Linking Emissions Trading Schemes

Synthesis Report

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Executive Summary

The aim of this study is to: (1) evaluate the feasibility of different forms of linking, with an emphasis on variations among bilateral and unilateral forms of linking; (2) assess the barriers and the time frames for implementing different forms of linkages; (3) determine the legal and institutional requirements for successful trading across jurisdictions; and (4) ascertain the roles for linking in post-2012 climate architectures.

The paper concludes that an OECD-wide company-level carbon market by 2015 is a highly ambitious goal. It is more likely that 2015 will be at the beginning of a period for establishing the first links between trading systems in different OECD countries. Candidates for earlier full bilateral links are systems in countries or regions that are close trading partners and already have a history of policy coordination.

A growing number of countries are integrating cap-and-trade systems into their national climate policies. The European Emissions Trading Scheme (EU ETS), is the frontrunner in this development. In addition, a number of other national and sub-national emissions trading systems are emerging around the world. In the United States, in particular, initiatives have been launched at the state level: the Regional Greenhouse Gas Initiative (RGGI) on the East Coast, the Western Climate Initiative (WCI) between states on the West Coast and other US states and Canadian provinces, and the Midwestern Greenhouse Gas Accord in the central part of the US. In addition, several legislative proposals for a federal system are currently under discussion in the US Congress. In Australia, detailed provisions for a scheme starting in 2010 have been tabled, and such schemes are also emerging in New Zealand and Japan.

The European Commission sees the EU ETS as nucleus for creating a global carbon market. It envisions an OECD wide Carbon market by 2015, and a priority for the EU is to establish a transatlantic link between the EU ETS and a federal US scheme. A combined EU-US market would cover the larger part of OECD emissions, and could thus constitute the backbone for the future international emissions trading regime. If the EU and U.S. find common ground on key design elements, this would probably exert significant influence on the other, much smaller-sized OECD trading systems to align their designs accordingly and to join the linked market.

In most schemes assessed in this study, however, full bilateral linking is not a short-term priority, and its benefits will be weighed against the costs of sacrificing other objectives, in particular control over domestic CO_2 price levels. Accordingly, linking has to be considered as a trade- off with other policy objectives. The EU for example clearly prioritizes the achievement of a defined reduction target, and thus will tolerate a relative increase in allowance prices to achieve this aim. In many other regions, there is greater sensitivity regarding the level of future carbon prices, and especially with a view to high prices in the near term. Other design features that may pose a significant barrier to linking in the short term include offset provisions (such as the eligibility of offsets) and intensity targets.

When discussing future linkages of emissions trading systems, it is important to be clear about assumptions regarding the policy scenario in which these occur. A distinction is necessary as to whether there will be a Kyoto-type successor agreement or not. Some of the potential barriers to linking cap-and-trade schemes, such as significantly divergent MRV provisions, will be easier to overcome with the adoption of a Kyoto successor treaty. More importantly, the comparability of targets will have been resolved through an international consensus-based burden sharing determination. However, regional carbon markets can be linked even in the absence of a Kyoto successor framework, enabling pioneers to cooperate in climate policy and keep up political momentum. It is also possible to link domestic carbon markets in the context of a Kyoto-II system. In this case, governments devolve trading activity to the level of companies, and trade only on behalf of sectors not covered by domestic ETS.

With negotiations on a global climate regime often threatened by diplomatic stalemate, linking provides a fallback option to the top-down international regime by offering a complementary bottom-up process through which national and regional emissions trading systems become increasingly integrated to eventually form a global carbon market. On its own, this process would not allow for negotiation of a global burden-sharing regime, nor would it result in the broad and instantaneous coverage of global emissions expected from an international Kyoto-II framework (unless a significant number of major emitters, such as the US, the European Union, China, Russia and others agree to form a joint carbon market outside of the UNFCCC arena).

Even if full bilateral links are unlikely to be implemented in the short term, most emissions trading systems will establish unilateral links to international offset mechanisms, such as the CDM or new crediting mechanisms under a Kyoto successor agreement. Indirect links among trading systems are also likely to play a prominent role under any of the expected scenarios. Indirect links could emerge by acceptance of CDM or new types of credits in all trading systems, and would lead to a complete or incomplete convergence of allowance prices, depending on the size of price differentials and the supply of CDM or other credits. The probability of price convergence increases with the available amount of credits and the relaxation of import restrictions on their use in cap-and-trade systems. Although overall the study shows that linking of emissions trading systems is likely to be some years away in terms of practical implementation, linking nevertheless merits careful attention as an important option in the future international climate regime.

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1 Context and aims of the study

A growing number of countries are integrating cap-and-trade schemes into their national climate policies. The European Emissions Trading Scheme (EU ETS), operational since 2005, is the frontrunner in this development. In addition, a number of other national and sub national emissions trading systems are emerging around the world[1]. In the United States in particular, initiatives have been launched at the state level: the Regional Greenhouse Gas Initiative (RGGI) on the East Coast, and the Western Climate Initiative (WCI) among states on West Coast as well as other US states and Canadian provinces. In addition, several legislative proposals for a federal system are currently under discussion in the US Congress. In Australia, detailed provisions for a scheme to start in 2010 have been tabled, and also in New Zealand and Japan such schemes are emerging.

These current and planned schemes vary significantly in size, design characteristics, geographical scope and other features. For instance, in terms of economic size and number of countries, the EU ETS is the largest of the current or planned schemes. Some emissions trading schemes are voluntary, while others are mandatory. Some schemes are designed to be used for compliance with the Kyoto Protocol, while others are planned or in use in countries that are not parties to the Kyoto Protocol. Some of the existing or planned schemes cover direct emission sources, while others include electricity retailers or users. Also the compliance provisions show significant differences among the schemes. There are also variabilities in the time-period over which the schemes extend, as well as the time period over which emissions targets are set. Furthermore, there are also variations in the types and amounts of "offset" credits that are allowed.

Creating a global carbon market is a key goal of EU climate policy. In its recent post-2012 communication, the European Commission proposes the establishment of an OECD-wide market by 2015 and suggests the creation of an EU-US working group on the design of carbon markets (European Commission, 2009). A US-EU carbon market would comprise the largest share of an OECD-wide emissions trading system. This would send a strong political signal in support of the establishment of a global carbon market. A transatlantic link and stronger integration of major developing countries, such as China and India in the carbon market may form one of the main building blocks of the future climate architecture.

Yet, there are currently only a few links between trading schemes and markets - mainly unilateral links to the CDM. Because of the diversity in numerous features of existing and emerging schemes, it is appropriate to ask a variety of questions, including whether the schemes can be linked and what obstacles there are to such linkages. Such questions have been posed in several theoretically-based studies that have been published in recent years. Research has also been done on how the EU ETS, in particular, could be linked to other trading schemes, and what the principal issues are about the prospects for such linkages. The present study draws upon those previous studies. But the approach of the present study is more empirically-oriented than the theoretical studies, and it uses several cases from diverse regions beyond the EU ETS as the basis for its findings.

[1] This paper uses the terminology emissions trading schemes and Carbon market, both for cap-and trade, and emissions reduction credits schemes. Cap-and-trade systems set a binding, absolute cap on total emissions, but allow for certificates–corresponding to the right to emit a specific volume of emissions–to be traded among the covered entities, which are either *nations* or *companies*. The Kyoto Protocol trading system for Annex-B countries is an example for cap-and-trade at the governmental level, while the EU ETS operates at the company level. In contrast, credit systems define a certain baseline such as a business-as-usual projection or a relative target, and only allow emission reductions that go beyond this baseline to be used as sellable credits (often referred to as 'offsets'). The CDM and JI mechanisms established under the Kyoto protocol are examples of such non-binding credit systems.

The specific aims of the study are to:

- evaluate the feasibility of different forms of linking, with an emphasis on variations among multilateral, bilateral and unilateral forms,
- assess the barriers and the time frames for implementing different forms of linkages,
- determine the legal and institutional requirements for successful trading across jurisdictions, and
- explore the roles for linking in post-2012 climate architectures.

2 Forms, rationale and implications of linking

2.1 *Forms of links*

Conceptually, a link can be either direct or indirect, with direct linking conditional on an explicit decision by at least one of the linked jurisdictions. Direct links allow trade between different schemes and can be distinguished by whether they allow trading in one or more directions. Under a unilateral link, entities in system A can purchase and use allowances from system B for compliance, but not vice versa (Sterk 2004). The administrator of a scheme can establish a unilateral link with another scheme by agreeing to accept allowances or credits issued by the other scheme for compliance purposes. Norway, for example, accepted Phase I EU allowances for compliance purposes, but the EU emissions trading scheme did not accept Norwegian allowances. A unilateral link between trading schemes can be established through the simple inclusion of a clause specifying the conditions for recognition of foreign allowances. One example is the EU Linking Directive (European Council, 2004), linking the EU ETS to the CDM.

If a system establishes a one-way link by recognizing another system's allowances, and the former system's allowance price is the higher of the two, inter-system trading will occur until the systems' prices converge at an intermediate level. If the former system's price is the lower of the two, there will be no incentive for inter-system trading (Jaffe, Stavins, 2007). Another important issue for unilateral links is their effect on the scheme being linked to. A large cap-and-trade system that establishes a unilateral link with a much smaller one could cause a price increase in the smaller scheme if the unilateral link results in the withdrawal of a large number of allowances for use in the larger scheme (Mehling, Haites, 2009). A scheme faced with an undesired withdrawal of allowances can amend its rules governing access to the registry, for instance by specifying that only domestic participants may open an account and hold allowances. If necessary, additional safeguards – for instance penalties – may be implemented to ensure that such a restriction is not circumvented. Hence, the risk of a scheme involuntarily losing control over its market due to an unilateral link is very limited (Mehling, Haites 2009). Unilateral links of small schemes to large ones will not significantly affect the price of the large schemes. Such links de facto introduce price caps for the smaller scheme at the price level of the larger scheme. Since a unilateral link can be terminated or amended if developments in the other scheme are considered likely to have adverse impacts, unilateral links may give rise to considerable uncertainty for capped entities.

In a full bilateral link allowances can be freely traded between two systems and each system's allowances are equally valid for compliance both systems. If more than two schemes participate, this becomes a multilateral link (Mehling, Haites, 2009). In theory, the more systems link, the larger

the potential efficiency gains. To implement bilateral or multilateral links, coordination is needed to synchronize the relevant aspects of legislation or rules governing each scheme. Such coordination may either be formal and binding, or informal and non-binding. Hence, a bilateral link can either be adopted through a formal international treaty, which binds its partners to domestic implementation of the link, or through reciprocal domestic legislation accompanied by an informal memorandum of understanding or other negotiated expression of intent (Mehling, 2007; Mace et al 2008). Binding agreements afford market participants significantly greater certainty, by specifying the exact conditions of withdrawals and termination (Mehling, Haites, 2009).

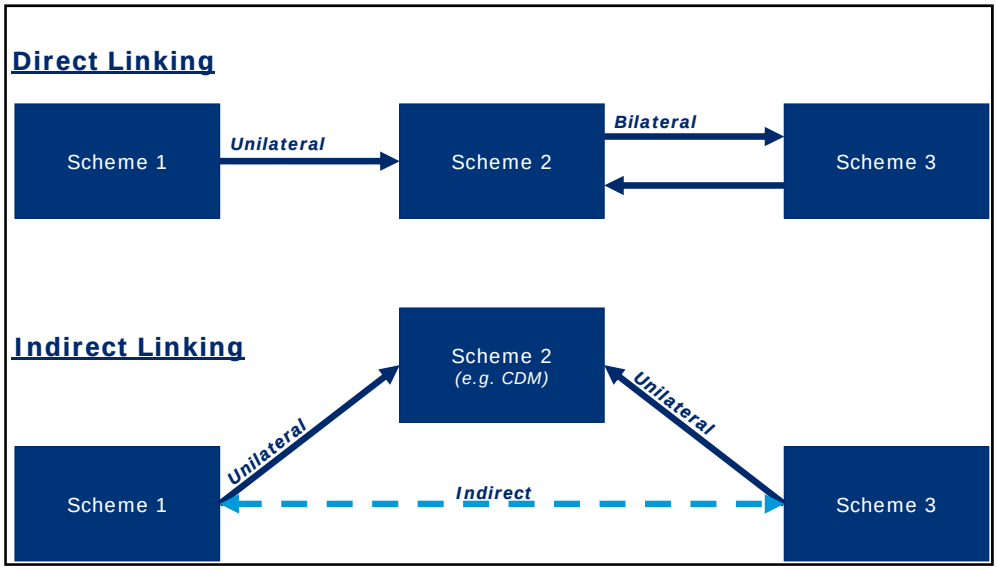

Figure 1: Direct and indirect linking[2]

Even if two systems are not directly linked, they can be **indirectly linked** through separate unilateral links with a common third system, such as the CDM. Through trading between each system and the common third system, the supply and demand for allowances in one system can affect that in the other system even though the two systems are not directly linked. Depending on the supply curve for offset credits, cap levels, marginal abatement cost (MAC) curves and quantity limits on the import of credits, indirect linking will lead to a complete or incomplete convergence of the allowance price in indirectly linked cap-and-trade markets (Flachsland et al 2009a)[3]. So far several ETS such as the EU-ETS and the Japanese JVETS have unilateral links to the CDM and therefore are indirectly linked.

[2] The arrows don't represent the credit flows

[3] Indirect links can also be established by governments acting as mediators that receive allowances from market actors wishing to make a transfer, convert them into AAUs, and transfer them to another government, which then converts them into their respective systems allowances.

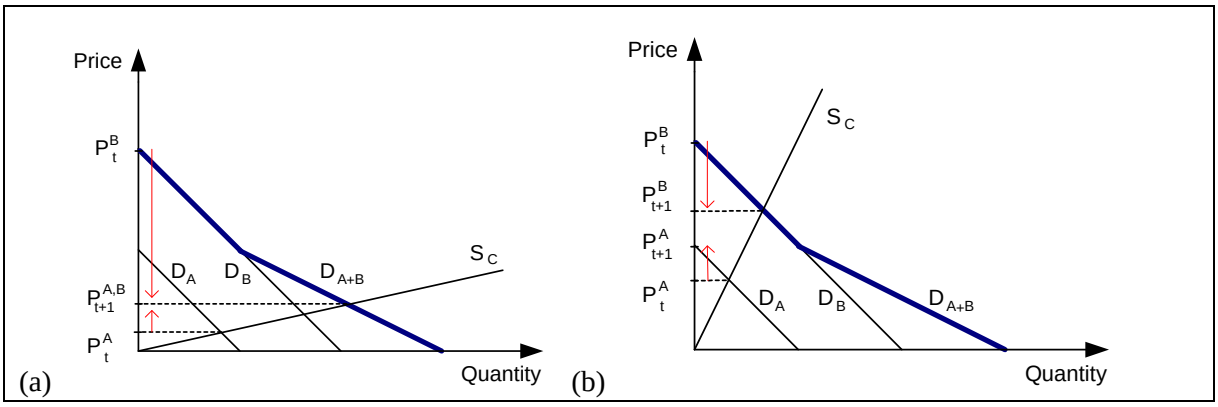

Figure 2: *Price convergence when cap-and-trade systems are linked indirectly via credits. Source: Adopted from Flachsland et al, (2009a).*

DA and DB are credit demand curves for cap-and-trade systems A and B, and DA+B is their aggregate demand curve. SC is the supply curve for credits from credit system C. The price level in system A prior to system B's joining of the credit market is PtA. The autarky price in system B without any linkage is PtB. The price levels in A and B after the entry of B into the credit market are P t+1A and Pt+1B, respectively. The arrows indicate the direction of price changes resulting from indirect linking. For each case we compare two periods. In the first period t, only cap-and-trade system A accepts credits from the baseline-and-credit scheme C, while cap-and-trade system B operates in autarky. In period t+1, system B also allows the import of permits from the baseline-and-credit scheme C, thereby establishing an indirect link between systems A and B. Figure *2*a illustrates the case of complete price convergence due to the indirect link. The price in system A increases from PtA to the new equilibrium price Pt+1A (= P t+1B), while the price level in B decreases from PtB to Pt+1B (= Pt+1A). In **Figure 2**b**,** price convergence is incomplete because of the steep credit supply curve SC. When entering the market for credits, system B buys credits at a market clearing price Pt+1B which exceeds the maximal willingness to pay of system A. The latter then resorts to domestic abatement only, leading to a new and different internal allowance price Pt+1A. Here, indirect linking brings about partial price convergence as the allowance price level in A increases, while it decreases in B (Flachsland et al. 2009a).

2.2 *Implications of linking*

First and foremost, linking results in a convergence of allowance prices. When two emissions trading schemes are linked, market prices will rise for allowances in one scheme, and fall in the other scheme, until full or partial convergence is achieved. Linking promises a wider range of abatement costs in the market by expanding the range of available mitigation options. To the extent that this promise is fulfilled, greenhouse gas mitigation can be achieved more cost-effectively as emissions are reduced where reductions are least expensive (see Blyth, Bosi 2004; Anger 2008). The degree of economic efficiency gain from international or interregional allowance trade is correlated to the difference in the pre-link allowance prices in the linked regimes. The greater the difference, the greater the potential gain in economic efficiency. A trading link also creates a larger, more liquid carbon market, reducing volatility, at the same time, however, a system can face volatility from the linked system (Jaffe, Stavins, 2007). As an additional benefit, linked trading schemes with harmonized prices eliminate any competitive distortions that might arise from different pre-link carbon prices between linking partners. Regarding leakage effects with respect to third regions, any changes resulting from a market link will depend on the sensitivity of each economy to changes in the carbon price. Regions with rising carbon prices due to linking may

encounter an increase in leakage, while regions with falling carbon prices will observe a reduced incidence of leakage (Jaffe, Stavins, 2007).

Linking trading schemes also entails considerable challenges, most notably with regard to distributional issues, regulatory control, and environmental performance. With regard to distribution, trading of allowances will presumably alter the cost of providing a specific amount of emission reductions in the participant nations (e.g. Anger 2008, Carbone et al 2008). Depending on relative market size, a link will create winners and losers in the linked schemes. Due to harmonization of allowance prices, buyers in the pre-link high price program and sellers in the low price program benefit from the link. Conversely, sellers in the high price program and buyers in the low price program suffer losses due to linking (Haites, 2001).

With regards to regulatory control, linking may reduce the control that a country has over the impacts of its domestic cap-and-trade system. For example, decisions by another government can influence the domestic system's allowance price, distributional impacts, and emissions implications (Jaffe, Stavins, 2007). In the case of bilateral linkages, certain program features propagate into the linked system. Ones of particular concern for environmental integrity include price caps and other cost containment measures. Such measures may undermine the environmental objectives of some participants in a linked system by increasing the total number of allowances available. Higher aggregate emissions – relative to the non-linking case – can also be caused by linked systems relaxing their cap to create additional revenue through international sales (Helm, 2003; Rehdanz and Tol, 2005). Several trade restrictions could be imposed by governments that would limit the price convergence. These include for example the introduction on an exchange rate between trading schemes. Such a requirement could serve as a simple fix to ensure the environmental integrity of a link if the linked systems' allowances or credits represent different amounts of emissions or emission reductions (e.g., short tons versus metric tons) (Jaffe, Stavins, 2007).

2.3 *Rationale for linking and trade offs*

Linking as a national and global goal

This chapter assesses the main reasons countries have to link. Most importantly, countries aim to increase the cost efficiency of meeting a certain emissions target by achieving greater heterogeneity of abatement costs, while also reducing competitiveness distortions and the ensuing threat of leakage arising from different carbon price levels. Small schemes aim to increase liquidity by linking, and overall, a joint market reduces the chances of market abuse by dominant players. Aside from these mainly economic reasons, there is also a strong political dimension. Currently, international climate negotiations are almost exclusively being held under the umbrella of the UNFCCC. These negotiations are characterized by near universal participation and consensus-based decision making; parties bring a range of highly divergent national circumstances and priorities to the negotiations, however, raising the threat of diplomatic stalemate over future commitments. However, bilateral talks between the EU, the US or Japan focusing on integrating national trading schemes may establish an additional and potentially synergistic arena for negotiations. This second arena could be gradually and purposefully expanded in order to include more actors.

Trade-offs of linking

Linking needs to be understood in the context of a range of policy objectives considered by policy makers when designing an ETS (see Jaffe, Stavins, 2007), and the desire to link to other schemes will depend on the extent that these policy objectives are affected by linking. Accordingly, linking has to be considered as a trade-off to other policy objectives. For example, if the EU would link to a federal US scheme there would likely be a net capital flow to the US and reduced CO2 prices, less domestic abatement as well as less control of the EU scheme. On the other hand it would send a strong political signal regarding the further development of international climate policy based on a global carbon market.

The EU view on building a Global Carbon Market

The EU Emissions Trading System (EU ETS) is the largest existing cap-and-trade system in the world and commenced operations in 2005. It covers about 2Gt of CO2 emissions at more 10,000 installations in the energy and industrial sectors which are collectively responsible for close to half of the EU's emissions of CO2 and 40% of its total greenhouse gas emissions. With a market value of 50bn US$, the EU ETS dominates the international carbon market, which totaled to 64bn US$ in 2007 (Capoor and Ambrosi, 2008). The European Commission sees the EU ETS as a nucleus for creating a global carbon market (Marr, 2008). The EU emphasizes that a Global Carbon market guarantees that environmental objectives are met globally and that least cost abatement options are identified at a global rather than regional scale, thereby considerable decreasing overall costs of a given emission reduction target (European Commission, 2008a). The EU has the vision of a broad, liquid global carbon market based on deep cuts in GHG emissions, in line with a 2 degree objective (Marr, 2008). This EU vision includes achieving an OECD-wide carbon market by 2015 as a first step and the establishment and integration of trading systems in economically more advanced developing countries by 2020 (EU Commission 2009). Over the last 2 years the European Commission explored bilateral linkages to several schemes, including Switzerland and New Zealand. In 2007 links to European Economic Area (EEA) countries Norway, Iceland and Liechtenstein have been established (EU Commission 2007). A transatlantic link of carbon markets currently has high priority for the EU as stated in the EU Commission proposal to advance the development of a link between the EU ETS and a future federal US ETS by establishing an EU-US working group on the design of carbon markets (EU Commission 2009). Given their status as the two largest integrated economies in the world, a transatlantic link between the EU system and a future federal US system would not only be a strong political signal for the creation of a global carbon market, but would eliminate competitive concerns between these two players caused by different carbon prices. If a combined EU-US market was established, this transatlantic market would provide the backbone for the overall international climate regime, with subsequent enlargements to other developed and developing countries.

3 Overview of existing and emerging emissions trading schemes

Current and planned ETSs vary significantly in their size, design characteristics and geographical scope. While most of the existing or planned schemes have absolute caps, some provide for intensity-based caps. Also, the mechanisms for cost containment show significant differences between the different schemes. Furthermore, there are differences regarding the sectoral coverage and the types and amounts of offset credits that are allowed. This chapter gives an overview of design differences of existing and emerging emissions trading schemes.

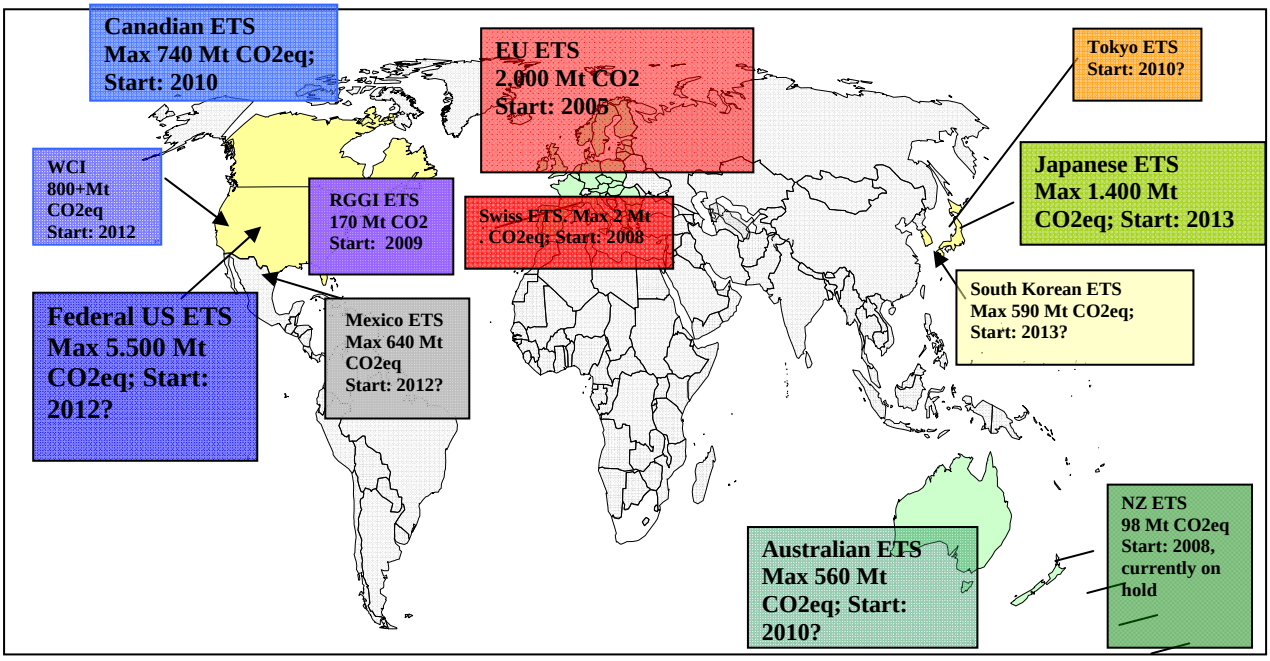

Figure 3: Existing and emerging emissions trading schemes (based on Flachsland, 2009c)

	EU-ETS	US Regional: WCI	US Federal: Waxman/Markey	Japan	Australia
Status (in place / proposed)	in place	proposed	proposed	Proposed (MoE proposal)	proposed
Date of entering into force	2005	2012	2013	2010	2010
Trading periods	2005-07 2008-12 2013-20	3 compliance period. (2012-end of 2014, 2015-end of 2016, etc)	2 year compliance periods	2010-2012 2013-2020 2021-2050	2010
Coverage	Downstream coverage of energy and industry sectors	Downstream coverage of electricity generation and industry, upstream coverage of residential, commercial and industrial fuel combustion as well as transportation	Downstream coverage electricity generators and large industrial sources and upstream coverage of refiners and other fossil-based liquid fuel producers and importers as well as producers and importers of fluorinated gases and other GHGs.	The MoE proposal outlines four options for sectoral coverage, one upstream and three downstream options. One downstream option provides for an optional inclusion of small-size energy users and transport.	All greenhouse gas emissions outside land use change and agriculture. Agriculture possibly to be included from 2015. Forestry is covered by a voluntary opt-in approach from the beginning. Entities above 25 ktCO2-q/year are to be directly liable for their emissions, and smaller sources of combustion emissions through 'upstream' permit liability on fuel suppliers.
Definition and recognition of trading units	EU Allowances measured in metric tonnes of CO2-eq.; non-LULUCF CERs/ERUs up to - 20% target: leftover amount from period 2008-2012 or minimum 11% of allocation in 2008-2012 period	Allowances measured in metric tonnes of CO2-eq.; Domestic offset projects, may include CDM (potentially subject to additional criteria), may accept foreign allowances Total of external units limited to 49% of reduction	For the year up to 2020, offset limit of about 30% of the allocation, to be split evenly between domestic and international offset credits. Discount factor (0.8) applied to offset credits	unclear	International Kyoto credits can be purchased in an unlimited quantity, restricted however to purchases of non-forestry CDM, JI and removal units

	EU-ETS	US Regional: WCI	US Federal: Waxman/Markey	Japan	Australia
	- more stringent target: half of additional effort needed Community offset projects	effort			
Stringency of targets	Depending on international agreement, at least 21% below 2005 levels by 2020	15% reduction from 2005 level by 2020	Cap at least 3% below 2005 by 2012, 20% below 2005 by 2020, 42% below 2005 by 2030, and 83% below 2005 by 2050.	unclear	5-15% compared to year 2000 levels
Distribution methodology	In total about 50% auctioning in 2013, increasing by 2020	Minimum 10% auctioning, increasing to 25% by 2020 Rest distributed by each partner jurisdiction as sees fit, may include further auctioning	A combination of free allocation and auctioning, with details still unspecified; free allocation likely to remain low	Auctioning and grandfathering, intensity targets for power companies	Permits are to be auctioned except for free allocations to emissions-intensive, trade-exposed industries such as aluminum, steel and liquefied natural gas and a defined amount to be granted to coal-fired electricity generators.
Temporal flexibility	1-year compliance periods Banking possible De facto borrowing possible within trading periods but phasing out	3-year compliance periods Banking possible No borrowing	1-year compliance periods Banking possible Borrowing possible	Banking, limited borrowing, international credits	
Penalties	EUR 100 per excess tonne plus surrendering of missing allowances in the next calendar year	3 allowances for each tonne not covered	Greater of 200 US-$ or 3 times average market value in that year plus surrendering of missing allowances in the next calendar year	unclear	
Intervention mechanisms	Possibility to move forward auctions to address excessive price volatility	None	Cost-containment auctions Possibility for emergency off-ramps	Administrative carbon market board, etc.	Price cap is to apply in the period 2010-15, starting at A$40/t and rising at 5% per year plus adjustment for inflation

Table 1 Overview of design features of different ETS

4 Case Studies

4.1 *Linking North American Schemes*[4]

A number of greenhouse gas emissions trading schemes have been implemented or proposed for Canada, the United States and Mexico. Links among those schemes make sense, given the close economic ties between the countries. All of the existing and proposed schemes, except Alberta, include provisions for unilateral use of credits and/or allowances from other schemes with quantity and qualitative restrictions. A federal scheme in the United States is likely to replace state schemes, with the possible exception of a few states with more stringent schemes, especially if states are given a role in the federal scheme. In Canada, provinces that want, and are able, to establish that their schemes are equivalent to the federal scheme could continue to operate. Given the uncertainty surrounding the implementation of possible national and regional emissions trading schemes, the prospects for linking are best discussed for different scenarios. For the United States linking with foreign schemes is considered for the following scenarios (1) a federal scheme only, (2) a federal scheme together with one or more state schemes, and (3) multiple regional schemes. For Canada linking with foreign schemes is considered for the following scenarios (1) a federal scheme only, (2) a federal scheme and one or more provincial schemes, and (3) a revised federal scheme with a link to a federal scheme in the United States.

4.1.1 Linking Scenarios for the United States

A Federal Scheme Only

A federal emissions trading scheme would probably establish a declining absolute cap, possibly with some state control over their allowance budgets, with annual compliance, permit the use of foreign allowances and credits subject to quantitative and qualitative restrictions, and include cost containment provisions such as a price cap. America's Climate Security Act (ACSA), for example, restricted foreign credits and allowances to between 15% and 30% of the cap depending upon the availability of domestic offsets. Foreign credits had to meet the same requirements as domestic offsets. And foreign allowances had to be issued by a foreign government for a scheme with a mandatory absolute cap of comparable stringency to that of the US scheme. The price would have been capped between $22 and $30 per allowance in 2012 with an annual adjustment for inflation thereafter. Those provisions might allow unilateral links with the Canadian provincial schemes and schemes (sectoral, state or national) in Mexico that have absolute caps and annual compliance periods, the EU ETS, and some CDM, JI or REDD credits. A link with Canada's national scheme, as currently proposed, would be precluded due to its intensity-based cap and likely differences in the price caps. Other schemes probably would not link to such an American scheme because of the price cap. However, acceptance of CDM and JI credits by the American scheme would create an indirect link with most other emissions trading schemes which also accept those credits.

A Federal Scheme Together with One or More State Schemes

Experience with other issues suggests that the federal scheme would apply nationally, but that states could implement more stringent requirements for the same sources. (Litz, 2008) Only ten states currently have emissions reduction targets more stringent than those proposed by the ACSA and hence might decide to implement state schemes in addition to the federal scheme. The prospects for

[4] This chapter is based on the Climate Strategies Working paper "Linking Existing and Proposed Greenhouse Gas Emissions Trading Schemes in North America" written by Erik Haites.

linking with the federal scheme would be the same as described in the previous section. Since the state schemes are more stringent than the federal scheme, their linking provisions presumably would be more restrictive – smaller quantities and more stringent qualitative criteria. This might create niche state markets with higher prices for the eligible foreign allowances and credits, but would not change the federal market for imported units.

Multiple Regional Schemes

If there is no federal scheme, at least three regional schemes are likely to be implemented – RGGI, the WCI and the MGGA. If there are only a few regional emissions trading schemes, they likely would explore options for direct links. The MGGA Advisory Group, for example, recommends that it seek to link to RGGI, the WCI, and other mandatory greenhouse gas reduction programs as appropriate. All three are likely to have declining absolute caps with three-year compliance periods,but they might need to harmonize their borrowing and offset provisions. RGGI participants could purchase credits generated by offsets projects in any state with a cooperating regulatory agency, which could include WCI and MGGA partner states. The WCI may approve and certify offset projects located throughout the United States, Canada and Mexico. RGGI and WCI share some of the same types of eligible offset projects. Both schemes also propose to allow the use of CDM credits subject to some restrictions. RGGI has a more restrictive quantity limit on the use of offsets than WCI. The offset provisions of the MGGA have not yet been finalised, but the use of CDM and JI credits could be allowed. Thus, the schemes might establish bilateral links with each other. Absent direct links, they could be effectively linked to each other and to foreign schemes through their domestic offset and CDM provisions if they agree on the protocols for their respective offset projects.

4.1.2 Linking Scenarios for Canada

A Federal Scheme Only

Canada's proposed federal emissions trading scheme offers limited scope for linking. A firm will be allowed to use CDM credits, with the exception of those originating from forest sink projects, for up to 10% of its target. In addition, Canada will consider linking with state, regional or national regulatory-based emissions trading schemes in the United States and possible schemes in Mexico. Due to its intensity target, the allowances and credits issued by the Canadian scheme are unlikely to be acceptable to any scheme with an absolute cap including a federal scheme in the United States, RGGI, WCI, MGGA, sectoral schemes in Mexico, and the EU ETS. The proposed price cap for the first several years probably would also preclude a link with any other scheme. However, the ability to use CDM credits would create a limited indirect link with many other schemes that also accept some CDM credits.

A Federal Scheme and One or More Provincial Schemes

Canada's federal scheme could enter into equivalency agreements with one or more provincial schemes. The most likely provincial schemes are the existing scheme in Alberta and a possible scheme(s) in British Columbia, Manitoba, Ontario and/or Quebec, all of which are WCI partners. Thus, the provincial scheme(s) in those provinces likely would be similar to the WCI design. The proposed federal scheme allows trading of allowances and domestic offset credits across Canada. Apart from limited use of CDM credits, it has no provisions for linking with other emissions trading schemes. The equivalency agreements, presumably, could include provisions for mutual recognition of allowances and offset credits – bilateral links. For example, a British Columbia scheme could agree to accept federal allowances and credits and the federal scheme could agree to accept British

Columbia allowances and credits, thus linking the two schemes. It could be argued that such a bilateral link, with no quantitative or qualitative restrictions, must be a requirement of an equivalency agreement otherwise the agreement reduces the market from what it would be under a federal scheme alone. The Alberta scheme has no provisions for a link of any kind to any other trading scheme and may resist a requirement to link with a federal scheme. The provinces that are WCI partners might prefer not to link with the federal scheme due to its intensity target and price cap. Thus, although it could be argued that a bilateral link should be part of an equivalency agreement, political considerations on both sides could limit such links. Links with schemes outside Canada could be limited as well. The federal scheme, as discussed in the previous section, is unlikely to have a link with any other scheme except for the limited use of CDM credits. Alberta has expressed no interest in linking with any other scheme. The other provincial schemes might wish to have links with other schemes. However, if the equivalency agreement includes bilateral federal-provincial links, it might restrict the links to those in the federal scheme because a foreign link for any provincial scheme would then apply indirectly to all federal and provincial schemes. If the equivalency agreements do not require bilateral links, the result could be a few, largely or completely isolated, emissions trading schemes operating in different provinces. If bilateral links are part of the equivalency agreements, the foreign links are likely to be limited as in the case of a federal scheme only.

A Revised Federal Scheme Linked with a Federal Scheme in the United States

Canada plans to move from emission-intensity targets to fixed emission caps between 2020 and 2025, but might do so earlier to facilitate development of a North American emissions trading scheme. Since one, perhaps the main, reason for changing the design would be to link with an American (and possibly Mexican) scheme, it is safe to assume that the modified Canadian scheme would include additional linking provisions. A switch to an absolute cap by the federal scheme could affect provincial schemes with equivalency agreements. Those schemes would need to change to be equivalent to the revised federal scheme. That would entail bigger changes for the Alberta scheme with its intensity targets than for provincial schemes with absolute caps. Switching to an absolute cap would eliminate one of the barriers to linking with national or regional schemes in the United States. The Canadian price cap mechanism probably would need to be dropped as well. Changes to the American scheme(s) also would be needed. The cost containment provisions proposed for national schemes and the three-year compliance periods proposed for the regional schemes could preclude links to a modified Canadian scheme.

Conclusions

All of the existing and proposed schemes, except Alberta, include provisions for unilateral use of credits and/or allowances from other schemes. But those provisions all include quantity restrictions and qualitative restrictions, for example that the allowances come from a scheme of comparable stringency. A federal scheme in the United States is likely to replace state schemes, with the possible exception of a few states with more stringent schemes, especially if states are given a role in implementation of the federal scheme. In Canada provinces that want, and are able, to establish that their schemes are equivalent to the federal scheme could continue to operate. A federal emissions trading scheme in the US would probably establish a declining absolute cap, permit the use of foreign allowances and credits subject to quantitative and qualitative restrictions, and include cost containment provisions. State schemes might create niche markets with higher prices for the eligible foreign allowances and credits, but would not change the federal market. Absent a federal scheme, the regional schemes would likely explore linking options beyond their domestic offset and CDM provisions. Any of these structures might allow unilateral links with the Canadian provincial

schemes and schemes (sectoral, state or national) in Mexico that have absolute caps and annual compliance periods, the EU ETS, and some CDM, JI or REDD credits, but not the proposed national scheme in Canada. Canada's proposed federal emissions trading scheme offers limited scope for linking. If the equivalency agreements with the provincial schemes do not require bilateral links, the result could be a few, largely or completely isolated, emissions trading schemes operating in different provinces. If bilateral links are part of the equivalency agreements, the foreign links are likely to be limited as in the case of a federal scheme only. Canada will have to modify its proposed scheme to achieve its expressed desire of linking with regulatory-based emissions trading schemes in the United States and Mexico. It would probably need to adopt an absolute cap and drop the price cap mechanism. But changes to the Canadian scheme would not be sufficient. Some features of the American scheme(s), such as the cost containment provisions of a national scheme or the three-year compliance periods of the regional schemes, would need to be changed to allow bilateral links with a modified Canadian scheme.

4.2 *Linking US schemes with the EU-ETS*

Introduction

This chapter aims to assess the potential for linking a US scheme along the lines of the Lieberman-Warner proposal (America's Climate Security Act (ACSA), see Annex I for details), the Waxman Markey proposal (American Clean Energy and Security Act of 2009, ACES 2009) or the Western Climate Initiative (see Annex I for details) to the EU ETS. The debate on emissions trading has intensified in the USA over the last two years. At the federal level, various bills have been introduced both in the Senate and in the House of Representatives. The most significant initiative coming out of Congress since the 2008 elections is a discussion draft disseminated on 31 March 2009 in the House of Representatives by Henry Waxman and Edward Markey, titled the American Clean Energy and Security Act of 2009 (ACES 2009). Given its influential sponsors – chairmen of the House committee and sub-committee with jurisdiction over climate change, respectively – this draft has a high likelihood of becoming the basis for future US climate legislation at the federal level[5]. Although the Senate has yet to see the introduction of a counterpart bill during the current legislative term, a prominent bill introduced during the previous Congress will likely continue to influence any major climate legislation emerging from the Senate: America's Climate Security Act (ACSA 2008), a proposal by Senators Joseph Lieberman and John Warner that was voted out of committee in 2008, but ultimately met defeat on the Senate floor. In addition to these developments in Washington, there have also been activities to develop sub-national trading systems in the absence of federal action. In 2003, nine north- and middle-eastern states of the USA set out to create the Regional Greenhouse Gas Initiative (RGGI), a mandatory multi-state cap-and-trade programme with absolute targets that started in 2009. Similar initiatives have been launched on the West Coast (Western Climate Initiative) and in the Midwest (Midwestern Regional Greenhouse Gas Reduction Accord). These sub-national activities have the stated goal of influencing national decision-making. If a national scheme is adopted, however, it will depend on its rules on federal pre-emption of state-

[5] Indeed, members of the US Senate have implied that they could see this discussion draft as the basis of the Senate legislative counterpart. Still, it can be expected that significant changes will still follow from the Subcommittee and Committee mark up process.

based initiatives whether such sub-national systems will be allowed to continue operating, for instance if they are more stringent than the national system.[6]

The EU and USA combined account for about 60% of total current Annex I emissions. Among Annex I, outside the EU only the OECD countries, i.e. Australia, Canada, Iceland, Japan, New Zealand, Norway, Switzerland and the USA, have already introduced or are considering to establish emissions trading. Among these, the EU and USA combined account for almost 80% of current emissions (UNFCCC 2009). Correspondingly, the EU and USA are also set to account for the lion's share of demand for offset credits from developing countries in the post-2012 regime as Russia and the Ukraine will hardly become major buyers due to their massive bankable surplus of assigned amount units and substantial low-cost domestic reduction potential. Hence, if a combined EU-US market was established, the "global carbon market" would for all intents and purpose be synonymous with this transatlantic market and provide the backbone for the overall international climate regime, and it would probably exert significant influence on the other, much smaller-sized OECD trading systems to align their designs accordingly. So far, the Lieberman-Warner bill has been the most prominent proposal for establishing an US ETS, although the discussion draft presented by Representatives Waxman and Markey in March 2009 is likely to be even more influential on climate lawmaking during the current legislative term. Finally, depending on how the discussion at the federal level develops, the sub-national schemes evolving in the USA such as the WCI may also be candidates for linking.

Prospect for linking

The design of the WCI system is relatively compatible with the EU ETS, even if there are some serious concerns: while at first sight, the 15% WCI target looks roughly similar to the 21% EU ETS target, it must be noted that this is only the EU's fallback position. The EU is striving for an international agreement that would entail a stronger target for itself. Furthermore, the WCI scheme will include sink credits, which the EU ETS presently excludes. The prospect for linking the EU ETS to the latest version of the Lieberman-Warner proposal would be restricted from the outset, since the Lieberman-Warner system would allow international allowances only if participants had not exhausted the 5% quota for "international offset allowances" or the 10% quota for "international forest carbon credits". In addition, the comparison reveals that the Lieberman-Warner scheme would be designed very differently from the EU ETS in crucial respects: The cap would probably be significantly weaker than the EU cap, US companies could borrow allowances from future years for up to 15% of their compliance obligation, the US scheme would include sink credits, which the EU ETS excludes, and the Lieberman-Warner scheme would include a whole raft of cost-containment measures. As a result, the Lieberman-Warner scheme would be systematically less stringent than the EU ETS. It can be expected that US prices would be consistently below EU prices. In the case of linking, this would probably lead to significant net purchases by the EU, i.e. significant transfers of wealth, occurring not due to economic activity but solely as a result of US regulation. It can be expected that this situation would not be palatable to the EU. Linking would also undermine the EU's decision of not allowing sink credits into the EU ETS. Most importantly, the various cost-containment measures of the Lieberman-Warner proposal, in particular cost-containment auctions that borrow from future allowance budgets to increase the current cap, aim to

[6] For instance, the Waxman-Markey explicitly provides in Section 861 that "no State or political subdivision thereof shall implement or enforce a cap that covers any capped emissions emitted during the years 2012 through 2017"; the purpose of this provision is to ensure that, at least during the initial setup phase of the federal system, compliance obligations and administrative structures are uniform throughout the US.

keep allowance prices within a certain range. Through linking, the EU would therefore effectively cede control over its allowance price and the emissions implications to the US. It does not seem likely that the EU would be willing to do so.

The Waxman Markey proposal, by contrast, creates far fewer barriers for a transatlantic link. By allowing international allowances from comparably stringent schemes without, in principle, any limitations, and by placing no restrictions on other schemes to purchase US allowances, the Waxman Markey proposal opens the door for a full bilateral link to the EU-ETS. The reduction target is in line with the EUs fallback option, and thus more ambitious than all other proposals for a federal US scheme so far. The reserve auction that may raise the scheme's cap and thus inflate the combined schemes' cap may pose a barrier. At the same time, it bears noting that such reserve auctions will only take place if the CO2 price doubles relative to the long-term average. After having established a full bilateral link to the EU-ETS, drastic short-term price increases in the US scheme would be largely absorbed by the link, and the reserve auction floor price would most likely never be reached. A transatlantic link may even offer an alternative to such reserve auctions in the long term. The acceptance of international REDD credits may constitute a barrier as the EU does not plan to accept such credits in the EU ETS until at least 2020. In addition, linking a scheme with a discount factor on international offsets and a scheme that does not discount these, can lead to arbitrage trading between schemes. However, the much more generous limit on offset use in Waxman-Markey would point to arbitrage in the opposite direction so that the two effects may cancel each other out. A common EU-US view about international crediting mechanisms within the post-2012 agreement would help to reduce barriers for a transatlantic link and would enable indirect links between these systems until a bilateral link is established. Moreover, while the Lieberman-Warner and the Waxman-Markey proposals include long-term emissions trajectories up to the year 2050, there is no explicit long-term trajectory for the EU ETS. Such a long-term mandate might be requested by the US as a condition for a link. Finally, for both of the two most likely linking mechanisms – the adoption and implementation of an international linking treaty or the mere amendment of domestic legislation – the elaboration of a link will be a lengthy process.

Even if the new Waxman-Markey draft clearly improves the prospects for transatlantic linking, any full bilateral link between the EU and the US is probably still some time away. The introduction of emissions trading in the US is still under debate, and it is not clear what shape an US ETS will finally take. Most likely, the coming years will be characterized by a number of unilateral links, such as those foreseen in the RGGI system subject to certain conditions, as well as indirect links to other trading systems through the CDM, both of which will yield some of the economic benefits of a direct bilateral link. On the other hand, the US debate has so far been driven largely by domestic concerns and especially by a desire to contain participant's costs. At this point, decision makers and stakeholders in the US are more concerned with the immediate effects – and political feasibility – of different design options for the domestic market, and less concerned with future prospects for linking with other systems. Nevertheless, given the potential economic and political benefits a linked trans-Atlantic emission trading system could provide, it might be advisable to broaden the scope of the US debate to take more account of international concerns. The EU has started to pro-actively engage with US actors to share its lessons learned and try to develop a harmonised approach to emissions trading. The EU and US actors are already taking steps in this direction, for example through the International Carbon Action Partnership (ICAP), which does not, however, currently engage the federal US level. These dialogue initiatives should therefore be expanded

further and strengthened. The proposal of the European Commission on creating an EU-U.S. working group on the design of carbon markets is a concrete step in this direction.

4.3 *Linking the Australian Emissions Trading Scheme*

Key features of the Australian Emissions Trading Scheme

In December 2008 the Australian government published a White Paper regarding the introduction of an ETS on Australia[7]. The proposed 'Carbon Pollution Reductions Scheme' has very broad coverage including practically all greenhouse gas emissions outside land use change and agriculture, covering initially around 75 per cent of Australia's emissions. Agriculture is possibly to be included from 2015. Forestry is covered by a voluntary opt-in approach from the beginning. Around 1000 entities above 25 ktCO2-eq/year are to be directly liable for their emissions, and smaller sources of combustion emissions through 'upstream' permit liability on fuel suppliers. In this way, transport and household emissions are also covered by the price signal created in the permit market, although some rebates are provided in early years in the transport sector. Permits are to be auctioned except for free allocations to emissions-intensive, trade-exposed industries such as aluminum, steel and liquefied natural gas and a defined amount to be granted to coal-fired electricity generators. The free allocation to EITEI is amounting to 90 or 60 per cent of historic benchmark emissions in the sector and includes new entrants. These kinds of industries account for a much larger share of the economy and aggregate emissions in Australia than in most other developed countries, posing heightened challenges for emissions trading design to address the threat of carbon leakage while avoiding an adverse political economy of discretionary handouts by government to industry. The decision to give an uncapped amount of free permits to trade-exposed industries simply on the basis of emissions intensity including new entrants has been one of the main points of criticism domestically of the scheme. Australia's unconditional national emissions target commitment is to be a 5% reduction at 2020, compared to year 2000 levels (which were almost identical to 1990 levels under Kyoto accounting rules, taking into account decelerating emissions from land clearing). Conditional on commitments undertaken by other countries, the proposed target range extends to a maximum national commitment of a 15% reduction. A price cap is to apply in the period 2010-15, starting at A$40/t and rising at 5% per year plus adjustment for inflation (approximately euro 25/t rising to euro 32/t in real terms at 2015, on the basis of longer-term average exchange rates). The government would sell additional permits into the market at this fixed price. If and when in place, the price cap would loosen the Australian Scheme cap, and the government would have to buy additional Kyoto units from the international market to meet its international obligations – possibly at a higher price than the price cap, creating potential budgetary exposure. International Kyoto credits can be purchased in an unlimited quantity, trading by scheme participants is to be restricted however to purchases of non-forestry CDM, JI and removal units, subject to future review. It is to be expected that the bulk of permit purchases by Australian emitters will be from the CDM. Permit sales from the Australian system into overseas systems are specifically excluded as transferring Australian permits to other countries would increase the Australian permit price resulting in relatively more abatement occurring in Australia than would otherwise be the case. It is a stated objective in the white paper to limit the upside risk in domestic permit prices. These rules cap the permit price in Australia at the international CDM price, the price

[7] http://www.climatechange.gov.au/whitepaper/index.html

cap, or the domestic price if no international purchases are necessary, whichever is lowest. The expectation, based on modelling, is that Australia in any case would be a permit buyer in international markets, under any of the proposed national targets. The current rules exclude the acceptance of Assigned Amount Units explicitly subject to future review for the period after 2013 depending on international developments. Thus, Australian companies cannot use so-called "hot air" units from Russia and Ukraine. Although Australian companies will not be able to benefit from those units directly, there is the potential that the Australian government would use such units to fill any gap between the scheme cap and the overall national target, which might be significant, especially if a price cap applies. The government might also allow those units into the scheme in future periods – under current Kyoto Rules there is no limit of banking of Assigned Amount Units. Banking is allowed in the scheme without restrictions, but borrowing is limited to 5% of the amount to be surrendered by a company.

Linking decisions

Bilateral links

The white paper states that Australia's scheme can be linked with other international schemes on the long-term, but emphasises that the control over the domestic CO2 price has a much higher priority in the short term than a full bilateral link to other trading schemes. Linking would have important implications for the operation of the Australian scheme, in particular for the price of Australian carbon pollution permits and the overall cost of the scheme, as Australia, being a relatively small emitter, is likely to be a price taker. The white paper states that the government believes the short-term priority is to minimise implementation risk while the scheme is being established. This includes promoting price stability and predictability in the early years of the scheme. In order to provide short and medium-term policy certainty over linking arrangements the government plans to give a minimum of five years' notice of a decision to allow the sale and transfer of Australian permits to international markets, except under some circumstances when establishing a bilateral link. The White Paper foreshadows that future bilateral links and deeper integration should only be with schemes of compatible rules and acceptable mitigation commitments. The scheme should have an internationally acceptable (or, where applicable, a mutually acceptable) level of mitigation commitment; adequate and comparable monitoring, reporting, verification, compliance and enforcement mechanisms; and be compatible in design and market rules. The White paper points out that linking rules are as important to market participants as decisions about the scheme cap as they are a key determinant of the domestic price. The nature of future international markets and the extent to which the Australian Scheme can be linked with other schemes will influence Australia's decisions on the national trajectory. Linking to an effective global market will ensure that the cheapest abatement opportunities are pursued first, reducing mitigation costs and allowing for deeper reductions in emissions for the same expenditure of resources. Therefore, the white paper argues, future linking decisions should be made together with decisions on the national trajectory.

Unilateral links to the Australian scheme

By discouraging permit sales from the Australian system into other trading schemes Australia prevents unilateral links to its scheme established by others. Here again the control of the domestic price has priority in the initial years up to 2013. In 2010, the Government would announce any provisions and restrictions that might apply to exports from 2012–13 to 2014–15, and thereafter would provide five years' notice of changes in export provisions. The white paper emphasizes that it would be extremely difficult to prevent the sale of Australian permits to parties in other countries, as businesses or governments outside Australia could decide unilaterally to recognise the retirement of Australian permits in Australia's scheme for the purpose of compliance under their own schemes.

This however would unlikely to be a significant issue, because such permits could not be counted towards other countries' Kyoto commitments unless they were accompanied by a transfer of an equivalent number of Kyoto units – and the Australian government would not surrender Kyoto units to accompany any international sale of ETS permits.

Linking and the price cap

A price cap can place a variety of complications for international linking and permit trading. Among fully linked schemes, if a price cap is in force in one country, it would effectively cap permit prices across all linked emissions trading schemes. If the permit price in the other country's scheme moved above the price cap, Australian permits would be exported and Australian liable entities would access the price cap, until the price was equalised again. This would be unacceptable to many other countries, as their own emitters would effectively comply with emissions limits by (indirectly) buying permits from the Australian government. Conversely, through linking under a price cap the Australian government would take on a greater budgetary risk, if the link leads to a greater probability of the price cap being accessed. This does not necessarily rule out bilateral links being established while the price cap is in place. For example, if the price in another scheme were below or equal to the price in Australia, the risk of the price cap being accessed would be lowered. However, the bilateral link would be problematic if the other scheme in turn allowed for the export of permits to a third scheme and that scheme's price cap were higher than the Australian price cap

Linking to the EU-ETS

Linking to schemes that may have a significant impact on the Australian permit price, such as the EU-ETS, at this stage does not appear a realistic prospect, or one desired by the Australian government. The prohibition on international permit sales is aimed to preclude the Australian permit price from rising to the level of the EU permit price, if the underlying supply and demand in Australia alone would result in a lower permit price. From the EU's perspective, the existence of the price cap provision would very likely preclude linking,

Linking to schemes in the region

While bilateral links to schemes that significantly impact the Australian permit price are not desired by the Australian government in the short and medium-term, bilateral links to schemes in the region may be established already in the first year of the schemes operation.

Linking the Australian and the New Zealand trading scheme

New Zealand would be a candidate for early linking, given that New Zealand is close geographically, a wide variety of close economic ties already exist, there is a history of policy coordination between the two countries, and both face the issue of how to bring large emissions from agriculture into a comprehensive system of mitigation policy. Links would also offer potential opportunities for sharing governance arrangements and technical resources (for example, auditors and accreditation resources). The proposed New Zealand scheme is currently under revision by a new government, and consequently any discussion of and decisions about linking is subject to policy uncertainty (see following section). The White Paper flags that links with New Zealand might be entered with less than 5 years' notice because such a link would most likely not lead to a significant change in the carbon price. New Zealand is a smaller market that can only marginally influence Australia's price. On the other hand, the New Zealand scheme as previously proposed would have allowed the unlimited use of international credits, allowed the export of permits, and had no price cap provision. This contrasts with the exclusion of AAUs from the Australian scheme, the ban on permit sales, and the price cap. Essentially, the proposed NZ scheme was fully open internationally, whereas the Australian scheme has provisions to partially de-couple from the international market.

More challenging and of much greater significance would be comprehensive engagement with possible future carbon markets in two other of Australia's neighbours, Indonesia and Papua New Guinea. The Garnaut Climate Change Review (Garnaut, 2007) commissioned by Australia's government, earlier suggested aiming to build "a regional market that encompasses (in the first instance) Papua New Guinea, other south-west Pacific developing countries, and — with greater difficulty and in the context of involvement by other developed countries — Indonesia". Papua New Guinea and Indonesia both have large opportunities to reduce emissions from land-use change and forestry and to quickly replace fossil fuels with renewable energies. Australia has significant technical knowledge to offer particularly on land management, and is already engaging in pilot projects for reducing deforestation in particular in Indonesia.

Timetable

How the final Australian Carbon Pollution Reduction Scheme will look like will depend on the legislative process in 2009. Before the start in July 2010 the government will be announcing the scheme caps up to 2014/15 and in early 2011 further indicative caps will be released (see Figure 4). Independent reviews of the scheme are to be held every five years and the first is scheduled for 2014. Thus those reviews will also allow the scheme to be adapted to new international developments.

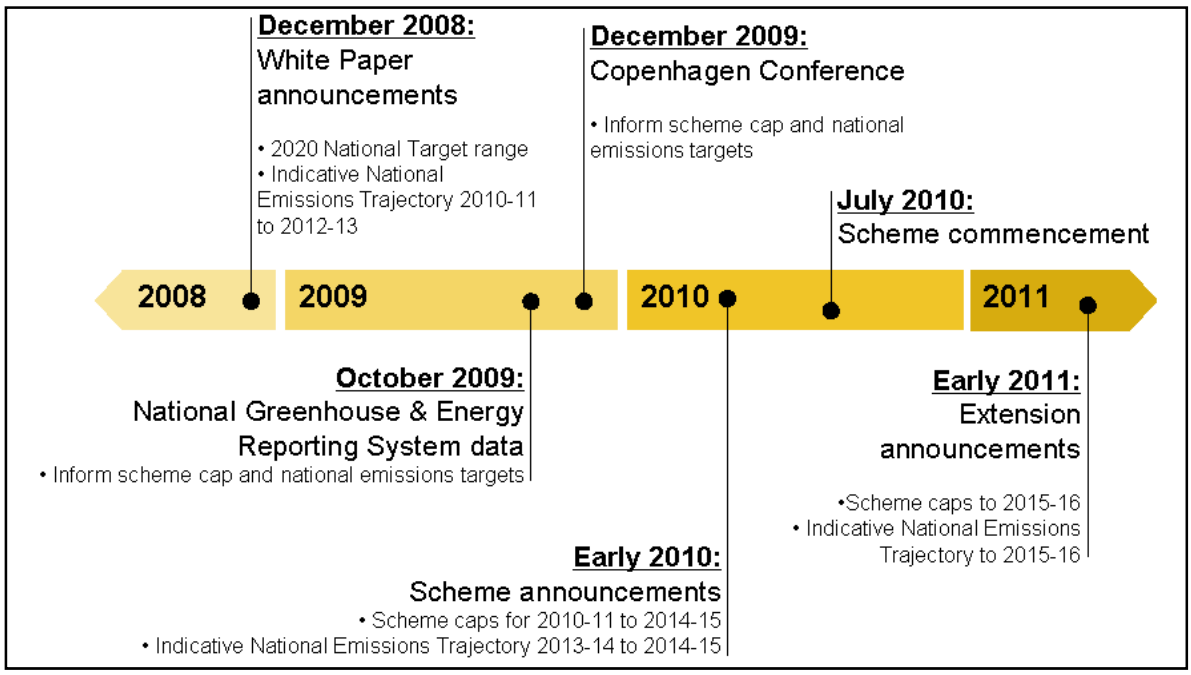

Figure 4: Timelines for CPRS; Source: White Paper Road Show Presentation, 2008

Conclusions

Australia is on the road to establishing an economy-wide emissions trading scheme that is very comprehensive in its coverage, and at the same time puts limits on the permit price in the domestic scheme, by way of a price cap and a ban on international permit sales. These provisions are there in essence to create greater certainty for emitters, and to limit the adjustment pressure in the economy. While these provisions are subject to review and phase-out, in the meantime they place significant obstacles to international linking. A possible scenario is that the Australian domestic permit price will be below the price in other major markets, and possibly below the price of CDM units. Depending on the interplay of the overall national commitment under a post-2012 international

agreement, the domestic scheme caps and the price cap, the Australian government may need to buy additional units on international markets to ensure national compliance. Looking to the future, Australia's opportunities are likely to lie in closer integration with international emissions markets. With emissions intensive export industries playing an unusually large role in the economy, Australia is likely to rely on significant international permit purchases under ambitious future greenhouse gas targets. Developing options and markets for emissions reductions in developing countries in the region, along with shifting the trading regime towards greater openness, would be a natural path to take for Australia. It would also be in line with Australia's overall orientation towards Asia, and general openness in trade.

4.4 *Linking from a New Zealand view*

Key features of the New Zealand scheme

In September 2007 New Zealand's Ministry for the Environment and the Treasury unveiled the cornerstones of an emissions trading scheme (New Zealand government, 2007). The scheme was implemented in early 2008 but is under review since the election in November 2008. It remains unclear at the moment to what extent the new government will change the scheme or even abandon. The assessment refers to the proposals of the old government. The scheme brings in all sectors of the economy over a six-year period, starting with deforestation in 2008 and ending with agriculture in 2013. 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 lCERs 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 agency. Currently New Zealand has no price cap in place as it expected a large supply of international credits and therefore a moderate price of these credits. A price cap or other cost containment measures may however be implement post 2012.

Linking decisions

As the New Zealand scheme allows the unlimited use of international Kyoto credits the unlimited use of international Kyoto credits would lead to act as a safety valve at the level of the international CO2 price in case of a bilateral link to a larger scheme with a higher CO2 price. In the short term, linkages between the NZ ETS and the emissions trading schemes of other countries will occur indirectly via the international market in Kyoto units, rather than through direct bilateral linkages. It is not clear to which extent New Zealand will implement cost containment measures in addition to the unlimited use of international credits. The old New Zealand government emphasized that bilateral linkages in general are no short-term priority. The government, however, considered a bilateral link with the EU ETS, the market price in the EU ETS would have to serve as a ceiling on the price in the New Zealand market. The European Commission has expressed concerns about linking to the NZ ETS if it remains open to "hot air" AAUs and potentially some sources of CERs.

4.5 *Linking Japanese Schemes*

Japan started with the Keidanren Voluntary Action Plan, based on the voluntary adoption of intensity targets, and then introduced a voluntary emission trading scheme (JVETS). Keidanren's Voluntary Action Plan was developed in 1997 with the aim of stabilizing energy-source and industrial-source CO2 emissions at their 1990 level by 2010. It has been reviewed and strengthened by the government as one of the main pillars of the Kyoto Target Achievement Plan (KTAP), but it is not a legally binding agreement. Within Keidanren's Voluntary Action Plan companies can take targets based on total CO2 emissions, CO2 intensity, energy consumption, or energy intensity. Furthermore, companies can buy and use CERs, ERUs, and AAUs without any limitation to comply with their targets. To date, of these instruments, companies have primarily used CERs, reflecting Japan's geographical interests in Asia as well as fear of creating a negative impression through a heavy reliance on future. Green Investment schemes, which may serve to improve the acceptability of using surplus AAUs, are currently being implemented in several Eastern European countries, and there is increasing interest by Japanese companies in purchasing AAUs. In 2005 Japan introduced a voluntary emission trading scheme the JVETS, based on absolute targets. This scheme however attracted only a very small number of participants. To achieve its pledged target, a target participant can buy JPAs from other participants as well as CERs from CDM projects (j-CERs)[8]. Neither AAUs nor ERUs are eligible for use in meeting JVETS targets. There is no limit on the use of j-CERs for compliance, but j-CERs should be used as supplementary measure, not the primary means of achieving the pledged targets. Since CERs can be used for compliance, JVETS has a unilateral link to the Clean Development Mechanism. But JVETS has no bilateral link with any mandatory scheme, which is not surprising, given that it is a temporary voluntary scheme. However, the CERs, creates an indirect link between the JVETS and the EU ETS.

In 2008, however, a discussion to reposition the Japanese climate policy towards a mandatory ETS has emerged. To reach its Kyoto Protocol target of a six percent reduction compared to 1990, additional policies and measures will be needed. Emission trading is likely to be an important additional measure. However, a transition period to a mandatory ETS is foreseen as lasting until 2013 and is expected to allow for a smooth transition from the current approach under Keidanren's Voluntary Action Plan. To accomplish this, during the transition period, voluntary, as well as absolute and intensity targets will be utilized. As a first step of this transition Japan introduced a voluntary test phase ETS from October 2008 due to strong opposition by industry against a mandatory scheme while continuing the JVETS. By including intensity based targets in the voluntary ETS test phase, it aims to get a large number of companies under Keidanren's Voluntary Action Plan into the trading scheme. As it is a voluntary scheme there will be no direct bilateral links to it but since it allows Kyoto credits for compliance, there will be indirect links to other schemes via the CDM. By December 2008 the scheme attracted 501 – including energy-intensitve – entities, such as steel and electricity, that were not covered by JVETS.

The way to a mandatory ETS in Japan and prospects for linking

In 2008 a proposal for a mandatory ETS in Japan was published by the MoE and a report by METI. A ETS following the METI report would pose more barriers to direct bilateral linking than with the MoE proposal, although both proposals mention intensity based caps and the control of Japans domestic CO2 price, although with different accentuations. According to the MoE proposal a mandatory ETS would start in 2010. The scheme would have a pre-2012 trading period, a second

[8] The Japanese government issues j-CERs to be used in the JVETS for CERs.

trading period from 2013-2020 and a third from 2021-2050. For the pre-2012 phase, the existing Kyoto Target Achievement Plan would be the basis for the amount of total emission allowances granted, and Japan's 2020 target for the second phase. In the event of non-compliance, a fine with substantially higher than the expected allowance price, will be charged corresponding to the amount of the excess emissions. The establishment of an "Administrative Carbon Market Board" will be considered for market control, similar to the Carbon Market Efficiency Board proposed in the U.S. (MoE 2006; MoE 2008a; MoE 2008b; Kimura 2006). The MoE proposal outlines four options for sectoral coverage, one upstream and three downstream options. One downstream option provides for an optional inclusion of small-size energy users and transport. The METI report mentions the necessity of limiting total emissions, the possibility of a transition from Keidanren Voluntary Action Plan to legally binding agreements, and the use of a domestic offset system similar to CDM. If a cap-and-trade type ETS is to be adopted[9], benchmarking on the basis of intensity is preferred to grandfathered absolute allocations and free allocation is preferred over auctioning of allowances. Furthermore, METI prefers a down-stream approach to an up-stream approach. The METI report points to cost-containment measures in other countries, such as a price cap and foresees no strict penalties for non-compliance what in effect would act as a price cap.

Although a mandatory ETS could be one of the main pillars to achieve the mid-term target of Japan, no consensus exists as to appropriate level of target, which will be released in 2009. The Environmental Minister Saito expressed his view that a reduction of more than 25% was feasible, which is also supported by LDP and DPJ, while METI estimated that a 14% reduction in the 2005-2020 period, as reflected in the Fukuda Vision, was more in line with the industrial potential based on bottom-up sectoral approach. Both the MoE proposal and the METI report do not have any clear position about linkages with other ETSs, although MoE proposal states the necessity to consider options for linking and compatibility with other ETS and MoE joined ICAP[10] as observer. Linkage is planned to be considered when implementing mandatory ETS as means to minimize the cost of meeting targets. Since the Japanese ETS will result in a medium-sized market, under direct bilateral linking a national Japanese system would be affected by the volatility of larger markets such as EU-ETS. Japan would be a price taker with entities buying or selling allowances at the price established by the larger system. Therefore, Japan will need to give careful consideration to linkage, especially in view of price stability, and carefully watch the performance of other trading schemes before linking to them. All proposals for a Japanese ETS envision an increase in Japan's dependence on CERs, especially from Asia due to geographical reason, to achieve the proposed mid or long-term targets. This strong links to the CDM market and indirect linkages to other schemes allowing Kyoto credits will also assist in establishing a low carbon society in the Asia-Pacific region.

[9] Based on the interviews with industries by the author, each stakeholder evaluates the effectiveness of its voluntary emission reduction target, but some companies recognize the necessity of further emission reductions to achieve Japan's Kyoto Protocol target of a six per cent reduction compared to 1990. Companies increasingly see that it is unlikely they will be able to escape from emission caps in the long run. Therefore, there is a possibility that even METI will support the introduction of a mandatory cap-and-trade scheme, once an understanding of the situation on the part of industry increases and more support is built in the industrial sector.

[10] A group of representatives of trading schemes who try to ensure sufficient harmonization and compatibility to support direct bilateral links between schemes.

Linking of the Tokyo Metropolitan Government ETS

The Parliament of the Tokyo Metropolitan Government (TMG) passed a municipal law in June 2008 to mandate a reduction of CO2 emissions during April 2010-2014[11]. The law includes the use of an ETS to assist entities in meeting targets, and use of domestic offsets from outside region[12]. The TMG takes a positive position in regard to linkage with other ETSs and joined ICAP in 2009 (Point Carbon, 2009). If Japan could not introduce a national mandatory ETS until April 2010, when the Tokyo scheme is being implemented, the legal issue arises whether TMG can make an agreement with other countries or states without the consent of the national government, since the Japanese Constitution limits the power to make a diplomatic treaty to the national government. A preliminary legal analysis of California's case in relation to the Federal Government shows that if it is an "arrangement" rather than "agreement", or there is no clear intention to increase the State power, linkage would be less problematic (Echikson and Wedeking, 2006), but linkage would be more difficult for Japanese local governments which have less power compared to U.S states. Rather, these initiatives by the local governments are expected to drive the introduction of a mandatory ETS at the national level early on, and to push its linkage considerations forward. In case of vanishing local system, there would be no compensation problems due to different characteristics of credits, but it may be necessary for the national ETS to give credits for early reductions achieved under the TMG ETS and other local ETSs if they should evolve. Since Environmental Minister Saito expressed his view that a national-level mandatory ETS may not be initiated until 2010 or 2011, this situation could easily arise.

Timeline for a future mandatory ETS

Figure 5 shows the envisioned gradual transformation from a voluntary to a mandatory ETS in Japan. While the JVETS continues to exist even after the start of the trial-ETS, as a first step, the trial-voluntary ETS will include a larger number of companies currently under the Keidanren Voluntary Action Plan and is expected to be transformed to a mandatory ETS sometime between 2011-2012. This possible mandatory ETS initially will likely allow both intensity and absolute targets - a mandatory scheme mainly based on absolute targets is not realistic before 2013. Therefore no bilateral linkages to others schemes are expected by then. However a Japanese Scheme will be indirect linked to other ETS via the CDM.

[11] In case of failure to meet targets, entities will be ordered to reduce emissions by up to 130% of the difference between the target and their emission level. Failure to comply with this order will result in penalties of up to 0.5 million Yen plus the cost of purchasing sufficient allowances or reduction credits to cover the deficiency in emission reductions.

[12] Some 1,300 large facilities which consume more than 1,500 kl (oil equivalent) of fuel/heat/electricity would be affected by the law. This ETS, with its target, forms the main pillar of the comprehensive effort to achieve emissions reductions of 25% between 2000-2020. In addition to Tokyo, the Hyogo prefecture (FY2009-), Hiroshima City (FY2009-) and the Fukuoka prefecture are also planning to introduce an ETS, although precise rules and designs are not clear yet.

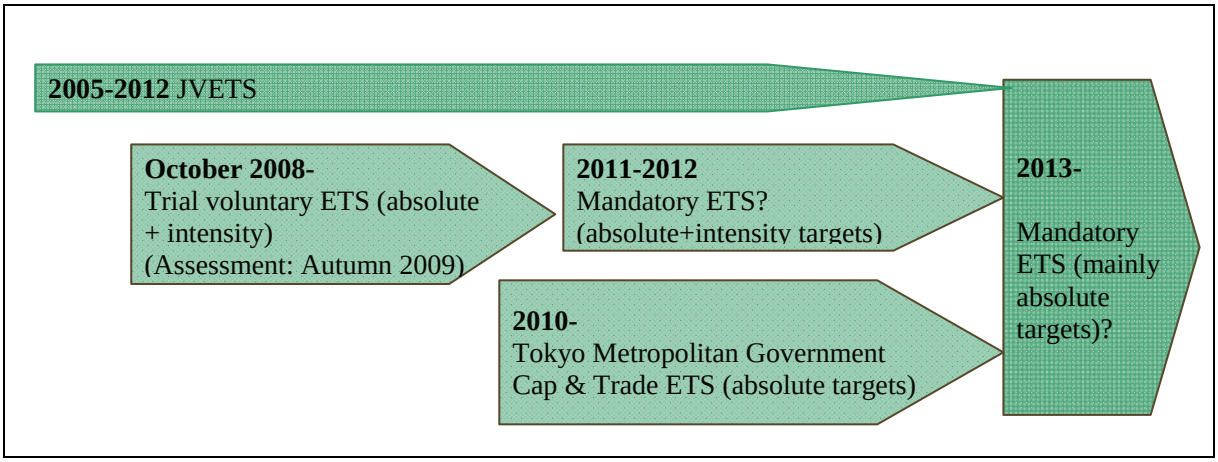

Figure 5: Timeline for a future Japanese ETS

Conclusions

While Japan has to date relied on voluntary instruments such as the JVETS and Keidanren's Voluntary Action Plan, the discussion is now moving towards the implementation of a mandatory ETS even if there is no final consensus on the implementation of such a scheme. In addition to the JVETS, Japan introduces a test-phase voluntary ETS in autumn 2008 in which a combination of absolute and intensity targets is used initially. Following this initial phase, foreseen as ending in 2010 or 2011, a mandatory ETS may be implemented in which again both mandatory and intensity targets will be used. A national mandatory ETS currently discussed in Japan is likely to put strong emphasis on measures to control the carbon price. As a mandatory scheme with absolute targets will not be implemented before 2013, direct bilateral linkages between a Japanese ETS and other ETSs will therefore not occur before then. Whether Japan will be able to link its national ETS after 2013 bilaterally to other schemes however depends on an early adjustment of critical design elements. As Japan as a medium–sized market would be a price taker when linking to bigger markets Japan will carefully observe other schemes before establishing direct links. Until 2013 and probably also afterwards, a link to the CDM and hence indirect links with other schemes will therefore be the major linkages for a Japanese ETS.

5 Assessment of barriers to bilateral linking

5.1 *Assessment of barriers based on the Case Studies*

The analyses of different schemes show that some system differences described in the literature are unlikely to create barriers to bilateral linking in practice or are comparable easy to harmonize. Major barriers to bilateral linking at this time include the relative stringency of targets and design features of cap-and-trade schemes that propagate into the linked scheme, such as cost-containment measures or offset provisions. The below discussion first reviews system differences where harmonization is comparable easy to achieve and then examines system difference likely to result in significant barriers to linkage.

System differences unlikely to create barriers in practice or easy to comparable easy to harmonize

In these cases although there are differences between systems, harmonisation is not needed and/or relatively easy to achieve. The issues in this category include:

i) monitoring, reporting and verification (MRV) rules for allowances,
ii) banking compliance periods,
iii) compliance periods,
iv) registries,
v) rules governing new entrants and closures,
vi) allocation methods.

To support linking, each linked schemes must have credible *MRV standards*. However, different MRV systems should not present barriers to linking as long as the schemes are robust and ensure integrity. Since the Kyoto Protocol is underpinned by robust MRV requirements, concerns regarding MRV are unlikely to inhibit trade of permits to emit between schemes whose trading units are backed by the Protocol. With regard to offset credits, comparable stringency of MRV and additionality in their creation is likely to be a precondition for linking. The degree to which different MRV and additionality rules will form a barrier to linking depends whether linking occurs under a widely accepted framework governing emissions limitations or not. If linking occurs between countries in which the ETSs function within an overall limit on emissions, e.g., a limited number of AAUs in the entire system, the stringency of MRV and additionality provisions governing offset credits is less problematic. However, if the ETS is not operating within such an overall framework, the comparability of the MRV provisions must be assessed and harmonized. There is one exception to the observation that within the Kyoto Protocol MRV and additionality rules governing offset creditsshould not pose linking problems. The EU excludes all LULUCF credits from its scheme partly due to a lack of confidence regarding the MRV provisions of these credits (Tuerk et al., 2008). This issue is further reviewed in the following section covering challenging system differences.

In theory different *banking provisions* could pose problems for linking since linking effectively extends the most generous banking rules to all other schemes. Therefore it could be undesirable to link schemes with banking provisions to schemes which do not allow banking. However, all of the

assessed schemes allow banking, providing a good example of an issue that has not arisen in practice.

Different cap-and-trade systems are likely to have different *registries*, regulations with regard to new entrants and closures, and allocation methods. None of these differences are, however, likely to pose significant barriers to linkage. In the case of different registries, registries can be rendered compatible through technical means. Distortions due to differing approaches in the *treatment of new entrants and installation closures* have the potential to affect the overall cap of a linked system. At the margins, a company will have an incentive to shut down production in countries that continue to allocate permits to emit to closed plants. Conversely, companies have an incentive to start up or expand new production capacity in countries that will allocate allowances free of charge. Blyth, Bosi, 2004). Consistency in these areas should be sought, even though linkage between systems can continue in the absence of consistent treatment (Mace et al., 2008). This has been seen within the EU ETS, where closures and new entrants have been treated differently in different Member States. The important point here is that the problem exists even in absence of linking, and differences in these rules only impact linking insofar as they affect allowance prices.

Different *compliance periods* also do not pose problems for linking. Sterk et al (2006) argue that different compliance periods are actually beneficial as they improve market liquidity. Temporary market shortages in one scheme at the end of the compliance period can be alleviated by purchases from another scheme that is at the beginning or in the middle of its compliance period. Having different *allocation methodologies* (typically, auctioning, free allocation or a mixture of such measures) is not, in itself, an obstacle for linking. However, the selected methods for auctioning will be an important consideration in deciding whether a linkage with an auction-based system is acceptable. Auctioning methodology can affect not just the carbon price, but also the legitimacy of the system as a whole (Mace et al, 2008). If auctioning is used, it is important that auctions are open to the widest possible set of bidders from all sectors. Poor auction design may facilitate non-competitive or collusive behaviour by bidders, potentially impacting not only the carbon price at auction but also in the wider market (Mace et al, 2008).

System differences likely to pose barriers to linking

Barriers that can pose significant challenges to linking include:

i) relative stringency of targets
ii) stringency of enforcement,
iii) eligibility of offsets credits
iv) intensity targets, and
vi) cost containment measures.

Relative stringencies of targets is one of the most politically critical issues when two or more systems consider linkage, and it may be a political precondition for linking that all systems involved have comparable caps (ie., require comparable effort) (Sterk, 2006; Flachsland et al. 2009b). The advantage of a Kyoto type agreement is that the international agreement itself establishes an accepted burden sharing rule for participating nations. However, an internationally agreed economy-wide cap may not be sufficient for linking. Nations may also require that the stringency of the national ETSs be comparable. The fact that two or more nations have agreed to respective national emissions targets does not mean that the stringencies of the ETSs reflects the relative

stringencies of the national targets. Since national ETSs do not impose emission obligations on all sectors, the cap within the ETS may be more or less stringent than the national commitment (Anger 2008; Alexeeva-Talebi and Anger, 2007). However, even in the absence of a Kyoto-type successor agreement, countries could agree on comparably stringent caps for their ETSs.

Stringency of enforcement is critical to ensure adequate market performance over time and to uphold confidence at the level of market participants. Stringency of enforcement will also impact carbon prices. Comparable governmental and enforcement structures are therefore essential for a link (Victor 2007). Fortunately, when linking between OECD systems comparable governance and enforcement provisions can be assumed.

Significant difficulties could arise if some types of offsets credits are considered as eligible in one ETS but not in the ETS of a potential linkage partner. In particular, a US scheme is likely to allow domestic credits from the domestic agricultural and forest sectors as well as REDD credits from developing countries whereas the EU does not currently allow use of any credits from the land sector in the EU-ETS.. Even if some credits are eligible in only one scheme, they will affect the overall supply of units, and therefore prices, in the combined scheme. Operators in the scheme where the credits are eligible can use the credits for their domestic compliance and sell their domestic allowances to the scheme where the offsets are not allowed. In addition, linking a scheme with a discount factor on international offsets, as provided for in the Waxman Markey proposal, and a scheme that does not discount these can lead to arbitrage trading between schemes and therefore pose a barrier.

Although *intensity targets* do not impose a defined cap on overall emissions, it is possible to link trading schemes with absolute targets to ones with intensity targets (Ellis, Tirpak, 2006). However, the large degree of uncertainties and technical challenges when linking schemes with absolute and intensity based targets are likely to make such links politically very difficult. Concerns include competitiveness, cap integrity, and liquidity shocks. Under an intensity-based system companies have some incentive to increase output, and therefore emissions, because the intensity-based allocation does not discourage increased production. Compared to a system that imposes absolute targets this could be viewed as a subsidy and raises competitiveness concerns (Fisher 2003). If an intensity-based system becomes a net buyer of permits from a trading system operating under an absolute cap, the intensity target system can compromise the environmental effectiveness of the intensity-based system by allowing more production than would have been otherwise possible. This then compromises the cap of the combined regime as well. Another potential problem is that in intensity-based approaches allocations are adjusted ex-post. This could lead to liquidity shocks for the linked scheme at the moment of adjustment (Sterk et al. 2006). The large degree of uncertainties and technical challenges when linking schemes with absolute and intensity based targets are likely to make such links politically very difficult. The only regions planning intensity-based trading system are Canada, and a Japanese ETS which may be implemented before 2013. Japan however may see a mandatory ETS based on absolute caps after 2013 (Kimura et al. 2008) and also Canada is moving to absolute caps in the long term (Government of Canada, 2008).

In order to avoid high CO_2 high prices or price spikes, cap-and-trade schemes may implement *cost-containment measures*, including offset provisions, borrowing provisions, or price caps. If these provisions are present in one of the linked systems, they will be made available to participants in the

other system regardless of whether the other system has the same provisions (Stavins, 2007). Unlimited import of low-cost credits from other sectors and regions will reduce the CO2 price and total abatement costs in a cap-and-trade system. However, if policymakers want to ensure that a certain level of domestic abatement is achieved, they may want to impose restrictions on credit imports. Different views on appropriate limits may inhibit linkages.

Allowing high rates of borrowing from future commitment periods can lead to delays of GHG abatement. This may lead to a situation where future abatement costs become very high, introducing an incentive for governments to relax emission caps, thereby reducing the environmental effectiveness of the scheme (Boemare and Quirion 2002). Thus linking a scheme that allows borrowing to a scheme that doesn't allow borrowing requires restrictive provisions to maintain the environmental effectiveness of the combined scheme. Of the analysed schemes, only the Lieberman Warner bill, however provides for a large degree of borrowing.

If a system without a price cap is linked to a scheme with a price cap, the price cap will set the compliance cost for the combined schemes. As long as the market price is above the price cap, companies from the scheme without a price cap, companies is the price cap system have an incentive to sell allowances to companies in the linked system undermining the environmental integrity of the combined scheme (Sterk et al. 2006, Blyth and Bosi 2004). Also, if the penalty for non-compliance releases the operator of an installation from the obligation to cover its full emissions with eligible units, it acts as a price cap and therefore poses a problem for linking (see Sterk et al, 2006).

5.2 *Barriers of linking the EU-ETS to emerging schemes*

This chapter assesses potential barriers of linking the EU-ETS to emerging schemes. Article 25, of amendment of the directive 2003/87/EC adopted by the European Parliament in December 2008 states that agreements may be made to provide for the recognition of allowances between the Community scheme and compatible mandatory greenhouse gas emissions trading systems with absolute emission caps established in any other country or in sub-federal or regional entities. There is not definition what a compatible greenhouse gas emissions trading system is, giving the European Commission significant freedom for negotiations. There is however a number of design elements that are likely to pose barriers for linking (some of them are formulated in the impact assessment of the amending directive 2003/87/EC13). The impact assessment states that the EU ETS could not be linked to systems directly using AAUs without undermining its effectiveness and environmental integrity. Furthermore, make-good provisions, the introduction of minimum penalties and of other sufficient sanctions to ensure compliance would need to be considered before linking. Potential criteria for linking the EU ETS with systems employing intervention measures designed to control costs may be (1) not to establish links to systems with intervention measures or (2) to define a list of acceptable intervention measures, the impact assessment says. In addition, only a certain level of banking/borrowing should be acceptable. Regarding a comparable stringency of targets the impact assessment only states that the total quantity of allowances should be smaller than the level of need under business-as-usual conditions. However in reality the mitigation effort adopted by the partner

[13] http://ec.europa.eu/environment/climat/emission/pdf/com_2008_16_ia_en.pdf

system will likely to be strong enough to avoid large scale net capital flows from the EU-ETS to the linked system, as this may make the link politically unacceptable. Furthermore, the EU currently excludes all LULUCF credits from its scheme partly due to a lack of confidence regarding the MRV provisions of these credits. If another scheme would include LULUCF credits this may be another potential barrier for linking, in particular in the case of international forestry credits, which the EU explicitly plans to exclude until 2020 (European Commission, 2008b).

The table below gives an overview of possible main barriers of bilaterally linking the EU-ETS to emerging schemes. There are however also other diverging design features that may pose barriers.

Main possible barriers of linking the EU-ETS to:	**Definition and recognition of trading units**	**Stringency of the cap**	**Intervention mechanisms**	**Temporal flexibility**
US Regional: WCI	LULUCF credits	Cap significantly weaker than the EU cap		
US Federal: Lieberman-Warner	Domestic LULUCF credits and international forest carbon credits	Cap significantly weaker than the EU cap	Whole raft of cost-containment measures The EU would cede control over carbon price and emission implications	Large scale borrowing
US Federal: Waxman/Markey	Domestic LULUCF credits and international forest carbon credits, discounting of offset credits		Reserve price auctions increasing the cap, additional intervention measures possible	
Australia		Cap possibly significantly weaker than the EU cap	Price cap, no export of Kyoto units possible	
New Zealand	AAUs in the NZ scheme			

Table 2: Possible Barriers of linking the EU-ETS to emerging schemes

5.3 *The role of offsets in linking trading schemes*

There are three major offset related linking issues which will be discussed in this chapter: differences in the relative stringency of domestic offsets, differences in project eligibility criteria and differences in quantitative limits.

Differences in the relative stringency of domestic offsets

Once offset units are incorporated into a corresponding ETS, these offset units become substitutable to the allocated ETS units. Thus, linking two ETSs – i.e. making units of two ETSs compatible - means also to make offset units compatible with ETS units of the systems to be linked. Therefore, in order to be acceptable for other ETSs, offset units need to have certain extent of stringency regarding MRV and additionality, especially if countries have not ratified the Kyoto Protocol. If ETS units and therefore their corresponding domestic offsets of a scheme are backed by AAUs, the stringency of the domestic offset creation under such a scheme is less problematic as if the ETS units are non-Kyoto units. In this case the host country takes the responsibility for the quality of the offsets. Even if technically no problem to purchase Kyoto units that are created by offset with low stringency, it might be politically unacceptable to link to an ETS that accepts offsets with low stringency.

Differences in project eligibility criteria

Significant difficulties could arise if types of offsets are considered as eligible in an ETS but not in the ETS to link with. The purchasing scheme's administrators would never be able to tell whether an incoming allowance has maybe been freed up by use of an external trading unit which they themselves would not accept for compliance. Taking as an example that one ETS accepts projects from LULUCF offsets, purchasing units from this ETS leads inevitably to a funding of these projects by the purchasing ETS – even if this was not intended by any means. Therefore, linking schemes where LULUCF power projects are eligible in one scheme and ineligible in the other would probably be politically not easy.

Differences in quantitative limits

To help companies to comply at low costs, ETSs allow certain amounts of domestic or international offsets or even unlimited use (see Australian CPRS). The carbon price in the respective ETSs may be influenced by those quantities. However, bilateral linking of schemes means that the offset limits need to be added up and will form the upper bound for both schemes.

	Lieberman-Warner bill	Waxman-Markey bill	EU-ETS (2008-2020)	WCI	Australia
Offset limit %	30% of cap	About 30% of cap by 2020, increasing over time	-20% emissions reduction by 2020: use credits given to them by their governments for the period 2008-2012 that they have not already used up. -30% emissions reduction by 2020: use of JI/CDM credits will be automatically increased up to half of the additional reduction effort	49% of required reduction effort	No limits to Kyoto Units
Eligibility	Issuance and use of domestic LULUCF offsets up to 15% of total cap. If 15% not exhausted, possible to use international offsets and allowances up to 5% and international forest credits up to 10% of cap. International project credits may not come from facility directly competing with US facility	unclear	JI/CDM but forestry, land use, agriculture excluded nuclear projects excluded hydropower >20MW only if criteria of World Commission on Dams are respected, >500MW are monitored for possible negative social and environmental effects	WCI will develop protocols for offset projects, may include CDM (potentially subject to additional criteria), may accept foreign allowances	CERs, ERUs, RMUs are allowed except temporary and long-term CERs. CERs/ERUs can be banked issued in first commitment period and be issued/banked if they are from a project established in first commitment period. Review or rules for period post 2012/13.

Table 3: Comparison of offset provision in selected schemes

Land-based offsets

Within this project and-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) have been reviewed. While the problem of additionality arises in any offset types, there are specific other issues which are unique to land-based offsets, such as the risk of reversibility and the eligibility of and limits for carbon pools and activities.

Additionality

There are substantial differences regarding additionality requirements within the analysed schemes. There are currently no methods available on which to assess the relative stringency of additionality provisions proposed. 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. While the problem of additionality arises in any offset types, there are specific other issues which unique to land-based offsets.

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 lightening-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 the 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. 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. In most of the analyzed schemes the liability for the replacement of losses rests with the creator of the offsets, by means of permanent easements, financial or physical insurance mechanisms, requirements for nullification of credits in case of losses or assurance factors. If the liability for the replacement of losses is 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 lCERs 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 under the cap of its trading scheme. Those schemes avoid the non-permanence problem completely, since e.g. forest owners will need to surrender permits if emissions are released into the atmosphere later on.

Eligibility of and limits for carbon pools and activities

Each of the schemes reviewed specifies which land-based options (carbon pools and activities) are eligible for offset crediting. The EU ETS bans all land-based offsets. Some schemes restrict the

total number of land-based credits that can be used (e.g. 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 under linked systems may be particularly difficult to preserve de facto. 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 systems (Lieberman-Warner bill, Waxman-Markey proposal), with its inclusion of avoided deforestation from developing countries, could also represent a very large influx of credits, particularly if the current limits 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. 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. 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 addressing problems 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 may pose challenges for linking.

5.4 *Desirability to link from the view of emerging schemes*

The country case studies illustrate that the design of ETS varies greatly, reflecting different national and regional policy priorities and country circumstances. The design of each ETS is tailored to achieve certain domestic or regional policy objectives and also reflects domestic circumstances. The EU ETS has a clear priority to meet a defined reduction target, and thus tolerates a comparable higher CO_2 price for achieving this aim. In many other countries, there is greater sensitivity to the level of future carbon prices, and the risk of high prices. As a case in point, the proposed Australian scheme includes a price cap, which if triggered, would make additional permits available to domestic emitters. System coverage also impacts the acceptable CO_2 price range. In schemes which cover almost all economic sectors, the CO_2 price is reflected in the costs faced by consumers, and the country may want to keep CO_2 prices low at least initially in order to achieve political acceptance for the scheme. Some ETS, such as the WCI, are not only designed to meet an emissions target a least cost, but also to spur technological innovation in low carbon technologies (Western Climate Initiative, 2008); accordingly, they rely on a higher range of CO_2 prices as a condition for their effectiveness.

Each ETS and its design reflect the evolution of climate policy and other specific circumstances in different countries. Some of the resultant differences in ETS design will make short term

harmonization difficult. Japan for example has been relying on voluntary intensity-based targets for more than a decade. Consequently, a shift to mandatory, absolute targets will be a long-term process. The country case studies show that the tolerance for a significant CO_2 price increase due to direct linkages –either bilateral or unilateral- is low in most of the assessed schemes. Emerging schemes, such as a federal US scheme modeled after the Lieberman Warner bill, or an Australian scheme, both with a large coverage, may not accept linkages- that lead to significant increasing CO_2 prices, at least in the initial years of the schemes. This may not be a problem for the comparable strict system proposed by Waxman-Markey. Price forecasts see the price of a US scheme following the Waxman-Markey draft at over 50 US-$/tonne and the EU-ETS at about 63 US-$/tonne (PointCarbon 2009) in 2020. This relatively similar carbon price implies that, in the case of a EU-US link, the CO_2 price in the larger US system would only slightly rise.

Ensuring a large degree of regulatory certainty and promoting price stability and predictability in the early years is particularly relevant for markets that can be expected to become price takers in fully linked markets. When establishing a bilateral link small schemes are much more affected by the price volatility and price relevant decision of large schemes than vice versa. Some countries (e.g. Australia), may even prevent unilateral links to their schemes in order to prevent price increases and the price cap assess to often (Department of Climate Change (2008a). The EU has a desire for bilateral links to other OECD country schemes by 2015 without declaring the avoidance of unwanted effects on its CO_2 price (price increase, volatility) a peremptory condition. This is understandable given the large size of the scheme, and the limited potential effects of bilateral links to other schemes on its CO_2 price (except when linking to a US scheme), as well as, on the other hand, the comparable high tolerance for high CO_2 prices in the EU. The EU ETS has been characterized by high CO_2 price volatility since its beginning in 2005. The absence of a clear position regarding the desired CO_2 price range in the EU may however limit the desire of other schemes to fully link up to the EU ETS in the short term, given its large market size and the desire of emerging schemes for long-term regulatory price certainty.

6 Implementing a Market Linkage: Ensuring Compliance with the Regulatory Framework

6.1 *Linking and the Legal System*

Overall, the conceptual challenges identified thus far are largely political in nature. For instance, while a high degree of harmonization between connected trading schemes may be desirable to facilitate smooth operation of the market link, such harmonization is not mandatory as a matter of law. Yet legal and normative requirements also play an important role in the context of linking; they create a framework from which derogation is not merely conditional on political preferences or economic expedience. Emissions trading schemes are complex entities embedded in a sophisticated system of substantive rules and principles, legal procedures, and regulatory traditions; they are born out of a decision to constrain certain forms of economic behaviour, and are thus in turn constrained by fundamental decisions on the boundaries of individual and collective freedom set out by each normative order (Anttonen, Mehling and Upston-Hooper, 2007).

Despite their obvious significance, such considerations have not yet featured heavily in the discussion on the different conditions and implications of carbon market linkages. On a general level, legal and normative aspects are likely to become relevant in two respects: first, in the establishment of a trading link, which invariably necessitates recourse to recognized sources of law and legal procedures; and, second, in the relationship of the trading link with the wider normative order. The first category relates to the different mechanisms available under the law to set up a link and govern its continued operation, including procedures required for their adoption; the second category relates to the subsequent interactions of the trading link with substantive rules and principles at the level of international, regional or domestic law, which may range from tensions and conflicts to mutual synergies. This second category also comprises normative considerations, which may not form part of the positive legal order, but nonetheless spell out important general tenets, such as accountability, transparency, fairness, and due process. Both categories are mutually contingent in that a failure to observe requirements under one category may also result in a violation of requirements under the other category.

When seeking to identify the legal implications of a linking arrangement, a distinction has to be made between those questions prompted by the link itself, and questions related to the general operation of the carbon market. Accordingly, the treatment of traded allowances under property, accounting, and taxation rules, for instance, is an issue typically governed by the regulatory framework of each participating jurisdiction, and not a necessary condition for the elaboration of an operational linking arrangement. In rare cases, moreover, essentially political aspects may also acquire legal relevance if they exceed certain thresholds; for instance, if the linking of two separate carbon markets results in such a loss of environmental integrity that the policy aims of either trading scheme are clearly undermined, they may compromise its proportionality as a restriction on economic freedom and thus infringe on vested rights under national constitutions or other legal precepts. Such considerations are highly conditional on the actual circumstances in each individual case, however, and cannot be addressed in a general manner.

6.2 *Legal Nature of Emissions Trading Linkages*

An important consideration in the creation of a trading link across carbon markets is the legal nature of the link. From a legal perspective, different links can have varying degrees of formality, with implications for the procedural requirements of their adoption and their binding force. In many cases, the instrument establishing the trading scheme, such as national or regional laws and regulations, will already contain a mandate for the adoption of a link with other trading schemes and specify the legal nature of that link. As mentioned earlier, a unilateral link between trading schemes can be established through inclusion of a clause specifying the conditions for recognition of foreign allowances. Its legal nature will then generally correspond to that of the instrument establishing the trading scheme, which is, in most cases statutory and thus binding legislation. Because the legislative amendment creating the unilateral link remains within the scope of national jurisdiction, the link can also be unilaterally changed or terminated at any point in time. Absent some form of bi- or multilateral agreement, the implementing entity – whether a state or a regional organisation such as the European Union – will not be bound by its decision to create a link.

A different assessment applies to bi- or multilateral links, however, which will typically necessitate some form of coordination between the affected trading schemes. Such coordination can be reached either by way of a political arrangement on the mutual recognition of allowances coupled with domestic adjustments to each scheme, or through a binding international treaty. In legal terms, the first option will be similar to the unilateral link described above, the only difference being that affected jurisdictions will establish unilateral links on a reciprocal basis. At the level of implementation, however, the actual link will still be created through adjustments to the instruments establishing each trading scheme, that is, to relevant national laws and regulations. Such reciprocal unilateral links have the benefit of obviating lengthy negotiation and ratification procedures, and also leave each jurisdiction with the flexibility to terminate the link or adapt it to changing circumstances as needed. Coordination between the schemes can be achieved through informal meetings, or – at a slightly more formal level – through conclusion of a Memorandum of Understanding and adoption of technical standards, each of which helps document a common intent and desired outcome, but lacks the binding power of a legal commitment.

Unlike multiple unilateral links, which leave each participating jurisdiction with the power to amend or terminate the link at any time, a formal bi- or multilateral link created through an international treaty will bind the participants and can only be amended in accordance with the terms set out under that treaty. Treaties form one of the recognized sources of international law, and are defined as an “international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation” (Vienna Convention, 1969). The violation of duties under a treaty counts as a breach of international law, incurring state responsibility and the possibility of sanctions, often defined in the treaty itself as part of a negotiated compliance mechanism. Accordingly, any mechanism to adjust the link over time to reflect changing circumstances and political priorities needs to be included in the treaty (Mehling, Haites 2008). Due to their formal nature, treaties offer a transparent and predictable framework for transactions across linked trading schemes. Still, they can only be concluded between formal actors of international law, which excludes sub-federal entities in many federal states as well as many regional arrangements, and their

adoption is subject to sophisticated procedures set out both under international law and in domestic constitutions or organisational mandates.

Finally, links across emissions trading schemes can also occur on a case-by-case basis, purely through contractual arrangements entered under private law, for instance in swap deals and arbitrage activities. Such links follow no general patterns and were not, therefore, addressed within the scope of this project.

6.3 *Consistency with Relevant Norms and Principles*

The Role of Norms and Principles

A little-discussed aspect of linking efforts between emissions trading schemes is their compliance with the wider body of norms and principles underlying each legal system. To date, the debate has largely focused on design features of different trading schemes, and technical solutions to accommodate remaining differences as well as ensure continued operation of the trading link. As trading schemes evolved from the early stages of preparation to more advanced stages of implementation, emerging details of their design and operation have also allowed an extension of the debate to legal and institutional considerations. Over time, however, the sustained viability and political acceptance of a trading link will also depend on its ability to secure consistency with a number of unwritten norms and principles recognised across most major jurisdictions, and guiding any form of public interference with economic activities and individual freedom (Tuori, 2002). Such norms can be rooted in customary law, constitutional doctrine, or have the status of common legal doctrines applied in all municipal legal systems, particularly rules of procedure, evidence, and jurisdiction, as general principles intrinsic to the idea of law and basic to all legal systems. Central considerations arising from these norms are described below.

Legitimacy of a Trading Link

Linking emissions trading schemes has the potential to facilitate the transfer of significant revenue streams across national borders. Irrespective of its design, thus, the creation of a trading link will have clear economic significance for market participants and, on a broader level, for civil societies in the affected jurisdictions. Any such measure adopted and implemented by a sovereign power needs to meet a certain set of norms and principles to minimise later challenges through judicial channels or at the larger scale of political debate. In particular, a trading link should raise no doubts as to its legitimacy, the main justification of political authority and a vital condition for institutional stability and adequate compliance by its addressees (Bodansky, 1999). Legitimacy can derive from various sources, notably from popular consent expressed through a system of elected representatives or, at the level of states, through treaties and state practice adopted by said representatives. A linking arrangement based purely on administrative or technical regulations without a corresponding mandate in formal (parliamentary or statutory) law thus risks being perceived as lacking in legitimacy; with rising trade flows and thus impacts on the trade balance of participating jurisdictions, such a linking arrangement will be more vulnerable to challenges, either on legal grounds or at the level of public opinion. A formal treaty and clear statutory mandates can help forestall any such concerns. On a broader level, the debate over an international “bottom-up” versus a “top-down” solution may also have implications for international legitimacy and widespread support for linking in the international community. A link adopted outside of the accepted decision making procedures within the auspices of the United Nations, for instance, may be perceived as

exclusive due to its lack of universal participation, and may thus face opposition from the states it excludes. An increase in political feasibility gained through narrower participation needs to be carefully balanced with the potential loss of legitimacy arising from non-universal involvement.

Another important condition for the legitimacy and thus social acceptability of a linking arrangement can be expressed in procedural terms during the process of establishment, but also in subsequent operation of the link. At all stages of its development, a linking arrangement should seek to ensure transparency (Stern, 2006); provisions on linking should be clearly worded and precise, the processes leading to their adoption open to public scrutiny. Involvement by affected stakeholders and the public can further help improve transparency. Once the linking arrangement enters into force, disputes and irregularities may arise across the link between participants in each emissions trading scheme, necessitating adequate dispute settlement mechanisms, but also raising the question of accountability by both participants and any institutions or officials supervising the operation of the link. Likewise, any activities relating to the trading link should generally be governed by principles of good faith, equity and fairness.

General Principles of Law and Environmental Protection

Beyond that, a linking arrangement that undermines the environmental objectives of the emissions trading scheme whose geographic scope it extends risks violating a central principle applied throughout all major legal systems, the principle of proportionality; the ability of a measure adopted by public authority to promote and sustain a socially desired outcome determines its necessity, and thus by extension its proportionality. This may become relevant if the environmental integrity of one emissions trading scheme negatively influences the integrity of other linked emissions trading schemes. And finally, both at the level of national and international law, a number of principles have emerged that govern both public and private activities relevant to the environment. Most importantly, these include the precautionary principle and the principle that the polluter should pay; while these principles may generally prove difficult to enforce in court and through other binding channels, they still have autonomous normative value (de Sadeleer, 2002). Accordingly, their material stipulations should be, where possible, observed when designing and implementing a link across emissions trading schemes.

6.4 *Consistency with International, Regional and Domestic Law*

While general norms and principles set out a broad framework under which linkages between emissions trading schemes should ideally evolve to remain viable over the longer term, compliance with material provisions of international, regional and domestic law is peremptory from the outset. In other words, the link must observe all constraints imposed by positive law, whether it originates in legislative statutes or substatutory ordinances and decrees, an international treaty, or customary practices accepted as law. Otherwise, it not only risks being annulled through a judicial challenge, but also undermines the formal basis of any transactions carried out under the link.

International Law

Relevant rules can originate on a number of regulatory planes. Under public international law, which is the body of rules and principles governing the conduct of nation states and international organizations as well as their relationship with each other and with natural and juridical persons, a number of issue areas can acquire relevance for links between emissions trading. By default, any linking arrangement created and operating within the realm of international law will be bound by

the stipulations of general international law and the international law of treaties, both of which set out doctrines and procedures necessary to any legal system. A link based on an international treaty, for instance, will be governed by the framework established under the Vienna Convention on the Law of Treaties (Vienna Convention, 1969) as regards its adoption, amendment, termination and interpretation, to name but some central elements.

Additionally, an important aspect to consider are the material stipulations adopted through the Kyoto Protocol, which has created tradable units recognized for compliance with the quantified emissions limitation and reduction commitments it sets out for a number of industrialized countries. Nation states that have entered such commitments need to avoid a gap between real emissions and the number of units they hold to avoid a breach of the Kyoto Protocol. As a result, such countries are unlikely to link their national emissions trading schemes with schemes in countries which have not ratified the Kyoto Protocol, given that allowances purchased from the latter will not be accompanied by Kyoto units. Under the current regime, this will effectively preclude linkages between parties to the Kyoto Protocol subject to its quantified emissions targets and other states; the same applies if parties decide not to base their domestic allowances on Kyoto units. A similar situation is likely to emerge under any successor agreement to the Kyoto Protocol creating similar compliance units only for ratifying parties. As an analysis of international trade law reveals, on the other hand, the free trade disciplines set out for trade in goods and services do not constrain a link between emissions trading markets, as greenhouse gas allowances do not fall within the scope of the trade liberalization regime.

National and Regional Law

National law can be of relevance to linking of trading schemes on a number of levels. In particular, the procedures and institutional responsibilities set out under national constitutions affect which entities have the ability to engage in a transboundary linking arrangements with other jurisdictions. Likewise, regional law, such as the rules adopted by organizations of regional economic integration, can be of relevance in that they either set out the institutional architecture of the trading schemes or again impose certain constraints that need to be observed. The following case studies can serve as examples of the various legal issues that are likely to arise.

Case Study: United States

Linking to a Federal Scheme

Creating a link to a federal emissions trading scheme in the US could raise a number of legal implications affecting the legal admissibility of the link. A range of procedural and substantive considerations set out requirements and constraints, which need to be taken into account for the link to become operational. Likewise, compliance with the overall regulatory framework determines whether the link conflicts with applicable rules and principles of law. In the US, the federal Constitution sets out rules outlining the power to adopt treaties. Its Article II, Section 2, Clause 2 states that the President “shall have Power, by and with the advice and consent of the Senate, to make treaties, provided two-thirds of the Senators present concur.” Again, international treaties do not usually become binding US law until Congress has enacted implementing legislation, and it is a longstanding practice of the executive branch not to bind the US internationally until such legislation has been adopted; in certain cases, known as “executive agreements”, Congressional approval may even obviate the need for a supermajority in the Senate (Purvis 2008: 10).

Linking to a Regional Scheme

When linking to a regional scheme or scheme adopted at the level of individual states, a sophisticated distribution of powers between the Union and the states will raise a number of concerns with regard to the admissibility of a regional linking agreement. Altogether, the federal Constitution contains only four articles pertaining to treaty powers. Of these, Article I is the most relevant for a potential market link, given that its section 10 prohibits any state from entering into a "treaty, alliance, or confederation" or from entering "without the Consent of Congress (…) into any Agreement or Compact (…) with a foreign Power." In essence, this provision denies the constituent states international legal personality, limiting their ability to participate in diplomatic relations and altogether barring them from the conclusion of an international treaty. Regarding international treaties, the scope of this restriction is wide, covering all binding international arrangements "regardless of title, designation, or form."

While the federate states may thus be precluded from entering into a formal linking treaty with other jurisdictions, they are empowered to adopt a binding "compact" or "agreement" with the consent of Congress. Article I, section 10 of the Constitution makes the conclusion of such a compact or agreement conditional on approval by Congress, something that, given the current majority situation, does not appear entirely unlikely. Still, even in the absence of Congressional endorsement, individual states may, under certain circumstances, enter into a compact or agreement with foreign powers. As the United States Supreme Court has declared, a compact with a foreign power requires Congressional approval only if it tends "to the increase of political power in the States which may encroach upon or interfere with the just supremacy of the United States." Consent to an agreement is thus only required if the agreement tends to give the state elements of international sovereignty, interferes with the full and free exercise of federal authority, or deals locally with a matter on which there is or might be national policy. As the Restatement Third of the Foreign Relations Law of the United States comments, "agreements involving local transborder issues, such as agreements to curb a source of pollution (…), have been considered not to require Congressional consent." Accordingly, it appears possible, albeit not certain, that a linking agreement could be adopted without federal endorsement by way of a state compact or agreement. Ultimately, however, Congress can always supersede such state arrangements by legislation.

Should the preceding options prove unfeasible, the federate states can always resort to amending their internal legislation with a view to including rules on the mutual recognition of foreign allowances. Since neither party is legally bound to maintain its law, reciprocal legislation adopted concurrently by two or more jurisdictions does not constitute a treaty, nor a compact or agreement requiring Congressional consent. Affording a means of circumnavigating the constraints of international and constitutional law, such reciprocal recognition could be based on an informal understanding setting out the substantive provisions required to create an operational trading link. Any institutional responsibilities could be assigned to a private body established and funded by the respective participants, obviating the need for recourse to international law. Reciprocal arrangements have been concluded with foreign powers in the past, occasionally also to overcome procedural constraints.

In all foregoing cases, moreover, a transatlantic market link would not appear to contravene the supremacy of federal law because, to date, no legislation that would be so dominant or so pervasive as to "occupy the field" and thus preclude state law has been adopted by the federal legislator in the

area of greenhouse gas emissions trading. Likewise, a trading link would not violate another doctrine known as the Commerce Clause. Contained in Article I, section 8, this clause empowers Congress to "regulate Commerce with foreign Nations, and among the several States." As the concept of commerce can also be applied to environmental markets, the Commerce Clause has raised doubts about the legality of provisions in both state and regional law constraining energy imports from outside in order to prevent leakages. As long as the Union fails to regulate international trade in greenhouse gases, however, this clause will remain dormant and merely prohibit states from passing legislation that improperly burdens transboundary commerce. Regarding the latter, moreover, the Constitution does "not prohibit every state law or regulation that has some effect on interstate or foreign commerce."

The Supreme Court has summarized the applicable jurisprudence as follows:
Where the Statute regulates evenhandedly to effectuate a legitimate local public interest, and its effects on interstate commerce are only incidental, it will be upheld unless the burden imposed on such commerce is clearly excessive in relation to the putative local benefit. If a legitimate local purpose is found, then the question becomes one of degree. And the extent of the burden that will be tolerated will of course depend on the nature of the local interest involved, and on whether it could be promoted as well with a lesser impact on interstate activities. Creation of a market link facilitates commerce, if anything. But even if a linking arrangement were, in any way, to be considered burdensome on domestic or international commerce, it appears likely that its environmental and economic benefits could justify any such impacts. Ultimately, thus, a variety of vehicles can be drawn on to implement a bridge between regional trading markets in Europe and the United States.

Case Study: European Union

In Europe, the supranational *acquis* constituting European Community law spells out a number of substantive principles and freedoms that a link between the European emissions trading scheme and other schemes may not infringe upon. More importantly, the directive establishing the European emissions trading scheme specifies certain conditions for a link to trading schemes in third states; specifically, it contains a mandate to explore agreements with "third countries listed in Annex B to the Kyoto Protocol which have ratified the Protocol to provide for the mutual recognition of allowances between the Community scheme and other greenhouse gas emissions trading schemes". Also, the directive empowers the Commission to "draw up any necessary provisions relating to the mutual recognition of allowances" under such an agreement. This concrete mandate strongly determines the nature and scope of the link. Moreover, it defines linking as a desirable objective and thereby obviates the need to justify any related action. At the same time, the mandate may also define the conditions for its exercise, including material and formal restrictions to the scope and partners of the link. Under the terms of the foregoing mandate, links with regional and sub-federal schemes as well as with national schemes in countries that have not ratified the Kyoto Protocol are excluded. While this mandate is phrased in positive terms, and thus does not categorically preclude the adoption of a linking agreement under different terms than those set out in the directive, it is unlikely that the EU would pursue efforts beyond the scope of this explicit mandate, as this would arguably set a higher threshold for the justification of such a measure.

Regarding procedural implications, the directive expressly refers to Article 300 of the Treaty establishing the European Community (EC Treaty). This provision stipulates the process for

adoption of international agreements between the EC and third states or international organizations, and would thus become relevant if the EU and the US were to create a link by way of an international treaty. Essentially, Article 300 of the EC Treaty grants the Commission a power to negotiate international agreements, subject to prior authorization by the Council. Once the negotiations result in an agreement on the text of the agreement, the Commission submits the text to the Council for approval. Ratification of the international agreement – a vital precondition of its entry into force – occurs through a Council decision. In the case of a linking agreement, the Council would have to decide by qualified majority, and with the participation of the European Parliament. Due to shared competences between the EU and its Member States, the link would probably be adopted as a mixed agreement to which both the Community and the Member States are parties.

If the trading link between the EU ETS and another scheme were to be established unilaterally or by way of mutually reciprocal domestic legislation, the applicable legislative procedures in the EU would be the same governing the adoption of the original scheme. In the case of the ET directive, the legislative basis was Article 175(1) of the EC Treaty, which sets out a general mandate for action on environmental protection. It calls upon the European Commission to submit a proposal to the European Parliament and the Council, which votes by qualified majority and in codecision with the European Parliament.

While the mandate and procedures it calls for can be amended, such an amendment will typically be subject to the same procedural requirements governing the adoption of the mandate itself, and thus necessitate a protracted legislative or diplomatic effort that can be politically undesirable. For the period beyond 2012, the EU adopted a comprehensive revision of the trading scheme in late 2008 to take account of the procedural obstacles mentioned above by introducing greater flexibility in the creation of trading links for the period beyond 2012. Under the new mandate, eligibility of suitable linking partners will be expanded to “compatible mandatory greenhouse gas emissions trading systems with absolute emissions caps established in any other country or in sub-federal or regional entities.” Additionally, “[n]on-binding arrangements may be made with third countries or with sub-federal or regional entities to provide for administrative and technical coordination in relation to allowances in the Community scheme or other mandatory greenhouse gas emissions trading systems with absolute emissions caps” (European Parliament, 2008). Importantly, however, the crucial determination of what constitutes a “compatible” scheme will be inherently political in nature, not legal.

7 The role of linking in a future climate agreement

7.1 *The role of linking in different scenarios for a future global climate architecture*

When discussing a future linkage of emissions trading systems and potential barriers to linkage, it is critical to be clear about assumptions regarding the policy scenario in which linkage may occur. Both for the broader policy framework and the technical design of trading schemes, the international regime succeeding the Kyoto Protocol will be of crucial importance. Aside from defining common policy objectives and a legitimate distribution of reduction burdens, a follow-up agreement can also set out uniform standards for tradable units and other design aspects of emissions trading. Overall, the existence of a consensus-based international framework for domestic emissions trading could greatly facilitate and accelerate linking at the bilateral or multilateral level. In the following several scenarios for a future global climate architecture are discussed.

Global governmental cap-and-trade[14]

A global governmental cap-and-trade architecture implies that every country in the world adopts a well-defined and limited GHG emissions budget for its entire economy, and that emission allowances can be traded between governments (e.g. Vattenfall, 2006). A global carbon budget is calculated and the burden is shared to the countries according to a formula. The environmental effectiveness of this architecture would be maximal, if all countries comply. Theoretically, global-cap-and-trade also implies cost-effectiveness, because a single price for emissions is established across all sectors and regions in the world. Integrated coverage of all world regions and sectors maximizes the gains from trading, as emissions are reduced in places where this can be achieved at the lowest possible costs (Flachsland et al. 2008b). However, given that a large share of all tradable allowances will very likely be concentrated in the hands of a rather small group of countries, vesting them with considerable market power, permit trade between governments will arguably be characterized by strategic – i.e. price influencing – behaviour. In fact, it seems questionable, whether a single, world-wide price of carbon would emerge at all, given that many transactions can be expected to occur in an 'over-the-counter' fashion, i.e. on the basis of bilateral bargaining and without public disclosure of the price. With such constraints on competition, efficiency losses become inevitable and a potentially sharp increase in total abatement costs is to be expected, as was shown, e.g., in simulations by Böhringer and Löschel (2003). Moreover, even in a perfectly competitive intergovernmental permit market, information asymmetries between governments and companies would limit the former's knowledge about the true marginal abatement costs incurred by the latter. Thus, unless an appropriate price revealing mechanism is put into place, it will be difficult for governments to optimize their trading positions on the global carbon market (Kerr, 2000). Possibly the greatest hurdle to an implementation of a global cap-and-trade architecture consists in its prerequisite, i.e. an agreement on global burden-sharing (Flachsland 2008b). Another barrier to political feasibility are high transaction costs, as the reaching of global agreement on carbon market rules and the implementation of the corresponding national provisions such as monitoring, reporting and verification systems (MRV), as well as emission registries, constitutes a formidable challenge. Cost-effectiveness, however, is likely to be compromised as long as emissions are traded by

[14] This sections is based on Flachsland 2008b

governments. Finally, large doubts remain with regard to its political feasibility, at least in the short term, given the high transaction costs and the need to achieve a global consensus on international burden-sharing (Flachsland 2008b).

Kyoto II

If a Kyoto-II agreement were to follow the current system's trading rules, trading would occur on a nation-to-nation basis. A major advantage of the Kyoto-type approach is that it facilitates negotiations of regional levels of ambitions in terms of emission caps, and enables flexibility in meeting these. If major emitters adopt caps or at least clear incentives for reducing emissions from their baseline, this can reduce concerns over carbon leakage, enabling a higher level of ambition of the aggregate reduction effort. However, given a lack of consensus over burden-sharing rules, negotiations of a Kyoto-type agreement will end up in political stalemate. Therefore a scenario in which some nations participate in a Kyoto-II agreement and others do not must be considered. Such a scenario implies major difficulties for linking participant trading systems to those of non-participants. In particular, allowances from non-participant systems would not automatically be eligible for use in meeting obligations. This problem could be solved if rules allowed Kyoto-II participants to use non-party allowances. The respective non-party government(s) and Kyoto-II participant's parties would have to agree on the future cap of the non-party ETS. If this cap is acceptable for both parties, AAUs can be issued accordingly to the non-party ETS, allowing unrestricted trade in both directions (Blyth, Bosi, 2004). In addition, a Kyoto-type government-level carbon market is prone to economic inefficiency mainly due to concerns over market power (Böhringer and Löschel 2003) and the question of whether government are generally able to act as cost minimizers on carbon markets (Hahn and Stavins 1999).

Bottom up architectures

Bottom up architectures can consist of direct unilateral, bilateral as well as indirect links. The environmental effectiveness of bilateral linking depends on the caps countries set and how man countries participate (Flachsland 2008b). However as already shown in the previous chapters there are main barriers that still have to be resolved before countries will be able to establish full bilateral links, such as the harmonization of cost-containment measures. This process on its own would not enable negotiation of a global burden-sharing regime and does not result in the broad instantaneous coverage of global emissions, except for the case where a significant number of major emitters like the US, European Union, China, Russia and others agree to form a joint carbon market outside the UNFCCC arena. There may be also a convergence of markets through indirect links. Depending on the size of the prize differentials and the supply from the CDM, this competition may already lead to a significant convergence of prices. CDM credits will exert a downward pressure on any system where allowance prices are higher until either prices are equalised or the CDM supply is exhausted. Systems where allowance prices are lower than CDM prices will however not be affected, since neither buyers in these systems nor sellers in the CDM would have an incentive to trade. Cost containment measures, providing a very low domestic CO2 price (lower than the price of international credits), may therefore be a barrier to market convergence through the CDM.

Complementing the Kyoto II architecture by bottom up links

If international negotiations for a future climate agreement fail, a bottom-up architecture of direct and indirect linkages between currently fragmented markets will be of great importance and a main pillar of the future international climate policy. A bottom-up architecture, however, mainly relying on indirect and unilateral link is unlikely, at least in the near-to-medium term, to deliver the same amount of emissions reductions. The two approaches, however, can operate simultaneously. Bottom up architectures can supplement the top-down architecture of a Kyoto II architecture, particularly where governments devolve trading to companies, which increases the liquidity of the market and the economic efficiency; whereas top-down architectures provide the basic framework supporting linkage. By devolving inter-governmental permit trading to the company level the economic performance of the international carbon market would be improved, as company level trading helps to ensure that the true marginal abatement costs are revealed. But unlike the Kyoto scheme, this architecture can be designed as an open system, where countries can join by linking-up their domestic ETS or even only sectors whenever barriers are reduced, comparable targets set or the necessary political momentum is reached. Methods for establishing links between parties that implement cap and trade regimes outside of the Kyoto compliance markets would have to be established. Another design option would be to enable international emission trading between ETS companies and governments, which would in theory be the economic most efficient option. (Anger, 2006)

Sectoral crediting/trading will be important in future international carbon markets. A Kyoto successor treaty may see international trading schemes for certain sectors such as aviation and maritime emissions or sectoral crediting mechanisms in developing countries. For developing countries several proposals for sectoral crediting are being discussed with potential links to the future Carbon market. Proposals include sectoral no-lose targets or sectoral cap-and trade. Under no-lose targets, targets are agreed on relative to accepted baselines, credits are granted for achievements beyond target, but no penalties are incurred if the targets are not met. Governmental or company based trading schemes in Annex-1 countries could implement a unilateral link to credits from sectoral no-lose targets in the same way as currently under the CDM. The following chapter assesses link of trading schemes established for international aviation and maritime emissions to existing and emerging emissions trading schemes.

7.2 *Case Study: Linking to Aviation/Maritime commitments*[15]

International aviation and maritime emissions are too large and growing too rapidly to be ignored. Attempting to allocate the emissions to countries as a basis for regulation has failed. These emissions can be regulated by treating them as separate sectors and implementing a global emissions trading or emissions fee regime for each sector. Those policies can be implemented in ways that minimize adverse impacts on vulnerable developing countries, which is very different than exempting all developing countries. Such policies can also raise substantial funds for emission

[15] This section is based on: Haites, 2008: Linking Emissions Trading Schemes for International Aviation and Maritime Emissions. Climate Strategies Working Paper and Haites (2009): Linking Emissions Trading Schemes for International Aviation and Maritime Emissions. Climate Policy Special issue on linking. (forthcoming)

reduction measures in the sectors and for mitigation and/or adaptation measures in developing countries. Most of the funds would come from developed countries and would benefit developing countries, which addresses the principle of common but differentiated responsibilities. Exclusion of air and ship traffic to/from all developing countries would benefit mainly a small number of relatively wealthy countries with large international airlines or shipping fleets. The European Union proposes to incorporate the emissions associated with flights to, from and within member states into its emissions trading scheme beginning in 2012. That proposal might be extended to international shipping emissions beginning in 2013. Revenue from the sale of allowances for international aviation and maritime emissions would create an incentive for other national trading schemes to extend their coverage to those emissions. Coordinating coverage of international aviation emissions among national trading schemes might prove difficult in practice.

Some countries/regions are implementing domestic emissions trading schemes that would cover these sources. These emissions also could be regulated through emissions trading schemes established by international organizations such as ICAO and IMO.

If international aviation and/or shipping emissions are covered by a domestic trading scheme the international aviation/shipping sector is likely to be linked with the other sectors covered by the scheme. If the domestic scheme is linked with other schemes, the international aviation/shipping sector will be linked with those other schemes directly or indirectly.

If international aviation and/or shipping emissions are covered by a separate trading scheme, it could have a unilateral or a bilateral link with one or more trading schemes covering other emission sources.

For a unilateral or bilateral link, the choice of scheme(s) with which to link depends on:

- The perceived quality of the allowances of the target scheme.
- The ease of establishing a link with the target scheme.
- The size of the target scheme relative to the projected demand for external allowances by the trading scheme for international aviation/shipping emissions.

Based on these criteria, the best candidate for a unilateral link is the Clean Development Mechanism as reformed and other crediting mechanisms established by a future agreement. A link with a large domestic scheme in a country/region with an emissions limitation commitment under the Kyoto Protocol or a future agreement, such as the EU ETS, is second choice, but it might require the cooperation of the relevant government(s).

A unilateral link would be much easier to implement than a bilateral link. A bilateral link requires that the schemes be “compatible” while a unilateral link does not. A bilateral link is likely to require an international treaty, while a unilateral link likely can be implemented without a formal agreement. Other schemes might be reluctant to link with an international aviation trading scheme because of the difference in the climate change impacts associated with their respective allowances. A mechanism that allows the international aviation/shipping emissions trading scheme to issue UNFCCC compliance units is likely to be a prerequisite for a bilateral link with most other schemes.

If international aviation/shipping is a net buyer as expected, a unilateral link may be sufficient. A bilateral link would allow the sale of surplus allowances to participants in the other scheme, but if there are no surplus aviation/shipping allowances this is irrelevant. A unilateral link would allow the purchase of additional allowances by participants in the international aviation/shipping scheme. A unilateral link also would moderate the price of allowances in the international aviation/shipping scheme.

8 Conclusions

While the EU envisions an OECD Carbon market by 2015, the paper concludes, based on country case studies, that there are only few candidates for full direct bilateral linking in the next decade. A OECD-wide company-level carbon market by 2015 therefore seems to be a very ambitious goal. A transatlantic link of carbon markets currently has high priority for the EU. Clearly a US-EU carbon market would constitute the major share of an OECD-wide system and would send a strong political signal regarding the further development of international climate policy based on a global carbon market. However, the prospects are difficult given the uncertainty of how the US Climate policy will evolve under the new US administration and what this implies for earlier US links. If the EU and U.S. find common ground on key design elements, this would probably exert significant influence on the other, much smaller-sized OECD trading systems to align their designs accordingly and to join the linked market.

In most of the assessed schemes however, full bilateral linking is not a short term priority, and its benefits will be weighed against the costs of giving up on other objectives, in particular the control over the domestic CO2 price level. Linking needs to be understood in the context of a range of policy objectives considered by policy makers when designing an ETS, and the desire to link to other schemes will depend on the extent that these policy objectives are affected by linking. Accordingly, linking has to be considered as a trade- off with other policy objectives. If the EU would link to a federal US scheme there would likely be a net capital flow to the US and reduced CO2 prices, less domestic abatement in the EU as well as less control of the EU scheme. On the other hand a transatlantic link would send a strong political signal regarding the further development of international climate policy based on a global carbon market.

In most of the emerging schemes there is greater sensitivity to the level of future carbon prices than in the EU, and the risk of high prices at least in the short term. In schemes which cover almost all economic sectors, the CO2 price is reflected in the costs faced by consumers, and the country may want to keep CO2 prices low at least initially in order to achieve political acceptance for the scheme. Other design features that may pose significant barrier to linking include offset provisions (such as the eligibility of offsets) and intensity targets.

Candidates for earlier full bilateral links are schemes that are close trading partners and where a history of policy coordination already exists. Linking within the same economic area gives a high degree of regulatory certainty. Likewise, full bilateral links between Australia and New Zealand are realistic in upcoming years given the similarities in their scheme design, as well as the desire of New Zealand – being a small market – to increase liquidity and to reduce transaction costs by sharing governance arrangements and technical resources with Australia.

When discussing future linkages of emissions trading systems, it is important to be clear about assumptions regarding the policy scenario in which these occur. It needs to be distinguished

whether there will be a Kyoto-II agreement or not. Some of the potential barriers to linking cap-and-trade schemes, such as significantly divergent MRV provisions, will be easier to overcome with the adoption of a Kyoto successor treaty. More importantly, the comparability of targets will have been resolved through an international consensus-based burden sharing determination. However, regional carbon market can be linked even in absence of a Kyoto-II framework, enabling pioneers to cooperate in climate policy and keep up political momentum. It is also possible to link domestic carbon markets in the context of a Kyoto-II system. In this case, governments devolve trading activity to the level of companies, and trade only on behalf of sectors not covered by domestic ETS. With negotiations on a global climate regime perpetually threatened by diplomatic stalemate, linking provides a fallback optional in case of driving a bottom-up process in which various domestic emissions trading schemes transform themselves into an international emissions market. This process on its own would not enable negotiation of a global burden-sharing regime and does not result in the broad instantaneous coverage of global emissions, except for the case where a significant number of major emitters like the US, European Union, China, Russia and others agree to form a joint carbon market outside the UNFCCC arena. Even if full bilateral links may not be implemented in the short term, most emissions trading systems will by indirectly linked by establishing unilateral links to international offset mechanisms, such as the CDM or new crediting mechanisms under a Copenhagen agreement.

9 Annex I Existing and Proposed Emissions Trading Schemes in North America

North America is characterized by state and provincial initiatives to establish regional emissions trading schemes as well as initiatives to establish national emissions trading schemes. Three regional emissions trading schemes have been established by US states and provinces, RGGI, WCI and the Midwestern Accord. There is a small amount of overlap with Manitoba being a member of both the Midwestern Accord and the WCI and Kansas being a member of the Midwestern Accord and an observer of the WCI. The following sections give a brief overview of existing and emerging schemes in North America

Alberta

Alberta (Canada) implemented an emissions trading scheme effective 1 July 2007. Industrial facilities that emit more than 100,000 tonnes of greenhouse gases per year must reduce their emissions intensity by 12%. They can comply by reducing the emissions intensity of their operations, buying credits for emission reductions or sink enhancements in Alberta, or contributing C$15/tCO2e to the Climate Change and Emissions Management Fund. The Alberta scheme has no provisions for a link of any kind to any other emissions trading scheme. The intensity target, price cap and offset credits, which do not have an additionality requirement, are likely to deter other schemes from linking to the Alberta scheme.

The Regional Greenhouse Gas Initiative

The Regional Greenhouse Gas Initiative (RGGI) in the US covers CO2 emissions by electricity generators with a capacity of 25 MW or more and comes into effect on 1 January 2009[16].The cap is constant from 2009 through 2014 then declines by 2.5%/year to a reduction of 10% by 2018. Most states plan to auction all of the allowances. Emission reductions relative to the reference case will be approximately 5 MtonsCO2 in 2012 and 15 MtonsCO2 in 2018[17]. Prices have been projected to rise gradually from US$2 in 2009 to US$3.75 in 2018[18]. At the initial auction in September 2008, over 12.5 million allowances were sold at a clearing price of $3.07 per allowance[19]. Participants are allowed to use credits from specified offset projects in eligible states for up to 3.3% of their compliance obligation[20]. If the allowance price averages more that (2005)$7, the limit on credit use rises to 5%[21]. If the allowance price averages more than (2005)$10, the limit on credit use rises to 10%. Eligible Credits are those issued by the UNFCCC or an approved emissions trading scheme

[16] There will be approximately 225 participants and the initial cap will be approximately 188 million tons of CO_2.

[17] Updated results, October 11, 2006. Available at: http://www.rggi.org/about/history/modeling. Note these are short tone (2,000 pounds) rather then metric tonnes (2,205 pounds).

[18] Updated results, October 11, 2006. Available at: http://www.rggi.org/about/history/modeling

[19] Point Carbon, 2008. Vol. 3, Issue 20, 8 October 2008.

[20] Eligible project types include: landfill methane capture and destruction; reduction in emissions of SF6; sequestration of carbon due to afforestation; reduction or avoidance of CO_2 emissions from natural gas, oil, or propane combustion due to end-use energy efficiency in the building sector; and, avoided methane emissions from agricultural manure management. Other project types may be added. The project can be located in any RGGI state or any other US state in which a cooperating regulatory agency has entered into a Memorandum of Understanding with the RGGI states to provide oversight support related to CO_2 emissions offset projects in its jurisdiction.

[21] A twelve month rolling average allowance price equal to or above $7 adjusted for inflation from 2005 is a "stage one trigger event".

outside the United States[22] .RGGI, then, has a unilateral link with the Kyoto mechanisms and with any other approved emissions trading scheme if its allowance price is above (2005)$10. That link, of course, would not be used unless the price of RGGI allowances approached the price of the eligible units, such as CERs, ERUs and EUAs[23]. Those units currently have prices around (2005)$20/ton[24]. Other schemes might consider establishing a unilateral link with RGGI to access its relatively low cost allowances. But the multi-year compliance period and the tiered offset mechanism are likely to be deterrents. The RGGI rule does not include a provision for a bilateral link with another emissions trading scheme.

Western Climate Initiative

The WCI currently inlcused the US privinces California New Mexico Oregon Utah Montana Washington and the Canadian provinces British Columbia Manitoba Ontario Quebec as member and the US provinces Alaska Colorado Idaho Kansas Nevada Wyoming as well as the Canadian provinces Saskatchewan as observers.

States and provinces that are partners in the Western Climate Initiative (WCI) have agreed to reduce their greenhouse gas emissions to 15% below their 2005 level by 2020. A recommended design for an emission trading scheme was released in September 2008. The scheme will be launched at the start of 2012. It will have annual emissions caps and a three year compliance period. Initially, sources with annual emissions over 25,000 tCO2e will be covered. Beginning in 2015 coverage will be extended to the emissions associated with fossil fuels sold for transportation, heating and other purposes. At least 10% of the allowances will be auctioned rising to 25% by 2020. Allocation rules for free allowances may be coordinated to address competitiveness concerns. Participants will be allowed to use credits from WCI offsets and allowances from other greenhouse gas emissions trading schemes to a maximum of 49% of the emission reductions from 2012 to 2020. CERs can be used although additional criteria may be imposed to ensure they are comparable to WCI offsets. Credits for emission reductions by developed country sources covered by the WCI will not be eligible. In summary, the WCI proposes unilateral links with the CDM, possibly subject to additional criteria, to JI for credits from sources not covered by the WCI, and to other, unspecified, emissions trading schemes. Point Carbon reports that a WCI link to RGGI could drive up the price of RGGI allowances[25]. The WCI is interested in bilateral links with government-approved cap-and-trade schemes but has not agreed on criteria for such links.

[22] A twelve month rolling average allowance price equal to or greater than $10 adjusted for inflation from 2005 is a “stage two trigger event”. In that case participants may use “allowances or credits issued pursuant to any governmental mandatory carbon constraining program outside the United States that places a specific tonnage limit on greenhouse gas emissions, or certified greenhouse gas emissions reduction credits issued pursuant to the United Nations Framework Convention on Climate Change (UNFCCC) or protocols adopted through the UNFCCC process”. The compliance period is also extended from three to four years.

[23] Certified emission reductions (CERs), emission reduction units (ERUs) and European Union allowances (EUAs) are, respectively, the units of the Clean Development Mechanism (CDM), Joint Implementation (JI), and the European Union emissions trading scheme (EU ETS).

[24] The current prices of these units need to be adjusted to 2005 US dollars and to reduce the quantity from 1 metric tonne to 1 short ton.

[25] Point Carbon, 2008. Vol. 3, Issue 20, 8 October 2008.

British Columbia

British Columbia passed legislation in 2008 to enable implementation of a greenhouse gas emissions trading scheme in the province (British Columbia, 2008). The WCI design could be implemented through regulations adopted under the law. The regulations can stipulate other units that are accepted as Recognized Compliance Units (RCUs). British Columbia has implemented a carbon tax of C$10/tCO2 rising to C$30/tCO2 in 2012. Large sources in British Columbia covered by the WCI will pay the carbon tax on the fossil fuels they purchase. To avoid double regulation of these emissions, the tax on the fossil fuels consumed by those entities could be refunded.

California

California's Global Warming Solutions Act of 2006 set an enforceable target of reducing the state's greenhouse gas emissions to 1990 levels by 2020. It makes the California Air Resources Board (CARB) responsible for adopting the measures needed to achieve the target and allows for the use of market mechanisms. The draft plan for meeting the targets includes an emissions trading scheme linked with the WCI scheme (CARB, 2008). The plan was approved in December.24

Ontario and Quebec

Ontario and Quebec signed a Memorandum of Understanding in June 2008 to work on the development of a cap-and-trade system for greenhouse gas emissions that could be in place as early as 2010 (Ontario, 2008). Since both are partners in WCI, the design of the scheme is likely to be similar to that of the WCI.

Midwestern Regional Greenhouse Gas Reduction Accord

The Midwestern Regional Greenhouse Gas Reduction Accord currently includes the US provinces Illinois Iowa Kansas Manitoba Michigan Minnesota and Wisconsin as members and the Canadian province Manitoba as members, and the US provinces Indiana Ohio and South Dakota as observers. In November 2007 participating jurisdictions agreed to establish greenhouse gas reduction targets, develop a market-based and multi-sector cap-and-trade scheme to help achieve the targets, and develop and implement other associated mechanisms and policies as needed to achieve the targets. The proposed design for the scheme will not be ready until May 2009 at the earliest. The ability to link with other schemes is one of the basic criteria for the design.

Florida

The Florida Climate Protection Act authorizes the Department of Environmental Protection to develop an electric-utility greenhouse gas cap-and-trade scheme for legislative approval. The Governor's Action Team on Energy and Climate Change recommends that Florida advocate a strong federal cap-and-trade program and join one or more of the regional (RGGI or WCI) programs (Florida, 2008).

A federal Canadian scheme

Canada is implementing an emissions trading scheme on 1 January 2010 for facilities with emissions over 100 kt CO2/yr. (Canada, 2008a) Each facility will have an intensity allocation (tCO2/unit of output). For an existing facility, the intensity allocation for 2010 will be an 18% reduction from 2006. The intensity allocation then drops by 2% per year through 2015. For a new

facility the intensity allocation starts in the fourth year of operation, based on data from its third year of operation, and declines by 2% per year. To comply a facility can: reduce its own emissions; contribute to a technology fund; purchase surplus allowances from other participants; purchase emission reduction credits from non-regulated activities; purchase CDM credits; and use credits for early action. Allowable contributions to the technology fund decline from 70% in 2010 to zero after 2017 and rise from C$15/tCO2e in 2010 to over C$20/tCO2e after 2013. Credits will be issued for emission reductions by non-regulated activities, such as capture of landfill gas to generate electricity. CERs, with the exception of those from forest sink projects, can be used for up to 10% of a facility's target.In addition to the limited unilateral link to the CDM, Canada will consider linking with state, regional or national regulatory-based emissions trading schemes in the United States. Cooperation on emissions trading with Mexico will also be explored. Initially, export of allowances and credits from Canada will not be allowed so the scope for bilateral links will be limited. The intensity target and price cap are likely to deter other schemes from establishing a link with the Canadian scheme.

A federal US scheme based on the Lieberman-Warner bill

Bills to regulate greenhouse gas emissions have been introduced in the Congress regularly since 1998. Most of the bills include an emissions trading scheme. (Paltsev et al., 2008) The bill that has advanced furthest was America's Climate Security Act (ACSA); the Boxer substitute amendment to the Lieberman-Warner bill which was defeated in the Senate. While federal initiatives to regulate greenhouse gases are virtually certain in 2009, the nature of those initiatives is unknown given the new president, new chairs for key Congressional committees, and Supreme Court decisions. (Hight and Silva-Chávez, 2008). Several of the recent bills would permit participants to use offset credits and foreign allowances toward their compliance requirements. The ACSA, for example, would have allowed:

- Credits for domestic offsets from LULUCF activities and emissions not covered by the trading scheme up to 15% of the cap for the year.
- Approved allowances and credits from other countries up to 5% of the cap.28
- International forest carbon credits for up to 10% of the cap for the year.
  If the limit on a particular category is not exhausted, units from other categories could be used. Unused units in each category could be carried over with no restrictions.

The ASCA would have included a limited unilateral link to emission reduction credits and emission allowances from other countries. The proposed restrictions would have excluded allowances from the Canadian scheme due to its intensity allocation and possibly excluded credits from facilities in Canada and Mexico that compete directly with American facilities. There was no provision in the bill for a bilateral link with another emissions trading scheme.
Canada has indicated an interest in linking with state, regional or national regulatory-based emissions trading schemes in the United States.

A federal US scheme based on the Waxman-Markey Proposal

The most significant initiative coming out of Congress since the 2008 elections is a discussion draft disseminated on 31 March 2009 in the House of Representatives by Henry Waxman and Edward Markey, titled the American Clean Energy and Security Act of 2009 (ACES 2009). The Waxman-Markey draft would capture approximately 85% of US GHG emissions. The Waxman-Markey draft also adopts an approach based on absolute targets. Its ETS would start out in 2012 with a cap that would be at least 3% below the 2005 level of greenhouse gas emissions from covered sectors, equaling 4,770 Mt CO2-eq. (Section 721). The cap would then decline to at least 20% below 2005 emissions by 2020, 42% below 2005 emissions by 2030, and 83% below 2005 emissions by 2050 (Section 703). Unlike the EU ETS and other US climate bills, the Waxman-Markey draft does not specify the details of allocation. Rather, the initial draft merely mandates the EPA with allocating and auctioning as yet unspecified amounts of allowances. Further details will be negotiated in the legislative process. While auction procedures are set out in greater detail, use of auctioning revenues is again not regulated. The Waxman-Markey bill foresees a mixed upstream-downstream system, with downstream coverage of electricity generators and large industrial sources (emitting more than 25,000 tons CO2-eq. per year) and upstream coverage of refiners and other fossil-based liquid fuel producers and importers as well as producers and importers of fluorinated gases and other GHGs. Natural gas local distribution companies (LDCs) would turn in allowances for the emissions of their customers that are not regulated downstream. The EPA could reduce emission thresholds for certain stationary sources, thereby bringing smaller facilities under the cap over time. The Waxman-Markey bill covers the entire Kyoto basket of GHGs and additionally nitrogen trifluoride and any other anthropogenic gas designated as a greenhouse gas by the EPA. The Waxman-Markey defines a number of preconditions for an offset programme to be eligible, such as having publicly published standards, methodologies, and protocols that require that credited emission reductions or sequestration are permanent, additional, verifiable, and enforceable.

In the Waxman-Markey bill, the total quantity of offsets allowed in any year cannot exceed 2 billion tons. The percentage of offsets follows the following formula:

Percentage of offsets= 2 billion/(2 billion + number of allowances in the previous year)

For the year up to 2020, this means an offset limit of about 30% of the allocation, to be split evenly between domestic and international offset credits. These offsets may be utilized by the system only in case that the USA is party to a bilateral or multilateral agreement which includes the developing host country of the offset project. International offsets can be sourced from sector-based reductions, credits issued by an international body such as the UNFCCC, and from reduced deforestation in developing countries. The draft bill states that 5 offsets equal 4 allowances, i.e. there is a discount factor of 0.8. This is to be valid for both international and domestic offsets. The bill gives little guidance as to what project types would be allowed in the domestic offset programme, but it sets general requirements for offset generation, such as additionality provisions, provisions for reversals of sequestered carbon in land-use projects, verification etc. The Waxman-Markey bill allows the use of international emission allowances from a qualifying international programme if the programme is run by a national or supranational foreign government, and imposes a mandatory absolute tonnage limit on greenhouse gas emissions. Additionally, the foreign programme has to be at least as stringent as the US programme, including provisions to ensure comparable monitoring, compliance,

enforcement, quality of offsets, and restrictions on the use of offsets. The owner or operator of an entity that holds an international emission allowance needs to then certify to the EPA that its international emission allowances have not previously been used to comply with any foreign, international, or domestic greenhouse gas programme. The bill does not limit the amount to which a covered entity can make use of international emission allowances, although the EPA may, by rule, modify the percentage of a covered entity's compliance obligation that may be met with international emission allowances. The Waxman-Markey bill also makes provision for early offset supply. The EPA is mandated with issuing an offset credit for each tonne of carbon dioxide equivalent of emissions reduced or avoided, or sequestered under an offset project that was started after 1 January 2001. This applies, however, only to reductions or avoidance of greenhouse gas emissions, or sequestration of greenhouse gases, that occur after 1 January 2009 and for which a credit was issued under any regulatory or voluntary greenhouse gas emission offset programme that the Administrator determines was established prior to 1 January 2009.

Under the current draft, a specified amount of allowances would be set aside each year for a "Strategic Reserve", from which allowances would be auctioned on a quarterly basis subject to a specified minimum auction price and a quantitative limit on the amount of allowances to be auctioned. The initial minimum price would be calculated on the basis of a model; after 2015, the minimum price would be set at "100 percent above a rolling 36-month average of the daily closing price for that year's allowance vintage". Given these high minimum prices, such "Strategic Reserve" auctions are clearly intended to avoid significant near-term price increases, as allowances from these auctions would otherwise not find purchasers. Moreover, the quantitative limit is initially set at 5% and, after 2017, at 10% of the aggregate number of allowances for each year. Proceeds from the strategic reserve auction would be used to purchase international offset credits from reduced deforestation, which would then be made available – subject to a 20% discount factor – as allowances for subsequent strategic auctions. Although such "Strategic Reserve" auctions would be unlikely to attract buyers except in the unusual event of a dramatic short-term price increase, the inflow of international credits may, in theory, raise the overall cap of the scheme.

The Waxman-Markey draft permits unlimited banking of allowances for use during future compliance years. The draft also establishes a rolling two-year compliance period, effectively allowing covered entities to borrow from one year ahead without penalty. In addition, allowances from two to five years in the future can be borrowed for up to 15% of the compliance obligation. Borrowed allowances have to be repaid with interest. Under the Waxman-Markey draft, the Federal Energy Regulatory Commission is charged with providing oversight of the carbon market by adopting regulations to preserve market integrity and facilitate compliance, for instance by preventing fraud, market manipulation, and excess speculation. Although the draft also mentions measures to limit unreasonable fluctuation in the prices of allowances, it does not specify the nature and scope of such measures. No further interventions into allowance prices and amounts are referred to in the draft.

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