: Five years (2021-2025)</p>
Allocation	<p>Phase one (2015-2017): 100% free allocation, no auctioning.</p> <p>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).</p> <p>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.</p> <p>Phase two (2018-2020): 97% free allowances, 3% auctioned.</p> <p>Phase three (2021-2025): Less than 90% free allowances, more than 10% auctioned.</p> <p>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:</p> <ol style="list-style-type: none"> 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	<p>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. In the first compliance year of Phase two (2018), borrowing will be allowed at a maximum of 15% of an entity's obligation. From 2019, the borrowing limit will be affected by how much an entity has borrowed in the past.</p>
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	<p>Specifically, the borrowing limit will be determined by the following: [Borrowing limit of previous year-(“borrowing ratio” in previous year x 50%)] /entity’s emission volume.</p>
<p>Offsets and credits</p>	<p>Phase one (2015-2017):</p> <p>Qualitative limit: Only domestic credits from external reduction activities implemented by non-ETS entities – and that meet international standards – may be used for compliance. Domestic CDM credits (CERs), and credits from domestically certified projects (Korean Offset Credits) are allowed in the scheme. These credits must be converted to Korean Credit Units (KCU) of a specified vintage before being used for compliance. Eligible activities include those eligible under the CDM and Carbon Capture and Storage (CCS). However, only activities implemented after 14 April 2010 are eligible. As of December 2017, 35 domestic and 211 CDM methodologies had been approved. For more, reporting procedures for small offset projects (below 100 tCO₂e) will be standardized and simplified to promote reduction activities by diverse stakeholders.</p> <p>Quantitative limit: Up to 10% of each entity's compliance obligation.</p> <p>Phase two (2018-2020) and Phase three (2021-2025):</p> <p>In Phase two, trades of CERs from international CDM projects developed by domestic companies will be allowed, up to 5% of each entity’s emission volume. In Phase three, credits of up to 10% of each entity's compliance obligation with a maximum of 5% coming from international offsets will be allowed.</p>
<p>Provisions for price management</p>	<p>The Allocation Committee may decide to implement market stabilization measures in the following cases:</p> <ol style="list-style-type: none"> 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. 4. When it is difficult to trade allowances due to the imbalance of supply or demand. <p>In 2015 and 2016, the price threshold is KRW 10,000 (EUR 7).</p> <p>The stabilization measures may include:</p> <ol style="list-style-type: none"> 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. <p>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.</p>

Compliance

<p>Monitoring, Reporting, Verification (MRV)</p>	<p>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).</p> <p>Verification: Emissions must be verified by a third-party verifier.</p> <p>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).</p> <p>If the liable entity fails to report emissions correctly, the report will be disqualified.</p>
<p>Enforcement</p>	<p>The penalty shall not exceed three times the average market price of allowances of the given compliance year or KRW 100,000/ton (USD 89).</p>

Other Information

Institutions involved	<p>In 2016 responsibility for the KETS moved from the Ministry of Environment to the Ministry of Strategy and Finance. On 1 January 2018, responsibility was transferred back to the Ministry of Environment, while the Ministry of Strategy and Finance takes the chair of the Allocation Committee.</p> <p>In 2018, a market maker will also be introduced. An institution that is designed to enhance the stability of the KETS</p>
Linkage with other schemes	No information available yet.

New Zealand Emissions Trading Scheme (NZ ETS)

General Information

<p>Summary</p>	<p>Status: ETS in force</p> <p>Jurisdictions: New Zealand</p> <p>The NZ ETS was launched in 2008, and covers all sectors of the economy, including forestry as a source of both emissions and units. However nitrous oxide and methane emissions from agriculture currently only have reporting obligations and no surrender obligations.</p> <p>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 December 2015 and concluded in July 2017. The latest review was conducted in two stages:</p> <p>The first stage of this review resulted in a decision to phase out the “one-for-two” transitional measure over three year from the beginning of 2017, so that all NZ ETS covered sectors will have full surrender obligations from 2019.</p> <p>The second stage of the review looked at the overall design and operation of the NZ ETS in the 2020s, with a view to ensuring it could help New Zealand meet its first Nationally Determined Contribution under the Paris Agreement. In July 2017, the Government adopted a package of four in-principle decisions: To introduce auctioning, to develop a different price ceiling measure, to limit the volume of international units once the NZ ETS reopens to international markets, and to coordinate decisions on the supply settings in the NZ ETS over a rolling five-year period. Options for simplified forestry-sector accounting are still under discussion and further policy decisions are expected in 2018.</p> <p>The NZ ETS was originally designed to be fully linked to international carbon markets under the Kyoto Protocol. However, as of 1 June 2015, international units were no longer accepted for compliance and the NZ ETS became a domestic-only system. As indicated by New Zealand’s NDC, reestablishing a link to high integrity international carbon markets will form part of New Zealand’s strategy for meeting its 2030 target.</p> <p>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)</p>												
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Emissions: 80.2 MtCO₂e (2015)</p>												
<p>Overall GHG emissions by sector</p>	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Agriculture</td> <td>38.4</td> </tr> <tr> <td>Energy (excl. transport)</td> <td>17.8</td> </tr> <tr> <td>Transport</td> <td>14.7</td> </tr> <tr> <td>Industrial processes and other product use</td> <td>5.3</td> </tr> <tr> <td>Waste</td> <td>4.0</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Agriculture	38.4	Energy (excl. transport)	17.8	Transport	14.7	Industrial processes and other product use	5.3	Waste	4.0
Sector Name	MtCO ₂ e												
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Waste	4.0												
<p>Overall GHG reduction target</p>	<p>By 2020: 5% reduction from 1990 GHG levels (unconditional target).</p> <p>By 2030: 30% reduction from 2005 GHG levels (equivalent to 11% reduction from 1990 GHG levels) (NDC of New Zealand).</p> <p>By 2050: 50% reduction from 1990 GHG levels.</p>												
<p>Type of ETS</p>	<p>Mandatory with voluntary opt-in</p>												

Cap and trajectory	<p>Type of Cap: If auctioning is introduced, then a cap on the supply of NZUs from free allocation and auctioning will be set.</p> <p>The NZ ETS was originally designed to operate within the international cap on developed country emissions provided by the Kyoto Protocol and has therefore operated without a specific domestic cap. This accommodated carbon sequestration from forestry activities and a full link to the international Kyoto Protocol carbon markets. As allowance supply is now restricted to New Zealand Units (NZUs), and future access to international units is will be subject to quantitative limits, the NZ ETS is expected to have its own fixed cap in the future.</p> <p>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 (NZD 25/NZU [EUR 15.17/NZU]), the annual cap is equivalent to the quantity of free allowances and removal units issued (see Allocation).</p> <p>The NZ ETS legislation includes provisions to introduce auctioning of New Zealand Units (NZUs) within an overall cap on non-forestry sectors. This would cap the amount of allowances (it will not limit the volume of NZUs representing removals from forestry or other removal activities). In future this will combine with a quantity limit on international units to provide the NZ ETS with an overall cap on emissions.</p>
Carbon Price	<p><i>Current Allowance Price (per t/CO₂e):</i> NZD 21.10 (approx. USD 15.47) (secondary market price of 26 February 2018)</p>

ETS Size

Emissions covered by the ETS	0.52
GHG covered	CO ₂ , CH ₄ , N ₂ O, SF ₆ , HFCs and PFCs
Sectors covered and thresholds	<p>Sectors were gradually phased-in over time.</p> <p>2008: Forestry (mandatory: deforesting pre-1990 forest land, voluntary: post-1989 forest land).</p> <p>2010: Stationary energy (various thresholds), industrial processing (various thresholds) and liquid fossil fuels (various thresholds).</p> <p>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.</p> <p>Biological emissions (methane and nitrous oxide) from agriculture must be reported, but face no surrender obligations.</p>
Number of liable entities	<p>2,360 entities registered, of which 2,290 have surrender obligations (as of June 2017).</p> <p>206 entities with mandatory reporting and surrender obligations.</p> <p>2,084 entities with voluntary reporting and surrender obligations; mostly for post-1989 forestry activities.</p> <p>70 entities with mandatory reporting without surrender obligations; mostly for agricultural activities.</p> <p>A liable entity in the NZ ETS is defined as a person carrying out an activity that falls under the scope of the ETS.</p>
Point of regulation	<p>The point of obligation is generally placed upstream.</p> <p>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.</p>

Phases & Allocation

Compliance period	<p>One year for most sectors.</p> <p>Participants registered for post-1989 forestry have mandatory five year compliance periods; however they may choose to report emissions and removals more frequently.</p>
Trading period	<p>For most sectors the NZ ETS has year-on-year allocations and surrender obligations.</p> <p>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.</p>
Allocation	<p>Emissions Intensive and Trade Exposed (EITE) activities: Intensity-based allocation for 26 eligible activities (industrial): 90% free allocation for highly EITE activities (1,600 tCO₂e/NZD 1 million of revenue [EUR 652,740]); 60% free allocation for moderately EITE activities (800 tCO₂e/NZD 1 million of revenue [EUR 652,740]).</p> <p>Under the one-for-two transitional measure, free allocation volumes to EITE activities were halved to reflect the 50% compliance obligation. In line with the phase out of the transitional measure, allocations for EITE activities have increased from 1 January 2017, with full allocations applying from 1 January 2019 (see Price Management Provisions).</p> <p>Post-1989 forestry sector and other removal activities: See 'offsets and credits'.</p> <p>In the year to June 2017, 5.5 million NZUs were allocated to industrial participants, and 9.5 million NZUs were granted for removal activities, compared to a total of 22.4 million certificates surrendered in this period.</p> <p>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.</p> <p>In 2012, the NZ ETS legislation was amended to allow the introduction of auctioning of NZUs within an overall cap on non-forestry sectors. In July 2017, an in-principle decision was taken to develop and introduce an auctioning mechanism. The mechanism is planned to be developed by 2012.</p>

Flexibility

Banking and borrowing	<p>Banking is allowed except for those units that were purchased under the fixed price option (see 'price management provisions').</p> <p>Borrowing is not allowed.</p>
Offsets and credits	<p>Qualitative Limit: As of 1 June 2015, international units are not eligible for surrender in the NZ ETS.</p> <p>NZUs are granted to participants that voluntarily register in the scheme for removal activities.</p> <p>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.</p> <p>Other Removal Activities: participants are entitled to receive one NZU per ton of removal from recognized industrial processes, e.g. embedding GHGs in certain products, exporting some products or destroying bulk synthetic GHGs. Entitlements were reduced by half, in</p>

	<p>line with the one-for-two transitional measure. This is set to increase to full entitlements by 1 January 2019 concurrent with the phase-out of the one-for-two measure (see Price Management Provisions).</p> <p>In the year to June 2017, 9.5 million NZUs were transferred to participants for removal activities (forestry removal activities - 7.7 million, and other removal activities - 1.8 million).</p> <p>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).</p>
Provisions for price management	<p>Transitional measures were implemented in 2009 to help firms adjust to the carbon cost. These included: (a) one-for-two surrender obligation for non-forestry sectors (one allowance could be surrendered for every two tons of emissions); and (b) a NZD 25 fixed price option (USD 18), which acts as a price ceiling.</p> <p>These measures were assessed in the most recent NZ ETS review. As a result the one-for-two measure is being phased out over the three years from 2017. The one-for-two measure, effectively a 50% surrender obligation, has been increased to 67% from 1 January 2017, to 83% from 1 January 2018 and will increase to full surrender obligations from 1 January 2019. Allocations and entitlements for EITE activities and other removal activities will increase concurrently. The current fixed price option will remain in place until a new price ceiling measure is developed and introduced.</p>

Compliance

Monitoring, Reporting, Verification (MRV)	<p>Reporting frequency: Most sectors are required to report annually.</p> <p>Verification: Self-reporting supplemented by a programme of second and third-party audits run by the regulator (approach is consistent with NZ income tax auditing procedures). Participants must seek third party verification if they apply for the use of a unique emissions factor.</p> <p>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.</p>
Enforcement	<p>An entity that fails to surrender emission units when required to, will have to surrender units and pay a penalty of NZD 30 (EUR 18.38) for each unit.</p> <p>Entities can be fined up to NZD 24,000 (EUR 14,702) 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.</p> <p>Entities can also be fined up to NZD 50,000 (EUR 30,630) 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.</p>

Other Information

Institutions involved	<p>Ministry for the Environment</p> <p>Environmental Protection Authority</p> <p>Ministry for Primary Industries</p> <p>New Zealand Customs Service</p> <p>New Zealand Transport Agency</p>
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Linkage with other schemes

Until 1 June 2015, the NZ ETS was indirectly linked to other systems (e.g. the EU ETS) via the international Kyoto Protocol Flexible Mechanisms. Since then, the NZ ETS has been a domestic-only system. The recent review of the NZ ETS resulted in a range of in-principle decisions that will make the NZ ETS more similar to emissions trading schemes in other countries, which will make it more compatible for international linking in the future.

Swiss ETS

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Switzerland</p> <p>The Switzerland (Swiss) ETS started in 2008 with a five-year voluntary phase as an alternative option to the CO₂ levy on fossil fuels. Revised regulations entered into force on 1 January 2013. The system 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.</p> <p>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.</p> <p>The Swiss Federal Council approved the signing of the linking agreement on 16 August 2017. In November 2017, the Council of the European Union adopted a decision authorizing the signing of the linking agreement. The agreement was signed on 23 November 2017. Following approval by the Parliaments of Switzerland and the EU, and when all criteria within the agreement are met (for this, amendments to Swiss legislation are necessary), the link will become operational the following year. This could occur as of 1 January 2020.</p> <p>Federal Office for the Environment (FOEN)</p>												
Overall GHG emissions (excluding LULUCF)	<p>Emissions: 48.14 MtCO₂e (2015)</p>												
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Energy (excl. transport)</td> <td>21.78</td> </tr> <tr> <td>Transport</td> <td>15.34</td> </tr> <tr> <td>Industrial processes</td> <td>4.10</td> </tr> <tr> <td>Agriculture</td> <td>6.07</td> </tr> <tr> <td>Others (incl. waste and solvent)</td> <td>0.85</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Energy (excl. transport)	21.78	Transport	15.34	Industrial processes	4.10	Agriculture	6.07	Others (incl. waste and solvent)	0.85
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Overall GHG reduction target	<p>By 2020: At least 20% reduction from 1990 GHG levels (unconditional, domestic target).</p> <p>By 2025: 35% reduction from 1990 GHG levels (NDC of Switzerland).</p> <p>By 2030: 50% reduction from 1990 GHG levels (NDC of Switzerland).</p>												
Type of ETS	Mandatory with voluntary opt-in												
Cap and trajectory	<p>Type of Cap: Absolute</p> <p>Voluntary phase (2008-2012): Each participant received its own entity-specific reduction target.</p> <p>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.</p>												

Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> CHF 7.50 (approx. USD 7.79) (clearing price at 31 October 2017 auction)
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ETS Size

Emissions covered by the ETS	0.11
GHG covered	CO ₂ , NO ₂ , CH ₄ , HFCs, NF ₃ , SF ₆ and theoretically PFCs (In principle all these gases are covered in accordance with the CO ₂ Ordinance. In practice, monitoring is only required for CO ₂ , NO ₂ and PFCs.)
Sectors covered and thresholds	<p>Mandatory participation: Industries listed under Annex 6 of the revised CO₂ Ordinance (25 sub-sectors) must participate in the Swiss ETS.</p> <p>Inclusion Thresholds: Industries in Annex 6 generally have a total rated thermal input of >20MW.</p> <p>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.</p> <p>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.</p> <p>Aviation: coverage of aviation is a requirement of the linking agreement between Switzerland and the EU. In July 2017, to prepare for the inclusion of aviation in the Swiss ETS, Switzerland introduced the legislation for mandatory reporting of ton-kilometer data for aircraft operators that are likely to fall within the scope of the Swiss ETS, when linked with the EU ETS. Aircraft operators submitted their monitoring plans by September 2017. Mandatory reporting began 1 January 2018 and verified monitoring reports are required by 31 March 2019. On the basis of the reported ton-kilometer data, free allocation to aircraft operators and the cap for aviation activities in the Swiss ETS will be calculated.</p>
Number of liable entities	56 (2016) 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	<p>Voluntary phase: 2008 - 2012</p> <p>Mandatory phase: 2013 - 2020</p>
Allocation	<p>Voluntary phase (2008-2012): Each participant was granted free allocation of allowances covering emissions up to their own entity-specific emissions target.</p> <p>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.</p>

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	<p>Banking within compliance periods is allowed. Banking from one compliance period to the next is also allowed without limit.</p> <p>Valid certificates (CERs, ERUs) from the 2008-2012 commitment period could 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 have been canceled.</p>
Offsets and credits	<p>Qualitative limit: Exclusion criteria are listed in Annex 2 of the revised CO2 Ordinance. Most categories of credits from CDM projects in Least Developed Countries (LDCs) are allowed. Credits from CDM and JI projects from other countries are eligible only if registered and implemented before 31 December 2012.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Provisions for price management	No information available yet.

Compliance

Monitoring, Reporting, Verification (MRV)	<p>Monitoring plans are required for every installation (approved by a competent authority) no later than three months after the registration deadline.</p> <p>Reporting Frequency: Annual monitoring report, based on self-reported information (by 31 March).</p> <p>Verification: The Federal Office for the Environment may order third party verification of the monitoring reports.</p>
Enforcement	The penalty for failing to surrender sufficient allowances is set CHF 125 /tCO ₂ (USD 127 / tCO ₂). 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
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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. Both the Swiss Federal Council and the Council of the European Union approved the signing of the linking agreement in 2017. The link will become operational on 1 January the year following ratification and completion of all requirements under the linking agreement.
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USA - California Cap-and-Trade Program

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: California</p> <p>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.</p> <p>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.</p> <p>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</p>														
Overall GHG emissions (excluding LULUCF)	<p>Emissions: 440.4 MtCO_{2e} (2015)</p> <p>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.</p>														
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO_{2e}</th> </tr> </thead> <tbody> <tr> <td>Transportation</td> <td>169.38</td> </tr> <tr> <td>Electric Power</td> <td>84.09</td> </tr> <tr> <td>Commercial and Residential</td> <td>49.10</td> </tr> <tr> <td>Industrial</td> <td>102.97</td> </tr> <tr> <td>Agriculture and Forestry</td> <td>34.65</td> </tr> <tr> <td>Other</td> <td>0.17</td> </tr> </tbody> </table>	Sector Name	MtCO _{2e}	Transportation	169.38	Electric Power	84.09	Commercial and Residential	49.10	Industrial	102.97	Agriculture and Forestry	34.65	Other	0.17
Sector Name	MtCO _{2e}														
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Electric Power	84.09														
Commercial and Residential	49.10														
Industrial	102.97														
Agriculture and Forestry	34.65														
Other	0.17														
Overall GHG reduction target	<p>By 2020: Return to 1990 GHG levels.</p> <p>By 2030: 40% reduction from 1990 GHG levels.</p> <p>By 2050: 80% reduction from 1990 GHG levels.</p>														
Type of ETS	Mandatory														
Cap and trajectory	<p>Type of Cap: Absolute</p> <p>The caps are listed below in MtCO_{2e} allowances.</p> <p>First Compliance Period (2013-2014): 2013: 162.8; 2014: 159.7.</p> <p>Second Compliance Period (2015-2017): 2015: 394.5; 2016: 382.4; 2017: 370.4.</p> <p>Third Compliance Period (2018-2020): 2018: 358.3; 2019: 346.3; 2020: 334.2.</p> <p>From 2021 to 2031, the annual caps are: 2021: 320.8; 2022: 307.5; 2023: 294.1; 2024: 280.7; 2025: 267.4; 2026: 254.0; 2027: 240.6; 2028: 227.3; 2029: 213.9; 2030: 200.5; 2031: 193.8</p> <p>Beyond 2020, compliance periods will be between two and three years long (2021–2022, 2023–2024, 2025–2027, 2028–2029, and 2030–31), if US Environmental Protection Agency (EPA) approves California's plan for compliance with the federal Clean Power Plan by 1 January 2019. Otherwise, the fourth compliance period will start on 1 January 2021, and</p>														

	end on 31 December 2023, and each subsequent compliance period will be three years long.
Carbon Price	<i>Current Allowance Price (per t/CO₂e)</i> : USD 15.06 (clearing price of November 2017 auction)

ETS Size

Emissions covered by the ETS	0.85
GHG covered	CO ₂ , CH ₄ and N ₂ O, SF ₆ , HFCs, PFCs, NF ₃ and other fluorinated GHGs.
Sectors covered and thresholds	<p>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.</p> <p>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.</p> <p>Inclusion Thresholds: Facilities $\geq 25,000$ tCO₂e (metric) per data year.</p>
Number of liable entities	<p>Approximately 450 entities (2015-2017)</p> <p>“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.</p>
Point of regulation	Mixed

Phases & Allocation

Compliance period	<p>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.</p> <p>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.</p> <p>First compliance period: 2013-2014</p> <p>Second compliance period: 2015-2017</p> <p>Third compliance period: 2018-2020</p> <p>* Fourth compliance period and following: Usually 2-year periods, with one three-year period (either 2021-2023 or 2025-2027 depending on U.S. EPA decision (see *)).</p> <p>* If U.S. EPA has not approved California's plan for compliance with the Clean Power Plan by 1 January 2019, then the fourth compliance period starts on 1 January 2021 and ends on 31 December 2023, and each subsequent compliance period will be three years long.</p>
Trading period	California's trading period is referred to as a "compliance period" (see “compliance period”).

	<p>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.</p>
Allocation	<p>Allowances are distributed either via auction or free allocation.</p> <p>Electrical distribution utilities and natural gas suppliers: Receive allowances on behalf of their ratepayers (consignment allowances). All natural gas and electrical utilities must use the allowance value for ratepayer benefit and for emissions reductions.</p> <p>Industrial facilities: Receive allowances for transition assistance and to prevent leakage. The amount of free allocation is determined by leakage risk (measured through emissions intensity and trade exposure, used to define assistance factors), sector-specific benchmarks and production volumes as well as a general cap-adjustment factor. In the third compliance period, the assistance factor is differentiated across sectors based on leakage risk. For the post-2020 period, assistance factors for allocation will be part of a new rulemaking to reflect the direction provided in (AB) 398, which specifies an assistance factor of 100% in the post-2020 period.</p> <p>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.</p> <p>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. In 2017, almost 70% of allowances were available through auction, including allowances from Air Resources Board (ARB) as well as consigned allowances to utilities.</p>

Flexibility

Banking and borrowing	<p>Banking is allowed but the emitter is subject to a general holding limit. Borrowing of future vintage allowances is not allowed.</p>
Offsets and credits	<p>Quantitative Limit: Up to 8% of each entity's compliance obligation.</p> <p>Qualitative Limit: Currently six domestic offset types are accepted as compliance units originating from projects carried out according to six 'protocols':</p> <ol style="list-style-type: none"> 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 <p>From 2021: AB 398 lays out two significant changes to the offset program from 2021 onwards:</p> <ol style="list-style-type: none"> (1) The share of offsets that can be used to fulfill the compliance obligation will reduce to 4% between 2021–2025 and will remain reduced at 6% thereafter (from 8% now). (2) In addition, half of the compliance obligation will have to stem from offsets creating direct environmental benefits in California.
Provisions for price management	<p>Auction Reserve Price: USD 14.53 in 2018 per allowance. The auction reserve price increases annually by 5% plus inflation, as measured by the Consumer Price Index.</p> <p>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).</p> <p>AB 398 requires two-thirds of the reserve allowances that remain on December 31, 2017 to be used to populate the two price containment points starting in 2021. The reserve sale administrator can sell accumulated allowances on a regular basis in three equal price tiers.</p>

For 2017, these prices are USD 50.69, 57.04, and 63.37 (EUR 48.61, 54.70 and 60.77). 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.

AB 398 reforms the price management provisions starting in 2021: Two price containment points triggered at increasing price levels will be filled with remaining APCR allowances. A third price level, yet to be determined, will be a price ceiling. At this level, allowances can be bought in unlimited quantities, with the revenues having to be invested in real, permanent, quantifiable, verifiable, enforceable, and additional emissions reductions on at least a metric ton for metric ton basis.

Compliance

Monitoring, Reporting, Verification (MRV)	<p>Reporting frequency: One year</p> <p>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 per year).</p> <p>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.</p> <p>More information: Mandatory Greenhouse Gas Reporting Regulation - Overview</p>
Enforcement	<p>Penalties may be assessed pursuant to Health and Safety Code section 38580 (misdemeanor, fines, and possibly imprisonment).</p> <p>There are separate and substantial penalties for mis- or non-reporting under the Mandatory GHG Reporting Regulation.</p>

Other Information

Institutions involved	California Air Resources Board (CARB)
Linkage with other schemes	California linked with Québec's ETS on 1 January 2014. The two extended their joint market by linking with Ontario on 1 January 2018.

USA - Massachusetts Limits on Emissions from Electricity Generators

General Information

Summary	<p>Status: ETS in force</p> <p>Jurisdictions: Massachusetts</p> <p>In 2016, a ruling by the Massachusetts Supreme Court established that the government would need to take additional action to guarantee that the state's climate targets, a 25% reduction in 2020 and an 80% reduction by 2050 (compared to 1990), are met.</p> <p>In response, several regulations were released, among them the Massachusetts' Department of Environmental Protection's (MassDEP) 310 CMR 7.74. This regulation is structured as a cap-and-trade program, but is intended to ensure that emissions reductions associated with other clean energy programs occur in Massachusetts, not to provide a significant independent incentive to reduce emission. The system began operation in January 2018. The first program review will be in 2021, with a review every ten years thereafter. The system exists in parallel to, but does not directly interact with, the Regional Greenhouse Gas Initiative.</p>																		
Overall GHG emissions (excluding LULUCF)	Emissions: 74.8 MtCO _{2e} MtCO _{2e} (2014)																		
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO_{2e}</th> </tr> </thead> <tbody> <tr> <td>Industry</td> <td>7.5</td> </tr> <tr> <td>Agriculture</td> <td>0.3</td> </tr> <tr> <td>Residential</td> <td>14.1</td> </tr> <tr> <td>Commercial</td> <td>7.2</td> </tr> <tr> <td>Waste</td> <td>0.8</td> </tr> <tr> <td>Electricity</td> <td>14.8</td> </tr> <tr> <td>Transport</td> <td>29.3</td> </tr> <tr> <td>Natural Gas Systems</td> <td>0.8</td> </tr> </tbody> </table>	Sector Name	MtCO _{2e}	Industry	7.5	Agriculture	0.3	Residential	14.1	Commercial	7.2	Waste	0.8	Electricity	14.8	Transport	29.3	Natural Gas Systems	0.8
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Transport	29.3																		
Natural Gas Systems	0.8																		
Overall GHG reduction target	<p>By 2020: 25% reduction compared to 1990.</p> <p>By 2050: 80% reduction compared to 1990 (Interim targets to be set).</p>																		
Type of ETS	Mandatory																		
Cap and trajectory	<p>Type of Cap: 8.96 MtCO_{2e} (2018)</p> <p>The cap declines annually by 2.5% of the 2018 cap, which corresponds to 223,876 tCO_{2e} per year until it reaches a cap of 1.8 MtCO_{2e} by 2050.</p>																		
Carbon Price	<i>Current Allowance Price (per t/CO_{2e}):</i> NA																		

ETS Size

Emissions covered by the ETS	0.2
GHG covered	CO ₂
Sectors covered and thresholds	<p>Power sector.</p> <p>Large electricity generators subject to RGGI (25 MWe).</p>

Number of liable entities	21 (2018). Fossil fuel electricity generators with capacity of 25MWe or above are included.
Point of regulation	Downstream (at installation level)

Phases & Allocation

Compliance period	The compliance period is yearly: Compliance has to be demonstrated by 1 March of the subsequent year. Allowances can be traded year-round except for the month of March. Exceptions exist for emergencies occurring in the last 45 days of the calendar year, for which deferred compliance is available. Emergencies are defined as situations where the regional transmission organization has issued an alert that abnormal conditions affect the reliability of the power system exist or are anticipated.
Trading period	Allowances can be traded year-round except for the month of March. There is no distinction between trading and compliance period.
Allocation	In 2018, allowances are allocated freely based on prior production volumes (electricity generation). A reserve for new entrants also exists to allocate allowances to facilities beginning operation in 2018. From 2019 onwards, allowances will be auctioned. Auction proceeds will be paid to a segregated account and shall be used to further reduce GHG emissions. There will be at least one auction per year; with a default of quarterly auctions (that can be adjusted by the Executive Office of Energy and Environmental Affairs and its Massachusetts Department of Environmental Protection (MassDEP)).

Flexibility

Banking and borrowing	Banking is allowed but restricted such that it is guaranteed that emissions in any year cannot exceed the emission limit of the prior year. This means that the total amount of allowances banked is, at maximum, the differential between last year's and this year's emission limit. This constraint is implemented by multiplying held allowances by a factor expressing the reduction between years (e.g. reduction of emission limit (223,876 tons)/emission limit from last year). Borrowing is not allowed, but the possibility of emergency deferred compliance exists (see "Trading/Compliance Period").
Offsets and credits	There are no offsets.
Provisions for price management	The possibility of an auction reserve price is mentioned in the regulation. At this point, no reserve price is published as auctions will only start in 2019. Other provisions for price management are not mentioned.

Compliance

Monitoring, Reporting, Verification (MRV)	Reporting frequency: Regulated entities have to submit emission reports (by 1 February) and compliance certification reports (by 1 March) indicating emissions and the holding of sufficient allowances, respectively. Verification: Documents (i.e. emissions reports and compliance certification reports) have to be certified and MassDEP may choose to verify compliance.
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	Other: Regulated entities are mandated to keep records and to grant access to information.
Enforcement	<p>If the MassDEP establishes a violation of compliance, this will be presumed to constitute “a significant impact to public health, welfare, safety or the environment”.</p> <p>Apart from additional penalties, the regulated entity has to submit three additional allowances for each ton of non-compliance.</p>

Other Information

Institutions involved	The Executive Office of Energy and Environmental Affairs and its Massachusetts Department of Environmental Protection (MassDEP).
Linkage with other schemes	No information available yet.

USA - Regional Greenhouse Gas Initiative (RGGI)

General Information

<p>Summary</p>	<p>Status: ETS in force</p> <p>Jurisdictions: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, Vermont</p> <p>RGGI is the first mandatory GHG ETS in the United States. As foreseen by the original MOU 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 concluded its Second Program Review in 2017 and a new Model Rule has been prepared.</p> <p>RGGI Model Rule</p> <p>RGGI Model Rule Update (Summary)</p> <p>RGGI Website</p> <p>RGGI Website - Program design</p> <p>RGGI Website - Regulations</p>												
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Emissions: 446 MtCO₂e (2012)</p> <p>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).</p>												
<p>Overall GHG emissions by sector</p>	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Energy</td> <td>388.5</td> </tr> <tr> <td>Industrial Processes</td> <td>23.8</td> </tr> <tr> <td>Agriculture</td> <td>9.4</td> </tr> <tr> <td>Waste</td> <td>24.2</td> </tr> <tr> <td>Bunker Fuels</td> <td>0.1</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Energy	388.5	Industrial Processes	23.8	Agriculture	9.4	Waste	24.2	Bunker Fuels	0.1
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<p>Overall GHG reduction target</p>	<p>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.</p> <p>By 2030: States propose to implement a reduction of 30% compared to 2020 CO₂ emissions cap, with a constant reduction of 2.275 million short tons/year between 2021 and 2030.</p> <p>Note: The participating states have their own emission targets, economywide targets are not defined at the level of RGGI.</p>												
<p>Type of ETS</p>	<p>Mandatory</p>												
<p>Cap and trajectory</p>	<p>Type of Cap: Absolute</p> <p>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.</p> <p>Following the most recent program review, the proposed reduction factor between 2021 and 2030 is about 3% of the 2020 cap resulting in a 2030 regional cap of about 55 million short tons.</p>												

Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> USD 3.80 per short ton, USD 4.19 per metric tonne (Auction clearing price December 2017)
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ETS Size

Emissions covered by the ETS	0.20
GHG covered	CO ₂
Sectors covered and thresholds	Fossil fuel electric generating units Inclusion thresholds: equal to or greater than 25MW.
Number of liable entities	165 entities (as of November 2017) 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	<p>RGGI's compliance and trading period is referred to as a control period.</p> <p>First control period: 2009-2011</p> <p>Second control period: 2012-2014</p> <p>Third control period: 2015-2017*</p> <p>Fourth control period: 2018-2020*</p> <p>*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.</p>
Trading period	<p>RGGI's trading period is referred to as a control period.</p> <p>First control period: 2009-2011</p> <p>Second control period: 2012-2014</p> <p>Third control period: 2015-2017*</p> <p>Fourth control period: 2018-2020*</p> <p>*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.</p>
Allocation	The vast majority of CO ₂ allowances issued by each RGGI state are distributed through quarterly, regional CO ₂ 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	<p>Quantitative limit: 3.3% of an entity's liability may be covered with offsets. This percentage share will remain equal between 2021 and 2030 according to the Model Rule.</p> <p>Qualitative limit: Currently the program allows offset allowances from five offset types located in RGGI states, although only one offset project (landfill methane capture and destruction) has been approved since the program's inception: (1) Landfill methane capture and destruction; (2) Sequestration of carbon due to reforestation, improved forest management, or avoided conversion; (3) Avoided methane emissions from agricultural manure management operations; (4) Reduction or avoidance of CO₂ emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency; and (5) Reduction in SF₆ emissions.</p> <p>According to the Model Rule, the offset protocols 4 and 5 above will be discontinued from 2021.</p>
Provisions for price management	<p>Minimum auction price: USD 2.20 in 2018, increasing by 2.5% per year (to reflect inflation).</p> <p>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%.</p> <p>In 2021, under the Model Rule, the trigger price will be set at USD 13 and will increase by 7% compared to the previous year thereafter. In addition, the Model Rule envisages the establishment of an Emissions Containment Reserve (ECR): Allowances would be withheld from circulation (from auction) to secure emissions reductions if the emission reduction costs are lower than projected. In 2020, this trigger price will be set at USD 6, increasing by 7% compared to the previous year thereafter.</p>

Compliance

Monitoring, Reporting, Verification (MRV)	<p>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.</p> <p>Data are then automatically transferred to the electronic platform of the RGGI CO₂ Allowance Tracking System, which is publicly available.</p>
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	Virginia has recently released a draft regulation that could eventually lead to an expansion of the RGGI allowance market. New Jersey also considers rejoining RGGI.

Canada - Nova Scotia

General Information

Summary	<p>Status: ETS implementation scheduled</p> <p>Jurisdictions: Nova Scotia</p> <p>On 21 November 2016, the Nova Scotia Premier announced the implementation of a Cap-and-Trade Program in 2018, in line with Canada's federal carbon pricing policy.</p> <p>In September 2017, amendments to Nova Scotia's Environment Act were introduced, which lay the foundations for the program. This legislation will enable the government to set caps, distribute emissions allowances and enable the trading of the allowances within the province. Companies will be required to monitor and report their GHG emissions. In order to ensure market stability, a small number of allowances will be kept for a strategic reserve and can be sold when market prices rise above a given threshold. Proceeds from these sales will be put in a Green Fund, which will then support climate change initiatives and innovations.</p> <p>The legislation will also enable the government to set a new GHG target for 2030 for Nova Scotia. The province has already met Canada's 2030 target of a 30% cut below 2005 levels.</p> <p>Nova Scotia's Action on Climate Change</p>														
Overall GHG emissions (excluding LULUCF)	Emissions: 16.2 MtCO ₂ e MtCO ₂ e (2015)														
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Electricity</td> <td>6.7</td> </tr> <tr> <td>Industry</td> <td>1.7</td> </tr> <tr> <td>Transportation</td> <td>4.7</td> </tr> <tr> <td>Buildings</td> <td>2.1</td> </tr> <tr> <td>Agriculture</td> <td>0.5</td> </tr> <tr> <td>Waste</td> <td>0.6</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Electricity	6.7	Industry	1.7	Transportation	4.7	Buildings	2.1	Agriculture	0.5	Waste	0.6
Sector Name	MtCO ₂ e														
Electricity	6.7														
Industry	1.7														
Transportation	4.7														
Buildings	2.1														
Agriculture	0.5														
Waste	0.6														
Overall GHG reduction target	<p>By 2020: At least 10% reduction from 1990 GHG levels.</p> <p>A 2030 GHG emission target will be set in 2018.</p>														
Type of ETS	No information available yet.														
Cap and trajectory	No information available yet.														
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> 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 implementation scheduled

Jurisdictions: Mexico

The General Law on Climate Change Law (GLCC) 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. On 12 December 2017, the Cámara de Diputados, the second Chamber of the Mexican Parliament, amended the GLCC requiring the establishment of a mandatory ETS. With the latest amendments, which still need to be approved by the Senate (first chamber of Parliament), there is now the basis to introduce a mandatory system.

Already in October 2014, a mandatory reporting system (the National Emissions Register, or RENE for the Spanish acronym) for both direct and indirect GHG emissions for facilities with annual emissions above 25,000 tCO₂e was established (as mandated by the GLCC). Emitters in the energy, industrial, transport, agricultural, waste, commercial, and services sectors are required to report the six GHGs identified by the UNFCCC as well as 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 2017, the Ministry of Environment and Natural Resources (SEMARNAT), the Mexican Stock Exchange (Grupo BMV), and MÉXICO₂ (the voluntary carbon platform at the BMV) announced the start of a national carbon market simulation. The simulation is implemented through CarbonSim, a software developed by the Environmental Defense Fund (EDF). Over 100 enterprises, which are responsible for two-thirds of the Mexican GHG emissions, will participate in the simulation. The simulation will last 10 months, with three phases. 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.

SEMARNAT has announced that the market rules for an ETS and updated rules for the National Emissions Register will be published in the first half of 2018. The market will then officially start operating in two phases in August 2018. The first phase (pilot phase) will last for three years until August 2021. Subsequently, the rules will be updated for the start of the second phase (formal phase), which will also be in line with the start of the first accounting period under the Paris Agreement in 2021.

Mexico is actively seeking to link its future ETS to markets in North America. To this end, in October 2015, Mexico signed an MOU with Québec that includes cooperation on ETS. In August 2016, Mexico, Québec, and Ontario issued a joint declaration on carbon markets collaboration. Additionally, in December 2017, Mexico, together with four countries and seven subnational governments, issued the Paris Declaration on Carbon Pricing in the Americas for carbon pricing implementation.

In 2014, Mexico introduced a USD 3.50 carbon tax on fossil fuel sales and imports (natural gas exempted). Firms may use offset credits from domestic projects to fulfill their tax liability. The rules for the optional use of offset credits, published in December 2017, allow for the use of CERs issued after January 2014 from projects developed in Mexico. During 2018, the use of CERs will be restricted to 20% of an entities carbon tax liability. In addition, authorities are currently discussing options for allowing the use of future ETS allowances to fulfill CO₂ tax obligations.

[Ley General de Cambio Climático](#)
[Ley del Impuesto Especial sobre Producción y Servicios](#)
[Activities of Mexico under the Partnership for Market Readiness \(PMR\)](#)
[Registro Nacional de Emisiones](#)

Emissions Trading Scheme Simulation																	
Overall GHG emissions (excluding LULUCF)	Emissions: 633 MtCO ₂ e (2013)																
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Electricity Generation</td> <td>127</td> </tr> <tr> <td>Industrial processes</td> <td>115</td> </tr> <tr> <td>Gas and Petroleum</td> <td>80</td> </tr> <tr> <td>Agriculture</td> <td>80</td> </tr> <tr> <td>Transport</td> <td>174</td> </tr> <tr> <td>Residential and Commercial</td> <td>26</td> </tr> <tr> <td>Waste</td> <td>31</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Electricity Generation	127	Industrial processes	115	Gas and Petroleum	80	Agriculture	80	Transport	174	Residential and Commercial	26	Waste	31
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Transport	174																
Residential and Commercial	26																
Waste	31																
Overall GHG reduction target	<p>By 2030: 22% reduction compared to BAU scenario and 36% conditional reduction, subject to a global mitigation agreement (NDC of Mexico).</p> <p>By 2050: 50% reduction from 2000 GHG levels (Climate Change Law aspirational goal).</p>																
Type of ETS	No information available yet.																
Cap and trajectory	No information available yet.																
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> 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)	<p>In October 2014, a mandatory reporting system (the National Emissions Register, or RENE for the Spanish acronym) for both direct and indirect GHG emissions for facilities with annual emissions above 25,000 tCO₂e was established (as mandated by the GLCC).</p> <p>Emitters in the energy, industrial, transport, agricultural, waste, commercial, and services sectors are required to report the six GHGs identified by the UNFCCC as well as 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.</p>
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.

Taiwan, China

General Information

<p>Summary</p>	<p>Status: ETS implementation scheduled</p> <p>Jurisdictions: Taiwan</p> <p>On 1 July 2015, Taiwan, China enacted the Greenhouse Gas Reduction and Management Act, which not only sets a 50% emissions reduction target for 2050 compared to 2005 GHG levels, but also implements carbon reduction through a five-year control circle. 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 the considerations that must be taken into account when setting the cap.</p> <p>Since then, a series of subsidiary regulations have been announced. For example the Regulations Governing Greenhouse Gases Offset Program Management, the Management Regulations Governing Greenhouse Gas Emission Inventories and Registration, and the Greenhouse Gas Accreditation Organizations and Verification Organizations Management Regulations.</p> <p>TEPA initiated an inter-ministerial consultation process on the climate strategy of Taiwan, China including the potential ETS in November 2016.</p> <p>On 23 February 2017, the government approved its Climate Change Action Guidelines, which lays out ten general principles on how to achieve its climate mitigation and adaptation targets. The third principle calls for the implementation of a Cap-and-Trade system. Energy, industry, agriculture and transport ministries were tasked to draft detailed plans on how to achieve the goals laid out in the guidelines. The guidelines also re-confirm its objective to halve the GHG emissions by 2050 set back in 2015. TEPA reiterated the commitment to develop an ETS on 17 March 2017.</p> <p>Currently, the TEPA is working to reach this goal, including assessing different ETS design options and identifying relevant factors for cap setting and allocation. It has also established mandatory emissions reporting for entities with annual emissions above 25,000 tCO₂e from certain sectors. Mandatory reporting has been ongoing since 2013.</p> <p>Greenhouse Gas Reduction and Management Act (Chinese) 2015 GHG Inventory (Executive Summary) Policies and Measures for Energy Conservation and Carbon Reduction First Year Implementation of the Greenhouse Gas Reduction and Management Act</p>										
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Emissions: 284.5 MtCO₂e (2013)</p>										
<p>Overall GHG emissions by sector</p>	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Energy (incl. Transport)</td> <td>250.8</td> </tr> <tr> <td>Industrial Processes</td> <td>26.4</td> </tr> <tr> <td>Agriculture</td> <td>2.8</td> </tr> <tr> <td>Waste</td> <td>4.4</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Energy (incl. Transport)	250.8	Industrial Processes	26.4	Agriculture	2.8	Waste	4.4
Sector Name	MtCO ₂ e										
Energy (incl. Transport)	250.8										
Industrial Processes	26.4										
Agriculture	2.8										
Waste	4.4										
<p>Overall GHG reduction target</p>	<p>By 2016 to 2020: Return to 2008 GHG levels (282 MtCO₂e) By 2025: Return to the 2000 GHG levels (247 MtCO₂e) By 2030: 50% below BAU (214 MtCO₂e) By 2050: 50% below 2005 GHG Levels (145 MtCO₂e)</p>										
<p>Type of ETS</p>	<p>No information available yet.</p>										

Cap and trajectory	No information available yet.
Carbon Price	<i>Current Allowance Price (per t/CO₂e)</i> : 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)	<p>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.</p> <p>Verification: Third-party verification is required.</p> <p>Framework: As of 2004, Taiwan, China 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.</p>
Enforcement	No information available yet.

Other Information

Institutions involved	Taiwanese Environmental Protection Administration (TEPA)
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Linkage with other schemes

No information available yet.

Ukraine

General Information

<p>Summary</p>	<p>Status: ETS implementation scheduled</p> <p>Jurisdictions: Ukraine</p> <p>Ukraine plans to establish a national ETS in line with its obligations under the Ukraine-EU Association Agreement, which entered into force on 1 September 2017. Climate change-related issues addressed in Article 365 (c) Title V and Annex XXX to the Agreement, the country has to prepare for ETS implementation, including:</p> <ul style="list-style-type: none"> · 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 issue 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). <p>The country is developing the main elements of the national MRV system to provide a solid basis for the upcoming ETS.</p> <p>Separate legislation is being drafted to establish the MRV system, transpose the relevant EU Directives, regulate GHG emissions and establish the ETS.</p> <p>Ukraine is working on its MRV plans and the plans for 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.</p> <p>Ministry of Ecology and Natural Resources of Ukraine (Ukrainian) Activities of Ukraine under the Partnership for Market Readiness (PMR)</p>												
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Emissions: 323.4 MtCO_{2e} (2015)</p>												
<p>Overall GHG emissions by sector</p>	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO_{2e}</th> </tr> </thead> <tbody> <tr> <td>Energy (excl. transport)</td> <td>177.8</td> </tr> <tr> <td>Transport</td> <td>31.1</td> </tr> <tr> <td>Industrial Processes, solvent and other product use</td> <td>56.0</td> </tr> <tr> <td>Agriculture</td> <td>46.3</td> </tr> <tr> <td>Waste</td> <td>12.1</td> </tr> </tbody> </table>	Sector Name	MtCO _{2e}	Energy (excl. transport)	177.8	Transport	31.1	Industrial Processes, solvent and other product use	56.0	Agriculture	46.3	Waste	12.1
Sector Name	MtCO _{2e}												
Energy (excl. transport)	177.8												
Transport	31.1												
Industrial Processes, solvent and other product use	56.0												
Agriculture	46.3												
Waste	12.1												
<p>Overall GHG reduction target</p>	<p>By 2020: Voluntary target of 20% reduction from 1990 GHG levels (Copenhagen Accord).</p> <p>By 2030: GHG emissions will not exceed 60% of 1990 GHG levels (NDC).</p> <p>By 2035: Domestic target to reduce GHG emissions from final energy consumption by 20% from 2010 levels (Energy Strategy 2035).</p> <p>By 2050: Voluntary target of 50% reduction from 1990 GHG levels.</p>												

Type of ETS	No information available yet.
Cap and trajectory	No information available yet.
Carbon Price	<i>Current Allowance Price (per t/CO2e)</i> : 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.

USA - Virginia

General Information

<p>Summary</p>	<p>Status: ETS implementation scheduled</p> <p>Jurisdictions: USA - Virginia</p> <p>On 16 November 2017, the Virginia State Air Pollution Control Board approved for public comment a proposal rule drafted by the state’s Department of Environmental Quality (DEQ) to link to RGGI by 2020. The proposal was published on 8 January, triggering a 60-day public comment period. Following this, the DEQ will prepare a draft final rule for the Air Board to consider for promulgation later in the year.</p> <p>The regulation would be in line with many of RGGI’s major design features, including a statewide cap starting at 33-34 MtCO₂e, declining annually by three percent to 2030. The program would distribute 95% allowances via consignment auctions and 5% will be allocated to the Department of Mines, Mineral and Energy to help the department reduce and control CO₂ emissions. Virginia’s proposal also adopts RGGI’s Cost Containment Reserve to deal with higher than expected carbon prices and Emissions Containment Reserve that would withhold allowances from in the event prices are lower than expected.</p> <p>This proposal is in line with an Executive Order from Governor McAuliffe in May 2017 for the DEQ to draft a proposed “trading ready” regulation to limit CO₂ emissions from the fossil fuel power sector that would be similarly stringent to measures in other states participating in CO₂ trading programs. The order envisioned that the “trading ready” CO₂ emissions reduction program created by the proposed rule would be likable to RGGI or to similar multi-state CO₂ trading programs.</p> <p>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.</p> <p>Proposed Regulation for Emissions Trading (2017) Executive Directive 11 (2017) Report and Final Recommendations to the Governor (2017)</p>												
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Emissions: 104 MtCO₂e (million metric tons) MtCO₂e (2014)</p>												
<p>Overall GHG emissions by sector</p>	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Transport</td> <td>48.9</td> </tr> <tr> <td>Electric Power</td> <td>30.3</td> </tr> <tr> <td>Industrial</td> <td>12.9</td> </tr> <tr> <td>Residential</td> <td>6.9</td> </tr> <tr> <td>Commercial</td> <td>5.3</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Transport	48.9	Electric Power	30.3	Industrial	12.9	Residential	6.9	Commercial	5.3
Sector Name	MtCO ₂ e												
Transport	48.9												
Electric Power	30.3												
Industrial	12.9												
Residential	6.9												
Commercial	5.3												
<p>Overall GHG reduction target</p>	<p>By 2025: 30% reduction below BAU projection of GHG emissions.</p>												
<p>Type of ETS</p>	<p>No information available yet.</p>												
<p>Cap and trajectory</p>	<p>No information available yet.</p>												
<p>Carbon Price</p>	<p><i>Current Allowance Price (per t/CO₂e):</i> No information available yet.</p>												

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	Virginia Department of Environmental Quality
Linkage with other schemes	Virginia and RGGI have held discussions about the possibility of Virginia participating in the RGGI cap-and-trade program.

Brazil

General Information

<p>Summary</p>	<p>Status: ETS under consideration</p> <p>Jurisdictions: Brazil</p> <p>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.</p> <p>As part of its activities under the Partnership for Market Readiness (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. A proposal of a policy package (policy scenarios for carbon tax and ETS) is under development with the support of the PMR. 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.</p> <p>Currently, the Brazilian government is working on the regulatory impact assessment of a National GHG Reporting Program and a national GHG emissions/removals registry with support from the German Development Agency (GIZ), thus developing the fundamentals of a central building block for carbon pricing.</p> <p>RenovaBio, the National Policy for Biofuels, has been approved in 2017 (Federal Law 13,576 of December 26, 2017), establishing mandatory goals for the reduction of GHG emissions from avoiding fossil fuels. The policy provides for a trading mechanism for emissions reduction units that have been generated from switching from fossil fuels to biofuels, relative to a 100% fossil fuel use scenario.</p> <p>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 of the simulation is coordinated by the Centro de Estudos em Sustentabilidade da Fundação Getúlio Vargas (GVCes/FGV).</p> <p>Brazilian states are also actively engaging in climate policy. In 2012, both Rio de Janeiro and São Paulo considered the implementation of a state-wide ETS.</p> <p>Lei sobre Mudança do Clima</p> <p>Activities of Brazil under the Partnership for Market Readiness (PMR)</p> <p>Plataforma Empresas pelo Clima – Simulação de Sistema de Comércio de Emissões</p> <p>Registro Público de Emissões</p>						
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Emissions: 1051.4 MtCO₂e (2014)</p>						
<p>Overall GHG emissions by sector</p>	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Energy</td> <td>469.8</td> </tr> <tr> <td>Industrial processes</td> <td>94.3</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Energy	469.8	Industrial processes	94.3
Sector Name	MtCO ₂ e						
Energy	469.8						
Industrial processes	94.3						

	Sector Name	MtCO ₂ e
	Agriculture	425.5
	Waste	68.2
Overall GHG reduction target	<p>By 2020: Voluntary commitment to reduce GHG emissions by 36.1-38.9% compared to BAU projections.</p> <p>By 2025: 37% reduction from 2005 GHG levels (NDC of Brazil).</p> <p>By 2030: Indicative contribution of 43% reduction from 2005 GHG levels (NDC of Brazil).</p>	
Type of ETS	No information available yet.	
Cap and trajectory	No information available yet.	
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> 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) Ministry of Mines and Energy
Linkage with other schemes	No information available yet.

Chile

General Information

<p>Summary</p>	<p>Status: ETS under consideration</p> <p>Jurisdictions: Chile</p> <p>In March 2013 under the Partnership for Market Readiness (PMR), Chile received funding to develop a roadmap for the design and eventual implementation of an ETS for GHG mitigation in the energy sector. 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.</p> <p>However, it subsequently shifted policy priorities towards the implementation of a carbon tax. In September 2014, as part of a broader fiscal reform, Chile approved the implementation of a carbon tax for fixed emission sources consisting of turbines or boilers with a thermal input equal to or above 50 MW (exempting biomass power plants), beginning on 1 January 2017. For the same emitting sources, a tax on local pollutants (SO₂, NO_x and particulate matter) must also be paid by emitters. Hence, from 2018, emitters will have to pay USD 5 for related 2017 CO₂ emissions, as well as the tax on local pollutants whose amount will vary depending on the location of each source. A tax on NO_x has been operating since 2015 as a one-time payment for the purchase of new lightweight vehicles based on the purchase price, fuel efficiency, and NO_x emissions/km.</p> <p>In the long run, Chile is considering deepening the use of carbon pricing instruments with the aim of facilitating the transition to a low carbon economy and achieving its NDC commitments. In order to assist in this process, the current work plan under the PMR is considering the required participatory and consultation processes with stakeholders and policymakers in the enhancement of the current carbon tax, the use of offsets as complementary and carbon leakage measures, and the possibility to transition to or supplement the carbon tax with an ETS. The PMR project will continue its support on MRV infrastructure required to make this transition possible—with carbon pricing as a cornerstone of the country's climate policy.</p> <p>Ley Reforma Tributaria (incl. Impuesto al Carbono)</p> <p>Ministerio de Energía</p> <p>Activities of Chile under the Partnership for Market Readiness (PMR)</p> <p>Ministerio del Medio Ambiente</p>										
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Emissions: 109.9 MtCO₂e (2013)</p>										
<p>Overall GHG emissions by sector</p>	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Energy</td> <td>85.0</td> </tr> <tr> <td>Agriculture</td> <td>13.7</td> </tr> <tr> <td>Industrial Processes</td> <td>6.6</td> </tr> <tr> <td>Waste</td> <td>4.5</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Energy	85.0	Agriculture	13.7	Industrial Processes	6.6	Waste	4.5
Sector Name	MtCO ₂ e										
Energy	85.0										
Agriculture	13.7										
Industrial Processes	6.6										
Waste	4.5										
<p>Overall GHG reduction target</p>	<p>By 2020: Under the UNFCCC and conditional to external support, Chile has pledged to reduce projected BAU emissions by 20% (as projected from 2007).</p> <p>By 2030: 30% reduction of emissions intensity compared to 2007, in terms of CO₂/unit of GDP. Conditional to international funding, 35-45% reduction of emissions intensity compared to 2007, in terms of CO₂/unit of GDP (NDC).</p>										
<p>Type of ETS</p>	<p>No information available yet.</p>										

Cap and trajectory	No information available yet.
Carbon Price	<i>Current Allowance Price (per t/CO₂e)</i> : 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)	The design and implementation of an MRV framework that is ETS compatible is part of the Chilean PMR Project Implementation .
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; PMR Chile (Precio al carbono Chile).
Linkage with other schemes	No information available yet.

Colombia

General Information

Summary	<p>Status: ETS under consideration</p> <p>Jurisdictions: Colombia</p> <p>In 2017, the Colombian Ministry of Environment published the National Policy on Climate Change (Política Nacional de Cambio Climático) with the objective of articulating, coordinating and mainstreaming climate change in all public and private decisions. This document sets the vision, objective, strategies, instruments and action plan of climate change policy in Colombia.</p> <p>In the medium term, Colombia is considering to implement an ETS. Currently, the macroeconomic impacts of different design options for an ETS are being assessed. Simultaneously, the basis for an ETS (a program of carbon credits and allowances) is currently discussed in Congress as one element of the Climate Change Law. Efforts to establish a voluntary carbon market are underway. The Colombian Stock Exchange (Bolsa Mercantil de Colombia) is in the process of establishing a platform of registry and transactions of verified emissions reductions.</p> <p>In 2016, as part of a broader fiscal reform, Colombia approved the implementation of a carbon tax on the carbon content of fossil fuels. The tax is levied on sales and imports of fuels and charges \$5 USD/tCO₂. The design of the tax allows compensating emissions using offsets. In the first semester of 2017, approximately 2MtCO₂ of offsets were surrendered, compensating covered entities tax liabilities. Colombia has committed to spend the CO₂ tax revenues on environmental and rural development projects.</p> <p>National Determined Contribution of Colombia Biennial Emissions Report of Colombia 2015</p>										
Overall GHG emissions (excluding LULUCF)	Emissions: 178.3 MtCO ₂ e MtCO ₂ e (2013)										
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Energy (w/transport)</td> <td>77.8</td> </tr> <tr> <td>Agriculture</td> <td>76.3</td> </tr> <tr> <td>Waste</td> <td>14.3</td> </tr> <tr> <td>Industry</td> <td>9.9</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Energy (w/transport)	77.8	Agriculture	76.3	Waste	14.3	Industry	9.9
Sector Name	MtCO ₂ e										
Energy (w/transport)	77.8										
Agriculture	76.3										
Waste	14.3										
Industry	9.9										
Overall GHG reduction target	By 2030: Under the UNFCCC, Colombia has pledged to reduce projected BAU emissions by 20%. Conditional to external support, Colombia could increase its ambition to a 30% reduction with respect to BAU (NDC).										
Type of ETS	No information available yet.										
Cap and trajectory	No information available yet.										
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> 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 Sustainable Development; Department of National Planning; Ministry of Mines and Energy; Ministry of Finance
Linkage with other schemes	No information available yet.

Japan

General Information

Summary	<p>Status: ETS under consideration</p> <p>Jurisdictions: Japan</p> <p>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.</p> <p>In March 2017, the Long-term Low-carbon Vision was formulated by the Global Environment Committee of the Central Environment Council, which refers to carbon pricing as essential to decarbonize the society. Based on that discussion, an expert committee on carbon pricing was launched in June 2017 to discuss how carbon pricing can help Japan achieve long-term, substantial emissions reductions, as well as solve economic and social issues.</p> <p>Japanese companies can familiarize themselves with a voluntary Cap-and-Trade scheme: the Advanced Technologies Promotion Subsidy Scheme with Emission Reduction Targets (ASSET).</p> <p>In parallel, Japan is implementing the Joint Crediting Mechanism (JCM) for the post-2012 era.</p> <p>Ministry of the Environment Website on Market Mechanisms</p>												
Overall GHG emissions (excluding LULUCF)	Emissions: 1324.7 MtCO ₂ e (2015)												
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Energy</td> <td>1174.6</td> </tr> <tr> <td>Industrial Processes & Product Use</td> <td>93.0</td> </tr> <tr> <td>Agriculture</td> <td>33.7</td> </tr> <tr> <td>Waste</td> <td>21.2</td> </tr> <tr> <td>Indirect CO₂</td> <td>2.1</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Energy	1174.6	Industrial Processes & Product Use	93.0	Agriculture	33.7	Waste	21.2	Indirect CO ₂	2.1
Sector Name	MtCO ₂ e												
Energy	1174.6												
Industrial Processes & Product Use	93.0												
Agriculture	33.7												
Waste	21.2												
Indirect CO ₂	2.1												
Overall GHG reduction target	<p>By FY 2020: 3.8% or more reduction from FY 2005 GHG levels.</p> <p>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).</p> <p>By FY 2050: 80% reduction (base year not stipulated).</p>												
Type of ETS	No information available yet.												
Cap and trajectory	No information available yet.												
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> 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.

Thailand

General Information

Summary	<p>Status: ETS under consideration</p> <p>Jurisdictions:</p> <p>The 12th National Economic and Development Plan (2017-2021) of Thailand calls for several mitigation measures, including the development of a domestic carbon market. The National Climate Change Master Plan (2015-2050) also refers to carbon markets as a potential mechanism to reduce GHG emissions in the private sector. In addition, the importance of carbon markets has also been emphasized in Thailand's NDC.</p> <p>From 2013 - 2016, the Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) developed an MRV system for the Thailand Voluntary Emissions Trading Scheme (Thailand V-ETS). In 2013, MRV general guidelines for the Thailand V-ETS were developed. In October 2014, the Thailand V-ETS started its pilot phase, which ended in 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. The second phase (2018-2020) will test the registry and trading platform. At the same time, TGO is working on an ETS implementation roadmap.</p> <p>Activities of Thailand under the Partnership for Market Readiness (PMR) Thailand Greenhouse Gas Management Organization</p>										
Overall GHG emissions (excluding LULUCF)	Emissions: 344.35 MtCO ₂ e (2013)										
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Energy</td> <td>258.8</td> </tr> <tr> <td>Industrial Processes</td> <td>36.1</td> </tr> <tr> <td>Agriculture and Land Use Change</td> <td>44.3</td> </tr> <tr> <td>Waste</td> <td>5.1</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Energy	258.8	Industrial Processes	36.1	Agriculture and Land Use Change	44.3	Waste	5.1
Sector Name	MtCO ₂ e										
Energy	258.8										
Industrial Processes	36.1										
Agriculture and Land Use Change	44.3										
Waste	5.1										
Overall GHG reduction target	<p>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.</p> <p>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).</p>										
Type of ETS	No information available yet.										
Cap and trajectory	No information available yet.										
Carbon Price	<i>Current Allowance Price (per t/CO₂e):</i> 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

<p>Summary</p>	<p>Status: ETS under consideration</p> <p>Jurisdictions: Turkey</p> <p>In April 2012, Turkey adopted a new regulatory framework for a comprehensive, mandatory MRV system. Monitoring started in 2015 and reporting (of 2015 emissions) began in 2017.</p> <p>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 in June 2018. Turkey receives additional funding from the PMR to prepare draft legislation and improve technical and institutional capacity towards piloting a suitable carbon pricing policy, which will be determined by the first implementation phase.</p> <p>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).</p> <p>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</p>												
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Emissions: 475.1 MtCO_{2e} (2015)</p>												
<p>Overall GHG emissions by sector</p>	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO_{2e}</th> </tr> </thead> <tbody> <tr> <td>Energy (excluding transport)</td> <td>191.4</td> </tr> <tr> <td>Manufacturing Industries and Construction</td> <td>80.5</td> </tr> <tr> <td>Transport</td> <td>105.9</td> </tr> <tr> <td>Fugitive Emissions from Fuels</td> <td>5.7</td> </tr> <tr> <td>Other Sectors</td> <td>91.6</td> </tr> </tbody> </table>	Sector Name	MtCO _{2e}	Energy (excluding transport)	191.4	Manufacturing Industries and Construction	80.5	Transport	105.9	Fugitive Emissions from Fuels	5.7	Other Sectors	91.6
Sector Name	MtCO _{2e}												
Energy (excluding transport)	191.4												
Manufacturing Industries and Construction	80.5												
Transport	105.9												
Fugitive Emissions from Fuels	5.7												
Other Sectors	91.6												
<p>Overall GHG reduction target</p>	<p>By 2030: Up to 21% reduction below the BAU scenario (INDC Submission).</p>												
<p>Type of ETS</p>	<p>No information available yet.</p>												
<p>Cap and trajectory</p>	<p>No information available yet.</p>												
<p>Carbon Price</p>	<p><i>Current Allowance Price (per t/CO_{2e}):</i> No information available yet.</p>												

ETS Size

<p>Emissions covered by the ETS</p>	<p>No information available yet.</p>
<p>GHG covered</p>	<p>No information available yet.</p>
<p>Sectors covered and thresholds</p>	<p>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</p>

	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)	<p>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).</p> <p>Entities had until October 2014 to submit their first monitoring plans and submitted verified emissions reports for 2015 and 2016 to the Ministry of Environment and Urbanization in October 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.</p>
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

<p>Summary</p>	<p>Status: ETS under consideration</p> <p>Jurisdictions: USA - Oregon</p> <p>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.</p> <p>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. No vote has been taken on this bill yet.</p> <p>An annual GHG emissions reporting program is in place since 2008, mainly covering industry and waste, as well as fuel distributors and electricity suppliers.</p> <p>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.</p> <p>DEQ Report – Considerations for Designing a Cap-and-Trade Program in Oregon (2017)</p> <p>Senate Bill 1574 (2016)</p> <p>Senate Bill 557 (Introduced in January 2017)</p>										
<p>Overall GHG emissions (excluding LULUCF)</p>	<p>Greenhouse Gas reporting Homepage - DEQ Emissions: 63.4 MtCO₂e (million metric tons) MtCO₂e (2015)</p> <p>Pacific Coast Action Plan on Climate Energy</p>										
<p>Overall GHG emissions by sector</p>	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO₂e</th> </tr> </thead> <tbody> <tr> <td>Transportation</td> <td>23.2</td> </tr> <tr> <td>Residential and Commercial</td> <td>22.2</td> </tr> <tr> <td>Industrial</td> <td>12.8</td> </tr> <tr> <td>Agriculture</td> <td>5.2</td> </tr> </tbody> </table>	Sector Name	MtCO ₂ e	Transportation	23.2	Residential and Commercial	22.2	Industrial	12.8	Agriculture	5.2
Sector Name	MtCO ₂ e										
Transportation	23.2										
Residential and Commercial	22.2										
Industrial	12.8										
Agriculture	5.2										
<p>Overall GHG reduction target</p>	<p>By 2020: 10% reduction from 1990 GHG levels. By 2050: at least 75% reduction from 1990 GHG levels.</p>										
<p>Type of ETS</p>	<p>No information available yet.</p>										
<p>Cap and trajectory</p>	<p>No information available yet.</p>										
<p>Carbon Price</p>	<p><i>Current Allowance Price (per t/CO₂e):</i> No information available yet.</p>										

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 - Washington

General Information

Summary	<p>Status: ETS under consideration</p> <p>Jurisdictions: Washington</p> <p>In 2008, the State of Washington adopted GHG reduction targets for 2020, 2035 and 2050.</p> <p>In 2017, the Washington Department of Ecology began implementing the Clean Air Rule to reduce emissions from industrial sources, petroleum fuel producers and importers, and natural gas distributors. Those responsible for at least 100,000 metric tons of GHG per year are affected. However, following a court ruling in December 2017, the compliance requirements are currently suspended.</p> <p>Covered facilities must reduce a cumulative 1.7% of their baseline emissions annually. They can comply by reducing their own emissions, buying credits from other regulated parties or from projects that reduce emissions, or by acquiring allowances from approved ETS programs. However, the Clean Air Rule is currently facing a legal challenge that is delaying implementation of the program.</p> <p>Recent changes to the legislature have renewed interest in putting a carbon pricing policy into law. On 9 January 2018, Governor Inslee proposed a USD 20 carbon tax for fossil fuels and electricity starting in July 2019, increasing 3.5% annually plus inflation. In addition, environmental NGOs have announced their intent to put a carbon pricing policy to a vote of the people in 2018 if the state legislature does not act.</p> <p>Clean Air Rule State of the State Address (2018)</p>																
Overall GHG emissions (excluding LULUCF)	Emissions: 98.3 MtCO _{2e} (million metric tons) MtCO _{2e} (2015)																
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO_{2e}</th> </tr> </thead> <tbody> <tr> <td>Electricity</td> <td>19.1</td> </tr> <tr> <td>Residential, commercial, transport</td> <td>20.7</td> </tr> <tr> <td>Transport</td> <td>42.9</td> </tr> <tr> <td>Fossil fuel industry</td> <td>0.8</td> </tr> <tr> <td>Industrial process</td> <td>4.9</td> </tr> <tr> <td>Waste Management</td> <td>3.3</td> </tr> <tr> <td>Agriculture</td> <td>6.6</td> </tr> </tbody> </table>	Sector Name	MtCO _{2e}	Electricity	19.1	Residential, commercial, transport	20.7	Transport	42.9	Fossil fuel industry	0.8	Industrial process	4.9	Waste Management	3.3	Agriculture	6.6
Sector Name	MtCO _{2e}																
Electricity	19.1																
Residential, commercial, transport	20.7																
Transport	42.9																
Fossil fuel industry	0.8																
Industrial process	4.9																
Waste Management	3.3																
Agriculture	6.6																
Overall GHG reduction target	<p>By 2020: reduce emissions to 1990 levels.</p> <p>By 2035: reduce emissions 25% below 1990 levels.</p> <p>By 2050: reduce emissions 50% below 1990 levels or 70% below state's expected emissions for that year.</p>																
Type of ETS	No information available yet.																
Cap and trajectory	No information available yet.																
Carbon Price	<i>Current Allowance Price (per t/CO_{2e}):</i> 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	<p>Status: ETS under consideration</p> <p>Jurisdictions:</p> <p>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. Vietnam is also considering the use of market-based instruments for the waste sector starting in 2020.</p> <p>Green Growth Strategy Vietnam</p> <p>Activities of Vietnam under the Partnership for Market Readiness (PMR)</p>										
Overall GHG emissions (excluding LULUCF)	Emissions: 293.3 MtCO _{2e} (2013)										
Overall GHG emissions by sector	<table border="1"> <thead> <tr> <th>Sector Name</th> <th>MtCO_{2e}</th> </tr> </thead> <tbody> <tr> <td>Energy</td> <td>151.4</td> </tr> <tr> <td>Industrial Processes</td> <td>31.8</td> </tr> <tr> <td>Agriculture</td> <td>89.4</td> </tr> <tr> <td>Waste</td> <td>20.7</td> </tr> </tbody> </table>	Sector Name	MtCO _{2e}	Energy	151.4	Industrial Processes	31.8	Agriculture	89.4	Waste	20.7
Sector Name	MtCO _{2e}										
Energy	151.4										
Industrial Processes	31.8										
Agriculture	89.4										
Waste	20.7										
Overall GHG reduction target	By 2030: 8% below BAU and 25% conditional on international support (NDC 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	<i>Current Allowance Price (per t/CO_{2e}):</i> 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.

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