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**Harmonisation between National and International  
Tradeable Permit Schemes: CATEP Synthesis Paper**

**by**

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## FOREWORD

This paper was prepared by Erik Haites (Margaree Consulting) for the OECD Global Forum on Sustainable Development: Emissions Trading and Concerted Action on Tradeable Emissions Permits (CATEP) Country Forum, held at the OECD Headquarters in Paris on 17-18 March 2003. The aim of the Forum was to bring representatives from OECD and non-OECD country governments together with representatives from the research community, to identify and discuss key policy issues relating to greenhouse gas emissions trading and other project based mechanisms for GHG emission reduction, such as Joint Implementation and the Clean Development Mechanism. The Forum also aimed to promote dialogue between the various stakeholder groups, and discuss policy needs in the design and implementation of tradeable emissions schemes. Forum participants included representatives from OECD and non-OECD governments, as well as from the research community. Those from industry and other institutions involved with emissions trading, joint implementation and clean development mechanism projects such as the European Commission and the World Bank were also represented.

The OECD Global Forums are one of the two pillars of the new architecture of the Centre for Co-operation with Non-Members, agreed upon by the Committee on Co-operation with Non-Members. The Global Forum on Sustainable Development (GFSD) provides a mechanism for achieving the OECD Ministers' outreach objective and will complement other work on sustainable development. Within the organisational framework of OECD, the GFSD will aim to facilitate a constructive dialogue between non-member and OECD economies on key issues on the sustainable development agenda.

This is the first of three synthesis papers presented by the Concerted Action on Tradable Emissions Permits (CATEP), a research network funded by DG Research of the European Commission and co-ordinated by the Department of Environmental Studies, University College, Dublin. The papers highlight key issues identified in CATEP research to date and cover selected themes presented and discussed at CATEP workshops hosted respectively by Fondazione Eni Enrico Mattei in Venice (2001), University College, London in London (2002), the World Economics Institute in Kiel (2002), and FIELD, UNEP and CEC in Budapest (2003). This paper provides a synthesis of papers and presentations on the theme: "linking and harmonisation of national emissions trading schemes".

The ideas expressed in the paper are those of the author and do not necessarily represent the views of the OECD or its Member Countries.

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## 1. INTRODUCTION

The papers and presentations that deal with “linking and harmonisation of national emissions trading schemes” focus on emissions trading schemes for greenhouse gases. Many Annex I Parties to the Kyoto Protocol are designing, or have implemented, national emissions trading schemes for greenhouse gases to help meet their national emissions limitation commitment under the Protocol. The designs of these national trading schemes are quite varied.

Increasing the number of participants in an emissions trading scheme usually reduces the cost of achieving the overall emissions limit. So linking two or more national emissions trading schemes offers the prospect of being able to meet the combined emissions caps at a lower total cost. Other potential benefits of linking include increased market liquidity, a more competitive allowance market for schemes with few participants, and more efficient technology development.<sup>1</sup> Can national trading schemes with different designs be linked or do the designs need to be harmonised? Which design features must be, or should be, harmonised to enable the potential cost savings to be realised? These are the broad questions addressed by the papers reviewed.

The answers to the questions depend to a considerable degree on the institutional setting assumed. The institutional settings assumed by the papers reviewed are:

- voluntary links between national trading schemes absent any international commitments;
- voluntary links between national trading schemes of Annex I Parties to the Kyoto Protocol prior to 2008; and
- voluntary links between national trading schemes of Annex I Parties to the Kyoto Protocol during the 2008 - 2012 commitment period.

The institutional setting affects how national trading schemes can be linked, so the synthesis is organised in terms of these three contexts. First it is useful to clarify some definitions.

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<sup>1</sup> Organisations developing low emissions technologies have a larger market with a single price for avoided emissions rather than several smaller markets with different prices.

## 2. DEFINITIONS

A national emissions trading scheme is one where the regulatory authority(ies) responsible for enforcing compliance is designated by the national government and all of the emissions sources with compliance obligations are located in that country. The emissions trading schemes implemented by Denmark and the United Kingdom are national schemes. So too are the schemes Member States would be required to implement to comply with the EU emissions trading directive and those that might be implemented by Canada, Japan, Norway, Switzerland and possibly other countries.

Two national emissions trading schemes are linked if one country's allowance can be used, directly or indirectly, by a participant in the other country's scheme for compliance purposes. National schemes are linked if the allowances can flow in either direction between the countries.<sup>2</sup> The link may be indirect. For example, the seller may exchange a national allowance for an assigned amount unit (AAU) that is transferred to a participant in the recipient country's scheme, which exchanges it for a national allowance that it uses for compliance.

The EU Directive and Kyoto Protocol establish international emissions trading schemes that link national trading schemes. The EU Directive, assuming it is adopted, will require that allowances be transferable between persons within the Community and that allowances issued by one Member State be recognised for the purpose of meeting a participant's obligations in another Member State.<sup>3</sup> Thus, the Directive will link the national greenhouse gas emissions trading schemes of all Member States from its expected commencement in 2005.

Assuming that the Kyoto Protocol enters into force, it will establish an international emissions trading scheme for Annex I Parties that can link national trading schemes in those countries. Each Party may establish rules governing acceptance of AAUs and other Kyoto units from, and transfer of Kyoto units to, other countries.<sup>4</sup> These rules are not expected to significantly restrict trade in Kyoto units. In that case national trading schemes in Annex I Parties can be linked through AAU transfers as described in the example above.

A country may be able to unilaterally link its emissions trading scheme to that of another country. Many national trading schemes allow any legal or natural person to own allowances and allow the owner of allowances to have them cancelled so that they can not be used for compliance. Country A can unilaterally link its emissions trading scheme to any other scheme that includes such provisions. Country A simply

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<sup>2</sup> A swap of Danish and UK allowances reported early in 2002 does not involve a link between the two schemes because the allowances continue to be used for compliance in their respective jurisdictions. The Danish allowances were sold to Shell for compliance with obligations in Denmark. Elsam, the seller, received UK allowances that will be banked or sold to another entity for compliance use in the UK.

<sup>3</sup> CEC, 2001, Article 12, paragraphs 1 and 2.

<sup>4</sup> The other Kyoto units are emission reduction units (ERUs), certified emission reductions (CERs) and removal units (RMUs). A Party may limit acceptance of Kyoto units to ensure that emission reductions are implemented domestically or for other reasons. A Party may restrict transfers of Kyoto units to ensure compliance with the commitment period reserve requirement.

decides to accept for compliance purposes allowances that a participant in its scheme has purchased and cancelled in country B's scheme. This does not permit country A's allowances to be used for compliance in country B, however that does not matter if the price in the absence of such a unilateral link is higher in country A than in country B. Such a unilateral link to the national emissions trading schemes of Annex I Parties is part of a bill recently introduced in the United States Senate to establish a national greenhouse gas emissions trading programme in that country.<sup>5</sup> Unilateral links are not discussed further.

### **3. VOLUNTARY LINKS ABSENT INTERNATIONAL COMMITMENTS**

Rehdanz and Tol (2002) consider links between national emissions trading schemes when countries determine their own emission reduction targets. In this case linking two trading schemes may cause the exporting country to increase its emissions target so that it can export more allowances. Here linking the schemes reduces the environmental benefits anticipated by the importing country when it agreed to link the schemes. To discourage the exporting country from raising its emissions target, the importing country could: discount imported allowances, apply a tariff on imported allowances, or limit the quantity of imported allowances.

Rehdanz and Tol find that a tariff or import quota can act as a deterrent to the adoption of a low emissions reduction target by the exporting country and so can protect environmental integrity. A quota on imported allowances is less costly to the importing country than a tariff. The import quota should be set equal to the quantity of imports under free trade with the exporter's original emission reduction target.<sup>6</sup> The importing country benefits from the trade in allowances despite the quota. The exporting country is better off with the limit on allowance imports than with no international trade in allowances, so allowance trading continues. Non-compliance by an Annex I Party with its emissions limitation commitment is equivalent to a country setting its own emissions target. This result, then, offers insight into strategies for limiting overselling by Annex I Parties if the current combination of a commitment period reserve and non-compliance penalties proves ineffective.

### **4. VOLUNTARY LINKS BETWEEN SCHEMES PRIOR TO 2008**

National trading schemes for greenhouse gases are already operating in Denmark and the United Kingdom (Hartridge, 2001). Additional schemes are expected to begin operation in the Member States of the European Union, Norway and possibly Canada, Japan and Switzerland prior to 2008 (Burkhardt, 2003;

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<sup>5</sup> United States Senate, 2003 and Haites, 2003.

<sup>6</sup> Policies to keep allowance imports constant are more effective than policies to keep the quantity of allowances issued by the exporting country or the aggregate emissions targets of the two countries constant.

Boemare and Quirion, 2002; Drexhage, 2003; Haites and Mullins, 2001; Takamura, 2003; Yamin, 2001). In addition, sub-national trading schemes are expected to be implemented in the states<sup>7</sup> of Massachusetts and New Hampshire (United States), the province of Alberta (Canada) and the state of New South Wales (Australia) during this period. Most non-government trading schemes have come to an end.<sup>8</sup>

The designs of the existing and proposed trading schemes vary significantly. Baron and Bygrave (2002) and Haites and Mullins (2001) review the designs of emissions trading schemes to determine which features preclude links between schemes. Both papers analyse possible designs rather than specific schemes because the detailed designs of proposed schemes are not yet known.

Both papers find few technical barriers to linking emissions trading schemes despite differences in their design. Where barriers exist, solutions are usually available. The design features that pose the greatest difficulty when linking schemes are the: allocation method, point of imposition, non-compliance penalty, banking of pre-2008 allowances into the commitment period, and trading restrictions.

### **Allocation method**

Allowances can be distributed by auction; free, based on output; or free, based on historic activity. The method used affects the total cost and/or aggregate emissions as well as the distribution of costs among participants. Adoption of different distribution methods can create competitive distortions when participants can sell their products in other countries. Different distribution methods do not preclude the use of one scheme's allowances by participants of the other scheme for compliance purposes. Linking can, however, accentuate or attenuate competitiveness impacts due to differences in the distribution methods adopted by the schemes.

Free distribution based on output is an implicit production subsidy. If one of the linked schemes, country C, uses such a distribution and the allowance price rises due to the linkage, the production subsidy is larger.<sup>9</sup> A higher allowance price due to the linkage would then stimulate production in country C and so enhance its competitive position relative to all other countries. The emissions associated with the increased production could lead to higher total emissions for country C or could lead country C to impose additional emission reduction obligations on sources to achieve its national emissions target.<sup>10</sup> If linkage

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<sup>7</sup> Oregon has a requirement for new energy facilities to offset part of their greenhouse gas emissions. Allowances or credits from emissions trading schemes can not be used to meet this requirement and the offsets purchased can not be traded, so this is not an emissions trading scheme. Although it does not have a regulatory requirement that new facilities offset part of their greenhouse gas emissions, Washington state requires this through its approvals process.

<sup>8</sup> The Pilot Emission Reduction Trading (PERT) project, the Greenhouse Gas Emission Reduction Trading (GERT) project and the internal greenhouse trading schemes at bp and Shell have come to an end. The Chicago Climate Exchange, which recently began operation for 2003-2006, is now the only non-government trading scheme.

<sup>9</sup> See Baron and Bygrave, 2002, sections 3.1 and 3.5; Boemare and Quirion, 2002, section 3; and Gielen et al., 2002, section 4.

<sup>10</sup> The additional reductions might be imposed on the participants in the trading scheme by reducing their allocations proportionally. Or they might be imposed on sources outside the scheme by adjusting the policies that regulate the emissions of those sources. Any combination of these approaches may be used.

causes the allowance price in country C to fall, the competitive distortions and emissions impacts are reduced.<sup>11</sup>

Allowance distribution by auction or free based on historic activity does not create competitive distortions.<sup>12</sup> Baron and Bygrave (2002) note that if one or more of the linked schemes uses an auction, allowing all participants in the linked schemes to participate in the auction is desirable. Free allocation based on historic activity requires a decision on how to treat new entrants. Schemes are likely to differ in their treatment of new entrants and this may affect where they locate.<sup>13</sup> Linking schemes may change the relative attractiveness of different jurisdictions for new sources and hence affect location decisions.

### **Point of imposition**

Energy related CO<sub>2</sub> emissions can be regulated at the point of release to the atmosphere (downstream) or at any point in the distribution chain for fossil fuels (upstream) by regulating the carbon content of the fuels.<sup>14</sup> Schemes with upstream and downstream designs can be linked provided the allowances use common units.<sup>15</sup> Exempting exports of fuels from the upstream scheme avoids possible double coverage of the emissions associated with combustion of those fuels.<sup>16</sup>

Emissions due to fossil fuel use by electricity generators can be regulated directly in a downstream design by requiring them to participate in the trading scheme. These emissions can be regulated indirectly by holding customers responsible for the emissions associated with the electricity they use. The emissions associated with electricity imported from a scheme with direct coverage into a scheme with indirect coverage are regulated in each jurisdiction. Conversely, the emissions associated with electricity imported from a scheme with indirect coverage into a scheme with direct coverage are not regulated. Linking schemes with direct coverage poses no problems. If one or more of the schemes being linked has indirect coverage, linking may require cumbersome arrangements to ensure that all emissions are properly accounted for in the combined regime.<sup>17</sup>

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<sup>11</sup> If all of the trading schemes to be linked distribute allowances on the basis of output, linking will strengthen the production subsidies in some countries and weaken them in other countries. The net effect is unknown a priori.

<sup>12</sup> Gielen et al., 2002 note that such a free allocation can have wealth effects that could influence competitiveness. They claim that such effects are likely to be less severe than those associated with a free allocation based on output.

<sup>13</sup> Baron and Bygrave, 2002, section 3.1.3.

<sup>14</sup> The CO<sub>2</sub> emissions due to combustion of a fossil fuel are very closely linked to the carbon content of the fuel. Upstream is sometimes considered to be the point at which each of the fossil fuel enters the national economy. Regulating the carbon content of fossil fuels at other points in the distribution chain is then called a mid-stream design. The upstream, mid-stream distinction is not important for this discussion.

<sup>15</sup> Baron and Bygrave, 2002, section 3.2.

<sup>16</sup> The emissions of the exported fuel would be covered through the carbon content of the fuel in the upstream scheme and again when the emissions due to combustion of the fuel are covered by the downstream scheme.

<sup>17</sup> See Baron and Bygrave, 2002, section 3.3 and Gielen et al., 2002, section 4.

### **Non-compliance penalty**

Emissions trading schemes require accurate monitoring, tracking of transactions, and effective enforcement of compliance. Penalties sufficient to deter non-compliance are one element of effective enforcement. A non-compliance penalty defined strictly in financial terms might be lower than the market price if the scheme is linked with other schemes.<sup>18</sup> Haites and Mullins (2001) argue that this situation would lead to non-compliance in the scheme with the lowest penalty. Baron and Bygrave (2002) suggest this need not be the case. Firms may be uncomfortable profiting from deliberate non-compliance and governments may restrict such purchases or sales through the registries. While that may be the case, the best solution is to ensure that linking does not create a situation where non-compliance may be rewarded. This requires not only appropriate non-compliance penalties,<sup>19</sup> but also confidence in the monitoring, verification and enforcement regime; the integrity of the registry; and the level of the “safety valve”<sup>20</sup> price.

### **Banking into the commitment period**

A government may authorise participants in its emissions trading scheme to bank pre-2008 allowances into the Kyoto commitment period to encourage early reductions. This awards some of the country's AAUs to reductions that occur prior to the commitment period and requires that emission reduction obligations during the commitment period be increased by a corresponding amount. Due to the increased obligations during the commitment period, countries are likely to limit banking into the commitment period, if it is allowed at all.

Linking a scheme that does not allow banking into the commitment period with one that allows such banking may lead to an inflow into the scheme that allows banking into the commitment period (Baron and Bygrave, 2002; Haites and Mullins, 2001). There will be a net inflow as long as purchased units increase the quantity that can be banked into the commitment period. The UK program allows direct entry participants to bank into the 2008-2012 period to the extent that they have over-complied with their targets (i.e., they cannot buy to bank). Such a rule effectively addresses this issue.

### **Trading restrictions**

The UK program has a “gateway” to limit flows from the rate-based (allocations tied to output) sector to the absolute (reductions in total emissions) sector. The existence of such restrictions could complicate attempts to link different programs (Haites and Mullins, 2001). For example, the Danish program, which has an absolute cap, could be linked to the absolute sector of the UK program and the proposed French program, which would allocate allowances on the basis of output, could be linked to the rate-based sector of the UK program. If the French and Danish programs were also linked, it could be used to circumvent the gateway in the UK program. The impact on trading restrictions of linkages with other programs must be examined on a case by case basis.

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<sup>18</sup> At times the price of allowances in the absolute sector of the UK program exceeded £10.00 (over US\$15) per metric ton of CO<sub>2</sub> during 2002. This was well above the Danish penalty of Dkr 40 (about US\$5).

<sup>19</sup> A non-compliance penalty defined as the loss of an allowance plus a financial penalty for each tonne of excess emissions will usually be higher than the market price of an allowance.

<sup>20</sup> The cost of meeting emissions targets is uncertain. To cap the compliance cost, some schemes adopt a safety valve. A safety valve is a relatively high price at which the regulator sells enough additional allowances to enable participants to comply. If the safety valve price in one scheme is lower than the market price when it is linked with other schemes, additional allowances would be issued until the market price fell to the level of the safety valve.

To repeat, differences in design present few technical barriers to linking emissions trading schemes. Clearly, linking schemes is easier if the designs are similar. The greatest barriers to linking schemes through mutual recognition prior to 2008 are time and political will. Most countries are still at an early stage in the design and implementation of their national schemes. The potential benefits that can be realised over the two or three years that links can be operational prior to 2008 may not justify the time and effort that would be required to negotiate such links. Devoting the resources to linking schemes during the commitment period is likely to yield greater benefits.

The political will to link schemes may be diminished by the higher emissions in some countries and the creation of winners and losers in each scheme. The country with the higher prices prior to linking becomes a net importer of allowances meaning that its actual emissions are higher than projected entering the commitment period (Haites and Mullins, 2001). This means it will have to continue importing allowances or make additional emission reductions to comply with its commitment, a significant difference from the situation analysed by Rehdanz and Tol.

Linking schemes creates winners and losers in each scheme. The buyers in the scheme with the high price prior to linking and the sellers in the low price scheme benefit from the link. Conversely, the sellers in the high price scheme and the buyers in the low price scheme lose as a result of the link. The creation of winners and losers is likely to weaken support for voluntarily linking trading schemes.

## 5. THE EU EMISSIONS TRADING DIRECTIVE

The EU Directive will establish an international trading scheme that links the national schemes of Member States from 2005 (Vis, 2001). The Directive harmonises many features of the national schemes, but allows other features to vary (Zapfel and Vainio, 2002). The Directive requires each Member State to establish a greenhouse gas emissions trading scheme that covers a well defined set of participants.<sup>21</sup> In addition, the point of imposition,<sup>22</sup> non-compliance penalty,<sup>23</sup> and other features<sup>24</sup> are harmonised. Boemare and Quirion (2002) conclude that the features harmonised by the Directive are quite similar to those harmonised by the Ozone Transport Commission NO<sub>x</sub> programme in the northeastern United States.<sup>25</sup>

National schemes are required to distribute allowances to participants at no cost during the 2005 - 2007 period. Member State governments have considerable discretion in setting the overall cap and in determining the allocations to individual participants.<sup>26</sup> Each national allocation plan must apply common

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<sup>21</sup> Some of the small states might not have enough participants to create a competitive allowance market. Linking the national schemes solves this problem and so increases the total number of participants.

<sup>22</sup> The Directive specifies a downstream design with direct coverage of the emissions by electricity generators.

<sup>23</sup> The penalty is loss of one allowance plus a penalty of at least EUR 40 for each tonne of excess CO<sub>2</sub> emissions.

<sup>24</sup> Annual compliance and common monitoring and registry requirements, for example.

<sup>25</sup> Boemare and Quirion, 2002, section 7.

<sup>26</sup> Member States are allowed to request that specific installations (not sectors) be allowed to opt-out of the scheme until 31 December 2007 at the latest. Such installations must be subject to similarly ambitious emissions

criteria, be reviewed by the Commission and other Member States, and may be rejected by the Commission for failure to comply with the criteria. A report for the Dutch government found that the criteria are not sufficiently clear and can be contradictory, thus allowing for differences in allocation with potentially important economic consequences (KPMG and Ecofys, 2002).

Each participant must be allocated a specified quantity of allowances, but the Commission notes that this quantity can be calculated using an output-related performance standard and a production forecast.<sup>27</sup> An allocation based on historic activity can increase profits for some participants, but does not protect competitiveness if capital is perfectly mobile (Boemare and Quirion, 2002). Given the differences in industrial structure and in existing environmental regulations across Member States, the Commission obviously found the task of specifying the allowance distribution to individual participants too daunting and chose to leave it to the Member States but with a review process to minimise the potential for economic distortion. Only experience can reveal whether the review process will keep economic distortions to a minimum or whether allowance distribution needs to be further harmonised.

Member States are free to decide on the extent of banking from 2005 - 2007 into the commitment period, but banking must be allowed within each period and between periods after 2008. Thus, the issues related to banking into the commitment period have not been resolved by the Directive. While Member States could introduce trading restrictions in their national schemes, the common design features required by the Directive and the requirement that allowances must be freely transferable throughout the Community make it unlikely that any Member State will introduce trading restrictions that pose problems for linking the schemes.

The Directive allows the Community to enter into agreements with non-members for mutual recognition of allowances between their greenhouse gas emissions trading schemes.<sup>28</sup> Norway has announced that it plans to launch its national scheme in 2005. Japan has stated that 2005 - 2007 will be the second step of a three step implementation process for greenhouse gas emissions trading (Takamura, 2003). Links with other trading schemes, by mutual recognition, has been identified as a desirable element of the second step. In Canada, attention has focused on design of a national scheme beginning in 2008, but implementation could begin earlier (Drexhage, 2003). Under the Swiss CO<sub>2</sub> law an emissions trading scheme could be implemented for 2008 - 2012, but ongoing negotiations with major industries have raised the possibility of a pilot scheme for 2005 - 2007 and links with other schemes (Burkhardt, 2003).

It is possible then, that Norway, Japan, Canada and Switzerland negotiate links with the EU emissions trading scheme and/or with each other beginning in the 2005 - 2007 period. However, several considerations reduce the prospects for links among schemes in these countries prior to 2008. First, all of these countries are expected to be net buyers during the 2008 - 2012 period, links with potential sellers make more sense than links with other buyers. Second, links will cause the actual emissions in some of the linked countries to be higher than planned entering the commitment period. Third, negotiating links is likely to involve considerable time and effort, and may require changes to the design of the linked schemes, at a time when all of the schemes are just being launched. Finally, the emissions trading schemes in several of these countries may not begin operation until 2008.

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reduction measures, including sanctions, to avoid creating competitive distortions. Requests for opt-out must be published and be agreed by the Commission.

<sup>27</sup> CEC, 2001, section 8.

<sup>28</sup> CEC, 2001, Article 24.

## 6. LINKS BETWEEN ANNEX I PARTY SCHEMES DURING THE COMMITMENT PERIOD

Article 17 of the Kyoto Protocol, if it enters into force, will establish an international emissions trading scheme for Annex I Parties that can link national trading schemes in those countries. The rules for international emissions trading were agreed as part of the Marrakech Accords in 2001.<sup>29</sup> The rules govern transfers of AAUs between the national registries of Annex I Parties. Parties must satisfy eligibility criteria to participate. Parties may establish rules governing acceptance of AAUs and other Kyoto units from, and transfer of Kyoto units to, other countries. Parties may designate which legal entities are allowed to have accounts in its registry and hence to own and trade AAUs.

The allowances used by a national emissions trading scheme in an Annex I Party after 2008 could be the country's AAUs or separate national allowances. To ensure compliance with the commitment period reserve, the export of AAUs will need to be regulated. If AAUs are used as the allowances in the national emissions trading scheme, some will need to be identified as exportable and others as for domestic use only. In practical terms an AAU that can only be traded domestically is equivalent to a separate national allowance. The exposition, then, will assume that the national schemes have national allowances.

National allowances can not be used by Annex I Parties for compliance with their national emissions limitation commitments under the Kyoto Protocol; only Kyoto units can be used for that purpose. Thus, links between national emissions trading schemes after 2008 must ensure that any international transfers lead to the appropriate transfers of Kyoto units as well. Assume that countries D and E are Annex I Parties eligible to participate in international emissions trading under Article 17 and that their national emissions trading schemes are linked by mutual recognition or through the EU Directive. Now assume that a participant in country D's scheme, entity D-1, wishes to sell surplus allowances to E-1, a participant in country E's scheme. The sale together with the appropriate transfer of Kyoto units can occur in either of two ways:

- Entity D-1 arranges with its government to exchange its surplus domestic allowances for country D AAUs. The government cancels the domestic allowances, so that allowable emissions are reduced. The AAUs are transferred to entity E-1 under the rules for international emissions trading. Entity E-1 arranges with its government to exchange the AAUs for an equal quantity of new domestic allowances, which it uses for compliance. This allows the emissions in country E to rise by the amount of the AAUs received. Call this the "exchange" model.
- Entity D-1 transfers the country D national allowances to entity E-1 using the provisions established by the registries for their national emissions trading schemes. Entity E-1 uses those allowances for compliance in the same way as country E national allowances. The international transfer of domestic allowances triggers an equal transfer of country D AAUs from the government of country D to the government of country E (Hobley, 2003). Call this the "shadow transfer" model.

The provision of the EU Directive requiring that allowances issued by one Member State be accepted by other Member States for compliance purposes suggests that national schemes subject to the Directive will need to use the "shadow transfer" model.<sup>30</sup> Implementation of this model raises several questions. Is each

<sup>29</sup> United Nations Framework Convention on Climate Change, 7<sup>th</sup> Conference of the Parties, Decision 18/CP.7, November, 2001.

<sup>30</sup> CEC, 2001, Article 12, paragraph 2.

international transfer of allowances matched by a shadow transfer of AAUs or is there a transfer of AAUs at regular intervals to reflect the net flow during the period? If each allowance transaction is matched, how are the government transfers triggered and what happens if a proposed government transfer violates the rules governing trades under Article 17? If government transfers occur at regular intervals, what is an appropriate interval and what happens if a proposed government transfer violates the rules governing trades under Article 17? How can government transfers be made if a Member State, such as Cyprus and Malta, is not an Annex I Party or if a Member State loses its eligibility to participate in international emissions trading under Article 17?

The “exchange” model resolves these questions by allowing international transfers to occur only if they are consistent with the rules for international emissions trading under Article 17 at the time of the transaction. It appears that both models could be used as long as transfers between two countries were governed by one model. For example, transfers between countries with national schemes governed by the EU Directive could be made using the “shadow transfer” model while transfers between EU Member States and other Annex I Parties could be made using the “exchange” model.

The Kyoto Protocol gives Annex I Parties complete freedom to choose the domestic policies to meet their national emissions limitation commitments. Annex I Parties that choose to implement national emissions trading schemes are free to design their own schemes; the Kyoto Protocol imposes no requirements relating to harmonisation of the national emissions trading schemes. The national schemes of Member States of the European Community will be subject to the EU Directive, but the schemes of other countries could have very different designs.<sup>31</sup>

As a result, most of the potential technical barriers to voluntary links between national emissions trading schemes prior to 2008 remain.<sup>32</sup> The methods of distributing allowances in different countries could create competitive distortions, although linking the schemes to the Kyoto mechanisms may attenuate or accentuate the distortions. Countries and entities that are adversely affected by the allowance allocation implemented by an emissions trading scheme may be able to use international institutions, such as the World Trade Organisation (WTO), to redress these impacts.<sup>33</sup> Differences in the point of imposition could lead to double coverage or exemptions of some emissions. However, each Annex I Party has an incentive to ensure that it receives allowances for all emissions it is accountable for if its trading scheme is linked with other schemes. This may require schemes that use indirect coverage of some sectors, such as electricity, to switch to direct coverage if the output of those sectors is exported to other Parties and may require schemes that have an upstream design to exempt fossil fuel exports (Baron and Bygrave, 2002).

The potential problems due to differences in non-compliance penalties also remain. Annex I Parties are subject to penalties for failure to meet their national emissions limitation commitments. Those penalties are not adequate to ensure compliance by participants in a domestic emissions trading scheme.<sup>34</sup> The importing country may decide to accept allowances even if they are issued to the seller at the safety valve

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<sup>31</sup> See Burkhardt, 2003; Haites and Mullins, 2001; and Takamura, 2003 for information on the proposed designs for Switzerland, Canada and Norway, and Japan.

<sup>32</sup> Baron and Bygrave, 2002, section 4 and Table 1.

<sup>33</sup> Member States of the European Community also have access to Community laws and institutions to redress adverse competitiveness impacts, although such impacts are less likely to occur due to the degree of harmonisation imposed on the emissions trading schemes of Member States by the EU Directive.

<sup>34</sup> The penalty is loss of 1.3 AAUs in the second commitment period for each tonne of excess emissions during the first commitment period. This penalty is effectively not collected until compliance is established for the second commitment period, probably 2019 or 2020. A delay of up to 10 years in collecting the non-compliance penalty is not appropriate for commercial firms.

price or if they leave the seller in non-compliance, as long as it gets the corresponding AAUs, because the extra emissions are the responsibility of the seller's government under the Protocol. However, the government of the buyer entity could also decide not to accept safety valve or non-compliance allowances in an effort to enhance the environmental integrity of the Kyoto commitments. The government would need to reject those transactions at the time they enter the national registry.<sup>35</sup> To be effective such a restriction would need to be adopted by almost all Annex I Parties.<sup>36</sup>

In summary, Article 17 of the Kyoto Protocol establishes an international emissions trading scheme capable of linking the national emissions trading schemes of Annex I Parties beginning in 2008. The rules governing international emissions trading under Article 17 impose no requirements for harmonisation on the national emissions trading schemes linked. Some design differences could create technical problems, although solutions are available and at least one of the governments involved has an incentive to solve the problem. Adverse competitiveness impacts due to differences in the distribution of allowances across national schemes may need to be addressed through institutions such as the WTO.

The EU Directive will apply to a relatively large number of the national emissions trading schemes and the Directive will impose even greater harmonisation on these schemes post 2008.<sup>37</sup> The opt-out provision is not available from 2008, the non-compliance penalties are higher after 2008, and differences related to banking into the commitment period no longer apply. The distribution of allowances is likely to be harmonised further after 2008. The Commission is required to specify a harmonised method of allocation for the 2008 - 2012 period and this is likely to incorporate auction of a share of the total allowances. Finally, the Directive allows additional sources and gases to be added to the emissions trading scheme post 2008, which may facilitate greater harmonisation with non-EU schemes.

The legal status of allowances in different national trading schemes and of Kyoto units has been discussed in two presentations at the CATEP Workshops (Yamin, 2001; Hobley, 2003). Hobley concludes that allowances in national schemes under the EU Directive are "property" in a legal sense with the property rights being protected by EU law, the European Charter on Human Rights and the domestic laws of Member States. The legal status of an allowance could differ in other national schemes; the Clean Air Act in the United States, for example, states that an SO<sub>2</sub> allowance does not constitute a property right.<sup>38</sup>

The Marrakech Accords state that "the Kyoto Protocol has not created or bestowed any right, title or entitlement to emissions of any kind on Parties included in Annex I."<sup>39</sup> This may mean that Kyoto units

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<sup>35</sup> In the exchange model it would be done at the time the AAUs are exchanged for domestic trading scheme allowances by the buyer. In the shadow transfer model, it would need to be done at the time the allowances enter the registry of the buyer's country. This would need to be implemented through the transaction log linking the registries of the national emissions trading schemes.

<sup>36</sup> Assume that country F does not allow imports of AAUs associated with safety valve and/or non-compliance allowances. Those AAUs could be sold to another Annex I Party (country G) that does not restrict imports of such allowances. Then country G's AAUs could be sold to country F, effectively circumventing country F's restriction.

<sup>37</sup> The EU Directive would apply to over 25 of the 37 Annex B country Parties. Since two countries have indicated that they will not ratify and some Parties are unlikely to implement national emissions trading schemes, there may be only four or five national trading schemes (Canada, Japan, Norway, Switzerland) not governed by the Directive.

<sup>38</sup> United States, *Clean Air Act*, section 403(f), "An allowance ... is a limited authorization to emit sulfur dioxide in accordance with the provisions of this title. Such allowance does not constitute a property right."

<sup>39</sup> United Nations Framework Convention on Climate Change, 7th Conference of the Parties, Decision 15/CP.7, November, 2001.

have a different legal standing than an allowance in a national emissions trading scheme. If all of the national allowances and the Kyoto units can be used to comply with an obligation to hold an allowance for each tonne of emissions and if the regulations clearly specify the conditions under which one unit can be exchanged for another, differences in legal status may have little practical impact. But the implications of differences in the legal status of allowances in the national emissions trading schemes and of Kyoto units on links between schemes has not yet been thoroughly analysed.

## 7. SUMMARY

It is technically possible to link national emissions trading schemes with widely divergent designs. Where design differences create potential problems, technical solutions are available. The greater the similarity of their designs, the easier schemes are to link.

During the 2005 - 2007 period the EU Directive, if it is adopted, will lead to the establishment of at least 25 national emissions trading schemes. The Directive specifies many of the design features of these schemes, but leaves the allocation of allowances, rules for banking allowances into the commitment period, use of the opt-out provision, and a few other design features to Member States. The resulting differences among Member State schemes are unlikely to undermine the links between the schemes established by the Directive. The Community may enter into agreements with non-members for mutual recognition of allowances between their emissions trading schemes, but few, if any, links of this type are expected prior to 2008 for practical reasons.

Beginning in 2008, Article 17 of the Kyoto Protocol establishes an international emissions trading scheme that can link the national trading schemes of Annex I Parties. It imposes no requirements for harmonisation on the national emissions trading schemes linked. Some design differences could create technical problems, although solutions are available and at least one of the governments involved has an incentive to solve the problem. Adverse competitiveness impacts due to differences in the distribution of allowances across national schemes may need to be addressed through institutions such as the WTO. Most of the national trading schemes will also be subject to the EU Directive and be subject to greater harmonisation after 2008.

The result is likely to be a progressive expansion and integration of greenhouse gas allowance markets over the next decade (Drexhage, 2003).

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