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**INTERNATIONAL EMISSIONS TRADING  
Under the Kyoto Protocol**

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## FOREWORD

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## EXECUTIVE SUMMARY

### Context and objectives

The Kyoto Protocol provisions on emissions trading and subsequent UNFCCC Conference of the Parties (COP) discussions leave many aspects of the system open for future decisions. The objective of this paper is to clarify several issues that are important considerations in deciding principles, modalities, rules, and guidelines for international emissions trading under Article 17 of the Protocol:

- i. participation by legal entities;
- ii. national and international systems for accounting for changes to assigned amounts as a result of trading and for verifying changes in ownership; and
- iii. encouraging compliance through the rules of the trading system.

These issues are inter-dependent. The types of participants in the trading system will affect national systems for registering transactions. Requirements for national systems will affect the functions needed at international level. Efforts to encourage compliance may influence decisions on national systems and eligibility to participate.

A conceptual model of an international emissions trading system is developed as a basis for the discussion in this paper. The model is based on Kyoto Protocol provisions as far as possible, and assumes minimum international institutional requirements, and strong reliance on national systems for Parties that implement domestic trading systems.

### Participation by legal entities

The participation of private sector entities in international emission trading would increase the number of trades and improve market efficiency through greater liquidity. Private sector participation would also reduce the potential for large sellers or buyers to influence market prices in their favour. Entity trading would not alter the fact that Parties, not firms, are ultimately responsible for meeting the Kyoto Protocol commitments.

Under Article 17 of the Kyoto Protocol, international emissions trading may take place among Parties with quantified national emission commitments, or “(initial) assigned amounts”. Participation by authorised legal entities is not included in Article 17, nor is it explicitly excluded. The conceptual model developed for this paper assumes that legal entities will participate, and that international emissions trading will take place between governments of Parties with national emission commitments, between private sector firms, and between firms and governments.

Decisions on which legal entities to authorise to participate in international emissions trading will be a sovereign issue for individual Parties. However, the eligibility of authorised legal entities to trade might be affected under international rules if there were a breach of eligibility requirements by the Party in which they are located.

### **Domestic emissions trading systems**

Parties may devolve some of the responsibility for greenhouse gas mitigation to private entities through a wide range of policies and measures, including domestic emission trading systems. Domestic emission trading systems could link directly to the international emission trading system and the other Kyoto mechanisms. In practical terms, this would mean that national governments would allow authorised entities to use parts of assigned amount (PAA), or tradable units from the other mechanisms, that are purchased from other countries to demonstrate entity compliance with domestic commitments. Similarly, national governments would allow authorised entities to sell PAA to an entity that is located in another country if their emissions are below their allowed level.

Countries are likely to implement different domestic emissions trading systems, depending on their institutional capacity, policies, and legislation, cultural preferences, and national circumstances. Some might choose not to implement a domestic emissions trading system but might still want to authorise one large legal entity to trade in the international system. Other countries might choose to implement a domestic emissions trading system, allowing domestic trades among entities, but might not to allow these entities to participate in the international emissions trading system.

### **Key requirements of an international emissions trading system**

#### National systems:

Most aspects of national systems can and should be left to the discretion of individual countries. However, decisions at the international level may affect certain features of national systems. There is a growing consensus that eligibility requirements should be established to ensure that adequate national systems are maintained by Parties that choose to participate in international emissions trading. One key function at the national level is to account for changes to the national pool of PAA that occur as a result of trading by both government and by private entities. Changes in the national holdings of PAA throughout the commitment period will, in the aggregate, affect the final level of any Party's assigned amount. A minimum international requirement for national systems is national accounting of changes to government and entity holdings of assigned amount. Another minimum international requirement for national systems is national records of all international transactions by the government or entities. Parties' could then check their records if ownership of PAA is disputed. These records should be available for international review if necessary.

#### International systems:

The simplest international system would simply compile and check Party reports of adjustments to their assigned amounts. The international review mechanism could investigate any inconsistencies among Party reports by checking the national records that Parties hold. If minor inconsistencies that are identified, the Parties concerned could rectify them without recourse to international procedures.

A more sophisticated international system, perhaps one that might evolve in the future, could record the change of title for each PAA that is traded. An international registry could receive electronic reports of the identification numbers of each PAA traded. The international registry would hold information about all transactions. A central computer check could then confirm that each PAA is held by only one Party or one entity.

Enhancing compliance through the trading system:

Ratification of the Kyoto Protocol will be an indication that Parties genuinely intend to meet their commitments. However, because of the legally binding nature of these commitments, many analysts and Parties have stressed the importance of responses to non-compliance.

In addition to Article 18 provisions, responses could be included in the rules for international emissions trading to enhance incentives for compliance with the Kyoto Protocol targets and to ensure the integrity of the trading system:

- eligibility requirements and insurance approaches act as preventive measures to encourage compliance by individual countries;
- devolving PAA (and the responsibility to reduce emissions) to entities that operate under strong domestic systems could help countries to achieve their assigned amounts at lower cost and increase the likelihood that Parties will meet their national emission commitments;
- liability provisions for transfers and suspension of trading privileges could form part of a broader set of responses for Parties that do not comply; and
- making entity eligibility to trade contingent on compliance by the Party in which they are located would create a domestic constituency for compliance.

## 1. INTRODUCTION

In December 1997, the Kyoto Protocol established quantified emissions limits for industrialised country Parties listed in Annex I of the United Nations Framework Convention on Climate Change (UNFCCC). Article 17 of the Protocol established that these Parties may participate in emissions trading to help them meet their emission commitments. The next step in the development of international emissions trading under the Kyoto Protocol is definition of “relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading” (Kyoto Protocol Article 17).

The objective of this paper is to clarify several technical issues that are important for UNFCCC Conference of Parties (COP) decisions on international emissions trading: participation by legal entities; national systems for accounting changes to assigned amount and recording changes in ownership of parts of assigned amount (PAA). These issues are important for two fundamental parameters that will affect the success of an international emissions trading system: environmental effectiveness; and economic efficiency.

To be environmentally effective, an international emissions trading system requires a binding upper limit on total emissions that are in the trading system. The 5.2 per cent reduction from 1990 emission levels in industrialised country Parties is the environmental constraint on which international emissions trading under the Kyoto Protocol is based. The tradeable commodity, which is derived from Annex I Parties' assigned amounts, must be clearly linked to actual emission levels. For every transfer that enables one Party to increase its assigned amount (and increase its emissions) there must be a corresponding decrease in the assigned amount of another Party or Parties. To ensure this, a trading system requires strong systems for estimating emissions, accurately accounting changes to assigned amounts as a result of trading, and verifying changes in ownership of PAA.

Environmental effectiveness also enhances the economic efficiency of an international emissions trading system. Market confidence will be higher if strong monitoring, accounting and verification systems are in place, which will encourage trading and lower transaction costs. National compliance with Parties' final assigned amounts (adjusted for transfers and acquisitions) will provide the rationale for trading and also enhance market certainty. In addition, for economic efficiency a trading system should be competitive, open and transparent, include a wide range of participants, gases and activities, and have low transaction and administration costs.

Other important, but more political, issues such as equity and “supplemental to domestic action”, are not discussed in this paper.

The discussion is structured as follows:

- section 2 describes a conceptual model of an emissions trading system which provides a basis for the discussion in the rest of the paper;
- section 3 addresses participation by Parties and legal entities;



- section 4 considers minimum international requirements for national systems for accounting for changes to national assigned amounts and verifying changes in ownership of parts of assigned amount;
- section 5 discusses possible ways to enhance compliance through the trading system;
- conclusions are presented in section 6.

## 2. CONCEPTUAL MODEL OF A TRADING SYSTEM

The following conceptual model is used as a basis for the discussion of the technical questions in the rest of this paper. This model is based as far as possible on the Kyoto Protocol provisions. It assumes minimum international institutional requirements and strong reliance on domestic systems for monitoring and compliance. The model is a working example and is not recommended as the best or only possible model.

*System-wide emission limit:* The Kyoto Protocol places an upper limit on the total quantity of emissions in industrialised countries by establishing quantified national emission commitments or “initial assigned amounts” for the commitment period 2008 to 2012 (Article 3). Assigned amounts for each Party are listed in Annex B of the Kyoto Protocol. Individual Parties’ assigned amounts may increase or decrease as a result of transactions; in aggregate, parts of assigned amount will be added to the assigned amount of a Party that buys, and subtracted from the assigned amount of the Party that sells. However, Article 17 emissions trading will not alter the system-wide emission limit among all Parties with Article 3 commitments.

*Tradeable units:* The tradeable commodity for international emissions trading is derived from national assigned amounts. The units traded will be parts of assigned amounts (PAA), expressed in tons of CO<sub>2</sub> equivalent (Article 3.1). In the case of Article 6 Joint Implementation (JI) among industrialised country Parties, the tradeable commodity is referred to in the Kyoto Protocol as emission reduction units (ERU). Certified emission reductions (CER) is the term used in the Protocol for emission reductions that industrialised countries purchase from developing countries. ERU<sup>1</sup> and CER from these mechanisms will be inter-changeable with PAA once they have been added to an Annex I Party’s assigned amount. A global warming potential weighting index will be used to convert other greenhouse gases into CO<sub>2</sub> equivalent units so that they are inter-changeable. Each unit will have a unique identification number that corresponds to information about the country of origin and the commitment period for which the PAA was issued.

*Gases and sinks:* National assigned amounts incorporate emissions of six greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, and SF<sub>6</sub>) from the energy sector, industrial processes, solvents and other product use, agriculture, and waste. Adjustments to assigned amounts for changes in carbon stocks as a result of activities under Article 3.3 (and potentially under Article 3.4) in the land-use change and forestry sector, will also be part of the tradeable commodity. Transfers of PAA by governments based on national assigned amounts will therefore include emissions of all six greenhouse gases and some sequestration.

*Limiting trading to certain sources:* Individual Parties could choose to limit trading by domestic entities to certain types of emission sources. The rationale would be to limit trading to certain greenhouse gas sources and sinks that can be monitored or estimated accurately. Limitations such as this on domestic firms would be a domestic decision for each Party to make and would not require rules at the international level.

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1. All acronyms used in this paper are defined in the glossary on page 29.

*Timing for beginning trading:* Trading could begin at any time. Trading that occurs before the first commitment period will be in the form of forward or futures trades (contracts to buy or sell PAA for the first commitment period). However, only trades formally recorded by a Party according to the defined principles, modalities, rules, and guidelines that are to be agreed under Article 17 will be recognised for the purposes of compliance with the Protocol.

*Period of validity:* Any part of a Party's allocation that is not used for compliance in the first commitment period will remain valid for use or sale in the future (i.e., it can be "banked"; Article 3.13).

*Traders:* Under this model, both governments and legal entities will trade. National governments will decide which legal entities they will obligate to reduce emissions and authorise to trade in order to meet their obligations at lower cost. In addition, any individual or an entity that does not have an emission obligation could buy PAA and hold them or sell them to others.

*Domestic trading systems:* Parties may devolve some of the responsibility for greenhouse gas mitigation to private entities through a wide range of policies and measures, possibly including domestic trading systems. Under a domestic emissions trading system, this devolution of responsibility is typically administered by placing limits on entity emissions, issuing PAA to entities (e.g., by giving PAA to entities that are responsible for emission mitigation, or auctioning PAA to the highest bidder).

A key aspect of domestic emissions trading systems is that Governments allow entities that have an obligation to limit their emissions to use PAA purchased from other entities (for example an entity with lower mitigation costs) to justify emissions above their initial allowed level. Similarly, national governments accept that if entity emissions are below their allowed level, the entity can sell PAA to another entity (that may have higher mitigation costs). Any emissions above entities initial allowed levels must be matched by corresponding emission decreases below the initial allowed level of other entities (or increases in sequestration). Entities that are responsible for emission mitigation are required to surrender PAA equivalent to their emissions to the government at the end of a specified period. The government monitors entity emissions and ensure that entities surrender the correct number of PAA to match their emissions. If entities do not comply the government could impose penalties under domestic law.

*National accounting and recording systems:* Each government that has a domestic trading system will implement a system for monitoring entity emissions and ensuring that entities surrender the correct number of PAA to demonstrate compliance. National governments should keep track of the impact of entity and government transactions on the national assigned amount and periodically report this information to the international community. National governments should also be responsible for ensuring that changes in ownership of PAA can be verified.

Table 1 below gives an example of how a national system might record transactions of different types. Party A's initial assigned amount is 100 million tons of CO<sub>2</sub> equivalent. Party A allocates 20 million tons of its assigned amount to two entities; Aa and Ab receive an allocation of 10 million tons of PAA each. The government requires both Aa and Ab to limit their emissions to 10 million tons. The government authorises them to trade PAA with other domestic entities or entities in other countries to meet their emission obligations. The government of Party A is left with 80 million tons of PAA that has not been allocated to entities. Over the commitment period, the government decides to transfer 5 PAA to Party B and to acquire 2 from Party C, leaving 77 PAA in the government's account.

Entity Aa sells 3 million tons worth of PAA, giving it an adjusted PAA holding of 7 million tons of CO<sub>2</sub> equivalent. Entity Aa's emissions are 7 million tons of CO<sub>2</sub> equivalent at the end of the commitment period, so it surrenders its entire holding of PAA to the government. Entity Ab acquires PAA equivalent to 5 million tons of CO<sub>2</sub> equivalent, giving it an adjusted PAA holding of 15 million tons. Entity Ab's

emissions are only 10 million tons of CO<sub>2</sub> equivalent, so it surrenders 10 million tons worth of PAA and banks 5 million tons.

Two entities - a broker and a non-governmental organisation (NGO) - have no initial PAA holding, and no requirement to surrender PAA to demonstrate compliance with an emission obligation. The broker Ac buys 11 million tons worth of PAA, sells 5, and chooses to bank 6. The NGO Ad buys and retires 10 million tons worth of PAA. The government records each transaction and keeps track of the change to the national assigned amount, which changes from 100 to 94 as a result of the aggregate international transactions by the Party and entities.

The example in table 1 does not show the details of national records. For each PAA, national governments will maintain a record of the holder, identification numbers, and buyers or sellers in their national recording systems. These records will enable a government to verify that part of its assigned amount had been bought by another Party or entity.

*International systems:* An important international function is to ensure that national systems meet any international requirements that are agreed under Article 17 of the Kyoto Protocol. It will also be important at the international level to ensure that unique identification numbers are issued by each Party for all PAA that could potentially be transferred. National governments will be responsible for ensuring that entities comply with their domestic emission obligations and that national emissions are within the final assigned amount. National governments will also report adjustments to holdings of PAA and to the assigned amount that occur as a result of trading. The international system will compile reports from Parties on changes to assigned amounts as a result of transfers and acquisitions. The international review mechanism could check national records if inconsistencies are found among Parties' reported changes in assigned amount or if ownership of PAA is disputed.

**Table 1: National system for accounting for changes to holdings of PAA and assigned amount**

Party	initial holdings following distribution of PAA to entities	Transfers	Acquisitions	Adjusted holding	PAA used for entity compliance, and available for national compliance	PAA retired	PAA banked
Party A initial assigned amount = 100	80	- 5 (to Party B)	+ 2 (from Party C)	77	77	0	0
entity Aa (electric utility)	10	- 2 (to a utility in Party B) - 1 (to entity Ac)	0	7	7	0	0
entity Ab (coal mine)	10	0	+5 (from Ac)	15	10	0	5
entity Ac (broker - no obligation)	0	- 5 (to Ab)	+10 (from Party C) + 1 (from Aa)	6	0	0	6
entity Ad (NGO - no obligation)	0		+10 (from Party C)	10	0	10	0
Total	100			115	94 (final assigned amount)	10	11

### **3. PARTICIPATION BY PARTIES AND LEGAL ENTITIES**

#### **3.1 Participation by Parties**

The Kyoto Protocol establishes that Parties may participate in emission trading to help them meet their Article 3 commitments. The Protocol language implies that trade in parts of assigned amounts can take place between governments of Parties with Article 3 commitments who have ratified both the UNFCCC and the Kyoto Protocol. Trading could begin as soon as the Kyoto Protocol has entered into force (which is likely to be after 2001). Trading could begin sooner than this, but any transfers from a Party that did not ratify the Protocol, or transfers that are not consistent with any principles, modalities rules and guidelines that are agreed following the transaction, might not be valid.

A Conference of Parties may establish requirements that Parties with Article 3 commitments must meet in order to be eligible to participate in international emissions trading. Any failure to meet these requirements could prevent a Party from trading until the failure is corrected. Eligibility could be contingent on other provisions of the Kyoto Protocol, such as meeting guidelines for Article 5 (national systems for emission inventories) and Article 7 (reporting). These requirements are discussed in section 0 below.

#### **3.2 Participation by legal entities**

Ideally, Parties should be able to devolve responsibility for emission mitigation to entities and to authorise them to trade internationally in order to meet these obligations. Participation by authorised legal entities is not included in Article 17, which leaves most aspects of international emissions trading open for future decisions. Because Article 17 does not explicitly exclude legal entity participation, it could be considered that participation by authorised legal entities is permitted.

There are many benefits to allowing legal entities to participate in international emissions trading, compared to a system in which only governments trade on behalf of Parties. The participation of many smaller private sector participants is likely to increase the number of trades and to improve market efficiency through greater liquidity. Legal entity participation would also reduce the potential for large sellers or buyers to influence market prices in their favour. Entities with domestic emission obligations would have strong incentives to exploit all cost-effective options for greenhouse gas reductions in their operations because they can profit by selling emission reductions. Transaction costs would be relatively low among companies that regularly do business with each other or within multi-national companies.<sup>2</sup>

In environmental policy, legal entities usually fall under the jurisdiction of domestic legal, monitoring, and enforcement systems. These are more effective compliance instruments than those currently available at the international level. Devolving PAA (and the responsibility to reduce emissions) to entities that operate under strong domestic systems could help countries to achieve their assigned amounts at lower cost. Participation by legal entities under domestic law would therefore increase the likelihood that Parties will meet their national emission commitments.

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2. Nussbaum, in OECD 1992.

### **3.3 Authorisation to participate in international trading**

Decisions on which legal entities to authorise to participate in international emissions trading should be left to individual Parties. However, certain minimum international requirements for entity authorisation may be necessary given the potential impact of entity transactions on national assigned amounts.

Entities that could potentially participate in international emissions trading include private sector firms, local and municipal governments, non-governmental organisations, brokers, and individuals. The main entity participants are likely to be entities that are legally responsible for a domestic emission obligation. The ability to monitor emissions at the entity level will be a key domestic consideration for determining which entities should have such obligations. These entities will have a domestic responsibility to surrender sufficient PAA to offset their emissions (along with proof of their emissions) in order to comply with their domestic obligations. International transactions by these entities will alter the amount of emissions that they can legally emit under their domestic programmes. The emissions of these entities, together with PAA that they surrender, will affect the assigned amount that the Party has available to demonstrate national compliance. These entities would therefore need to be authorised to trade and hold PAA.

Entities such as brokers and non-governmental organisations that do not have domestic emissions obligations may also choose to acquire PAA and then re-sell, hold, or retire them. These entities will not have a domestic obligation to surrender PAA to the government. Changes in their holdings of PAA will not affect the national assigned amount. Governments might choose to require that these entities must obtain authorisation before they can trade internationally. Government authorisation of all traders may be relatively simple. It would be possible, for example, for a government to issue a one-off authorisation allowing any domestic entities or individuals to participate in international trading as long as they report their PAA holdings to the Party's national recording system. However, government authorisation of such traders need not necessarily be a requirement under the international trading rules. An international requirement may establish that governments must record PAA holdings and changes in PAA holdings in order to verify changes in ownership (discussed in section 0 below), and the PAA that are held by each Party. Therefore governments will need a mechanism for tracking changes in entity PAA holdings and this will in turn require some method of registering each PAA holder.

An issue for further consideration is whether legal entities that operate within strong domestic monitoring and enforcement systems could be permitted to continue to trade internationally even if the Party in which they are located is not eligible to trade. A trading system would work better if participants' eligibility to trade were not affected by elements beyond their control, such as lack of greenhouse gas mitigation effort by other sectors. However, if entities continue to trade after their Party has been suspended from trading for non-compliance, the integrity of these transactions, which rests on national compliance, may not be assured. If legal entities were prevented from trading for a breach of the eligibility requirements by the Party, an influential domestic constituency would exist to ensure the integrity of the Party's monitoring and recording systems and to encourage the Party to rectify any problems quickly (or to prevent a problem from occurring).

## 4. NATIONAL AND INTERNATIONAL SYSTEMS

### 4.1 Compatibility among national systems

National systems are the most effective mechanisms for ensuring the integrity of an international trading system because they are backed by domestic law.

Some national accounting and recording procedures and systems can be expected to be established under domestic emissions trading systems regardless of whether international trading by private entities is authorised and the type of domestic trading system that is implemented. Under domestic emission trading systems, governments are likely to:

- devolve responsibility for emission mitigation to some entities by placing some form of limit on their emissions;
- distribute PAA to entities (for example by giving PAA to entities that are responsible for emission mitigation, or auctioning PAA to the highest bidder);
- keep records of private entities that have emission obligations, monitor their emissions, and check that they surrender the correct number of PAA at the end of their domestic compliance period; and
- record changes in holdings of domestic PAA among all domestic entities, both those with and those without emission obligations.

Different types of national accounting and recording systems may be implemented depending on different Parties' cultural, institutional and legal frameworks. National systems may also vary depending on the entities they authorise to trade, domestic institutions, national capacity to establish and maintain emission monitoring systems, and systems for accounting and recording changes in PAA holdings.

International guidelines for national systems should ideally be established before significant amounts of international emissions trading takes place. Guidelines will have to take into account approaches and institutional capacity for implementing domestic emission trading systems in different countries. Ideally, incompatibilities that could arise at the interface of several national systems should be identified and considered early. Most aspects of national systems can be left to the discretion of individual Parties. It is important to avoid duplicating functions at the international level that are already needed in domestic emission trading systems. However, compatibility in some aspects of national systems would facilitate trading. International requirements should ensure that there is sufficient compatibility among national systems to facilitate transactions and to guarantee the overall environmental performance of the trading system. For example:



1. the units traded should be easily transferable in different Parties' records (some form of electronic accounting that gathers comparable information in a consistent format could be implemented in most countries);
2. all PAA that could potentially be traded should have a unique identification number according to an internationally consistent format;
3. minimum standards for national systems for recording and verifying all PAA holdings and subsequent changes in holdings as a result of trades, and for accounting for changes to national assigned amounts as a result of trading.<sup>3</sup>

National systems for recording, verifying, and accounting are discussed in sections 0 and 0 below.

#### **4.2 Accounting for changes to assigned amounts**

The international system must be able to verify that for every transfer that enables emissions to increase above an assigned amount in one Party there is a corresponding decrease in emissions elsewhere. The international community must be confident that the overall system limit on emissions (which underpins both the environmental and economic effectiveness of the trading system) will be achieved and that it will be possible to verify this.

The information that is relevant to changes in assigned amount includes the number of PAA used by entities to demonstrate their compliance with domestic emission obligations and transfers and acquisitions by the government. Reporting requirements under domestic law are the most effective mechanism for gathering information from private entities. The precedent established for national reporting under the UNFCCC is self-reporting by Parties. National systems are therefore a logical point for recording information that is relevant to changes to assigned amount as a result of trading by entities and Parties, at least initially.

National systems must differentiate among different types of holdings of PAA and account for them appropriately. Some holdings of PAA should not automatically lead to adjustments of Parties' assigned amounts. For example, PAA that are held by an NGO that wishes to retire them from the market permanently should not be added to the assigned amount of the Party in which the NGO is located. If any entity wished to retire or bank units for use in later commitment periods, the retired or banked units should be recorded by the government before the end of the commitment period. The government would report retired and banked units (in aggregate) to the international system at the end of the commitment period along with its report of changes to assigned amounts. This information would enable the international system to check that the overall system is in balance (see table 2 below).

Information on changes to the national assigned amount (including net amounts sold to or bought from each Party) must, at the latest, be available when compliance is assessed after the end of the commitment period. More frequent reporting would be useful to give an indication of Parties' interim progress towards meeting their national emission commitments and likely future demand and supply of PAA. The Kyoto Protocol affirms that emission inventories will continue to be submitted annually (Article 7.3), and that this information should include the necessary supplemental information for the purposes of ensuring compliance with Article 3 (Article 7.1). It may be useful for information on transactions to be part of the supplementary information reported along with annual inventories (Corfee 1998). Annual information

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3. One of the eligibility requirements that is supported by most Annex I Parties is that each Party wishing to trade should maintain national systems for accounting and tracking holdings of PAA. FCCC/SB/1998/MISC.1/Add.1/Rev.1 and FCCC/SB/1998/MISC.1/Add.3

may be of use in considering a Party's potential risk of not complying with their assigned amount, but interim information will not indicate what a Party's final assigned amount or emissions will be at the end of the period.

#### **4.3 Verifying ownership**

National assigned amounts (adjusted for transfers and acquisitions) are both the obligation from which the tradeable commodity is derived and the basis for compliance assessment. Verifying ownership of the PAA that are held by the government and obligated entities is therefore linked to national compliance. The capacity to verify all holdings of PAA (those held by governments, obligated entities and non-obligated entities) is also critical for an effective, open and transparent emissions trading market.

The information that is required for verifying ownership of PAA includes the identification number of the PAA (which will correspond to information on the country of origin and period in which it was issued), the buyer and seller, and the national system in which the PAA are held. This information could be reported directly by the buyer and seller to an international registry. However, it is likely that an international institution of this sort would take some time to establish. In the absence of an international registry, Parties will need to maintain complete records of transactions by the government and by entities. If an entity or Party claims ownership of PAA, the Parties concerned could check their records of each transfer and acquisition and reconcile any inconsistencies. An international review mechanism can then check Party records if inconsistencies are not reconciled by Parties.

To verify ownership, the minimum international requirement for national systems is that they have the capacity to record holdings of PAA, and changes in holdings due to trading, within an agreed period of time. A short settlement period should ideally be the basis for all transactions to facilitate the efficient operation of the international trading market. However, there could be differences in national capacity for recording transfers and acquisitions.

#### **4.4 Minimum functions for international systems**

If PAA holdings and both domestic and international transactions are recorded by governments, the *minimum* international function that is needed is a system to record and check changes in each Party's assigned amount as a result of international trading. Parties would report their national aggregate transfers and acquisitions to the international system. A minimum international double entry recording system would show the aggregate transfers and acquisitions for each Party, the Parties involved, and changes in the assigned amounts of each Party as a result of international trading. These international records would highlight any inconsistencies among reports from individual Parties. A simplified example of international records at the end of the first commitment period is given in Table 2.

**Table 2: International records of Party reports on adjustments to assigned amounts**

Party	Initial assigned amount	Transfers during commitment period	Acquisitions during commitment period	units retired	units banked	Final assigned amount
A	100	- 7 (to B)*	+ 22 (from C)	10 (NGO)	11 (5 - entity Ab 6 - broker)	94
B	100	- 1 (to C)	+7 (from A)	0	0	106
C	100	- 22 (to A)	+ 1 (from B)	0	0	79
Total	300	-25	+25	10	11	279

\*International records would include the identification numbers of units transferred. Identification numbers are not shown here to simplify the example and save space. The transactions of Party A match those in Table 1.

In table 2, the total of all Parties final assigned amounts is 279 at the end of the commitment period after trading, compared with 300 in the initial assigned amounts. The missing 21 PAA are accounted for as banked or retired, so in this case there would be no need to check the Parties' records of individual transactions. If the Party reports were not consistent, their records of transactions could be checked to see whether an error had occurred at the entity or the national level. For example, if an entity did not record its sale to another entity in another country but the buying entity recorded a purchase, the Party of the seller might report an adjusted assigned amount that is too high. The adjusted assigned amounts reported by the two Parties would not be consistent so a check of Party records would reveal that both the national registry of the buyer and seller had recorded that they hold the same PAA. Once inconsistencies are identified and resolved, the Parties could submit the correct information to the international system.

A more sophisticated international system, perhaps one that might evolve in the future, could record the change of title for all PAA that are traded. An international registry could receive electronic reports of the identification numbers of each PAA traded. The international registry would hold information about all transactions and a central computer check could confirm that each PAA was held by only one Party or one entity.

A central international registry of all transactions might reassure traders of the validity of transactions, avoid duplication of national registry functions, reduce costs, and reduce the potential for recording errors. An international registry would also make it easier to check inconsistencies in Party reports on aggregate PAA transactions and adjustments to assigned amounts. It may be administratively simpler for some or all traders to hold international accounts in an international registry or for countries to consolidate their national registries. Consider, for example, an entity in a country that does not have a system for recording entity transactions that buys PAA and wishes to retire them from the market permanently. The entity could register those PAA as "retired" with the international registry or with the registry of another country.

Reporting each individual transaction to an international registry is not a minimum requirement for the trading system, however. An international registry might be more difficult to develop at the outset than a network of national systems. In addition, national systems can use domestic law to ensure that entities report information on changes in their PAA holdings.

## **5. ENHANCING COMPLIANCE THROUGH THE TRADING SYSTEM**

Preventive measures to encourage compliance and responses to non-compliance with trading rules are extremely important for a trading system. The discussion below considers options for enhancing the integrity of international emission trading under Article 17 of the Kyoto Protocol. Two other OECD papers discuss the broader issue of compliance with commitments under the Protocol (Corfee 1998 and Werksman 1998). The following discussion is preliminary. Further analysis of the merits of each approach or option is required.

### **5.1 Commitments**

There are many types of commitment in the Kyoto Protocol, such as reporting, policies and measures, technology transfer, finance, education, research, and demonstrable progress by 2005 in addition to quantified limits on emissions for Annex I Parties. Ratification of the Kyoto Protocol will be an indication that Parties genuinely intend to meet these commitments. Many analysts and Parties have stressed that responses for non-compliance are needed to reinforce the legally binding nature of the Annex I Parties' quantified limits on emissions (e.g. Werksman 1998). Parties' commitments to report the information that is needed for assessing compliance is also very important for the international emissions trading system, particularly national systems for emission inventories under Article 5 and reporting under Article 7.

Compliance is important for the integrity of the trading system and, more generally, for the success of the Protocol. Strong and effective domestic compliance systems for entities that participate in emissions trading can provide a strong basis for the international trading system. In addition, a number of possible options to complement the compliance incentives under Article 18 of the Protocol could be included in the rules for international emissions trading. Compliance with the rules for emissions trading will also be an important aspect of a comprehensive compliance system. Possible responses for non-compliance with trading rules will need to be considered both in decisions on international rules for emissions trading under Article 17 and in decisions on non-compliance responses under Article 18.

There are two main compliance approaches for enhancing the integrity of the trading system and the Protocol: the first is to establish preventive measures that place minimum conditions on participation; the second is to establish responses in cases of non-compliance. These approaches are discussed below.

### **5.2 Preventive approaches to encourage compliance**

#### **5.2.1 Eligibility requirements**

There is growing recognition that Annex I Parties that wish to trade should meet and maintain minimum eligibility requirements. Eligibility requirements could include standards for the quality of emissions data

and for reporting.<sup>4</sup> Such requirements could prevent Parties with lower standards of emission monitoring and reporting from trading under Article 17. This would minimise the possibility that PAA transfers from a Party with a national inventory system that does not accurately reflect emissions would be used to increase emissions in another country. Eligibility requirements for Parties wishing to participate in Article 17 international emissions trading have been proposed by Annex I Parties in submissions to UNFCCC subsidiary bodies, for example:<sup>5</sup>

- Parties wishing to trade must comply with Articles 5 and 7 of the Kyoto Protocol (Umbrella Group and EU);
- Parties wishing to trade must establish and maintain a national system accounting and tracking PAA held or traded by the Party and/or its legal entities (Umbrella Group and EU);
- Parties wishing to trade must have adopted and ratified a compliance regime under Article 18 (EU only);
- Parties wishing to trade must demonstrate compliance with the rules of the emission trading system (EU only).

Minimum standards for national systems to monitor and estimate national emissions under Article 5 could be a pre-requisite for eligibility to join the international emissions trading system or to authorise entities to participate in international emissions trading. Alternatively, all Annex I Parties could initially be eligible to trade, but may subsequently lose this right if they fail to comply with trading rules and other Protocol provisions. Such standards could have equity implications due to differences in national capacities which would result in richer countries benefiting most from trading.

Good quality inventory data and national systems will be required under Article 5 of the Protocol even for those countries that choose not to trade. However, for Parties that wish to participate in international emissions trading it will also be important to ensure that they have the institutional capacity for accounting and registering PAA held or traded by entities or the Party as discussed in section 0 above.

Eligibility requirements for trading could provide an incentive for Parties to improve the quality of their emission data and reporting, and would facilitate compliance assessment as well as establishing a good base for trading. Emission data from entities that are monitored under domestic trading systems or other policies and measures might improve the quality of information used in national inventories. Information from independent sources that are not influenced by political considerations could be beneficial to the trading market and for compliance assessment. Eligibility requirements would also enhance the effectiveness of the market since traders would have greater confidence in the national systems run by Parties, such as the systems that track changes to assigned amount and verify the title to each holding of PAA. An important consideration, however, is that the eligibility requirements should not be so stringent as to prevent too many Parties from trading under Article 17.

Domestic trading systems which effectively enforce domestic entities' obligations, could also reinforce national compliance with national commitments.

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4. Current emission inventory estimates, although improving, are of varying quality and transparency (OECD 1998a, and UNFCCC/1996/12/Add.1).

5. The countries associated with the EU paper FCCC/SB/1998/MISC.1/Add.3 were: the European Community and its member states, and Bulgaria, Croatia, the Czech Republic, Latvia, Poland, Slovakia, Slovenia, and Switzerland. The countries associated with the umbrella group paper FCCC/SB/1998/MISC.1/Add.1/Rev.1 were: Canada, Australia, Iceland, Japan, New Zealand, Norway, Russian Federation, Ukraine, and the United States of America.

### 5.2.2 *Compliance reserve*

Parties could be required to hold a minimum reserve of part of their assigned amount either during or at the end of each year to ensure that they manage their emissions and assigned amount responsibly. This minimum balance could be based on an agreed portion of assigned amount per year. Under this approach a Party may have an assigned amount of 500 million tons of CO<sub>2</sub> equivalent for the commitment period. The Party could be required to hold a fifth (i.e. 100 million tons CO<sub>2</sub> equivalent) of its assigned amount as a minimum balance either during or at the end of 2008. In 2009 (either during or at the end - depending on the approach) the Party must hold 200 million tons CO<sub>2</sub> equivalent, and so on.

Because of the lag between emissions and data reported in national emissions inventories, it would be necessary to review the minimum compliance reserve for each country as the emissions data comes in. For example, if the minimum balance is based on one-fifth of the Party's assigned amount (equivalent to its base year emissions) and it becomes clear that the Party has made emission reductions so that its actual annual emissions have been lower than its base year emissions, then the compliance reserve could be decreased and more PAA could become available for possible transfer.

Alternatively, the minimum balance could be based on the Party's actual cumulative emissions at the end of each year. Under a cumulative emissions approach, at the end of each year, the Party would be required to set aside part of its assigned amount equal to its emissions in that year. The compliance reserve would thus reflect cumulative annual emissions throughout the commitment period.

## 5.3 **Possible responses to non-compliance**

### 5.3.1 *Liability*

Rules governing liability must be clear from the outset as part of the trading system design. Liability for the PAA that are transferred could potentially be an important tool to provide incentives for general compliance with commitments through the rules of the trading system.<sup>6</sup> Liability provisions apply to international emission trading transactions. They do not remove the need for consequences for non-compliance under Article 18. The options for liability provisions that have been discussed to date are summarised below: issuer liability (often referred to as seller liability); buyer liability; and shared liability.

*Issuer liability:* Under issuer liability it is the selling Party that is liable for national non-compliance. The Kyoto Protocol establishes that Parties must comply with national emission commitments as defined by their assigned amounts adjusted for PAA, ERU, or CERs transferred and acquired. This implies that issuer liability will be the norm in the absence of further decisions on liability with respect to the trading system. Under issuer liability, any part of an assigned amount acquired by a Party would be added to the buyers' assigned amount (regardless of the compliance status of the issuer). If a Party is not in compliance at the end of the commitment period, the government of that Party would have the responsibility to come into compliance or face consequences under Article 18. If the main participants in the international trading system are legal entities that operate under effective domestic monitoring and enforcement systems, issuer liability could be a simple and effective approach. However, the effectiveness of the issuer liability

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6. Depending on the liability provisions for trading, it is likely that clauses would be included in contracts to settle the question of who should pay for the greenhouse gas reductions in cases of non-compliance or invalidation of any PAA traded. These contractual provisions would probably be natural developments in response to some form of shared or buyer liability provisions being established in the principles, modalities, rules and guidelines for emissions trading. Brokers/exchanges guarantee settlement of the transaction, not the validity of the PAA traded.

approach (with or without trading) depends on the existence of an effective national compliance regime to ensure that Parties comply.

*Buyer liability:* The principle of buyer liability is that “any transferred ‘assigned amount’ should only contribute towards compliance by the acquiring Party to the extent that the transferring Party also complies” (Grubb, 1998). In effect, if the issuer Party does not comply, PAA that the Party had transferred would not be valid for use by the buyer for demonstrating compliance. The possible invalidation of PAA would discourage Parties and entities from purchasing PAA from Parties that are less likely to meet their emission commitments. PAA from potential non-compliers would be more risky (since they may not be valid for compliance) and the market would devalue PAA from Parties that are less sure to comply. Buyer liability would be more complicated to administer than issuer liability. For example, issuers will typically be both buyers and sellers of PAA, perhaps ending up a net seller and in non-compliance for a wide variety of reasons from changes in inventory methods to non-compliance by one large entity in the country with its domestic obligations. The question of which PAA should be invalidated would have to be resolved - invalidating the last PAA to be sold, or all PAA or discounting all PAA sold by the issuer proportionally; invalidating PAA sold by the government first so that domestic entities that comply are less likely to be penalised for national non-compliance. One Party’s non-compliance could also cause other Parties to fall into non-compliance, thus causing a chain reaction among a number of Parties that had acquired PAA.

*Shared or double liability:* Under shared issuer/buyer liability, transfers made by a non-complying Party would be reduced in quantity once non-compliance was discovered. For example, perhaps only 60% of the quantity transferred would be added to the buyer’s assigned amount (i.e. the PAA acquired would be discounted by 40% to enable the issuer to return to compliance). This discounting could be “across-the-board” for all PAA traded or it could apply to the most recent transfers (up to the quantity by which the Party has exceeded its assigned amount).

1. Article 6.4 opens up the possibility of a hybrid approach in the case of joint implementation projects that would include both issuer and buyer liability:

2. “If a question of implementation by a Party ...of the requirements referred to in this article is identified... transfers and acquisitions of emission reduction units may continue to be made after the question has been identified, provided that any such units may not be used by a Party to meet its commitments under Article 3 until any issue of compliance is resolved.”

This provision implies that any units acquired remain valid unless an issue of compliance is not resolved, leaving buyer liability as the last resort option if a question of implementation is not resolved. Non-compliers could be required to pay a penalty or to deduct the excess (plus a penalty) from the Party’s assigned amount for the next commitment period. If these options fail, or are deemed inadequate given a Party’s lack of capacity to reduce emissions or purchase PAA, buyer liability or shared liability could be invoked.

Liability responses to non-compliance, as with other approaches, will depend on why the Party did not comply. Non-compliance due to lack of capacity to track changes in holding of PAA or to enforce entity emission obligations would merit a different response than a rogue government trader that sells the Parties assigned amount unscrupulously.

### **5.3.2 *Conservative or escrow approaches***

Conservative approaches for estimating the amount of PAA that can be transferred, or setting aside funds from a transfer until compliance is demonstrated, could be used as a response to non-compliance. These approaches would increase the cost of meeting the national emission commitments and reduce incentives

to trade. However, further consideration of these approaches as responses to certain cases of non-compliance could be useful, for example if emission inventory and reporting requirements are not met.

*Conservative estimate:* Discount factors could be applied to units transferred to ensure that any trades err on the side of caution (ICF 1998). These discount factors might be set to ensure that for every unit of greenhouse gas reduction, only a percentage of a unit of PAA could be transferred. This would not be necessary for all trades, but it could be required for Parties that do not comply with article 5 and 7 requirements. It might be more appropriate to address this issue in the context of conservative estimates for emissions inventories rather than of traded amounts.

*Escrow accounts:* For transfers by governments that have not complied with their commitments, a portion of the proceeds from a transfer of PAA could be held in an escrow account until the seller's compliance is established (Haïtes 1998). If all of the "assigned amount" sold is found to be surplus when compliance for the commitment period is established, the funds would be disbursed to the national government of the selling Party. If some of the "assigned amount" sold is needed for the seller to achieve compliance, the funds could be given to an international fund as a penalty for non-compliance, or the seller could be obliged to use the proceeds to purchase PAA in order to achieve compliance.

### 5.3.3 *Suspension of trading privileges*

Some forms of non-compliance could warrant loss of some or all trading privileges. For example Parties that do not comply with the eligibility requirements for trading, or who wilfully exceed their assigned amounts, could face suspension of their eligibility to trade internationally. Loss of trading privileges could also be a "hard" response for persistent or serious non-compliance with the monitoring and reporting commitments. Suspension of trading privileges could be invoked after other approaches had been tried, such as capacity building and expert assistance (see also Werksman 1998). The suspension would last until the Party came back into compliance.

3. Different approaches to suspension of trading privileges require further consideration. An Umbrella Group paper tabled in Bonn in June 1998 stated that a breach of Article 5 and 7 would lead to suspension of the right to transfer, but that Parties would still be able to acquire.<sup>7</sup> An EU paper stated that any breach should lead to suspension of privileges to both transfer and acquire.<sup>8</sup> Article 6 (concerning project-based trading) states that non-compliance with Article 5 or 7 should result in ineligibility to *acquire*.

4. Acquiring PAA is a potentially legitimate way for a Party to come back into compliance with national emission commitments. Suspending eligibility to acquire could lower the efficiency of the trading system by removing part of the demand from the market. However, suspending the right to transfer, alone, may not provide a sufficient incentive or deterrent to comply with the rules for trading, particularly for those countries who expect to be net buyers. In some circumstances, consideration may need to be given to suspending both transfers and acquisitions, at least until the initial cause is remedied. Suspending both the right to transfer and acquire would provide strong incentives for Parties to ensure that they establish and maintain good national systems for estimating and reporting emissions. If suspension of a Party's eligibility to trade also affects its entities, this approach would create a domestic constituency to lobby for compliance with monitoring, reporting requirements and trading rules.

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7. FCCC/SB/1998/MISC.1/Add.1/Rev.1

8. FCCC/SB/1998/MISC.1/Add.1/Rev.1 and FCCC/SB/1998/MISC.1/Add.3



#### **5.3.4** *Mix of responses*

Non compliance with different types of commitment may warrant different remedies. Different degrees of seriousness of non-compliance may also warrant various types of remedy. Some aspects of trading make non-compliance with international emission commitments less likely. An obvious example is that emissions trading offers potential non-compliers an alternative means to help them to achieve their target through acquiring PAA from other Parties who have surplus PAA. Such acquisitions could take place during the commitment period, or at the end of the period. An initial response to non-compliance could be to give Parties an opportunity to come into compliance through purchasing PAA within a certain period. Tougher response options could be considered for Parties that remain in non-compliance once a Party has been given adequate opportunity to fulfil its commitments. A suite of different response options for non-compliance of different types, cause, degree and frequency should ideally work together in a mutually reinforcing way. Responses associated with the international emissions trading system should form part of a broader system of graduated non-compliance responses.

## 6. CONCLUSIONS

Many of the questions that remain to be resolved concerning international emissions trading are inter-dependent. For example, decisions on legal entity participation could affect the types of national systems that are needed. National recording systems that are needed for trading are closely interwoven with accounting for changes to assigned amounts and verifying changes in ownership. Functions established for national systems will affect the functions needed at the international level. Efforts to encourage compliance may influence requirements for national systems and discussions about eligibility to participate. These questions are important for the principles, modalities, rules and guidelines for emissions trading. To the extent that these questions are practical considerations of a technical nature it may be possible to make progress on them in the near term. For example, further analysis and discussion is needed on:

- Participation by legal entities, and minimum international requirements concerning their authorisation, (section 0)
- minimum international requirements for national systems to ensure effective accounting of changes in assigned amount (section 0) and to record changes in holdings of PAA (section 0),
- compatibility among national systems to facilitate international emissions trading (section 0);
- institutional capacity for implementing domestic emissions trading systems and national systems for accounting and recording holdings of PAA (section 0)
- analysis of the pros and cons of various preventive measures to encourage compliance and responses to non-compliance with respect to trading (section 0 and 0).

Following entry into force of the Protocol, trading among Parties with Article 3 commitments is likely to begin in earnest. Forward or futures transactions could take place at any time before the first (and any subsequent) commitment periods. Some have already taken place, although at some risk to those involved because rules for international trading are not yet agreed. The sooner principles, modalities, rules, and guidelines are defined for the trading system and the other mechanisms, the less risk there will be in forward transactions. Since emissions trading is also an important factor in some Parties' decision to ratify the Protocol, it is important to make progress in defining a framework for emissions trading and the other co-operative mechanisms.

The broad parameters for trading should therefore ideally be established by 2001, which is the earliest date that entry into force is expected. Further refinements could be made to the principles, modalities, rules, and guidelines for emissions trading under Article 17 and the other mechanisms following COP/MOP1. The period between the Protocol's entry into force and the first commitment period could be used as a test period for refinement of the international framework for emissions trading based on practical experience, particularly once domestic emissions trading systems are implemented.

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## 8. GLOSSARY OF TERMS

acquisitions.....	purchases of parts of assigned amount
Article 3.....	Kyoto Protocol provisions on national emission commitments
Article 5.....	Kyoto Protocol provisions on emissions inventories
Article 6.....	Kyoto Protocol provisions on project based trading among Parties with quantified national emission limits (industrialised countries)
Article 7.....	Kyoto Protocol provisions on reporting
Article 12.....	Kyoto Protocol provisions on transfers of certified emission reductions from projects in developing countries to industrialised countries.
Article 17.....	Kyoto Protocol provisions on international emissions trading among industrialised countries.
assigned amount .....	quantified national emission limits for industrialised countries under the Kyoto Protocol.
CER.....	certified emission reductions derived from projects in developing countries under Article 12 of the Kyoto Protocol
CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O .....	greenhouse gases : carbon dioxide, methane, and nitrous oxide
HFC, PFC, SF <sub>6</sub> .....	the “new” greenhouse gases: hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.
CO <sub>2</sub> equivalent .....	the unit for an amount of greenhouse gases taking into account their relative radiative forcing potential (i.e. their contribution to global warming over a specified year time frame).
commitment period .....	the period for which industrialised countries’ national quantified emission commitments have been set under the Kyoto Protocol: 2008 to 2012
compliance .....	meeting legal obligations e.g. obligations of Parties under the Kyoto Protocol and obligations of entities under domestic law.
COP .....	Conference of the Parties of the UNFCCC.
COP/MOP .....	COP that serves as the Meeting of the Parties to the Kyoto Protocol.
emission obligations.....	emission limits that are placed on entities under domestic law.
ERU.....	emission reduction units is the unit for project-based trading under Article 6 of the Kyoto Protocol
EU .....	European Union
IEA.....	International Energy Agency
Kyoto Protocol .....	Protocol under the UNFCCC which strengthened industrialised Parties climate change commitments. Agreed in Kyoto (Japan) December 1997.
legal entities.....	firms, organisations or individuals; any entities other than Parties.
liability .....	responsibility for ensuring the environmental validity of PAA that are transferred.
NGO .....	non-governmental organisation.
OECD.....	Organisation for Economic Cooperation and Development
Parties with Article 3 commitments .....	Parties with commitments under Article 3 listed in Annex B of the Kyoto Protocol.
parts of assigned amount ....	.....PAA: tradeable units derived from national assigned amounts.
registering/registration.....	notification of a transaction e.g. to a national or international authority.
“retire” .....	PAA removed from the market permanently.
“surrender” .....	PAA used or given back to the government by entities to demonstrate their compliance with domestic obligations (i.e. to justify emissions)
transfers.....	sales of PAA
transactions (or trades) .....	general term for sales or purchases of PAA
UNFCCC.....	United Nations Framework Convention on Climate Change, agreed in Rio June 1992