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**MARKET ACCESS ISSUES  
IN INTERNATIONAL GHG EMISSIONS TRADING**

INFORMATION PAPER



## FOREWORD

This document was prepared by the IEA Secretariat in October 2000 at the request of the Annex I Expert Group on the United Nations Framework Convention on Climate Change. The Annex I Expert Group oversees development of analytical papers for the purpose of providing useful and timely input to the climate change negotiations. These papers may also be useful to national policy makers and other decision-makers. In a collaborative effort, authors work with the Annex I Expert Group to develop these papers. However, the papers do not necessarily represent the views of the OECD or the IEA, nor are they intended to prejudge the views of countries participating in the Annex I Expert Group. Rather, they are Secretariat information papers intended to inform Member countries, as well as the UNFCCC audience.

The Annex I Parties or countries referred to in this document refer to those listed in Annex I to the UNFCCC (as amended at the 3<sup>rd</sup> Conference of the Parties in December 1997): Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, the European Community, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, and United States of America. Where this document refers to “countries” or “governments” it is also intended to include “regional economic organisations”, if appropriate.

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## 1. Introduction – definitions of market access issues

Article 17 under the Kyoto Protocol to the United Nations Framework Convention on Climate Change introduces the possibility for Parties with emission commitments (assigned amounts) to trade emission reductions or assigned amount units (AAUs). In principle, international emission trading (IET) should allow those Parties involved in transfers to achieve their greenhouse gas emission objectives while minimising the overall cost of reduction. No decision has been taken yet on the possible participation of legal entities in IET. In any case, Parties remain responsible for achieving their quantified objectives under the Protocol and for the transfers and acquisitions of AAUs. Other modalities, rules and guidelines for IET, including liability in case of non-compliance by a seller of AAUs, remain to be defined.

An earlier paper discussed whether and how market power exerted by some participants could affect the quantity of traded emissions and reduce the efficiency gains that it theoretically provides (Baron, 1999.a). The paper discussed potential scenarios where market power could emerge and explained mitigating factors that may reduce such risk. Beyond market power, there is a concern that all Parties (and legal entities, if they were allowed to participate in trading) may not have equal access to internationally traded AAUs in spite of their willingness to pay for these units.

In their submissions to the UNFCCC on emissions trading, some Parties have proposed that “*transfers and acquisitions of AAUs between Parties may [shall] take place through an exchange. This exchange shall also be open to legal entities*”, and that “*any Party wishing to transfer or acquire AAUs must publish the amount to be transferred prior to the transfer*”. Other Parties propose that “*bilateral and multilateral arrangements, as well as exchanges, are acceptable options for Parties and legal entities to choose to use in order to facilitate emissions trading under the Protocol.*”<sup>1</sup> Although some Parties have expressed a concern about equal market access, the submissions do not provide a clear indication of what may constitute barriers to market access in emissions trading.

This paper explores this issue. A list of potential market access problems in IET is proposed in this section. The second section discusses these issues in more depth. The third section presents possible solutions and discusses their relevance and effectiveness in the context of various design options for IET. The final section is intended to indicate next steps for work on this question.

Without prejudging on the validity of concerns about market access, circumstances where restricted access to the IET market could occur include the following:

- **Favouring large buyers:** Sellers could tend to give primary access to large buyers in order to minimise transaction costs.
- **Tied trades:** Transactions may involve other elements than the direct transfer of AAUs for a price especially, but maybe not uniquely, in Party-to-Party trades. Not all participants may be treated equally in such transactions.
- **Domestic markets/international access:** Access to emission reductions traded within a country may be reserved to domestic sources and/or to the government of that country.
- **International transactions within multinational companies:** These companies may give priorities to their affiliates when transferring or acquiring AAUs, *de facto* excluding others from their internal markets, even if it were efficient to do so.

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<sup>1</sup> Respectively, paragraphs 159 and 160 from the *Note by the Chairman of the Contact Group on Mechanisms*, UNFCCC, Bonn, 1999.

## 2. Preliminary appraisal of the issues

### 2.1 Favouring large buyers

*Sellers could tend to give primary access to large buyers in order to minimise transaction costs.*

A “small” Party, or entity, may fear that other participants with a higher level of demand would corner the market, e.g. by offering to acquire large amounts of AAUs in a single transaction, hence minimising transaction costs for the issuer / seller. That in itself is not a market failure, but rational economic behaviour on both sides.

The fee that brokers charge for a transaction depends on the size, as well as the complexity of the transaction (i.e. a higher percentage fee for small transactions). Typically, markets with higher traded volumes see a lower fee (as a percentage of the transaction value) applied to each transaction, e.g. if it goes through a broker. Similarly, if the seller must incur significant search costs to find a proper buyer, it would be in the interest of the seller—and the buyer, as both eventually share the transaction cost—to trade as many AAUs as possible in a single transaction, all other things being equal.

One obvious solution is to try and limit transaction costs to a minimum, while at the same time giving the opportunity to the issuer to maximise its revenues by accessing potentially small buyers that are willing and able to acquire AAUs at a relatively high price. This could be done through an organised market (or several organised markets), and / or a requirement to give prior notification of the intention to sell or buy, which would reduce the cost of searching a trade partner. In that latter case though, the seller would still incur the cost of prior notification.

Although sellers may be inclined to favour large buyers, buyers may be reluctant to acquire all AAUs from a single issuing Party (seller), if they were liable for the seller’s non-compliance, e.g. under buyer liability or shared liability. These liability regimes would therefore tend to discourage single large transactions when there is a risk of non-compliance, and open the market to other buyers; issuer liability regimes would not have that effect. A buyer liability system would, however, have negative impacts on other aspects of market access (Baron, 1999.b).

### 2.2 Tied trades

*Transactions may (implicitly or explicitly) involve other elements than the direct transfer of AAUs for a price, especially in Party-to-Party trades. Linking non-AAU related transactions with AAU trades means that not all Parties may be treated equally.*

By means of introduction, it is useful to recall one of the principles governing international trade:

*“The principle of non-discrimination can be considered as the central trade principle which underpins the philosophy of liberal trade. This principle is embodied in most favoured nation treatment, which prohibits discrimination among foreign countries in certain trade matters...” (OECD, 1995).*

This is further defined in Article I.1 of the GATT on most favoured nation treatment:

*“... any advantage, favour, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originated in or destined for the territories of all other contracting parties.”*

If this principle were to apply to international emissions trading, a government transferring AAUs to, or acquiring AAUs from, a Party could be required to grant the same conditions to other Parties, that is, provided it still holds AAUs for sale, or needs to acquire additional quantities. The concern is that government (i.e. states, as opposed to private entities) with more political power on other (non-IET) issues of importance to potential sellers could influence transactions to their advantage. This would in effect grant them preferential access to these Parties' AAUs, and restrict other Parties' access. This concern is already expressed, albeit in a different form, in Article XVII of the GATT 1994 related to state trading enterprises.

Article XVII of the GATT 1994 sets out that:

*"... state trading enterprises – in their purchases or sales involving either imports or exports – are to act in accordance with the general principles of non-discrimination, and that commercial considerations only are to guide their decisions on imports and exports."*<sup>2</sup>

The above principles and article apply to trade in goods and services, and some legal experts have expressed the opinion that AAUs trade may not be subject to ruling under the WTO, since they would probably not be considered as a "good" or a "service" (Werksman, 1999)<sup>3</sup>. However, Article XVII introduced the notion of the risk that states, when involved in international transactions, can be motivated by non-commercial considerations; for that reason, discrimination and unfair access to the market may occur.

In the context of IET, governments may rely on levers other than a high price in order to acquire / offer AAUs. Such levers could include international aid, existing foreign debt, etc. The ability of some governments to use these other levers could create an exclusive access to the sellers of AAUs<sup>4</sup>. The result of such exclusive access would be transactions and (lower) prices that are not strictly motivated by mitigation cost considerations, and would affect the overall efficiency of IET.

This is probably only a major concern for government-to-government trades, as entities are unlikely to be able to have as significant negotiating power as states on political issues. This risk could be limited if both buying and selling countries were to devolve AAUs to legal entities.

In other cases, some governments may wish to barter goods or commodities against AAUs. Barter transactions may not be detrimental to the economic efficiency of the system, but it could prevent other interested buyers from buying these AAUs if they cannot provide the same "package".

One proposal advanced by Parties to avoid tied transactions in IET would be to rely on competitive markets such as exchanges. Alternatively, governments that intend to acquire or transfer AAUs could notify all other participants so as to give all an equal opportunity to acquire or transfer AAUs at the best possible price. These options are discussed in section 3.

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<sup>2</sup> This Article has traditionally been referring to enterprises from Central and Eastern European Countries, but illustrates a concern about government transactions. <http://www.wto.org/wto/goods/statrad.htm>

<sup>3</sup> This should not be interpreted to mean that none of the aspects of emissions trading could be subject to WTO rules. For instance, the allocation of assigned amount units to legal entity could be mis-used to grant a hidden subsidy to certain companies, which could be sanctioned by the WTO.

<sup>4</sup> See, for example, the possibility to exchange debt for AAUs, through debt-for-carbon swaps (Legro, 1998).

## 2.3 Domestic markets/international market

*Access to emission permits traded within a country may be reserved to domestic sources, even if some of the units traded were issued by other Parties.*

Governments may not systematically allow their legal entities to transfer any devolved domestic emission rights in the form of AAUs to other Parties. While this would impede the efficiency of IET, justifications for such limits could be twofold:

1. A government may not have full confidence over the level of emissions of sources not included in its domestic emission trading system. There could therefore be a lag between entities' intention to transfer and the authorisation to do so, until the government has gathered all inventory data.
2. The government could also decide to interrupt transfers of AAUs by legal entities (but not domestic trades) if sources not covered by the domestic trading system fail to respect expected emission levels, or if some sources in the trading system are not in compliance.<sup>5</sup>

Such restrictions would arise for example if *ex-post* trading is chosen as a rule by some or all Parties (see the Swiss proposal<sup>6</sup>): entities' ability to transfer AAUs would be predicated on the national inventory, compared with the pre-agreed annual allocation. Even without *ex-post* trading, governments may apply year-by-year objectives to entities and only allow them to transfer AAUs if they have over-complied with their annual goals, regardless of their expected performance over the whole five years of the commitment period.

As a result, domestic markets may not be fully integrated with the international emissions trading regime, and possibly restrict access to the supply of reductions generated on these markets. This could result in an excess supply of tradable emissions among entities operating in a country, at a price that is lower than the international price.<sup>7</sup> Without restrictions on the transfer of AAUs, sources outside that country could in theory acquire such AAUs at a price that would be economically beneficial for the selling entities. And sources within will strongly argue with the government that they should be allowed to sell on to the international market.

What would happen if indeed the access were to be restricted because of a compliance problem identified by the Party? In theory, the government responsible for the high level of emissions should try to restore compliance. It could take one or several of the following measures:

1. Tighten policies and measures on other sources;
2. Acquire excess emission reductions back from domestic sources—possibly at the international price;
3. Acquire AAUs from the international market;

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<sup>5</sup> Or the government could accept to let entities trade freely provided that they meet their (annual) objectives, hence assuming full responsibility if, in the end, entities transferred AAUs and the Party's emission level is above its adjusted assigned amount.

<sup>6</sup> Paragraph 159 of Mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol, synthesis of proposals by Parties on principles, modalities, rules and guidelines (FCCC/SB/1999/8).

<sup>7</sup> The opposite – an international price lower than the domestic price – could only happen if domestic entities cannot acquire AAUs on the international market, that is, if there were a ceiling on how much entities are authorised to rely on IET for compliance.

4. Tighten the constraint on domestic entities covered by the trading regime, in fact changing the rules in the middle of the commitment period, which could be problematic.

Once the Party has acquired the AAUs needed to match its emission level—or taken domestic measures—entities should in theory be free again to transfer any surplus AAUs to other Parties, hence restoring the efficiency of the system. In other words, the market access problem may only be temporary, if the government acts promptly to solve its compliance problem.<sup>8</sup>

The alternative to government control over entities' international transfers could be a non-interventionist policy by the government, once it has set the emission limits over its entities. The government could agree to bear full responsibility if emissions outside the domestic trading regime are above expected levels. In that case, the government could systematically offset excess emissions by acquiring from either domestic or international markets.

To a large extent, the specific question of access by foreign sources to domestic emission trading markets—more precisely, their ability to acquire from these markets—can be perceived as a domestic question. Annex I Parties have not decided to systematically co-ordinate domestic mitigation policies, and this would also apply to domestic trading systems. It is therefore difficult to see why a Party which adopted domestic trading should be obliged to open its domestic market to foreign sources, when, in theory, another Party without domestic emission trading could retain full control over the international transfer of its AAUs.<sup>9</sup>

## 2.4 International transactions within multinational companies

*A subsidiary of a multinational company may reserve AAUs in its possession to other subsidiaries in the same company at a favourable price.*

Trade in goods and services within multinational companies (so-called intra firm trade) accounts for a significant share of international trade, at least in some countries.<sup>10</sup> Based on this observation, it is possible that multinationals would reserve their potential for reductions (and corresponding AAUs) to their subsidiaries in other countries, when needed. They would in effect exclude other potential buyers from their “internal” markets. Two questions arise: is this phenomenon likely to be significant, and if so, would it represent a market access problem?

It is almost impossible to predict how much AAUs trading<sup>11</sup> would be taking place inside multinationals, but here are the circumstances that would be required for such transactions to become possible. Ultimately, transfers in AAUs are the responsibility of Parties. Transactions among subsidiaries of multinational companies in different countries will therefore be subject to some kind of *ex ante* or *ex post* control and monitoring by governments. For such extended intra-firm trading to be possible, entities within a

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<sup>8</sup> The government could also keep a buffer of AAUs. The buffer could be used to offset any unexpected increase in emissions in sectors outside the domestic trading regime, or non-compliance among the trading sources (Australian Greenhouse Office, 1999).

<sup>9</sup> The banking provision of the Protocol (Article 3.13) also recognises the right that Parties have to hold their excess AAUs regardless of market conditions.

<sup>10</sup> “Intrafirm trade—parts, subassemblies, or finished goods being transferred back and forth across borders without ever leaving the boundaries of the corporation—accounts for more than 40 per cent of all imports and a third of exports in the United States, according to the Bureau of Economic Analysis *Survey of Current Business*.” (World Trade - April 1998).

<sup>11</sup> But also emission reduction units and certified emission reductions.

multinational enterprise but operating in different territories need first to be covered by similar kinds of tradeable permit regimes. Second, the entity with a surplus in AAUs must be authorised to transfer them. Third, there must be both buyers and sellers within the same company, operating in different Parties. If all these conditions are met, then entities could decide to give other entities within the multinational a privileged access to their AAUs, at a price that may be different from the market price. Then, only, could such transactions be *perceived as* discriminatory. Last, if the multinational's entities are organised as separate profit centres, they would have no incentive whatsoever to give another entity a better deal than the market price.

Interestingly, GHG mitigation projects under joint implementation or the clean development mechanism bear some resemblance with the multinational transactions described here. In JI/CDM projects, a company sees an opportunity to invest in another country to generate GHG reductions at lower cost than what is available on the market. The company may also find other advantages in the project, such as market penetration, etc. For the transaction to take place, the host Party must recognise the validity of the transaction. The fact that the host Party could agree to transfer certified emission reduction units or emission reduction units to the investor at a mutually-agreed price—which may be lower than the market price—can hardly be interpreted as a discriminatory trade practice. In the case of multinationals, it seems natural that corporations look first within their boundaries—where they have most detailed cost information—to see whether there is not a potential to invest capital to reduce emissions inside before acquiring AAUs from the market. This could well be the purpose of trades inside multinationals, if they are possible.

In all, the issue of trades internal to multinationals may not be relevant (and may be governed by existing rules), as far as market access is concerned.

## **2.5 What could be important market access issues?**

From the above discussion, the only significant concern with market access in international emission trading could be the role of transactions initiated by governments, because governments may trade another “commodity” for assigned amount units, and obtain exclusive access in that way. From an economic efficiency standpoint, this does not necessarily imply a market distortion, but these tied-trades would give unequal access to traded AAUs as not all governments may have the same “commodity” to offer.

In some cases however, other participants to IET may be willing to offer a higher price for the traded AAUs. The seller is then at a disadvantage, as it will obtain a lower total payment for the transferred AAUs. If an active market were existing at the time, such transactions would be difficult to conclude, as both Parties to the transaction would know the regular market price. In the case such markets were not to emerge naturally, what form of rules or guidelines could be envisaged to solve this potential market access problem?

### 3. Possible solutions

The market access issues raised by tied trades and/or large buyers reflect largely a concern about the transparency (and transaction costs) of IET. What measures could Parties take, collectively or individually, to allow for sufficient transparency in emissions trading, without replacing a potential distortion by a real one, of a different nature?<sup>12</sup>

This section first discusses exchange-based trading and the role of brokers; the requirement of prior notification by governments is addressed next. The last section looks into the issue of the size of transactions that Parties may wish to regulate.

#### 3.1 Exchange-based trading: advantages and requirements

##### 3.1.1 Exchanges, in brief

The role of an exchange is to facilitate trading but also to guarantee each trade. In order to fulfil this role, access to the exchange floor is restricted to its members / seat-holders, who can act as buyers or sellers. The exchange has the discretion to accept or refuse membership, based on the applicant's financial situation, etc. The financial condition of the member is surveyed to ensure that it can fulfil its obligations with the exchange. Membership is open at a fee. In order to trade on an exchange like the New York Mercantile Exchange, ParisBourse, the International Petroleum Exchange, or the Sydney Futures Exchange, one must go through a member of the exchange. Traders on the exchange must also pay a fee *per transaction*, expressed either as a fixed amount regardless of the size of the transaction, or as a percentage of the total transaction amount. Both membership fees and transaction fees are subject to negotiation depending on the volume of transactions that a particular trader conducts through the exchange. The higher the volume is, the cheaper the cost per transaction is likely to be.<sup>13</sup>

Exchanges generally monitor trading to detect price distortions or market manipulation that are deemed non-competitive. Penalties, suspension or exclusion from membership are used to discourage such behaviour.

Most commodities, currencies, stocks, etc. traded on an exchange are also traded in bilateral arrangements, or via brokers, but also on the floors of other exchanges.<sup>14</sup> One key characteristic of exchange-traded goods is their homogeneity, as is illustrated below.

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<sup>12</sup> For instance, it has been argued that all transactions should take place on a single market place (e.g., an exchange). This could create a monopoly for such transactions, at the benefit of the institution that would be responsible for administering this unique market. Already several stock or commodity exchanges have proposed their services on domestic emissions trading markets, and they are likely to strongly oppose the centralisation of all transactions. As they could offer similar guarantees in terms of transparency, it is hard to argue why there should be a unique exchange to handle international transactions.

<sup>13</sup> Thierry Carol, ParisBourse, personal communication.

<sup>14</sup> Nordpool, the Scandinavian electricity exchange, covers about 20 per cent of all traded electricity in the region.

### 3.1.2 Organisation of transactions on an exchange

Exchange-based trading works via so-called double-auction, whereby supply and demand for a stock / commodity meet on a centralised market (electronically or physically). Transactions are concluded once both the buyer and seller agree on a common price. Traded commodities must be homogenous to be traded in a double auction.

Transactions are usually, although not always, anonymous until the transaction has been completed. Members of an exchange agree, when posting bids and offers, to buy from / sell to whoever is willing to match the offered price. This offers some guarantee of market transparency and full price competition and largely prevents market manipulations and market power.

### 3.1.3 Exchanges and international emissions trading

Anonymous AAU transactions through an exchange would help remove the concern about pre-arranged transactions: any buyer willing to pay the highest price for offered AAUs will obtain the quantity for which it bid, provided it is not above the offered quantity. The following table illustrates what participants to an AAU exchange could see when accessing the exchange.<sup>15</sup>

BUY – Demand		SELL – Supply	
Quantity (MtCO <sub>2</sub> )	Price OFFERED (\$/tCO <sub>2</sub> )	Price ASKED (\$/tCO <sub>2</sub> )	Quantity (MtCO <sub>2</sub> )
22	50	52	15
50	43	53	50
12	40	55	27
5	38	56	80

In this case, one or several buyers have offered to buy (bid) 22 MtCO<sub>2</sub> at \$50 per tonne (first two columns); immediately below, other buyers are offering to buy 50 Mt at a lower price (\$43), etc. The next two columns show one or several sellers asking US\$52/ tCO<sub>2</sub> for 15 Mt; the next best offer is at US\$53 for a total of 50 Mt.

If one buyer, previously offering US\$50, is now willing to pay US\$52 for 3 Mt, and concludes that transaction, the offer to sell these tonnes at that price would be removed from the exchange and go into the buyer's account. The result would be as follows (changes are highlighted):

BUY – Demand		SELL – Supply	
Quantity (MtCO <sub>2</sub> )	Price OFFERED (\$/tCO <sub>2</sub> )	Price ASKED (\$/tCO <sub>2</sub> )	Quantity (MtCO <sub>2</sub> )
<b>19</b>	50	<b>52</b>	<b>12</b>
50	43	53	50
12	40	55	27
5	38	56	80

<sup>15</sup> See IEA-ParisBourse-Eurelectric-Unipede (1999) for a fuller illustration of a CO<sub>2</sub> exchange.

The seller automatically accepts to transfer 3 MtCO<sub>2</sub> to the buyer. The fact that the buyer only offered to buy 3 Mt is indifferent: the matching is done through prices only.

Exchanges usually assure that no pre-arranged transactions take place. In the above example, the exchange would launch an investigation if a buyer were to offer to buy 150 Mt at US\$51, and be immediately matched by a seller for that quantity at that price, whereas there was not any demand for such volume on the market earlier. So the exchange offers some protection against what could be tied transactions: exchanges provide a framework to encourage competitive pricing and avoid gaming.

### **3.1.4 Exchange trading and liability rules**

In the above example, we assumed that all traded AAUs would be equivalent with respect to their validity for compliance: this would be the case under regimes relying on issuer liability or ex-post trading (Baron, 1999b). If the buyer is made partly liable for the acquisition of AAUs issued by a Party that does not comply, it should know the identity of the issuing Party before it can decide on the appropriate price. This implies that AAUs issued by different Parties could not be traded in the same double-auction: buyers ought to know the identity of the issuer in order to offer a price that reflects the risk attached to its AAUs.

In theory, there could therefore be as many markets as there are Parties listed in Annex B of the Protocol, as the probability of compliance may differ from one Party to the next, and so would the value of AAUs.<sup>16</sup> Instead of a single market and a homogenous commodity (AAUs), the exchange would need to organise several markets (AAUs from country A, B, C...), in a way that resemble stock markets, where one can trade separately stocks from different companies listed on the exchange.

The organisation of exchange transactions would be made more complex if, under buyer liability, AAUs were to be discounted on the basis of their vintage (e.g. according to the “last-in, first-out” principle), as opposed to a systematic discounting of all AAUs transferred by the Party in non-compliance. With vintage discounting, the validity and price of AAUs would depend on both the issuing Party and the date of issuance. Buyer liability *and* vintage discounting would make it virtually impossible to trade AAUs in a single double auction, as described in the above example, where the traded commodity is homogenous.

### **3.1.5 Exchanges and brokers**

There is also a specific market issue raised by the *modus operandi* of exchanges. Exchanges only allow their members to trade on their markets. Membership comes at a price, and requires certain financial guarantees. Not all governments (or entities) may be willing to become members of an exchange, especially if their needs in terms of AAUs and the number of transactions that they want to conduct are small. They would need to trade through official members of the exchange and pay a fee for each transaction (Evans, 1999). There would always be a trade-off between the cost of exchange transactions and the potential gain of accessing this competitive market place. If given a choice, a government may choose to go through a member of an exchange, if available; to rely on a broker to find a buyer / seller; or to do such inquiry itself, depending on what it would cost.

Brokers, who usually arrange over-the-counter (bilateral) transactions, also argue that there may not be enough activity on the international AAU market to sustain the activity of exchanges. In the meantime, brokers may offer a more flexible, and sometimes less costly alternative to an exchange, depending on the

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<sup>16</sup> Only a few Parties may be net sellers of AAUs, but this would not prevent legal entities—those that are allowed to trade—from all Parties to both buy and sell AAUs on the international market. AAUs from Parties that are net buyers would also be traded on the market.

size and number of transactions that a Party / entity wants to engage in. It is also common practice in brokerage firms to keep transactions confidential until both counterparts have agreed on price and quantity. Brokers are also more flexible in organising the terms of the transaction.<sup>17</sup>

For the most part, brokers organise *bilateral* transactions, even if they sometime run continuous auctions, through a bulletin board that is in fact very much like the double auction system described above. They may be less able to access a large number of buyers and sellers for each transaction than what exchanges can bring through their organised market, but in the end it is a matter of transaction cost for both buyers and sellers.

Outside IET, emission reduction units based on project-activities (JI or CDM) may also be primarily traded by brokers, as they offer more flexibility to organise custom transactions (e.g. the transfer and acquisition of varying quantities from one year to the next, etc.) These transactions could also take place directly between the investor and the host, at a pre-arranged price that would not necessarily be in line with internationally traded AAUs, all this without the intermediary of a broker or exchange.

It is safe to conclude that because two other trading-type mechanisms—joint implementation and the clean development mechanism—are available to Parties, there will be a number of different ways to transfer AAUs, ERUs and CERs. The purpose of requiring only certain transactions—AAU trades initiated by governments—to take place on exchanges should also be considered in that context.

There is no example of a good or service that is exclusively traded on exchanges. The natural evolution of markets seem to be from bilateral transactions to brokers and then to exchanges. In the end, all three means co-exist as they each offer specific features that meet the needs of the buyer and seller. Brokers are often members of an exchange themselves.

As explained above, granting the privilege of AAU trading to exchanges may also raise some questions about transaction costs, even if there may be competition *among* exchanges for the cheapest service in AAU trading.

### 3.2 Prior notification of transactions by governments

If a government were to wish not to issue its AAUs on an exchange, other mechanisms could be envisioned to assure some degree of market transparency and guarantee fair access to the market for all participants. Most importantly, the concern to be addressed is that of large trades in AAUs initiated by governments, and the risk of tied transactions.

Governments that wish to issue AAUs on the market could be required to announce their intent in advance, hereafter referred to as prior notification.<sup>18</sup> For instance a government could post an offer to sell 50 MtCO<sub>2</sub> a few days before it is to be brought on the market. Posting could mean communication with other Annex I delegations via email, fax or otherwise, or an announcement on a dedicated UNFCCC web-site, provided all interested Parties have access to such media. It would indicate the offered or asked quantity, give a date of issuance / acquisition, and possibly contacts for offers (a broker, exchange, or otherwise). Such measures alone would not guarantee that the selection of buyers would strictly be based on price considerations, but it would at least give all participants an opportunity to bid for AAUs they need at what they think is the right price.

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<sup>17</sup> Garth Edward, Natsource, personal communication.

<sup>18</sup> Such a proposal has been tabled by the European Union and associated countries.

Other possible options to assure fair access and market transparency include a prior notification followed by a period during which bids would be publicly posted: all participants will be aware of each others' offers. After this open bidding phase, buyers would send sealed proposals to the seller, based on which the final selection would be done. If none of the prices offered in the sealed proposals were above the public bids, the public bids would be used to determine which participants would acquire the offered AAUs and the corresponding price(s). Acquiring governments could use a similar method.

The seller could also organise a standard auction, via an exchange or else, along the lines of SO<sub>2</sub> allowances auctioned by U.S. Environmental Protection Agency through the Chicago Board of Trade.<sup>19</sup> Note that both arrangements (prior notification and bidding, or the model of the SO<sub>2</sub> auction) would differ from the double auction system of exchanges described in the previous section, where both buyers and sellers compete. Here, there would be a single seller with potentially many buyers.

### 3.3 Large versus small transactions

Not all international transactions may warrant the use of exchanges or prior notification. Such requirements may impose overly high transaction costs on small transactions whereas these are unlikely to have significant effects on the efficiency of the regime. Small transactions could be conducted as buyers and sellers see fit (bilateral, via brokers, exchanges or other).

In other words, the obligation of a prior notification and/or exchange-based trading could only apply to large transactions, i.e., transactions beyond a certain threshold. The risk of setting such threshold is that Parties who want to conclude tied or preferential transactions do so by setting the size of each transaction under the agreed threshold.

However, it may be feasible for the UNFCCC Secretariat, or any other authority with access to the international registry of AAU transfers and acquisitions, to spot a series of transactions of this kind. Non-compliance measures could be taken to discourage such behaviour. So the threshold could be expressed as a cumulative quantity of AAUs issued by one Party over a given period of time. For instance, no Party could transfer more than X per cent of its total AAUs in any period of Y months, without prior notification or whatever arrangement is introduced to assure fair access to the market. This rule may be difficult to implement as governments could simply disguise these transactions through a series of forward transactions below the threshold, with contract dates scattered over a longer period.

Another approach could be to simply forbid transactions above a certain size, without any requirement on the way transactions should be conducted, regardless of whether the parties to the transactions are governments or not. If Parties were confident that these smaller and therefore more numerous transactions would guarantee a competitive market, they could agree that other requirements are not warranted. Yet the same caveat applies about the possibility to bypass this rule with forward contracts. On the cost side, it should be noted that brokers, exchanges and other intermediary usually apply lower percentage fees on larger transactions. The transaction cost would therefore be higher if all transactions were below a certain size.

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<sup>19</sup> In this auction, buyers submit their bids for a given quantity at a given price, and are served according to price: the buyer with the highest price obtains the quantity it asked, etc. until the supply is exhausted (Ellerman et al. 1998).

## 4. In summary

Concerns about access to the market in IET tend to focus on trades involving governments as opposed to entities. There could be a requirement that transactions of large quantities of AAUs issued by governments be conducted via a range of possible systems (double auctions via exchanges, standard auctions, prior notification, etc.) Many details, in particular the level of the threshold, would need to be worked out to make this requirement effective, operational, and economic.

The advantage of such options is that neither the buyer nor the seller has to incur significant *search* costs to buy / sell AAUs at the best possible price. In theory, all participants would gain economically from the increase in efficiency of the potentially enhanced market transparency, and the system would operate in the most cost-effective fashion, given other rules agreed for trading. The disadvantage may be in the cost incurred to trade on an exchange, or to organise prior notifications, auctions, etc. Of course, it may be in government's own interest to rely on these approaches in any case. A number of exchanges are already developing domestic markets for carbon emissions, or testing the development of international AAU markets. They could become active market intermediaries on the international market provided there is certainty and homogeneity in the traded AAUs. Brokers are also starting to compete for the marketing of AAUs, CERs and ERUs. Entities and governments will only rely on these intermediary agents if they believe that they help reduce transaction costs. Forcing all transactions to go through a specific mechanism is likely, if anything to increase transaction cost by limiting competition.

Will the benefits in terms of reduced market access problems—and potentially less risk of market power—outweigh the cost? If international emissions trading is characterised mostly by government transactions, the answer is “maybe”. If legal entities are the primary participants in the system, access to the market will not be a problem and the answer is “probably not”.

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## 6. Glossary

<b>AAUs</b>	Assigned amount units. Unit of international emission trading.
<b>Assigned amount</b>	Emission objectives of Parties, as defined by the Kyoto Protocol for the commitment period 2008-2012.
<b>Ask</b>	On an exchange, offer to sell a certain quantity of a commodity at a certain price (the seller “asks” for a price)
<b>Bid</b>	On an exchange, offer to buy a certain quantity of a commodity at a certain price (the buyer “bids” a price).
<b>Bilateral trade</b>	Simple AAU transaction arranged and finalised by a buyer and a seller.
<b>Broker</b>	Private entity operating on as a market intermediary to match a buyer with a seller for a fee.
<b>CDM</b>	Clean development mechanism. The CDM enables reductions generated in non-Annex I Parties to be used by Annex I Parties for the purpose of meeting their emission objectives under Article 3.
<b>CERs</b>	Certified emission reductions. Tradeable emission reductions generated by CDM projects undertaken in developing countries, to be certified in order to be transferable.
<b>Double-auction</b>	Auction system whereby all “bids”—offers to buy—and “asks”—offers to sell—are posted simultaneously to allow transparent and competitive transactions.
<b>ERUs</b>	Emission reduction units. Tradeable emission reductions generated by joint implementation projects.
<b>Exchange</b>	Organised and regulated market on which buyers and sellers—members of the exchange, or agents relying on these members—can trade commodities, stocks, etc. Membership is based on an annual fee and on certain financial guarantees.
<b>GHG</b>	Greenhouse gases. Six gases targeted for reductions by the Kyoto Protocol.
<b>IET</b>	International emissions trading, international greenhouse gas emissions trading among Parties with commitments listed in Annex B of the Kyoto Protocol.
<b>Issuer, issuing Party</b>	Party that allows a transfer of parts of its assigned amount (AAUs) to another Party.
<b>JI</b>	Joint implementation. Mechanism established by the Kyoto Protocol allowing transfers of project-based emission reductions units among Parties with emission objectives under the Protocol.
<b>Kyoto Protocol</b>	Protocol under the UNFCCC, which sets legally-binding greenhouse gas emission objectives for a number of Parties, and establishes international emissions trading.
<b>Liability rules</b>	Rules established to allocate responsibility in case a Party which has transferred parts of its assigned amount is found in non-compliance (e.g. buyer liability or issuer liability).
<b>Prior notification</b>	Announcement by a Party of its intent to buy or sell AAUs.