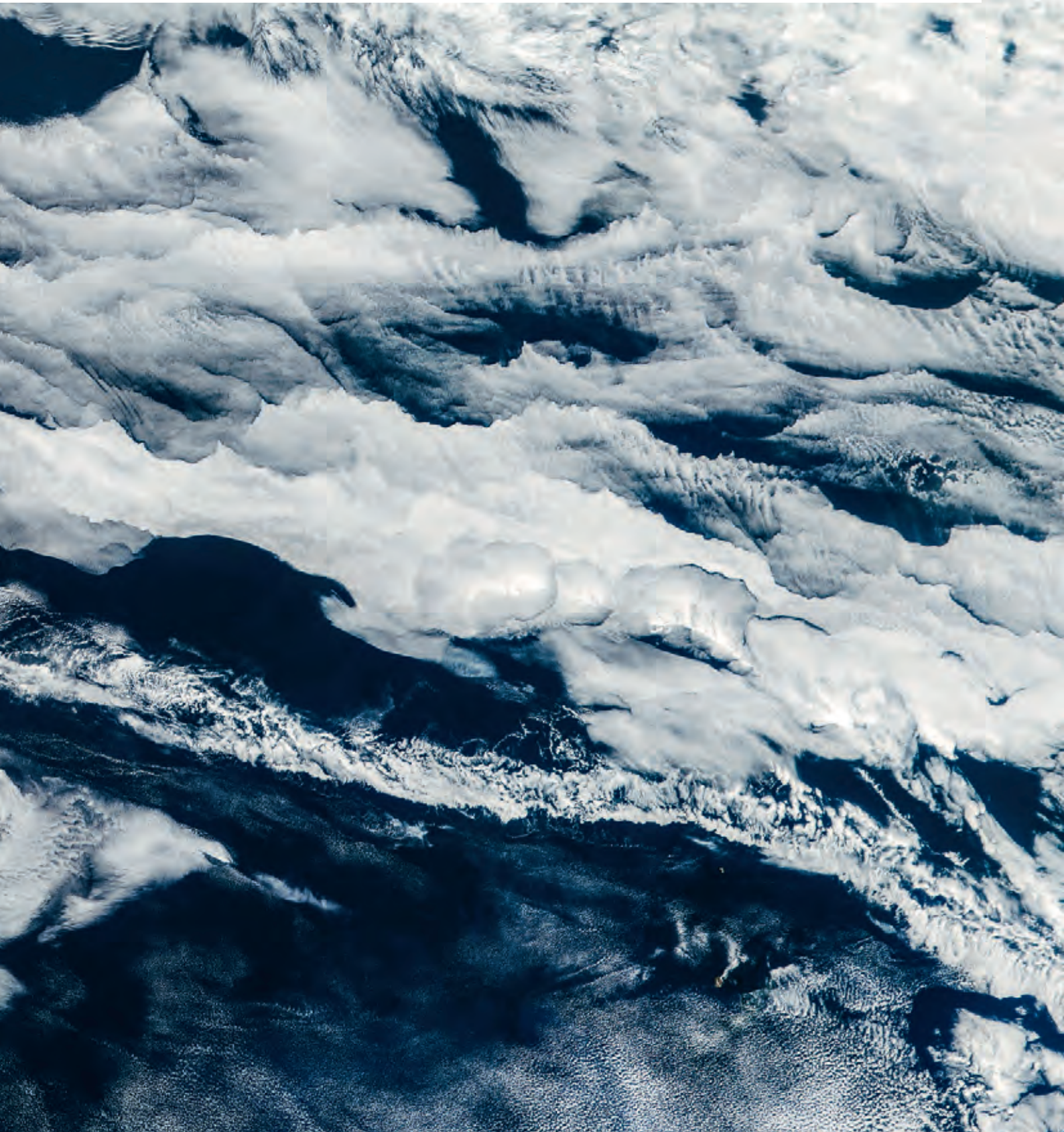
Emissions Trading Worldwide

International Carbon Action Partnership (ICAP)
Status Report 2014



Imprint

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Foreword

Despite years of international negotiations, a comprehensive global accord to halt climate change remains elusive. And yet this storyline omits an important part of global efforts to reduce greenhouse gas emissions: the momentum that is building at lower levels of governance to effectively address climate change. Governments around the world are implementing policies that put a price on carbon and stimulate polluters to reduce their emissions.

The present report by the International Carbon Action Partnership (ICAP) surveys the global state of play on one key climate policy instrument: emissions trading for greenhouse gases. It assembles contributions by policymakers and practitioners on their experiences setting up and running emissions trading systems (ETS) in different parts of the world and combines this with detailed, up-to-date fact sheets on systems worldwide, both those currently operating and those under construction.

Now is a good time for such a stock-taking exercise: 2013 was a particularly dynamic year in emissions trading, with nine mandatory ETS starting compliance. Developments in China are particularly in the limelight, where seven pilot programs in big cities and provinces are trying out and experimenting with different designs in the run-up to a possible national system. Five were launched in 2013, another two will start in 2014. A national system in the Republic of Korea is then to follow in 2015. No less important, however, was an event on the North American continent where years of preparation led to the first fully fledged link between two systems, the ETS in California and Québec.

The year 2013 was also an important one for programs that have been up and running for some time. The European Emissions Trading Scheme (EU ETS), the world's largest and longest-running ETS, entered its third phase. The system now has an EU-wide, gradually declining cap on emissions and auctioning has become the default method of allocation. At the same time, the nine American states participating in the Regional Greenhouse Gas Initiative (RGGI) are reducing their emissions cap by 45percent, locking in ample emission reductions and demonstrating that it is feasible to substantially reform an ETS to ensure its environmental effectiveness.

As the second part of this report shows, other jurisdictions at different levels of government around the world are also busy designing ETS systems. At different stages of development, these efforts show that emissions trading has become a truly global phenomenon as a tool in the fight against climate change. It is also becoming clear that contrary to the expectations of policy-makers and analysts in the 1990s and early 2000s, a global carbon market is unlikely to come about in a harmonized, top-down fashion. Rather, it will emerge from the bottom up, building on a multitude of systems that do not follow one blueprint, but have found different answers to questions like cap-setting, allocation, scope, and flexibility provisions, based on their own local needs and conditions.

This assessment underscores the continuing importance of ICAP as a forum for governments and public authorities to share knowledge and experiences in ETS design and implementation, thus helping to pave the way to a robust global carbon market.

Leif Ervik
Director General, Ministry of Finance,
Norway and ICAP Co-Chair

Jared Snyder
Assistant Commissioner for Air Resources,
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of Environmental Conservation and ICAP Co-Chair

List of Acronyms

AAU	Assigned Amount Unit
ARB	Air Resources Board
BAU	Business as Usual
BM&F	Brazilian Mercantile and Futures Exchange
Bovespa	BM&FBovespa S.A—Bolsa de Valores, Mercadorias e Futuros de São Paulo (São Paulo Stock Exchange)
BV Rio	Bolsa Verde do Rio
CAL EPA	California Environmental Protection Agency
CCAP	Climate Change Action Plan
CCER	China Certified Emission Reductions
CCR	Cost Containment Reserve
CCS	Carbon Capture and Storage
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CH_4	Methane
CHF	Swiss Franc
CNY	Chinese Yuan Renminbi
CO_2	Carbon Dioxide
CPM	Carbon Pricing Mechanism
DRC	Development and Reform Commission
EBRD	European Bank for Reconstruction and Development
EEA	European Economic Area
EFTA	European Free Trade Association
EITE	Energy-Intensive and Trade-Exposed
EPC	Energy Performance Certificate
ERU	Emission Reduction Unit
ETS	Emission Trading System or Emission Trading Scheme
EU	European Union
EUR	Euro
FY	Financial Year
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GLOBE	Global Legislators Organisation
HFC	Hydrofluorocarbon
HFC-23	Fluoroform
ICAO	International Civil Aviation Organization
ISO	International Organization for Standardization
JCM	Joint Crediting Mechanism
JI	Joint Implementation
JPY	Japanese Yen
JVETS	Japan Voluntary Emission Trading Scheme
KZT	Kazakhstan Tenge
LCC	Low Carbon Cities Program
LDCs	Least Developed Countries
LULUCF	Land Use, Land-Use Change and Forestry
MCI	Monthly Calculation Index
MRV	Monitoring, Reporting and Verification
MW	Megawatt
N_2O	Nitrous Oxide
NAMA	Nationally Appropriate Mitigation Actions
NAP	National Allocation Plan
NDRC	National Development Reform Commission
NEa	Nederlandse Emissieautoriteit (Dutch Emissions Authority)
NER	New Entrant Reserve
NGO	Non-Governmental Organization
NZ	New Zealand
NZD	New Zealand Dollar
PFC	Perfluorocarbon
PMR	Partnership for Market Readiness
REDD	Reducing Emissions from Deforestation and Forest Degradation
RGGI	Regional Greenhouse Gas Initiative
RMU	Removal Unit
SF_6	Sulfur Hexafluoride
SZ ETS	Shenzhen Emission Trading Scheme
T-COP	Thailand—Carbon Offsetting Program
TGO	Thailand Greenhouse Gas Management Organization
TMG	Tokyo Metropolitan Government
TMS	Greenhouse Gas Energy Target Management System
T-VER	Thailand Voluntary Emission Reduction
UNFCCC	United Nations Framework Convention on Climate Change
USD	US Dollar
US EPA	US Environmental Protection Agency
VCS	Verified Carbon Standard
WCI	Western Climate Initiative

Practitioner Insights
designing cap-and-trade

Creating a robust system that is flexible enough to accommodate changing external conditions is the key to an effective emission trading scheme (ETS). In this section, policy practitioners share insights on how their jurisdictions have tackled this challenge. Peter Zapfel and Vicky Pollard report on the debate on the so-called back-loading in the European Emissions Trading Scheme (EU ETS), and Mariette van Empel highlights the importance of stakeholder involvement in ETS design and implementation from the Dutch perspective. Jared Snyder then discusses the recent program review of the Regional Greenhouse Gas Initiative (RGGI) and the potential of the system to act as a model for a national program in the United States. Subsequently, Jean-Yves Benoit explains how Québec designed a robust cap-and-trade program and prepared for linking with California's. Finally, the Tokyo Metropolitan Government and the China Emissions Exchange provide valuable perspectives on the experiences of the cities of Tokyo and Shenzhen as urban pioneers in emissions trading.

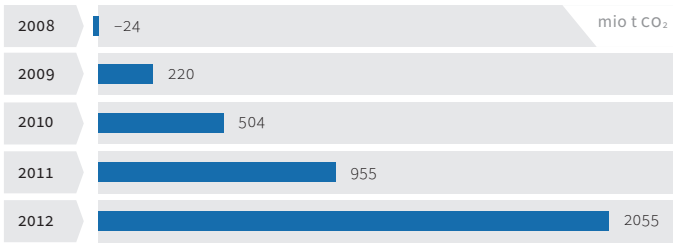
The EU ETS: a Review of the Back-Loading Debate

Peter Zapfel and Vicky Pollard
European Commission*

The year 2008 was a watershed moment for the European carbon market. In late 2008 European leaders agreed legislation—the so-called climate and energy package. One of the central elements of this package was a revision of the EU Emissions Trading System (EU ETS) Directive, the primary legislation that establishes the EU ETS. The revision included major architectural changes that substantially strengthened the system and incorporated the learning of the early years of operation. It saw the introduction of a 'linear reduction factor', which defines the ever-declining emissions cap far into the future and the largest ever allowance auctions agreed worldwide (with annual volumes of about one billion allowances on average from 2013 to 2020, or around 50 percent of available allowances).

At the same time, late 2008 was marked by the collapse of Lehman Brothers and the onset of a deep worldwide financial crisis, which in Europe was followed by the public debt crisis, giving rise to a double-dip recession of almost unprecedented magnitude. In some sectors covered by the European carbon market, output levels dropped by 30 percent or more between 2008 and 2009. These macro-economic shocks eroded a healthy market balance and gave rise to a gradual accumulation of an allowance surplus. In later years, the surplus build-up accelerated. Between 2011 and 2012, it doubled from around one billion to some two billion allowances, after having already doubled between 2010 and 2011. A second major factor, as phase 2 of the EU ETS drew to a close (end of 2012), was the huge increases seen in the import and use of international credits (JI and CDM) for compliance use, due to the regulatory decisions restricting the use of certain credits after 2012.

Allowance surplus build-up in the EU ETS from 2008–2012



The growing market imbalance and weakening price signal gave rise to a public debate on what the policy response should be to the unfolding phenomena the EU ETS was exposed to. Some voices argued that given the major changes agreed in late 2008, no further policy change should be introduced so soon after the revision, otherwise the market participants' confidence would be shattered. Others called for strong and immediate action, e.g. in the form of a permanent retirement or set-aside of an amount of allowances so as to neutralize the impact of the recession on the market balance.

In April 2012, after observing the debate for a considerable time, the European Commission gave a first response. Commissioner Hedegaard announced her intention to propose to back-load (or postpone) auction volume from the early to the late years of phase 3 (which runs from 2013 to 2020). In July 2012, the Commission proposed a clarifying amendment to the EU ETS Directive, to seek the consent of the two European co-legislators (the Council, which brings together the 28 states that are members of the EU, and the European Parliament) for back-loading. At the same time, a proposal for an amendment to the EU ETS Auctioning Regulation was disclosed, with an annex for the back-loading volume without figures. In November 2012, figures were provided to fill this empty annex and a back-loading of 900 million allowances from 2013–2015 to 2019–2020 was proposed.

"As back-loading nears implementation, the debate on how to tackle the huge market imbalance is continuing and is far from being conclusive. Backloading being of a temporary nature, both analysts and stakeholders strive to understand how the carbon market can cope with a significant surplus and what the implications of alternative options for action would or could be. (…) The approaching implementation of back-loading will provide valuable information to this debate."

Proposed backloading volumes

in mio. allowances	2013	2014	2015	2019	2020
Proposed change in auction volume	–400	–300	–200	300	600

In parallel to completing the proposed amendment of the Auctioning Regulation, the Commission tabled a carbon market report, which made clear that back-loading was only a first step toward addressing the serious supply-demand imbalance and that more (structural) action is needed. The report outlined six options for structural changes, which would increase demand for and/or reduce the supply of allowances.

At the time of writing this article in late 2013, back-loading was close to political agreement, while the actual lowering of auction volume, due to legal and technical steps that still need to be taken, was still several months off. At the same time, the carbon price had stabilized at a rather low level of some four to five Euros. Those observing these developments in Europe from a distance may well wonder why it took so long to agree back-loading, while fundamental changes to the EU ETS architecture were agreed a few years ago in much less time.

There are several reasons for this. Firstly, the rapid build-up of the surplus and consequential weakening of the carbon price signal happened not only in very difficult economic times. In parallel, the energy as well as industry sectors were contemplating the major implications of the unfolding US shale gas revolution. These two phenomena gave rise to significant uncertainty and reluctance to act quickly.

Secondly, those forces in the debate who wanted to act rapidly to strengthen the carbon market initially widely regarded back-loading as insufficient and a diversion from the real issues. The Commission had been clear up front that it did not see back-loading as the ultimate solution to the market imbalance, but a first step. Only when these actors understood that back-loading was a necessary first step to allow for more time for reflection on how to address the market imbalance in a more structured manner, did the support for the measure broaden. As the debate dragged on, what had started as a discussion on a simple technical shift in sale of allowances over time became confused and complicated with debate on issues more relevant to further structural reform, and this further delayed an outcome to the back-loading debate.

Thirdly, the long-held negative attitude in Europe toward price management and other forms of intervention in the carbon market also slowed down decision-making. In contrast to other developing carbon markets, Europe has systematically refrained from any type of direct price intervention. In technical terms, back-loading is simply a revision of the planned time period for the sale of allowances, for a very good reason, namely to auction the allowances at a time when there is a real demand in the market for these allowances, and not earlier. However, the discussion was quickly dubbed as one about market intervention, which would be going against predictability and stability.

As back-loading nears implementation, the debate on how to tackle the huge market imbalance is continuing and is far from being conclusive. Backloading being of a temporary nature, both analysts and stakeholders strive to understand how the carbon market can cope with a significant surplus and what the implications of alternative options for action would or could be. In this context, the approaching implementation of back-loading will provide valuable information to the debate: At present, there are very divergent views on how back-loading will impact the carbon price over time.

* The views expressed here are those of the authors and do not represent formal positions of the European Commission.

Stakeholder Engagement
crucial for a robust ETS system

Mariette van Empel
Deputy Director General of the Directorate-General for the Environment and International Affairs of the Netherlands

The Netherlands has a long tradition of stakeholder engagement, which we call the Polder Model. The concept dates back to the middle ages, when farmers, nobility, and other civilians all had to work together to build dikes to protect their land—the so-called polder—from flooding. The Dutch approach to stakeholder engagement has been crucial for the development of a strong ETS system in the Netherlands.

National ETS versus EU ETS? It's the discussion that counts

The Netherlands started looking at the possibility of a national CO_2 emission trading system in 1997. The Minister of Environment formed a special committee, led by Mr. Vogtländer of Royal Dutch Shell, to advise on the feasibility of such a system in 2000. The committee, which conducted numerous stakeholder consultations, concluded in 2002 that emissions trading at the national level would be a feasible, desirable, and efficient method to achieve the desired emission reduction goals. It also concluded that a European or even international emission trading system would be even better.

The stakeholder reaction to the Vogtländer-commission's recommendations focused specifically on the advantages of an EU level system. This was no coincidence because discussions on a European ETS system had also started in March 2000 and by the end, of 2001, the European Commission made a formal proposal to launch a European ETS system. For the Dutch stakeholders, a scheme at the EU level meant a level European playing field for business and was therefore preferable to a national system.

In retrospect, it was not the choice between a national and an EU system that was most important. What really mattered was that the national discussion process had already started. This created support for, and understanding of, the possibilities of emission trading among the various stakeholders. As a co-benefit, lessons from the national stakeholder dialogue could readily be incorporated into the national position on the EU ETS proposal by the European Commission.

Stakeholder dialogue: a balancing act of the different roles of government

In 2003, the EU decision to establish the EU ETS was taken. From this moment on, the role of the Dutch government and other EU governments became two-fold:

- The EU member state governments became national regulators, which have to transpose the legislation of the EU ETS into national law. They also have to ensure that the ETS legislation is implemented well by all stakeholders. In the Netherlands, the Dutch Emissions Authority (NEa) was created as a semi-independent body of the government. This semi-independent character was to guarantee that the implementation of the ETS legislation would be independent of everyday politics.

- At the same time, when European law is developed or changed, the different EU governments are stakeholders themselves within the European decision-making process, just like other stakeholders such as the European Parliament, industry, NGOs etc. In this role, the Dutch government wants to make sure that the interests of Dutch stakeholders are taken into account at the EU level.

These roles are of course inseparable. The dual role of the Dutch government determines government policy, which makes it all the more important that the Dutch government position is balanced and well thought through. Since EU member states have had to (and still do) take both roles into account in the discussion on the functioning of the EU ETS, the system has been tested and has become stronger over time.

Implementation stage: critical to involve stakeholders

In implementing the EU ETS, there were a number of crucial points to be discussed with stakeholders. The first was Monitoring, Reporting, and Verification (MRV), the second was the allowance

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allocation. For the government, the reliability of information on greenhouse gas emissions is the most important issue. However, because of the economic value at stake, the most important issue for most stakeholders is how allowances are allocated. In both cases, the underlying foundation is the measurement of greenhouse gases emitted.

When we started implementing EU ETS in the Netherlands, the data we had as a government was insufficient, which made stakeholder involvement crucial. Without fully consistent, transparent, and accurate emissions monitoring, emission trading is not possible. As a government, we needed to ensure that a ton reduced from one source would be the same as a ton reduced from another source. To ensure the reliability of the data and to prevent unnecessary administrative burdens, the government and industrial stakeholders together started a project team that defined and determined how MRV could best be organized.

At the same time, we had long discussions on the various possible allowance allocation methods in the Netherlands. We started by mostly grandfathering the allowances; now, allowances are increasingly auctioned, with some free allocation based on benchmarks. This seems quite simple, but discussions always go far deeper into the regulatory details. Every decision regarding allocation has advantages and disadvantages for different stakeholders and therefore financial consequences. As a regulator, it is crucial to create a very thorough process to engage stakeholders and make sure that all decisions are well thought through and well documented.

Stakeholders can help to prevent implementation issues during operation

The Dutch government philosophy is that one should be in close contact with one's stakeholders, not only in designing the system, but also in its operation.

The NEa efforts to assist entities with compliance is an excellent example. The idea is simple. NEa helps companies with regulatory compliance before the deadline. Thanks to the authority's efforts, the number of entities complying with the regulation is far higher than it would otherwise be. Such efforts are a win-win: Maintaining the system is cheaper like this for the government; entities receive such help and, even more importantly, understanding of, and support for, emissions trading grows.

Another good example is the Dutch financial sector's commitment to prevent fraud. In the past, there have been incidents of VAT-fraud and theft of allowances. The Dutch financial sector has provided significant support in solving these issues and preventing them from reoccurring. The sector has made these efforts because it is in its own interest: Uncertainty about the system itself undermines the stakeholders' positions and they are therefore willing to work with government to protect the system.

Stakeholders now working together to strengthen the EU-ETS

In the summer of 2013, the Netherlands achieved a whole new level of stakeholder engagement. In the process of drawing up the national energy agreement, all relevant Dutch stakeholders—namely those from various government functions, environmental NGOs such as Greenpeace, financial institutions, and heavy industry—all arrived at a common position on strengthening the EU ETS. This is important because discussions on future EU ETS reform are starting now. In the process of achieving this national energy agreement, the dialogue between stakeholders has been especially important. Through this, different stakeholders grew to understand each other's positions and were thereby able to learn from one another.

From my perspective, there is only one conclusion: The fact that so many different stakeholders have supported the EU ETS in the past and now share the goal to strengthen the system shows that emissions trading is a necessary instrument to achieve the desired emission reductions in the EU and that stakeholder engagement is key to helping it function.

"The fact that so many different stakeholders have supported the EU ETS in the past and now share the goal to strengthen the system shows that emissions trading is a necessary instrument to achieve the desired emission reductions in the EU and that stakeholder engagement is key to helping it function."

The Regional Greenhouse Gas Initiative
lessons from a successful cap-and-invest model

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The Regional Greenhouse Gas Initiative (RGGI) is the first US mandatory market-based emissions trading program to reduce greenhouse gases and the first anywhere to use the cap-and-invest model for reducing pollution. When the participating states established the program in 2005, they envisioned the program as a model for emission trading in other regions and in the United States as a whole, pioneering the auction of emission allowances and the investment of proceeds to advance efficiency and clean energy and provide consumer benefits.

Launched in January 2009, RGGI currently applies to 168 electricity generation facilities in nine Northeast and Mid-Atlantic states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont). Together, these facilities account for approximately 95 percent of CO_2 emissions from electricity generation in the region.

The RGGI participating states established a regional cap on CO_2 pollution from the power sector and require power plants to possess a tradable CO_2 allowance for each ton of CO_2 emitted. Under RGGI, nearly 90 percent of emission allowances are distributed through auction. As of September 2013, cumulative auction proceeds totaled nearly 1.5 billion USD (about 1.1 billion EUR). Participating states have invested approximately 80 percent of these auction proceeds in consumer benefit programs, including investments stimulating local economies and creating jobs through the development of greenhouse gas abatement technologies, and end-use energy efficiency and renewable energy deployment at the state and local levels.

RGGI's performance—the first six years

Reducing emissions

In creating RGGI, the participating states sought to stabilize power sector CO_2 emissions over the first six years of the program (2009–2014) at a level roughly equal to 2005 emissions. Subsequently, the emissions cap was set to decline by 2.5 percent per year for the four years 2015 through 2018.

The actual emissions reduction outcome, however, greatly exceeded expectations: Emissions from the power sector have declined more than 40 percent across the RGGI region since 2005 as energy efficiency programs contributed to reduced demand and generation shifted from coal and oil to renewable power and natural gas. RGGI's price signal, predictable regulatory environment and the investment of auction proceeds facilitated the GHG emissions decline:

- Energy efficiency and renewable energy programs have proven very effective in reducing electric power demand and have received a boost from allowance auction proceeds. With aggressive programs already in place, the RGGI states had capacity to make the best use of these funds.

- In response to market forces, other regulatory requirements and the RGGI price signal, power generation utilities have made a significant shift from high-emitting coal and oil to natural gas and renewable power.

In each participating state, RGGI plays a key role in a state-designed suite of regulations and incentives directed at promoting a cleaner energy system. Because states and electric utilities play important roles in determining how emissions are reduced, the RGGI system facilitates optimal emission reductions from the power sector. The RGGI cap collects all power sector GHG emission reductions under a single cap, regardless of their program origins, and ensures that reductions are fully realized and accounted for in the emissions trading system.

Economic performance

RGGI has demonstrated that regional, state, and local economies and energy consumers can directly benefit from emissions reduction. An independent report by the Analysis Group found that the investment of RGGI proceeds from the first three years will:

- generate 1.6 billion USD (about 1.2 billion EUR) in net region-wide economic benefit through the end of the decade;
- put 1.1 billion USD (about 0.8 billion EUR) in electricity bill savings back into the pockets of consumers in the region over the next decade;
- create 16,000 "job-years" in the region; and
- keep 765 million USD (about 565 million EUR) in the local economy thanks to reduced fossil fuel demand.

It is notable that the RGGI participating states have achieved significant GHG emission reductions while their economies continue to grow.

RGGI amendments to enter in force in 2014

Based on a scheduled program review in 2012, the RGGI states agreed to reduce the cap by 45percent in 2014 to lock in the CO_2 pollution reductions achieved to date from power plants across the region and drive additional emissions reductions. Statutory and regulatory processes are underway in each RGGI participating state to revise the states' CO_2 Budget Trading Programs in accordance with this agreement. To improve the integrity of the cap, the new rules reduce the regional CO_2 budget (RGGI cap) from 165 million to 91 million tons (approximately current emissions) in 2014. The cap will then decline 2.5 percent each year from 2015 to 2020. Unsold 2012 and 2013 allowances will not be re-offered and interim adjustments in the cap will account for "banked" allowances remaining from earlier periods.

The RGGI revisions reflect current market conditions and the participating states are adopting a flexible cost containment mechanism as an additional consumer protection. To protect against price swings in the allowance market, a cost containment reserve creates a fixed additional supply of allowances available for sale in the event that CO_2 allowance prices exceed certain price levels.

The program review was informed throughout by thorough technical analyses and extensive stakeholder input. Economic modelling to support the RGGI states' deliberations projects that the changes to the program will increase gross state product by a cumulative total of 8 billion USD (about 6 billion EUR) through 2040, and create more than 125,000 job-years.

RGGI as a Model for a National Program

RGGI provides a successful model for consideration as the United States Environmental Protection Agency (US EPA) issues guidelines for the states to regulate CO_2 emissions from existing power plants for the first time, as directed by President Obama in a June 2013 announcement. The RGGI states have shown that a regional emission trading system can achieve cost-effective emission reductions and facilitate the transition to a lower-emitting and more efficient power sector while creating economic benefits and jobs throughout the region.

RGGI also demonstrates how a cap-and-invest program can play several integral roles in achieving GHG emission reductions. The price on emissions and declining cap provide a market signal that supports measures to reduce emissions, such as fuel switching, on-site efficiency improvements, retirement of high-emitting plants, and construction of new, more efficient plants. The auction mechanism provides a source of funding for complementary energy efficiency and renewable energy investments that further reduce emissions. The enforceable emission cap ensures that the combined effect of the emission trading system and the suite of supporting policies actually do reduce emissions to below the cap level.

The RGGI participants are promoting the RGGI model as an acceptable compliance mechanism under the pending federal program, and expect that other states would benefit from participating in RGGI or from developing a similar regional electricity system-based cap-and-invest approach.

"Participating states have invested approximately 80 percent of these auction proceeds in consumer benefit programs, including investments stimulating local economies and creating jobs through the development of greenhouse gas abatement technologies, and end-use energy efficiency and renewable energy deployment at the state and local levels."

The Québec Carbon Market
a strong carbon price signal bodes well for future alliances

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The Québec government has opted for a cap-and-trade system as the centrepiece of its current greenhouse gas (GHG) mitigation strategy. In 2008, Québec joined the Western Climate Initiative (WCI) and actively contributed to the design of its regional carbon market. Québec considers an emissions trading system (ETS) as the best policy instrument capable of achieving GHG emission reductions by sending a price signal to most economic stakeholders and allowing them the necessary flexibility to integrate that signal in their activities. It also provides increasingly strong incentives to businesses to make the shift to a green economy by improving their energy efficiency or their production methods either by using the best technologies currently available on the market or by developing new technologies. The cap-and-trade revenues will be fully reinvested in initiatives for reducing GHG emissions and adapting to the impacts of climate change.

Learning from the successes and challenges of other carbon markets worldwide, the Québec government launched its trading system in 2012. Its regulation was modeled on the architecture set up by the WCI. A number of regulatory provisions were drafted to send a strong carbon price signal to the Québec economy, to protect allowance prices from excessive fluctuations, to avoid over-allocation, and to ensure the environmental integrity of offsets while avoiding double counting.

An economy-wide coverage

In its first two years, the Québec ETS covers electricity and industrial GHG emissions. However, from 2015, it will also include emissions from fossil fuels distribution. The system will cover about 85 percent of Québec's GHG emissions. In addition, offset protocols have been or are being developed to allow GHG reductions in sectors not covered by the scheme. Currently, protocols have been approved for the destruction of GHGs from landfill waste, manure storage areas, and ozone depleting substances contained in refrigerating appliances.

Accurate data

Covered entities in the Québec ETS must report their GHG emissions using specific and internationally recognized protocols. Furthermore, emissions data must be verified independently by an accredited verifier in accordance with ISO standards. The WCI stipulates that regulations and standards must be harmonized among its members. This ensures that one ton of GHG emitted and calculated is the same across the partnership.

A strong price signal sent to the economy along with a floor price …

The Québec Cap-and-Trade Regulation sets a minimum price for allowances sold at auction. At the first auction, which was held on Dec. 3, 2013, the minimum price, or "floor price", was 10.75 CAD (about 7.25 EUR). The price will rise annually by five percent plus inflation until 2020. This guarantees a progressively stronger carbon price signal to the Québec economy.

The allowance price at auctions is determined by the lowest offer equal to or above the floor price that allows for selling the last GHG emission allowance available. Because all offers remain confidential over a three-hour window, the system prevents carbon prices from skyrocketing and the hoarding of allowances by some auction participants.

"The link between the Québec and the California ETS creates the largest carbon market in North America, and the first transnational cap-and-trade system run by subnational governments in the world."

… and a ceiling price

If the situation arises that demand for allowances significantly exceeds supply, leading to a disproportionate increase in allowance prices, the Québec government may hold a sale of emission allowances with set prices in three categories (40, 45 and 50 CAD or 27, 30 and 34 EUR). Only covered entities having difficulty finding enough allowances to meet their obligations could participate in this sale. This effectively acts as a "ceiling price" on emission allowances.

Avoiding carbon leakage

Covered companies whose products face national or international competition do not have much leeway to raise prices and recoup the costs of allowances they may need to buy at auction. In addition, they are vulnerable to carbon leakage. Therefore, they receive about 80 percent of the allowances needed for compliance free of charge. However, starting in 2015, the number of freely allocated allowances will decrease by one to two percent annually to provide an incentive for GHG emission reductions.

Conversely, the electricity and fossil fuels distribution sectors, which have a more captive clientele and are not subject to carbon leakage, have to buy all allowances at auction or on the carbon market in order to meet their obligations.

Avoiding over-allocation

The number of emission allowances distributed free of charge is calculated and adjusted according to the real annual production levels of individual covered facilities. This avoids over-allocation and allows installations to expand or increase their production without being penalized. Moreover, allowances not sold at auction will be temporarily taken out of circulation and gradually put back up for sale when demand returns to normal.

Avoiding market manipulation

To avoid market manipulation, purchase limits apply for auctions in the Québec ETS. In addition, WCI Inc., a non-profit organization that provides administrative and technical services to support ETS implementation, has retained the services of an independent firm to oversee the market and detect any evidence of wrongdoing. Severe administrative and criminal penalties are in place for non-compliance with ETS provisions.

An offset credit system based on rigor and environmental integrity

Projects eligible for offset credits under the ETS are those that meet regulatory requirements and are covered by a protocol prescribed by regulation. To date, Québec's three approved offset protocols provide for a rigorous validation and verification process in compliance with ISO standards. To avoid double counting, these credits cannot be used in another ETS. Furthermore, for the sake of transparency, Québec provides information on all offset projects and the stages of their implementation on its website.

If an offset project developer sells credits and it is later determined that the credits are invalid or the environmental integrity of the project has been compromised, the regulation requires the developer to replace the invalidated credits. In the event of non-compliance, the government can use credits from its Environmental Integrity Account to replace them, reserving the right of recourse against the developer who retains responsibility for project validity. The government withholds three percent of each admissible project's credits and deposits them into that account for that exclusive purpose.

A flexible system that allows for long-term planning

The first compliance period began on Jan. 1, 2013 and will end on Dec. 31, 2014. The following two periods will last three years each and extend to 2020. In all cases, covered establishments have until Nov. 1 following the end of a compliance period to remit the number of allowances corresponding to their reported and verified GHG emissions. These deadlines give emitters the time and flexibility needed to comply with their obligations and to plan investments for GHG mitigation.

Facilities can bank their surplus allowances for future compliance periods. However, borrowing from a future period is not permitted to prevent the build-up of allowance debts as the floor price increases over time.

Solid, predictable financing

The Québec government has earmarked the revenues from its auctions for a Green Fund to finance initiatives in its 2013–2020 Climate Change Action Plan (CCAP 2020) that focus on GHG emission reduction and climate adaptation. The ETS floor price ensures stable and predictable long-term funding for these initiatives. We estimate that auction revenues will bring CCAP 2020's budget up to at least three billion CAD (about 2 billion euros).

The way forward

In October 2013, Québec and the California Air Resources Board signed an agreement to link their respective schemes from January 2014. A first joint auction of emission allowances is expected in 2014. As WCI members, Québec and California have cooperated closely for the past five years and have strengthened their partnership over this period. The signing of the agreement completed a year-long negotiation process, marked by excellent cooperation, to harmonize and integrate their respective ETS regulations. The link between the two systems creates the largest carbon market in North America, and the first transnational cap-and-trade system run by subnational governments in the world.

Both parties have shown that regional cooperation to address climate change can be beneficial from an economic and an environmental point of view. Both are actively seeking potential partners, particularly in North America, and are willing to look at expanding their carbon market around the world. Québec is prepared to share its expertise to facilitate the development and implementation of other schemes likely to link up with WCI's system and welcomes expressions of interest to that effect.

The linking of Québec and California's ETS is a milestone in the fight against climate change in North America and beyond. Both governments are sending a clear message to their respective federal governments and other subnational governments that those who have the power to act must move forward. Québec and California also call upon Parties to the United Nations Convention on Climate Change to recognise that a truly comprehensive and efficient future climate change accord should include subnational GHG trading schemes.

The Tokyo Cap-and-Trade Program
a driving force to deliver substantial CO_2 reductions

Tokyo Metropolitan Government
Bureau of Environment

The Tokyo Cap-and-Trade Program is the world's first urban cap-and-trade program targeting urban facilities, including office buildings and commercial and industrial facilities. The mandatory emission reduction and emissions trading program was launched in April 2010 and covers approximately 1,400 large facilities that consume energy equivalent to 1,500 kiloliters of crude oil or more per year. It has an absolute cap of six percent for the first compliance period (FY2010–FY2014) and a 15 percent cap (17 percent for existing buildings) for the second compliance period (FY2015–FY2019). Facilities can reduce emissions themselves or buy credits to meet their obligations. Facility owners are required to submit their reduction plans and emissions reports annually and have them verified by third-party verification agencies.

Why a city-level cap-and-trade Program?

Cities account for more than 66 percent of energy-related greenhouse gas emissions. This figure is projected to grow to 73 percent by 2030. According to the International Energy Agency, 60 percent of the world's population currently lives in an urban area. As one of the largest energy consumers in the world, Tokyo has considerable responsibility to reduce its CO_2 emissions. Also, with an eye to the future increasing pressure on environmental resources, Tokyo needs to become more sustainable. For these reasons, in 2006, the Tokyo Metropolitan Government (TMG) set a GHG reduction target of 25 percent below 2000 levels by the year 2020. In order to achieve this goal, TMG announced the Tokyo Climate Change Strategy in 2007 and set out a range of climate change programs including a cap-and-trade scheme, which targets the building sector, the largest energy consumer at the city level.

Program development

It took many years to develop the Tokyo Cap-and-Trade Program. In 2002, TMG implemented the Carbon Reduction Reporting Program, which required large buildings and facilities to report their yearly energy consumption and CO_2 emission data as well as their reduction plans in the hope of promoting voluntary reductions. The reduction rates, however, remained low under the voluntary scheme. In 2005, we enhanced the program, adding mechanisms like performance evaluations. Again this did not lead to significant reductions. In short, the voluntary program did not work. Based on these experiences, in 2007, TMG announced the introduction of a mandatory cap-and-trade program. By making emissions cuts mandatory, our intention was to ensure that all facilities bear the cost of investing in emission reductions. We wanted to avoid a situation in which only companies sensitive to environmental problems pay for mitigation, thereby suffering a competitive disadvantage.

Over the year following the announcement of our plans, we held three meetings with stakeholders, listening to a variety of opinions as we built the program. Initially, business groups and corporations strongly opposed the plan, and the stakeholder meetings were filled with extremely lively debate. Finally, however, the Tokyo Chamber of Commerce and Industry, which represents business interests in Tokyo, issued a statement of support for the introduction of the cap-and-trade program.

Unique feature of the Tokyo Cap-and-Trade Program

The program covers not only large factories but also office buildings, commercial facilities, and public buildings. Controlling demand-side facilities which consume electricity and gas is very important in the urban context. To this effect, Tokyo's program is the world's first urban cap-and-trade program, tailored to a city that consumes large amounts of energy. The program covers about 1,400 facilities, and about 1,200 of them are offices or other commercial facilities. The remaining 200 are factories, supply and

“By making emissions cuts mandatory, our intention was to ensure that all facilities bear the cost of investing in emission reductions. We wanted to avoid a situation in which only companies sensitive to environmental problems pay for mitigation, thereby suffering a competitive disadvantage.”

processing facilities. Almost all prominent high-rise buildings in central Tokyo are covered by the scheme, which also includes central government buildings including the Prime Minister's Office and the Parliament.

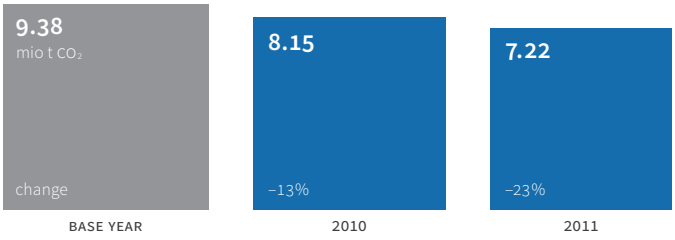
We set five-year compliance periods for our caps. For the first period, from 2010 to 2014, the cap is set at six percent below base-year emissions. The compliance factor (the reduction obligation rate) is eight percent for the commercial sector including office buildings, and six percent for the industrial sector including factories. Any company that fails to carry out its reduction obligations will be publicly named and subject to penalties and surcharges.

Initial results

The program started in April 2010, and so far it has been successful. In 2011, emissions had been reduced by 23 percent compared to the base-year. This is a further ten percent reduction from the first year in 2010, which showed a 13 percent reduction. The main factor behind this drop was significant electricity savings by the covered facilities.

TMG has gained a good understanding and support of the involved facilities. The program has also pioneered an effective approach to cooperation between owners and tenants in multi-tenant buildings.

Performance of the Tokyo Cap-and-Trade Program



Tokyo's program and the earthquake in 2011

In the aftermath of the severe earthquake in East Japan in March 2011, Tokyo faced a major power crisis following the Fukushima nuclear power plant accident. Amid severe electricity shortages, business facilities in Tokyo were able to implement electricity saving measures quickly and effectively. This is thanks to both the energy conservation system in place as a result of the Carbon Reduction Reporting Program, in force since 2002, and the ongoing cap-and-trade program, which started in 2010. Many facilities have continued to work on electricy-saving measures.

The second compliance period (2015 to 2019)

In 2013, TMG announced the cap for the second period—a 15 percent reduction from base-year emissions. Compared to the cap for the first period, this may be seen as a rather ambitious goal. The goal for this phase is to consolidate and build on the substantial results that the scheme has already made. During the second compliance period, the compliance factor is 17 percent for the commercial sector including office buildings and 15 percent for the industrial sector including factories.

In conclusion, TMG will continue its utmost efforts to achieve a low-carbon society. As a frontrunner, which introduced a city-level cap-and-trade program, we would like to share our experiences and make a major contribution to advancing climate change measures worldwide.

China's First ETS:
a Brief Introduction to the Shenzhen Carbon Market

China Emissions Exchange

After only a little over one year of preparation, the Emission Trading Scheme of Shenzhen city (SZ ETS) was launched on June 18, 2013, as the first carbon market in a developing country and in China. Shenzhen lies to the north of Hong Kong. A major city in Guangdong province, it is the first Special Economic Zone in China. This young city has 15 million inhabitants with an annual GDP growth rate of ten percent (2012). In the first trading period 2013–2015, the trading system covers 635 companies and 197 public buildings. The competent authority is the Shenzhen Development and Reform Commission (SZ DRC) and the China Emissions Exchange is the only legal trading platform. By Oct. 23 2013, 119,491 tons of allowances had changed hands with an average price of approximately 63 CNY (ca. 7.60 EUR).

The legal basis for Shenzhen's ETS, the Provisions of Shenzhen Special Economic Zone on Carbon Emission Management, was passed by the Shenzhen Municipal People's Congress in October 2012. It is the first emissions trading law in China, and was named one of the nine major highlights in climate change legislation for 2012 by the Global Legislators Organisation (GLOBE). According to the law, enterprises who fail to comply face a penalty of three times the carbon market price.

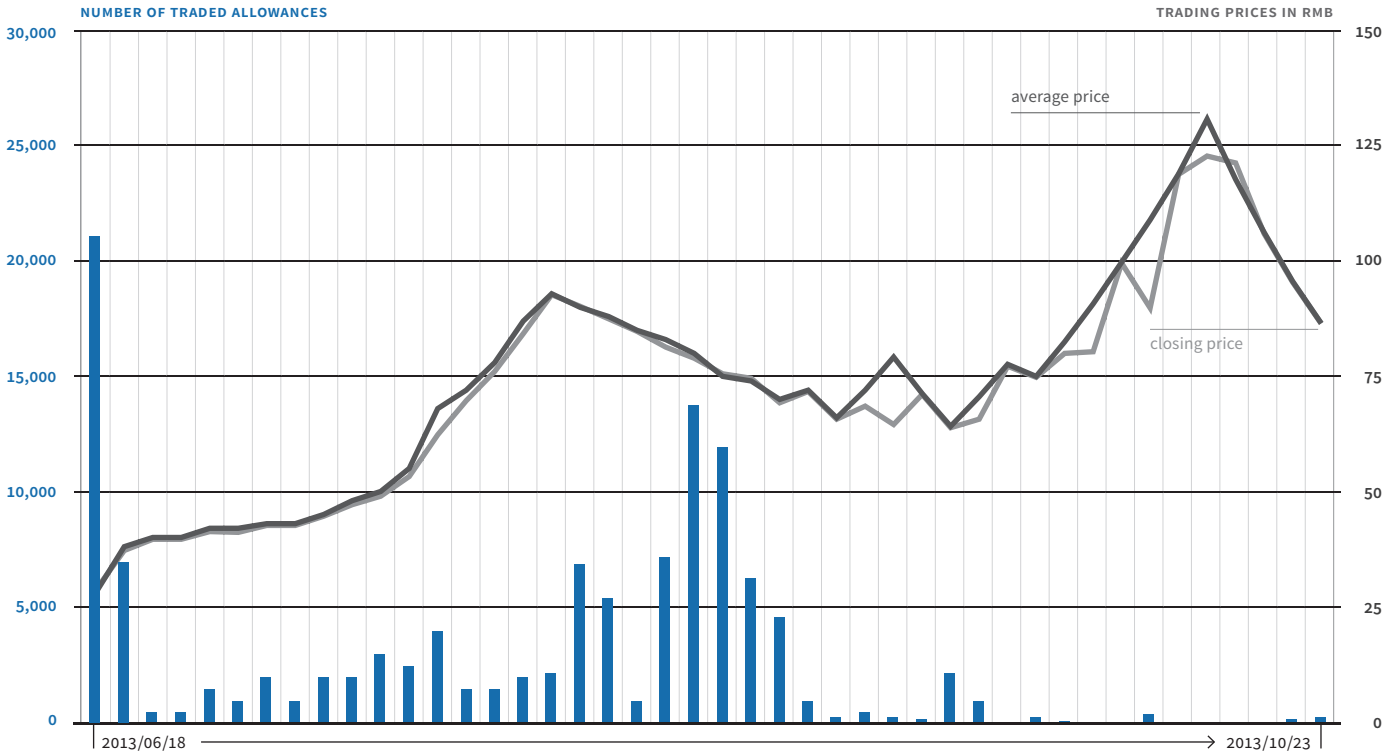
Scope of the scheme

The scope of the Shenzhen ETS will expand gradually. Industrial enterprises and the building sector are covered in the pilot phase. The transport sector will be considered in the next phase. Since Shenzhen has limited heavy industry, the Shenzhen ETS needs to cover a large number of relatively small polluters to account for about 40 percent of the city's carbon emissions. Two aspects were considered in determining the list of industrial enterprises to be covered by the system. One aspect was the companies' industrial added value (gross industrial output value–intermediate input + value-added tax) provided by the Municipal Bureau of Statistics, the other was a company's energy consumption data. These criteria resulted in a list of 635 companies. Moreover, the ETS covers 197 large public buildings (with a more than 20,000 square meters of floor space) during the pilot phase.

Cap-setting and allocation

A particularly innovative feature of the Shenzhen scheme is its allocation methodology. It was developed through more than one year of intensive research by a team including Deputy Mayor Tang Jie, Secretary-General Wu Delin and experts from Tsinghua University, Peking University, and the Harbin Institute of Technology Graduate School. Drawing on lessons from the European Union and the United States, allocation to the power sector and the water supply sector was based on benchmarking. For manufacturing industries, given the large number of industry segments and the wide variety of products, processes and device facilities, the allocation team decided on a carbon intensity allocation method, based on carbon emissions per unit of industrial added value. Companies are first divided into different groups, and a reduction target is set for each group. The companies of the same group then compete with each other to apply for the allowances based on their respective estimated industrial added value and projected emissions for the years 2013–2015. An allowance distribution software was developed to improve efficiency and fairness.

Allowance trading on the Shenzen Carbon Market during its first months of operation



For 2013–2015, over 100 million tons of allowances were pre-allocated to the 635 companies, 30 million tons of which were for the first year. There is the option of an ex-post adjustment to the allocated allowances, as long as such an adjustment does not exceed ten percent of the cap and is in line with Shenzhen's carbon intensity target. Based on this carbon intensity reduction target, the overall reduction will amount to approximately 30 percent over the whole period, far more than the requirement of the 21 percent reduction target for Shenzhen in the 12th Five Year Plan period (2011–2015), against the base year 2010.

"Drawing on lessons from the European Union and the United States, allocation to the power sector and the water supply sector was based on benchmarking. For manufacturing industries, given the large number of industry segments and the wide variety of products, processes and device facilities, the allocation team decided on a carbon intensity allocation method, based on carbon emissions per unit of industrial added value."

Monitoring, reporting and verification

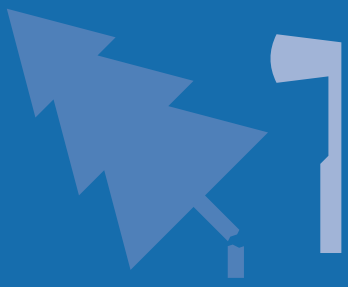
Reporting and verification work in the Shenzhen ETS is guided by two specifications: The Specification of Guidance for Quantification and Reporting of the Organization's Greenhouse Gas Emissions, and the Specification of Guidance for Verification of the Organization's Greenhouse Gas Emissions. Strict measures are taken to supervise verification bodies, including the establishment of a credit rating system for verification bodies and the prohibition for a company to appoint the same verification body for three consecutive years.

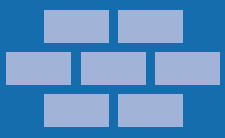
Three electronic systems—the registry, a system for trading and a greenhouse gas emissions management system—were developed by the China Emissions Exchange to support the Shenzhen ETS on behalf of SZ DRC. Both the trading system and the GHG emissions management system are linked to the registry. Companies use the GHG emissions management system to calculate their annual CO_2 emissions, submit emission reports and upload necessary documents for verification. Verification bodies then draw on it to complete verification work except for on-site audits. Finally, SZ DRC uses the system to check the emission data and submits the approved data to the registry.

Trading in the first months of operation

Because emissions trading is a new concept for both the compliance companies and investors, after the first eight transactions on June 18, 2013, no trading took place until Aug. 5, 2013. Since then, the carbon market has become increasingly active and prices have risen from 30 to more than 100 CNY. Most trades closed between 60–90 RMB (approximately 7.20–10.80 EUR). The following picture shows the trading price and volume in the Shenzhen carbon market until Oct. 23, 2013. Due to the strict financial laws in China, only spot trading is currently allowed in the Shenzhen ETS.

At a Glance
global trends in emissions trading



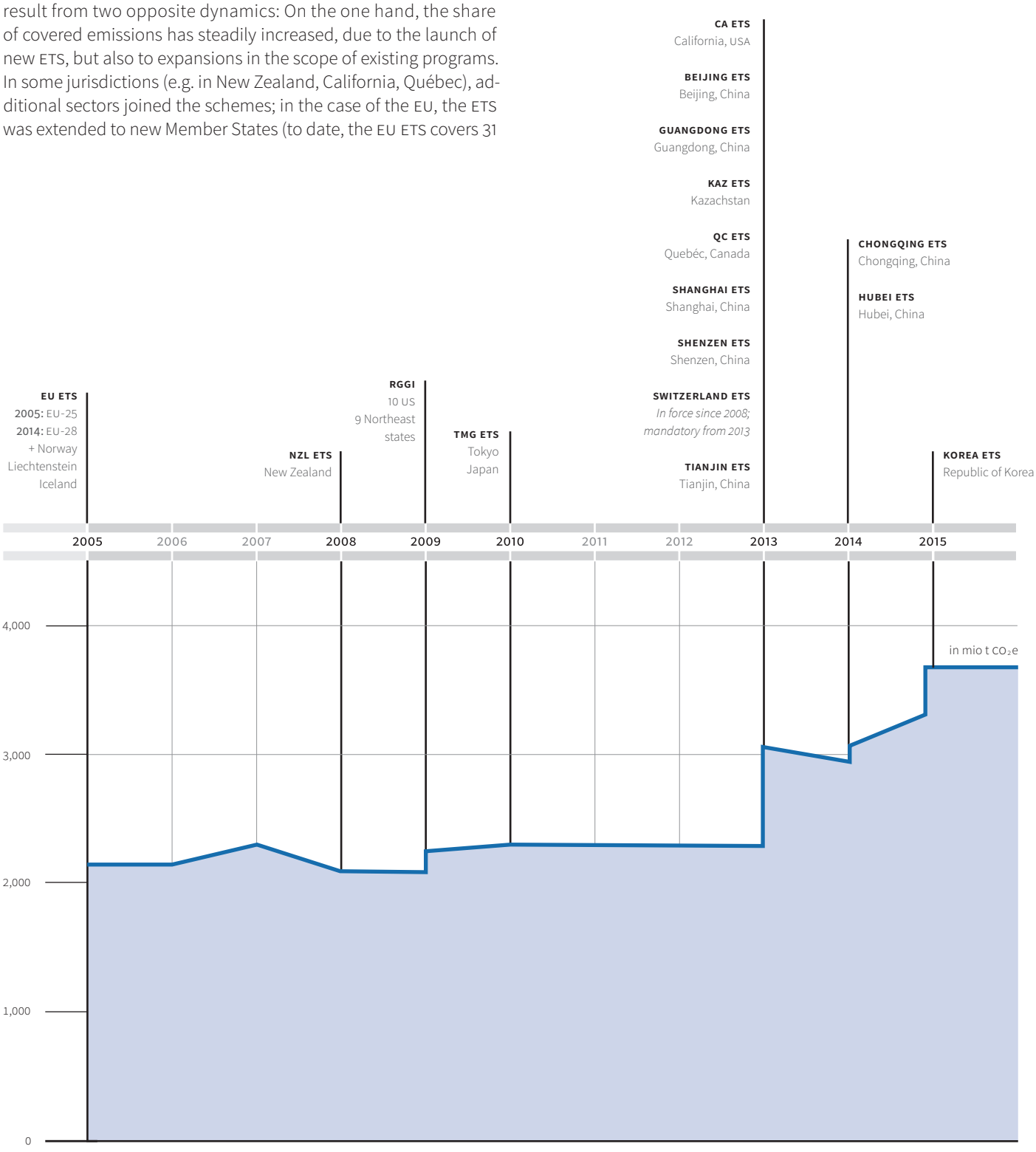


The data used in this section reflects the global state of play at the time of writing, December 2013. However, the Australian Carbon Pricing Mechanism (CPM) is not considered here as it is expected to be repealed before it enters its flexible price period (more information on the situation in Australia on p.58).
Data for global covered emissions was obtained by aggregating absolute caps. Where such information was not available, cap estimates based on covered emissions were used instead. A range of sources have been drawn upon, including official ETS information by governments or public authorities, data submitted to the UNFCCC, or, where not available, other official reporting and information provided by ICAP members. No data was available for estimating coverage of the ETS pilots in Hubei and Chongqing.

Proliferation of ETS Over Time
2005–2015

Almost a decade has passed since the European Union launched the world's first emissions trading scheme for greenhouse gas mitigation (ETS). Since then, the use of this policy instrument has spread around the globe. Last year, nine additional programs started in North America, Central Asia and East Asia. Three additional schemes are to follow in 2014–2015, bringing the expected total up to 16 by 2015. From 2005 to 2015, the share of global emissions covered by ETS will have increased by more than 70 percent.

The changes in covered emissions on the infographic over time result from two opposite dynamics: On the one hand, the share of covered emissions has steadily increased, due to the launch of new ETS, but also to expansions in the scope of existing programs. In some jurisdictions (e.g. in New Zealand, California, Québec), additional sectors joined the schemes; in the case of the EU, the ETS was extended to new Member States (to date, the EU ETS covers 31 countries compared to 25 in 2005). On the other hand, the downward trends (e.g. in 2008 and 2014) go back to the fundamental idea of cap-and-trade: The maximum amount of emissions allowed in an ETS (the cap) declines over time to create an incentive for covered entities to reduce their emissions.



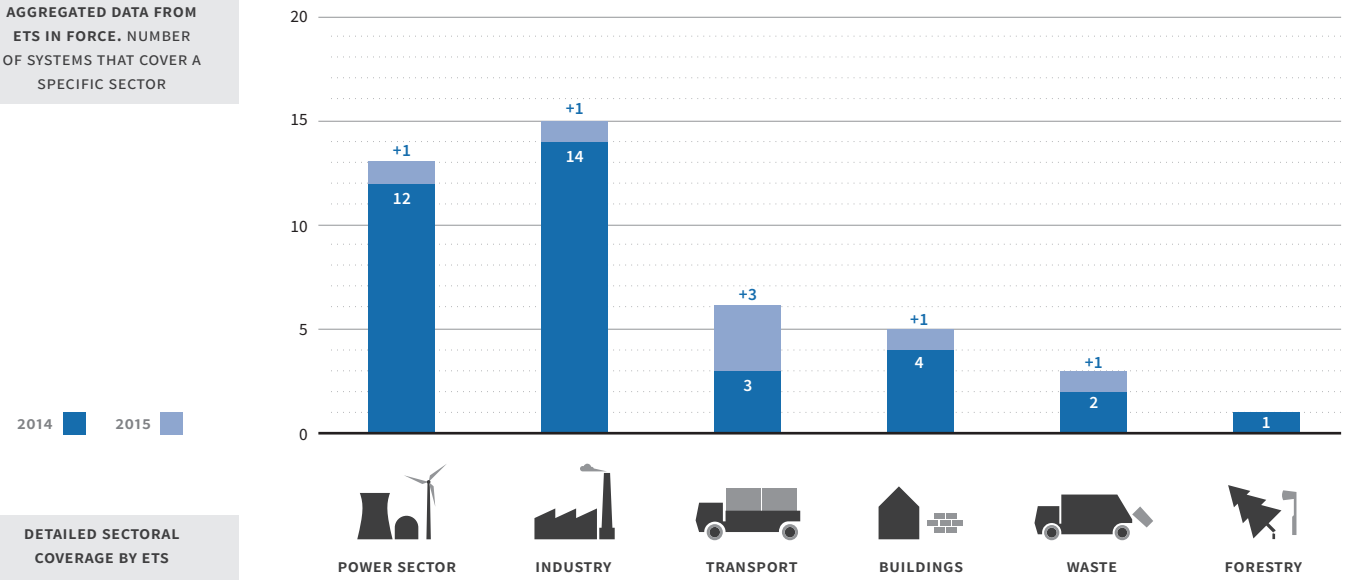
Scope and Coverage across ETS

sectors and gases included 2014–2015

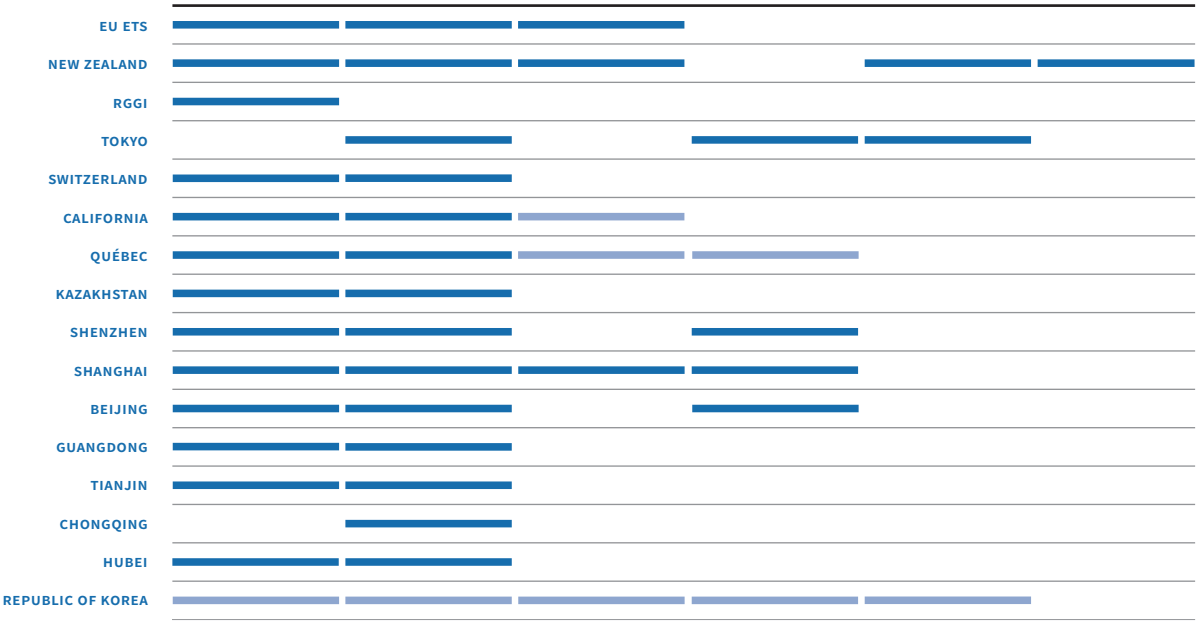
Defining the scope and coverage of an ETS requires decisions on which greenhouse gases and sectors should be included in the system. There is no one-size-fits-all answer: A scheme that includes more sectors and/or gases is not necessarily more efficient. However, it is possible that it provides a greater range of abatement options, and therefore decreases overall mitigation costs. The graphics below illustrate general trends and specificities in gas and sector coverage across systems in force by 2015.

Sectoral coverage tends to vary across systems, depending on local needs and conditions. Key considerations in this regard include the largest emitting sectors in a given jurisdiction and the available abatement options. Some sectors, like the power sector or industry, are included in the scope of almost all ETS. Others, such as buildings or transport, are covered only by some programs.

AGGREGATED DATA FROM ETS IN FORCE. NUMBER OF SYSTEMS THAT COVER A SPECIFIC SECTOR



DETAILED SECTORAL COVERAGE BY ETS



Among the six main greenhouse gases, carbon dioxide (CO_2) is the most common one and is therefore usually the first gas covered in an ETS. However, some programs also target additional gases like methane (CH_4), nitrous oxide (N_2O), or fluorinated gases (SF_6, HFC, PFC, etc.). For reporting purposes, CO_2 serves as the point of reference and is the gas against which others are measured, expressed in terms of tons of carbon dioxide equivalents (CO_2e).

Carbon dioxide (CO_2) is the most common greenhouse gas emitted, primarily from the combustion of fossil fuels and changes in landuse. CO_2, with a global warming potential of one, is the gas against which others are measured.

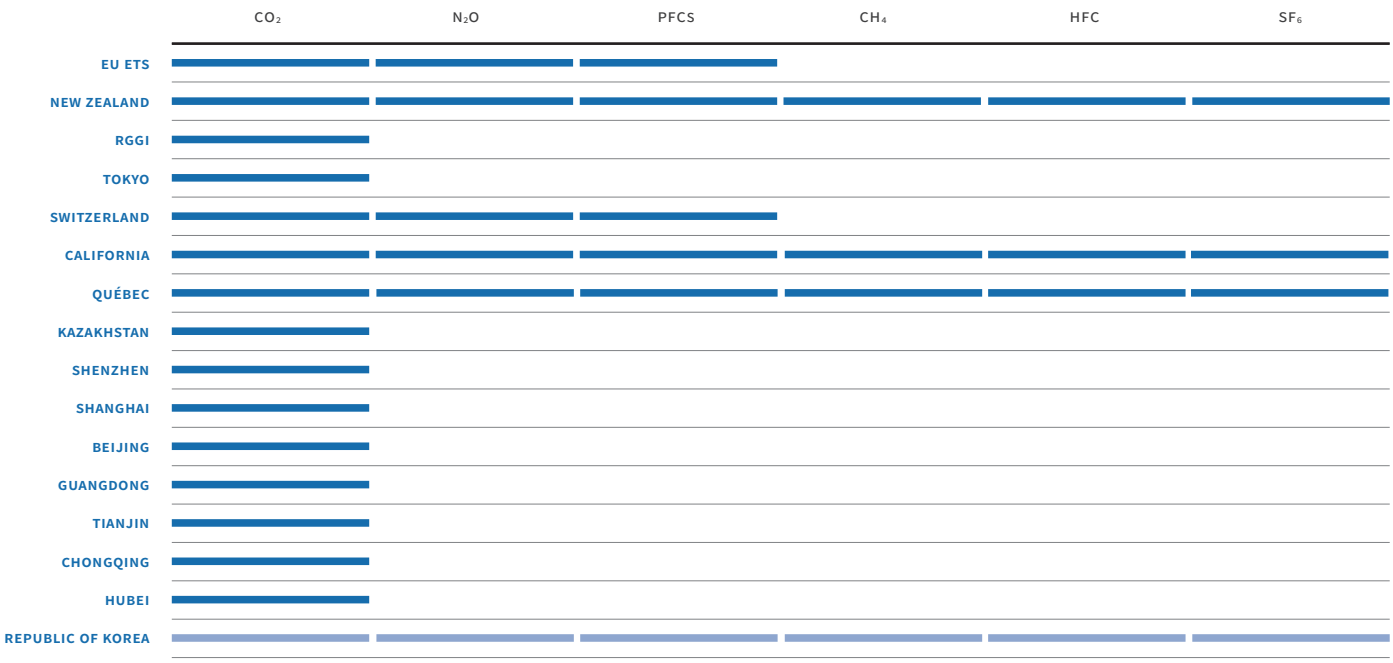
Nitrous Oxide (N_2O), also known as laughing gas, is third most common greenhouse gas, mostly from fertilizer use in agriculture. An extremely potent long lasting gas, it has a global warming potential of 310 over a 100 year period.

Perfluorocarbons (PFCs) are potent man-made gases consisting of fluorine and carbon with a lifetime of thousands to tens of thousands of years. PFCs are a by-product of industrial processes including aluminum production and semiconductor manufacturing.

Methane (CH_4) is the second most common greenhouse gas and is created when organic material decays or is digested by livestock. Other sources include emissions from fossil fuel extraction. Methane is 21 times more potent than CO_2 over a 100 year period.

Hydrofluorocarbons (HFCs) are used as refrigerants, aerosol propellants, solvents, and fire retardants and were developed to replace ozone depleting substances. There are several kinds of HFCs, many with long lifespans and high global warming potential.

Sulfur Hexaflouride (SF_6) is used in transmitting electricity power grids, magnesium processing, semiconductor manufacturing, and as a tracer gas for leak detection. SF_6 stays in the atmosphere for thousands of years and has an extremely high global warming potential.



ETS Map
state of play of cap-and-trade worldwide

The ICAP ETS Map depicts operating and planned emissions trading schemes for greenhouse gases (ETS) around the world. Thirteen systems are in force to date. Two additional Chinese pilots are to start compliance in the course of 2014, and the Republic of Korea is preparing for the launch of its ETS in 2015. Last but not least, 15 governments at various levels are considering an ETS to mitigate their GHG emissions, including China, Chile and Turkey.

A continuously updated, interactive version of the ETS map with detailed information on all ETS schemes is available at **www.icapcarbonaction.com.**

Europe and Central Asia

1 European Union
2 Switzerland
3 Kazakhstan
4 Russia
5 Turkey
6 Ukraine

North America

7 Regional Greenhouse Gas Initiative

Western Climate Initiative (WCI)

8 California
9 Québec
10 British Columbia
11 Manitoba
12 Ontario

Latin America and the Caribbean

13 Brazil
14 Rio de Janeiro
15 Sao Paulo
16 Chile
17 Mexico

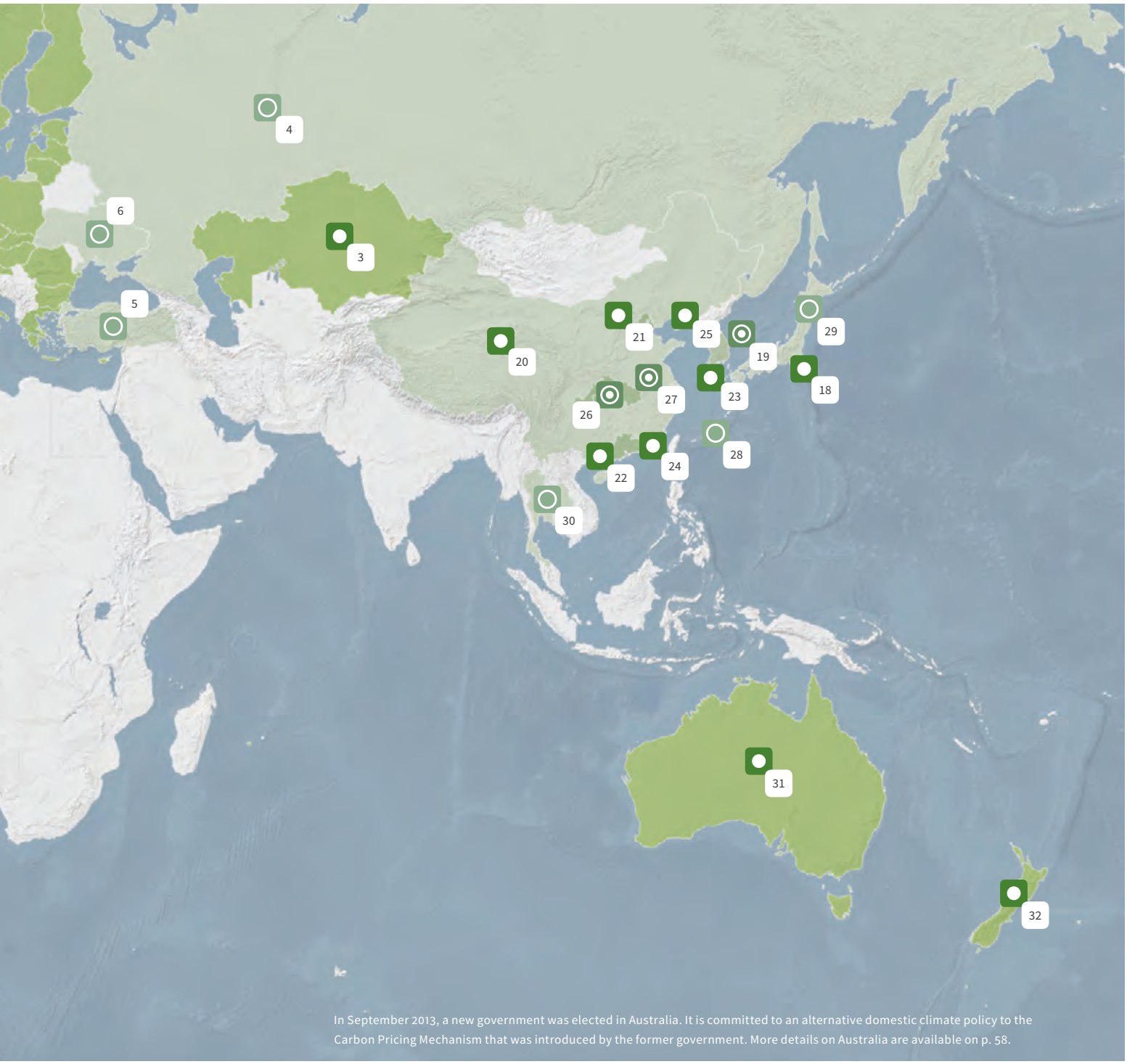
Asia

18 Tokyo
19 Republic of Korea
20 China
21 Beijing
22 Guangdong
23 Shanghai
24 Shenzhen
25 Tianjin
26 Chongqing
27 Hubei
28 Hangzhou
29 Japan
30 Thailand

Pacific

31 Australia
32 New Zealand

ETS in force
ETS scheduled
ETS considered



In September 2013, a new government was elected in Australia. It is committed to an alternative domestic climate policy to the Carbon Pricing Mechanism that was introduced by the former government. More details on Australia are available on p. 58.

Diving into the Details:
planned and operating emissions trading schemes around the world

ETS STATUS

- ETS IN FORCE
- ETS IN SCHEDULED
- ETS CONSIDERED

BANKING AND BORROWING

- BANKING ALLOWED
- BORROWING ALLOWED

GAS COVERAGE

- CO_2 ONLY
- SEVERAL GASES

SECTORS

- POWER
- TRANSPORT
- INDUSTRY
- FORESTRY
- BUILDINGS
- WASTE

POINT OF REGULATION

- UPSTREAM
- DOWNSTREAM
- MIXED

OFFSETS AND CREDITS

- DOMESTIC OFFSETS
- INTERNATIONAL OFFSETS

ALLOCATION

- FREE ALLOCATION
- AUCTIONING

Information presented in this section was compiled by the ICAP Secretariat. The data was initially collected for the ICAP Interactive ETS map at **www.icapcarbonaction.com**, which was launched in December 2012 and upgraded in December 2013. The initial data as of December 2012 was compiled by the ICAP Secretariat for ICAP jurisdictions and by Ecofys for non-ICAP jurisdictions. Since, data has been updated by the ICAP Secretariat, drawing on official, public information and on information provided by government officials for ICAP jurisdictions and Switzerland. Information on emission sectors included in this section is based on self-reporting by the respective jurisdictions. The designation of sectors is therefore not necessarily consistent across jurisdictions.

Europe and Central Asia

European ETS

in force

28 EU MEMBER STATES AND THREE EEA-EFTA STATES: ICELAND, LIECHTENSTEIN AND NORWAY

The EU ETS was launched in January 2005 and is the centerpiece of the EU's efforts to reduce GHG emissions. To date, the EU ETS covers emissions from 31 countries (Croatia joined the EU ETS on Jan. 1, 2013); it is the world's largest emissions trading scheme. The program underwent major changes as its third phase started on Jan. 1, 2013.

In the face of a significant allowance surplus (almost 2 billion permits) and a subsequent price drop on the market as a consequence of the emissions downturn caused by the economic crisis, an internal debate on both short-term and long-term reform of the EU ETS is currently taking place. The European Commission suggested postponing the auctioning of 900 million allowances from 2013–2015 to a later time in phase III. On Dec. 16, 2013, ministers of EU Member States in the European Council and the European Parliament approved the 'back-loading' proposal. On Jan. 8, 2014, the draft amendment of the EU ETS Auctioning Regulation was endorsed by the EU Climate Change Committee and is now under consideration by the EU Council and the EU Parliament.

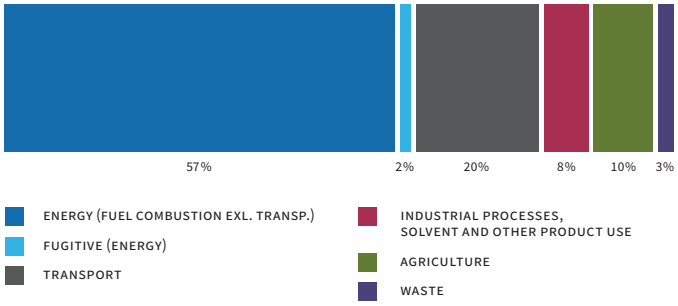
In parallel, the Commission submitted six structural measures for debate and consultation in a report published in November 2012. On Jan. 22, 2014, the European Commission published an additional proposal for structural reform of the EU ETS. To address the imbalance between demand and supply of allowances, the Commission recommends implementing a market stability reserve. Auction volumes would be automatically adjusted by placing allowances into the reserve or releasing them. This would base on pre-defined and objective conditions and depend on the amount of the total surplus. The Council, the European Parliament, the Committee of the Regions and the Economic and Social Committee will now consider this legislative proposal.

EUROPEAN ETS

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS: **4.636 MTCO$_2$E** (2011)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET **BY 2012:** –8% below 1990 GHG levels (EU-15 target in the Kyoto Protocol, implemented through the EU burden-sharing agreement) **BY 2020:** –20% below 1990 GHG levels (EU-27) (headline target of the 2008 EU Climate and Energy Package)
BY 2050: Aspirational target to reduce emissions by –80 to –95% below 1990 GHG levels.

ETS SIZE

ETS CAP **PHASE I AND II:** Decentralized cap-setting, the EU cap resulted from the aggregation of National Allocation Plans of each member state. **PHASE III:** Centralized EU-wide cap for stationary sources: 2,084 MtCO$_2$e in 2013, reduced by 1.74% annually (effective beyond 2020). Aviation sector cap: 210 MtCO$_2$e/year for 2013–20 (not decreasing). The aviation cap was adjusted to accommodate the inclusion of Croatia's aviation emissions in the ETS from Jan. 1, 2014.

EMISSIONS COVERAGE

GHG COVERED CO$_2$ (since Phase I), N$_2$O and PFCs (since Phase 3), unilateral opt-in of N$_2$O in the Netherlands since Phase II)
SECTORS **PHASE I (2005–2007):** Power and heat generation (>20 MW annual thermal capacity per installation), industry (various thresholds): oil refineries, coke ovens, iron and steel plants and production of cement, glass, lime, bricks, ceramics, pulp, paper and board.
PHASE II (2008–2012): Phase I sectors + commercial aviation starting in 2012 (>10,000 t CO$_2$/year).
PHASE III (2013–2020): Phase II sectors + CCS installations, production of petrochemicals, ammonia, non-ferrous metals, gypsum and aluminum, nitric, adipic and glyoxylic acid.
The European institutions agreed on exempting flights into and out of Europe operated in 2010, 2011 and 2012 from enforcement (so-called stop-the-clock decision adopted in April 2013). This measure was taken in order to provide more time to discuss alternative measures to regulate international aviation emissions within the International Civil Association Organization (ICAO). At the ICAO General Assembly in October 2013, ICAO Members agreed to develop a global market-based mechanism to address emissions from international aviation by 2020. In response to this outcome, the European Commission has proposed to include only emissions from the proportion of flights taking place within the EEA airspace in the EU ETS from Jan. 1, 2014. Emissions from flights to and from countries outside the EEA would be fully exempted for 2013.
NUMBER OF ENTITIES More than 11,000 heavy energy-using installations in power generation and manufacturing industries and flights to and from the EU and the three EEA-EFTA states
POINT OF REGULATION downstream

PHASES AND ALLOCATION

COMPLIANCE PERIOD 1 year
TRADING PERIODS **PHASE I:** 3 years (2005–2007); **PHASE II:** 5 years (2008–2012); **PHASE III:** 8 years (2013–2020)
ALLOCATION **PHASE I (2005–2007):** Nearly 100% free allocation through grandfathering. Four EU Member States used auctioning to allocate allowances to incumbents and nine used it to allocate leftovers from the New Entrant Reserve (NER). Eight jurisdictions used benchmarking to some extent. Phase II (2008–2012): Similar to Phase I with some benchmarking for free allocation and some auctioning in eight EU-Member States.
PHASE III (2013–2020): 100% auctioning for the electricity sector, free allocation based on industry benchmarks for the manufacturing industry. Free allocation for sectors not exposed to risk of carbon leakage will be phased out gradually, decreasing from 80% of free allocation in 2013 to 30% in 2020. Optional derogation for the power sector in new Member States (Art. 10c of revised EU ETS Directive). 5% of the allowances are set aside in the New Entrants Reserve.
The European Commission is to determine the next list of industrial sectors and subsectors eligible for free allocation for 2015–19 (so-called carbon leakage list) by the end of 2014.
ALLOCATION OF AVIATION ALLOWANCES: in 2012, 85% of allowances were allocated for free based on benchmarks. 2013–2020: 15% of allowances are auctioned and 82% allocated for free based on benchmarks. The remaining 3% constitute a special reserve for new entrants and fast growing airlines

FLEXIBILITY

BANKING AND BORROWING Unlimited banking allowed since 2008. Borrowing is not allowed.
OFFSETS AND CREDITS **PHASE I (2005–2007):** Unlimited use of CDM and JI credits allowed
PHASE II (2008–2012) AND III (2013–2020): Qualitative limit: Most categories of CDM and JI credits allowed (restrictions vary among Member States), credits from LULUCF and nuclear power are excluded; strict requirements for large hydro projects.
STARTING IN PHASE IIII (Jan. 1, 2013), additional restrictions apply for CDM. International credits from post-2012 can come from projects only in Least Developed Countries. Further, certain industrial gas credits (projects involving the destruction of HFC-23 and N$_2$O) are also excluded from eligibility in the scheme.
QUANTITATIVE LIMIT: In Phase II, operators are allowed to use JI/CDM credits up to a percentage determined in the National Allocation Plans (NAP). Unused entitlements were transferred to the next trading period (2013–2020). Further, between 2008 and 2020, EU ETS legislation provides for use of credits up to 50% of the overall reductions below 2005 levels made under the EU ETS (approx. 1.7 billion t CO$_2$e). By the end of 2011, just under one third of the limit had been used.
In November 2013, a proposal for revising the use of international credits in Phase III was adopted by the Commission after undergoing scrutiny by the European Parliament and the Council. Stationary installations can now choose to either import credits following the entitlements specified in the National Allocation Plans for 2008–12, or up to 11% of the allowances they were allocated for free in that period, whichever is higher.
PRICE MANAGEMENT PROVISIONS In the event of excessive price fluctuations (allowance prices more than three times higher than the average price of the two preceding years for more than six consecutive months), measures may be adopted allowing Member States to bring forward allowance auctioning, or to auction up to 25% of remaining allowances in the new entrants reserve.

COMPLIANCE

MRV PROVISIONS Monitoring plans are required for every installation (approved by competent authority). Annual self-reporting is based on harmonized electronic templates prepared by the European Commission. Verification by independent accredited verifiers required before March 31, of each year. In addition, the European Commission developed specific monitoring and reporting guidelines for aircraft operators and a EU ETS verification guidance for aviation. MRV for aviation will take place on the basis of tonne-kilometers.
ENFORCEMENT 100 EUR/t CO$_2$e for each excess tonne of GHG emitted. The name of the non-compliant entity is published.

OTHER INFORMATION

INSTITUTIONS INVOLVED The European Commission and relevant authorities in the 27 European Member States, Iceland, Liechtenstein and Norway.
LINKAGE WITH OTHER SCHEMES Based on a mandate from the Council, the Commission is in the process of negotiating with Switzerland on linking the EU ETS with the Swiss ETS.
In a major step toward the first full inter-continental linking of emission trading systems, the Commission and Australia announced agreement in August 2012 on a plan to link the EU ETS and the Australian emissions trading scheme. A full two-way link between the two cap-and-trade systems was envisaged to start no later than July 1, 2018, with an interim, unilateral link starting on July 1, 2015. However, in light of new developments in Australia subsequent to the government change in September 2013, bilateral linking talks currently are on hold.

Switzerland

in force

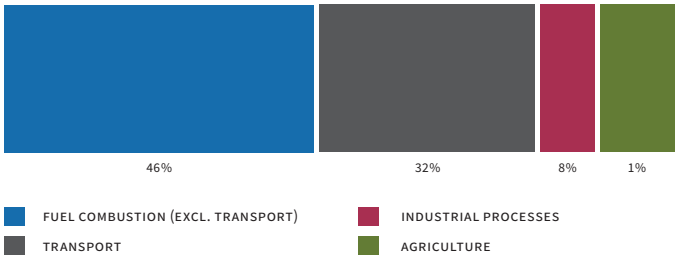
The Swiss ETS started in 2008 with a five-year voluntary phase as an alternative option to the CO_2 levy on fossil fuels. Revised regulations entered into force on Jan. 1, 2013. The scheme subsequently became mandatory for large, energy intensive industries. Medium-sized industries may opt in voluntarily. In the 2013–2020 mandatory phase, participants in the ETS are exempted from the CO_2 levy.

Switzerland is currently negotiating with the European Union regarding a link between the Swiss ETS and the EU ETS. While many elements of the Swiss ETS have been designed to match provisions in the EU ETS (e.g. allocation benchmarks), current negotiations may have further impact on the design of the Swiss ETS.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS 49.88 $MTCO_2E$ (2011)

GHG SECTORAL BREAKDOWN

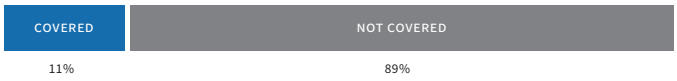


OVERALL GHG REDUCTION TARGET BY 2012: –8% below 1990 GHG levels (Swiss target in the Kyoto Protocol) **BY 2020:** At least –20% below 1990 GHG levels (unconditional, domestic target). Switzerland may commit to reduce its emissions by 40% depending on future international agreements.

ETS SIZE

ETS CAP VOLUNTARY PHASE (2008–2012): Each participant got its own entity specific reduction target. **MANDATORY PHASE (2013–2020):** Cap annually reduced by 1.74% based on its 2010 level. (The 2010 level is calculated as follows: average allocated allowances in 2008–2012 to industries that participated in the voluntary phase; average emissions from 2009–2011 of new participants as well as newly covered gases). At the time of writing, the cap level based on the exact number of covered entities (incl. opt-in) is still to be released.

EMISSIONS COVERAGE



GHG COVERED CO_2, N_2O and theoretically PFCs since 2012 (but there is no production of primary aluminum in Switzerland to date) **SECTORS** Mandatory participation: Industries listed under Annex 6 of the revised CO_2 Ordinance (25 sub-sectors). They generally have a total rated thermal input of >20MW. Possible voluntary opt-in: Industries a) listed under Annex 7 of the revised CO_2 Ordinance (20 sub-sectors) and b) with a total rated thermal input of >10MW. One-time, binding notification must be given before June 1, 2013 for industries currently above the threshold. Industries that may become eligible for participation in the future must then register within 6 months after they have reached the threshold. Possible opt-out: Industries with a total rated thermal input of >20MW, but yearly emissions <25,000 t CO_2e/year in each of the past 3 years. Should their emissions rise above the threshold in the future during at least one year, they must start participating in the ETS the following year.
NUMBER OF LIABLE ENTITIES About 55 entities **POINT OF REGULATION** Downstream

PHASES AND ALLOCATION

COMPLIANCE PERIOD One year **TRADING PERIOD VOLUNTARY PHASE:** 2008–2012 **MANDATORY PHASE:** 2013–2020 **ALLOCATION VOLUNTARY PHASE (2008–2012):** Each participant gets own entity specific reduction target, which induces a free allocation of certificates that covers the emissions according to the set target. **MANDATORY PHASE (2013–2020):** Free allocation is based on industry benchmarks using a similar methodology as in 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, in 2020: 30% free allocation. No free allocation for the power sector. An overarching correction factor will be applied if the benchmarked allocation exceeds the overall emissions cap. Allowances that are not allocated for free are auctioned. 5% of the allowances are set aside in the New Entrants Reserve.

FLEXIBILITY

BANKING AND BORROWING Surplus of allowances from the voluntary phase (2008–2012) will be converted into 2013–2020 allowances by June 30, 2014. **OFFSETS AND CREDITS QUALITATIVE LIMIT:** Most categories of credits from CDM projects in Least Developed Countries (LCDs) are allowed. Credits from CDM and JI projects from other countries are eligible only if registered and implemented before Dec. 31, 2012. **QUANTITATIVE LIMIT:** Industries that participated in the voluntary phase (2012–2020): For the whole period, the maximum amount of offsets allowed into the scheme equals 11% of emissions allowances allocated in the voluntary phase (2008–2012) minus offset credits used in that same time period. Industries entering the Swiss ETS in the mandatory phase: 4.5% of their actual emissions in 2013–2020.

COMPLIANCE

MONITORING, REPORTING AND VERIFICATION Monitoring plans are required for every installation (approved by competent authority) no later than three months after the registration deadline. Entities have to submit an annual monitoring report, based on self-reported information. The Federal Office for the Environment may order verification of the monitoring reports by a third party. **ENFORCEMENT** Fine of 125 CHF/t CO2 (about 100 EUR/t CO2). In addition to the fine, entities must surrender missing allowances and/or international credits in the following year.

OTHER INFORMATION

INSTITUTIONS INVOLVED The Federal Office of the Environment and the National Emissions Trading Registry. **LINKAGE WITH OTHER SCHEMES** Switzerland is currently negotiating with the European Union on linking the Swiss ETS with the EU ETS. A third round of negotiations took place in October 2012. While many elements of the Swiss ETS have been designed to match the EU ETS (e.g. allocation benchmarks), current negotiations may have further impact on the Swiss ETS.

Kazakhstan

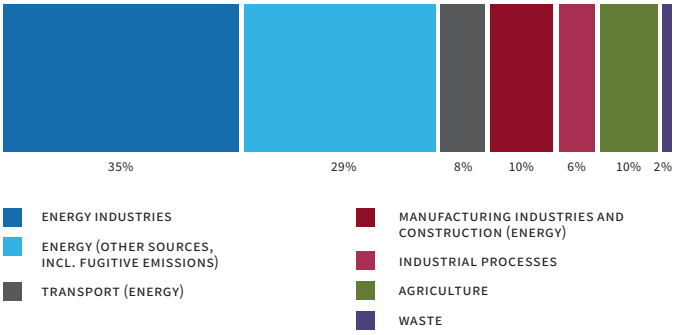
in force

In December 2011, the Republic of Kazakhstan introduced amendments and additions to its environmental legislation that laid the groundwork for the development of a cap-and-trade program. A one-year pilot phase for the country's first emissions trading scheme started in January 2013. A second phase is scheduled to take place from 2014 to 2015. In parallel, Kazakhstan is working on improving current national legislation.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **263 MTCO$_2$E** (2010)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET BY 2020: –5% below 1990 GHG levels

ETS SIZE

ETS CAP An absolute cap of approx. 147 MtCO$_2$ (+reserve of 20.6 MtCO$_2$) was set for 2013. This cap will decrease in a linear trajectory to achieve the 2020 target.

EMISSIONS COVERAGE

GHG COVERED CO_2
SECTORS Entities in the energy, oil and gas sectors, and in some industries such as mining and cement production that emit more than 20,000t CO_2/year. Possibility of voluntary opt-in of additional sectors
NUMBER OF ENTITIES Approx. 178 businesses
POINT OF REGULATION downstream

PHASES AND ALLOCATION

COMPLIANCE PERIOD One year
TRADING PERIOD **PHASE I** (Pilot phase): 2013; **PHASE II:** 2014–2015; **PHASE III:** 2016–2020
ALLOCATION A National Allocation Plans (NAP) for Phase I (2013) was adopted on Dec. 13, 2012 by Government Decree. A National Allocation Plan for Phase II (2014–2020) is currently under development (status: November 2013). **PHASE I (2013):** 100% free allocation based on emissions data from 2010, new entrants reserve of 20.6 million units **PHASE II (2014–2015):** free allocation based on verified emissions from 2011 and 2012 for 2014, and 2013 for 2015.
As of 2016 some degree of auctioning and benchmarking may be introduced.

FLEXIBILITY

BANKING AND BORROWING Banking and borrowing were not allowed in Phase I.
OFFSETS AND CREDITS Kazakhstan is currently working on a domestic offset system for specific sectors and gases (e.g. CH_4) not covered by the scheme. International credits may be allowed in the future, subject to approval of the Kazakh reduction target for the second commitment period of the Kyoto Protocol.
PROVISIONS FOR PRICE MANAGEMENT Part of the allowances from the reserve may be sold at a fixed price in the pilot phase.

COMPLIANCE

MONITORING, REPORTING AND VERIFICATION Annual reporting is required for businesses or financial facilities above the threshold of 20,000 t CO_2/year. Aside from CO_2, reporting is also required for CH_4 and N_2O emissions. Emission data reports and their underlying data to be verified by accredited third-party verifiers. Installations below the compliance threshold must submit non-verified inventory reports.
ENFORCEMENT Penalties for non-compliance in the Kazakh ETS are calculated based on the Kazakh Monthly Calculation Index (MCI). They amount to 10 MCIs/unit, which corresponded to 17,310 KZT (approx. 90 EUR) in 2013.

OTHER INFORMATION

INSTITUTIONS INVOLVED Ministry of Environment Protection and the institute Zhasyl Damu JSC (formerly KAZNIIEK).

Russia

under consideration

Russia is currently exploring options for developing a domestic carbon market to achieve its GHG reduction target of at least 25% by 2020 adopted by presidential decree.

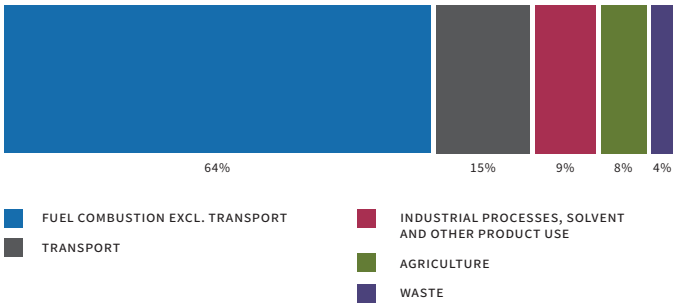
The Ministry for Economic Development is in charge of elaborating a national GHG mitigation action plan and cooperates in this regard with the business group Delovaya Rossiya (Business Russia) on the potential introduction of carbon regulations.

With the support of the European Bank for Reconstruction and Development (EBRD), an international consortium was commissioned to carry out a carbon market scoping study. The goal is to explore potential impacts of a carbon pricing instrument on the Russian energy and industry sectors and to assess existing emissions trading schemes. Recommendations will be formulated and reported back to the Russian government at the beginning of 2014.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **2320 $MTCO_2E$** (2011)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET BY 2020: at least –25% below 1990 levels (target adopted by presidential decree in 2013).

Turkey

under consideration

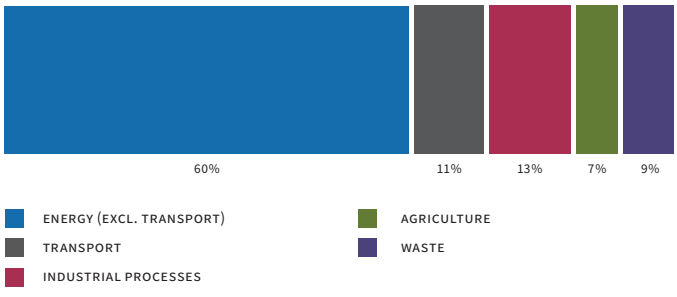
Turkey's National Climate Change Action Plan, which was adopted in 2011, called for studies to be carried out to establish a carbon market by 2015. In April 2012, Turkey adopted a new regulatory framework for a comprehensive mandatory MRV system. Monitoring is expected to start in 2015, and reporting (of 2015 emissions) in 2016.

As an implementing country under the Partnership for Market Readiness, Turkey received funding in May 2013 to help implement the MRV regulation by introducing a pilot MRV system in the energy sector, and to explore options for a market-based instrument. This includes a report on consideration of emissions trading for the electricity sector, Turkey's largest emitting sector.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **422 $MTCO_2E$** (2011)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET Turkey is not listed in Annex B of the Kyoto Protocol and has no mandatory GHG reduction target under the Convention. So far, it has not announced a voluntary reduction goal, either.

ETS SIZE

GHG COVERED The Turkish MRV regulation covers CO_2.
SECTORS ETS coverage has not been set yet. However, the Turkish MRV regulation, which is based on the MRV regulation in the EU Emissions Trading Scheme, establishes an installation-level MRV system. The system covers all major sources of GHG emissions from the energy (combustion of fuels with output of 20MW thermal or more) and industry sectors (coke production, metals, cement, glass, ceramic products, insulation materials, paper and pulp, chemicals over specified threshold sizes/production levels). Possibility of voluntary opt-in of additional sectors into the MRV system. **NUMBER OF ENTITIES** 1,500 (covered by the Turkish MRV regulation)
POINT OF REGULATION downstream

COMPLIANCE

MONITORING, REPORTING AND VERIFICATION Under the Turkish MRV legislation operators are obliged to monitor their emissions in accordance with approved monitoring plans and submit their verified emissions reports annually. The MRV regulation does not establish any emission limitation or reduction obligation on the operators. The GHG verifiers will be accredited by the Turkish Accreditation Organization. Each operator needs to submit the monitoring plans for its installations to a verifier first for review and then to the Ministry by June 2014. The monitoring plans need to prepared and submitted to the approval of the Ministry of Environment and Urbanization by 2015, before which they need to be submitted to an accredited verifier for its vetting. The Ministry will then approve the monitoring plans by December 2014. Development of the monitoring and reporting protocols and practices are likely to be part of the capacity building and training activities that Turkey would propose to do in its Market Readiness Proposal. The protocols could be able to build on those used in the EU ETS. The first year for monitoring is 2015 and the reporting for that year will be in 2016. Monitoring reports are first independently verified by one of the accredited verifiers—this will typically include a site visit.

OTHER INFORMATION

INSTITUTIONS INVOLVED Ministry of Environment and Urbanization

Ukraine

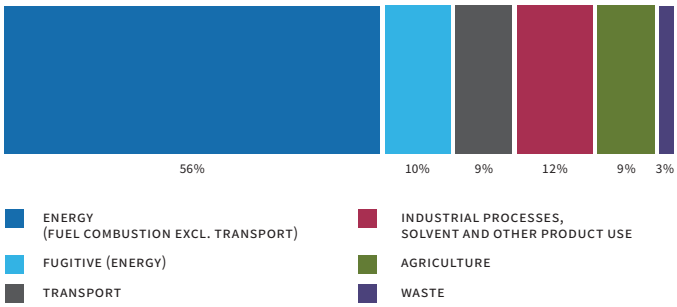
under consideration

In November 2010, a bill that laid the foundation for introducing a domestic emissions trading system (ETS) passed the first reading in the Ukrainian Parliament. The ETS legislation is pending and Ukraine continues to work on its ETS and MRV plans, with the assistance of the Partnership for Market Readiness (PMR), the European Bank for Reconstruction and Development (EBRD), and others. Activities under the PMR focus on the development of an MRV system as a first step to a potential future ETS. Currently, consultations on a draft MRV law are being held at the national level.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **402 MTCO$_2$E** (2011)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET **BY 2020:** voluntary target of –20% below 1990 levels
BY 2050: 50% below 1990 levels

North America

Regional Greenhouse Gas Initiative

in force

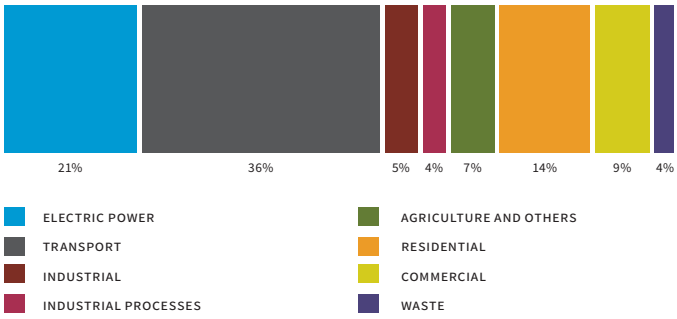
CONNECTICUT, DELAWARE, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW YORK, RHODE ISLAND, VERMONT

The Regional Greenhouse Gas Initiative (RGGI) was the first mandatory GHG emissions trading scheme in the United States. The program's first compliance period was from Jan. 1, 2009 to Dec. 31, 2011. It is now in its second compliance period (Jan. 1, 2012–Dec. 31, 2014). As foreseen by the original Memorandum of Understanding between the participating states, a RGGI program review was conducted over the course of 2012. Based on the program review, an Updated Model Rule and further recommendations were released on Feb. 7, 2013.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS 473 $MTCO_2E$ (2010)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET RGGI members do not share a common overall GHG reduction target. The RGGI program itself is targeted to reduce GHG emissions from the regulated power sector regionally by over 50% from 2005 levels by 2020.

ETS SIZE

ETS CAP PHASE I AND II (2009–2014): Stabilization at 149.7 Mt (165 M short tons) CO_2
FROM 2015: 2.5% reduced annually (from 2015);
TOTAL REDUCTION BY 2018: 10%.
The RGGI Region has experienced a 33% reduction in emissions from the original cap. Because of these reduced emissions, the states lowered the cap to 82 Mt in 2014 as part of the 2012 program review. The Model Rule change extends of the 2.5% reduction trajectory through 2020, with a 2020 cap of approx. 71 Mt.

EMISSIONS COVERAGE

GHG COVERED CO_2
SECTORS Fossil Fuel Electric Generating Units (Threshold: >25MW)
NUMBER OF ENTITIES 168 entities (211 entities in the first control period)
POINT OF REGULATION Downstream (at installation level)

PHASES AND ALLOCATION

COMPLIANCE PERIOD 3 years
TRADING PERIODS **PHASE I:** 2009–2011; **PHASE II:** 2012–2014
ALLOCATION Approx. 90% of all allowances are offered at auction (using a "single-round", "sealed-bid", "uniform-price" format. These auctions are open to all parties with financial security; maximum bid of 25% of auctioned permits per quarterly auction). Minimum required auctioning level is 25%
Approx. 1% offered at fixed price of 2 USD (approx. 1.5 EUR) in Phase I. The rest of allowances are held as reserve.

FLEXIBILITY

BANKING AND BORROWING Banking allowed without restrictions. Until May 1, 2009 borrowing was allowed through Early Reduction Allowances.
OFFSETS AND CREDITS **QUALITATIVE LIMIT:** Credits from five offset types located in RGGI states may be allowed into the scheme: Landfill methane capture and destruction, reduction in emissions of sulfur hexafluoride (SF_6) in the electric power sector (provision deleted under model rule changes), sequestration of carbon due to afforestation, reduction or avoidance of CO_2 emissions from natural gas, oil, or propane end use combustion due to end-use energy efficiency in the building sector, avoided methane emissions from agricultural manure management operations.
QUANTITATIVE LIMIT: 3.3% of an entity's liability may be covered with offsets (under special conditions up to 5–10%). As part of the 2012 program review, RGGI members decided to abolish the price triggers and some states chose to adopt a new forestry offset protocol based on the California Air Resources Board protocol for US forestry projects.
PRICE MANAGEMENT PROVISIONS Minimum auction price: 2 USD (approx. 1.50 EUR) in 2014, increasing by 2.5% per year (to reflect inflation).
Also as part of the 2012 program review, the states created a cost containment reserve (CCR) and eliminated the former price trigger offset provisions. CCR triggers prices: 4 USD in 2014, 6 USD in 2015, 8 USD in 2016, and 10 USD in 2017 (respectively about 3 EUR, 4 EUR, 6 EUR and 7 EUR). Each year after 2017, the CCR trigger price will increase by 2.5 %.

COMPLIANCE

MONITORING, REPORTING AND VERIFICATION Emissions data for emitters is recorded in the US Environmental Protection Agency's (US EPA) Clean Air Markets Division (CAMD) database in accordance with state CO_2 Budget Trading Program regulations and US EPA regulations. Provisions are based on the US EPA monitoring provisions at 40 CFR Part 75. Data is then automatically transferred to the electronic platform of the RGGI CO_2 Allowance Tracking System (RGGI COATS), which is available for public view.
ENFORCEMENT Penalties for non-compliance are set at state level.

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 cooperation.

Western Climate Initiative (WCI)

BRITISH COLUMBIA, CALIFORNIA, MANITOBA, ONTARIO, QUÉBEC

The WCI is an initiative of American state and Canadian provincial governments that aiming to develop a joint strategy to reduce greenhouse gas emissions via a regional cap-and-trade program. Currently, British Columbia, California, Manitoba, Ontario, and Québec are members of the initiative. California and Québec independently established cap-and-trade systems, their first compliance periods started on Jan. 1, 2013. One year later, on Jan. 1, 2014, California and Québec linked their systems creating the first international cap-and-trade scheme consisting of sub-national jurisdictions.

California (WCI)

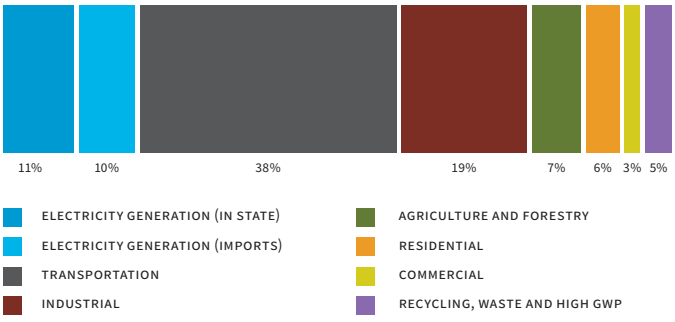
in force

Initiated in 2012, the Californian cap-and-trade program entered enforceable compliance obligation on Jan. 1, 2013 with the start of its first compliance period (2013–2014). Starting in the second compliance period (2015–2017), the cap-and-trade program will cover sources responsible for 85% of California's GHG emissions. A key pillar in California's climate plan, the program will help to meet the state's goal of reducing GHG emissions to 1990 levels by 2020 and to achieve the 80% reduction target from 1990 levels by 2050.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **451 MTCO$_2$E** (2010)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET **BY 2020:** 1990 GHG level; **BY 2050:** –80% of 1990 GHG level

ETS SIZE

ETS CAP **FIRST COMPLIANCE PERIOD:** 2013: 162.8 MtCO$_2$e; 2014: 159.7 MtCO$_2$e
SECOND COMPLIANCE PERIOD: 2015: 394.5 MtCO$_2$e; 2016: 382.4 MtCO$_2$e; 2017: 370.4 MtCO$_2$e
THIRD COMPLIANCE PERIOD: 2018: 358.3 MtCO$_2$e; 2019: 346.3 MtCO$_2$e; 2020: 334.2 MtCO$_2$e

CURRENT EMISSIONS COVERAGE

GHG COVERED CO_2, CH_4, N_2O, SF_6, HFC, PFC, NF_3 and other fluorinated GHG
SECTORS **FIRST COMPLIANCE PERIOD (2013–2014):** electric utilities and large industrial facilities; i.e. operators of facilities in: cement production; cogeneration; glass production; hydrogen production; iron and steel production; lime manufacturing; nitric acid production; petroleum and natural gas systems; petroleum refining; pulp and paper manufacturing; self-generation of electricity; stationary combustion and first deliverers of electricity.
SECOND COMPLIANCE PERIOD (2015–2017): sectors from 1st compliance period + distributors of transportation fuels, natural gas and other fuels (i.e.: suppliers of natural gas, suppliers of RBOB (reformulated blendstock for oxygenate blending) and distillate fuel oil, suppliers of liquefied petroleum gas, carbon dioxide suppliers). Accordingly, coverage is projected to increase to about 85% of California's overall GHG emissions.
NUMBER OF ENTITIES About 350 entities representing about 600 facilities.
POINT OF REGULATION Mix of downstream and midstream (fuels distribution)

PHASES AND ALLOCATION

COMPLIANCE PERIOD Three years (after first compliance period of two years)
TRADING PERIOD California's trading period is referred to as "compliance period" though a portion of allowances must be submitted for each year's emissions depending on the year of the trading/compliance period. First compliance period: 2013–2014 Second compliance period: 2015–2017 Third compliance period: 2018–2020 **ALLOCATION** Publicly owned and regulated investor-owned electric utilities receive allowances on behalf of their ratepayers. Investor-owned utilities must consign the allowances they receive to state-run auctions. Industrial facilities receive free allowances for transition assistance and to prevent leakage. The risk of leakage is determined by emissions intensity and trade exposure. Transition assistance declines in the third compliance period. Allowances are allocated by benchmarks in each sector. Provisions for new entrants follow established methodologies for leakage vulnerability. The remainder of allowances, about 10% of allowances in the first compliance period, increasing in subsequent compliance periods is auctioned.

FLEXIBILITY

BANKING AND BORROWING Banking is allowed. Borrowing across compliance periods is not.
OFFSETS AND CREDITS **QUALITATIVE LIMIT:** Currently four domestic offset types are accepted as compliance for up to 8% of each entity's compliance obligation. These project types originate from projects carried out according to four "protocols". The existing protocols are for: US Forest Projects, Urban Forest Projects, Livestock Projects (methane management), Ozone Depleting Substances Projects. An additional protocol for mine methane projects is currently going through the approval process. **PRICE MANAGEMENT PROVISIONS** **AUCTION RESERVE FLOOR PRICE:** 10.71 USD (approx. 8 EUR) per allowance (vintage 2013 and 2016 allowances auctioned in 2012), to increase by 5% plus inflation as measured by the Consumer Price Index. An "Allowance Price Containment Reserve" will be allocated allowances from various years (1% for budget years 2013–2014; 4% for budget years 2015–2017; and 7% for budget years 2018–2020). The reserve sale administrator can sell accumulated allowances on a regular basis in three equal price tiers at 40, 45 and 50 USD (approx. 30, 35 and 40 EUR). Tier prices increase by 5% plus inflation measured by the Consumer Price Index. If the allowances in the reserve are all sold, allowances from future years are transferred to the reserve and made available for sale.

COMPLIANCE

MONITORING, REPORTING AND VERIFICATION In most sectors, reporting is required for entities in with emissions over 10,000 MtCO$_2$e. In general, reports are submitted annually generally by April 10 (June 1 for electric power entities). Operators must implement systems of internal audit, quality assurance, and quality control for the reporting program and the data reported. **ENFORCEMENT** For false reporting, there is the possibility of a fine or imprisonment.

OTHER INFORMATION

INSTITUTIONS INVOLVED California Environmental Protection Agency (CAL EPA), Air Resources Board (ARB). **LINKAGE WITH OTHER SCHEMES** California was a founding member of the Western Climate Initiative (2007) and linked with Québec on Jan. 1, 2014.

Québec (WCI)

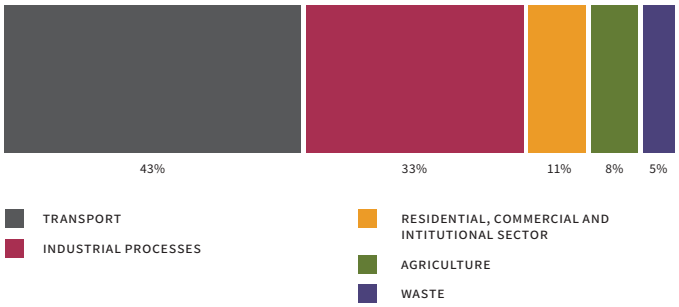
in force

Québec's cap-and-trade system for greenhouse gas emissions allowances was introduced in 2012 with a transition year in which emitters could familiarize themselves with the program and prepare without mandatory compliance. The programs enforceable compliance obligation began on Jan. 1, 2013. It covers about 36% of Québec's emissions (estimate based on 2010 emissions). Coverage is expected to increase to 86% in 2015 when the program expands to cover the distribution of fossil fuels.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **82.47 $MTCO_2E$** (2010)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET BY 2020: The current government's objective is to reduce GHG emissions by –25% below 1990 levels as part of Québec's 2013–2020 Climate Change Action Plan.

ETS SIZE

ETS CAP FIRST COMPLIANCE PERIOD (2013–2014): 2013: 23.2 $MtCO_2e$, 2014: 23.2 $MtCO_2e$ **SECOND COMPLIANCE PERIOD (2015–2017):** 2015: 65.3 $MtCO_2e$; 2016: 63.19 $MtCO_2e$; 2017: 61.08 $MtCO_2e$ **THIRD COMPLIANCE PERIOD (2018–2020):** 2018: 58.96 $MtCO_2e$; 2019: 56.85 $MtCO_2e$; 2020: 54.74. $MtCO_2e$

CURRENT EMISSIONS COVERAGE

GHG COVERED CO_2, CH_4, N_2O, SF_6, HFC, PFC, Nitrogen trifluoride (NF_3)
SECTORS In the first compliance period (2013–2014), the electricity and industry sectors are covered when the respective entities have emissions of more than 25,000 CO_2e/year.
In the second compliance period (2015–2017) and third compliance period (2018–2020), the sectors covered in the first compliance period are covered as well as distributors and importers of fossil fuels used for consumption in the transport and building sectors as well as in small and medium-sized businesses. The threshold for these fuel distributors and importers is also 25,000 CO_2e/year. Accordingly, coverage is projected to increase to about 86% of Québec's overall GHG emissions.

NUMBER OF LIABLE ENTITIES Approx. 80 facilities (60 operators or companies) for 2013–2014
POINT OF REGULATION FIRST COMPLIANCE PERIOD (2013–2014): Downstream
SECOND COMPLIANCE PERIOD (2015–2017): Downstream and upstream (fuel distribution)

PHASES AND ALLOCATION

COMPLIANCE PERIOD FIRST COMPLIANCE PERIOD: Jan. 1, 2013–Dec. 31, 2014.
The following compliance periods last 3 calendar years each starting on Jan. 1, 2015 (2015–2017 and 2018–2020). Rules pertaining to the free allocation of allowances are only set by regulation until 2020 for the time being.
Allowances have to be surrendered by Nov. 1 following the end of compliance period.
TRADING PERIODS In Québec's cap-and-trade system, trading period is referred to as "compliance period" (see above). Allowances are allocated and auctioned with calendar vintage years.
ALLOCATION AUCTION: Generally, electricity and fossil fuel distributors have to buy 100% of their allowances at auction (or on the market). Allowances are auctioned at most four times per year (joint auctions with California will be held starting in 2014).
On Dec. 3, 2013, an auction was held where 1,025,000 units for vintage year 2013 and 1,708,000 units for vintage year 2016 were sold.
Unsold allowances will be removed from future auctions if the auction sale price is lower than the minimum auction price. If the sale price is higher than the minimum price for two consecutive auctions, removed allowances may be gradually reoffered at auction.
FREE ALLOCATION: Sectors subject to international competition which will receive free allowances 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 agri-food establishments).
In the first compliance period (2013–2014), free allocation is based on historical levels, production level and intensity target of GHG emissions attributable to the activity, with 100% allocation for process emissions, 80% for combustion emissions and 100% for emissions from other sources
In the second compliance period (2015–2017), free allocation will be reduced and continue to be reduced by approx. 1–2% on a yearly basis.
75% of free allowances issued on Jan. 14 of each year (year X except in 2013 when they were issued on May 1) plus remaining 25% of estimated quantity in September of year X+1 after the Minister's verification of emission reports and estimated quantities for year X. Free allocation is based on real output, thereby preventing windfall profits.

FLEXIBILITY

BANKING AND BORROWING Banking is allowed but emitter is subject to general holding limit. Borrowing is not allowed. **OFFSETS AND CREDITS QUALITATIVE LIMIT:** Currently three domestic (non-Kyoto) offset types are accepted as compliance units originating from projects carried out according to three "protocols" in Québec: → CH_4 destruction as part of projects to cover manure storage facilities → Capture of gas from certain landfill sites → Destruction of certain ozone depleting substances contained in insulating foam recovered from appliances
Further offset types may be approved by the authority.
QUANTITATIVE LIMIT: Up to 8% of each entity's compliance obligation
Offsets issued by jurisdictions linked with Québec, such as California are recognized for compliance. The Minister may require the promoter to replace any offset credit issued to the buyer for a project: **1)** where, because of omissions, inaccuracies or false information in the information and documents provided by the promoter the GHG emission reductions for which the offset credits were issued were not eligible; **2)** where offset credits were applied for under another program for the same reductions as those covered by the application for credits under the Cap-and-Trade Regulation.
In the instance that credit recovery is not possible, an equivalent number of credits will be retired from the Minister's environmental integrity account. The Minister takes 3% of issued offset credits as a contingency reserve to fill that account.
PRICE MANAGEMENT PROVISIONS MINIMUM AUCTION PRICE: 10.75 CAD/t (approx. 7.20 EUR) in 2013, increasing by 5% plus inflation per year until 2020
Starting in 2014, each December, Québec and California will announce an Auction Reserve Price for auctions conducted in the following calendar year. The Auction Reserve Price for each auction will be announced prior to the opening of the auction window on the day of the auction. The Auction Reserve Price announced for an auction will be equal to the higher of the two values previously announced by Québec and California based on the exchange rate set at noon on the date of the auction or, when that rate is not available, the most recent rate published.
Reserve emission units held in the Allowance Price Containment Reserve account may be sold at 40, 45, 50 CAD/t CO_2e (approx. 27–34 EUR). Only covered entities established 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.

QUÉBEC (WCI)

COMPLIANCE

MONITORING, REPORTING AND VERIFICATION **REPORTING FREQUENCY:** one year. Report to be submitted by June 1 of each year. **REPORTING FRAMEWORK:** Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere' of the Environment Quality Act. **VERIFICATION:** GHG reporting for emitters participating in ETS (higher threshold than regulatory reporting requirement) must send a verification report carried out by an organization accredited to ISO 14065.

ENFORCEMENT 3,000–500,000 CAD (approx. 2,000–335,000 EUR) and up to 18 months in jail in the case of a natural person, and 10,000–3,000,000 CAD (6,700–2,011,000 EUR) in the case of a legal person. Fines doubled in case of second offense. In addition, the Minister of Sustainable Development, Environment, Wildlife and Parks may suspend the allocation to any emitter in case of non-compliance.

A covered entity that fails to cover its real and verified GHG emissions with enough allowances on Nov. 1 following the end of a compliance period will have to remit three allowances for each allowance it failed to remit to the Minister.

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

OTHER INFORMATION

INSTITUTIONS INVOLVED Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs (Ministry of Sustainable Development, Environment, Wildlife and Parks), Office of Climate Change, Carbon Market Directorate. **LINKAGE WITH OTHER SCHEMES** Québec has been a member of the Western Climate Initiative since 2008 and has linked its system to that of California on Jan. 1, 2014.

Other Western Climate Initiative Members

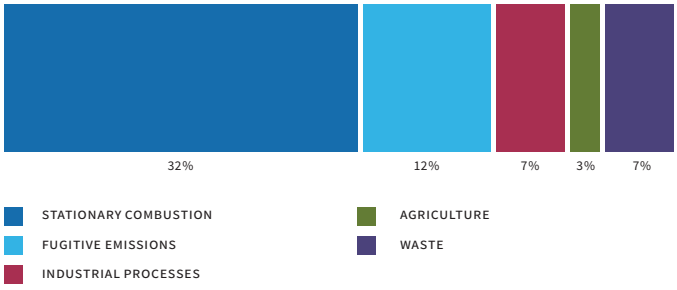
British Columbia (WCI) — under consideration

Carbon pricing is a key element of British Columbia's Climate Action Plan adopted in 2008. To accomplish this element, BC pursued emissions trading as a partner in the Western Climate Initiative and introduced a revenue neutral carbon tax in July 2008. BC is not implementing an emissions trading system at this time and continues to monitor the progress of the WCI.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **59 $MtCO_2e$** (62 $MtCO_2e$ with net deforestation) (2011)

SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET **BY 2020:** 33% below 2007 levels; **BY 2050:** 80% below 2007 levels

OTHER INFORMATION

INSTITUTIONS INVOLVED
Climate Action Secretariat in the British Columbia Provincial Government

Manitoba (WCI)

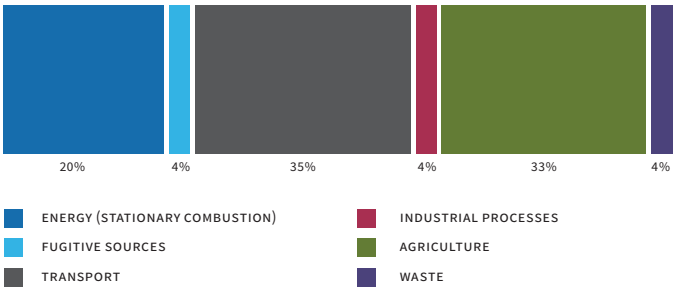
under consideration

Manitoba (MB) joined the Western Climate Initiative (WCI) in June 2008. Stakeholders were invited to share their views on a cap-and-trade plan for Manitoba through March 2011. The government is currently considering further measures.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **20.8** $MTCO_2E$ (2010)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET Manitoba has achieved its initial target of stabilizing emissions in 2010 at year 2000 levels, and is currently evaluating the extent to which the province met its 2012 target of reducing emissions to 6% below 1990 levels.

Ontario (WCI)

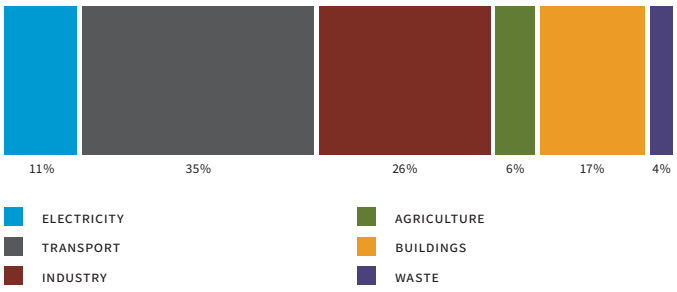
under consideration

Ontario joined the Western Climate Initiative (WCI) as a partner in July 2008. Cap-and-trade is one of the policy instruments Ontario is considering in order to achieve its GHG emissions reduction goal. In December 2009, Ontario laid the foundation for an ETS by introducing GHG reporting requirements. In parallel, ON continues to work with WCI jurisdictions on developing a regional cap-and-trade system.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **171** $MTCO_2E$ (2010)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET **BY 2014:** 6% below 1990 levels; **BY 2020:** 15% below 1990 levels; **BY 2050:** 80% below 1990 levels

Latin America and the Caribbean

Brazil

under consideration

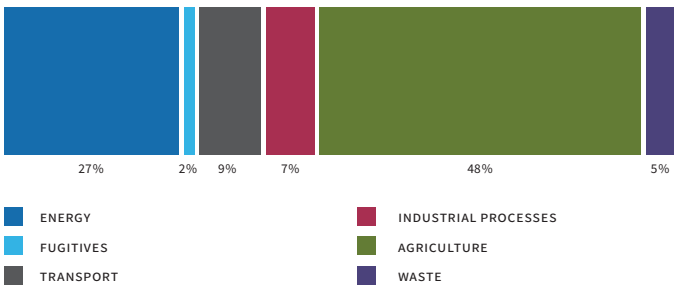
Brazil enacted its National Climate Change Policy in December 2009. This law sets out Brazil's policy on climate change and aims to promote the development of a Brazilian market for emissions reductions. In the law, the country adopted a national voluntary commitment to reduce GHG emissions by 36.1% to 38.9% compared to business as usual (BAU) projections for 2020, as communicated to the UNFCCC.

As part of its activities under the Partnership for Market Readiness (PMR), the Brazilian government is looking into market instruments that can be implemented to meet Brazil's voluntary GHG reduction commitment under the Brazil National Climate Change Policy and reduce overall mitigation costs. Options assessed include a domestic ETS, sectoral crediting approaches, and a carbon tax.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **863 MTCO$_2$E** (2005)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET BY 2020: voluntary commitment to reduce GHG emissions by 36.1% to 38.9% compared to BAU projections.

Rio de Janeiro

under consideration

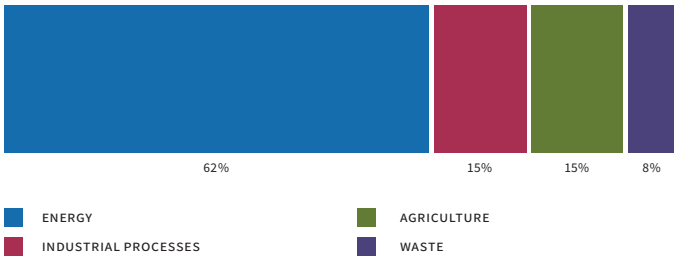
The Brazilian state of Rio de Janeiro is planning to implement a mandatory ETS to cover major polluting industries. The scheme was announced during the Rio+20 conference in 2012 and was expected to start early 2013, but was later delayed until further notice.

In the law establishing a state policy on climate change (Law Nr. 5690/2010), the government of Rio stated its support for the development of a carbon market. A decree published in October 2011 expands on the provisions in the law and establishes an overall emission reduction target for Rio state and specific targets for some segments of the waste, energy, transport, and agriculture sectors. It does not specify the instruments to be implemented to achieve these goals. A state plan on climate change was published in February 2012. This plan presents economic instruments that could be used to promote emissions reductions, including in the industrial sector. It discusses steps to be taken toward the creation of an ETS (e.g. development of targets for sectors, definition of rules around allocation, use of offsets, and linkages).

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **70 MTCO$_2$E** (2005)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET BY 2030: carbon intensity below 2005 levels (Decree regulating the law establishing a state policy on climate change (Law Nr. 5690/2010).

ETS SIZE

ETS CAP It has been reported that Rio is planning to set a target to cut the emissions intensity of companies' production by 10% by 2030. A study from Rio's Federal University estimated that intensive industries have the potential to reduce 209 Mt of CO_2 by 2030.
SECTORS The scheme is expected to cover the cement, steel, chemical, petrochemical, and ceramics sectors.
NUMBER OF ENTITIES The scheme is expected to cover around 70 companies.

PHASES AND ALLOCATION

TRADING PERIOD The scheme was originally set to start with a three-year pilot phase in 2013, followed by three five-year trading phases. However, the start of the scheme has been delayed until further notice. The initial timeline was as follows: **PHASE I:** 2013–2015, **PHASE II:** 2016–2020, **PHASE III:** 2021–2025 **PHASE IV:** 2026–2030 No revised implementation schedule has been published so far.
ALLOCATION In the first phase of the ETS, most of the allowances are expected to be allocated to companies for free. The amount of free allowances will then decrease annually over future ETS phases and the relative amount of allowances auctioned off will increase.

FLEXIBILITY

OFFSETS AND CREDITS The Rio government is expected to accept CDM certified emissions reductions (CERs), voluntary credits validated under standards recognized by the regional Rio de Janeiro State Environment Institute (Instituto Estadual do Ambiente—INEA), and projects on a positive list pre-approved. REDD (Reducing Emissions from Deforestation and Forest Degradation) projects may be allowed in the future. The amount of credits to be accepted into the system and the proportion of credits from offset projects implemented in Rio de Janeiro will be set at a future time.

COMPLIANCE

MONITORING, REPORTING AND VERIFICATION At the end of each year, companies will have to submit their emission inventories to INEA. The total emissions of each company must match the amount of quotas and credits that they present to INEA.

OTHER INFORMATION

INSTITUTIONS INVOLVED The main government entity involved in the design of the scheme is the Rio de Janeiro State Environment Institute (Instituto Estadual do Ambiente or INEA). Bolsa Verde do Rio (BV Rio) or "Green Exchange" will be Brazil's first exchange for trading emission allowances in relation to the mandatory emission caps. BV Rio will be hosting the trading platform.
LINKAGE WITH OTHER SCHEMES Potential to link with other regional schemes, e.g. São Paulo, in the future.

São Paulo

under consideration

An ETS is currently under development in the Brazilian state of São Paulo. No information has been released yet on the planned schedule for its implementation.

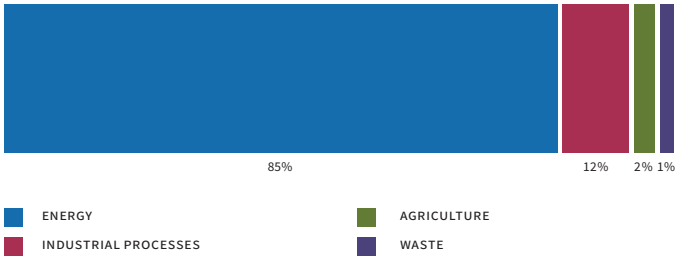
GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **100** $MTCO_2E$ (2008)

OVERALL GHG REDUCTION TARGET

BY 2020: 20% reduction GHG emissions compared to 2005

GHG SECTORAL BREAKDOWN



OTHER INFORMATION

INSTITUTIONS INVOLVED State Fund for Pollution Prevention and Control (FECOP) (a fund for projects related to environmental improvements in São Paulo); Secretariat for the Environment of the State of São Paulo, the authority in charge of administering the FECOP; the environmental agency of the state of São Paulo (Companhia de Tecnologia de Saneamento Ambiental); Brazilian Mercantile & Futures Exchange (BM&F) and the São Paulo Stock Exchange (Bovespa).

LINKAGE WITH OTHER SCHEMES There are indications that the São Paulo system might be linked with the Rio system via BM&F Boverde and BV Rio.

Chile

under consideration

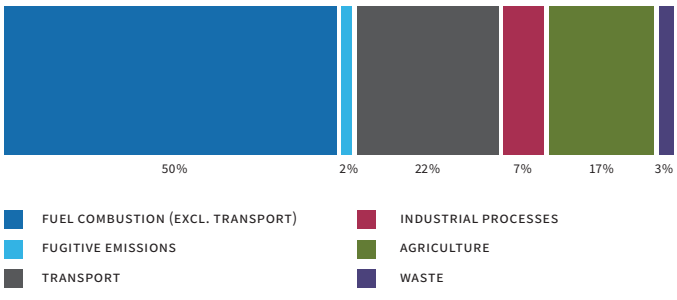
Under the Partnership for Market Readiness (PMR), Chile received implementation funding to develop a roadmap for the design and eventual implementation of an ETS for GHG mitigation in the energy sector in March 2013. The roadmap includes an evaluation of mitigation targets, necessary institutional arrangements, regulatory options, economic impacts and technical requirements for a MRV framework to track GHG emissions.

In parallel, Chile has several registered CDM projects and is active in the development of nationally appropriate mitigation actions (NAMAs). The Santiago Climate Exchange provides a local platform for trading voluntary greenhouse gas (GHG) reductions. In January 2013, the Chilean government decided to establish a "Platform for the Generation and Trading of Carbon Credits from the Forestry Sector in Chile" in cooperation with Verified Carbon Standard (VCS), a major GHG program in the global voluntary carbon market

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **79** $MTCO_2E$ (2006)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET By 2020: target of –20% compared to BAU projections, conditional on international support.

Mexico

under consideration

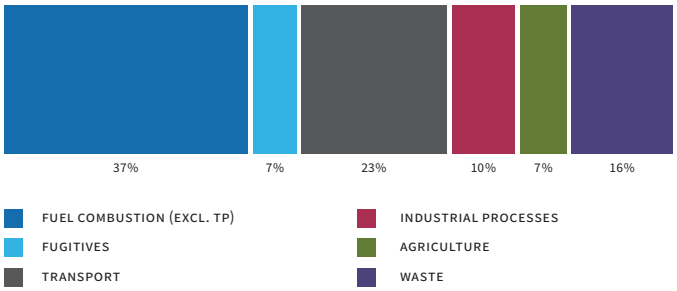
The General Climate Change Law (Ley General de Cambio Climatico) of April 2012 establishes a basic framework for the establishment of a voluntary ETS in Mexico. In a subsequent step, the government released a National Strategy on Climate Change in June 2013, to outline the country's transition to a low carbon economy. The Law stipulates mandatory GHG emission reductions of 30% compared to a business-as-usual scenario by 2020 (conditional on international financial support), and 50% compared to 2000 GHG emission levels. Further, the law requires the largest polluters to report their emissions.

At the time of writing, a bill proposing a carbon tax on the production and import of different fossil fuels was introduced in the parliament. In light of this new development, Mexico's next steps toward a domestic carbon market now depend on how the government will implement complementary mitigation instruments to achieve the overall reduction target. The current carbon tax proposal, which is expected to go into effect in early 2014, would allow companies to surrender domestic offsets and Kyoto units instead of paying the tax.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **641 $MTCO_2E$** (2006)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET **BY 2020:** reduce emissions by up to 30% below BAU emissions, dependent on international financial support **BY 2050:** reduce emissions by 50% below the 2000 level by 2050

OTHER INFORMATION

INSTITUTIONS INVOLVED The Interministerial Commission on Climate Change will be in charge of enforcing the Law and overseeing the development of the carbon market.

Asia

Tokyo Cap-and-Trade Program

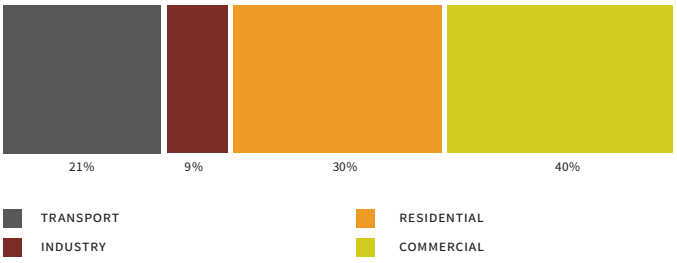
in force

The Tokyo Cap-and-Trade Program (TMG ETS) is Japan's first mandatory emissions trading scheme. It was launched on April 1, 2010 as part of the Tokyo Climate Change Strategy and is currently in its first compliance period (2010–2014). The unique feature of the TMG ETS is that it regulates commercial and industrial GHG emissions at the level of large-scale buildings.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **53.7 $MTCO_2E$** (2011)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET BY 2020: –25% below 2000 GHG levels

ETS SIZE

ETS CAP Absolute cap set at facility level that adds up to Tokyo-wide cap: Sum of base-year emissions of covered facilities multiplied by a compliance factor multiplied by number of years of a compliance period (five years). **CAP:** First compliance period: 6% reduction below base-year emissions. Second compliance period: 15% reduction below base-year emissions (For existing buildings, 7% and 17% respectively) **COMPLIANCE FACTOR:** First compliance period: 8% or 6%. Second compliance period: 17% or 15%

EMISSIONS COVERAGE

GHG COVERED Energy related carbon dioxide (CO_2): CO_2 emitted by the use of fuels, heat and electricity (excluding for residential purposes)
SECTORS **COMMERCIAL SECTOR:** Office buildings, public buildings, commercial buildings, heat suppliers, etc., **INDUSTRIAL SECTOR:** Factories, sewage and waste management, etc. General threshold: Facilities that consume more than 1,500 kiloliters of crude oil equivalent or more.
NUMBER OF ENTITIES 1,323 facilities (as of 31 March 2012)
POINT OF REGULATION Downstream

PHASES AND ALLOCATION

COMPLIANCE PERIOD: 5 years **FIRST COMPLIANCE PERIOD:** April 1, 2010–March 31, 2015; **SECOND COMPLIANCE PERIOD:** April 1, 2015–March 31, 2020
TRADING PERIODS:
FIRST PERIOD: April 1, 2011–September 30, 2016 (compliance period and adjustment year)
SECOND PERIOD: April 1, 2015–March 31, 2020(compliance period) plus adjustment year (TBD)
Facility owners that did not meet their reduction target during the compliance period will trade during adjustment year to fulfill the obligation.

ALLOCATION In general, grandfathering based on historical emissions is calculated according to the following formula: base-year emissions × (1—compliance factor) × compliance period (5 years). Base-year emissions for the first compliance period are based on an emissions average of three consecutive years between 2002 and 2007.
Allocation to new entrants is based on past emissions or on emission intensity standards: Emission activity (floor area) × emission intensity standard.
The emission reduction obligation rates (compliance factors) for entities during the first compliance period are set at 8% for office buildings, other facilities and district heating and cooling plants, and at 6% for facilities using large amounts of district heating and cooling and factories, water and sewage facilities and waste processing facilities. For the second compliance period, they amount to 17% and 15%, respectively. Finally, reduced compliance factors apply to so-called Top-Level Facilities and Near Top-Level Facilities, which have already made outstanding or excellent progress in the implementation of measures against climate change (Top-level Facilities: a 50 percent reduction, Near Top-level Facilities: a 75 percent reduction).
Only when a facility surpasses its reduction obligation, tradable excess credits are issued for the reduction amount exceeding the obligation. Tradable excess credits can be issued each year beginning with the second year of the first compliance period (FY2011). The reduction obligation is calculated by the formula: base-year emissions × compliance factor × elapsed years of the compliance period.

FLEXIBILITY

BANKING AND BORROWING Banking is allowed between two consecutive compliance periods. Borrowing is not allowed. **OFFSETS AND CREDITS** **QUALITATIVE LIMIT:** Currently credits from 4 offsets types are allowed into the scheme: → SMALL AND MID-SIZE FACILITY CREDITS: Total amount of emission reductions achieved by implementing emission reduction measures from non-covered small and medium sized facilities in Tokyo since FY2010. Issuance of credits from FY2011. Small and Mid-size Facility Credits can be used for compliance without a limit. → OUTSIDE TOKYO CREDITS: Emission reductions achieved from large facilities outside of the Tokyo area. Large facilities: energy consumption of 1,500 kL of crude oil equivalent or more in a base-year, and with base-year emissions of 150,000 tonnes or less. Credits only issued for the reduction amount that exceeds the compliance factor of 8%. Issuance of credits from FY2015. Outside Tokyo Credits can be used for compliance for up to one-third of facilities' reduction obligations. → RENEWABLE ENERGY CREDITS: Credits from solar (heat, electricity), wind, geothermal, or hydro (under 1,000 kW) electricity production are counted 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 a limit.
→ SAITAMA CREDITS (via linking): 2 types.
1) Excess Credits of the Saitama Scheme: Emission reductions from facilities with base-year emissions of 150,000t or less. Issuance of credits from FY2015.
2) Small and mid-size Facility Credits issued by Saitama Prefecture.
Issuance of credits from FY2011. Saitama Credits can be used for compliance without a limit.
All offsets have to be verified by external agencies.
PRICE MANAGEMENT PROVISIONS 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

MRV PROVISIONS Participants are required to annually report their verified emissions based on TMG Monitoring/Reporting Guidelines and TMG Verification Guidelines. All six GHG gases have to be monitored and reported: CO_2 (non-energy related), CH_4, N_2O, PFC, HFC and SF_6. Verified reduction amounts can be used for compliance, but cannot be traded to other facilities except for energy-related CO_2. Verification is required only when it is used for compliance.
ENFORCEMENT Penalties of up to 500,000 JPY (3,645 EUR) per tonne. In case of non-compliance, the following measures may be taken in two stages: **FIRST STAGE:** The governor orders to purchase credits by the amount of reduction shortage multiplied by 1.3. **SECOND STAGE:** Any facility that fails to carry out the order will be publicly named and subject to penalties (up to 500,000 JPY—about 3,645 EUR) and surcharges (1.3 times the shortfall).

OTHER INFORMATION

INSTITUTIONS INVOLVED TMG Bureau of Environment **LINKAGE WITH OTHER SCHEMES** Linking with the Saitama Prefecture started in April 2011 when the Saitama ETS was launched. Credits from excess emission reductions, small and mid-size facility credits (offsets) are officially eligible for trade between the two jurisdictions. However, since excess emission reductions need to be confirmed at the end of the first compliance period and credits will thus only become tradable from 2015 on, no trade has occurred yet.

Republic of Korea

implementation scheduled

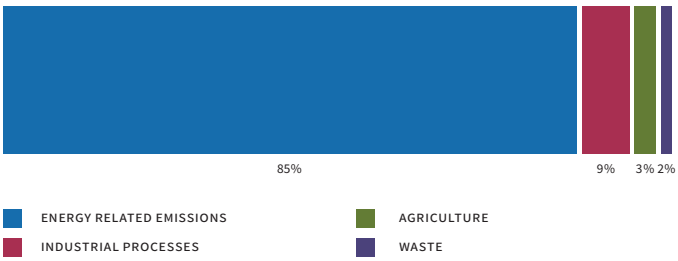
In May 2012, the Republic of Korea adopted legislation to launch the country's first emissions trading scheme in 2015. The Korean economy has grown very fast over the past two decades and the country has become the OECD's fastest-growing GHG emitter. In response, Korea developed a low carbon, green growth strategy in 2008. Since 2010, all companies with large energy consumption must report their GHG emissions under the Greenhouse Gas Energy Target Management System (TMS). Based on the TMS, Korea is now moving forward with the introduction of a mandatory cap-and-trade system with voluntary opt-in that should allow the country to reduce its emissions by 30% against BAU by 2020.

The framework for a Korean Emissions Trading Scheme was adopted on May 2, 2012 with bipartisan support (148 lawmakers in favor, no dissenting vote, three abstentions). The framework—The Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances—provided a first basis for introducing the ETS. A Presidential Decree was adopted on Nov. 14, 2012, which sets out, inter alia, details on the ratio of free allocation and the eligibility of offset credits. Further decrees on details will follow before the start of the system.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **669 MTCO$_2$E** (2010)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET

BY 2020: Unconditional, voluntary target of –30% below BAU

ETS SIZE

ETS CAP Emissions caps are to be announced in 2014. They should reflect the national GHG emissions reduction target.

EXPECTED EMISSIONS COVERAGE

GHG COVERED CO_2, CH_4, N_2O, HFC, PFC, SF_6
SECTORS Business entities emitting more than 125,000 t CO_2e/year and single installations emitting over 25,000 t CO_2e/year. Voluntary opt-in of additional sectors.
NUMBER OF ENTITIES The ETS should cover approx. 460 entities (estimate).
POINT OF REGULATION Downstream

PHASES AND ALLOCATION

COMPLIANCE PERIOD: One year
TRADING PERIODS: **FIRST COMMITMENT PERIOD:** 2015–2017; **SECOND COMMITMENT PERIOD:** 2018–2020; **THIRD COMMITMENT PERIOD:** 2021–2026
ALLOCATION **FIRST COMMITMENT PERIOD** (2015–2017): 100% free allocation to entities
SECOND COMMITMENT PERIOD (2018–2020): Free allocation for up to 97% of a firm's emissions allowances **AS OF 2021:** Free allocation for up to 90% of a firm's emissions allowances.
Allocation will be based on historical average estimated emissions of entities. Early action will be recognized.
Energy-intensive and trade-exposed (EITE) sectors will receive 100% of their allowances for free. These sectors are defined along following criteria: production cost intensity of more than 5% and trade-exposed intensity of more than 10%; production cost intensity of more than 30%; or trade-exposed intensity of more than 30%.

FLEXIBILITY

BANKING AND BORROWING Banking is allowed within one year of the following compliance period. Borrowing is only allowed from the next compliance year (maximum of 10% of entity's obligation), but not from the following trading phase.
OFFSETS AND CREDITS First and second compliance periods (2015–2017 and 2018–2020):
→ **QUALITATIVE LIMIT:** Only domestic offsets with applicable standards (e.g. CDM or standards set by the government) may be used for compliance. → **QUANTITATIVE LIMIT:** Up to 10% of each entity's compliance obligation.
From 2021, up to 50% of the maximum quantity of offsets allowed into the scheme may be covered with international offsets.

COMPLIANCE

MONITORING, REPORTING AND VERIFICATION Annual reporting of emissions must be submitted within three months from the end of a given compliance year.
Emissions must be certified by the competent authority. If the liable entity fails to report emissions, the competent authority may conduct a fact-finding survey. An Emissions Certification Committee will be established to deliberate on technical matters regarding conformity issues. Further details to be specified by Presidential Decree.
ENFORCEMENT **PENALTIES:** Max. of 100,000 KRW/t (approx. 70 EUR)
A penalty shall not exceed three times the average market price of allowances of the given compliance year. Further details to be specified by Presidential Decree.

OTHER INFORMATION

INSTITUTIONS INVOLVED The framework for a Korean Emissions Trading Scheme was drafted by the Presidential Committee on Green Growth. In the future, the Ministry of Environment will be responsible for the KOR ETS.

China

under consideration

In its 12th Five Year Plan, China set its commitment to gradually develop a carbon trading market. In October 2011, the National Development Reform Commission (NDRC) designated seven provinces and cities—Beijing, Chongqing, Guangdong, Hubei, Shanghai, Shenzhen and Tianjin—as regional mandatory ETS pilots. Most of the pilot regions submitted their implementation ETS plans to the NDRC before November 2012. At the time of writing, Shenzhen, Beijing, Shanghai, Guangdong and Tianjin have started operation, while Chongqing and Hubei are expected to start early 2014. The following fact sheets have been carefully prepared with information available at the time of writing. Updated and/or additional information may have been released as this report went to press.

The NDRC also announced its aspirations to build a national ETS in China by 2015. In November 2012, the vice minister of the NDRC announced that there will be an extension of the piloting period to more regions in 2016–2020, which may imply a delay in the national scheme. In March 2013, China received funding from the Partnership for Market Readiness (PMR) to design its national scheme.

In parallel to the development of a mandatory ETS, NDRC released a regulation on voluntary trading in June 2012. It aims at encouraging voluntary GHG emission trading such as offsetting with China Certified Emission Reductions (CCERs) and at ensuring that trading activities are conducted in an appropriate manner.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **11.182 MTCO$_2$E** (2011)
OVERALL GHG REDUCTION TARGET **BY 2015:** 17% reduction in carbon intensity and 16% reduction in energy intensity compared to 2010 (12th Five Year Plan)
BY 2020: 40–45% reduction in carbon intensity compared to 2005 (voluntary commitment under the Copenhagen Accord of 2009)

Beijing

in force

Beijing was the first among the seven pilot ETS in China to announce its implementation plan on April 10, 2012. The scheme started on Nov. 28, 2013, with its pilot trading period to be 2013–2015. The system covers both indirect and direct emissions from electricity providers, the heating sector, manufacturers and major public buildings. The pilot covers about 40% of the city's total emissions.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **100 MTCO$_2$E** (2011)
OVERALL GHG REDUCTION TARGET By 2015: –18% in carbon intensity and –17% in energy intensity, based on 2010 levels (12th Five Year Plan)

ETS SIZE

EMISSIONS COVERAGE

GHG COVERED CO_2
SECTORS Industrial and non-industrial companies and entities, including electricity providers, heating sector, cement, petrochemicals, manufacturers and major buildings (e.g. health, banking, education or retail), which emitted more than 10,000 t CO_2/year during 2009 to 2012, including both direct and indirect emissions.
NUMBER OF ENTITIES approx. 490
POINT OF REGULATION The power sector as well as other sectors that use electricity are included in the scheme. Electricity prices are regulated in China, and a scheme based on direct emissions alone would not induce a pass through of carbon costs into the electricity price and would not incentivize demand-side management of electricity. The system therefore covers the power sector upstream and other sectors downstream including both direct and indirect electricity.

PHASES AND ALLOCATION

COMPLIANCE PERIOD one year
TRADING PERIOD Phase I (pilot): 3 years (2013–2015)
ALLOCATION Free allocation based on 2009–2012 emissions and considering sector development. For new entrants, free allocation will be based on sector-specific benchmarks.
PRICE MANAGEMENT PROVISIONS The government of Beijing will hold some of the allowances for market stabilization purposes, e.g. to buy/sell allowances in case of market fluctuation.

FLEXIBILITY

BANKING AND BORROWING No borrowing; banking is allowed during the pilot period.
OFFSETS AND CREDITS Domestic project-based carbon offset credits—China Certified Emission Reduction (CCER)—are allowed. The use of CCER credits shall be limited to 5% of the annual allocation, of which at least 50% have to be from projects from within the jurisdiction of the city of Beijing.

COMPLIANCE

MRV PROVISIONS Annual reporting of GHG emissions. Third-party verification is required. The Beijing DRC released guidelines for monitoring and reporting of GHG-emissions on Nov. 22, 2013 for the following sectors: heat production and supply; thermal power generation; cement; petrochemicals; other industrial enterprises; and the service sector.

OTHER INFORMATION

INSTITUTIONS INVOLVED The Beijing Development and Reform Commission (DRC) as the main government entity is coordinating ETS development. Other institutions involved include China Beijing Environment Exchange and Tsinghua University on policy framework design and the National Climate Center on MRV issues.

Guangdong

in force

On Dec. 19, 2013, Guangdong was the fourth Chinese pilot region, after Shenzhen, Shanghai and Beijing, to start its pilot ETS. Guangdong is the biggest of the seven cities and regions selected to launch pilot ETS. It has set the ETS cap for 2013 at 338 $MtCO_2$. Initially, the scheme covers 202 enterprises from four industries: power, iron and steel, cement, and petrochemicals. These industries account for more than half of the province's emissions. Additional enterprises from these sectors are expected to join at a later stage of the first trading period.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **510 $MTCO_2E$** (2010)
OVERALL GHG REDUCTION TARGET BY 2015: –19.5% in carbon intensity and –18% in energy intensity, based on 2010 levels (12th Five Year Plan)

ETS SIZE

ETS CAP 2013: 388 $MtCO_2$

EMISSIONS COVERAGE

GHG COVERED CO_2
SECTORS Power, iron and steel, cement, and petrochemicals. Textile, non-ferrous metals, plastic and paper production are planned to be included later; transportation and construction/building sectors may be included from 2015 onward.
At the start of the system, entities emitting more than 20,000 t CO_2/year including both direct and indirect emissions in the period 2011–2014 are included in the scheme. Industrial entities emitting more than 10,000 t CO_2/year and non-industrial entities emitting more than 5,000 t CO_2/year will be required to participate in the scheme at a later stage.
NUMBER OF LIABLE ENTITIES Initially, about 200 companies are included in the scheme. More than 300 companies are required to annually report their emissions.
POINT OF REGULATION The power sector as well as other sectors that use electricity are included in the scheme. Electricity prices are regulated in China, and as such a scheme based on direct emissions alone would not induce a pass through of carbon costs into the electricity price and would not incentivize demand-side management of electricity. The system may therefore covers the power sector upstream and other sectors downstream including both direct and indirect electricity.

PHASES AND ALLOCATION

COMPLIANCE PERIOD One year
TRADING PERIODS **PHASE I** (pilot): three years (2013–2015).
PHASE II (demonstration and improvement): five years (2016–2020)
PHASE III (maturation and operation): not yet specified (post 2020)
ALLOCATION **PHASE I** (2013–2015): Mainly grandfathering (97% in the first two years of operation, 90% in 2015) based on historical emissions (2010–2012), taking account of the characteristics of the sectors. The remaining allowances will be auctioned.
At the time of writing, two options are envisaged for new entrants: either free allocation based on a carbon emission assessment or purchase of allowances from the competent authority. No further details are available at the time of writing.
PRICE MANAGEMENT PROVISIONS The Guangdong government will hold some of the allowances for market stabilization purposes, e.g. to buy/sell allowances in case of market fluctuation.

FLEXIBILITY

BANKING AND BORROWING Banking is allowed within phase I (2013–2015).
Borrowing is not allowed.
OFFSETS AND CREDITS **PHASE I** (2013–2015): Domestic project-based carbon offset credits—China Certified Emission Reduction (CCER)—are allowed. The use of CCER and other credits is limited to 10% of the compliance obligation, of which at least 70% have to come from projects within the province.

COMPLIANCE

MRV PROVISIONS Annual reporting of GHG emissions. Third-party verification is required. No further details are available at the time of writing.

OTHER INFORMATION

INSTITUTIONS INVOLVED The Guangdong Development and Reform Commission (DRC) as the main government entity coordinating ETS development. Other institutions include: the Chinese Academy of Social Sciences, the Guangzhou Institute of Energy Conservation of Chinese Academy of Sciences and the Guangzhou Property Exchange.
LINKAGE WITH OTHER SCHEMES Guangdong and Hubei are considering linking their pilot schemes. However, this has not been officially confirmed at the time of writing.

Shanghai

in force

In July 2012, Shanghai was the second city, after Beijing, to announce its implementation plan for a pilot system confirming its 2013–2015 trading period. The scheme started on Nov. 26, 2013. It covers about 200 companies annually emitting over 100 $MtCO_2$ in total from the following industrial industries: iron and steel, petrochemicals, non-ferrous metal, chemicals, electricity, building materials, textiles, pulp and paper, rubber and chemical fibers; and the following non-industrial industries: aviation, ports, airports, railways and commercial buildings.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **250 $MTCO_2E$** (2010)
OVERALL GHG REDUCTION TARGET By 2015: –19% in carbon intensity and –18% in energy intensity, based on 2010 levels (12th Five Year Plan)

ETS SIZE

EMISSIONS COVERAGE

GHG COVERED CO_2
SECTORS Companies producing electricity, iron and steel, petrochemicals, non-ferrous metals, chemicals, building materials, textiles, pulp and paper, rubber, and chemical fiber and that emitted more than 20,000 t CO_2/year in 2010/2011 are included in the scheme. Airlines, ports, airports, railways, commercial, hotels and financial sector buildings that emitted more than 10,000 t CO_2/year in 2010/2011 also fall within the scope of the scheme. Plants and factories that start operation after the ETS launch are not covered in the pilot phase.
NUMBER OF ENTITIES **PILOT SYSTEM:** about 200 companies Mandatory reporting of emissions: about 600–800 companies.
POINT OF REGULATION The power sector as well as other sectors that use electricity 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 into the electricity price, and therefore would not incentivize demand-side management of electricity. The system thereforecovers the power sector upstream and also including other sectors downstream including both direct and indirect electricity.

PHASES AND ALLOCATION

COMPLIANCE PERIOD One year
TRADING PERIOD Three years (2013–2015)
ALLOCATION One-off free allocation for 2013–2015 based on 2009–2011 emissions considering company growth. Benchmarking will be used for the energy setor, airlines, ports and airports. Auctioning will be considered.

FLEXIBILITY

BANKING AND BORROWING Banking is allowed within the pilot phase. Borrowing is not allowed.
OFFSETS AND CREDITS Domestic project-based carbon offset credits—China Certified Emission Reduction (CCER)—are allowed. The use of CCER credits shall be limited to 5% of the annual allocation.
PRICE MANAGEMENT PROVISIONS The Shanghai government will hold some of the allowances for market stabilization purposes, e.g. to buy/sell allowances in case of market fluctuation.

COMPLIANCE

MRV PROVISIONS Annual reporting of GHG emissions. Third-party verification is required. A provisional guideline for monitoring and reporting of GHG-emissions was published on Dec. 11, 2012, and entered into force on Jan. 1, 2013. Additionally, nine sector-specific guidance documents were released. No further details are available at the time of writing.
ENFORCEMENT Penalties for non-compliance range from 50,000–100,000 CNY (about 6,000–12,000 EUR).

OTHER INFORMATION

INSTITUTIONS INVOLVED Shanghai DRC as the main government entity coordinating the ETS development. Other institutions include the Shanghai Environment and Energy Exchange, Shanghai Carbon Accounting Center, Shanghai Information Center and the Law Research Institute of Shanghai People's Congress.

Shenzhen

in force

The draft Shenzhen ETS design was released in September 2012. In addition, the City Council passed its ETS bill, which forms the legal basis for the Shenzhen ETS, on Oct. 30, 2012. The system started officially on June 18, 2013 as the first of the Chinese pilot ETS. Shenzhen does not have a much heavy industry: 635 medium and small emitters from 26 sectors and 197 buildings are covered under the Shenzhen ETS accounting for about 40% of Shenzhen's 2010 emissions.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **83 $MTCO_2E$** (2010)
OVERALL GHG REDUCTION TARGET By 2015: –21% in carbon intensity, based on 2010 levels (12th Five Year Plan)

ETS SIZE

EMISSIONS COVERAGE

GHG COVERED CO_2
SECTORS 26 sectors, including electricity generators, industrial companies and the building sector. Inclusion threshold: 5,000 t CO_2/year considering both direct and indirect emissions. Inclusion of the transport sector is under consideration.
NUMBER OF ENTITIES 635 companies and 197 public buildings
POINT OF REGULATION The local government would like to include the power sector as well as other sectors that use electricity. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass through of carbon costs into the electricity price, and therefore would not incentivize demand-side management of electricity. Therefore, the system may consider covering the power sector upstream and also including other sectors downstream including both direct and indirect electricity. However, the details of how this will be done in relation to allocation and the avoidance of double-counting, has not been finalized at the time of writing.

PHASES AND ALLOCATION

COMPLIANCE PERIOD One year **TRADING PERIOD** Three years (2013–2015)
ALLOCATION Allowances are distributed for free based on sector-specific carbon intensity benchmarks. In addition, a game theoretical approach that takes into account the companies' own estimations of output and emissions is applied for manufacturing companies. Ex-post adjustments are possible. In the future, auctioning will complement other allocation methods. In the long run, the proportion of allowances allocated through auctions is to increase progressively transitioning toward full auctioning.

FLEXIBILITY

BANKING AND BORROWING Banking is allowed within the pilot phase. Borrowing is not allowed.
OFFSETS AND CREDITS Domestic project-based carbon offset credits—China Certified Emission Reduction (CCER)—are allowed Similar to the other Chinese pilot schemes, it is expected that Shenzhen will allow the use of offsets with a limit of 5–10%.
PRICE MANAGEMENT PROVISIONS The Shenzhen Government is considering holding some of the allowances for market stabilization purposes, e.g. to buy/sell allowances in case of market fluctuation.

COMPLIANCE

MRV PROVISIONS Annual reporting of GHG emissions. Third-party verification is required. The Shenzhen GHG Monitoring and Reporting Regulation and Guideline and the Shenzhen GHG Verification Regulation and Guideline establish a system for monitoring, reporting and verification. **ENFORCEMENT** Companies failing to surrender enough CO_2 permits to match their emissions are fined three times the market price for permits.

OTHER INFORMATION

INSTITUTIONS INVOLVED Shenzhen DRC as the main government entity is coordinating the ETS development. Other institutions involved include the China Shenzhen Emission Rights Exchange, the Shenzhen Institute of Building Research, the Shenzhen Academy of Environmental Science, the Shenzhen Campus of Tsinghua University and the Shenzhen Campus of Harbin University.

Tianjin

in force

On Dec. 26, 2013, Tianjin was the fifth Chinese pilot region, after Shenzhen, Shanghai, Beijing and Guangdong, to start its pilot ETS. The system covers enterprises from five sectors: heat and electricity production, iron and steel, petrochemicals, chemicals, and exploration of oil/gas. These industries account for around 60% of the city's total emissions.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **130 MTCO$_2$E** (2010)
OVERALL GHG REDUCTION TARGET By 2015: –19% in carbon intensity and –18% in energy intensity, based on 2010 levels (12th Five Year Plan)

ETS SIZE

EMISSIONS COVERAGE

GHG COVERED CO_2
SECTORS Heat and electricity production, iron and steel, petrochemicals, chemicals, exploration of oil/gas. Inclusion threshold: 20,000 t CO_2/year considering both direct and indirect emissions.
NUMBER OF ENTITIES 114
POINT OF REGULATION The local government would like to include the power sector as well as other sectors that use electricity. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass through of carbon costs into the electricity price, and therefore would not incentivize demand-side management of electricity. Therefore, the system may consider covering the power sector upstream and also including other sectors downstream including both direct and indirect electricity.

PHASES AND ALLOCATION

COMPLIANCE PERIOD: One year **TRADING PERIODS:** Three years (2013–2015) **ALLOCATION** Free allowances are expected to be distributed mainly based on historical emissions for existing entities and on benchmarks for new entrants. Auctioning may also be used.

FLEXIBILITY

BANKING AND BORROWING Banking is allowed within the pilot phase. Borrowing is not allowed. **OFFSETS AND CREDITS** Domestic project-based carbon offset credits—China Certified Emission Reduction (CCER)—are allowed. The use of CCER credits shall be limited to 10% of the compliance obligation. **PRICE MANAGEMENT PROVISIONS** Tianjin Government is considering holding some of the allowances for market stabilization purposes, e.g. to buy/sell allowances in case of market fluctuation.

COMPLIANCE

MRV PROVISIONS Annual reporting of GHG emissions. Third-party verification is required. No further details are available at the time of writing.

OTHER INFORMATION

INSTITUTIONS INVOLVED Tianjin DRC as the main government entity is coordinating the ETS development. Other institutions include the Tianjin Climate Exchange, Nankai University and Tianjin University of Science and Technology on policy design issues and the Tianjin Low Carbon Development Research Center on MRV.

Chongqing

implementation scheduled

Chongqing finished the drafting of its implementation plan in November 2012. It has been reported that the scheme is expected to cover the following sectors: production of electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel. The scheme may also allow participants to use forest-based offset credits to meet part of their targets. The system is expected to start in 2014.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS 100 $MTCO_2E$ (2011)
OVERALL GHG REDUCTION TARGET BY 2015: –18% in carbon intensity and –17% in energy intensity, based on 2010 levels (12th Five Year Plan)

ETS SIZE

GHG COVERED CO_2 **SECTORS** Producers of electrolytic aluminum, ferroalloys, calcium carbide, cement, caustic soda, and iron and steel (not yet officially confirmed), which emit more than 20,000 t CO_2/year including both direct and indirect emissions.
NUMBER OF LIABLE ENTITIES approx. 435–600
POINT OF REGULATION The local government may include the power sector as well as other sectors that use electricity. Electricity prices are regulated in China, and a scheme based on direct emissions alone would not induce a pass through of carbon costs into the electricity price and would not incentivize demand-side management of electricity. The system may therefore consider covering the power sector upstream and other sectors downstream including both direct and indirect electricity.

PHASES AND ALLOCATION

TRADING PERIOD Two years (2014–2015)

FLEXIBILITY

OFFSETS AND CREDITS Similar to the other Chinese pilot schemes, it is expected that Chongqing will allow the use of offsets with a limit of 5–10%. Domestic project-based carbon offset credits—China Certified Emission Reduction (CCER)—are likely to be allowed. Eligibility of forestry carbon credits is likely, but no details have been published officially yet.

COMPLIANCE

MRV PROVISIONS The pilot aims to complete guidelines on carbon emissions measurement for businesses, build an enterprise emissions inventory and require verification by a third party. Penalties are not specified. Chongqing also developed a carbon emissions verification system, which includes emissions prediction and analysis, environmental impact assessments for planned projects and projects under construction and GHG monitoring methods.

OTHER INFORMATION

INSTITUTIONS INVOLVED The Chongqing Development and Reform Commission (DRC) as the main government entity coordinating the ETS development. Other government bodies and entities engaged include: the Chongqing Science Commission, the Chongqing Finance Bureau, the Chongqing Economic Commission, the Chongqing Price Bureau, the Chongqing Forestry Bureau, the State Asset Commission and the Chongqing Stock Exchange

Hubei

implementation scheduled

Hubei released its implementation plan for the Hubei ETS in March 2013 and draft legislation in August 2013. The system is expected to cover around 150 of the most carbon intensive companies in the province that account for approx. 35% of the province's total carbon emissions. The system is expected to start in 2014.

GENERAL INFORMATION

OVERALL GHG REDUCTION TARGET BY 2015: –17% in carbon intensity and –16% in energy intensity, based on 2010 levels (12th Five Year Plan)

ETS SIZE

EXPECTED EMISSIONS COVERAGE

GHG COVERED CO_2 **SECTORS** Industrial companies producing iron and steel, chemicals, cement, automobile manufacturing, electricity, nonferrous metals, glass, and paper. Companies consuming more than 60,000 tonnes of standard coal equivalent of energy per year are included in the scheme. Companies consuming more than 8,000 tonnes of standard coal equivalent are required to report their emissions. **NUMBER OF LIABLE ENTITIES** 153 **POINT OF REGULATION** The local government would like to include the power sector as well as other sectors that use electricity. Electricity prices are regulated in China, and therefore a scheme based on direct emissions alone would not induce a pass through of carbon costs into the electricity price, and therefore would not incentivize demand-side management of electricity. Therefore, the system may consider covering the power sector upstream and also including other sectors downstream including both direct and indirect electricity.

PHASES AND ALLOCATION

TRADING PERIODS Three years (2013–2015) **ALLOCATION** Allocation will be free of charge based on historical emissions, also considering sector-specific factors and early action.
Hubei will set aside no more than 15% of the total carbon allowance quota for new enterprises or investment projects, in line with its investment growth rate target of 15% for the 12th Five Year Plan (2011–2015).

FLEXIBILITY

BANKING AND BORROWING Banking is allowed within phase I (2013–2015). Borrowing is not allowed. **OFFSETS AND CREDITS** The Hubei scheme will allow emitters to use a certain amount of offset credits from projects located in the province of Hubei to meet their targets (including domestic project-based carbon offset credits—China Certified Emission Reduction (CCER)—and possibly credits from forestry projects). Covered entities can fulfill up to 10% of their compliance obligation with offset credits. **PRICE MANAGEMENT PROVISIONS** Hubei will hold 5% of total allowances for market stabilization/control purposes.

COMPLIANCE

MRV PROVISIONS The pilot aims to complete guidelines on carbon emissions measurement for businesses, build an enterprise emissions inventory and require verification by a third party. The China Quality Certification Center Wuhan Branch is carrying out some initial work on MRV. Further details on the MRV system were not available at the time of writing. **ENFORCEMENT** A fine of three times the average market price of allowances of the given compliance year applies for each allowance that was not surrendered. Additionally, twice the number of allowances that were not surrendered will be subtracted from next year's allocation and non-compliance will be made public. For other violations, the maximum fine is 150,000 CNY (approx. 18,100 EUR).

OTHER INFORMATION

INSTITUTIONS INVOLVED Hubei DRC as the main government entity is coordinating the ETS development. Other government bodies and entities engaged include the Wuhan Optical Valley United Property Rights Exchange (Hubei environmental voluntary exchange), the Wuhan Emission Reduction Association (under the Exchange), the China Quality Certification Center Wuhan Branch, the Hubei CDM Service Center, Wuhan University, Huazhong University of Science and Technology and Hubei College of Economics. **LINKAGE WITH OTHER SCHEMES** Guangdong and Hubei are considering linking their pilot schemes. However, this has not been officially confirmed at the time of writing.

Hangzhou under consideration

On Jan. 9, 2013, the Hangzhou municipal government announced its plan to introduce an ETS and published a document entitled "Interim Measures for the Management of Equivalent Carbon Emission Trading during Energy Consumption Process in Hangzhou (Exposure Draft)" for public comment. A final version was released in June 2013 and entered into force on July 19, 2013. The system will focus on energy intensive industries and will have an absolute cap. Further design details and a timetable have not been published at the time of writing.

Japan under consideration

In 2010, the Basic Act on Climate Change Countermeasures mandating the introduction of a domestic ETS passed the lower house of the parliament. Though several options have been proposed, the government decided to continue evaluating the potential impact on the Japanese economy and the impact of ETS in other countries, while taking into account existing global warming countermeasures (e.g. voluntary actions by industry) and prospects for a fair and effective international climate framework.

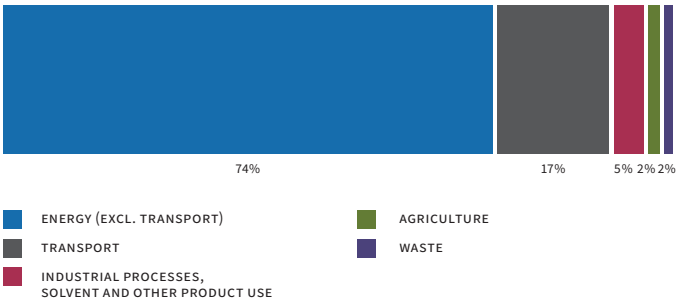
Since the Great East Japan Earthquake in 2011, Japan has focused on revising its national energy policy. In parallel, Japan is currently working on finalizing its plan on global warming countermeasures. Meanwhile Japanese companies can familiarize themselves with several voluntary cap-and-trade schemes including the Japan Voluntary Emission Trading Scheme (JVETS) introduced in 2005 by the Ministry of the Environment.

Japan participates in the Kyoto carbon market. In parallel, Japan promotes the Joint Crediting Mechanism (JCM) for the post-2012 area.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **1.341 MTCO$_2$E** (2012)[1]

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET In November 2013, Japan adjusted its GHG reduction target for 2020 from the 25% reduction from 1990 levels to a 3.8% reduction from 2005 levels, taking into account the impact of the shutdown of all 52 nuclear power plants following the Great East Japan Earthquake. This amounts to a 3.1% rise from 1990 levels, and is subject to change depending on future developments in energy policy. Japan continues to aim at achieving 80% reduction below 1990 levels until 2050 (within the Fourth Basic Environment Plan adopted in April 2012).

1 Overall GHG emissions are preliminary figures for 2012; figures for sectoral breakdown are from 2011.

Thailand

under consideration

Thailand's 11th National Economic and Development Plan (2012–2016) foresees the establishment of a carbon market. Various programs have been initiated and/or are currently under development. Among those, the Thailand Greenhouse Gas Management Organization (TGO) is looking into introducing a voluntary target-and-trade scheme for energy efficiency certificates—the Energy Performance Certificate Schemes (EPC)—as part of its activities under the Partnership for Market Readiness (PMR). Based on this experience, Thailand plans on establishing a mandatory emissions trading scheme (ETS) for greenhouse gases (GHG). Thailand intends to use PMR funding to help lay the legal groundwork for a future ETS. At the time of writing, TGO also has plans to launch a voluntary GHG ETS in October 2014 in preparation of a potential future mandatory ETS.

Other programs under development include: a domestic project-based GHG crediting mechanism, the Thailand Voluntary Emission Reduction (T-VER), was at the time of writing expected to be officially launched by the end of 2013; and the Low Carbon Cities program (LCC), a GHG crediting mechanism to be developed as part of its activities under the PMR and to be integrated into the T-VER program. Further, a carbon offsetting program (T-COP) was launched in August 2013 to facilitate corporate social responsibility activities in the private sector.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **331.4 MTCO$_2$E** (2009)

OVERALL GHG REDUCTION TARGET Thailand is not listed in Annex B of the Kyoto Protocol and as such has no mandatory GHG reduction target under the Convention.

Pacific

New Zealand

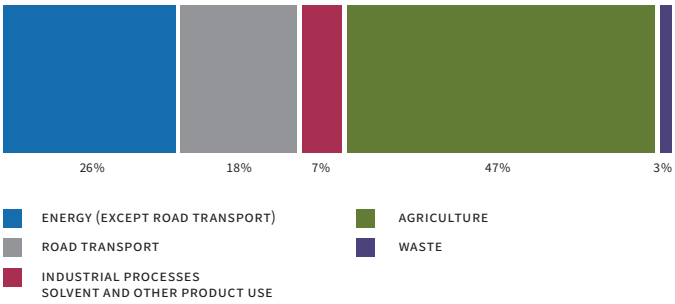
in force

New Zealand launched its emissions trading scheme (NZ ETS) in 2008, with forestry the first sector be included in the program. Additional sectors were phased in over time: liquid fossil fuels, stationary energy and industrial process entered in 2010. In 2013, waste and synthetic GHG were also included in the scheme. Agriculture currently has a reporting obligation. A statutory review of the ETS was completed in 2011; amendments passed into law in 2012.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS 73 $MTCO_2E$ (2011)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET **BY 2012:** Stabilization at 1990 GHG levels (Kyoto Protocol) **BY 2020:** –5% below 1990 GHG levels (unconditional target) **BY 2050:** –50% below 1990 GHG levels

ETS SIZE

ETS CAP If auctioning is introduced, then a cap will be set on the total supply of allowances (including both the freely allocated units and the units to be auctioned).

CURRENT EMISSIONS COVERAGE

GHG COVERED CO_2, CH_4, N_2O, SF_6, HFC, PFC
SECTORS **FORESTRY** (mandatory: pre-1990 forest land, voluntary: post-1989 forest land), **STATIONARY ENERGY** (various thresholds), **INDUSTRIAL PROCESSING** (no threshold except for producers of gold: >5000t CO_2e/year), **LIQUID FOSSIL FUELS** (various thresholds), **WASTE** (except for small and remote landfills), and **SYNTHETIC GHGS** (various thresholds).
NUMBER OF ENTITIES As of June 30, 2013, 2,880 entities registered: 221 entities with mandatory reporting and surrender obligations, 79 entities with mandatory reporting obligations only and 2,580 entities with voluntary reporting and surrender obligations (mostly for forestry removal activities). **POINT OF REGULATION** Generally upstream point of obligation (such as miners, importers and producers). Some large businesses that purchase directly from mandatory participants can choose to opt in to the NZ ETS.

PHASES AND ALLOCATION

COMPLIANCE PERIOD One year
TRADING PERIODS There are no phases per se in the NZ ETS, but year-on-year allocations and surrender obligations. **ALLOCATION** Intensity based allocation: 90% for highly emissions-intensive and trade exposed activities (1600 t CO_2e per 1 million NZD of revenue). 60% for moderately emissions-intensive and trade exposed activities (800 t CO_2e per 1 million NZD of revenue). 3.47 million units were allocated in 2011, compared to 16.34 million units surrendered during the 2011 surrender period.
Two sectors received one-off free allocation of allowances: Owners of pre-1990 forestry to compensate for a decrease in land value, and fishing quota owners to make up for rising fuel costs. Participants in the liquid fossil fuel, energy, industrial, waste and synthetic gas sectors are only required to surrender one unit for every two tonnes of emissions produced.
A recent amendment to the NZ ETS has introduced an express regulation-making power to allow the auctioning of allowances within an overall cap on the number of units auctioned and freely allocated.

FLEXIBILITY

BANKING AND BORROWING Banking is allowed except for those units that were purchased under the fixed price option (see below under provisions for price management). Borrowing is not allowed. **OFFSETS AND CREDITS** International units allowed in NZ ETS: ERUs, RMUs and CERs from the first commitment period of the Kyoto Protocol until the end of its true up period (expected in May 2015). Carry-over provisions are still under discussion. Kyoto units from the second commitment period are not allowed in the NZ ETS, with the exception of primary CER units.
Qualitative limit: CERs and ERUs from nuclear projects, long-terms and temporary CERs from afforestation and deforestation, and non-NZ originated AAUs are ineligible for surrender. CERs and ERUs from HFC-23 and N_2O destruction projects, and CERs and ERUs from large-scale hydroelectricity projects are also banned from the NZ ETS.
Quantitative limit: Unlimited use, except that under the first Kyoto Commitment Period, New Zealand is required to hold at least 90% of its initial assigned amount in the registry (approx. 280 Mio. units—AAUs, CERs, ERUs or RMUs).
Since January 2013, pre-1990 forest landowners have the option to offset deforestation on their land by planting an equivalent new forest elsewhere in New Zealand (under given conditions). **PROVISIONS FOR PRICE MANAGEMENT** 25 NZD fixed price option (approx. 16 EUR), functions as a price ceiling.

COMPLIANCE

MRV PROVISIONS Annual self-reporting. Verification by a third party is required only when participants apply for use of a unique emission factor.
ENFORCEMENT An entity that fails to surrender emission units when required to, or surrenders less units than required to, will have to surrender or cancel units and pay a penalty of 30 NZD (approx. 20 EUR) for each excess emission unit. In addition:
Fine up to 24,000 NZD (approx. 15,300 EUR) 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.
Fine up to 50,000 NZD (approx. 31,800 EUR) for knowingly altering, falsifying or providing incomplete or misleading information about any obligations under the emissions trading scheme, including emissions return.
Fine up to 50,000 NZD (approx. 31,800 EUR) and/or imprisonment of up to 5 years for deliberately lying about obligations under the NZ ETS to gain financial benefit or avoid financial loss.

OTHER INFORMATION

INSTITUTIONS INVOLVED Primarily, the Ministry for the Environment. The Environmental Protection Authority and the Ministry for Primary Industries are also involved.

Australia

in force

Australia's former Government introduced an emissions trading scheme (also known as the Carbon Pricing Mechanism), which started on July 1, 2012. The Carbon Pricing Mechanism became law in November 2011 as the Clean Energy Act (2011).

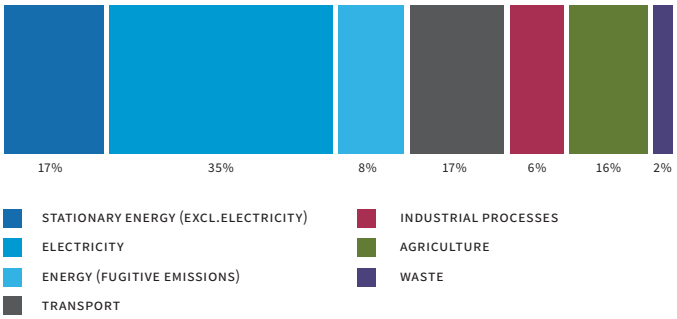
The legislation required the Carbon Pricing Mechanism to start with a three-year fixed price period (2012–2015) and then transition to a fully flexible emissions trading scheme in July 2015.

On Sept. 7, 2013 a new Government was elected with a policy to repeal the Carbon Pricing Mechanism and replace it with a Direct Action Plan. On the Nov. 13, 2013, the Government introduced draft legislation to repeal the Carbon Pricing Mechanism. Until the repeal legislation passes both Houses, the CPM will remain law.

GENERAL INFORMATION

OVERALL GREENHOUSE GAS EMISSIONS **552 $MTCO_2E$** (Year to December 2012)

GHG SECTORAL BREAKDOWN



OVERALL GHG REDUCTION TARGET **BY 2012:** 108% of 1990 GHG levels (Kyoto Protocol CP1) **BY 2020:** Unconditional target: –5% of 2000 GHG levels; Conditional target: –15% to –25% of 2000 GHG levels; **BY 2050**: –80% below 2000 GHG levels

About ICAP
introducing the International Carbon Action Partnership

Members (as of 2014)
Arizona, Australia (CPM), British Columbia (WCI), California (WCI/CA ETS), Denmark (EU ETS), European Commission (EU ETS), France (EU ETS), Germany (EU ETS), Greece (EU ETS), Ireland (EU ETS), Italy (EU ETS), Maine (RGGI), Manitoba (WCI), Maryland (RGGI), Massachusetts (RGGI), Netherlands (EU ETS), New Jersey, New Mexico, New York (RGGI), New Zealand (NZ ETS), Norway (EU ETS), Ontario (WCI), Oregon, Portugal (EU ETS), Québec (WCI/QC ETS), Spain (EU ETS), Tokyo Metropolitan Government (TMG ETS), Vermont (RGGI), United Kingdom (EU ETS) and the state of Washington

Observers
Japan, Kazakhstan, Republic of Korea, and Ukraine

ICAP is the only multilateral forum focusing exclusively on cap-and-trade systems for GHG mitigation, thereby promoting detailed technical discussions on design and compatibility issues. ICAP aims to contribute to the global effort to create a global carbon market.

ICAP is a partnership made up of public authorities and governments that have established or are actively pursuing carbon markets through mandatory cap-and-trade systems with an absolute cap. The partnership provides a forum to share knowledge and experiences and discuss important issues in the design and implementation of emissions trading schemes (ETS) and the way forward to a global carbon market.

ICAP brings together countries, regions, states, provinces and cities. It was established in Lisbon, Portugal on Oct. 29, 2007 by leaders of more than 15 governments. The partnership now counts 30 full members and four observers (as of January 2014). The ICAP Secretariat is based in Berlin, Germany.

Mission

- Share best practices and learn from each other's experiences with ETS
- Help policy makers recognize design compatibility issues and opportunities at an early stage
- Facilitate possible future linking of trading programs
- Highlight the key role of cap-and-trade as an effective climate policy response
- Build and strengthen partnerships among governments

Technical dialog

ICAP organizes regular public conferences and internal workshops on important ETS design issues, in particular with respect to preparing for potential future linkages between systems (e.g. benchmarking, market oversight, monitoring and compliance, auctioning, and offsets).

Events typically bring together representatives from ICAP jurisdictions, international and local experts to share experience on technical issues and to reflect on steps ahead to build a robust global carbon market.

Outreach activities

ICAP builds capacity for emissions trading.

Since 2009, ICAP has held courses on emissions trading for developing countries and emerging economies. They provide an intensive ten day to two week introduction to all aspects of the design and implementation of emissions trading systems as a tool to mitigate greenhouse gas emissions. For each course, between 25 and 30 highly qualified participants are selected. Applicants include policymakers and stakeholders from the non-governmental, academic and private sectors.

ETS knowledge sharing

ICAP contributes to the dissemination of information on existing and planned emissions trading schemes for GHG mitigation.

Knowledge platform on the ICAP website

Launched in December 2012 and updated regularly, the ICAP Interactive ETS Map is a unique online tool that follows developments in jurisdictions that have implemented or are actively pursuing the implementation of carbon markets through cap-and-trade systems. The ETS Map provides concise information on key elements of these schemes, such as their size, allocation methods, flexibility provisions, and compliance.

Background information and various aspects of cap-and-trade design are also explained on the ICAP website, giving interested readers a starting point to find further information about the choices involved in establishing an ETS.

www.icapcarbonaction.com

2013 was a particularly dynamic year for emissions trading worldwide. The 2014 Status Report by the International Carbon Action Partnership (ICAP) combines contributions by policymakers and carbon market practitioners with detailed, up-to-date factsheets on all programs in force or currently under consideration around the globe.

International Carbon Action Partnership