

CLIMATE STRATEGIES



Working Paper Linking-2

The role of land-based offsets in Emissions Trading Systems: Key design aspects and considerations for linking

August 2008

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Thanks to Penny Baalman and Wolfgang Sterk for their helpful comments.

Abstract:

The provisions under which offset projects have been developed in different greenhouse gas emissions trading schemes play an important role in the acceptance of the resultant credits by systems other than the system of origin. The present paper describes how trading schemes in operation or design in the EU, Australia, Canada, the US, and New Zealand as well as offset standards deal with land-based offsets. Program rules and provisions regarding reversibility (non-permanence) of sequestered Carbon, additionality, and the choice of eligible activities, land areas, and carbon pools differ significantly among the systems. This paper discusses how these differences impact linking of trading systems. It concludes that the differences in offset provisions such as the stringency of additionality are likely to be a major obstacle to linking. Another potential barrier to linking is the reversibility of emission reductions for which credits have been issued, a problem that arises uniquely in the land use and management sector. A number of mechanisms are available that can adequately address the reversibility of the sequestered Carbon within trading schemes as long as they are strictly enforced. Moreover, in a trading system that includes forest and agricultural land owners among the entities that must surrender allowances for their emissions – as New Zealand is proposing – permanence is automatically addressed, in the same way as under national emission caps and in addition no additionality problem arises. Linking will also erase differences in eligibility of lands, activities, or carbon pools, with the result that if one system is determined to constrain land use management, type of eligible lands, or carbon pools, the only option may be to avoid linkage with systems allowing a wider range of eligible offset categories.

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TABLE OF CONTENTS

1	Introduction	1
2	Background	2
3	Key land-based offset linking issues	3
4	Land-based activities in emissions trading schemes	4
4.1	Land-based activities in the Kyoto Protocol and the CDM	5
4.2	The European Emission Trading Scheme	5
4.3	Australia: The New South Wales Greenhouse Gas Reduction Scheme	6
4.4	New Zealand: The New Zealand Emissions Trading Scheme	8
4.5	US Emissions Trading Schemes	10
4.5.1	The US Regional Greenhouse Gas Initiative (RGGI)	10
4.5.2	California: AB 32— Global Warming Solutions Act of 2006	12
4.5.3	The Lieberman-Warner Climate Security Act of 2008 (S.3036)	13
4.6	Canada: The Alberta Climate Change and Emissions Management Amendment Act	15
4.7	Voluntary Regimes	16
4.7.1	The Chicago Climate Exchange	16
4.7.2	The Voluntary Carbon Standard	18
5	Comparison of design features and implications for linking	20
5.1	Offset versus Cap Approaches	23
5.2	Non-Permanence/Reversability	23
5.3	Eligibility	25
5.4	Additionality	26
6	Conclusions	27
7	References	29

1 Introduction

Offset credits form part of many emissions trading systems. Most cap-and-trade schemes do not impose emission reduction and reporting obligations (i.e., caps) on all emission sources. Offset credits represent emission reductions achieved by uncapped sources. If offset credits are allowed in a trading scheme, capped entities may purchase and use them to meet obligations. Offset credits provide a mechanism to encourage emission reductions from uncapped sources, and they may lower the costs capped entities incur in meeting their obligations under a cap-and-trade scheme. The use of offset credits adds flexibility, increasing system liquidity and can serve as a price valve. The EU Emission Trading Scheme (EU ETS), for example, allows Certified Emission Reductions (CERs) from the CDM and Emission Reduction Units (ERUs) from JI. It does not, however, allow CERs from the land use sector.

Industrial and electricity-generation sector entities are most likely to be subject to caps. Entities in the transport, building, and agricultural and forestry sectors are less likely to face such obligations. Reasons for not capping entities in these sectors include the great number of entities involved, difficulties in reliably measuring emissions or emission reductions, and administrative burdens that would arise. However, the land use sector can be a significant source of emissions and may offer reduction opportunities at relatively low costs. For this reason, as well as due to stakeholder pressure, offset credits based on emission reductions or carbon stock increases in the land use sector may be allowed to enter a trading system.

Where reductions from land-based offset projects are allowed by a cap-and-trade regime, however, a set of issues arise. Offset credits face challenges in establishing additionality and accounting for leakage. However, land-based offsets face two challenges that either do not occur, or have been less problematic in other sectors: reversibility (lack of permanence) and the selection of eligible activities and carbon pools. The reversibility of land-based emission reductions and carbon stock increases is the issue that most clearly distinguishes land-based offsets from offsets in other sectors, and the way in which reversibility is dealt with in different schemes will most likely have important implications for the linking of regimes. But also the fact that current and planned schemes are selecting some carbon pools or land-use activities as eligible while excluding others is likely to impact linking decisions. Of particular concern is the fact that, in contrast to all other systems, the EU Emission Trading Scheme (“EU ETS”) completely excludes the use of credits from land use, land-use change and forestry (“LULUCF”) projects.

The present paper first provides a brief review of issues that have arisen as GHG mitigation regimes have considered the inclusion of land-based activities. The paper then reviews the land-based provisions of emissions trading programs that are currently being designed, or have already been implemented in the EU, Australia, Canada, New Zealand, and the US, as

well as offset standards that have been established under the Kyoto Protocol's CDM and through the Voluntary Carbon Standard (VCS). The paper ends with a discussion of the implications for linking of different mechanisms of addressing additionality and reversibility, and of alternative choices regarding eligible carbon pools and activities.

2 Background

Land-use offsets in the Carbon Market

Deforestation and agriculture are major emission sources, contributing about a quarter of global GHG emissions. However, the question of whether and how to include land-based emissions and emission reductions has been a controversial issue throughout the Kyoto Protocol negotiations. Some Parties and groups wanted to exclude LULUCF activities completely, pointing out problems with the measurement of soil and vegetation carbon, the potential for leakage and potential reversals of the sequestered Carbon. Given the way targets were established for the first commitment period, there was also concern that LULUCF offset credits from non-Annex 1 countries (i.e., countries without national emission targets) could undermine domestic, industrial and electricity sector reduction efforts in Annex 1 countries.

These concerns are reflected in the decision by European lawmakers to exclude land use, land-use change and forestry (LULUCF) credits from the European Emission Trading Scheme. Creators of other emissions trading systems have not shared this resolution to LULUCF. Australia, the US, Canada, New Zealand, and Japan argued in favour of a broad use of the LULUCF sector during the negotiations of the Kyoto Protocol and the Marrakesh Accords, and therefore it is no surprise that land-based offsets play a prominent role in Australia, New Zealand, Canada, and planned US GHG cap-and-trade schemes.

In contrast to their limited role in the CDM and the exclusion from the EU ETS, as of 2007 land-based credits accounted for 36% of the transacted volume in the voluntary carbon market, the largest market share of any single type of credits¹. The large share of land-based credits in the voluntary market results from a number of factors. First, many environmental organizations have preservation of natural ecosystems as part of their mission, and these organizations have been active in using voluntary carbon markets to achieve this goal. Second, corporations frequently undertake voluntary GHG emission reductions to improve the corporate image. Since the public associates trees with environmental and social benefits, forest preservation and planting projects work well to improve the corporate image.

¹ Hamilton K., R. Bayon, G. Turner and D. Higgins (2007), "State of the Voluntary Carbon Markets 2007: Picking Up Steam." Ecosystem Marketplace and New Carbon Finance

These forces have also reinforced each other, with environmental organizations working closely with corporations to foster forest-based projects.

Linking of trading schemes

A growing number of countries are adopting cap-and-trade schemes as part of their national climate change policies. In the United States dynamic initiatives have been launched at the state level, especially on the East Coast (Regional Greenhouse Gas Initiative) and the West Coast (California, Western Climate Initiative). In addition, several legislative proposals for a federal system are currently under discussion in Congress. In Australia, a new proposal for a countrywide scheme has been published in July 2008, in New South Wales a regional scheme exists already since 2003. Also in New Zealand an emissions trading scheme is emerging. In Canada a federal scheme is under development while the province of Alberta has implemented a regional trading scheme in 2007.

Currently there are only a few links between different trading schemes, but more are contemplated. Linkage of the EU ETS with other comparable schemes is a strategic goal of the European climate policy, and several emerging schemes explicitly envision linking to other schemes. Establishing links between cap-and-trade schemes increases abatement options, leading to improved market liquidity, and possibly to more efficient allocation of resources. There are a couple of design elements of trading schemes, however, which may be barriers when linking schemes. Different provisions for the creation of offset credits belong to the potential barriers.

3 Key land-based offset linking issues

The following paragraphs discuss issues related to linking of trading schemes for the two offset issues that arise primarily or exclusively in the land use sector: reversibility and the restriction of eligibility to specific activities or carbon pools.

Risk of reversibility

A fundamental property of biological carbon stocks is that they increase and decrease over time. These changes result from both human and natural factors. In particular, carbon dioxide (CO₂) removed from the atmosphere and stored as carbon in, for example, soils and forests can be returned to the atmosphere through natural events such as lightning-induced fires or diseases, or through human actions such as logging or changes in agricultural practices. This situation is referred to as “reversibility” or lack of permanence. It represents a challenge for the use of offset credits in meeting obligations under a cap. If CO₂ removed from the atmosphere returns to it after the use of the credits, the fulfilment of the obligation will, in effect, have been nullified unless a mechanism is in place to rectify this situation. Reversibility does not arise in other sectors because GHG emission reductions achieved are

not released back into the atmosphere. Reversibility is not a problem if land-based emissions are under the cap. In this case all emissions from the sectors under the cap will be counted during the determination of whether they have complied with the cap.

Selection of lands, activities, and carbon pools

Which activities or carbon pools are eligible for offset credits is an important potential difference among schemes and may impact how these schemes could link. If one scheme restricts the use of land-based offsets to reforestation, and another scheme stipulates avoided deforestation, forest management or agricultural activities as eligible, the restriction to reforestation will be difficult or impossible to enforce if the schemes are linked. While many factors contribute to decisions on which land-based activities to include in cap-and-trade schemes, prominent considerations in discussions have included:

- Ease of establishing credible baselines,
- Concerns about the level of fossil-fuel emission reduction efforts,
- Differing country opportunities within LULUCF, and
- Political factors.

Afforestation has proved popular due to the relative ease of establishing credible baselines and its lack of threat to fossil-fuel emission reduction efforts. Both the Kyoto Protocol's CDM mechanism and the U.S. Regional Greenhouse Gas Initiative (RGGI), for example, have limited eligible land-based offset credits to afforestation projects during their first years of operation. Difficulties in establishing baselines, together with concerns that credits could swamp the market, have to date posed hurdles to the inclusion of offset credits from avoided deforestation and forest management.

4 Land-based activities in emissions trading schemes

Most regulated CO₂ emissions trading schemes rely on a mix of government-issued allowances and recognized offset credits. GHG emissions trading programs differ in how they deal with potential non-permanence or reversibility of carbon stored in plants and soils, with respect to the eligibility criteria that land-based offset projects need to meet, with respect to additionality, monitoring, reporting, and verification requirements, and the amount of offset credits allowed. The following section reviews how selected emissions trading schemes have dealt with reversibility, additionality, and the selection of eligible offset credits in the land-use sector.

4.1 Land-based activities in the Kyoto Protocol and the CDM

At the seventh Conference of the Parties to the UN Framework Convention on Climate Change (“COP7”) in 2001 in Marrakesh, Parties agreed in principle to allow afforestation and reforestation projects (“A/R projects”) in the CDM. The use of credits generated by such projects was capped at the equivalent of one percent of any industrialized country’s 1990 emissions for the first commitment period². In 2003, at the COP9 in Milan, the Parties to the UNFCCC adopted a detailed set of rules for the inclusion of A/R projects in the CDM. These rules included a number of differences between rules for A/R projects compared to non-A/R projects. The most significant differences were that the credits granted to A/R projects expire and cannot be banked. The expiring credits agreed upon in Milan include two types of CERs: temporary Certified Emissions Reductions (tCERs) and long-term Certified Emission Reductions (ICERs). tCERs expire at the end of the period subsequent to the one in which they are issued, while ICERs expire at the end of the crediting period of the project, which can be up to 60 years. ICERs also expire if carbon is released due to natural hazards, such as fires or disturbances³. If the verifier of ICERs finds a loss of accumulated carbon stock compared to issued credits, the loss must be made good by the entity that used the credit. Both tCERs and ICERs must be replaced when they expire. The expiring credit approach used in the CDM places the responsibility for reversibility on the entity acquiring the carbon credit. In contrast, since JI LULUCF projects are undertaken only in countries that have to meet a GHG target, the problem of non-permanence is addressed by the complying Party and it is not necessary to resort to a temporary credit approach. If increases of carbon stocks generated under a JI project is lost in later years, the host country will have to include the emissions when it calculates its emissions for compliance purposes.

4.2 The European Emission Trading Scheme

The EU ETS, which began operation in 2005 and covers 27 EU countries, is the world’s largest emissions trading scheme. The EU ETS allows the use of credits from JI and CDM projects under the Kyoto Protocol based on the so-called Linking Directive⁴. The Linking Directive authorized Member States to allow capped emitters to use CERs from 2005 and

² See Decision 17/CP.7, Modalities and procedures for a clean development mechanism. UN Doc FCCC/CP/2001/13/Add.2

³ See Draft Decision -/CMP.1 2003, Modalities and procedures for afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol, UN Doc FCCC/SBSTA/2003/L.27

⁴ Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol’s project mechanisms.

ERUs from 2008 for compliance, with the exception of CERs and ERUs from LULUCF projects. However, it foresees a periodic evaluation of the exclusion of land use. In conjunction with the adoption of the Linking Directive, the EU Commission received a mandate to monitor technical progress and evaluate options for including LULUCF credits in the EU ETS at a later stage.

In the political process leading to the adoption of the Linking Directive, the majority of the EU member states opposed the inclusion of LULUCF credits in the EU ETS. While some Member States and the European Parliament opposed the inclusion of LULUCF projects on the grounds that the Carbon sequestered cannot be measured as accurately as emission reductions from other project categories, the majority of the stakeholders were more concerned about problems associated with reversibility. EU stakeholders considered the liability inherent in LULUCF CDM offset credits an undesirable feature of the burgeoning EU ETS. In addition, some Member States argued that LULUCF offset credits are expected to be cheaper than credits from other project categories and might be preferred at the expense of project categories that promote technology transfer.

In 2007, the EU Commission held consultations regarding the amendment of the EU ETS Directive and received a series of submissions requesting the lifting of the ban on LULUCF credits. Since 2004, when the Linking Directive was adopted, many methodological issues have been addressed and political pressures have changed. Some technical issues related to the temporary nature of the credits remain, however a better understanding of available measuring techniques has addressed measurement concerns. Nonetheless, in the draft amendment of the EU ETS Directive published by the EU Commission on 23 January 2008, units arising from LULUCF activities remain excluded. This exclusion may be reviewed however in the context of an international post-Kyoto agreement⁵.

4.3 Australia: The New South Wales Greenhouse Gas Reduction Scheme

Introduction and overview

The NSW Greenhouse Gas Abatement (now “Reduction”) Scheme (“GGAS”) is a baseline-and-credit scheme that commenced operation in 2003 and remains in force until 2012. The scheme establishes mandatory annual greenhouse gas benchmarks for the electricity retail sector and also allows other large users of electricity to voluntarily undertake reductions. The scheme requires participants to meet mandatory benchmark targets based on the size of

⁵ Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading system of the Community. COM(2008) 16 final

their share in the electricity retail market or the supply of electricity within NSW. To meet their targets participants are able to use abatement certificates called NSW Greenhouse Gas Abatement Certificates (“NGACs”) that can be created from low emission generation of electricity, demand side abatement or reforestation projects. If the benchmark participants fail to meet their targets, a penalty is charged. Monitoring the performance of benchmark participants is undertaken by the Independent Pricing and Regulatory Tribunal of NSW (IPART) in its role as Compliance Regulator⁶. In order to generate NGACs from reforestation activities, an entity must receive approval as an accredited Abatement Certificate Provider and have registered Carbon Sequestration Rights over the eligible forests in their Sequestration Pool. A Carbon Sequestration Right is a property right to carbon sequestered on a particular piece of land.

Eligible activities and carbon pools

Only reforestation that occurs on land that was non-forest on 31 December 1989 is eligible⁷. All carbon pools as defined for LULUCF activities under the Kyoto Protocol are allowed.

Reversibility

Participants in the scheme that generate carbon sequestration abatement certificates need to demonstrate that the carbon sequestration from which NGACs are registered is maintained for 100 years. The Carbon Sequestration Rule and associated conditions of accreditation provide a non-permanence framework consisting of four main elements:

- The generation of certificates is limited to the minimum carbon stocks or net accumulated carbon stock change from the Sequestration Pool over the 100 years subsequent to the time of registration of certificates.
- Abatement Certificate Providers and land owners must agree to a restriction on use of land. This instrument gives the Scheme Administrator the power to undertake or restrict activities on the land in the event of non-compliance.
- The Abatement Certificate Provider must have in place appropriate arrangements for long-term reporting of the maintenance of the registered abatement.
- Buffering is required when approaching the limit of certificate generation (minimum stocks) which is determined based on the relative risk of the project and the risk management procedures the certificate provider has in place.

⁶ See http://www.greenhousegas.nsw.gov.au/overview/scheme_overview/overview.asp

⁷ See Greenhouse Gas Benchmark Rule (Carbon Sequestration) No. 5 of 2003
<http://www.greenhousegas.nsw.gov.au/documents/syn66.asp>

The Carbon Sequestration Rule establishes the requirements for a monitoring methodology while the choice of a specific methodology is left to the Abatement Certificate Provider. The rule requires that there is at least a 70% probability that the actual carbon sequestration in any given period exceeds the quantum of carbon sequestration represented by NGACs issued for that period⁸. The total adjusted carbon stock change is calculated at the end of each crediting period, which can be up to one calendar year.

Additionality

Under the GGAS rules the project must be beyond regulatory requirements.

4.4 New Zealand: The New Zealand Emissions Trading Scheme

Introduction and overview

In September 2007 New Zealand's Ministry for the Environment and the Treasury unveiled the cornerstones of an emissions trading scheme. The proposed scheme would bring in all sectors of the economy over a six-year period, starting with deforestation in 2008 and ending with agriculture in 2013⁹. A New Zealand Unit (NZU) will be the primary domestic unit of trade. The scheme allows also the unlimited use of international Kyoto credits, with the exception of ICERs and tCERs. NZUs are to be auctioned in some sectors, such as the stationary energy sector, and a proportion of NZU's are to be provided free in other sectors.

The New Zealand emissions trading scheme is the first to place a cap on emissions from deforestation. Landowners of pre-1990 non-indigenous forests will automatically be included, i.e., have emission reporting obligations, in the system. It has been proposed to allocate NZUs for free on a pro rata basis, using land area to determine the percent of available units given to each land owner. Under the proposed scheme, NZUs would not have to be submitted for GHGs released as a result of harvesting and regrowth cycles. In addition, landowners who deforest less than two hectares do not have to report (or submit NZU's) and owners of less than 50 hectares of forestland can apply for an exemption from the system. Methodologies for determining emissions from deforestation will be provided by the administering agency¹⁰.

⁸ See Greenhouse Gas Benchmark Rule (Carbon Sequestration) No. 5 of 2003
<http://www.greenhousegas.nsw.gov.au/documents/syn66.asp>

⁹ The Framework for a New Zealand Emissions Trading Scheme. New Zealand Ministry for the Environment (NZ MfE) and the Treasury. <http://www.mfe.govt.nz/publications/climate/framework-emissions-trading-scheme-sep07/html/index.html>

¹⁰ Forestry in a New Zealand Emissions Trading Scheme. New Zealand Ministry of Agriculture and Forestry (NZ MAF). <http://www.maf.govt.nz/climatechange/forestry/ets/>

New Zealand desires to increase its forestlands and understands that participation in the trading scheme may not be advantageous for all those who have undertaken, or expect to undertake, reforestation activities. Consequently, owners of forest established after 1989 may opt to join the emissions trading scheme but are not required to. Those who decide to join the trading scheme will receive one NZU for each tonne of carbon sequestered but would then also be liable for subsequent emissions. The number of NZUs issued to a particular area of forest will be conservative and reflect uncertainty in the carbon estimation method.

Eligible activities and carbon pools

The New Zealand scheme envisions including emissions from forest activities under the cap, rather than via offsets, thus avoiding the need to select among activities.

Reversibility

Since emissions from pre-1990 forests are included in the cap, and the covered entities are liable for emissions, no permanence issue arises for these forests. In the case of post-1989 forests that are opted into the scheme, permanence will similarly be addressed by the emissions being included within the cap. The government retains the responsibility for carbon stock changes in post-1989 forests that do not opt into the scheme.

Additionality

As emissions from forest lands are either under the cap or the responsibility of the government, rather than entering into the scheme as offset credits, the additionality issue does not arise. There is, consequently no provision for the determination of additionality.

4.5 US Emissions Trading Schemes

A number of climate initiatives have been launched at state and regional levels in the United States. Initiatives include the Regional Greenhouse Gas Initiative (RGGI) on the east coast, the Western Climate Initiative (WCI), the Midwestern Regional GHG Reduction initiative, and initiatives in California and Florida. In addition, proposals for a federal system are currently under discussion in Congress. All of the US initiatives envision linkage to other domestic or international schemes.

4.5.1 The US Regional Greenhouse Gas Initiative (RGGI)

Introduction and overview

The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort by ten US Northeast and Mid-Atlantic states to implement a regional cap-and-trade system¹¹. RGGI, which represents the first mandatory GHG emissions trading scheme in the US, will begin operations in 2009. Emissions from fossil-fuel electricity generators larger than 25 MW are restricted under the cap with a goal of stabilizing these emissions between 2009 and 2014 and reducing them by 10 percent by 2019. Each participating state will receive an emissions budget and is free to determine how to allocate 75 percent of the corresponding allowances among industries. At least 25 percent of the allocated allowances must be assigned to consumer benefit or strategic energy purposes, such as new technologies. The scheme allows the use of five types of offsets for compliance, one of which is carbon sequestration resulting from afforestation projects. The extent to which covered entities may use offset credits to meet obligations is restricted, with restrictions dependent on allowance prices. Offsets are restricted to 3.3 percent of a generation unit's emissions during an initial control period. If the 12-month rolling average of allowance prices exceeds US \$7 per ton, units may use offset credits to meet up to 5 percent of their obligation; if the 12-month rolling average exceeds US \$10, plants may offset up to 10 percent of emissions¹². In the event that up to 10 percent of emissions can be offset, participants may also use credits from the EU ETS and the flexibility mechanisms under the Kyoto Protocol.¹³ Offsets thus serve as a safety valve to limit costs of the scheme.

Eligible activities and carbon pools

RGGI currently includes only domestic afforestation. Afforestation projects should promote afforestation of native forests¹⁴ and projects must take place on lands that have been non-

¹¹ See www.rggi.org

¹² U.S. 2005 dollars, adjusted according to changes in the consumer price index.

¹³ The model rule doesn't give details on how such use can technically be achieved.

¹⁴ RGGI Model Rule, p. 124

forested for at least ten years prior to the commencement of the offset project. The rules provide for the inclusion of live above- and below-ground carbon in tree biomass as well as soil carbon stocks. Carbon stocks in coarse woody debris and dead organic matter are also required unless carbon in these pools is at or near zero. Carbon in above-ground non-tree biomass can be included if desired. RGGI also requires carbon estimation methodologies to be based on homogenous sub-populations taking different vegetation and species as well as factors such as soil type, elevation, slope, and age class into account¹⁵.

Reversibility

The RGGI rules address permanence through the requirement that lands included in the offset project boundary are placed in a legally binding conservation easement. The conservation easement must specify that the land will be maintained in a forested state in perpetuity and that the carbon density within the offset project boundary will be maintained at or above what was achieved by the end of the CO₂ offset crediting period. The scheme requires a written legal opinion confirming the enforceability of the permanent conservation easement and requires that carbon stocks are calculated at least every 5 years¹⁶. In addition, offset credits allocated represent only 90 percent of carbon stock increases achieved unless the project sponsor retains a long-term insurance that guarantees the replacement of any lost sequestered carbon for which CO₂ offset allowances were issued.

Additionality

The RGGI model rule includes legal, financial, and historic baseline tests to address additionality. Offset credits can not be awarded to projects required pursuant to any local, state, or federal law, regulation, or administrative or judicial order. Offset allowances can also not be awarded to projects that receive funding or other incentives from electricity system or consumer benefit funds. Offset allowances are allocated based on the net increase in carbon stocks relative to a baseline. The increase in the first reporting period is measured relative to an estimate of carbon stocks in the year prior to the initiation of the project. In subsequent reporting periods increases are measured relative to the stocks reported for the previous period. Credits are awarded for net carbon stock changes which are the sum of the net changes in carbon stocks of all applicable pools.

¹⁵ RGGI Model Rule, p. 127

¹⁶ Ibid p. 131

4.5.2 California: AB 32— Global Warming Solutions Act of 2006

Introduction and overview

California's Global Warming Solutions Act of 2006 (AB 32) establishes an enforceable, state-wide program to cap all GHG emissions. AB 32 requires California's GHG emissions to be reduced to 1990 levels by 2020 and authorizes the California Air Resources Board (CARB) to adopt a market-based compliance mechanism to achieve these goals. A draft Scoping Plan, which describes the strategies to be used to meet the AB 32 targets, was released in June 2008 for public review and comment. The Scoping Plan includes a full range of options, including direct regulation, monetary and non-monetary incentives, and market-based mechanisms such as a cap-and-trade system¹⁷. As a first step in defining how voluntary efforts to achieve GHG reductions should be undertaken, CARB adopted the California Climate Action Registry's Forest Protocols. The California Climate Action Registry (CCAR) is a private, non-profit organization which was established in 2001 to register and promote early voluntary GHG reduction efforts. The registry established tools for measuring, monitoring, verifying, and reporting emissions and emission reductions in a number of sectors as well as a guidance protocol for forest projects.

CCAR's Forest Sector Protocol is one of several CCAR protocols affecting forest projects. Under the CCAR Forest Sector Protocol, registration of a forest project requires entity-wide reporting, with entities being individuals or legally constituted bodies owning at least 100 acres of forestland.

Eligible activities and carbon pools

CCAR's Forest Project Protocol provides for three types of forest projects:

- Forest management, using natural forest management practices
- Reforestation of native tree cover on lands that have been out of tree cover for at least ten years
- Conservation, i.e., prevention of the conversion of native forests to a non-forest use

Reversibility

Non-permanence is addressed through the requirement for a perpetual conservation easement dedicating the land to forest use. Native species must be promoted and natural forest management techniques used.

¹⁷ Draft AB 32 Scoping Plan Document. <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

Additionality

The Forest Project Protocol requires a qualitative additionality characterization to characterize the project baseline, including any mandatory statutes, regulations, existing practices, and land-use change threats. The sampling error of carbon measurements must be less than 20 percent of the mean at the 90 percent confidence interval for projects to be registered. Under CCAR provisions project developers decide whether to invest sufficient resources to avoid discounting of the reductions measured relative to the baseline. Deductions are taken only if the sampling error is greater than five percent¹⁸.

4.5.3 The Lieberman-Warner Climate Security Act of 2008 (S.3036)

Introduction and overview

The Lieberman-Warner Climate Security Act, amended by the U.S. Senate Environment and Public Works Committee Chair Barbara Boxer, is the most important of current U.S. federal proposals and illustrates the significant role land-use offsets are likely to play in any future U.S. cap-and-trade bill. The Senate bill 3036 was originally introduced as America's Climate and Energy Security Act (S. 2191) and has gone through extensive modifications.

The cap currently would start at 5.775 million tons in 2012 (7 percent below 2006 emission levels) and decline to 1.732 million in 2050 (72 percent below 2006 emission levels). An increasing percent of allowances would be auctioned over time.

The bill also stipulates that up to 30 percent of an entity's obligation can be met through the use of offset credits. The use of domestic offset credits is capped at 15 percent of an entity's annual emission allowance obligation and currently includes only land-based project types. If sufficient domestic offsets are not available, the administrator may allow "international allowances" and "international forest carbon credits" to make up the difference. The remaining 15 percent of offset credits may come from abroad, with 10 percent sourced from international forestry credits and 5 percent from other reductions made in developing countries under CDM-like provisions. If sufficient credits are not available from these sources, allowances from other countries' emissions trading programs can be used. The bill specifically recognizes offsets issued under RGGI but "an appropriate discount rate" will be applied¹⁹.

As has been typical of U.S. bills, details of which activities and carbon pools are to be eligible as well as details on addressing additionality and permanence are left to the Administrator of the U.S. Environmental Protection Agency (USEPA) in conjunction with

¹⁸ CCAR's Forest Project Protocol, p. 15

¹⁹ S. 3036, Title III. Sec. 302 (b) (4))

the Secretary of Agriculture. The bill itself instructs the Administrators to establish regulations to, for example, insure that credits issued for offsets represent “real, verifiable, additional, permanent, and enforceable” GHG reductions or increases in sequestration²⁰. The Administrators are also directed to establish procedures to monitor, quantify, and discount reductions or increases in sequestration, and to provide and periodically revise a list of eligible offset categories.

Eligible activities and carbon pools

Currently the bill restricts the use of domestic offsets to land-based offsets. Eligible offset types include sequestration achieved through management practices on agricultural, grazing, and forestlands as well as manure management, afforestation, and reforestation.

Reversibility

Although details are left to the Administrators, provisions under which projects are registered for offset credits must include the following:

- Assessment of the risk of reversals;
- Descriptions of measures to be taken to reduce risks;
- Procedures to measure, report, and compensate for reversals;
- Project-developer responsibility to compensate for reversals unless there is a legally binding contract specifying another responsible party.

In addition, certifications of reversals must be submitted annually following the registration of a project and if reversals have occurred, the Administrator must declare offset allowances invalid in proportion to reversals.

Additionality

Projects may not receive assistance from government incentives, subsidies or mandates; be required by Federal or State regulation; use practices or technologies in common use in a given jurisdiction; or have taken place in absence of the offset revenue.

²⁰ S. 3036, Title III. Sec. 302(c)(2))

4.6 Canada: The Alberta Climate Change and Emissions Management Amendment Act

Introduction and overview

The Canadian province Alberta is the first Canadian province to have passed legislation that regulates GHG emissions of large emitters. Alberta's system is intensity-based as will be the national GHG system for large final emitters scheduled to start in 2010. As of July 1, 2007, Alberta's Climate Change and Emissions Management Amendment Act requires companies that emit more than 100,000 tonnes of CO₂ per year to reduce their emission intensity by 12 percent annually. The law applies to about 100 facilities which account for about 70 percent of Alberta's industrial GHG emissions. According to the law industries have three options to meet the target: to reduce the emission intensity by 12 percent, to contribute to a new Alberta-based technology fund at the rate of C\$15 per tonne for every tonne above the 12 percent target, or to use offsets²¹.

The Alberta system relies on an ex-post verification of project-achieved reductions and a GHG Assertion (a statement of the reductions achieved) rather than requiring pre-acceptance reviews (e.g. of baseline approaches). This approach was adopted to minimize administrative burdens and to enable businesses to implement effective solutions in a timely and cost-effective manner. The Alberta government offers government-approved quantification protocols to facilitate the ex-post verification. For offsets to be used by emitters, a Project Report and a Verification Statement, including the verification of the GHG Assertion by an independent verifier, must be submitted to the Alberta ministry of the environment.

Eligible activities and carbon pools

Both agricultural soil sequestration through practice changes and afforestation projects are eligible²². All projects must be Alberta-based. Reductions or removals must result from actions taken starting January 1, 2002, and ownership of reductions must be established in legal documents. In the case of afforestation projects the credit duration period is set at 60 years due to the slow rate at which carbon accumulates in growing forests. Afforestation projects can only be undertaken in areas that were not in tree-cover prior to December 31, 1989 as confirmed by land-use records, aerial photos, or other means²³. The area must also not have had tree cover in the year prior to the first year of the project. While it is expected

²¹ Alberta's Strategy for Reduced Emissions. <http://environment.alberta.ca/1345.html>

²² Offset credit project guidance document. <http://environment.alberta.ca/1239.html>

²³ Afforestation Quantification Protocol. <http://environment.alberta.ca/1241.html>

that most projects will occur on agricultural land, projects are also permitted on, for example, land that had been in urban uses.

Reversibility

The problem of reversibility is dealt with by means of assurance factors. In the case of afforestation, for example, a factor of 90 percent is applied to stock increases. In essence this amounts to an assessment, or determination, that 90 percent of reductions achieved through afforestation will be permanent. This approach prevents liability for reversals from attaching to either the project developer or to the user of the offsets credits.

Additionality

Additionality is addressed through requirements that reductions or removals must be “beyond normal business operations or common industry practice” and incremental to any actions required by regulatory statutes or law²⁴. In the case of afforestation projects, projections of management activities that would take place in the absence of the project are to be used to establish baselines. For other projects, developers may select the most appropriate baseline method for the project, including historic benchmarks, standards, comparisons, and projections.

4.7 Voluntary Regimes

4.7.1 The Chicago Climate Exchange

Introduction and overview

The Chicago Climate Exchange (CCX) is a voluntary US GHG programme. In 2007 the number of members rose to about 400 and nearly 23 million tonnes of carbon dioxide were traded²⁵. The CCX accepts members provided that they make a legally binding commitment to reduce their GHG emissions. In the first period (2003-2006) emission reduction targets were one percent per year below an average of the baseline period 1998-2001. Phase two extends the reduction period through 2010, with an additional two percent reduction commitment for first periods participants and a total of six percent reduction commitment by 2010 for new members joining in the second phase²⁶. The tradable emission offset credits created under the CCX are called Carbon Financial Instruments (“CFIs”). Members

²⁴ See Offset credit project guidance document. <http://environment.alberta.ca/1239.html>

²⁵ <http://www.chicagoclimatex.com/>

²⁶ <http://www.chicagoclimatex.com/>

of the CCX can choose to reduce emissions internally, create CFIs, purchase CFIs from other members, or verified external offset projects from the US and abroad.

Eligible activities and carbon pools

Eligible land-based offset project categories include agricultural practices, afforestation, long-lived wood products, managed forest projects, combined forestation and forest conservation projects²⁷. Afforestation projects must be implemented on land that was not forested as of January 1990. To participate in the CCX offset program, forest owners must provide evidence that forest holdings are sustainably managed, by obtaining a certification from CCX-approved third party verification programs. Afforestation and forest enrichment projects can earn CCX CFI offsets at a rate based on the annual increase in the carbon stock during the CCX programme years. Forest conservation credits can be issued if the conservation occurs on a site contiguous to a forestation project²⁸.

Reversibility

The CCX addresses non-permanence by requiring land-based project owners to demonstrate a long-term commitment to maintain carbon stocks. Landowners must sign a contract attesting that the land will be maintained as forest for at least 15 years from the date of enrolment. In addition, all participants are required to sign a letter of good faith stating that they will maintain enrolled land in the appropriate use or practice beyond the commitment period of the program. To account for any net losses in forest carbon stocks, a quantity of CCX CFI offsets equal to 20 percent of all forest offsets generated by CCX eligible land-based projects is held in a CCX forest carbon reserve pool. All CCX CFI offsets remaining in the reserve pool after accounting for losses will be released to project owners at the end of the program.

Additionality

Rather than having a formal project-specific assessment of additionality, additionality criteria are incorporated into the eligibility criteria of the project types, including the requirements that an activity for which credits are given is well beyond average management practices for lands and that the practice must qualify as a “best-in-class” approach to forestry or agriculture. The project must also be beyond what is required by regulations or laws and initiated in the recent past²⁹. If an action encourages or involves reversing some other GHG mitigation activity the project also can not qualify for CFIs.

²⁷ http://www.chicagoclimatex.com/docs/offsets/CCX_Rulebook_Chapter09_OffsetsAndEarlyActionCredits.pdf

²⁸ www.carbon.sref.info/registering/ccx-forest-offsets.pdf

²⁹ McComb S. (2007), Role of Offsets in the U.S. Carbon Market. Chicago Climate Exchange 2007

4.7.2 The Voluntary Carbon Standard

Introduction and overview

The Voluntary Carbon Standard (VCS) was launched in November 2007 by the Climate Group, the International Emissions Trading Association, and the World Business Council for Sustainable Development. The goal is to create a new, robust standard for the measurement and recognition of verified emission reductions from projects for the voluntary carbon market. This initiative was stimulated by the strongly growing demand for voluntary credits that has emerged over the past several years. A report by Ecosystems Market Place and New Energy Finance estimated that around 65 million carbon credits, known as verified emissions reductions (VERs), were traded in the global voluntary market in 2007³⁰. This rising demand for voluntary credits is a result of several factors, including:

- Companies or individuals not bound by the Kyoto agreement are using voluntary-offset credits to demonstrate that they are addressing global warming.
- Some companies are engaging in pre-compliance purchases in anticipation of regional and federal cap-and-trade schemes.

The VCS defines a Voluntary Carbon Unit (“VCU”). VCUs must be verified by an approved, accredited, independent certification entity in accordance with the Voluntary Carbon Standard criteria. Verifiers must be approved under a GHG Program recognized under the VCS or accredited under the ISO verification standards (ISO 14065). VCUs are registered in a VCU Registry, approved by the Voluntary Carbon Standard Steering Committee. To generate VCUs a project must apply a VCS-approved methodology for estimating and monitoring its net GHG emission reductions or removals. Methodologies accepted under the CDM and JI are approved automatically under the VCS³¹.

Eligible activities and carbon pools

Acceptable land-based projects include afforestation, reforestation and revegetation, improved forest management and reducing emissions from deforestation³². The VCS crediting periods for land-based projects have a minimum of 20 and a maximum of 100 years.

³⁰ Hamilton K., M. Sjardin, T. Marcelllo and G. Xu (2008), Forging a Frontier: State of the Voluntary Carbon Markets 2008. Ecosystem Marketplace and New Carbon Finance

³¹ See www.theclimategroup.org/assets/Voluntary_Carbon_Standard_Version_2_final.pdf

³² Voluntary Carbon Standard Guidance for Agriculture, Land-based and Other Land Use Projects, 19 November 2007

Reversibility

To address reversibility, the VCS requires that projects maintain adequate buffer reserves of non-tradable carbon credits to cover potential carbon losses. The number of buffer credits that a given project must deposit into the pooled VCS buffer account is based on an assessment of the project's potential future carbon loss. Projects with higher risk of (partial) failure must include a larger buffer than projects with smaller risks. Risk assessment and subsequent buffer determination is conducted by two separate independent verifiers. If a project fails to submit a verification report to the VCS within five years from its latest verification, 50 percent of the credits associated with its buffer are automatically cancelled. After another five years, all of its remaining buffer credits are cancelled³³.

Additionality

Additionality has to be demonstrated using a project, performance or technology test. There is an overlap between the specifics of these tests, all three options, for example, include a provision that the project can not be required by laws or regulatory requirements. Each option includes further criteria that must be met depending on the nature of the project. Criteria include,

- The demonstration of the existence of barriers that impede the implementation of the project. Barriers can be financial constraints, technological hurdles, or social or organizational constraints.
- Evidence that the project represents an undertaking beyond common practice. Common practice can be defined in a number of ways, including through the comparison with practices utilized in a region, the establishment of emission rates (performance standards), or determinations of technologies in use.

³³ Voluntary Carbon Standard Guidance for Agriculture, Land-based and Other Land Use Projects, 19 November 2007

5 Comparison of design features and implications for linking

Design features of emissions trading schemes matter when it comes to linking as will be shown in this chapter. Of the schemes covered in this paper, only the New Zealand includes deforestation and agriculture in the cap. All other schemes address these activities and carbon pools through an offset mechanism. Some forest-based offsets, particularly afforestation, are eligible to receive credits in many schemes and agricultural offsets are eligible in several.

As summarized in Table 1, the methods used to address additionality and reversibility as well as eligible activities and carbon pools vary across different schemes. Decisions on direct bilateral linking between schemes will need to consider the impacts of these differences as well as differences in monitoring, reporting and verification (MRV) regulations and restrictions on the use of domestic or international credits to be used for compliance. Although a discussion of MRV provisions is beyond the scope of this paper, MRV rules will affect the environmental integrity of offsets. If a MRV process is not sufficiently robust, there is the danger of over-reporting carbon sequestration and under-reporting carbon losses, which would undermine confidence in the units. However, reviews of MRV rules will be needed across all offsets; this is not an issue that arises only for land-based offsets. The primary unique considerations for LULUCF offsets will be which activities and carbon pools are eligible and how the scheme deals with permanence.

Table 1: Comparison of different design elements in the analysed schemes

Trading Scheme or offset standard	Non-permanence	Carbon Pools and Eligible Activities	Additionality
CDM	<ul style="list-style-type: none"> • Concept of expiring credits (ICERs, tCERs) 	<ul style="list-style-type: none"> • Afforestation and reforestation • Above and belowground biomass, soil carbon, dead wood, and litter 	<ul style="list-style-type: none"> • Regulatory Surplus, Investment analysis or Barrier Analysis; Common Practice; Impact of CDM Registration
NSW GGAS	<ul style="list-style-type: none"> • Carbon sequestration from which NGACs are registered has to be maintained for 100 years. • Credit generation is limited to 100 year minimum stocks (accumulated carbon) • Restriction on use of land Long-term reporting arrangements need to be in place and approved 	<ul style="list-style-type: none"> • Reforestation • Above and belowground biomass, soil carbon, dead wood, and litter 	<ul style="list-style-type: none"> • The project must be beyond regulatory requirements
NZ ETS	<ul style="list-style-type: none"> • No specific mechanism other than potential emissions liability at harvest 	<ul style="list-style-type: none"> • No selection among carbon pools and activities 	<ul style="list-style-type: none"> • No provisions for additionality
RGGI	<ul style="list-style-type: none"> • Conservation easement (in perpetuity) • Project sponsor must either discount by 10% or retain approved long-term insurance to guarantee replacement of any lost sequestered carbon for which allowances were awarded • Project lodges easement with registered NGO 	<ul style="list-style-type: none"> • Domestic afforestation (if the relevant land has been non-forested for at least ten years prior to commencement of the offset project) • Live above- and below-ground carbon in tree biomass as well as soil carbon stocks. Carbon stocks in coarse woody debris and dead organic matter are also required unless carbon in these pools is at or near zero 	<p>No credits to a project:</p> <ul style="list-style-type: none"> • that is required pursuant to any local, state or federal law, regulation, or administrative or judicial order • that receives funding or other incentives from electricity system or consumer benefit funds

Trading Scheme or offset standard	Non-permanence	Carbon Pools and Eligible Activities	Additionality
CCAR/AB32	<ul style="list-style-type: none"> Perpetual conservation easement 	<ul style="list-style-type: none"> Conservation-based FM and conservation (Forest projects that are based on specific actions to prevent the conversion of native forests to a non-forest use). Reforestation: Forest projects based on the restoration of native tree cover on lands that were previously forested, but have been out of tree cover for a minimum of ten years Above and belowground biomass, soil carbon, dead wood, and litter. Optional: Wood products 	<ul style="list-style-type: none"> Qualitative additionality characterization, including any mandatory statutes or regulations used to characterize the project baseline
Liebermann/Warner bill	<ul style="list-style-type: none"> Annual review of potential reversal. In case of reversal allowances are declared invalid and have to be compensated by project developer 	<ul style="list-style-type: none"> Sequestration achieved through management practices on agricultural, grazing, and forestlands as well as manure management, afforestation, and reforestation. 	<ul style="list-style-type: none"> Projects may not receive assistance from government incentives, subsidies or mandates; be required by Federal or State regulation; use practices or technologies in common use in a given jurisdiction and have taken place in absence of offset revenue
Alberta Offset System	<ul style="list-style-type: none"> Assurance factor accounts for the average number of reversal events anticipated over a 20 year period 	<ul style="list-style-type: none"> Afforestation and agricultural soil sequestration through practice changes 	<ul style="list-style-type: none"> Reductions or removals must be “beyond normal business operations or common industry practice” and incremental to any actions required by regulatory statutes or law. In the case of afforestation projects, projections of management activities that would take place in the absence of the project are to be used to establish baselines.
VCS	<ul style="list-style-type: none"> Buffer approach based on project-specific risk and declining over time 	<ul style="list-style-type: none"> Afforestation, Reforestation and Revegetation (ARR), Improved Forest Management (IFM), Reducing Emissions from Deforestation (RED). Above and belowground biomass, soil carbon, dead wood, and litter. Optional: wood products 	<ul style="list-style-type: none"> Additionality tests (regulatory surplus, investment barriers, technological barriers, common practice)
CCX	<ul style="list-style-type: none"> Long term conservation easements for forestry maintenance A quantity of CCX CFI offsets equal to 20 percent of all forest offsets generated is held in a CCX forest carbon reserve pool 	<ul style="list-style-type: none"> Agricultural practices, afforestation, long-lived wood products, managed forest projects, combined forestation and forest conservation projects 	<ul style="list-style-type: none"> Projects must be other than Business As Usual: beyond regulation, rare (best-in-class), recent

5.1 Offset versus Cap Approaches

The design of an ETS should take into account the pros and cons of including land-based emissions in the cap versus an offset crediting approach. Advantages of including land-based emissions under a cap include:

- Avoiding the additionality issue with its attendant baseline-setting problems,
- Avoiding the need for a mechanism to address reversibility, and
- Addressing a larger portion of emissions by the cap.

Factors that tend to discourage the inclusion of land-based emissions in a cap include:

- Large numbers of landowners, raising the issue of administrative feasibility of reporting, including monitoring and verifying reports,
- Traditions of independence from regulation, particularly in the agricultural sector,
- Relative lack of sophistication and capacity to undertake measuring and reporting by small landowners, particularly given the age of many agricultural operators, and
- The separation of land ownership from land operator prevalent in many countries.

All of these factors, for example, are operative in the United States³⁴. New Zealand has addressed the small land owner problem in the forestry sector by exempting owners of small tracts of land. A similar approach would likely be needed in many other countries if they imposed emission limitations and reporting obligations in the land-based sector. The fact that New Zealand will only determine rules for the inclusion of agricultural lands at the end of the trading period perhaps indicates the difficulties that are expected.

5.2 Non-Permanence/ Reversibility

Non-permanence is the most important issue that distinguishes land-based offsets from offsets in other sectors. All the mandatory schemes reviewed provide mechanisms that adequately address permanence, as long as the cap-and-trade schemes or national caps that include land use emissions are in place. However, mechanisms vary and the way

³⁴ Paustian et al. 2006. Agriculture's Role in Greenhouse Gas Mitigation. Pew Center on Global Climate Change. Arlington, VA. and Richards et al. 2006. Agricultural & Forestlands: U.S. Carbon Policy Strategies. Pew Center on Global Climate Change. Arlington, VA.

permanence is dealt with in different schemes will most likely have important implications for linking of schemes.

Under the Kyoto Protocol the reversibility of LULUCF achievements led to the creation of new types of tradable carbon units. In particular, the negotiators of the Kyoto Protocol created trading units that expire at the end of specified time periods. Other schemes have chosen not to follow this approach but rather to adopt mechanisms which place the responsibility for reversals – and the consequent nullification of emission reductions or stock increases represented by the credits – on project developers, users of credits, or the national government.

The Kyoto Protocol is the only system that uses temporary credits to address reversibility, and ensuring liability for reversals under the Kyoto Protocol's CDM mechanism approach is complicated. First, the credits travel abroad, gaining physical and regulatory distance from the country of origin and the carbon stock changes on which they are based. Insuring liability thus requires a reliable flow of information from the country of origin to the user country. Second, the temporary credit approach means that, at some point, the credits have to be replaced with other credits, even if no reversibility has occurred. In the case of tCERs, the user must replace the credits when the tCERs expire. In the case of ICERs, the holder must replace any losses discovered as of each verification report. In the case in which temporary credits are allowed in the system, the linked schemes will also have to harmonize or recognize the respective verification systems. The importing country will have to enforce the replacement obligation if the stored carbon that ensures the value of the carbon credit is lost³⁵.

In practice such countries are likely to pass legislation requiring the entity that uses the credit to take responsibility. Given these complications, nations may be hesitant to accept temporary credits, which could complicate linking between schemes that do and schemes that do not accept them. Solutions that have been proposed include swapping of temporary credits for permanent credits or the charging of a permanence premium. An insurance premium would lead to an increase in the value of temporary credits as they would have been stripped of the replacement obligation.

Linking of systems is likely to be unhindered by schemes where the liability to replace losses rests entirely with the creator of the offsets. This is the case in most of the analysed

³⁵ Streck et al. (2008), Offsets in Emissions Trading Systems: Land-use offsets an important issue when linking ETSs. Mitigation and Adaptation Strategies for Global Change (forthcoming).

schemes such as the New South Wales and proposed U.S. systems, which include clear, internal procedures for insuring the replacement of losses. The problem of reversibility is dealt with by means permanent easements, financial or physical insurance mechanisms, requirements for nullification of credits in case of losses or assurance factors. In such cases credits should have the same value as any other permanent credits and there should be no reason why they should not flow freely into the market. Linking does not pose any regulatory problem provided that the schemes to be linked apply the same (or sufficiently similar), accounting and verification rules. The integrity of the system depends on the enforcement capacity of the country that has approved the issuance of the respective credits. New Zealand would avoid the reversibility problem completely with its approach to include deforestation in its trading scheme from the start, but not through use of offset credits.

5.3 Eligibility

The EU ETS with its ban on any land-based offsets is a notable exception to a pattern of the inclusion of at least some land-based options among eligible offset categories. Most nations apparently believe that the benefits of allowing at least some LULUCF offsets outweigh reversibility concerns and that there are practical ways to address it. However, current restrictions will pose hurdles to linking.

Each of the schemes reviewed specifies which land-based options are eligible for offset crediting. In addition, schemes can restrict the total number of land-based credits that can be used as it is the case in the Kyoto Protocol or provide rules that may restrict non-domestic offsets as foreseen in the proposed Lieberman-Warner bill. Quantity and country-of-origin restrictions may be particularly difficult to preserve de facto if systems are linked.

Land-based options may be restricted due to concerns over the ultimate quantity of credits. For example, if harvested wood products were to be accepted in a system, it could represent a large pool of carbon. Furthermore, the addition of low cost carbon pools to the offset categories has important implications on the price of carbon in a particular system. In general the broader the scope, the more inclusive the definition of eligible carbon pools is, the greater is the availability of offsets and the lower is the price. The proposed federal US system (Lieberman-Warner bill), with its inclusion of avoided deforestation from developing countries, could also represent a very large influx of credits, particularly if the current 10% limit were raised or eliminated at some point.

In addition to quantity concerns, country views on issues such as reliability of baselines, measurement and reporting, or concerns about perverse incentives may result in the exclusion of land-use categories accepted by other systems.

Concerns about reliability of measurement or the establishment of additionality may affect, for example, the acceptance of forest management, avoided deforestation, and agricultural practice changes; whereas concerns about perverse incentives may impact the acceptance of afforestation. Many negotiators and NGOs, for example, saw the acceptance of afforestation as entailing a risk of rewarding large “carbon plantations”. They were particularly concerned that the inclusion of afforestation could augment the replacement of native forests that hold high importance for NGOs.

Restrictions of certain land-based options will be difficult or impossible to enforce when linking to another scheme that allows a broader range of project types. For example, if RGGI, which restricts the use of land-based offsets to afforestation, links to the Alberta scheme, offset credits from agricultural options will flow into the system either directly or indirectly through the use of the credits by entities that then release other types of credits into the RGGI system. It is possible that the problem for linking posed by the acceptance of a limited set of carbon pools or activities by some schemes will resolve itself over time. Pressure to include more options, along with increasing experience and design of solutions to concerns may lead an increasing number of schemes to accept a wider range of land-based offset categories. Experience may also show that fears of over-supply of credits from, e.g., avoided deforestation, are unfounded. Experience may also lead to increased confidence in the reliability of baselines to filter out non-additional credits and in the reliability of measurement and reporting regimes. However, until a full set of LULUCF options is accepted by all schemes, eligibility limitations will pose challenges for linking.

5.4 Additionality

As indicated, additionality is an issue for all offset projects. For offsets credits to be accepted into a cap-and-trade system, the emission reductions they represent should be additional to reductions that would occur in the normal course of business (BAU). To the extent that offset credits are not additional, the cap will be weaker than intended: higher total emissions (i.e. emissions from capped plus uncapped entities together) will occur than would occur if offset credits were not allowed. If all offset credits represent emission reductions that would not have occurred under BAU, the system has accomplished its goal and the cap retains its intended stringency.

The additionality requirement means that reductions, or removal enhancements need to be measured against some business as usual (BAU) baseline. Proposed BAU baselines include the use of historical values, trend projections, legal requirements, financial considerations, and the status of technologies. Consequently, different trading schemes establish additionality in quite different ways. Additionality is difficult to assess, as it requires a

projection of what would have happened in the future had a project not been initiated. Linking an ETS to schemes with loose additionality rules poses a threat to the environmental integrity of the ETS, as offset credits that do not represent real emission reductions beyond what would have occurred without the offset program lead to higher total emissions and negatively impact what is accomplished through in the ETS that imports them.

There are substantial differences regarding additionality requirements within the analysed schemes. Some schemes, such as the VCS or the CDM, require additionality tests, testing a set of barriers such as the regulatory surplus or investment barriers. The VCS requirements, however, are much less stringent those in the CDM. The other analysed schemes, such as RGGI, have no additionality tests. The RGGI scheme appears to offer the simplest approach. Additionality is taken care of by restricting projects to afforestation, specifying that the land could not be in forest for 10 years prior to the beginning of the project, and specifying that projects can not be required by any regulation. Other schemes, most notably the Lieberman-Warner Bill, include complex directives in their attempt to ensure that credits represent real, additional reductions. The CCX which is a voluntary scheme has comparable poorly-defined additionality requirements. The purpose of the CCX, however, was to serve as a pilot scheme and to assist companies in becoming familiar with emissions trading rather than to insure that a mandatory emission limit was met.

As there are currently no methods available on which to assess the relative stringency of additionality provisions proposed, only after the schemes are in place for some time relative evaluations will be possible. The only system that has no additionality problem is the New Zealand scheme, where deforestation is under the cap.

6 Conclusions

The present paper reviewed how different trading schemes or offset standards deal with land-based offsets. Design issues which impact the creation of land-based offset credits differ significantly in the analysed schemes and may be a barrier when linking different schemes. Different rules and requirements may threaten the environmental integrity of the more restrictive schemes. When two or several emissions trading schemes are linked, the flexibility as well as the vulnerability inherent in each scheme flows to the linked scheme.

Linking an ETS which has stringent additionality screens to schemes with less stringent screens will lead to the less stringent screens setting the overall standard. The analysed trading schemes and offset standard show significant differences in dealing with additionality of offset projects. However, there are currently no methods available on which

to assess the relative stringency of additionality screens proposed. Only after the screens have been in use for some time relative evaluations may be possible.

Also regarding the replacement of losses of sequestered Carbon, the analysed schemes implement different approaches. If the liability for the replacement of losses rests with the creator of the offsets as in most of the analysed schemes the case, and the provisions how to deal with the replacement of losses are strictly enforced, linking would be easy as the credits would have the same value as any other permanent credit. Linking does not pose any regulatory problem provided that the schemes to be linked apply the same (or sufficiently similar), accounting and verification rules. If tCERs and ICERs created under the CDM are allowed into any scheme, the country allowing the credits to be imported must assume the liability attached to the credits. As the credits get sold through linked schemes, this responsibility for permanence would have to be assumed by the recipient nations. This may introduce a considerable complexity. The proposed New Zealand emissions trading scheme takes a complete different approach than all the other analysed schemes by including deforestation in its trading scheme. It thereby would avoid the reversibility problem completely.

Schemes furthermore distinguish between eligible and non-eligible crediting options. The inclusion of land-based options has to be considered in the linking of trading systems since it determines the quantity, quality, and price of available offsets. It will not be possible, de facto, to prevent the flow of credits from all options of one scheme into the linked scheme. Unilateral restrictions of certain offset types are not likely to be very effective. Covered participants in countries which allow a wide range of options can retire offset credits from options not allowed in a linked system and then export credits from options allowed in another scheme. Also quantity and county-of-origin restrictions may be particularly difficult to preserve de facto if systems are linked. Until a full set of LULUCF options is accepted by all schemes, eligibility limitations will pose significant challenges for linking.

This paper illustrated a number of design elements related to forestry offsets, which have to be carefully assessed before linking to other trading schemes. It shows that there is a strong case for harmonising the way forestry offsets are generated in order to enable the future linking of trading schemes.

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