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Making Markets: Unpacking Design and Governance of Carbon Market Mechanisms

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ABSTRACT

Carbon market mechanisms such as emissions trading systems and crediting mechanisms can have multiple objectives. A key goal is to lower the cost of achieving greenhouse gas (GHG) emissions reductions. Market mechanisms can also catalyse investment in low carbon technologies and practices, provide local environmental and health benefits, contribute to fostering innovation, provide a source of government revenue and facilitate more ambitious mitigation action in future. They can therefore play an important role in the diverse policy toolkit needed to address the global issue of climate change.

This paper identifies the key design elements of market mechanisms and examines the governance structures and decision-making processes used to create tradable GHG units in existing systems both inside and outside of the UNFCCC. The analysis explores the potential involvement of international, national and sub-national regulatory bodies in the governance and decision-making processes and the possible role that internationally-agreed standards could play in providing confidence in the quality of GHG units.

JEL Classification: F53, Q54, Q56, Q58
Keywords: Climate change; mitigation; carbon market; new market mechanism

RÉSUMÉ

Les mécanismes de marché appliqués au carbone, par exemple les systèmes d'échange de droits d'émission ou les mécanismes d'attribution de crédits, peuvent avoir plusieurs finalités. Abaisser le coût de réduction des émissions de gaz à effet de serre (GES) est notamment un objectif essentiel. De plus, les mécanismes de marché peuvent catalyser l'investissement dans les technologies et les pratiques à faible émission de carbone, procurer des avantages pour l'environnement et la santé au niveau local, contribuer à stimuler l'innovation, représenter une source de recettes publiques et faciliter une action d'atténuation plus ambitieuse à l'avenir. Ils peuvent donc jouer un rôle important dans les diverses boîtes à outils dont les pouvoirs publics ont besoin pour faire face au problème mondial du changement climatique.

Ce document met en évidence les principales caractéristiques des mécanismes de marché et examine les structures de gouvernance ainsi que les processus décisionnels qui interviennent dans la création des unités négociables de GES utilisées dans les systèmes existants, que ceux-ci relèvent ou non de la CCNUCC. Il analyse aussi la possible participation d'organismes réglementaires internationaux, nationaux et infranationaux ainsi que le rôle que pourraient jouer des règles internationalement admises pour inspirer confiance dans la qualité des unités de GES.

Classification JEL: F53, Q54, Q56, Q58
Mots-clés: Changement climatique; atténuation; marchés du carbone; nouveaux mécanismes de marché

FOREWORD

This document was prepared by the OECD and IEA Secretariats in 2012 in response to a request from the Climate Change Expert Group (CCXG) on the United Nations Framework Convention on Climate Change (UNFCCC). The CCXG oversees development of analytical papers for the purpose of providing useful and timely input to the climate change negotiations. These papers may also be useful to national policy-makers and other decision-makers. Authors work with the CCXG to develop these papers in a collaborative effort. However, the papers do not necessarily represent the views of the OECD or the IEA, nor are they intended to prejudge the views of countries participating in the CCXG. Rather, they are Secretariat information papers intended to inform Member countries, as well as the UNFCCC audience.

Members of the CCXG are Annex I and OECD countries. The Annex I Parties or countries referred to in this document are those listed in Annex I of the UNFCCC (as amended by the Conference of the Parties in 1997 and 2010): Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, the European Community, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, the Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom of Great Britain and Northern Ireland, and the United States of America. As OECD member countries, Korea, Mexico, Chile, and Israel are also members of the CCXG. Where this document refers to "countries" or "governments", it is also intended to include "regional economic organisations", if appropriate.

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Executive summary

Carbon market mechanisms such as emissions trading systems and crediting mechanisms can have multiple objectives. A key goal is to lower the cost of achieving greenhouse gas (GHG) emissions reductions. Market mechanisms can also catalyse investment in low carbon technologies and practices, provide local environmental and health benefits, contribute to fostering innovation, provide a source of government revenue and facilitate more ambitious mitigation action in future. They can therefore play an important role in the diverse policy toolkit needed to address the global issue of climate change.

The designs and governance structures of market mechanisms need to provide confidence to the international community that the tradable GHG units created represent real emissions reductions. This is important to facilitate (i) further **linking** of trading systems; and (ii) **unit accounting**, in cases where countries wish to use GHG units from market mechanisms to meet part of their national mitigation targets or goals put forward under the United Nations Framework Convention on Climate Change (UNFCCC).

This paper identifies the key design elements of market mechanisms and examines the governance structures and decision-making processes used to create tradable GHG units in existing systems both inside and outside of the UNFCCC. The analysis explores the potential involvement of international, national and sub-national regulatory bodies in the governance and decision-making processes and the possible role that internationally-agreed standards could play in providing confidence in the quality of GHG units.

The emerging landscape of market mechanisms

In addition to existing GHG market mechanisms, new emissions trading systems and crediting mechanisms are being implemented and planned at international, national and sub-national scales, both inside and outside the UNFCCC process. This diversity of mechanisms is leading to an increasing variety of unit types created using different standards and governance processes, and these differences mean that units from different mechanisms may not be fungible with one another. Designs and governance structures that incorporate international or mutually-agreed standards in order to help provide assurance of unit quality could therefore help to move towards more integrated and cost-effective carbon markets. Segmented markets with a wide range of standards could lessen the overall cost-effectiveness of market mechanisms and discourage private sector support and participation.

In parallel to the development of domestic market mechanisms and their bilateral linking, countries have agreed through the UNFCCC process to establish a "new market-based mechanism" under the authority of the Conference of the Parties (COP) and to consider a "framework for various approaches" including market-based approaches (UNFCCC, 2011a). The Kyoto Protocol (KP) flexible mechanisms will also continue to operate beyond 2012. A key challenge for the use of market mechanisms internationally will be how to co-ordinate this diversity of mechanisms to ensure that the mechanisms achieve their objectives and environmental integrity is assured.

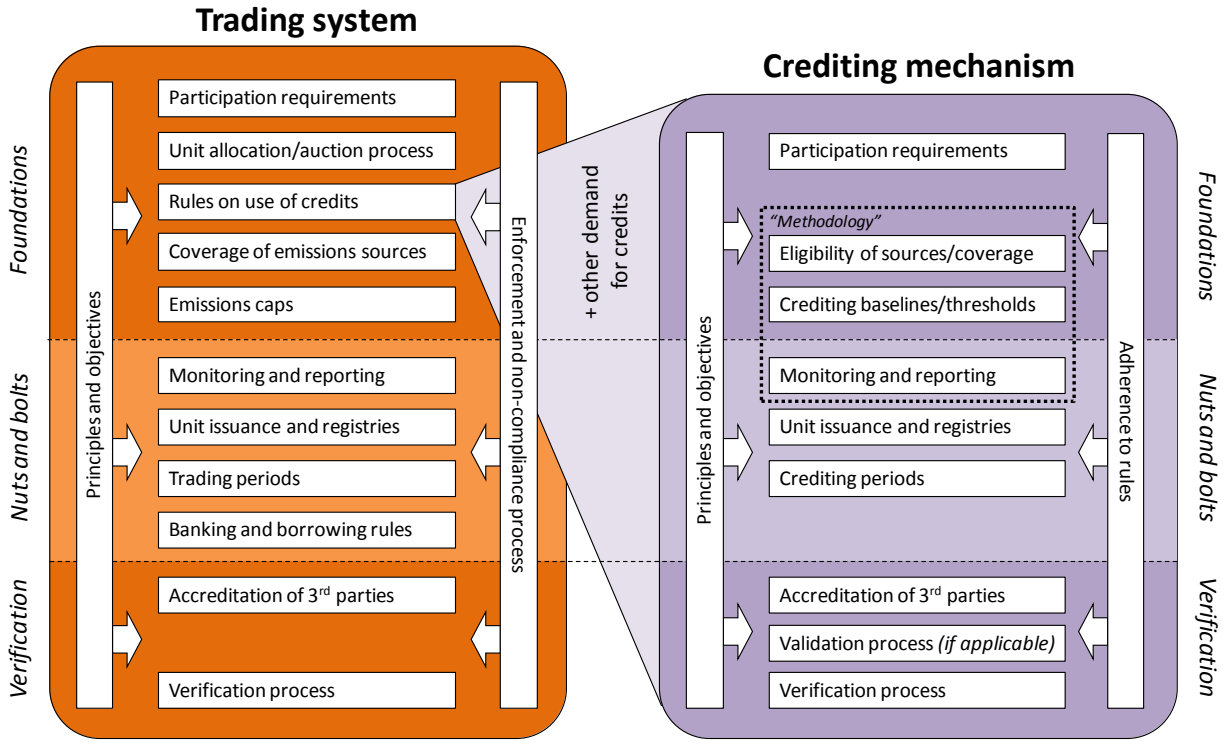
Furthermore, the form of the post-2020 international agreement on climate change has yet to be decided. If the future agreement is of a more facilitative rather than contractual nature, then robust processes of international assessment and review (IAR) and international consultations and analysis (ICA) may be needed to provide confidence that mitigation targets and goals will be met. This is particularly important if the future unit accounting framework is based on the "seller beware" principle (as it is under the KP), whereby purchased GHG units remain valid for the buyer even if the seller subsequently defaults on its emissions target or goal.

Design elements of market mechanisms

To be effective, market mechanisms require procedures and rules that outline how the mechanism will work and how GHG units will be created and traded. This paper separates trading systems and crediting mechanisms into design elements, as shown in Figure 1. Both types of mechanism are usually based on a set of principles and objectives which shape the detailed design elements. **Foundations** are the essential elements that describe the creation and nature of GHG units. **Nuts and bolts** comprise more technical design elements important for the smooth functioning of the mechanism. **Verification** covers the verification of emissions levels and other data reported by participants, and may also include the accreditation of third-party entities to carry out this task. Finally, implementation of mechanisms requires enforcement processes, which cover the regulatory processes for compliance (if applicable) and ensuring adherence to the mechanism rules.

For **trading systems**, an important design element is the set of rules describing how many credits can be purchased from outside the emissions cap (if any) and which types of credit are valid. The rules may specify that units from an existing crediting mechanism can be recognised as valid for compliance, or the rules may specifically create a new crediting mechanism specifically for that trading system. **Crediting mechanisms** and their design elements are depicted in Figure 1 as a subset of the rules for trading systems in order to emphasise that (i) crediting mechanisms rely on demand for their units to function, and (ii) that many crediting mechanism design elements are similar to trading system design elements. The principal source of demand to date for credits has been from entities covered by trading systems; however, demand can also come from governments or voluntary buyers.

Figure 1: Design elements of trading and crediting mechanisms



Source: Authors

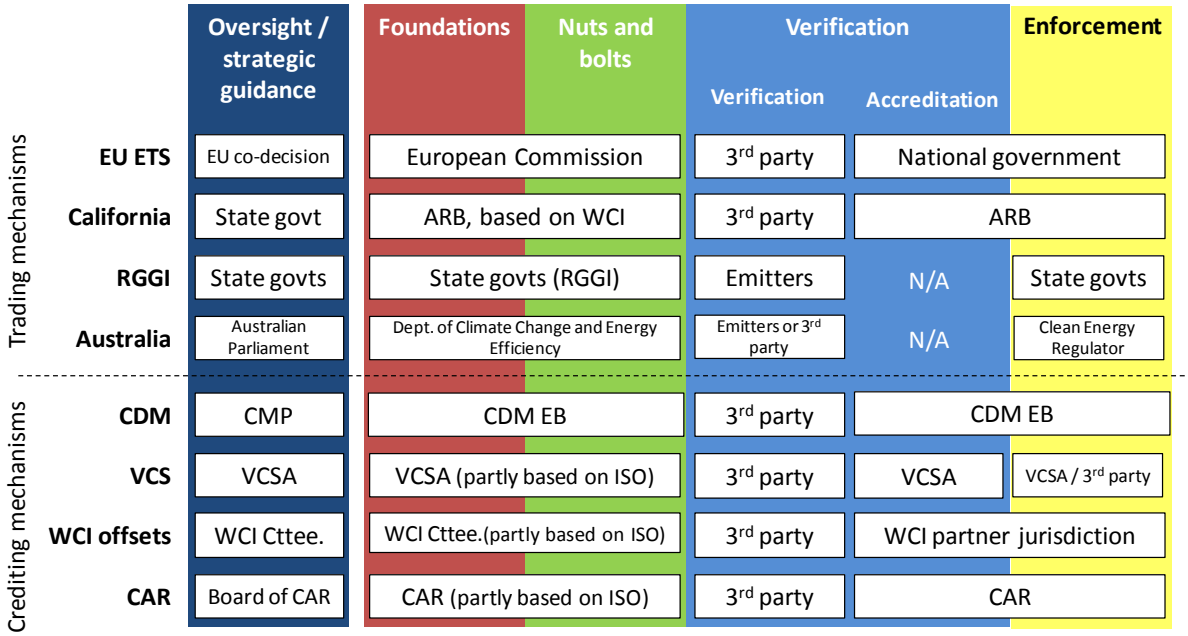
Governance of market mechanisms

The term "governance" is taken here to mean the institutional structure and decision-making processes needed for both design and operation of carbon market mechanisms, both of which are crucial to ensuring the quality and environmental integrity of GHG units. A distinction is made here between mechanisms that are governed domestically and those governed internationally. Domestically-governed mechanisms can be designed and operated autonomously by national governments, sub-national governments or non-government entities, although tools may be adopted from existing international mechanisms and units from internationally-governed mechanisms may be recognised as valid to meet commitments under domestically-governed trading systems.

The governance structure of a market mechanism generally needs to strike a balance between a number of factors. These include the **sovereignty** of the government authority (where there is an element of international governance); the ability to demonstrate the **quality** and **environmental integrity** of units being created; the potential **fungibility** of the units with others internationally; the **cost-effectiveness** of the mechanism's procedures; the **reliability** and **predictability** of the mechanism's institutions; and the extent to which mandatory **compliance** is necessary.

Existing mechanisms have sought to achieve this balance in different ways and using different governance structures (see Figure 2). Most have a high-level body providing strategic guidance and holding ultimate authority and responsibility for the mechanism. Some (e.g. the European Union Emissions Trading System (EU ETS) and the Western Climate Initiative) have an international or multi-state body through which participating governments agree the foundations and nuts and bolts, while the responsibility for implementation and enforcement lies with individual governments. Others, such as the Australian carbon pricing mechanism, are designed and enforced by separate entities within a national government.

Figure 2: Distribution of governance roles in some existing market mechanisms



Source: Authors

Amongst crediting mechanisms, the Clean Development Mechanism has one central body which oversees nearly all design and enforcement aspects, whereas others assign these roles to different bodies. Accredited third-party entities play a role in verification for most existing mechanisms, with the exception of the New Zealand and Australian systems and the Regional Greenhouse Gas Initiative (RGGI) in the US where emitters mostly self-verify but face penalties if inconsistencies are found.

Towards international standards?

The use of international standards for certain design elements could facilitate two-way linking between trading systems (whereby units become mutually fungible) without necessarily imposing international governance structures. In this way, new mechanisms designed in accordance with the standards (or existing mechanisms that meet or surpass the standards) would be in a better position to demonstrate the quality of the units being issued, even if the mechanism's governance structure remains under domestic authority. One-way links between trading systems (whereby units from system A can be used in system B but not *vice versa*) require only a unilateral decision by system B and the use of standards may therefore be less important. Should countries decide to introduce an international review process to assess the eligibility of GHG units from domestic mechanisms for meeting mitigation targets/goals under the UNFCCC, use of such standards could also facilitate this.

Similarities in the design and governance structures of existing mechanisms show that design elements of market mechanisms have already crossed national borders, with pre-existing rules and standards adopted by national regulators. However, the difficulty of agreeing standards multilaterally (such as through the UNFCCC process) is likely to vary between the different design elements. The politically-sensitive nature of the elements categorised as foundations and enforcement could make it difficult to agree standards for these elements multilaterally, although examples do exist of agreement across more than one jurisdiction. For the "nuts and bolts" and verification, some international standards already exist and the prospects for achieving convergence under the UNFCCC may be brighter. Whilst agreement and subsequent use of standards for the "nuts and bolts" and verification elements would help to increase international credibility and transparency of mechanisms, it is unlikely that these standards by themselves would provide a strong level of confidence in unit quality.

Relevance to UNFCCC negotiations

There are different ways that new standards could be integrated into the UNFCCC process. One approach would be for the COP to agree to develop new standards under the Subsidiary Bodies, as was done for the KP mechanisms. Alternatively, Parties could agree to recognise certain pre-existing international standards (such as relevant ISO standards, KP procedures or others) under the UNFCCC, provided that the use of such standards is overseen by a domestic or other certification body that is itself recognised internationally (e.g. by the International Accreditation Forum). Finally, in the absence of any agreement on standards under the UNFCCC, Parties might agree only on transparency and disclosure requirements, so that all documents pertaining to internationally-traded GHG units are made available for international scrutiny. However, it is unlikely that such an approach would provide a high level of confidence in the quality and environmental integrity of GHG market units.

At COP 17, countries agreed to define a new market-based mechanism and consider a framework for various approaches, including market-based approaches, under the UNFCCC. Although the purpose of the framework is not yet clear, if established it could facilitate the linking of trading systems and/or provide some level of assurance of the quality and environmental integrity of GHG units from market mechanisms used to meet mitigation targets and goals under the UNFCCC. The existence of internationally-agreed standards for certain design elements of market mechanisms could aid the operation of such a framework, as well as inform the design of a new market-based mechanism operated under the guidance and authority of the COP.

1. Introduction

Market mechanisms are well established as tools to achieve reductions of greenhouse gas (GHG) emissions and encourage uptake of clean technology and practices. The principal way that markets have been used to tackle growing emissions is through emissions trading, based primarily on capped trading systems supplemented by crediting mechanisms that award credits for emissions reductions achieved outside of the capped system. The primary goal of market mechanisms is to lower the cost of achieving mitigation objectives. Market mechanisms can also catalyse investment in low carbon technologies and practices, provide local environmental and health benefits, contribute to fostering innovation and provide a source of government revenue.

Trading systems work by issuing a limited number of tradable emissions permits that equal the target total emissions quantity. A market price for GHG emissions is therefore created; this price is variable and is a function of the scarcity of permits and the perceived abatement cost faced by entities covered by the cap. Crediting mechanisms work by issuing credits for verified emissions reductions achieved relative to an agreed baseline. They therefore operate only on the supply side of the market, providing an option for entities with mitigation commitments (e.g. under a trading system) to offset part of their emissions levels at low cost. Unlike trading systems, crediting mechanisms do not generate their own price signal and require a source of demand for their credits in order to function.

A new landscape of market mechanisms developed domestically and bilaterally, both inside and outside of the UNFCCC process, is starting to emerge. New carbon pricing legislation has recently been adopted in Australia and Korea and regulations for cap-and-trade programmes have been adopted in California and Quebec. City- and regional-scale pilot trading systems are currently being implemented in China and potentially also the city of Rio de Janeiro in Brazil. Furthermore, the regulators of some of these market mechanisms are making plans to link their systems together in order to enhance the liquidity of the carbon market and further reduce overall mitigation costs.

Although trading systems mostly operate under caps enforced in domestic legislation, in some cases these mechanisms could have implications for international emissions accounting – particularly if GHG units from domestically-governed market mechanisms are used to meet part of national mitigation targets or goals under the UNFCCC. The development of domestically-governed market mechanisms may therefore be an important issue for discussions on emissions accounting rules, accounting for GHG units, and the development of new international market-based mechanisms under the UNFCCC.

At the COP 17 conference in Durban, countries agreed under the UNFCCC to "define" a new market-based mechanism and "consider" a framework for various approaches, including market-based approaches (UNFCCC, 2011a). Further, the agreement by some Annex I countries to accept commitments under a second period of the KP means that the existing KP market mechanisms will continue to operate until at least 2017. It is not yet clear how and to what extent these various internationally-governed mechanisms will interact with one another and with the landscape of domestically-governed mechanisms.

There is not yet agreement on how international emissions accounting under the UNFCCC for Parties without KP commitments will be carried out in future and how non-KP GHG units may be accounted for within national targets and goals. Countries have different views on the form and purpose of both the framework for various approaches and the new market mechanism, as well as on the relation between the two (UNFCCC, 2012a). One approach is that the framework could cover all GHG units from market mechanisms used to meet part of national mitigation targets or goals under the UNFCCC, with different levels of oversight from international bodies depending on the target/goal concerned and the emissions accounting rules adopted by the participating Parties. In such a system, the new market mechanism could be a specific market approach that Parties can voluntarily engage in

within the framework. An alternative approach is that the framework for various approaches and the new market mechanism remain distinct.

Given that many domestically-governed mechanisms are emerging in parallel to discussions under the UNFCCC, it is desirable that any new developments under the UNFCCC facilitate the co-ordination of these domestically-governed mechanisms and help to achieve the shared objectives of making global mitigation cheaper through market mechanisms with strong quality standards. This paper therefore identifies the key design elements of market mechanisms and takes a closer look at the institutional structures and decision-making processes needed to oversee market mechanisms that create GHG units traded internationally. In doing so, the paper considers the potential role that international, national and sub-national bodies as well as internationally-agreed standards could play in a world of ever more inter-connected market mechanisms.

The paper is organised as follows: Section 2 assesses the emerging landscape of market mechanisms and the existing and potential interactions between these mechanisms; Section 3 splits up market mechanisms into their design elements; Section 4 draws lessons from the governance structures and processes of existing mechanisms; and Section 5 presents conclusions. This paper is a revised version of a draft discussion document prepared for the CCXG Global Forum in Paris on 26-27 September 2012.[1]

2. The emerging landscape of market mechanisms

This section assesses developments in market mechanisms around the world and discusses the potential interactions between different types of mechanism. It also looks at how the current uncertainty over international emissions accounting and the measurement of progress towards national targets and goals put forward under the UNFCCC affects how this diverse landscape of mechanisms might fit together.

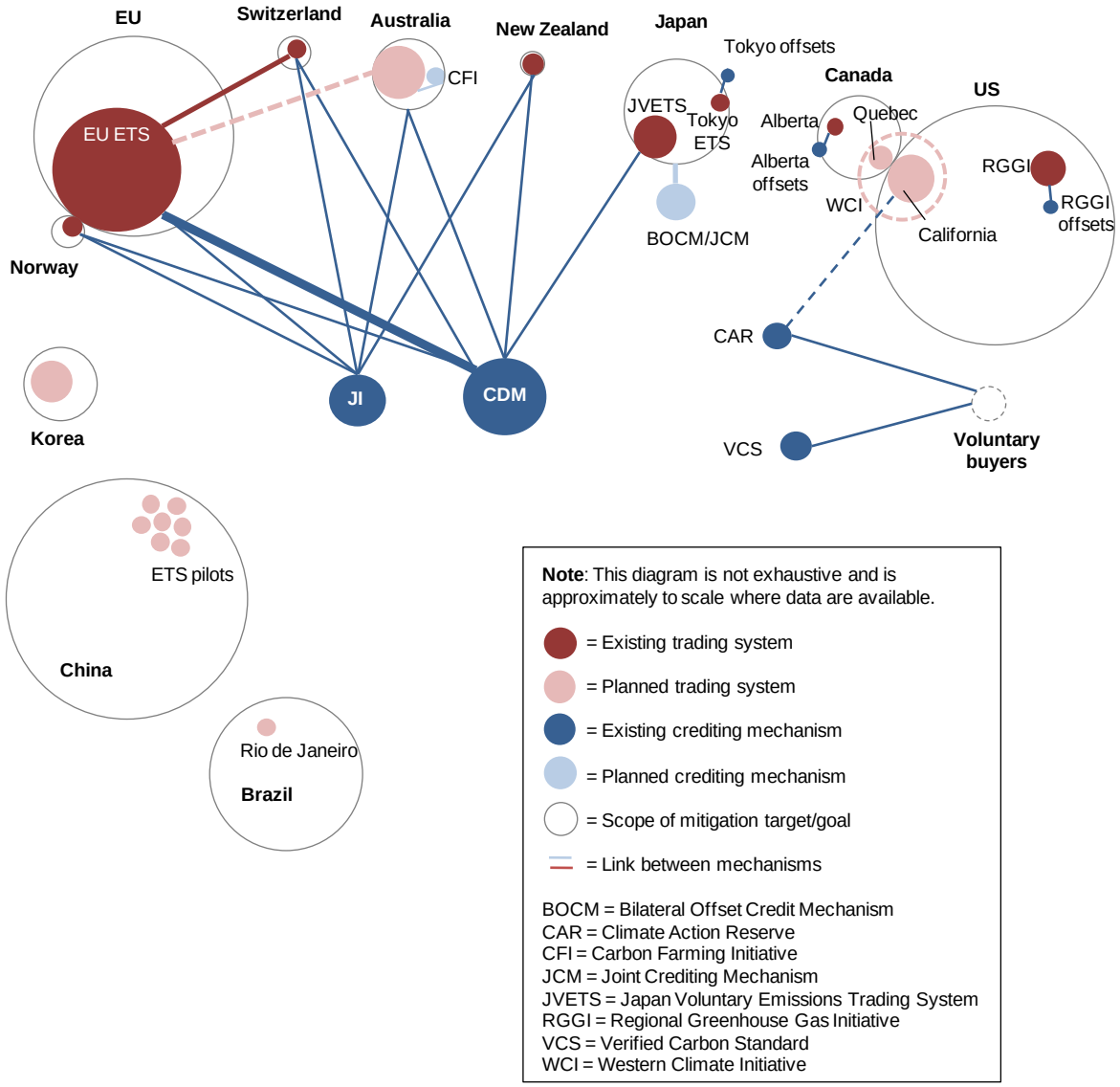
2.1 Navigating the landscape

A number of trading systems and crediting mechanisms are now implemented or planned at international, national and sub-national scales (see Figure 3). In general, trading systems feature mandatory obligations for covered entities coupled with *ex-ante* allocation of allowances, while crediting mechanisms are voluntary for participants and credits are issued *ex-post*, although exceptions exist in both cases.[2] These mechanisms differ in their governance structures as well as in scale.

[1] See http://oecd.org/env/climatechange/climatechangeexpertgroupglobalforumseptember2012.htm

[2] For example, participation in the Japan Voluntary Emissions Trading System is voluntary, the UK Carbon Reduction Commitment trading scheme features *ex-post* allocation of allowances and group performance crediting mechanisms could have a mandatory component.

Figure 3: Some existing and planned market mechanisms



Source: Authors

Emissions trading systems

The KP provisions for international emissions trading (IET) constitute a form of multilateral trading system, whereby the capped participants are the national governments or regional economic organisations included in Annex B of the KP. However, the EU ETS (a regional mechanism) is the largest trading system at the international level in terms of traded volumes, accounting for around 97% of allowances traded worldwide in 2011 (World Bank, 2012). Elsewhere, national trading systems covering various proportions of total GHG emissions have been established (or are soon to be established) in New Zealand, Switzerland, Norway, Australia, Japan and Korea.

At the sub-national level, trading systems have been implemented or planned under the Western Climate Initiative (WCI) in Quebec and California, as well as the Regional Greenhouse Gas Initiative (comprising nine northeast and mid-Atlantic US states), Alberta in Canada and New South Wales in Australia (now superseded by the national carbon pricing mechanism). At the city level, Tokyo has had a system operating since 2011 and Rio de Janeiro is currently planning a city-wide trading

system. In China, pilot trading systems are currently being developed in five cities and two provinces, with a view to establishing a national system after 2015 (Point Carbon, 2012a).

Crediting mechanisms

Crediting mechanisms require demand for their credits. This demand can come from individual emitters or governments seeking to meet mitigation targets or goals under a binding emissions cap more cost-effectively (compliance), or from other buyers seeking emissions offsets for reputational reasons or other self-imposed goals (voluntary). Several trading systems include provisions that enable capped entities to meet part of their objectives using offsets from a crediting mechanism. For example, both IET for KP Parties and the EU ETS allow mitigation obligations to be met in part through the purchase of credits from the Clean Development Mechanism (CDM) and Joint Implementation (JI).[3] The Australia, Alberta, RGGI and Tokyo trading systems each have a corresponding domestic offset mechanism, while capped entities in the forthcoming California ETS will be able to purchase offsets from projects located in the US, Mexico or Canada that have been developed using approved protocols.[4] Japan is developing a Bilateral Offset Credit Mechanism (BOCM, or Joint Crediting Mechanism, JCM) in collaboration with developing country partners that will provide offsets intended to meet part of its national mitigation target under the UNFCCC (Government of Japan, 2012).

Demand from voluntary buyers has existed in both Annex I and non-Annex I countries although the scale of the voluntary market remains small with traded volumes amounting to 87 million tCO_2-eq in 2011, compared to 1,734 million tCO_2-eq for secondary CERs (World Bank, 2012). This voluntary market incorporates a wide range of crediting systems and protocols, and the wide price discrepancy evident in the market shows that there is a wide range of perceived environmental quality of these units (Ecosystem Marketplace and BNEF, 2012). Some of these systems were designed with a view to projects being developed in one particular country (e.g. the Climate Action Reserve and the Chicago Climate Exchange offsets), whereas others were designed to be international in nature for both projects and buyers (e.g. the Verified Carbon Standard and the Gold Standard).

To date, all crediting mechanisms have been voluntary for participants and are designed to compare the performance of individual emitters to a baseline in order to calculate credits due (the "individual performance" approach). In theory, scaled-up crediting mechanisms could use the aggregate performance of a group of emitters to calculate credits due (the "group performance" approach, see Prag and Briner, 2012, building on earlier CCXG work). A "group performance" crediting mechanism may require an enforcement aspect to ensure that an aggregate mitigation objective so that credits will be awarded to the group (some initiatives put forward as "credited NAMAs" may operate in this way). In some aspects, therefore, group performance crediting mechanisms could be similar to trading systems.

2.2. Interactions between market mechanisms

GHG market mechanisms rarely operate in isolation. Interactions between mechanisms can exist both horizontally, e.g. through linking of geographically distinct systems in different countries or different regions of the same country, and vertically, e.g. through overlap of mechanisms in the same geographical area with different levels of governance. This section explores examples of both types of interactions already existing within the landscape of market mechanisms and describes how these

[3] Although credits from some types of CDM project (e.g. HFC-23 destruction) can no longer be used to meet EU ETS obligations.

[4] To date, four protocols have been approved, all based on protocols already developed on a voluntary basis under the Climate Action Registry (IETA, 2012).

interactions have been managed. These existing interactions help to shed light on how a future, more integrated network of markets could operate, and how this could relate to the UNFCCC context.

Trading systems can be linked together so that allowances from one system are recognised as valid for compliance in a different system. Such links can be one-way, whereby allowances from system A can be used in system B but not *vice versa*, or two-way, whereby allowances from both systems become fungible (including where a pre-established trading system is subsequently adopted in another country). Trading systems can also link indirectly, whereby both mechanisms recognise the same credit types as being valid for compliance. Direct and indirect linking of trading systems can significantly decrease the cost of achieving mitigation goals (OECD, 2009).

While the current landscape of trading systems remains segmented, some examples of direct and indirect linking do exist (as shown in Figure 3). In August 2012, the EU and Australia announced plans for a one-way direct link to be established in 2015 and negotiations aiming to establish a full two-way link by 2018 (Australian Government, 2012a). In addition to these plans for intercontinental linking, the EU ETS is itself in some sense a linked system since the three European Economic Area (EEA) states of Norway, Iceland and Liechtenstein have joined the system by enacting the ETS Directive (with negotiated modifications) in their domestic legislation. In Norway, a domestic trading system operated independently during Phase I of the EU ETS before Norway joined the EU ETS in 2008. Norway's negotiated modifications include more ambitious targets and a much lower overall level of free allocation. Switzerland is currently in negotiations to link its trading mechanism to the EU ETS. This is likely to involve modifications of the Swiss mechanism to be compatible with the EU ETS, including adoption of the EU method for calculating caps (Point Carbon, 2012b).

When the EU ETS was introduced in 2005 there were two pre-existing market mechanisms in member states: a power sector trading mechanism in Denmark and a Climate Change Agreement (CCA) trading scheme in the UK. The Danish mechanism was closed when the EU ETS began operation because the obligations would have overlapped with those for power plants under the EU ETS. The UK CCA trading scheme, on the other hand, continued alongside the EU ETS because it covered different entities and had different objectives. The UK scheme had begun in 2002 as a voluntary system. Companies with a CCA with the government received a partial exemption from the Climate Change Levy (a tax on fossil fuel use) and were later able to trade their over- and under-achievement in reducing emissions. Some installations covered by CCAs also came under the EU ETS, so the CCA rules were modified to ensure that emissions changes were not double counted.[5] CCAs are still in place although the trading aspect of the system was closed in June 2012, replaced by a direct compliance regime that does not include trading between companies. Allowances remaining in the UK ETS registry were cancelled.

In North America, the WCI is an initiative for joint emissions trading. It originally aimed to link 11 US states and Canadian provinces, but now only California, Quebec, British Columbia, Manitoba and Ontario are participating. The initiative is designed to reduce emissions by 15% below 2005 levels by 2002; this target was set to be consistent with the sum of existing goals of individual partners rather than to impose a new obligation. Design recommendations were developed centrally and the WCI maintains a central registry for participating mechanisms. It is up to individual states to enact appropriate state regulations if they wish to participate; as of 2012, California and Quebec have enacted emissions trading legislation and they are currently in negotiations to link their mechanisms via WCI.

Although there is not currently federal cap-and-trade regulation in the US, some potential interactions between sub-national and national mechanisms can be identified by looking at the American Clean

[5] The CCA target was adjusted to reflect EU ETS activities so that, for example, excess emissions already compensated by purchase of EU ETS allowances did not require a further purchase of UK ETS allowances.

Energy and Security Bill (H.R.2454, known as "Waxman-Markey") considered by the US Congress in 2009-2010 (US GPO, 2009). Thirty US states now have renewable or alternative energy standards, in addition to the existing California ETS and the RGGI. The Bill assumed that these would overlap with the proposed federal mechanism, so the following arrangements were proposed:

a) State-level market mechanisms would have been prohibited for 2012-17.

b) A federal combined energy efficiency and renewable electricity standard was proposed which would have built on existing state schemes where possible. States would have had review and verification functions devolved to them and would have received devolved funding from alternative compliance payments made under the scheme in their states. States would have retained the ability to control the rates charged for renewable electricity, such as through setting feed-in tariffs.

c) Banked allowances from the RGGI would have been transferable dollar-for-dollar (not tonne-for-tonne) into the federal scheme.

In Australia, the pre-existing New South Wales greenhouse gas scheme closed on 1 July 2012 in order to coincide with the start of obligations under the new national carbon pricing mechanism. A more complex issue is the proposed introduction of a national energy savings trading initiative (i.e. a "white certificates" scheme) which would overlap with existing state mechanisms in New South Wales, Victoria, and South Australia. An Energy Savings Initiative Working Group has been established to advise the government on the issue and further consultations and design work on a national energy savings initiative are being undertaken by this group in 2012 (Australian Government, 2012b).

Interactions involving crediting mechanisms: indirect linking and double counting

The interaction and overlap between crediting mechanisms and trading systems is also important and can occur in two ways. Firstly, separate trading systems can agree either together or independently to recognise the same offset units from a particular crediting mechanism. This indirect linking has already occurred at the international level with Kyoto-compliant CDM and JI credits recognised by the EU ETS, New Zealand and Australian mechanisms, amongst others. In North America, the WCI is designed to facilitate the recognition by participating mechanisms of each others' offsets. To achieve this, a WCI offsets committee was established to create offset standards and a WCI-wide process for approving offset protocols. Offset standards were agreed not only among the WCI partners but also with representatives of states involved in the now-defunct Midwestern Greenhouse Gas Accord, to facilitate future linking of these mechanisms.

Secondly, crediting mechanisms interact with trading systems in cases where a trading system is introduced in a region where offset projects have already been developed. For example, the issue of how emissions reductions from existing (and future) CDM projects will be accounted for in domestic trading systems in Korea and China. The Korean authorities have announced rules for CER use by trading system participants,[6] but have not to date set out how caps will take CDM projects into account. Similarly, early indications suggest that the Chinese pilot trading systems could allow the use of offsets and that in some cases these will be sourced from former or existing CDM projects (Point Carbon, 2012a). There is not yet information on how interactions or overlaps between the pilots and existing CDM or other projects will be managed.

There could also be interactions between different unit types, such as tradable energy efficiency credits, that also have an impact on emissions, and therefore may need to be considered as an

[6] No foreign CERs are allowed until 2020.

overlapping policy measure. In this case methodologies for converting different credit types may need to be considered.

2.3. Accounting for international unit flows

The landscape of market mechanisms has already generated a large number of different unit types, operating under diverse operational environments and governance structures. This diversity is only likely to increase as more countries release plans to use market-based approaches within their national legislation to achieve emissions mitigation goals at reduced cost. Even where mechanisms are governed under domestic legislation and regulation, international transfers of units mean that these units can become relevant to international emissions accounting discussions under the UNFCCC.

The issue of how GHG units from market mechanisms may be recognised under the UNFCCC process is linked to the wider issue of GHG unit accounting – in particular how national emissions reduction targets or goals are accounted for. Apart from the second KP commitment period, there is not yet any formal international accounting framework for emissions units after 2012. The nascent processes for international transparency on progress towards national mitigation targets and goals – international assessment and review (IAR) for developed countries, and international consultations and analysis (ICA) for developing countries – include references to information on the use of carbon credits to meet national targets, but these processes do not yet offer the grounding for a full emissions accounting system. Some Parties see that a priority for the framework for various approaches is to provide a robust accounting framework that clarifies the role that market-based approaches will play in meeting countries' mitigation targets (UNFCCC, 2012a).

IET under the KP is underpinned by the "seller beware" principle. This means that the traded Assigned Amount Units (AAUs) remain valid for the buyer even if the seller party subsequently defaults on its KP emissions target (Grubb *et al.*, 1999). As a result, crediting units generated within the capped region through Track 1 JI could be issued and traded without international approval, as these are converted from the stock of "seller beware" AAUs. A strong regulatory process governing the issuance of credits was required to expand this "seller beware" concept to the CDM where credit units are issued for reductions occurring outside of (Annex I) capped countries. This is because in the absence of any emissions cap or target for the host country there is a strong incentive for project owners and host countries to inflate the number of credits issued. Common accounting rules and strong governance were introduced to maintain the seller beware concept without diluting the environmental integrity of emissions trading in the capped KP environment.

The current lack of a compliance and accounting system for national targets and goals put forward under the UNFCCC raises the question of how to best ensure "seller beware" status for units that are traded internationally from a diverse range of market mechanisms. The forthcoming California cap-and-trade program has adopted a "buyer beware" element to the use of offsets, in that issued credits can be cancelled *ex-post* if annual verification shows that projects have become invalid, with buyers being liable to replace cancelled credits. There are fears that this will prevent liquidity and increase transaction costs in the offset market (IETA, 2012).

If links between two or more trading systems in different countries are established then the international flow of allowances between the mechanisms may need to be considered when undertaking international unit accounting. The countries concerned may need to decide whether and how to account for any net flows of allowances as part of reporting on progress toward their national mitigation targets or goals. If, for example, these units are used to partly meet 2020 targets and goals then there may be international interest in how the quality of these units has been ensured (for a fuller discussion, see Prag *et al.*, 2011a; 2011b, which builds on earlier CCXG analysis such as Mullins and Baron, 1997).

For developed countries with national emissions targets, confidence in the environmental integrity of GHG units could be improved through a robust IAR process for national emissions that includes full reporting of international unit flows coupled with agreed emissions accounting and unit tracking arrangements. Units traded internationally would be added or subtracted to the developed country's overall national target. Analogous to Track 1 JI, the issuing country would therefore have an incentive to ensure the integrity of these units because if units did not correspond to real emission reductions, this would increase the effort needed to deliver the national emissions target. In this case, unit quality is ensured by providing confidence in the achievement of the national target (via IAR) rather than by scrutiny of the market mechanism itself.

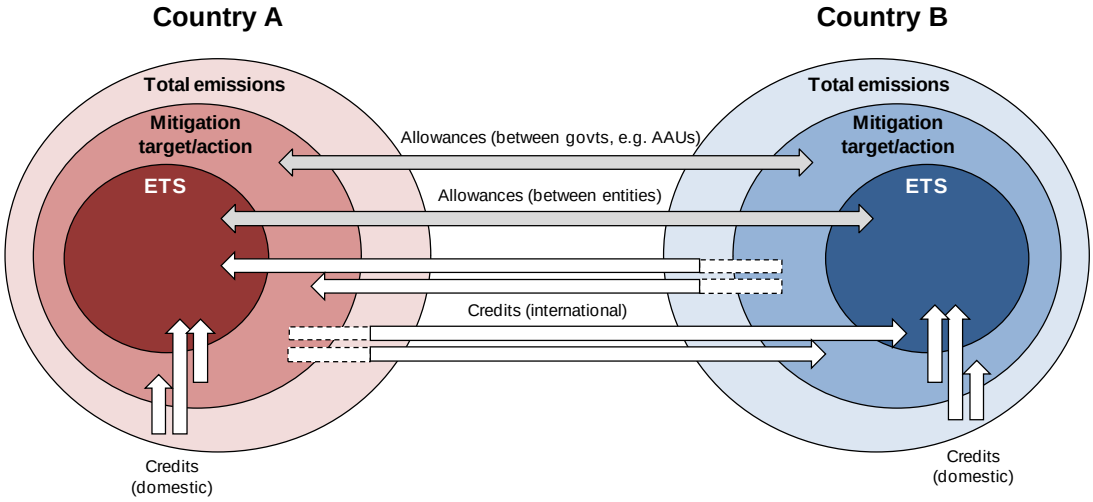
Where units are generated in regions without quantified emissions reduction targets and clear accounting rules, or if international agreement on accounting and review processes has not been reached, the quality assurance processes of market mechanisms themselves become even more important. In these cases a key issue would be how to ensure the quality of units traded internationally in order to maintain international confidence in the environmental integrity of the system. Related issues would be how the governance structure and decision-making processes of domestically-governed mechanisms could provide international assurance of unit integrity, and what role there may be for international oversight or co-ordination.

Figure 4 demonstrates how international unit flows may occur between countries with different types of mitigation targets or goals outside of the KP. Countries A and B represent countries with clearly defined mitigation targets or goals and domestically-governed trading systems covering different proportions of the scope of their respective mitigation targets/goals. Numerous unit flows are possible between these countries. Firstly, if a one-way or two-way direct link is established between the two domestically-governed trading systems, allowances can flow between covered entities in the two countries. If the scope of these trading systems falls within the national targets or goals (as is usually the case) then the transferred units may need to be taken into account when the countries report on progress towards their national target/goal. In addition, allowances may flow directly between governments, as in the case of IET.[7]

Figure 4 also shows flows of credits originating outside of trading systems. Country A may set up a domestic offset system to benefit from emissions reductions made outside of its mitigation target. It may also purchase offsets from country B, but if these are issued for emissions reductions occurring within the scope of country B's emissions target then an issue of double counting may arise and unit transfers would need to be clearly documented.

[7] Other government-level trading systems are possible, such as the EU-wide system to trade emissions reductions outside of the EU ETS sectors via the Effort Sharing Decision (European Commission, 2012).

Figure 4: Potential GHG unit flows between two hypothetical countries



Source: Authors

In order to provide transparency regarding the use of GHG units from market mechanisms to meet part of mitigation targets or goals, an accounting system needs to (i) provide quantitative information on how many units, and of which type, have been used to meet targets or goals; (ii) prevent double counting; and (iii) provide some level of assurance on the quality of the units used. The first two points are discussed in Prag *et al.* (2011a) and elsewhere. The third point is explored in this paper, focusing on the design and governance of market mechanisms.

3. Design elements of market mechanisms

Splitting market mechanisms up into their design elements can help to frame discussions of governance and the possible role of international standards in shaping the landscape of market mechanisms. This section therefore identifies the design elements of trading systems and crediting mechanisms, then describes and analyses these design elements using examples from existing and planned market mechanisms.

3.1 Identifying design elements

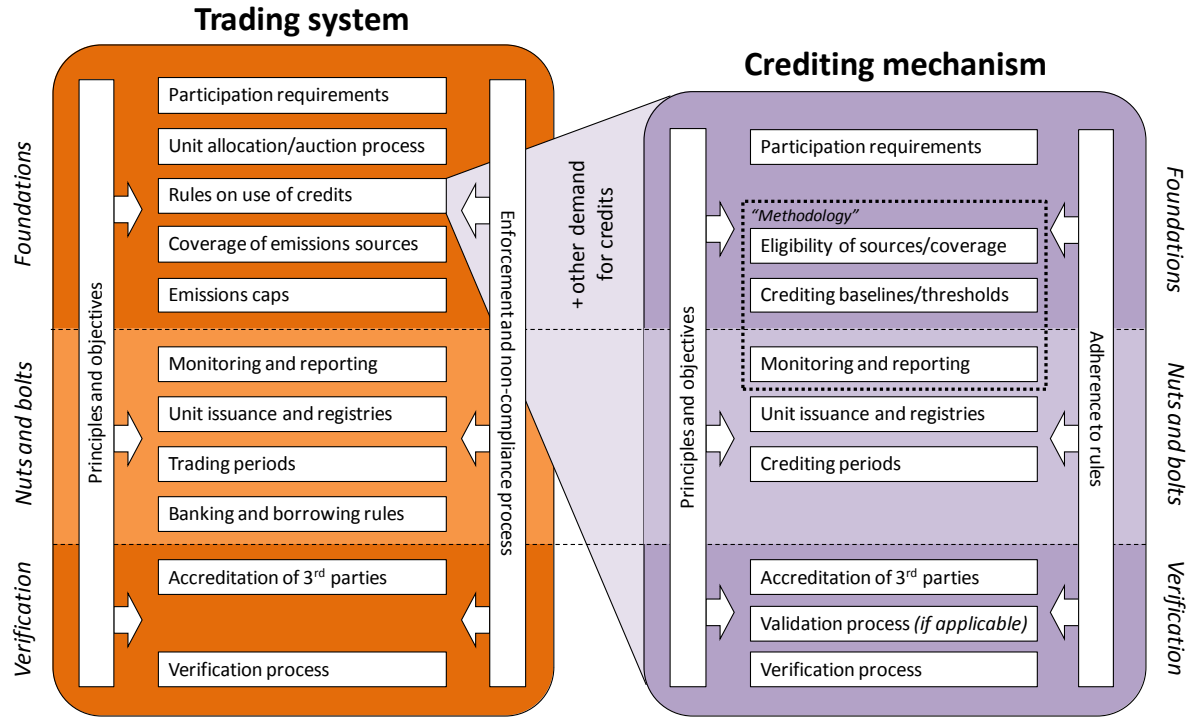
Figure 5 outlines how the procedures and rules that outline how GHG units are created and traded in market mechanisms can be separated into individual design elements.[8] Both trading systems and crediting mechanisms are generally based on a set of principles and objectives which shape the detailed design elements. These design elements have been categorised here into (i) foundations, which are fundamental to describing the nature of the traded units and their environmental integrity; (ii) "nuts and bolts", which describe the more technical elements necessary for trading; and (iii) verification, which describes the process required for ensuring that emissions performance is verified.[9] In addition, all mechanisms require either systems for enforcement of non-compliance procedures (in the case of trading systems) or processes for ensuring that rules are adhered to (in the case of crediting mechanisms).

[8] Many of these design elements are also important for mitigation-relevant market mechanisms that do not trade GHG-based units (e.g. the Perform, Achieve and Trade energy efficiency trading system in India and the energy-based mechanism currently under consideration in Thailand).

[9] The groups have been chosen to facilitate a discussion of governance and standards for market mechanisms. The borders of these categories are not clear cut and other approaches to grouping design elements are possible.

Figure 5 also illustrates how trading systems and crediting mechanisms have many similar design elements. It is therefore useful to consider them in parallel when considering design and governance arrangements for market mechanisms. The figure highlights that crediting mechanisms are dependent on demand for their credits from trading systems or other sources (such as governments or voluntary buyers). Demand from trading systems is created if covered entities are able to offset part of their GHG emissions by purchasing recognised credits from outside the emissions cap, and the rules for this are therefore an important design element of trading systems.

Figure 5: Design elements of trading and crediting mechanisms



Source: Authors

3.1.1 Principles and objectives

Most market mechanisms have a set of policy objectives and principles that guide the detailed design of the mechanism. Whilst these principles are often not sufficient in themselves to describe the operation of the mechanism, having clear principles agreed by major stakeholders at the outset can provide a platform for further development of the mechanism design and rules – especially if there are subsequent obstacles in the political process of a particular jurisdiction.

Most market mechanisms have multiple objectives. A key aim is to lower the **cost** of achieving mitigation objectives, which in turn can facilitate more ambitious mitigation action in future. Cost containment should continue to provide a strong incentive for using trading systems to achieve mitigation objectives, especially given the economic challenges currently faced by governments and industries in many countries. Since abatement costs differ by sector and by country, further cost reductions can be achieved by broadening the coverage of trading systems, linking trading systems together and allowing covered entities to purchase credits from crediting mechanisms to meet part of their mitigation targets. In addition to lowering costs, market mechanisms can also aim to:

- **Catalyse investment** in low carbon technologies and practices. Both trading systems and crediting mechanisms can play a role in shifting investment patterns from conventional investments towards low-carbon, climate-resilient infrastructure and practices.

- Contribute to fostering **innovation**. By establishing a carbon price signal across broad segments of the economy, both trading systems and crediting mechanisms can help to stimulate innovation when combined with long-term mitigation goals and complementary policy instruments such as research and development support and technology diffusion incentives.

- Provide environmental and health **benefits** to local communities and promote **sustainable development** in developing countries. Crediting mechanisms can provide local benefits such as improved air and/or water quality, health benefits, local job creation, reduced traffic congestion and biodiversity protection, depending on the mitigation activity undertaken. If the price of credits from a crediting mechanism reflects only the quantity of emissions reductions achieved, then additional procedures may be needed to ensure that local benefits and sustainable development objectives are realised.

- Provide a source of **government revenue**. Trading systems can generate revenue if emissions permits are auctioned. There are many ways in which this revenue can be used; for example, it can be used to mitigate the impact of carbon pricing on low income households and/or energy-intensive industries (which can help build broad-based political support for the mechanism) and/or used to reinforce mitigation effects by rewarding activities with good emissions performance (e.g. via tax breaks for low carbon industries).

A set of principles for market mechanisms has already been agreed by Parties to the UNFCCC; the text of decision 2/CP.17 states that various approaches for mitigation actions (including markets) "must meet standards that deliver real, permanent, additional and verified mitigation outcomes, avoid double counting of effort, and achieve a net global decrease and/or avoidance of GHG emissions" (UNFCCC, 2011a). A further set of principles has been agreed for the "new market-based mechanism" defined in Durban which includes voluntary participation of Parties, stimulation of mitigation across broad segments of the economy, safeguarding of environmental integrity and good governance. The challenge presented by such lists of desirable principles is that they embody complex concepts with no internationally-agreed definition (Box 1, for example, highlights different possible interpretations of the term "environmental integrity"). Thus the way in which they are interpreted and translated into mechanism design can vary.

Box 1: What is environmental integrity?

The term "environmental integrity" has long been used in discussions of market mechanisms. While there is widespread agreement that environmental integrity is a desirable objective, there are different views regarding the meaning of this term and what is required to demonstrate that it has been achieved.

Although the overall ambition of national mitigation targets and goals is often seen as underpinning the integrity of market mechanisms, some see the environmental integrity of GHG units as depending on the specific design and governance of market mechanisms. In particular, two aspects are important: (i) the methodologies and rules used to create GHG units; and (ii) the institutions and procedures in place to ensure adherence to these methodologies and rules. Together, these can provide confidence to market participants and the international community that GHG units represent genuine emissions reductions.

Environmental integrity of GHG units is sometimes equated to ensuring that units represent emissions reductions that are real, permanent and additional, as well as requiring that units be verifiable and avoiding double counting. The latter two issues are relatively straight forward and can be addressed technically, e.g. through effective unit tracking systems and monitoring, reporting and verification (MRV) provisions.

Agreement on defining what constitutes "real, permanent and additional" reductions is more difficult. The counterfactual nature of establishing emissions baselines (either for setting caps or crediting baselines) means that the environmental integrity of a GHG unit cannot be known with certainty. The agreement at COP 16 that market mechanisms should ensure a "net global decrease" of emissions raises further questions regarding the meaning of environmental integrity. The nature of environmental integrity may also differ between trading systems and crediting mechanisms. Some see other potential threats to environmental integrity including how new sources and closed-down installations are treated, use of intensity-based targets, banking and borrowing provisions, length and renewal of crediting periods, use of unit exchange mechanisms, use of independent regulators, accounting of indirect emissions and emissions leakage.[10]

Environmental integrity has also sometimes been linked to particular political demands in the climate change negotiations. For example, the Least Developed Countries (LDCs) and the Alliance of Small Island States (AOSIS) have stated that ensuring environmental integrity includes putting in place restrictions on carryover of AAUs, respect of commitment period reserves, use of eligibility requirements and the setting of limits on use of offsetting by developed countries as a way to achieve part of their mitigation commitments.

In general, strong rules and institutions for market mechanisms combined with ambitious national targets and robust MRV would help to maximise confidence in the environmental integrity of GHG units. Further, the EU and AOSIS have stated that common, internationally-agreed rules for emissions accounting and design of market mechanisms are needed to ensure environmental integrity of GHG units (UNFCCC, 2012b).

3.1.2 Foundations

"Foundations" are design elements essential for the creation of GHG units. They describe the nature of the units themselves as well as the overall form of the mechanism, and therefore constitute some of the most difficult and contentious decisions that need to be taken when designing a market mechanism.

[10] Issues raised at CEPS Carbon Market Forum Task Force roundtable on environmental integrity, 16 November 2012, Brussels, see www.ceps.eu/content/ceps-carbon-market-forum.

Emissions caps and crediting baselines/thresholds

The emissions cap of a trading system determines its aggregate emissions reduction objective. The level of the cap is an important driver of the scarcity and price of emissions units. Over-allocation can occur if the cap set at a level at or above the effective BAU pathway; this has been a longstanding challenge in cap-and-trade systems for air pollutants and GHGs (McAllister, 2009). Over-allocation can lead to collapses in unit prices which in turn weaken the incentive for innovation and investment in clean technologies and practices. It is common for the cap to be set relative to historical emissions and to become gradually more stringent over time.[11]

Setting emissions caps using relative metrics such as tCO_2-eq per unit GDP can help to reduce the risk that over-allocation will occur as a result of unforeseen changes to the economy, such as economic recession.[12] However, the use of relative metrics means that the overall level of emissions abatement is unknown in advance and so the total emissions of covered entities could increase. Some may perceive this as weakening the environmental integrity of the trading system (see Box 1). It is also possible to establish a trading system without setting a pre-determined aggregate emissions cap. For example, covered emitters in the New Zealand ETS are to surrender a quantity of units equivalent to their emissions with unlimited use of international KP units permitted.[13] In this way the strength of the signal for investment in low carbon technologies in New Zealand depends on the international carbon price, even without a direct link to other trading systems.

Crediting baselines or thresholds describe what would have happened in the absence of an action and are at the heart of any crediting mechanism. In many existing crediting mechanisms, the selection of a baseline is reinforced by an additionality test designed to demonstrate that the emissions reductions are additional to those that would have happened in the absence of the mechanism. Baselines are built upon a set of assumptions that can vary in their conservativeness and various approaches to calculating a crediting baseline are possible (Prag and Briner, 2012).

Coverage of emissions sources and eligibility of activities

For trading mechanisms, the coverage determines which emitters have obligations under the trading system. Coverage can be in terms of types of sources, gases and installation size, whereby small emissions sources may be excluded. Under a mandatory mechanism, the coverage details will have important legal consequences for the emitters concerned. In general, broadening the coverage of a trading system increases the options available for emissions abatement and helps to reduce the overall costs of mitigation action while increasing the liquidity of the market. However, expanding coverage to energy-intensive industrial sectors in a world of non-uniform carbon pricing can be politically difficult to implement, partly because of short-term cost increases.

For crediting mechanisms, only certain types of emissions reduction activities are eligible for credits. A greater number of eligible activities can increase opportunities for mitigation; however, if participation in the mechanism is voluntary, these emissions abatement opportunities may not necessarily be realised. For example, over 180 CDM methodologies exist but only a small proportion of them account for the majority of CERs issued to date (UNFCCC, 2011d).

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[11] For example, the cap of the EU ETS is decreasing at 1.74% per year during Phase III; the cap of the RGGI is stable for 2009-2014 then will decrease at 2.5% per year in 2015-2018; the proposed cap for the California ETS will decrease at 2% per year in 2013-15 and 3.0-3.5% per year in 2016-2020.

[12] For example, in the Alberta Specified Gas Emitters Regulation, covered installations are to reduce their emissions intensity by at least 12% from 2007 relative to the 2003-2005 level.

[13] Note that the cap for the New Zealand ETS is nested within New Zealand's national target for the first KP commitment period and an emissions cap may be set once auctioning is introduced into the scheme.

The coverage of a trading system or the list of eligible activities under a crediting mechanism may be influenced by the presence of existing domestic environmental legislation. For example, CAR protocols have not been developed for projects in the energy sector partly because it is expected that in future these emissions will be capped by the forthcoming California cap-and-trade system. This makes them less desirable sources of offsets, even for discerning voluntary buyers. Data availability can also be an important influence on the coverage of trading systems in some countries since detailed installation-level time series data on emissions levels may be incomplete or unavailable for some sectors.

Rules on use of credits to partially meet objectives

Trading systems often offer flexibility to covered emitters in terms of how they can meet their mitigation obligations. If covered emitters can meet part of their mitigation obligations by purchasing credits, then rules on both the quantity and quality of credits may be introduced. While restricting the quantity of credits that can be used by covered entities to meet their individual mitigation obligations may theoretically limit the cost-effectiveness of a trading system, doing so can ensure that some of the low carbon investment and co-benefits generated by the mechanism accrue to the country or region concerned.

The upper limit on credit use has varied considerably between different trading systems to date.[14] Some trading systems have introduced further qualitative restrictions on recognised credit types that go beyond the international standard of the KP mechanisms in order to maintain the perceived environmental integrity of their trading system. For example, CERs from certain types of industrial gas and land-use projects cannot be used for compliance in the EU ETS,[15] the NZ ETS has restrictions on the use of credits from nuclear project activities and CERs from land-use activities, and the Australia carbon pricing mechanism will not accept some types of CER.

The source of the credits recognised for compliance in trading systems can be pre-existing crediting mechanisms and/or new custom crediting mechanisms defined as part of the trading system rules. The EU ETS only accepts credits from the pre-existing KP project-based mechanisms. The California scheme will only accept credits from its custom protocols (though these are based on pre-existing CAR protocols). The Australian carbon pricing mechanism will accept both KP units and domestic credits from its Carbon Farming Initiative programme. The rules and standards for credits currently being developed for these and other major trading systems may "set the bar" for the standards and design of future crediting mechanisms.

Unit allocation or auction process

At the beginning of each trading period of a trading system, a quantity of allowances equivalent to the level of the cap needs to be allocated, auctioned or otherwise distributed to covered emitters. In theory, full auctioning of allowances leads to efficient allocation and facilitates price discovery. However, it is common to undertake some level of free allocation when introducing a trading system due to political constraints and the economic concerns of covered entities, particularly in sectors where the direct costs cannot be immediately passed on to consumers and/or where entities face strong international competition. Free-allocation plans can be drafted on the basis of historical emissions (grandfathering) or using performance benchmarks; both approaches present challenges and rely on high quality data records of historical and actual emissions. Existing trading systems differ in

[14] For example, this limit is 3.3% for the RGGI; 8% for the proposed California ETS; 12.5% in the Australian carbon pricing mechanism.

[15] Further, from 2013, CERs from new projects will only be accepted for projects based in LDCs.

terms of what percentage of covered emitters (if any) receive free allowances, and the quantity of free allowances distributed usually decreases over time.[16]

Participation requirements

While country participation in multilateral market mechanisms has been voluntary to date, countries wishing to make use of such mechanisms may need to meet certain participation requirements. For example, in order to participate in the KP mechanisms, Annex I countries need to have: (i) ratified the KP; (ii) calculated their assigned amount; (iii) set up a national system for measuring GHG sources and sinks; (iv) established a national registry for unit tracking; and (v) submitted an annual GHG inventory. There are also eligibility requirements for the host countries of the KP crediting mechanisms; for example, non-Annex I countries need to have ratified the KP and to have a Designated National Authority (DNA) in order to host CDM projects.

In future, to participate in trade of GHG units recognised for compliance with mitigation targets and/or goals under the UNFCCC, participation requirements for countries could include technical criteria (e.g. possession of the infrastructure needed to process unit transactions) as well as non-technical criteria (e.g. countries could be required to have submitted a mitigation goal under the UNFCCC in order to participate in a future mechanism), in addition to meeting any agreed standards for other design elements.

3.1.3 Nuts and bolts

"Nuts and bolts" comprise more technical design elements important for the smooth functioning of market mechanisms. These design elements illustrate how market mechanisms can be based on similar sets of principles but have different ways of implementing them in practice.

Monitoring and reporting provisions

The aim of the monitoring and reporting provisions of a market mechanism is to provide an effective and timely flow of information between mechanism participants and other relevant stakeholders that gives reassurance on the environmental integrity of units and ensures that all stakeholders can fulfil their roles. Decisions need to be taken when designing a trading or crediting mechanism regarding the scope of GHG emissions that need to be measured and the frequency at which they are to be measured and reported. Further, for crediting mechanisms, participants may need to show that the emissions reductions were achieved via the method described *ex-ante* in the project documentation in order to earn credits. For trading systems, participating emitters are required to report their total GHG emissions and demonstrate that they hold an equivalent quantity of allowances – in general it is not necessary in this case to describe the method used to achieve emissions reductions in order to demonstrate compliance (which may also be the case in a "group performance" crediting mechanism).

Existing trading systems have built up significant experience of emissions monitoring and reporting during their early trading periods. Data quality prior to the start of trading was poor in many cases, meaning that initial caps and allocations were difficult to calculate accurately; this was partly the cause of the apparent over-allocation in Phase 1 of the EU ETS. One way to address this is to introduce compulsory emissions monitoring and reporting of covered entities prior to the launch of

[16] For example, most allowances were allocated for free in the first two phases of the EU ETS and a transition plan is in place to move towards full auctioning in Phase 3; most allowances in the proposed California ETS will be allocated for free in 2013 and the proportion auctioned will subsequently increase between 2014 and 2020; allowances in the New Zealand ETS are currently distributed for free although the mechanism will be amended after 2012 to introduce auctioning (NZ MFE, 2012); Australia is planning a transition towards full auctioning from 2015 with initial allocation for energy-intensive industrial sectors based on performance benchmarks.

the trading system. This has been the approach taken in Australia, where the National Greenhouse and Energy Reporting Act has mandated the reporting of emissions levels by Australian corporations since 2008 and this data underpins the carbon price mechanism established in 2012 (Australian Government, 2007).

For crediting mechanisms, the CDM provides perhaps the largest existing catalogue of international monitoring and reporting guidelines for credited emissions reductions. Crediting mechanisms such as the JI and the VCS have taken advantage of this body of experience and incorporated it into their designs, such that CDM monitoring methodologies can be used for JI and VCS projects.[17] Other internationally-agreed standards also exist for aspects of monitoring and reporting, such as ISO 14064 Part 2 which provides standards for the quantification, monitoring and reporting of GHG emission reductions or removals.

Unit issuance and registries

Once the quantity of units to be issued has been agreed and the necessary validation and verification exercises have been completed, issuance of units can occur. For most existing mechanisms, units are issued electronically and each unit is given a unique serial number which facilitates unit tracking. The units are issued into holding registries. For trading systems, these are the holding accounts of covered emitters. For crediting mechanisms, the credits can be issued directly into the individual holding accounts of participants (e.g. the VCS) or initially issued into a central registry (e.g. the central CDM registry).

In order for a unit transaction between two carbon market actors to be processed, the registries of the two actors need to be able to communicate with each other. This requires registries to have common technical specifications (e.g. to use compatible software and data exchange standards). International data exchange standards have been developed for registries under the Kyoto Protocol (UNFCCC, 2010b) and subsequently adopted for use in the EU ETS. A central communications tool linked to the registries (such as the KP International Transaction Log) can undertake a series of technical and/or policy-related checks before each transaction is completed, as well as to keep a record of transactions for reporting purposes.[18]

Trading/crediting periods

Trading systems generally comprise a series of discrete trading periods. At the end of each trading period, covered emitters need to demonstrate compliance by surrendering units. The length of trading periods in existing trading systems ranges from one year (e.g. the Alberta GHG Reduction Program) to eight years (e.g. Phase III of the EU ETS, albeit with annual reporting and verification requirements). Shorter trading periods encourage near-term action by covered emitters (either in terms of reducing their emissions or investing in offsets) while longer trading periods allow emitters greater flexibility in the timing of their investment decisions and longer-term certainty on the continuation of a carbon price. The proposed California ETS has an annual obligation to surrender allowances covering a minimum of 30% of the previous year's emissions, while at the end of the trading period emitters are to surrender allowances equal to their total emissions during the period.

Crediting periods determine the length of time for which emissions reductions are measured and verified, and credits can be issued. An activity can no longer be issued with credits once its crediting period has expired; thus the crediting period determines the period of time for which an activity can be financially supported by the crediting mechanism. The length of crediting periods depends on the

[17] The VCS has recognised CDM as an approved program, meaning that all CDM methodologies, including for baselines, are eligible for use in the VCS.

[18] See Prag *et al.* (2011a) for a more detailed treatment of the options available for tracking unit transactions.

type of mitigation activity concerned (land`-use projects tend to have longer periods), as well as the mechanism used to generate credits.[19]

Banking and borrowing

Banking and borrowing provisions can provide emitters with access to allowances from past (banking) and future (borrowing) trading periods, thereby giving them increased flexibility regarding their unit purchases. Some trading systems provide for unlimited banking of allowances from one trading period to the next (e.g. RGGI), while others place a limit of the quantity of units that may be banked (e.g. the proposed California ETS). The EU ETS did not allow banking and borrowing of allowances for its first phase, in part because of concerns over the reliability of data and allocation plans. The result is that the price crashed to nearly zero in 2006. However, full banking and borrowing of allowances is allowed between the second and third phases and this may be supporting the current permit price, given the apparent surplus of allowances in Phase 2 and stretching out into Phase 3 (Deutsche Bank, 2012).

Market mechanisms are generally intended to facilitate the participation of broader private sector market participants such as traders, brokers and project developers, in addition to covered entities. An important aspect of mechanism design is therefore to ensure that the rules regarding trading arrangements such as banking and borrowing provisions are unambiguous and encourage this participation while setting clear boundaries regarding what is permissible.

3.1.4 Verification process

An important design element in any carbon market mechanism is the process by which emissions performance is checked in detail "on the ground" at emissions sources. In many cases, accredited private sector third-party verifiers have been used to carry out this task. Project-based crediting mechanisms have often included an extra step in the verification process, whereby a potential project is vetted prior to construction or implementation to assess its suitability for crediting. This is known as validation and is also often carried out by third-party entities.

Accreditation of third-party entities

The aim of the accreditation process is to provide assurance that third-party entities are competent, capable and suitably qualified for the tasks they are required to perform. At the same time, the process needs to be cost-effective and not too time- or resource-intensive. In the CDM and JI, accredited entities are termed Designated Operational Entities (DOEs) and Accredited Independent Entities (AIEs) respectively. The procedure for accreditation of DOEs involves multiple steps and bodies (e.g. submission to the CDM Accreditation Panel, assessment by a CDM Assessment Team, accreditation by the CDM EB, designation by the CMP).

The eligibility criteria for third-party entities commonly include accreditation to an international standard such as ISO 14065 in addition to context-specific requirements.[20] ISO 14065 ("Requirements for greenhouse gas validation and verification entities for use in accreditation or other forms of

[19] In the CDM, for example, project proponents can choose between a single ten year period or up to three consecutive seven year periods (with renewal criteria). For Alberta offset projects the standard crediting period is 8 years with a possible 5-year extension (and longer periods for land use projects). For offsets adopted by the California Air Resources Board (ARB) it is between 7 and 10 years for non-sequestration projects and between 10 and 30 years for sequestration projects.

[20] For example, in addition to being accredited to ISO 14065, third-party auditors for the CAR must also have a minimum of two staff members that have completed a special CAR training course to become "Lead Verifiers" (CAR, 2010). DOEs for the CDM need to meet the "CDM Accreditation Standard for Operational Entities", parts of which are based on ISO 14065 (UNFCCC, 2011e).

recognition") provides guidance on aspects such as impartiality, personnel competencies, confidentiality, record keeping, legal matters and management systems (ISO, 2007). Certification under ISO 14065 is usually done by an accreditation body, often an agency of a national government, There are separate ISO standards defining requirements of accreditation bodies (the ISO 17000 family), and accreditation bodies meeting these standards may be members of the International Accreditation Forum (IAF). The CDM Accreditation Standard is partly based on ISO 14065 (UNFCCC, 2011e). Under the VCS, validation/verification bodies accredited under a VCS-approved GHG program (e.g., CDM) are eligible, as are bodies accredited under ISO 14065 by an accreditation body that is a member of the IAF (e.g., the American National Standards Institute).

Validation and verification

Validation and verification exercises[21] are used in trading and crediting mechanisms to build confidence in the data reported by market participants regarding, *inter alia*, reported emissions levels or offset project eligibility. Some existing trading mechanisms (e.g. RGGI and New Zealand) have relied on strong enforcement processes to allow emitters themselves to self-verify emissions reports (UNEP Risø Centre *et al.*, 2012). However, most trading mechanisms and all existing crediting mechanisms have relied on accreditation of professional third-party verifiers. In the Australian carbon pricing mechanism, all emitters prepare an emissions and energy report with larger emitters (>125 kt CO_2-eq/year) required to provide an additional reasonable assurance report undertaken by an independent third-party auditor. The EU ETS requires all emissions reports to be verified by accredited third-parties.

While all existing crediting mechanisms feature some sort of verification step, the validation step is voluntary in some cases (e.g. Alberta offsets) and not included as a standalone step in others (e.g. the CAR offset protocols). In the CDM, the initial validation by a third-party entity is followed by a further "registration" step, which is essentially a second validation exercise conducted by the CDM EB. In JI this step is referred to as "determination" and may be undertaken either by the host country for Track 1 projects or by the Joint Implementation Supervisory Committee (JISC) for Track 2 projects. In the WCI recommendations for offsets, validation can be undertaken by either a WCI Partner jurisdiction or an independent validation body.

ISO 14064 Part 3 ("Specification with guidance for the validation and verification of greenhouse gas assertions") provides international guidance for how to undertake these activities, including on principles, independence, ethical conduct, due professional care, levels of assurance and the wording of GHG assertions (ISO, 2006c). The principles underpinning the CDM Validation and Verification Standard are taken from ISO 14064 Part 3. In the Alberta offset system, third-party verifiers can choose to use one of three standards for verification – ISO 14064 Part 3, a national standard developed by Canadian Institute of Chartered Accountants or an International Standard on Assurance Engagements (Government of Alberta, 2012).

Enforcement

Enforcement covers the regulatory processes for compliance and ensuring adherence to rules.

Compliance procedures and adhering to rules

In trading systems, covered emitters demonstrate compliance by providing information to the system authority on their monitored and verified emissions and holdings of emissions units (i.e. allowances

[21] The difference between these two terms is that validation generally takes places *ex-ante* (to approve potential crediting projects) and verification generally takes places *ex-post*; however, both exercises serve the same ultimate purpose which is to provide confidence in emissions performance and emissions reductions achieved.

and credits) and/or other valid certificates. The role of penalties in a trading system is to deter covered emitters from not complying with their obligations and, by doing so, to underwrite the integrity of the emissions cap.

Existing trading systems have used a range of penalties for non-compliance with trading system obligations, including fines, mandatory purchase of emissions units, reduced allocation of allowances for the subsequent trading period and public lists of emitters in non-compliance. The type of compliance system is closely linked to both monitoring/reporting and verification requirements. The design of non-compliance penalties requires a delicate balance to be struck between guaranteeing the integrity of the trading system and maintaining the support of key emitting industries. This balance can be dependent on country circumstances and the surrounding regulatory environment, and is an important consideration for linking of systems (Kruger and Egenhofer, 2006).

As crediting mechanisms to date have operated on a voluntary participation basis, they have not required compliance enforcement procedures. Nevertheless, an important design element of a crediting mechanism is a process for ensuring that rules have been adhered to prior to issuing credits. This is important to ensure the environmental integrity of the credits issued, in a similar way to the compliance process ensuring the integrity of allowance units in a trading system. Enforcement processes are an important part of mechanism governance and are explored further in Section 4.

3.2 Use of standards in carbon markets

International standards and guidelines can help to make markets more efficient and effective by providing international specifications or guidance for certain technical elements. The standards adopted as part of carbon pricing legislation can be a combination of existing international standards and context-specific provisions developed from scratch.[22] The use of international standards can provide assurance to other authorities regarding the environmental quality of the units being traded. Adopting an international standard that has already been developed can also save valuable time and resources for a mechanism regulator. On the other hand, the use of context-specific provisions can help to maintain flexibility and tailor the standard to national circumstances.

International standards and guidance of relevance to the operation of carbon market mechanisms already exist. These include the ISO 14000 series of standards, the Verified Carbon Standard (VCS) and the WRI/WBCSD GHG Protocol, as well as the CDM standard itself, amongst others. Table 1 provides some examples of where such standards have been integrated into the modalities and procedures of other market mechanisms. A key issue is how standards may be used in the UNFCCC process going forward, including their potential role in (i) the new market mechanism, (ii) the framework for various approaches, (iii) co-ordinating the linking of domestically-governed market mechanisms and (iv) facilitating recognition of GHG units from market mechanisms used to meet part of mitigation targets and goals under the UNFCCC. This is related to the governance and decision-making processes used; these are explored further in Section 4.

[22] While the standards developed by international bodies such as the International Organisation for Standardisation (ISO) are voluntary, such standards can be embedded into regulatory frameworks and therefore required by law. For example, an ISO minimum standard for ergonomics in offices (ISO 9241) underpins the UK Health and Safety (Display Screen Equipment) Regulations 1992, and ISO guidelines for the manufacture of cosmetics (ISO 22716) will form the basis of the manufacturing requirements in the European Cosmetic Regulations (ISO, 2012).

Table 1: Examples of adoption of international standards in market mechanisms

Standard	Design element(s) covered	Examples of adoption
ISO 14064 (Parts 1-2)	Coverage Monitoring and reporting	ISO 14064 forms the basis of the VCS CAR protocols are designed to be consistent with ISO 14064-2 Alberta offset projects must be implemented according to ISO 14064-2 MRV under the JVETS is consistent with ISO 14064
ISO 14064 (Part 3)	Validation Verification	The validation and verification principles from ISO 14064-3 are used in the CDM Validation and Verification Standard
ISO 14065 and 14066	Accreditation of 3rd parties	Third-party auditors undertaking validation and verification under the WCI and the CAR must be accredited to ISO 14065 ISO 14065 is one of three standards available for use by 3rd party verifiers in the Alberta offset system
ISAE 3000 and ISAE 3410	Verification	Emissions and energy reports prepared for the Australia carbon pricing mechanism must be in accordance with these International Standards on Assurance Engagements (ISAEs).
WRI/WBCSD GHG Protocol	Crediting baselines	CAR Offset Project Protocols are designed to be consistent with the WRI/WBCSD Protocol for Project Accounting
IPCC Inventory Guidelines	Monitoring and reporting	IPCC Inventory Guidelines are to be used for GHG inventories and national communications under the UNFCCC (required as part of the eligibility report for participation in KP mechanisms)
CDM standard	All design elements for a crediting mechanism	CDM is a recognised programme under the VCS
CAR protocols	All design elements for a crediting mechanism	Some CAR protocols have been adopted for use for California offset projects
VCS	All design elements for a crediting mechanism	The VCS has been accepted under initiatives such as Australia's National Carbon Offset Standard (for voluntary buyers outside of the CPM), Costa Rica's carbon neutrality program, and the Santiago Climate Exchange.

4. Unpacking governance of market mechanisms

Successful implementation of market mechanisms requires clear and effective governance and decision-making processes. This section unpacks how these processes have been carried out in existing market mechanisms, in particular focusing on where different bodies have had responsibility for different design elements, and where common standards have been used by different governing bodies. The term "governance" is taken here to mean the institutional structure and decision-making processes needed for both design and operation of carbon market mechanisms, both of which are crucial to ensuring the environmental quality of units.

Previous CCXG work assessed how international assurance of the quality of traded units might be provided in the UNFCCC context under a less centralised accounting system (Prag *et al.*, 2011a). That analysis considered how international crediting mechanisms might be governed in future and put forward three governance options: (1) a mechanism fully designed and regulated under the auspices of

the UNFCCC; (2) multiple mechanisms designed and regulated by country governments, but only recognised internationally if they meet certain UN eligibility criteria; and (3) fully country-led mechanisms with internationally-agreed transparency requirements. The analysis in this section adds further resolution to the first two of these options by assessing how governance is relevant to the different design elements outlined in Section 3. It also explores how these options might work for new market mechanisms in the UNFCCC context.

4.1 Effective governance for market mechanisms

An effective market mechanism that generates internationally-tradable units requires a governance structure that balances a number of potentially diverse factors, including:

- the **sovereignty** of the government authorities involved, such that countries retain what they consider to be sufficient control over mechanisms operating under their jurisdiction;
- the ability to demonstrate assurance of the **environmental integrity** of units being created;
- the potential **fungibility** of the units with others internationally (for either direct linking of trading systems or mutual recognition of common offset units);
- the **cost-effectiveness** of the mechanism's procedures, to avoid unnecessary complexity and high transaction costs for the private sector emitters impacted by the mechanism;
- the **reliability and predictability** of the institutions responsible for the mechanism and the procedures used, to avoid unacceptable levels of regulatory or country risk being perceived by private sector actors;
- extent to which mandatory **compliance** is needed for covered emitters.

The relevance of the issue of sovereignty over the operation of the mechanism depends on the nature of the mechanism and to what extent it is internationally- or domestically-governed (see Box 2). If the units from a market mechanism are neither traded internationally nor used to meet part of a mitigation target or goal under the UNFCCC then such a system can be a fully domestic tool with complete autonomy of design and governance resting with the national or sub-national government. If, however, a direct link is sought between two trading systems in different countries or regions, bilateral discussions are required regarding the objectives and design features of the respective mechanisms – even if each jurisdiction retains authority over its trading system. For multilateral trading or crediting mechanisms, participation requirements may be needed which would also need to address concerns over sovereignty. These requirements could entail a checklist of what regulatory capability is required by a host country in order to participate in an international mechanism or some form of review of the design and governance of the market mechanism concerned. A key question in that case would be which regulatory body has authority to approve whether the requirements have been met.

Box 2: Levels of governance

When considering the governance structure of market mechanisms, an important distinction can be drawn between (i) mechanisms that are conceived through multilateral agreement and subject to governance by an international body ("internationally-governed"), (ii) mechanisms instigated domestically, subject to national or sub-national legislation and authority ("domestically-governed"), and (iii) mechanisms established by non-government entities such as the VCS and Gold Standard ("voluntary").

Internationally-governed market mechanisms are governed by procedures agreed under a multilateral negotiation process. The nature of these procedures, and whether they can be enforced under international law, depends on the type of treaty or other international agreement under which they operate. The KP is essentially an example of a contractual international agreement; Parties agree to be held accountable to specific commitments under international law. Future instruments adopted under the UNFCCC may be of a more facilitative nature (Bodansky, 2012). With the assurance of the contractual nature of the over-arching KP, the three KP flexible mechanisms (IET, CDM and JI) were described through prescriptive procedures.

Market mechanisms developed under national or sub-national legislation or regulations are answerable only to the national or sub-national authority. To date, some domestically-governed mechanisms have been kept separate from the internationally-governed mechanisms (e.g. the forthcoming California Scheme, RGGI, the Alberta Specified Gas Emitters Regulation and the Tokyo ETS, and their associated offset provisions).

However, the distinction between internationally- and domestically-governed mechanisms is not always clear cut. For example, the EU ETS was designed to facilitate achievement of countries' international commitments and therefore operates in conjunction with the internationally-governed KP mechanisms, whilst remaining under domestic authority. Further, even under the KP some governments have imposed additional requirements on top of the KP market mechanism procedures to add further assurance of the quality of units accepted. These include bilateral and unilateral requirements. Examples of bilateral agreements include "Green Investment Schemes" whereby an assurance is provided that for each AAU transacted, a specific investment has been made in emission reduction activities. An example of a unilateral measure is the decision of some European countries to restrict certain CER types to be used for meeting their national KP commitments.

A further category describes mechanisms designed and implemented by non-government bodies to service international or domestic voluntary demand for carbon credits. These mechanisms (such as the VCS) have often developed independent processes and procedures, albeit often based partly on pre-existing standards or procedures. Voluntary buyers choose to recognise the resulting units for their own reputational or other purposes without necessarily needing the endorsement of a national or sub-national authority. In future, however, such programmes could be endorsed by governments or recognised internationally, for example through the UNFCCC framework for various approaches.

National or sub-national regulators may adopt tools and procedures from international processes in order to facilitate international linking of mechanisms or recognition of units. To date this has included the recognition of KP units (from CDM and JI) as valid compliance units under the EU ETS (through the Linking Directive; see EC, 2004b) and the Australian carbon pricing mechanism. A different example of a process for recognition of the units and procedures between mechanisms is the VCS gap analysis process for recognition of other crediting programmes under VCS. Once approved, all methodologies from the other programme become valid under VCS, validation/verification bodies accredited under the other programme can operate under the VCS, and units from the other programme can be converted into Verified Carbon Units (VCUs) (VCS, 2012).

The ability to demonstrate environmental quality of units and the potential fungibility of those units internationally are related issues. Units are likely to be fungible if they are mutually accepted as valid

for meeting obligations under more than one trading system. For ETS units, this occurs when the systems are linked directly. For credits, this occurs when more than one trading system or other form of capped system recognises the same source of units as valid for compliance purposes.

Fungibility can have both technical and non-technical components. For example, essential technical pre-requisites for fungibility include having a linked registry system with the ability to process unit transactions. However, less technical elements are also important, including the rules and standards developed to avoid double counting as well as the decision-making process used to demonstrate the quality of units. The greater the degree of convergence between mechanisms on these issues, the more promising the prospects for achieving unit fungibility between those mechanisms.

Moving towards convergence in terms of standards and decision-making processes for market mechanisms could also facilitate the participation of private sector entities in the carbon market. This is because standards could simplify involvement of entities with operations covered by more than one trading system as well as creating lower transaction costs for those seeking to invest in mitigation activities across multiple regions. Experience with existing market mechanisms to date suggests that country risk can play an important role in the level of private sector support for, and participation in, a market mechanism.

Country risk can take different forms. A generally poor investment climate in a country can discourage private sector investment, including in carbon market mechanisms. This effect is evident in the distribution of CDM projects (Ellis and Kamel, 2007). A different type of country risk is involved in the case of Track 1 JI, where the carbon market incentive is managed by the host country exclusively and underwritten by the country's commitment under the KP and accompanying compliance requirements. This freedom from international governance processes has not necessarily led to increased investment. Russia has a large potential for JI, for example, but uncertainty and unexpected changes in the country's regulatory approach to JI have led to a perception of high risk for investors (Shishlov *et al.*, 2012). Such risk has led some investors to withdraw from JI in Russia, including the Danish public sector projects (DEA, 2011).

A further distinction can be drawn between mechanisms with mandatory participation for covered entities and those for which participation remains voluntary. All existing individual performance crediting mechanisms are based on voluntary participation. The new market-based mechanism under the UNFCCC has been defined as "ensuring voluntary participation of Parties" (UNFCCC, 2011a). However, once a country has decided to participate, if the mechanism operates as a group performance crediting mechanism then this may require mandatory participation of covered emitters in order to function (Prag and Briner, 2012). As a result, a participation requirement of such a mechanism might be for host countries to need to demonstrate a governance structure with compliance capability under local legislation or regulation.

Participation is mandatory for covered emitters in most (but not all) trading systems, with penalties issued by the relevant government authority in cases of non-compliance with the mechanism rules. Whilst "rules" is a general term commonly used when describing the governance of carbon markets, the term is rarely explicitly used in formal documentation. Annex A lists various examples of terms used in different jurisdictions and circumstances for procedures critical to the functioning of different carbon market mechanisms. It could be argued that all of these can be classified as "rules" in the sense that they define permissible actions. Clearly the degree to which a set of provisions is enforceable depends on the regulatory framework by which it is adopted, rather than the label used. The terminology itself is often in line with the prevailing practice in different jurisdictions.

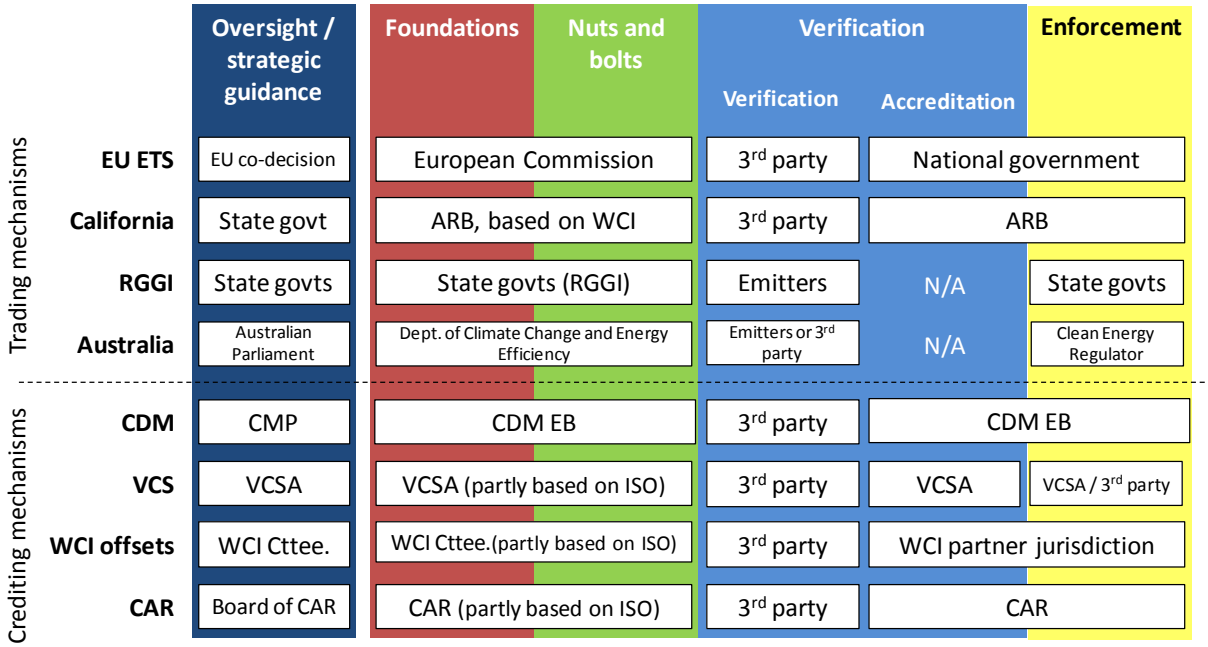
The distinction between internationally- and domestically-governed mechanisms could become even less clear if future agreements under the UNFCCC take a more facilitative approach. Such overlaps in the governance of existing mechanisms set precedents for how new international mechanisms (e.g.

under the UNFCCC) could interact with existing mechanisms at the international, national and sub-national level. In future, some countries may seek to use units from national or sub-national market mechanisms to meet part of their international mitigation commitments under the UNFCCC. A challenge facing the UNFCCC negotiations is to decide whether units generated by national or sub-national mechanisms could be recognised as valid for meeting international commitments, and if so, how. Although this will depend on the nature of the overarching international agreement yet to be reached, it is useful to look at how existing mechanisms have been governed and how the various types of international governance bodies currently used in the UNFCCC process (see Annex B) might be applied to new mechanism structures.

4.2 Governance models in existing market mechanisms

Successful implementation of market mechanisms requires a number of governance roles to be fulfilled. In addition to a high-level body providing the legal mandate and strategic direction, a decision-making role is required for each of the design elements described in Section 3. Existing market mechanisms have approached these governance roles in different ways and this is informative for considering how new market mechanisms might operate in the context of diverse domestic arrangements in different countries. In some cases, a single governing authority has been designated as the decision-maker for many or all of these roles. In other mechanisms, procedures have been designed to allow more devolved decision-making, with different bodies taking responsibility for different decision points. Figure 6 highlights some examples of how different trading and crediting mechanisms have approached the different levels of decision-making roles. The rest of this section assesses where commonality can be found between existing mechanisms, and how this could be relevant for the use of market mechanisms under the UNFCCC.

Figure 6: Distribution of governance roles in some existing market mechanisms



Source: Authors

NOTE: The WCI offsets process is shown here alongside other crediting mechanisms. However, it does not create and issue credits in its own right. The WCI Offsets Committee agrees processes and criteria for subsequent adoption by partner jurisdictions as they develop specific offset procedures for their own trading systems.

4.2.1 Legal mandate and strategic direction

Most market mechanisms operate under the oversight of a high-level body that provides the legal mandate for the mechanism and may deliver strategic guidance for its development. For internationally-governed mechanisms, this is often a multilateral body given powers under an international treaty (e.g. the CMP for the CDM); for domestically-governed mechanisms this is often the national or sub-national government or a related body.

Governance of the EU ETS is particular to the structure of the EU and the relationships between the participating national governments. Over-arching legislation is adopted through co-decision between the Council of Ministers of Member States and the European Parliament. The detailed procedures and specifications – both the foundations and nuts and bolts – are drawn up by the European Commission in consultation with the national governments and stakeholders. The competent authorities of the national governments themselves are nevertheless responsible for enforcement of rules and managing the verification process in their jurisdictions. In Australia, the carbon pricing mechanism is under the legislative oversight of Acts and Regulations adopted by the Australian Parliament with operational governance provided by the Department for Climate Change and Energy Efficiency (DCCEE) and the newly established Clean Energy Regulator.

In North America, the design of the California cap-and-trade system is in accordance with the recommendations agreed with other member states and provinces of the WCI. However, the State Government has full jurisdictional control of the mechanism and provides high-level guidance. Also within the state jurisdiction, the California ARB has full authority for operational regulation of foundations and the verification process. Similarly, the RGGI is a multilateral co-operative agreement where state governments participate by enacting an agreed model regulatory rule into their own state legislation while retaining full sovereignty over the operation.[23] The system operates a single independent emissions registry; access to this registry depends on states enacting appropriate regulations. There is still a central decision-making body, the non-profit RGGI Inc., which manages the mechanism under the guidance of directors appointed by participant states.

In the CDM, the same decision-making body (the EB) sets the foundations and technical rules (including accreditation criteria), as well as takes decisions on whether rules have been met in particular cases and which verification entities meet accreditation standards. The VCS is an example of a non-government mechanism, administered by the VCS Association (VCSA) and its board of directors. The VCSA is also responsible for all the rules of the mechanism (partly based on ISO standard 14064) and general oversight of the programme. The CAR, however, not only approves protocols but also requires all project documents to be submitted for final approval after verification.

Principles and objectives

The objectives of market mechanisms are usually established by the high-level body with overall control of the mechanism, in accordance with the political aims of the jurisdiction in question, as described in Section 3. Similarly, the design principles by which the mechanism will operate are usually agreed at a high-level politically, and these can serve as a political mandate for development of detailed design elements.

Many existing and planned mechanisms state similar principles, with goals based on environmental and functional integrity. Principles and objectives are therefore one area where commonality can be found between mechanisms, through agreement among their governing bodies. The principles adopted by the KP mechanisms and the set of principles agreed by UNFCCC Parties in decision 1/CP17

[23] The overall emissions cap for the mechanism and individual state caps to 2018 were agreed collectively as part of the initial RGGI Memorandum of Understanding between states in 2005.

demonstrate the feasibility of agreeing principles internationally. However, the greater challenge is to design rules, procedures and decision-making processes that allow the principles to be upheld in practice.

4.2.2 Foundations

Coverage of emissions sources for trading systems

For existing domestically-governed trading mechanisms (including the EU ETS, considered here as domestic to the EU), deciding which emitters will be covered by caps has often been a matter for negotiation between regulatory authorities and the private sector emitters concerned. This is partly due to concerns over impacts on the competitiveness of trade-exposed energy-intensive industries in a world of non-uniform carbon pricing (OECD, 2009).

Therefore, whilst it may prove difficult to agree on prescriptive international standards for trading system coverage (since national circumstances mean that economic sectors vary considerably between countries), there is nevertheless an interest that the coverage of trading systems be aligned to some extent to minimise competitive distortion and to prevent potential carbon leakage. One example of standardised coverage is in the WCI design recommendations, where governors of all participating states and provinces agreed on the details of coverage including minimum threshold levels (WCI, 2010). Although termed "recommendations", they were adopted at a high political level on the understanding that they would form the basis of trading systems in the WCI area. The recommendations have since been transposed into the trading system legislation of California and Quebec.

Linking of trading systems does not require identical coverage of emitters between linked mechanisms. If the governing authorities of two or more trading systems have confidence in the environmental integrity of units circulating in each others' systems, they may still agree to link even if coverage is not the same. This integrity derives from other design elements including cap setting and allocation, monitoring and reporting standards, and processes and systems for compliance. These factors are therefore potentially more important for linking than standardising coverage (Ellis and Tirpak, 2006). Another important factor influencing the perceived quality of trading system allowances is the set of rules relating to use of offsets, and therefore the governance of associated crediting mechanisms.

Rules on offset use in trading systems and eligibility of activities in crediting mechanisms

The voluntary nature of project-based crediting mechanisms means that the development of projects has to date been driven not only by rules stipulating which activities are eligible under each crediting mechanism, but also by supply and demand factors. Demand factors include which project types are eligible for particular trading systems or other sources of demand, a reflection of the fact that crediting mechanisms require demand to operate and are therefore affected by the design of trading systems even if they are not formally connected.

Consistency in the rules for use of international credits for domestically-governed trading systems could be an important factor for facilitating both future linking between systems and potential recognition of units in the UNFCCC process. When considering how international standards might be utilised for future market mechanisms, it is important therefore not to consider trading systems and crediting mechanisms in isolation.

Supply factors include the abatement cost of different project types and the risk-return ratio of operating in different countries. For example, the distribution of project types under the first decade of CDM has been influenced by low marginal costs and high returns for industrial gas projects (supply

factors) and the ineligibility of forestry and land-use projects for use within the EU ETS (demand factors). The link between offset project types developed and the design of trading systems is even clearer where the trading system itself stipulates its own in-house offset provisions, such as in California where the regulator has stipulated a small number of eligible project types as well as approved the crediting baselines procedures.

Cap setting and unit allocation

The level of the emissions cap is one of the most important decisions taken when designing a trading system as it sets the level of environmental ambition, its cost to the economy and the demand for external credits it will generate. In the case of the EU ETS, the cap is agreed at the EU level in consultation with national governments. The balance of decision-making between participant national governments and centralised EU decision-makers has changed over the three phases of the EU ETS, with key decisions on allocation becoming more centralised as confidence in emissions data and trading systems has grown over time.

During EU ETS Phase I (2005-07) and Phase II (2008-12), national governments had significant decision-making responsibilities; the total EU cap on emissions was calculated relative to the sum of national allocations. These national allocations were described by national governments in National Allocation Plans (NAPs) that were guided by criteria specified in the jointly-agreed ETS Directive. This structure accommodated different legal requirements; for example, in France the development of the NAP was administrative, whereas in Germany legislation was required (Ellerman *et al.*, 2010). The role of the European Commission was to provide co-ordination, guidance and oversight, and it could reject NAPs if they were not consistent with the agreed criteria.[24]

For Phase III, a significant shift towards more centralised governance has been made, seeking to eliminate competitive distortions caused by the different approaches countries took to allocation in their NAPs now that data quality issues and political acceptability have improved. Joint decision-making at the EU level is now undertaken on the overall EU ETS cap, harmonised allocation rules based on benchmarking, common auction platforms and the move to a single centralised registry. This shift could also reduce the potential for fraud that has been demonstrated in the system of individual linked registries.

In the WCI, an overall cap was agreed by governors of participating states and provinces, based on mitigation commitments that had already been made by state governors. This meant that design recommendations could be agreed that included details of the aggregate cap of participating systems without needing a political negotiation of the cap level itself. However, the detail of allocation of permits between covered emitters was left to the participating partner jurisdictions (reminiscent of NAPs in the first two phases of the EU ETS). Emissions trading in the United States began with EPA programmes for pollutants under the Clean Air Act. The SO_2 programme was fully federal while the NO_x programme was more decentralised; the EPA decided the level of the overall cap and apportioned this to states. States could decide how to meet this budget, including whether to participate in the trading system, and made all decisions on allowance allocations within their budgets.

The integrity and stringency of an absolute cap on future emissions is dependent on good data on historical emissions and an effective forecast of future emissions under "business as usual" conditions. The latter is a difficult exercise at either sector or national level, and highly dependent on specific circumstances (Clapp and Prag, 2012). While agreeing an international standard for setting

[24] These criteria focused primarily focused on consistency with achieving countries' KP obligations. The Commission required reductions totalling 4.3% in Phase I and 10% in Phase II compared with the levels that countries had proposed.

the level of emissions caps seems unlikely, agreement of facilitative guidance related to the process of cap setting may be feasible, with the objective of increasing comparability of different emissions caps to facilitate future linking of systems. This could be related to guidance on setting emissions baselines at the sector and national level, e.g. including providing opportunities for stakeholder consultation and justifying the choice of assumptions used in emissions projections.

Crediting baselines

Crediting baselines are crucial to crediting mechanisms as they determine the quantity of credits that are created and therefore the potential revenues of credited activities. Deciding on qualitative and quantitative aspects of baselines has been integral to the concept of additionality under most existing crediting mechanisms, including the CDM. The process for approving crediting baselines involves a two-step approach with initial approval of the specific approach used to calculate each baseline, usually in the form of approving a baseline methodology, followed by validation of individual baselines by third-party validators.

Baseline methodologies are one example where there has been substantial cross-fertilisation between different crediting mechanisms, with existing internationally-agreed CDM baseline methodologies being used by other programmes. For example, CDM baseline methodologies are being used as a basis for JI projects and some CDM methodologies have been used directly under the VCS and Gold Standard. However, some crediting mechanisms have chosen to develop their own independent methods for setting and approving baselines, distinct from the CDM approach. This suggests that the CDM procedures and methodologies are not considered suitable by some regulators and that it may therefore be difficult to agree universal crediting procedures, even if the overarching principles of different systems are similar. For example, the WCI Partner jurisdictions have agreed an offset protocol recommendation process and are currently reviewing a specific set of new offset protocols under the WCI. These include avoided CH_4 from manure management, ozone depleting substances, coal mine methane and small landfills (WCI, 2012a; 2012b).

The governing bodies of several crediting mechanisms, including the CDM and the VCS, have recently taken steps to develop tools and approval processes for standardised baselines applicable to multiple similar projects (UNFCCC, 2011f; VCS, 2012). This involves shifting the key decision-making point further "upstream" from the individual project level in order to facilitate the scaling up of credited mitigation activities. However, this means that single *ex-ante* decisions on the level of the crediting baseline can impact the environmental integrity of credits from a large number of projects.

If the new market mechanism applies simultaneously to groups of emitters, this will also require *ex-ante* approval of the crediting baselines or thresholds to be used and these single decisions could impact the environmental integrity of an even larger volume of credits. Parties will therefore need to agree on whether this approval can be carried out by (i) a domestic governing body in the host country; (ii) an internationally-appointed committee under the UN or otherwise; or (iii) a domestic body subject to review by international independent expert review teams (Prag and Briner, 2012). In the latter case, an important consideration is that to date the recommendations expert review teams under the UNFCCC have not been binding, but rather rely on the overarching legal nature of the KP (via the threat of action through the Enforcement Branch of the Compliance Committee, see Annex B). As crediting baselines represent the creation of a tradable unit with financial value, a more robust review process may be necessary if a future agreement uses a less prescriptive legal model than the KP.

4.2.3 Nuts and bolts

Trading/crediting periods and banking/borrowing provisions

Decisions taken on the length of trading period are closely linked with decisions on how many units might be banked or borrowed between periods. Together, these are important functional issues to facilitate the linking of trading systems. The trading periods for the EU ETS have been set in line with the commitments of participating national governments under the first KP commitment period. In general, countries may synchronise trading periods with the timeframes of national emissions targets or goals in order to simplify accounting measures. If links were to be established between trading systems with different trading periods, however, this would affect the overall supply of allowances and therefore the stringency of the linked system (Ellis and Tirpak, 2006). The WCI provides an example of where the trading periods of multiple trading systems have been harmonised with a view to linking the systems concerned, although the allowance allocation decisions remain at the discretion of each partner jurisdiction.

Monitoring and reporting requirements

In governance terms, the distinction between verification and monitoring/reporting is important. Requirements for monitoring and reporting of emissions of covered entities in a trading system or projects eligible for crediting can include the means by which emissions are measured (directly or indirectly), the level of accuracy required of emissions measurement and the reporting formats necessary. The question of how that information is used and subsequently verified comes under the verification process. Existing mechanisms present a wealth of experience in monitoring and reporting requirements and guidelines, and the complexity of the requirements is dependent on the types of emitters covered. For example, for a mechanism that covers only industrial energy-based emissions, an internationally-acceptable standard for monitoring and reporting requirements might be relatively easy to agree on, particularly if a tiered approach is used to recognise different circumstances. The EU ETS Accreditation and Verification Regulation could form a useful model in this regard, along with the monitoring methodologies that form part of CDM methodologies. For coverage involving land-use emissions, international agreement on standard provisions may be harder due to the greater uncertainties over emissions monitoring.

Unit issuance and registries

Important governance issues for the trading of permits or credit units include the process for authorising issuance of units, whether the same unit type can be issued from more than one source, and the specification and management of unit registries that will subsequently be used to hold units belonging to market participants.

In trading systems, the EU ETS system of national registries was designed in close co-operation with the national KP registries to facilitate countries' participation in both mechanisms. However, in 2012 the registries migrated to a single European registry to increase efficiency of operation and reduce the risk of electronic fraud. This suggests that centralised registries are useful for trading mechanisms, even across multiple jurisdictions. A key element of the WCI design recommendation is that all linked schemes under WCI will use a common registry in order to facilitate tracking of units between states and provinces.

In crediting mechanisms, the number of issuance points can affect the potential fungibility of units as well as the risk of double counting whereby more than one emission reduction unit is issued for the same emission reduction. When there is more than one issuance point there is a risk that units issued from different points may be deemed of different quality and therefore not fully fungible. Under the CDM, units have been issued from a single issuance point, with the EB authorising every issuance of

units into the central CDM Registry hosted by the UNFCCC. In JI, countries can effectively issue their own JI units, provided that an equivalent quantity of AAUs is retired. This retains fungibility between Emission Reduction Units (ERUs) from JI projects and AAUs because of the detailed accounting rules and specifications of the KP.

Outside of the international mechanisms, the VCS has retained fungibility of units despite authorising a number of different registries to issue units once required verification controls have been passed. This has been successful due to a central project database that generates unique VCU serial numbers and ensures uniqueness of projects, plus detailed registry specifications and close controls and communication between the authorised registries to avoid any double issuance or other double counting (VCS, 2012). In the WCI, the offset recommendation process is designed to facilitate the mutual acceptance of each others' offsets in all trading systems operating under the WCI, facilitated by the single WCI registry. Given that the Quebec and California mechanisms only begin operation in 2013, at the time of writing there is not yet practical experience of this.

For development and recognition of mechanisms under the UNFCCC, a key issue is whether the existing KP unit registries and tracking systems could be used to recognise and track units issued from mechanisms that are fully or partially domestically-governed. The International Transaction Log is part of the KP infrastructure and facilitates use of the KP flexibility mechanisms by allowing transactions only when rules are not infringed. If this system is to be used as part of the framework for various approaches it would depend not only on an agreement by Parties to develop (and fund) the system itself, but more importantly on agreement on the rules about which units could be eligible to be transacted within the system.

Whether under the KP system or a new agreement on registry specifications, an international standard for registry communications would facilitate the accounting of units from international mechanisms, but does not in itself solve the underlying challenge of agreeing on standards and governance arrangements for the "foundations" of market mechanisms.

4.2.4 Verification process

Although some trading systems allow self-verification of emission reports by emitters, a large body of experience exists in devolving some verification oversight to third parties. A balance needs to be found between the level of confidence provided by the verification process and the time and resources needed (both for the regulatory authority to manage accreditation, and for emitters to engage verification entities). In the EU ETS, the Accreditation and Verification Regulation (formerly the Monitoring and Reporting Guidelines) requires that verifiers meet accreditation standards set out by the European co-operation for Accreditation (EA) Certification Committee, which in turn makes reference to the international standard ISO 14065. Accreditation of verifiers is the responsibility of national governments, many of whom have an accreditation body that is a member of EA. This is an example of a centrally-designed trading system, delegating responsibility for verification to member governments but with overall quality ensured by the use of common international standards.

International standards have been widely used for accrediting GHG validators and verifiers. ISO 14065 is used by accreditation bodies such as the American National Standards Institute to grant accreditation for VCS and CAR and the international standard resembles closely the CDM Accreditation Standard for DOEs. In addition, the new standard ISO 14066 provides more detail on specific competencies required by verification teams. Furthermore, the international standard ISO 14064 Part 3 has also been used to define the verification requirements themselves (as opposed to the competency of the verifiers) in the VCS.

The verification process (including accreditation of third parties as well as actual verification) therefore appears to be an area where international standards already exist, both in the UNFCCC and through ISO, and could therefore be developed in the context of new mechanisms and criteria for

recognising units from domestically-governed mechanisms. A key issue, however, is the interplay between the verification process and the overall enforcement of rules within the mechanism. Whilst third-party verification processes have been defined in several instances to operate largely independently of the oversight body governing the mechanism (e.g. CDM and VCS), in reality the governing body has, in practice, had a heavy involvement in individual decisions.

4.2.5 Enforcement and adherence to rules

Enforcement of compliance procedures is the crux of any governance structure for a trading mechanism. For a mandatory trading system, the body tasked with enforcing rules also needs legal powers to ensure that penalties or other consequences are applied in the case of non-compliance. The only example of this in an existing internationally-governed trading mechanism is the enforcement branch of the Compliance Committee of the Kyoto Protocol (apart from the special case of EU law governing the EU ETS). As well as applying consequences in cases of non-compliance with countries' KP commitments, the Compliance Committee is also responsible for suspending Parties' participation in the KP flexible mechanisms if appropriate. This again highlights that the governance structure of the new market-based mechanism under the UNFCCC is likely to be highly dependent on the overall legal character of a new overarching agreement in the UNFCCC process.

In domestically-governed, mandatory trading mechanisms, enforcement roles have usually been carried out by bodies given a legal mandate by the jurisdictional government, e.g. the competent authorities in EU national governments, the ARB under the state government in California and the Clean Energy Regulator under the national government of Australia (see again Figure 6). This has held true even where the design of a trading mechanism has been strongly influenced by an international or regional agreement. For example, although the California program is fully in line with agreed WCI design and process recommendations, enforcement is under the authority of the State of California and not of WCI bodies. In the case of RGGI, participating states agreed a standard penalty for non-compliance by power plants (surrendering allowances for three times their excess emissions) in addition to facing "state-specific penalties". Both types of penalty are enforced by state authorities (RGGI, 2010b). These governance models could also be envisaged under a new market mechanism within the UNFCCC, in cases where design recommendations are agreed by Parties at the COP but enforcement of rules remains with national or sub-national governments (depending again on the legal nature of an agreement under the UNFCCC).

All crediting mechanisms to date have been voluntary and have not involved the enforcement of a non-compliance procedure. However, ensuring adherence to rules before issuing credits is still required in order to ensure that credits that meet the requirements of the mechanism's principles and detailed procedures. In cases where offsets are being created specifically for use in a particular trading system, this function is sometimes carried out by the governing body of the trading system. In cases where a crediting mechanism has been developed to operate with relative autonomy (subject to demand for the credits), a dedicated governing body has often been established for this purpose; key examples are the CDM EB and the VCSA.

The body overseeing the adherence with rules of a crediting mechanism can be involved to a greater or lesser extent with project-level decisions. Most crediting mechanisms have "outsourced" the verification (and validation where appropriate) to accredited third parties. Whether the overseeing body subsequently scrutinises each opinion put forward by verifiers is an important aspect of the design of mechanism governance. The CDM EB scrutinises every decision, whereas the VCSA takes a more "hands-off" approach, relying more on the accredited third-party verifiers as part of its governance approach.

4.3 Towards international standards?

The previous sections highlighted examples of how existing international, national, sub-national mechanisms have approached governance roles within mechanisms and provided examples of where common standards, shared designs, or shared decision-making exist. These examples can inform how international agreement might be reached on different aspects of governance for a new market-based mechanism under the UNFCCC, and potentially on how internationally-traded units from other mechanisms might be recognised as valid under the UNFCCC process. If established, such standards could serve to guide future mechanism design in a way that would facilitate progress towards further linking of markets, even if use of the standards themselves is not mandatory. These standards could thus serve to help co-ordinate a recognition process under the framework for various approaches or form the basis of the new market mechanism. There are three broad ways that such standards might be agreed:

1. COP decisions to develop standards within UNFCCC process

This would represent a more conventional approach to developing standards under the UNFCCC, as was done for the flexible mechanisms under the KP. Parties could agree to use bodies within the UNFCCC process, such as the permanent Subsidiary Bodies, to develop standards for some design elements of market mechanisms, for subsequent adoption by the COP. These standards could focus initially on certain key design elements, and could be prescriptive to a greater or lesser extent, as a matter for negotiation.

2. COP decisions to recognise existing international standards

Given the large body of existing experience in developing and operating market mechanisms, Parties could agree under the COP to recognise certain pre-existing standards as eligible under the UNFCCC process. These standards could comprise existing agreements already developed under the KP (e.g. for the CDM), or international standards from outside the UNFCCC, such as combinations of certain ISO or other recognised standards. An example would be the package of ISO standards relating to accreditation of verifiers and verification process and competencies. Under such a system, the COP decision could stipulate that domestically-governed mechanisms would only be recognised if use of the listed standards is certified through a national process and certification body that is itself internationally-recognised, such as through membership of the International Accreditation Forum or similar body.

3. Untried and untested: The transparency and rating approach

It is also conceivable that no international agreement on mechanism governance will be reached. Previous CCXG analysis considered an option for recognising units issued from crediting mechanisms without oversight by an international body (Prag *et al.*, 2011a). In this case, countries could agree on transparency and disclosure requirements which could allow domestically-governed market mechanisms to establish international links. In this case the units from such mechanisms would become relevant to emissions accounting under the UNFCCC and therefore of interest to the international community. Given the complexity of designing and regulating market mechanisms and the importance of maintaining strong international confidence in environmental integrity for any internationally-traded units, this option is considered as a fall-back approach if agreement on more substantial involvement of international bodies cannot be achieved. In this case, transparency principles from the annex to ISO 14064 Part 2 could, for example, provide a pre-established, internationally-recognised approach to agreeing transparency for the creation of GHG units.

A transparency approach by itself is unlikely to offer sufficient assurance of environmental quality to enable the smooth functioning of an international unit accounting system. One way that this approach could be reinforced is with a form of assessment or rating given to units issued under national

systems. This could be undertaken by a form of international rating agency (UN or otherwise) or a network of private companies and/or NGOs providing opinion based on publicly-available material. If there is significant private sector interest in the investment opportunities provided by carbon market mechanisms, it is possible that such agencies would develop spontaneously without being created by the UN process. However, this form of "soft governance" would provide a low level of assurance of environmental integrity because there is no guarantee that regulatory bodies would act on the recommendations provided.

5. Conclusions

Extensive experience exists around the world regarding the design and governance of GHG market mechanisms in international, national, sub-national and non-governmental contexts. This landscape of market mechanisms has already created a number of different unit types, mechanism designs and governance structures. The existing body of experience can provide insights into how the emerging landscape of trading systems and crediting mechanisms could be co-ordinated and governed in future.

The design and governance of market mechanisms that trade units internationally needs to provide confidence to governments, the private sector and other stakeholders that the GHG units traded represent real emissions reductions. This is important for establishing links between trading systems. Establishing one- or two-way direct links between trading systems can raise both technical issues (e.g. regarding compatible design elements) and political issues (e.g. regarding policy ambition and retaining sovereignty). Indirect links can also be established where two or more trading systems recognise credits from the same crediting mechanism.

When direct links are established between domestically-governed market mechanisms in different countries, the resulting international transfer of units can have implications for GHG unit accounting. This is because mitigation targets and goals under the UNFCCC are generally accounted for on a national (i.e. geographical) basis. However, there is not yet agreement in the UNFCCC negotiations on how international transfers of GHG units from domestically-governed market mechanisms should be treated in the future GHG unit accounting framework.

The KP accounting framework is based on the "seller beware" principle, whereby purchased GHG units remain valid for the buyer even if the seller subsequently defaults on its emissions target or goal. If the future unit accounting framework is also based on this principle, such that the environmental integrity of GHG units from market mechanisms is underwritten by national mitigation targets and goals, a system is needed that provides confidence that countries will not default on their targets and goals. For developed countries, such confidence could be provided by a robust IAR process for national emissions that includes comprehensive reporting of international unit flows and clear emissions accounting and unit tracking arrangements.

It is common for regulators to adopt tools and procedures from existing market mechanisms when designing new systems. These can be combined with extra unilateral or bilaterally-agreed quality or eligibility criteria, especially if there are plans to establish links with other market mechanisms in future. In the case of trading systems, one example is that credits from pre-existing crediting mechanisms (such as the CDM) are recognised as valid for use by entities covered by the trading system to meet part of their commitments.

In order to participate effectively in the future landscape of market mechanisms, the private sector needs clear and simple rules, stable regulatory frameworks and preferably similar rulebooks in different countries. The use of standards and similar decision-making procedures for domestically-governed market mechanisms could simplify participation for companies with operations covered by more than one trading system and lower transaction costs for entities investing in mitigation activities across multiple regions.

The use of international standards in the design of market mechanisms that trade units internationally could help to provide confidence in the environmental integrity of GHG units. However, the prospects for agreeing standards multilaterally vary depending on which aspect of a market mechanism is being considered. To facilitate discussions of standards, market mechanisms can be divided into the following groups of design elements: (i) **foundations**, (ii) **nuts and bolts**, and (iii) **verification processes**. These elements are shaped by the principles and objectives of the mechanism, while enforcement processes are needed to ensure compliance and adherence to rules.

The foundations are the design elements most fundamental to defining the nature of the tradable units. For trading systems these include setting emissions caps, coverage, unit allocation processes, participation requirements and rules on offsets, while for crediting mechanisms these include setting crediting baselines and specifying the eligibility of mitigation activities. These elements affect the overall cost of the mechanism to the economy and its potential impact on international competitiveness. They therefore comprise important domestic political decisions and are likely to be the most difficult areas for which to develop standards under the UNFCCC, although the WCI provides an example of how it is possible for different jurisdictions to develop a shared approach to coverage and cap setting for trading systems.

The more technical "nuts and bolts" and verification design elements may offer better prospects for agreeing standards under the UNFCCC. These include monitoring and reporting, unit issuance and registries, trading/crediting periods and banking and borrowing rules. International standards have already been agreed for some of these elements. For example, standards for verification processes and competency criteria for verifiers have been developed under the KP flexible mechanisms (e.g. the CDM Validation and Verification Standard) and elsewhere (e.g. ISO 14064 Part 3, ISO 14065 and ISO 14066). Further, standards for the detailed technical specifications of unit registries and data exchange protocols have been developed to facilitate trading under the KP as well as for domestically-governed trading systems and non-governmental crediting mechanisms. It would be technically feasible for the existing KP system of registries and the international transaction log to be modified in order to store and track units from domestically-governed market mechanisms that have met certain design standards or eligibility criteria. A greater challenge would be to agree *what* can be tracked by the system.

Most international standards, such as those developed by ISO, are voluntary to use unless adopted as part of national legislation. If international standards for some of the design elements of market mechanisms are to be further developed, there are different ways in which this could happen. One approach would be to expand the portfolio of internationally-agreed voluntary standards (such as ISO standards) related to GHG emissions. Parties to the UNFCCC may then decide that units from mechanisms that are certified to meet those standards are then eligible towards meeting targets or goals under the UNFCCC process. Without such agreement, the existence of such voluntary standards may anyway help to co-ordinate the development of domestically-governed market mechanisms around the world.

Another approach would be to develop and agree new standards under the auspices of the UNFCCC process. This approach has the advantage that the resulting products would be free to use (whereas ISO products, for example, must be purchased by the user for a small fee), but it could mean that the standards take longer to develop since consensus between all UNFCCC Parties on the content would be needed. Agreeing common standards is one way to move towards improved international assurance of the environmental integrity of GHG units, without necessarily adopting a centralised governance structure with decision-making by international bodies.

Existing international mechanisms under the UNFCCC, such as the three KP mechanisms, have been governed by international procedures and regulatory bodies (in addition to national ones). The powers of these international bodies, including enforcement by the Compliance Committee of the KP, are

recognised through countries' ratification of overarching agreements under the UNFCCC. If a new agreement is of a more facilitative nature, agreement of standards for market mechanisms could be an important step towards reconciling the need for transparent emissions accounting with countries' desire to use units from domestically-governed market mechanisms to meet emissions targets or goals.

If established, the framework for various approaches currently being considered by the COP could provide some level of quality assurance for internationally-traded units representing emissions reductions or removals. There could be different levels of oversight from international bodies depending on the targets, goals and emissions accounting rules adopted by participating Parties. In such a system, the new market mechanism defined at COP 17 in Durban could be a specific market approach that Parties can voluntarily engage in within the framework.

The new market mechanism could in theory operate as a crediting mechanism and/or a form of trading system. As a crediting mechanism, it could (i) provide credits to meet part of national mitigation targets or goals put forward under the UNFCCC for the post-2012 period (inside or outside of the KP); or (ii) provide credits that emitters covered by domestically-governed trading systems could use for compliance purposes (a form of indirect linking). As a trading system, the new market mechanism would need to provide confidence that the trading caps proposed by participating countries are stringent and will be effectively enforced. Trading systems implemented by host governments could therefore be required to meet agreed design standards and be subject to in-depth technical reviews by an internationally-appointed body. However, in the absence of a KP-style compliance system, such a review process would need to have a stronger enforcement aspect than that of existing reviews of national communications and GHG inventories.

A growing number of countries are starting to re-examine their economic development models and develop strategies to achieve a transition to greener economies that take into account the limits that exist on natural resources. As part of the new green growth paradigm, market mechanisms can serve as one lever in the policy toolkit to increase the scale of private sector investment into low emission technologies rather than conventional options (Corfee-Morlot *et al.*, 2012, draft). Further, the successful implementation of market mechanisms cannot be achieved by governments alone; a partnership is needed between governments, the private sector and civil society in order to realise the potential benefits that carbon market mechanisms can bring.

Annex A: Terminology describing "rules" in existing mechanisms

Term	Examples of use
Standard	"CDM Validation and Verification Standard" "Standards and procedures for the accreditation of independent entities" (Decision 9/CMP.1) "Corporate Accounting and Reporting Standard" (WRI/WBCSD)
Protocol	"The GHG Protocol for Project Accounting" (WRI/WBCSD) "Climate Action Reserve Offset Project Protocols"
Requirements	"Eligibility requirements" and "participation requirements" for the KP flexible mechanisms "ISO 14065:2007 Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition"
Recommendations	"Design Recommendations for the WCI Regional Cap-and-Trade Program" "Final Recommendations: Offset System Process" (WCI Offset Committee)
Regulation	"The Interim Regulation of Voluntary Greenhouse Gases Emission Trading in China" "Final Regulation Order: California cap on greenhouse gas emissions and market-based compliance mechanisms"
Criteria	"Criteria for Baseline Setting and Monitoring" (JI)
Specification	"ISO 14064-3:2006 Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions"
Guidelines	"Guidelines for the implementation of Article 6 of the Kyoto Protocol" (Decision 9/CMP.1) "Monitoring and Reporting Guidelines" (EU ETS pre-2013; after 2013 the guidelines will become part of a regulation). "Mandatory Guidelines" (Gold Standard) "Program Level GHG Reduction Accounting Guidelines" (CAR)
Guidance	"Guidance on Criteria for Baseline Setting and Monitoring" (JI) "Land Use, Land-Use Change, and Forestry Guidance for GHG Project Accounting" (WRI/WBCSD)

Annex B: Governance bodies under the UNFCCC

In addition to the COP and CMP as supreme decision-making bodies, the UNFCCC process has developed a number of bodies to govern the implementation of the UNFCCC and KP. These include:

Bureau of the COP: The Bureau supports the COP and CMP through provision of advice and guidance regarding work under UNFCCC and KP, including negotiations and UNFCCC secretariat.

Compliance Committee: Amongst other functions, the Compliance Committee determines cases of non-compliance with emissions and reporting commitments and, in for the KP, decides whether and how to apply consequences. The Committee comprises a bureau and two branches – the facilitative and enforcement branches. The enforcement branch is the only UNFCCC body that can suspend Parties from participating in KP market mechanisms and enforce penalties in the case of non-compliance with KP commitments.

Executive Board of the CDM (CDM EB): The CDM EB supervises the CDM under the authority and guidance of the CMP. The CDM EB is the key decision maker for the operation of the CDM. It undertakes the registration of projects and the issuance of CERs.

Joint Implementation Supervisory Committee (JISC): The JISC, under the authority and guidance of the CMP, supervises the verification procedure for submitted JI projects to confirm that the ensuing emissions reductions/removals meet the relevant requirements of the KP and the JI guidelines (particularly for Track 2 JI projects, hosted by Parties not meeting conditions for self-regulation of JI).

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Glossary

AAU	Assigned Amount Unit
AOSIS	Alliance of Small Island States
ADP	Ad-hoc Working Group on the Durban Platform
ARB	Air Resources Board (California)
BAU	Business As Usual
BOCM	Bilateral Offset Crediting Mechanism (Japan)
CAR	Climate Action Reserve
CCA	Climate Change Agreement (UK)
CCXG	OECD/IEA Climate Change Expert Group
CDM	Clean Development Mechanism
CER	Certified Emission Reduction (from a CDM project)
CFI	Carbon Farming Initiative (Australia)
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
COP	Conference of the Parties to the UNFCCC
CRC	Carbon Reduction Commitment (UK)
EB	Executive Board (of the CDM)
EC	European Commission
EEA	European Economic Area (EU 27 + Norway, Iceland and Liechtenstein)
ERU	Emission Reduction Unit (from a JI project)
ETS	Emissions Trading System
EU ETS	European Union Emissions Trading System
GHG	Greenhouse Gas
GS	Gold Standard
HFC	Hydro fluorocarbon
IAF	International Accreditation Forum
IAR	International Assessment and Review
ICA	International Consultation and Analysis
IET	International Emissions Trading
ISO	International Organization for Standardization
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
JVETS	Japan Voluntary Emissions Trading System
KP	Kyoto Protocol
LDC	Least Developed Country
MRV	Measurable, Reportable and Verifiable
RGGI	Regional Greenhouse Gas Initiative (ETS in the north-eastern US states)
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association
VCU	Verified Carbon Unit (from VCS)
WCI	Western Climate Initiative

www.oecd.org/env/cc/ccxg.htm

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