

Technical Note 2 | April 2012

Domestic Emissions Trading

Existing and Proposed Schemes

This document provides an overview and summary assessment of lessons and insights learned from various existing and proposed domestic cap and trade schemes. For each scheme, a set of general characteristics (or issues) is considered.

The characteristics (or issues) covered include the following:

- Coverage and scope
- Setting a cap
- Setting the points of obligation
- Allocation of allowances
- Systems for domestic monitoring, reporting and verification (MRV) and compliance
- Enabling trading and fostering stability
- Institutional arrangements, including technical and legal infrastructures
- Use of offsets and linking

The domestic emissions trading schemes included in this assessment are the following:

- European Union ETS (EU ETS)
- New Zealand ETS (NZ ETS)
- US northeast states Regional Greenhouse Gas Initiative (RGGI)
- California ETS (CalETS)
- Australia “Clean Energy Future” Carbon Pricing Mechanism (AusCPM)
- Tokyo Cap and Trade Program (TokyoC&T)

Resource materials are available at the following websites:

On EU ETS : http://ec.europa.eu/clima/policies/ets/index_en.htm

On NZ ETS : <http://www.climatechange.govt.nz/emissions-trading-scheme/>

On RGGI : <http://www.rggi.org/rggi>

On California ETS : <http://www.arb.ca.gov/regact/2010/capandtrade10/capandtrade10.htm>

On Australia Carbon Pricing Mechanism: <http://www.cleanenergyfuture.gov.au/>

On Tokyo Can and Trade Program: http://www.kankyo.metro.tokyo.jp/en/climate/cap_and_trade.html

Comprehensive IEA study on current and proposed emissions trading schemes:
http://www.iea.org/papers/2010/ets_paper2010.pdf

On Offsets: *Carbon Offset Research and Education (CORE)*, Stockholm Environment Institute and Greenhouse Gas Management Institute, homepage <http://www.co2offsetresearch.org/>

Coverage and Scope

The term “coverage” is intended in the macro sense of geographies, sectors and timing. “Scope” is intended in the micro sense of emissions sources (e.g., size thresholds) and perhaps institutions or entity types.

Coverage and scope define the boundary of a scheme, i.e. what emissions (and removals) sources are included. In deciding on this, policy makers need to balance a number of key issues:

- What are the important sources of emissions (and removals) of greenhouse gases (GHG)?
- Is a price-based mechanism likely to be an effective and efficient mitigation policy instrument?
- Is it feasible to engage emitters in legal obligations, measuring and reporting emissions and trading allowances at a cost that is affordable, given the scale of the outcomes that are sought?
- What are the ‘political economy’ circumstances of including or not including specific sources?

The coverage and scope of the five schemes reviewed reflect different national circumstances in responding to these questions.

EU ETS:

- Covers 30 countries (27 EU member states plus Iceland, Liechtenstein and Norway).
- Covers about 45% of the EU’s total CO₂ emissions and includes about 11,000 installations.
- Organised in phases, 2005-2007 (pilot phase), 2008-2012, 2013-2020 etc.
- Phase 1 (2005-2007) and Phase 2 (2008-2012) cover CO₂ emissions from fuel combustion activities (with a thermal input capacity > 20 MW) and five major industries: oil refineries, coke ovens, iron and steel, cement, glass and ceramics, and pulp and paper.
- CO₂ emissions from aviation (domestic/intra-EU and arriving and departing international flights) are covered from 2012.
- In Phase 3 (2013-2020) CO₂ emissions from bulk organic chemicals, ammonia and aluminium industries are to be included, as well as N₂O from certain production processes and PFC from aluminium production.

NZ ETS:

- Covers all Kyoto Protocol GHG and all sectors, with staggered entry:
 - From 1 January 2008, emissions from deforestation.
 - From 1 July 2010, emissions from energy, transport and industry (non-synthetic gases) sectors.
 - From 1 January 2013, emissions from industry (synthetic gases) and waste sectors.
 - From 1 January 2015, emissions from agriculture sector (if at processor level).^a
^a subject to ETS Review, including if should be at farm level.
 - From 1 January 2008 on voluntary opt-in basis, removals from post-1989 forest lands (and subsequent matching emissions on harvest, as applicable).
- Virtually the entire economy will be covered by 2015.

RGGI:

- Covers 10 northeast states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont).
- Covers 2009 - 2018 with an initial 3 year compliance period 1 Jan 2009 - 31 Dec 2011.
- Covers CO₂ emissions from fossil-fuel powered electricity generating plants ≥ 25MW (currently 209 facilities region-wide).

CalETS:

- Cap-and-trade regulation became effective on 1 January 2012.
- Compliance obligation for GHG emissions to start on 1 January 2013.
- Covers period 2013 – 2020, in three three-year compliance periods.
- Over time will cover all major sources, representing 85% of California’s GHG emissions.

- Covers about 350 businesses, representing 600 facilities.
 - Starts in 2013 for electric utilities and large industrial facilities.
 - Starts in 2015 for distributors of transportation, natural gas and other fuels.

AusCPM:

- Australia's Clean Energy Legislative Package provides a pathway to introduce a carbon price.
- The Carbon Pricing Mechanism begins on 1 July 2012 as a fixed price carbon 'levy' (permits initially sold at A\$23/tonne CO₂ and increasing by 2.5% a year in real terms).
- From 1 July 2015, transitions to a cap and trade scheme where market sets price (with a price ceiling and floor for the first 3 years of the flexible carbon price period).
- Covers CO₂, methane, nitrous oxide, and PFCs from aluminium smelting.
- The Carbon Pricing Initiative is expected to cover about 500 businesses operating in Australia. Most operate large emitting facilities (i.e., those generating over 25,000 tonnes CO₂e per annum). They account for about 60% of Australia's GHG emissions.
- Covers stationary energy, industrial processes, fugitive emissions (except decommissioned coal mines), and emissions from 'non-legacy waste'.

TokyoC&T:

- The TokyoC&T was launched in April 2012 by the Tokyo Metropolitan Government (TMG). It is Japan's 1st cap-and-trade emissions trading scheme and the world's 1st urban cap-and-trade program to cover buildings.
- It covers approximately 40% of Tokyo's commercial and industrial sector's emissions (and about 20% of Tokyo's total CO₂ emissions), representing about 1000 commercial and institutional buildings and 300 industrial facilities (with annual energy consumption of at least 1,500 kl of crude oil equivalent).

Miscellaneous notes

- For schemes that allow delayed entry of sectors, a period of mandatory emissions reporting (e.g., 6 months or 1 year) prior to the start of the obligatory surrender of allowance is common.

Setting a cap

For a cap and trade scheme, the cap is the number of 'allowances' (or units) that is available for a given compliance period. The purpose of the cap is to set the environmental objective of the scheme, that is, the scale of emission reductions sought from sources within the boundary during a given compliance period. The total amount of allowed emissions in a given period will be the sum of the cap plus the total allowed amount (if any) of external offsets, i.e., credits generated from activities outside the boundary of the scheme. In this context, removals credits under Articles 3.3 and 3.4 of the Kyoto Protocol can be seen as offsets, as they add to the overall Kyoto cap. Articles 3.3 and 3.4 outline provisions related to the sources and removals by sinks resulting from human-induced, land-use change and forestry activities (LULUCF) in Annex I parties. CDM credits are also offsets.

In a multi-jurisdiction scheme (e.g., the Kyoto Protocol which includes all Annex B (developed) countries that ratified), the cap is the sum of the individual country targets. The country targets can be seen as initial grandfathered (gratis) allocations of allowances, so are not caps *per se* (though, this term is sometimes used).

For countries under the Kyoto Protocol cap and trade scheme that, in turn, have implemented domestic entity-level cap and trade schemes, the design of the scheme determines whether there is a separate initial cap for the 'nested' entity-level scheme (e.g., there is no separate cap in the case of the NZ ETS).

For a given cap and trade scheme, the cap (plus the level of any allowed offsets) is one of the two core elements that determines demand (and, in turn, the value of carbon). The other core element is the reference ('anyway') level of emissions expected to occur. The 'scarcity' of the market commodity (the allowances), which gives carbon a value and drives emission reductions (or removal), is the difference between the cap and the reference emissions. In the absence of any permit carryover (banking) provisions to subsequent compliance periods, an overly generous cap that proves to be higher than the reference emissions will lead to the allowances having zero value. This occurred in the EU ETS Phase 1.

All the caps in the schemes reviewed are set on an absolute tonnes basis. (This should not to be confused with the subsequent allocation of allowances, where a variety of absolute and relative approaches are taken. See

the following section.)

The effects of complementary policies and measures to the ETS (e.g., on energy efficiency or renewable energies) should be considered for the cap setting.

Schemes address Cap setting as follows:

EU ETS:

- For Phase 1 and Phase 2, each EU member state developed a national allocation plan that was subsequently reviewed and approved by the European Commission based on criteria laid down in the basic legislation (EU ETS Directive) and guidelines developed by the Commission.
- In Phase 3 the scheme transforms to an EU-wide cap based on the cap for Phase 2 and a linear reduction factor of 1.74% annually from 2010 onwards (going beyond the end of Phase 3 in 2020).
- The EU's combined goals on GHG gas emission reductions and expansion of renewables (which is subject to other policies and measures) were reflected explicitly when the cap was set.

NZ ETS:

- There is no separate ETS cap in New Zealand; instead, it is nested within that of the Kyoto Protocol.

RGGI:

- The cap is the sum of all allocations provided at the member states level. The objective for the period 2009-2014 is to stabilize emissions from the covered sources at an initial set level (of 188 million short tons per annum) and then have this decline at 2.5% per annum over 2015-2018.

CalETS:

- In 2013, the cap is set at about 2% below emission level forecast for 2012. It declines by 2% in 2014 and declines again by about 3% annually from 2015 to 2020. The overall objective of the scheme is to contribute to the reductions needed to achieve the goal set under the California Assembly Bill (AB32), which requires California to return its GHG emissions to 1990 levels by 2020.

AusCPM:

- During the first 3 years (July 2012-July 2015), when the price of carbon units is fixed, emissions will not be capped. Thereafter, the government will set an annual cap. The extent of the cap will be based on advice from the Climate Change Authority and will be consistent with Australia's downward emissions trajectory (Australia's unconditional commitment to reduce its GHG emissions by 5% compared to 2000 levels by 2020).

TokyoC&T:

- The cap for the first compliance period (fiscal year 2010 to fiscal year 2014) aims to reduce total emissions from capped sectors by 6% from base-year emissions. The second compliance period (fiscal year 2015 to fiscal year 2019) will include a stricter cap (expected to be a 17% reduction; it will be fixed during the 1st compliance period).
- The TokyoC&T is a key measure for the TMG to achieving its target of reducing Tokyo's GHG emissions by 25% below 2000 levels by 2020.

Setting the *points of obligation*

Setting the *points of obligation* means defining those entities that will have the legal requirement to surrender allowances against the emissions for which they are held responsible. This might either be the point where GHGs are released into the atmosphere (e.g., in the case of a fossil fuel power plant or a cement plant), or it could be emissions that occur downstream through the use of a product (e.g., petroleum products in the transportation sector or natural gas for heating businesses and homes).

Schemes address setting points of obligation as follows:

EU ETS:

- Points of obligation are essentially downstream. They include medium and large sources of emissions.

NZ ETS:

- Points of obligation in the energy sector are essentially upstream, i.e., at the point when fossil fuels are introduced into the economy. However, some large downstream emitters (e.g., fossil fuel fired

electricity generators) can elect to become points of obligations. The point of obligation for industrial processes (e.g., cement plants) is downstream.

RGGI:

- Points of obligation are fossil fuel fired electricity generators.

CalETS:

- Points of obligation are essentially downstream. They include large sources of emissions.

AusCPM:

- Points of obligation are essentially downstream. They include large sources of emissions.

TokyoC&T:

- Points of obligation are downstream, on commercial buildings, district cooling & heating facilities, as well as commercial buildings using district heating and cooling and factories.

Allocation of allowances

Allocation is a critical step in any cap and trade scheme. It is what sets the distribution of costs of an ETS across participants and societies as a whole. Because of this, it is can be highly political and potentially contentious as various entities lobby the government seeking to best protect their interests. Approaching allocation, therefore, usually reflects decisions made regarding the points of obligation.

There are two main methods of allocation: (1) gratis allocation of allowances, either based on historic emissions (sometimes referred to as 'grandfathering'), or based on benchmarks (tons of CO₂ per unit of product); and (2) selling allowances, e.g., at an auction conducted by the administrator of the ETS scheme. It is also possible to have a hybrid of these approaches, e.g., the case of the NZ ETS.

A key consideration when deciding on the allocation approach is whether the point of obligation is able to (and likely will) pass on the cost (including the opportunity cost) of the allowances to some other party. If this is likely and the point of obligation is provided the allowances gratis, then the point of obligation is in a position to make a windfall profit from the scheme. Note that the solution is not to prevent firms from passing the costs on. A key purpose of a market mechanism like an ETS is to send price signals into the market for products and services. This helps stimulate efficiency responses, which are important to elicit.

Another effect of providing allowances gratis is that their value shows up as an asset on balance sheets. This can provide a point of obligation an opportunity to capitalise on a larger asset sheet for the period prior to the surrender of allowances. This may be good for the point of obligation, but detrimental to others.

These market distortions can lead to significant wealth transfers between groups of firms, which can be detrimental to economies and can lead to a political backlash following the introduction of an ETS. This is another lesson learned from the first two phases of the EU ETS. In that scheme, member countries' allocation was primarily grandfathered to points of obligation.

Given the ability to pass on the costs of carbon, a scheme could allow the gratis allocation to entities other than those that are regulated in order to provide compensation on the consumer side.

Auctioning allowances, or requiring points of obligation to buy allowances in the market (e.g., the NZ ETS), is generally a preferred approach to allocation. But this can be challenging when the points of obligation cannot easily pass on the cost, e.g., if they face competition from others in jurisdictions that do not face a carbon cost. In these cases, the provision of some level of gratis allowances can be a means of compensation. It might also be the case that a firm other than the point of obligation (for example, a firm further downstream) faces costs that cannot be passed on due to 'across border' competitiveness concerns. To address this situation, gratis allowances can also be made to firms that are not points of obligation.

Another important aspect of auctioning is that it can provide governments with revenues that can be used to invest in climate change mitigation actions and to address social issues that result from increased energy prices following the implementation of an ETS.

In multi-period schemes the gratis allocation of allowances is not only a distributional issue and can significantly distort the uniform price on carbon across the regulated entities. Thus gratis allocation based on product-specific benchmarks as an alternative to gratis allocation based on historical emissions has raised

increasing interest.

Schemes address the allocation of allowances as follows:

EU ETS:

- The allocation approach in Phases 1 and 2 was primarily gratis based on member countries' national allocation plans (at least 95% of allowances in Phase 1 and 90% of allowances in Phase 2 should be allocated gratis); however, following concerns of carbon price distortions and windfall profits among electricity generators during Phase 1, some countries, such as Germany, introduced some level of auctioning in Phase 2.
- From the start of the third trading period in 2013, auctioning will progressively replace gratis allocation as the main method for allocating allowances to all EU ETS sectors except aviation. In particular, electricity generators will not receive any EU allowances gratis (with the potential exception of those in 10 new EU member states that may continue to allocate limited volumes of allowances gratis for a few years in Phase 3). All other installations will receive free allocation based on product-specific benchmarks derived from the 10% best installations within the EU

NZ ETS:

- Points of obligation are required to buy allowances (New Zealand Units (NZU) and Kyoto compliance units) in the market.
- Until the end of 2012, points of obligation are only required to submit 0.5 NZUs for each tonne of CO₂e. Also, they can choose to buy NZUs at NZ\$25/unit from the government.
- As compensation for increased energy prices, firms in sectors considered to be at-risk for weakened competitiveness internationally, receive a gratis allocation of NZUs based on an intensity factor (e.g., 1.06 NZUs per tonne of bell pepper produced). Similarly, industrial process firms that are points of obligation and deemed competitiveness-at-risk are provided with some level of gratis allocation.
- The level of emissions intensity of production for industrial sectors required to receive an allocation is set out in legislation, being 800 tonnes of CO₂ per million NZ dollars of revenue to receive a 60% rate of allocation, and 1,600 tonnes of CO₂ per million NZ dollars of revenue to receive a 90% rate of allocation.
- Owners of post-1989 forests can receive gratis NZUs for CO₂ removals (sequestration) occurring from 1 January 2008.

RGGI:

- While RGGI rules require member states to auction at least 25% of allowances, overall member states have elected to distribute 90% of allowances through quarterly auctions (with revenues from auctioning directed at consumer benefits: energy efficiency, renewable energy, and other clean energy technologies).

CalETS:

- For large industrial facilities, allowances are initially provided gratis, based on industry benchmarks. Over time, allowances will be auctioned.
- For electric utilities, allowances are provided gratis, with value of allowances to benefit ratepayers. Allowances will be set at about 90% of average emissions computed from recent data.

AusCPM:

- Permits (allowances) will be allocated by auctioning, taking into account transitional assistance provisions for key sectors (allocations of gratis permits based on intensity formulas, and potentially cash payments).
 - All revenue from the carbon price will be used by the government to (i) assist households; (ii) support competitiveness; and (iii) invest in clean energy and climate change programs.

TokyoC&T:

- Allowances are freely allocated at the beginning of each compliance period, according to the grandfathering method based on past emissions.
- New office buildings and other new entrants built after fiscal year 2010 are allocated allowances from a new entrants reserve free of charge.

MRV and Compliance

The functioning of a cap and trade scheme relies on the following core pillars:

- that the commodity is secure within its supply and demand boundaries, i.e., that units created are genuine and the emissions that will 'consume' the commodity are properly measured and accounted;
- that points of obligation comply with their obligations – and that governments enforce these requirements, including with penalties sufficiently high that the cost of non-compliance for entities is much greater than the benefits they can derive by not complying;
- that there is transparency and publicly available information on GHG emissions; and
- that the market has visibility of demand and supply and transaction prices, including so that entities can make the judgement when it is cheaper for them to mitigate and when it is cheaper to buy units – the fundamental 'least cost' point of the use of price-based instruments like cap and trade schemes.

Schemes address MRV and compliance as follows:

EU ETS:

- Common MRV rules are set out through 'MRG' guidelines developed by the European Commission for all source types covered in the EU ETS.
- Point of obligation entities must have approved monitoring plans as part of their permits to operate
- Member countries have national emissions authorities responsible to ensure monitoring, third-party verification and reporting of the emissions of point of obligation entities, based on activity data and emissions factors; public release of emissions is done annually on an installation level.
- Allowances are held in national registries in Phases 1 and 2; from Phase 3 these registries will be transferred to an EU-wide registry.
- The penalty for a point of obligation failing to retire sufficient allowances is €100/tonne plus the make-up of the short allowances.

NZ ETS:

- MRV rules are set out in regulations under the legislation.
- Points of obligation ('participants') must collect the data and information prescribed and must use prescribed methodologies to calculate their emissions; third party verification is not required, but participants can be audited (this follows general practice for tax returns in New Zealand).
- Reporting of emissions by participants is done on an annual basis (by 31 March for emissions in the previous calendar year).
- Units (NZUs and other accepted Kyoto compliance units) must be surrendered for the previous year's emissions by 31 May.
- Units are held in the national units registry.
- The penalty for a point of obligation failing to retire sufficient units is NZ\$30/unit plus the make-up of the short units. A fine regime (of up to NZ\$50,000 for firms) exists for any wilfully false declarations and a participant can face imprisonment for up to five years for deliberately lying about obligations under the NZ ETS to gain financial benefit or avoid financial loss.

RGGI:

- Common MRV rules are set out through a RGGI 'Model Rule' and enacted through legislation and regulations in the member states.
- Monitoring is done on a quarterly basis and reported within 30 days of the end of each quarter.
- The surrendering of allowances is done at the end of the three compliance period (first ends on 31 December 2011).
- Allowances are held in the RGGI CO₂ Allowances Tracking System.
- Penalties for non-compliance are determined by each member state – and are of the order of 3:1.

CalETS:

- Capped industries must continue to report emissions annually (as required since 2008).
- Independent third-party verification of reported emissions.
- If deadline for surrendering allowances is missed or there is a shortfall, four allowances must be provided for every ton of emissions that was not covered in time.

- The program includes mechanisms to prevent market manipulation.

AusCPM:

- MRV and compliance rules will be set out in regulation and the market oversight system managed by a new Clean Energy Regulator that will begin operating in April 2012.

TokyoC&T:

- Covered facilities are obliged to report GHG emissions in the previous fiscal year to the governor and to disclose such data every fiscal year. (Penalties apply to facilities that fail to meet their reporting and disclosure obligations.)
- GHG emissions are verified by a third-party agency registered with the governor of Tokyo.

Emissions trading periods; Enabling trading and fostering stability

Cap and trade schemes take time to design and implement. Most schemes have had some form of soft ‘take-off’. This normally entails a period in advance of the first compliance period where points of obligation begin to monitor and report emissions following the scheme’s rules. This can start with a voluntary period, then a mandatory period, e.g., 6 months each in the year prior to when emissions carry the obligation to be matched with units.

During this start-up phase, the scheme can also be readying other key elements of ‘the architecture’, e.g., the allocation rules and process and units registry, including the legal framework by which the scheme will be given force and the regulatory authority that will manage it.

Regarding compliance periods, the key issues are:

- How long should compliance periods be? And should more than one be established at the outset?
- When are points of obligation required to surrender units equal to their emissions – periodically through the compliance period or just at the end? If periodically, is this timing specifically connected to when emissions are to be reported? And to when allowances are allocated (whether gratis or by auction)?
- Can unused allowance allocations be carried over to the next period? Will this also apply to possible voluntary, trial or pilot phases?
- Will there be phased entry of sectors? If so, how can emissions reporting and allowance allocations for new sectors be managed to ensure an entry that is as seamless as possible into the market and that minimizes price volatility?

One key issue with respect to ‘market stability’ are fears (of some) about prices for allowances becoming too high – or too low. Are mechanisms needed to address these concerns?

Another key issue is the extent to which the government (and scheme regulating authority) will play an active role in helping the broader set of players get ready (usually from the private sector that typically become integral parts of a well functioning market). These include:

- Forums for buyers and sellers to connect with each other, which can range from formal carbon trading exchanges to web-based platforms accessible from smart phones.
- Legal services, to provide contracts needed by buyers and sellers (noting that buying and selling will often occur on a forward basis prior to the allocation of allowances).
- Insurance services, to address and spread risks if something does not happen as expected.
- Market information services that provide details of trading activity, and prospective activity, given trends in underlying fundamentals that lead to demand and supply.
- Consulting services for how to mitigate carbon risks or capture carbon opportunities.

Or can a more hands-off “build it and they will come” approach be adopted?

Insights available from the schemes on emissions trading periods include:

- It has been common to have a number of multi-year periods. (See section on “Coverage”).
- Carryover of surplus allowances to a following period is normally allowed. This is considered a key means to incentivize over-compliance in early trading periods, especially if caps will be progressively tightened. Where this did not happen in the case of the EU ETS Phase 1, this was one of the reasons (along with over-allocation because the cap was established and the scheme started before there was a good understanding of the expected reference level emissions) that the price collapsed to zero by the end of the period. However, the arguments on allowing banking or not must be balanced between the consequences of trial and error during the take-off and the implications of non-banking.
- The practice is normally to have annual surrender of allowances by points of obligation following a period of time (e.g., 1 - 3 months) after their annual emissions reports are provided. In RGGI, the fact that surrender does not happen until the end of the first three-year compliance period is one reason given (by some market observers) for the low levels of trading activity in the early years of the scheme.
- A lesson from both the EU ETS and NZ ETS is that care needs to be taken in the early stages to better match the flow of supply of allowances with the demand-side compliance surrender dates, although this also depends on the schemes’ rules on the use of offsets (e.g., CDM credits) and the availability of these. Liquidity (an adequate supply of units in the market) and information on emissions and allocations are important for markets to work effectively, including providing price discovery so the market price signal is visible and guides investment decisions.
- Where the scheme includes multiple sectors, it has been usual practice to use a phase-in approach.
- The NZ ETS and the contemplated AusCPM both include a price control mechanism, essentially the option of buying allowances from the government at a specific price. In the case of the NZ ETS, this mechanism has proven to be unnecessary. The price of units in the market has always been lower than the price cap (currently around 60%). In the AusCPM, a price ceiling and floor will apply for the first 3 years of the flexible carbon price period (2015-2018). The price ceiling will be set at A\$20 above the expected international price and will rise by 5% in real terms each year. The price floor will be A\$15, rising by 4% each year in real terms. In RGGI, there is a price floor (minimum price) for allowances being auctioned and auction prices have hovered just above this floor – because of what appears to have been an overly generous cap, including in light of lower emissions because of depressed economic activity in the region since 2008.
- A ‘hands-off’ approach has generally been taken with respect to the readiness of the more ancillary private sector market players.

Institutional arrangements, including technical and legal infrastructures

Cap and trade schemes need to be set in some form of legal framework. Like any market commodity, carbon derives its value through scarcity and this relies on rules requiring emitters to match their emissions with allowances and face penalties if they do not. Moreover allowances have a value and trading in them can represent wealth transfers between private sector players and between the private sector and governments.

There are three key classes of issues requiring institutional arrangements:

- **Policy setting** – e.g., what sectors to include, what should the cap be, who should be considered as points of obligation, what method of allocations should be employed, what methods should be adopted for monitoring and reporting emissions and compliance obligations, what methods of compensation should be employed for firms and households disproportionately (and unacceptably) impacted by increases in the cost of energy and other commodities, how should any revenues (e.g., from government auctions of allowances) be distributed? These are not just one-off issues only to be addressed at the start-up of a scheme. The initial scheme settings dealing with these issues may require programmed periodic review
- **Operational** – e.g., implementing the monitoring and reporting methods with points of obligation,

establishing and operating the units registry, establishing and implementing (and enforcing) the compliance regime, managing the compensation disbursements

- **Market oversight** – e.g., implementing provisions to avoid abuse of market power and fraud within the carbon market – preferentially compatible with, or integrated in the provisions set up for, other commodity and financial markets

For schemes involving multiple independent legal/sovereign jurisdictions (e.g., the EU ETS and RGGI), there is also the institutional issue of how these can operate within a common or harmonised framework.

Insights available from the schemes on institutional arrangements include:

- There is normally a separation of institutions between policy and operations. In particular, the process for cap setting should be separate from the process for allocation.
- This may involve existing institutions or require the set up of new fit-for-purpose institutions. The units (and emissions) registry is a critical institutional function and is central to the operational integrity of the scheme.
- The way in which verification is handled reflects other aspects of the legal systems in the specific jurisdictions, e.g., in New Zealand where the tax system involves self reporting following standard guidelines, the possibility of audits, strict fines and the possibility of prison sentences for wilful misreporting.
- Third-party verification requires an early phase-in of provisions for preparation and accreditation of verification service providers.
- In multi-jurisdiction schemes there is usually a central third-party body that develops the rules and guidelines, and requires (or encourages) the individual jurisdictions to follow these rules and guidelines e.g.,
 - in the case of the EU ETS, the European Commission, has a policy making role while operation is mainly carried out at the national level; and
 - in the case of RGGI, a not-for-profit corporation (RGGI Inc) created to provide a suite of operational services to the RGGI member states – following the development of the RGGI ‘Model Rule’ by a RGGI working group made up of staff of the participating states.
- The infrastructure for trading on the primary and secondary markets (e.g., standard contracts, trading platforms) is usually left to the private sector, but should be subject to commodity and financial market oversight.
- The implementation of cap and trade schemes requires a range of complementary provisions with regard to taxation and accounting standards as well as early measures for the respective education of the regulated entities.

Use of offsets and linking

Offsets are usually provided for in schemes as a means to lower the cost of compliance, as they access opportunities for cheaper emission reductions and sink enhancements that occur outside the boundary of the scheme. Given that the atmospheric concentrations of GHGs are insensitive to where GHGs are emitted or reduced, the provisions of offsets can enhance the economic efficiency of meeting climate change mitigation goals set in a cap-and-trade scheme. However, because the use of offset credits allows emissions inside the boundary to be higher than they would otherwise be (i.e., effectively increasing the cap of a cap and trade scheme), for environmental integrity purposes it is important that offset credits are derived from real mitigation actions that lower emissions below where they would have been otherwise. If not, the atmosphere sees an increase in emissions.

In order to ensure that the cap-and-trade scheme provides an incentive for investments in low and zero emissions technologies within the jurisdiction of the cap-and-trade scheme, as well as to ensure that the cap is met at least partly through reductions of GHG emissions covered under the cap-and-trade scheme – and

not entirely through offsets – it is common practice for there to be constraints on the provision of offsets, both in their nature and quantity.

Linking refers to the connection, in some manner, of one cap and trade scheme with another. The other scheme might be another cap and trade scheme or to an offsets generating scheme, such as the CDM. This might also be an indirect means by which two cap and trade schemes become linked (to a degree), e.g., two cap and trade schemes may have no formal links but may both accept CDM credits as offsets.

Direct links of two cap and trade schemes are feasible, and there are active efforts by international policy experts to determine how this can be done, e.g., those being undertaken in the International Carbon Action Partnership (ICAP) initiative. But there is a range of challenges to linking that need to be overcome through these technical discussions. In particular, the demand and supply fundamentals are likely to be unique to each particular scheme and, consequently, so will the price for carbon. Even where both schemes may accept CDM credits, there may be different constraints to the use of CDM credits, so the effect of these on the price of allowances in the two schemes may be different. Moreover, the price for CDM credits in the market may be higher than the price for allowances in a given scheme (e.g., in RGGI) so will not be an influencing factor in such a scheme.

A number of issues shall be taken into account for linking. They most often trace back to the effect on price and cost distribution in each scheme, both in general and with respect to individual emitting entity types. These include:

- What is the relative stringency of the overall caps, by comparison with the likely marginal abatement costs of major emitter groups?
- What are the allocation methods (e.g., auction or gratis, and if gratis on an absolute or intensity basis)?
- Are there cost compensation provisions included in the scheme?
- Are there price control mechanisms?
- Are there policy requirements for levels of abatement required from sources within a scheme's boundary?
- What provisions are included for offsets?
- What are the market oversight mechanisms?

Schemes address offsets and linking as follows:

EU ETS:

- In Phase 2, the EU ETS has accepted CDM credits (as well JI credits), but with some constraints on both the type and quantity. Key exclusions have been credits from forest and nuclear projects.
- In Phase 3 these constraints will be tightened further, e.g., industrial gas projects will no longer be allowed. Eligibility of CDM credits from projects registered after 2012 will be limited to only projects located in least developed countries (LDCs). The EU is looking to sectoral crediting mechanisms as the means for other developing countries to provide offset credits. However, Use of international credits should not exceed 50% of reduction below 2005.
- The EU is interested in the possibility of linking the EU ETS with other countries' domestic emissions trading schemes; but not with the effect of significantly affecting on the incentive for mitigation actions within the EU.

NZ ETS:

- As a key purpose of the design of the NZ ETS was to connect it to the international Kyoto price for carbon, the NZ ETS currently allows an unlimited supply of CDM and other Kyoto compliance units, subject to some exceptions. There is exclusion for compliance purposes of tCERs, ICERs and CERs and ERUs generated from nuclear power projects. An exclusion for CERs from HFC-23 and N₂O destruction projects has also recently been adopted.
- New Zealand is an active participant in the international technical discussions about linking emissions

trading schemes. There are active technical discussions occurring about the feasibility of linking the NZ ETS with the upcoming AusCPM.

RGGI:

- Offsets from anywhere in the United States are allowed, but limited to methane capture (from landfills, farming operations and leaking natural gas infrastructure), energy efficiency of natural gas and oil heating, afforestation and capture of SF₆ emissions from electricity transmission and distribution equipment. Sources can cover up to 3.3% of their emissions using offset allowances, an amount initially estimated to be up to 50% of their emissions reduction obligations.
- If the price of RGGI allowances rises to \$7 per ton, sources can cover up to 5% of their emissions using offsets. If it rises to \$10 per ton, sources can cover up to 10% and also use allowances from the EU ETS and CDM.
- In practice, given the very low prices in RGGI allowance auctions (currently hovering around the floor price of \$1.89), there is limited incentive for offset projects.
- The low price and reasons for this (essentially a cap that is above current emissions levels), plus the prevailing political environment (where some states are seeking to leave RGGI) would seem to be major barriers to linking RGGI with other schemes.

CalETS:

- Offsets are allowed – up to 8% of a covered entity’s compliance obligation.
- There are 3 sources of compliance offsets: (1) offsets issued by the California Air Resources Board (ARB); (2) offsets issued by a linked regulatory program, and (3) offsets issued by sector based mechanisms (2 and 3 are subject to future rule-making).
 1. “Compliance Offsets” issued by ARB from projects developed under ARB-approved compliance offset protocols: *“A Compliance Offset Protocol must specify where the protocol is applicable. The geographic boundary must be within the United States or its Territories, Canada, or Mexico.”* To date, ARB has adopted 4 compliance offset protocols¹: (i) [U.S. Forest Projects](#); (ii) [Livestock Projects](#); (iii) [Ozone Depleting Substances Projects](#); and (iv) [Urban Forest Projects](#). For those four protocols, eligible activities must be US-based. So localization eligibility is defined by the protocols. In addition, “Early Actions” are recognized for reductions made between January 2005 and December 2014: Early action projects must be US-based. To date, 4 California Action Reserve (CAR) protocols can generate early action credits.
 2. Compliance offsets issued by a linked regulatory program. CalETS is designed to link with similar trading programs in other states and regions. For example, California is taking a lead role in the Western Climate Initiative also involving four Canadian provinces that look to the linking of (future) emission trading schemes.²
 3. Offsets issued by sector based offset mechanisms:
 - From developing countries or from subnational jurisdictions within those developing countries;
 - REDD³, others to be defined; and
 - Sub-limit on the use of sector-based offsets for compliance: 1st compliance period no more than 2% of an entity’s compliance obligation, 2nd and 3rd compliance periods no more than 4%.

AusCPM:

- A companion policy in Australia is a project based crediting scheme for land-use, agriculture and forest credits called the Carbon Farming Initiative (CFI). Australian Carbon Credits Units (ACCUs) issued under the CFI are acceptable permits under the proposed AusCPM (with some constraints).

¹ Additional protocols are under consideration by ARB, such as Emissions Reductions in Rice Management Systems, N₂O Emissions Reductions from Changes in Fertilizer Management, Conversion of High-Bleed Pneumatic Controllers in Oil & Natural Gas Systems.

² A draft regulation for linking California’s and Quebec’s Cap-and-Trade programs expected to undergo stakeholder comments in spring 2012, and be considered by ARB in June 2012.

³ With regards to REDD, an memorandum of understanding was signed with Acre in Brazil and Chiapas in Mexico. Working groups have been established to make recommendations on the future inclusion of REDD offsets.

- Kyoto credits (CERs, ERUs, RMUs) are eligible for use in the carbon price mechanism, but with restrictions to exclude CERs and ERUs sources from: (i) nuclear energy projects; (ii) certain industrial gas destruction projects; (iii) large-scale hydro-electric projects that are not consistent with World Commission on Dams; or (iv) certain time-limited land-use sector projects (temporary and long-term CERs). Further restrictions may be added on the advice of the Climate Change Authority.
- Until 2020, liable parties (points of obligation) must meet at least 50% of their annual liability with domestic permits (including CFI credits). The Climate Change Authority will review this restriction in 2016.
- The Australia government will consider future bilateral links with other international schemes that are of a suitable standard, based on a range of criteria, including the following:
 - an internationally acceptable (or, where applicable, a mutually acceptable) level of mitigation commitment;
 - adequate and comparable monitoring, reporting and verification, compliance and enforcement mechanisms; and
 - compatibility in design and market rules.

TokyoC&T:

- Covered facilities may use several offset projects to meet their obligations.
- The TMG's offset projects basically cover the industrial sector and the commercial sector:
- (a) **Small and medium-sized installation credits within the Tokyo area:** emissions reductions achieved through energy-saving measures by small and medium-sized facilities other than facilities under the scope of the TokyoC&T.
- (b) **Outside Tokyo credits:** emissions reduction achieved through energy-saving measures. The TMG sets restrictions, including upper limits, to ensure that emissions continue to be reduced within the Tokyo metropolitan area.
- (c) **Renewable Energy Certificates:** the TokyoC&T program prioritizes renewable energy certificates as one of the most effective offset credits. In particular, for electricity generated by solar power, wind power, geothermal power, and hydropower (generation below 1,000 kW), the renewable energy credit is calculated at one and a half (1.5) times the general amount.



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