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The Post-Trade Infrastructure for Carbon Emissions Trading

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THE POST-TRADE INFRASTRUCTURE FOR CARBON EMISSIONS TRADING

A report prepared for the City of London Corporation

By Peter Cox, Hugh Simpson and Stuart Turner

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Executive Summary

Europe – and within Europe, the UK – has taken the lead in establishing a market-based approach to reducing greenhouse gas emissions. The emissions market in Europe has grown rapidly since the European Union Emissions Trading Scheme (EU ETS) came into being in 2005. It is now a significant tradable market with annual turnover of $144 billion and set to grow considerably as the European scheme is extended beyond 2012.

In this report we compare the post-trade infrastructure that has emerged to cater for emissions trading in Europe with the standards expected of the infrastructure supporting the major financial markets. We note that the EU ETS was originally seen as principally a compliance mechanism and the infrastructure designed accordingly. Its growth as a trading market is a sign of its success. Many of our critical comments should be seen against that background.

However, when we assessed the emissions market post-trade infrastructure against the best practice recommendations for securities market infrastructure, we judged that the emissions infrastructure met only half the recommendations.

Our conclusions are that, whilst a great deal has been achieved, there are still some areas which require attention to bring them into parity with comparable facilities in financial markets.

In particular we find that:

- there is a lack of legal certainty over the status of emissions units, the point at which transfer instructions become irrevocable, and the validity of their use as collateral;
- there are operational risks in accessing emissions registries and performing transfers which should be ironed out;
- there are limited facilities for Delivery Versus Payment (DVP) settlement of emissions units.

The market will go through significant changes in 2012, with the introduction of a common European auction system and a single registry. It is better to address these issues when the market is still at an early stage of development and before they are tested by a major market failure.

We recommend that these issues are addressed as follows:

1. That the legal uncertainties should be resolved at the European level.
2. That emissions registries and particularly the proposed Union registry, should more directly involve users in the design of their services and should make public information about their operational performance.
3. That the post-trade infrastructure chosen to support the EU auction platform should be open, so as to preserve competition.
4. That serious consideration should be given to the provision of DVP settlement, even if it is not directly offered by the Union Registry itself.
5. That the UK and London should take the lead in ensuring that these issues are fully considered at a European level or by working at national level, if a European response is not forthcoming.

Introduction

This Special Interest Report on the Post-Trade Infrastructure for Carbon Emissions Trading was commissioned from Bourse Consult by the City of London Corporation.

Its objectives are:

- to identify areas where the existing clearing and settlement infrastructure for emission rights falls short of the best standards expected for financial instruments;
- to set out a series of recommendations and an agenda for future work, identifying who we believe should be responsible for taking these forward;
- in particular, to focus on the UK infrastructure to ensure that it does not lag behind that of other European countries; and
- to inform the position of the City of London as a thought-leader and the natural European centre for this business.

Our focus is specifically on the clearing and settlement infrastructure in Europe. There are many other aspects of the market, such as the arrangements for the issuance of allowances and the regulatory framework, which are important but are not discussed here.

Methodology

The research for this report was carried out using desk research and, most importantly, through a serious of interviews with senior figures at a number of organisations involved in emissions trading. The information gleaned was analysed by the authors; follow-up questions were undertaken when necessary; and conclusions were drawn and documented.

The following organisations were interviewed, either face to face or via telephone:

Barclays Capital - international broker in emissions contracts

Baker & McKenzie - international law firm with particular expertise in emissions

Department for Energy and Climate Change

Ecosecurities - CDM project developer and broker

Euroclear Bank & ClimateSettle - financial market custodian and settlement organisation, offering services for emissions contracts

ICE Europe - London-based exchange for EUA and CER futures trading

European Commission - responsible for the overall policy direction of the EU Emissions Trading Scheme

Green Exchange - new emissions exchange initiative from CME Group

LCH.Clearnet - European Clearing House, offering OTC Clearing for emissions contracts

London Energy Brokers Association - industry body representing energy and emissions brokers

Vertis Environmental Finance - boutique broker, specialising in spot emissions contracts

International Emissions Trading Association - industry body representing major emissions trading organisations

These interviews took place during June 2010. Two consultants were present at each interview and each interview was structured with a series of questions to which the consultants required answers.

We appreciate the time taken by the people we spoke to in these organisations, who provided invaluable information and insights to our research. The conclusions and recommendations, however, and any errors that remain, are entirely our responsibility.

1 Legal Basis for Emission Trading in the EU and Types of Emissions Traded

1.1 UNFCCC and Kyoto

All emission units mentioned in this report ultimately owe their existence to the Kyoto Protocol of 1997. This Protocol is, in effect, an action plan to bring about greenhouse gas (GHG)[1] reductions as proposed by the United Nations Framework Convention on Climate Change (UNFCCC), itself signed by most countries in 1994. Under the UNFCCC, a group of countries (basically the OECD plus the ex-Soviet Union countries) are known as Annex 1 countries. These countries agreed to limit their own GHG emissions to a percentage of previous output levels.

A subset of the Annex 1 countries that ratified Kyoto (a group known as Annex B) agreed to reduce their GHG emissions relative to 1990 levels on aggregate by 5.2%, averaged over the first commitment period (2008-2012). The EU, signing the treaty as a single body, has made a commitment to make an overall 8% reduction on 1990 emissions. The burden for achieving the EU target is divided unequally between EU member states under the 'Burden Sharing Agreement'.

Countries with such commitments must meet their targets primarily through national GHG reduction measures. However, as additional means of meeting these targets, the Kyoto Protocol introduced three market-based mechanisms, thereby creating what is now known as the 'carbon market'.

These are:

- Emissions Trading
- The Clean Development Mechanism (CDM)
- Joint Implementation (JI)

These mechanisms are discussed in detail in the following sections.

1.1.1 Emissions Trading

Countries with commitments under the Kyoto Protocol have accepted targets for limiting or reducing emissions. These targets are expressed as levels of allowed emissions, or 'assigned amounts', over the 2008-2012 commitment period. Allowed emissions are divided into assigned amount units (AAUs – each AAU representing one tonne of $CO2e^2$) and issued to each country at the level of its emissions target (i.e. a country will get fewer AAUs than would cover the existing, business as usual, emissions levels). Emissions trading allows countries that have unused emission allowance units – allowances allocated to them but not 'used' – to sell this excess capacity to countries that are over their targets.

[1] Greenhouse gas is the name for the group of six gases (including CO2) which have an impact on global warming.

[2] CO2e is the unit of measurement used to compare the relative climate impact of the different GHGs. The CO2e quantity of any greenhouse gas is the amount of carbon dioxide that would produce the equivalent global warming impact.

Annex 1 countries can achieve their targets by allocating their reduced annual allowances to major operators within their borders; operators who have reduced their emissions below their level of allocation can sell this excess to operators who exceed their allocations. This type of trading scheme is known as 'Cap and Trade'.

1.1.2 The Clean Development Mechanism (CDM)

The Clean Development Mechanism (CDM), allows a country with an emission-reduction commitment to implement an emission-reduction project in developing countries, where the cost of reducing emissions may be cheaper than at home. Such projects can earn saleable Certified Emission Reduction (CER) credits, each equivalent to one tonne of CO2, which can be counted towards meeting Kyoto targets. In this way countries (and operators within a country) can purchase CERs to meet their obligations if they face a shortfall. A CDM project activity might involve, for example, a landfill methane capture project, a rural electrification project using solar panels or the installation of more energy-efficient boilers. The idea is that the mechanism stimulates sustainable development and emission reductions, while giving industrialised countries some flexibility in how they meet their emission reduction targets.

1.1.3 Joint Implementation (JI)

The Joint Implementation mechanism (JI) allows a country with an emission reduction commitment to earn Emission Reduction Units (ERUs) from an emission-reduction or emission removal project in another Annex B country, each equivalent to one tonne of CO2, which can be counted towards meeting its Kyoto target. The idea behind JI is that it offers countries a flexible and cost-efficient means of fulfilling a part of their Kyoto commitments, while the host country benefits from foreign investment and technology transfer. These projects are similar to CDM projects but the creation of units is different. ERUs come about by the conversion of AAUs (or RMUs – see below) into ERUs; the latter can then be sold to meet a Kyoto reduction target. They do not add to the overall supply of units in the market.

1.1.4 Removal Units

In addition to the above mentioned market mechanisms, there is a fourth unit which can be created and traded under the Protocol. These are removal units (RMUs) and are given for net removals of carbon by sinks from activities in the Land Use, Land Use Change and Forestry sector (LULUCF).

1.2 Kyoto Infrastructure

As the number of units and their location has to be tracked to determine if countries have met their obligations, the Kyoto protocol mandates that each Annex B country create and maintain a registry for the holding of Kyoto units and provide a mechanism for their transfer (both domestically and internationally). AAUs, RMUs and ERUs are issued by the national registry in each country. CERs are issued by the UNFCCC-operated CDM registry once the emission reductions from a project have been independently verified.

Once issued, units can be freely transferred between accounts on the registry. A country can decide whether to hold all the units in its own name, or transfer units to companies with high emissions levels.

Transfers can also be made to accounts on a foreign registry (subject to each country maintaining a commitment period reserve[3]). Therefore, a national registry can hold AAUs, RMUs, ERUs that it has itself issued, plus AAUs, RMUs and ERUs issued by other countries, as well as CERs issued by the CDM registry.

International transfers are verified by another Kyoto mechanism, the International Transactions Log (ITL), administered by the UNFCCC. The ITL verifies transactions proposed by registries to ensure they are consistent with rules agreed under the Kyoto Protocol. Once approved, registries complete the transaction. In the event that a transaction is rejected, the ITL sends a code indicating which ITL check has been failed and the registry terminates the transaction.

At the end of the commitment period (2012), the actual emissions of each Annex B country over the period will be compared with the holding of all the units in the registry. If a country does not have enough units to cover its emissions, it has to make good the shortfall plus an additional 30% of the shortfall.

Some trading of AAUs between nations has taken place in the past. Some of this trade is controversial, especially the purchase of AAUs from the old Eastern Block. The baseline for Kyoto was 1990, which was just at the point that these inefficient economies started to collapse. This meant that current emissions for this region are well below 1990 levels. These excess units are known as 'hot air'. In an effort to improve the situation, the Green Investment Scheme (GIS) was developed, obligating participating countries who sell such excess units to reinvest the proceeds in green projects.

1.3 How Kyoto units are created/issued

1.3.1 Kyoto allocation of AAUs

The amount of AAUs allocated to a country is dependent on its emissions target for the period 2008 to 2012, based on the 1990 baseline. At the start of the period each country was allocated all of its units for the five-year period – i.e. it received (tonnes emitted in 1990) * (100 - reduction percentage)*5[4]. These units are created in the national registry for that country, and the government of the country could then decide whether to manage the holdings themselves, or issue them to major energy consuming businesses to encourage emissions reductions at source.

1.3.2 RMUs

RMUs are issued into the national registry of the country that hosts the project that results in net removal of carbon from the atmosphere (by creating or enhancing a carbon sink).

[3] The commitment period reserve is a requirement under the Kyoto Protocol that requires each Party to maintain a reserve of ERUs, CERs, AAUs and/or RMUs in its national registry at least equal to 90% of the Party's assigned amount (KP Emissions Trading).

[4] Not all countries are subject to a reduction on 1990 levels. Australia, which did not initially ratify Kyoto, negotiated an 8% increase.

1.3.3 ERUs from JIs

ERUs differ from other units, in that they can only be created if another unit type is cancelled. ERUs result from projects in one Annex B country sponsored by another. These units can be used by the sponsor to add to its holdings in its own country. The conversion of AAUs or RMUs to ERUs prevents double counting. The units are issued in the host country's national registry.

1.3.4 CERs from CDM

The CDM process is one of the major planks of Kyoto. As mentioned, it encourages emission projects in less developed countries, where the environmental benefit may be produced at a lower cost than could be done in a developed country. As GHGs know no national boundaries, saving carbon emissions in India, for example, has the identical impact of saving carbon emissions in Germany. A key imperative of CDM schemes is additionality. Additionality is the requirement that the greenhouse gas emissions after implementation of a CDM project activity are lower than those that would have occurred in the most plausible alternative scenario to the implementation of the CDM project activity. An example would be the building of a wind farm instead of a thermal power station.

The UNFCCC operates a comprehensive approval process to determine which projects are eligible as well as a verification process to ensure the emission reductions have actually taken place. Each year, once the verification has taken place, the resulting CERs are issued on the CDM registry in the name of the project developer. These units can then be sold to Annex B countries, industrial users or traders. Once transferred, they can exist in the holding accounts in national registries.

Chart 1.1: Summary of main tradable units under Kyoto

Unit	Unit Name	Issuer	Description
AAU	Assigned Amount Unit	National Registry	Units representing the initial assigned amount of each Annex B Party
RMU	Removal Unit	National Registry	Units given for net removals from land use, land-use change and forestry activities
ERU	Emission Reduction Unit	National Registry	Units converted from AAUs or RMUs on the basis of JI projects
CER	Certified Emission Reduction	CDM Registry	Credits given for emission reductions certified for a CDM project

Source UNFCCC (undated – 2)

1.4 European Infrastructure

1.4.1 UK Emissions Trading Scheme (UK ETS)

Europe did not wait for the Kyoto commitment period to start in 2008. Denmark ran a small pilot scheme between 2001 and 2003 with a few electricity generators, but the first economy wide scheme was the UK Emissions Trading Scheme (UK ETS), which ran from 2002 and closed to new entrants in 2006. The objective of the scheme was twofold – to enable business to gain practical experience with emissions trading, and to assist in achieving the UK's climate change targets. The scheme was voluntary and 34 companies took part, receiving annually declining caps on their emissions. Units were auctioned from 2002 onwards.

Interestingly, besides emissions reductions, a further declared objective of the UK ETS was to establish the London financial markets as the global location for environmental permit trading. The early launch of the scheme certainly enabled the City of London to establish itself as a global centre for emissions trading, particularly in advance of the mandatory European Emissions Trading Scheme (see following section) that started in 2005. It gave UK business a first-mover advantage on the global carbon trading market. Companies providing emissions trading services (such as brokerage and verification) gained valuable experience, placing them in a strong position before the launch of the EU scheme. In addition, the UK Emissions Trading Registry was adapted for use in the EU scheme and the UK's EU/Kyoto registry was licensed to 16 other countries.

The scheme had some success in reducing emissions but its main success was in preparing British companies for the EU scheme.

1.4.2 European Union Greenhouse Gas Emission Trading System (EU ETS)

This report focuses on the EU ETS, which is by far the largest multi-national emissions trading scheme in the world. This ETS currently covers around 12,000 installations in the energy and industrial sectors which are collectively responsible for close to half of the EU's emissions of CO2e and 40% of its total greenhouse gas emissions.

Under the scheme, which is mandatory and backed by EU statute, large emitters of carbon dioxide within the EU must monitor and annually report their CO2e emissions. They are also obliged every year to return an amount of emission allowances (see following for acceptable allowances) that is equivalent to their CO2e emissions in that year. Emission allowances for any operator subject to the EU ETS are given out for a sequence of several years at once. Each such sequence of years is called a Trading Period. These Trading Periods are discussed in more detail in the next section.

The primary 'currency' of the EU ETS is the EU Allowance (EUA). Since 2007 each EUA is backed by one AAU. However, besides EUAs, installations can meet their obligations with units from JI and CDM projects, but with certain restrictions: Projects involving nuclear power or temporary forest credits are not allowed, and there are restrictions on hydro power projects exceeding 20MW of installed capacity[5]. This ban and these restrictions mean that certain types of ERUs and CERs cannot be surrendered under the scheme.

[5] European Commission (undated)

Table 1.2: Summary of main tradable units under the EU ETS

Unit	Unit Name	Issuer	Description
EUA	EU Allowance	National Registry	Units representing the allocation under a country's NAP
Certain ERUs	Emission Reduction Unit	National Registry	Units converted from AAUs on the basis of JI projects
Certain CERs	Certified Emission Reduction	CDM Registry	Credits given for emission reductions certified for a CDM project

1.4.3 EU allocation of EUAs

The responsibility for issuing EUAs actually rests with the national governments. Under the Burden Sharing Agreement, each member state is given a set number of AAUs. The member governments then propose national emission caps (National Allocation Plans – NAPs) which are then approved by the EU commission. Once the NAP is approved, the country converts a proportion of its AAUs into EUAs, equal to the total number of EUAs set out in the NAP. It then allocates allowances to the installations covered by the ETS. These allowances are issued in the national registry of the country concerned.

The EU ETS has three phases of issuance.

Phase 1 - January 2005 to December 2007

Phase 1 was in operation before the 1st Kyoto commitment period. It covered nearly half of all EU CO2e emissions (emitted from around 12,000 operators in such energy intensive industries such as thermal power stations, oil refineries, steel plants, cement, glass and paper production). Most of the allocation of units to these plants was free of charge to the receivers. This led to some windfall profits for some operators and later led to a collapse in prices when it was revealed that over-allocation had taken place.

Phase 2 - January 2008 to December 2012

This period coincides with the 1st Kyoto commitment period. In this period the allocation of units aligns with each state's Kyoto commitment. Again, issue of EUAs is largely free of charge to receivers (less than 4% is auctioned). It is proposed that aviation be included from 2012.

Phase 3 - January 2013 to December 2020

For phase 3 the EU Commission has proposed the setting of an overall EU cap on emissions and centralised allocation. The actual allocation to companies will include auctioning a proportion of units (over 50% is proposed), rather than a completely free allocation (proposals for the auctioning process are described in Section 2.6.1).

1.4.4 Other schemes

The schemes described here are known as compliance schemes, in that they are backed by legal commitments. There is one other such national scheme in place in the world, the New Zealand ETS, and several regional schemes in the US, such as The Regional Greenhouse Gas Initiative (RGGI) involving ten North-eastern and Mid-Atlantic states. Units traded in these schemes are not fungible with the EU ETS units.

There is also an active voluntary marketplace, which allows companies (for corporate social responsibility reasons) and individuals to buy units established under other initiatives. Again, such units are not allowable in the EU ETS.

These schemes are outside the scope of this report and will not be discussed further.

2 Structure of the European Market

This chapter describes the structure of the European emissions market. It provides a brief description of the participants in the market and the type of instruments which are traded. It also describes the infrastructure which has been developed to facilitate trading, clearing and settlement and the transfer of ownership of emissions units.

2.1 Participants in the market

2.1.1 Installations

The primary participants in the market are the 12,000 or so installations covered under the EU ETS, who receive allocations of EUAs in each phase of the scheme. These installations need to annually match their actual measured emissions with their holdings of EUAs (or other acceptable units). If they are successful in reducing emissions below their EUA allocation, they can sell the surplus. If they are short, they need to purchase EUAs, or other units such as CERs.

2.1.2 CDM project developers

Project developers provide the finance for CDM projects. They receive the actual CERs created from these projects once the emission reductions have been verified. However, it is possible to sell Primary CERs (see following) to organisations that wish to lock in the price or supply of units.

2.1.3 Brokers

Brokers exist to facilitate trading in financial assets. In the emissions space, specialist brokers have emerged, and established brokers in other assets have moved into the emissions space. Some brokers specialise in the CER market, sourcing CERs (pre- or post-issuance) directly from CDM schemes for their customers; others operate exclusively in the secondary market.

2.1.4 Traders

Like any financial asset, emission units vary in price over time and provide another vehicle for traders to profit from. Traders are an essential component of the secondary market.

2.1.5 Voluntary offsetters

There are many opportunities for companies and individuals to offset their own emissions by buying emission units. Such units are often sourced from voluntary schemes but there is nothing preventing such buyers from purchasing EUAs, CERs or other Kyoto units. For example, the EasyJet offsetting scheme, whereby passengers can purchase offsets at the time of booking a flight, meets the offset by buying CERs from a small hydro project in Ecuador. These schemes only account for a small proportion of the overall market.

2.2 How and where emissions are traded

2.2.1 Primary market

Increasingly, allowances and credits first become tradable through an auction process. National governments have evolved this method of allocating a proportion of the allowances that are distributed to installations. It not only raises revenue but also helps to ensure that the allowances maintain a market value which provides an incentive for installations to reduce emissions. The auction method is also used to sell CER credits released by CDM projects. The objective is for the project developer to maximise the revenue from a block of CERs, avoiding the potential market impact on the price if they were sold into the secondary market.

Auctions are operated as a service by some of the organisations running secondary markets, such as EEX, BlueNext and Climex. The UK government Debt Management Office organises the auction of EUAs to obligated emitters, using its long experience of auctioning government bonds. Direct participants in the auction are banks who act on behalf of the compliance buyers.

Phase 3 of the EU ETS will rationalise the auction process across all EU countries and will require governments to increase the percentage of allowances which are distributed through auctioning.

2.2.2 Types of Secondary Trading

2.2.2.1 Private contract

Like any asset, it is possible to exchange units for cash with another party by private contract. In this way installations that have an excess of EUAs as a result of being successful in their emission reduction efforts can transfer them directly to another party in exchange for cash. Units can be transferred directly between holding accounts in the national registries or from a holding account on one national registry to a holding account on another national registry. The cash and the asset transactions are not directly linked, so the parties have to agree on the timing of the two exchanges (units and cash). This creates a counterparty risk which will be commented on later in this report.

2.2.2.2 OTC markets

Much trading of spot and futures contracts takes place in the OTC markets. Brokers bring together buyers and sellers, and offer both spot contracts or forward contracts, covering EUAs and Primary and Secondary CERs.

2.2.2.3 Exchange Markets

Exchange Markets provide an open and transparent marketplace for emissions units. The various markets offer spot, futures and options contracts.

2.2.3 Forms in which units are traded

2.2.3.1 Spot

Spot trading is trading for immediate delivery. The buyer and seller agree a price for an amount of EUAs or Secondary CERs and settlement takes place within two or three days. Transfer of cash and units takes place independently due to most

registries not having facilities to allow for delivery versus payment (DVP), with the exception of the French registry.

2.2.3.2 Forwards

Forward contracts are offered by many brokers, in EUAs, Primary CERs and Secondary CERs. These contracts allow buyers and sellers to lock in a price for a delivery sometime in the future. Most of these contracts carry counterparty risk as they are not cleared[6].

There is an active market in Primary CERs. Primary CERs are CERs that do not yet exist but will be issued to the Project Developer in the underlying CDM project. These are effectively forward contracts on CERs that are expected to be issued. There is, of course, a risk that the number of CERs issued will be less than expected, or that none will be issued. For this reason, Primary CERs trade at a discount to Secondary CERs – that is, CERs already verified and issued, the level of discount being proportional to the project risk.

2.2.3.3 Futures

Cleared futures contracts on EUAs and CERs are offered by the major emissions contract exchanges. The great majority of futures contracts are for December delivery[7], allowing installations to lock in a price for any units they may need to buy to meet their obligations or to profit from any excess units they may hold. There is an active secondary market in such units, supported by speculators. Contracts are cleared through a recognised clearing house, protecting participants from the failure of a counterparty. Daily futures, which expire and settle on the day after trade date, are offered by some exchanges as a surrogate spot contract. They have the side effect of being classed as derivatives and, for instance in the UK, being regulated by the FSA.

2.2.3.4 Options

Options are offered by a couple of regulated exchanges, notably on ECX/ICE. These are European style options on futures contracts. On expiration the option holder has the right to buy (in the case of a call) or sell (in the case of a put) a December expiring futures contract. Options have been offered for a while but growth in volume has been more recent. Exchange options contracts are cleared.

2.2.4 Major Exchange Markets

There are six significant operators of exchanges offering trading in EU ETS eligible units.

2.2.4.1 BlueNext

BlueNext is a joint venture between the NYSE Euronext global exchange group and Caisse des Dépôts et Consignations (CDC) a unique French public institution with a high credit rating and a remit to encourage sustainable development.

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[6] Only Nord Pool offers clearing for forwards.

[7] Nord Pool offers quarterly expiries but the majority of the volume is in the December contracts.

2.2.4.2 Climex

Climex is a private venture jointly owned by Rabobank and TenneT, the operator of the Dutch electricity grid. It has a contractual relationship with APX-ENDEX, operators of electricity and gas markets in the Netherlands, Belgium and the UK.

2.2.4.3 European Climate Exchange (ECX/ICE)

ECX was established by the Chicago Climate Exchange, one of the earliest entrants into emissions trading. The market is operated in partnership with Intercontinental Exchange (ICE) Europe. ICE provides the exchange trading platform, clearing house, market regulation and business development functions for contracts devised by ECX. At the time of writing ICE is in the process of concluding the purchase of ECX and its parent group.

2.2.4.4 European Energy Exchange (EEX)

EEX is the German-based electricity and gas exchange. Its major shareholders are Eurex, the German/Swiss derivatives exchange and Landesbank Baden-Württemberg, the remainder being owned by market participants.

2.2.4.5 The Green Exchange

The Green Exchange is a venture recently launched by the CME Group, the US operator of the largest futures exchange in the world. It aims to focus the trading in environmental instruments which is currently conducted by the NYMEX division of the group into an exchange with its own regulatory licence in the USA and regulatory permissions to also operate in Europe, with its European base in London.

2.2.4.6 Nord Pool

Nord Pool is the Nordic Electricity exchange owned by NASDAQ OMX, the global exchange operator.

Each exchange offers a different mix of contract types and trading methodology. Table 2.1 summarises the offerings.

Table 2.1: Offerings of European emissions exchanges

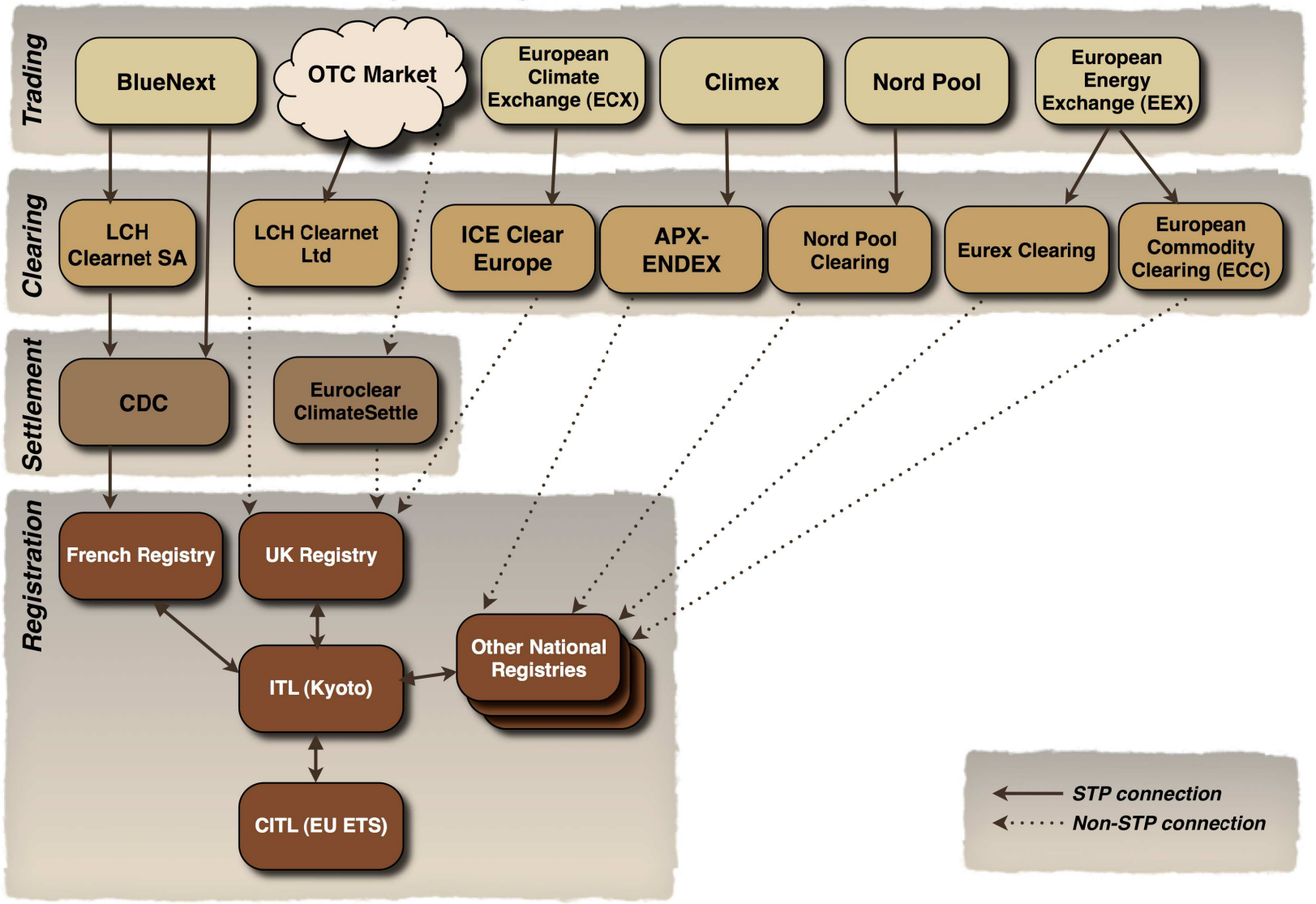
Exchange	Country of Operation	Continuous Exchange Trading									Auctions	OTC Clearing
		Spot			Futures		Forwards		Options			
		EUAs	CERs	ERUs	EUAs	CERs	EUAs	CERs	EUAs	CERs		
ECX/ICE	UK	✓	✓		✓	✓			✓	✓		✓
Bluenext	France	✓	✓		✓	✓					✓	✓
EEX	Germany	✓			✓	✓			✓		✓	✓
Nord Pool	Norway	✓	✓		✓	✓	✓	✓	✓	✓		✓
Green Exchange	USA				✓	✓			✓	✓		✓
Climex	The Netherlands	✓	✓	✓							✓	

2.3 Current post-trade infrastructure

Most of the infrastructure used for the secondary trading of emissions in Europe has evolved from existing infrastructure used in other markets. The post-trade infrastructure is more diverse, some of it having been purpose-built in response to the EU's commitment to the Kyoto Protocol and the EU ETS, for example most of the settlement and registration infrastructure, and some developed from existing infrastructure, for example most of the clearing infrastructure.

The diagram overleaf gives a broad view of the relationships between the major European market venues for trading emissions and the post-trade service providers.

Structure of trading, clearing and settlement in European emissions markets



2.3.1 Clearing arrangements

Clearing manages the exposures between buyers and sellers between the times of trade and settlement. The key objective of clearing is to protect each party to a trade from the failure of their counterparty. Often this is managed by a clearing house, which interposes itself between the two parties, acting as buyer to the seller and seller to the buyer, and manages the risks by collecting collateral from the two parties as protection against price movements. A clearing house may also net the obligations of its members to reduce the number of settlements that have to take place.

One other advantage of clearing is that it can facilitate anonymous trading. Since the parties to the trade will each settle it via the clearing house they do not need to know each other's identity and the facilitation of the trade – by a trading system or broker – can be done without disclosing counterparties.

2.3.1.1 Exchange Traded Derivatives

Each of the emissions exchanges clears its derivatives trades through a clearing house. Participants in the exchange traded derivatives markets therefore have a clearing house as their settlement counterparty. In the event of a trading counterparty failing to deliver allowances or cash to settle their part of the trade the clearing house will fulfil the commitment to the other party.

For its derivatives market BlueNext uses the independent LCH.Clearnet SA. The other exchanges all use a clearing house which they wholly or partly own.

EEX offers participants a choice of clearing house – either European Commodity Clearing AG (ECC) or Eurex Clearing. The two clearing houses have an inter-operation arrangement to cover trades in which the parties each use a different clearing house.

2.3.1.2 Exchange Traded Spot

Whilst there is a fairly uniform way of handling the clearing and settlement of derivatives, a number of different approaches have been applied to spot trading done on exchanges.

Firstly, the exchanges offering spot in the form of daily futures or forwards – ECX/ICE and Nord Pool – apply essentially the same processes to these contracts as they do to longer term futures.

Climex offers a form of clearing for its spot market. Settlement is contractually through a central counterparty – APX-ENDEX, the Dutch power exchange. Sufficient units or cash must be deposited in the participant's Climex account to cover a trade before the trade can be done. APX-ENDEX does not take margin from participants to cover its risks as a central counterparty.

EEX uses European Commodity Clearing (ECC) to clear all spot trades. ECC operates its clearing in a conventional manner, taking collateral from participants to cover its risks.

BlueNext does not offer a central counterparty clearing arrangement for its spot market but has aimed to address post-trade risks through the design of its settlement arrangements, discussed later.

2.3.1.3 OTC markets

Traditionally, OTC business has been bilaterally settled and not cleared. If the trade is facilitated by a broker, maintaining the anonymity of its clients up to the time the trade has been agreed, the broker will then give up the names of the counterparties who will settle the trade without the broker's further involvement. Since clients of OTC trades tend to be large professional firms, often in the same industry, they have in the past been comfortable accepting the counterparty risk of the other party revealed in such trades. However, the financial crisis has changed attitudes to counterparty risk. Facilitating brokers now have to be able to offer a clearing service for OTC trades and anecdotal evidence suggests that as much as 75% of OTC trading is now submitted for clearing.

The five emissions derivatives exchanges in Europe all offer OTC participants the opportunity to enter trades in contracts with similar terms to their exchange traded contracts into clearing, by-passing the exchange trading facility but receiving exactly the same clearing service.

In addition LCH.Clearnet Ltd in London offers a clearing service specifically aimed at the OTC market. LCH.Clearnet has long experience in clearing emissions derivatives, having operated the clearing house for ECX/ICE up to 2008 when ICE established its own clearing house. The OTC clearing service, which launched in 2009, is based on infrastructure already in use by OTC traders for submitting trades for clearing in other markets. The service handles approximately 5% of the total volume of emissions traded in Europe.

2.3.2 Settlement

Settlement is the process of discharging the obligations of buyers and sellers. For some derivative contracts, such as cash settled futures, settlement takes place only as a cash payment, depending on the movement in prices since the time of trade and with no delivery of the underlying asset. For other contracts, such as physically delivered futures, settlement consists of the delivery of an asset against payment. The key objective of the settlement process is to ensure that the buyer receives what they have bought and that the seller receives payment and that in both cases they can be confident that they have received full and unconditional ownership of an asset or payment.

Currently the settlement of private contracts or non-cleared OTC trades for emissions must be settled by the two parties using two separate facilities – an emissions registry for transferring the emissions allowances and a banking system to transfer the cash. Since there is no co-ordination between the two mechanisms, there will almost inevitably be an unpredictable difference in the timing of the completion of the two transfers.

It is possible to reduce the risks presented by these timing differences using contractual mechanisms – involving escrow accounts operated by third parties – to protect the parties during bilateral settlement, but they are cumbersome and expensive and only have merit for a few large transactions.

Because of the potentially very large values involved, most mature financial markets have evolved mechanisms that ensure that the exchange of asset and cash happens simultaneously and efficiently. The establishment of Central Securities Depositories (CSDs) has been the solution in the securities markets. Similar facilities have not yet emerged widely in the emissions markets.

BlueNext has a settlement system operated by CDC, a 40% owner of the exchange, which is closely coupled both with the exchange and the French registry and ensures the security of delivery versus payment by requiring sufficient units or cash to be deposited in the participant's CDC account to cover a trade before the trade can be done. Units and cash are moved across the participants' accounts within the CDC system simultaneously.

Euroclear has established a CSD-like service – ClimateSettle[8] – for the settlement of emissions trades, which promises efficient delivery versus payment. The service is operated in London, but could be used by participants in any country. ClimateSettle participants choose to have Euroclear acting as the custodian of their emissions units. Euroclear holds a single omnibus account at the UK registry in which it holds all ClimateSettle participants' positions. A trade between any two ClimateSettle participants can be settled by book entry within the Euroclear system rather than requiring a registry transfer. Since cash is transferred simultaneously with units within the Euroclear accounts the settlement risk is alleviated. To achieve its potential this service, by its nature, needs a number of sizable participants to use it before achieving the critical mass that will ensure that most transactions take place without registry movements. We understand that so far the service has not attracted widespread usage.

Clearstream[9], the Luxembourg-based international CSD owned by Deutsche Börse, announced in December 2009 that it intended to launch a settlement and custody service for carbon trading rights early in 2010 but there has been no further public announcement since then.

2.4 Role of the registries and links between European registries

Ownership of emissions allowances and credits is recorded in the accounts of the national GHG registries. Any compliance-obligated installation holds an account, as can any third party holding units on behalf of an installation or a trader. Transfer of ownership of units is performed by altering the records of ownership in the registry.

Transfer instructions are input by account holders, in most cases through a secure web browser and internet connection. A notable exception is the French registry, which, in addition to web browser access, allows instructions to be input through an API interface.

Before the instruction can be acted upon, however, it must be verified by the International Transaction Log (ITL). The instruction is therefore sent to the ITL by the national registry system via a secure computer-to-computer connection. The ITL system makes its validation checks and then sends the instruction back to the national registry, which then executes the transfer if it has been verified.

If the transfer is within the EU ETS then there is a further checking mechanism – the European Community Independent Transaction Log (CITL) must also verify that the transfer meets the rules of the EU ETS before it can be executed. In this case the transfer instruction is sent from the national registry to the ITL which, after its own checks have been satisfied, sends the instruction on to the CITL, which sends it back to the ITL from which it is finally sent back to the national registry.

[8] See Euroclear (2009)

[9] See Clearstream (2009)

Installations or traders may hold accounts in any of the European registries but must submit their allowances and credits for compliance with their emission reduction obligations through their own national registry. The clearing arrangements associated with the exchanges currently hold accounts at small number of registries – usually one or two. Therefore, in order to settle an exchange trade the seller has to transfer allowances into the account of the exchange clearing and settlement service in their preferred registry and the buyer may well have to transfer the bought allowances into another registry where they have their compliance account.

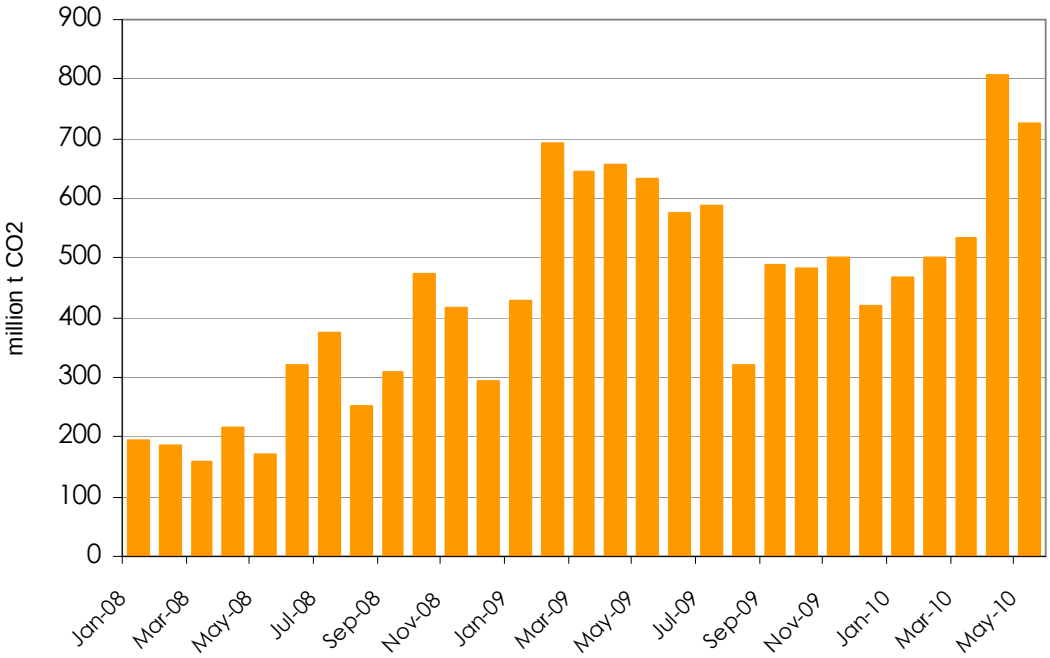
2.5 Evolution of the European Emissions Market

Despite the financial crisis, the global emissions market grew significantly in 2009. The volume of units traded worldwide grew by 80% and its value increased by 6% to $144 billion[10], 85% of which takes place within the EU ETS.

2.5.1 Exchange Trading

European trading volume has grown strongly since the EU ETS was launched in January 2005. Chart 2.1 shows the total volume of carbon trading – spot and derivatives – handled by the exchange and clearing operations of the six largest European emissions market operators.

Chart 2.1: Volume of Trading on European emissions exchanges



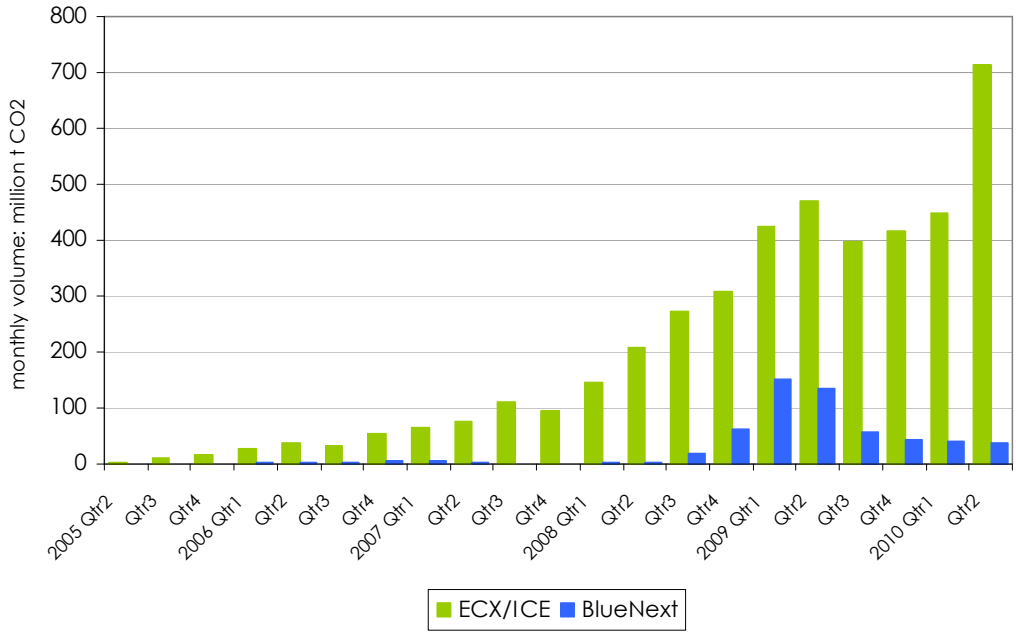
Sources: ECX, Bluenext, Nord Pool, EEX, The Green Exchange, Climex

[10] World Bank (2010) Table 1

The majority of trade is now in derivatives contracts. This is similar to the situation in most energy markets (to which the carbon emissions market is closely associated) in which the futures markets are the principal price setting mechanisms and spot trade tends to be done at prices benchmarked to the futures price.

Chart 2.2 shows the development of trading volume on the two largest European emissions markets, ECX/ICE and BlueNext.

Chart 2.2: ECX/ICE and BlueNext monthly volumes – all contracts

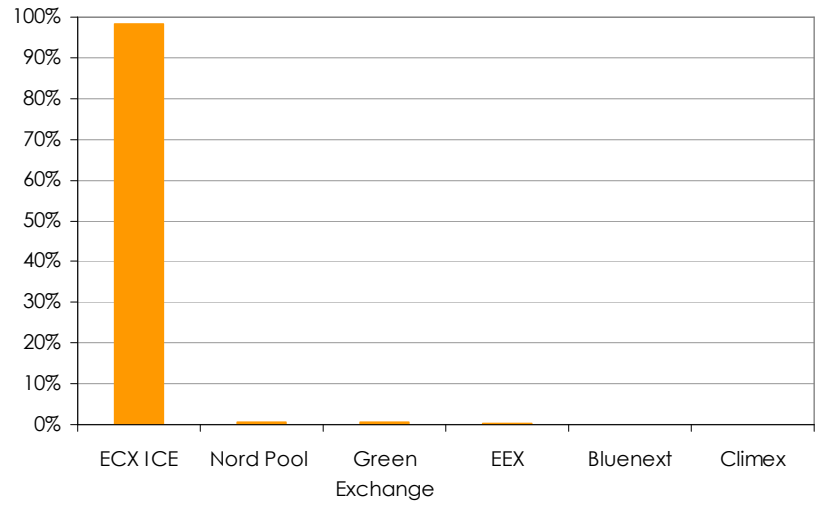


Sources: ECX and BlueNext

Both the spot market[11] and the derivatives market are heavily concentrated. The largest emissions derivatives market by far is the London-based partnership between ECX and ICE as can be seen from Chart 2.3 looking at market share.

[11] Spot market volumes include trading in the daily settled futures offered by some exchanges.

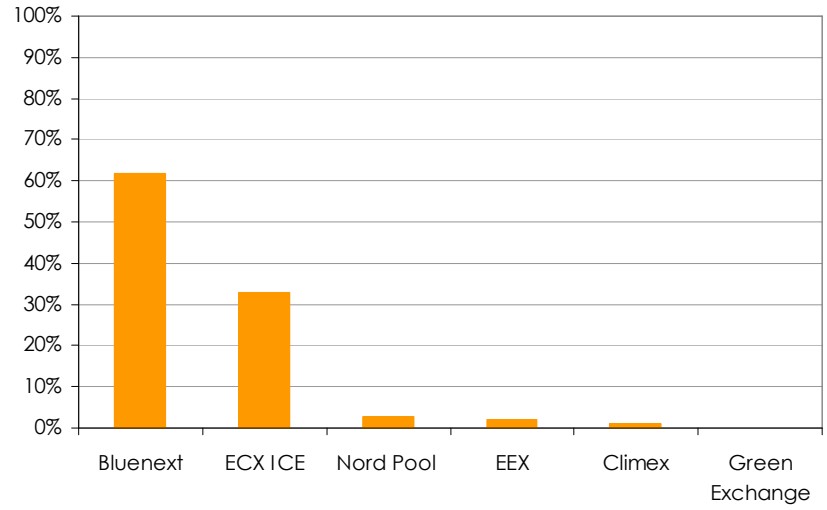
Chart 2.3: Derivatives Market Shares 2010



Sources: ECX, Bluenext, Nord Pool, EEX, The Green Exchange, Climex

BlueNext has the greatest market share in the spot market as can be seen in Chart 2.4.

Chart 2.4: Spot Market Shares 2010



Sources: ECX, Bluenext, Nord Pool, EEX, The Green Exchange, Climex

Almost all of BlueNext's business is now in spot trading, its derivatives business appearing to have virtually disappeared in 2010. The peak in trading on Bluenext in the early part of 2009 may in part be attributable to obligated firms adjusting their positions in time for the annual compliance deadline in April, but anecdotal evidence suggests that a significant part of the increase may also have been related to cross-border trading between EU and non-EU countries in order to strip out the VAT chargeable on the sale of emission units. Some of this activity was done in

order to gain a cash flow advantage but some was driven by straightforward VAT carousel frauds which were discovered in that year and which gave rise to the VAT treatment of emissions allowances being changed across the EU. A report on the Regulation of the CO2 Market published by the French Economics Ministry in April 2010 notes

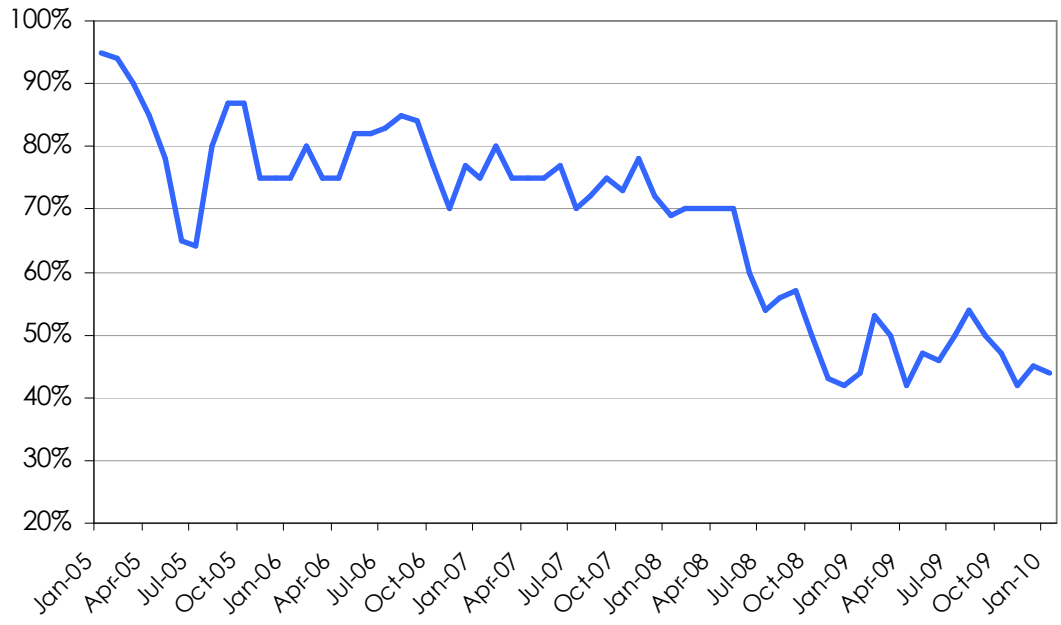
> *"… the striking coincidence between the suspension of the VAT regime applicable in France on the spot market at the end of the second quarter of 2009 and the corresponding decrease in traded volumes and trading platform transactions."*[12]

There are suggestions that BlueNext's success in attracting spot trading may be due to its improved post-trade infrastructure, which offers computer-to-computer connection and the security of delivery versus payment settlement.

2.5.2 OTC Trading

In the early years of the EU ETS most of the trading was done OTC rather than through exchanges. The majority of the OTC trading was facilitated by energy brokers using the same price display/price discovery systems as they use for the energy markets. As the market has evolved, however, the balance has shifted towards the exchanges. Chart 2.5 shows this development up to January 2010. Anecdotal evidence suggests that OTC trading may have declined to less than 30% since then.

Chart 2.5: Percentage of OTC vs Exchange Traded Emissions



Source: World Bank 2010

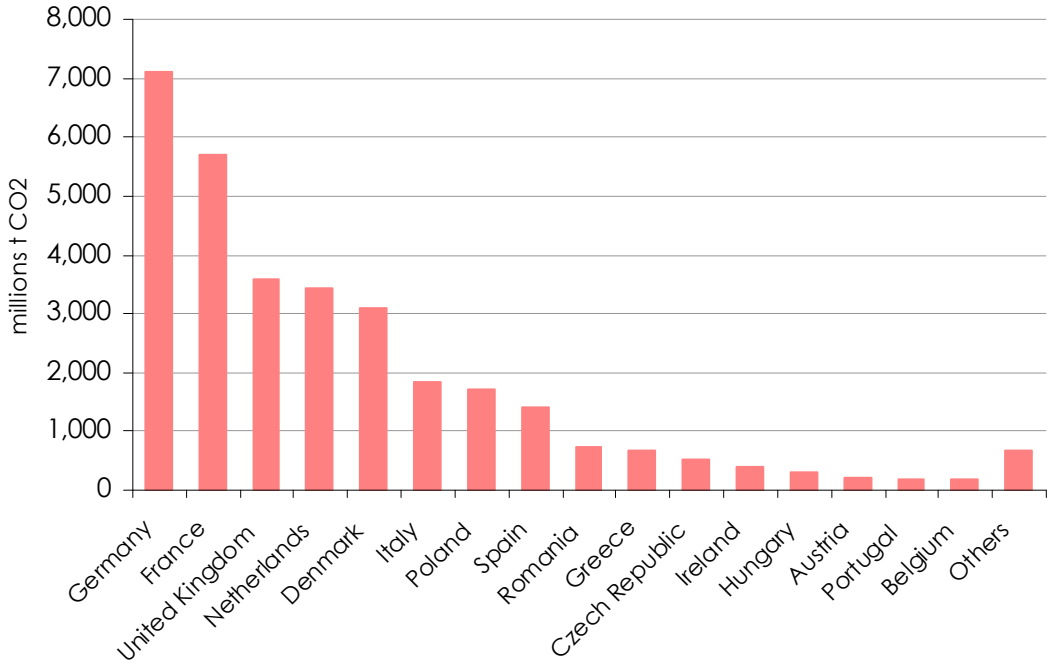
[12] Prada (2009) Section 3 (page 78)

In part this is due to the growing liquidity on some of the exchanges attracting further trading and in part it has been driven by the increased focus on counterparty credit risk after the recent financial crisis and a consequent demand for more trades to be traded on a transparent market and cleared. However, as the emissions market becomes more sophisticated, brokers expect to increase their business in more bespoke OTC contracts, especially more customised options.

2.5.3 Registries

In the last reporting period of the ITL, up to October 2009, 20% of units moved within the EU ETS were handled by two national registries. Interestingly the fact that the UK is the focus of most emissions trading as well as the focus of the commissions trading community does not translate into the UK registry being the most active registry.

Chart 2.6: Emissions Units Moved by EU Registries – Nov 2008 to Oct 2009

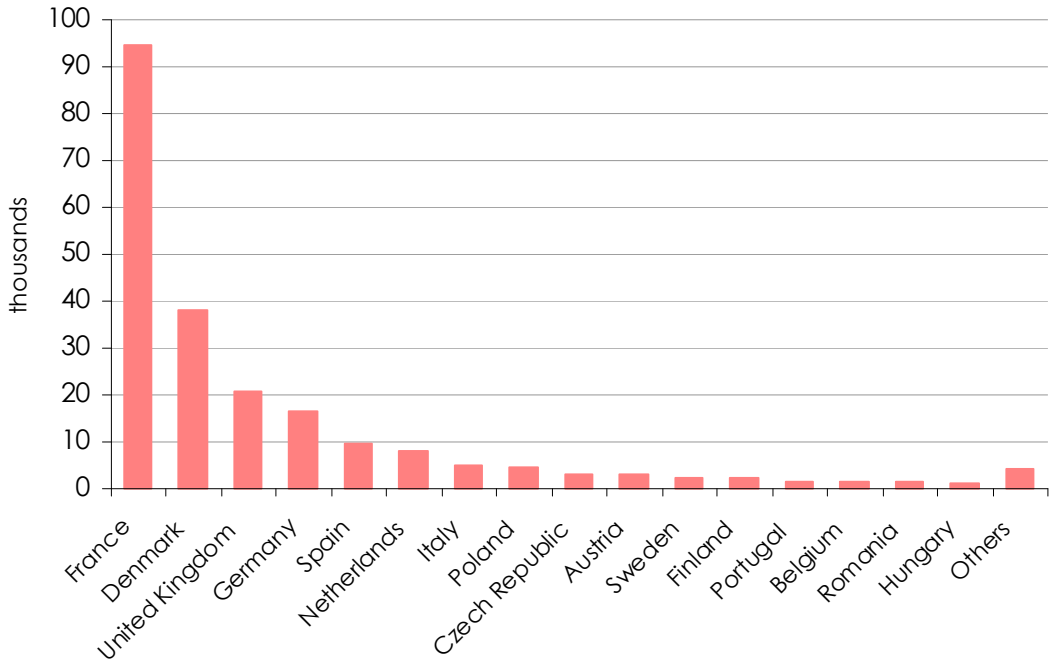


Source: ITL Administrator (2009), Annual Report

This contrasts with the distribution of the number of transfer instructions shown in Chart 2.7. The French registry handles more than twice the number of transfer instructions of any other registry. This is mainly due to the unique arrangement between the DVP settlement system and the registry. Because units must be transferred by the seller to the account of CDC before a trade can settle and are subsequently transferred to the account of the buyer, the process involves two registry transfer transactions. Since the second of these transfers is fully automated, however, this is not as inefficient as it may at first seem.

By contrast, the number of instructions handled by the UK registry will be significantly less that the number of trades they represent due to the fact that all trading done on ECX/ICE or traded OTC and cleared by ICE or LCH.Clearnet will, at settlement, be netted down to a single registry movement per participant.

Chart 2.7: Registry Transfer Instructions Processed by EU Registries – Nov 2008 to Oct 2009



Source: ITL Administrator (2009), Annual Report

The time taken to complete a transfer through the registry/ITL/CITL network can vary significantly and there does not seem to be any agreed service level for transaction turnaround against which the registries can be benchmarked. Information published by the ITL for the year to October 2009 shows monthly average transaction completion times varying between 60 and 320 seconds.

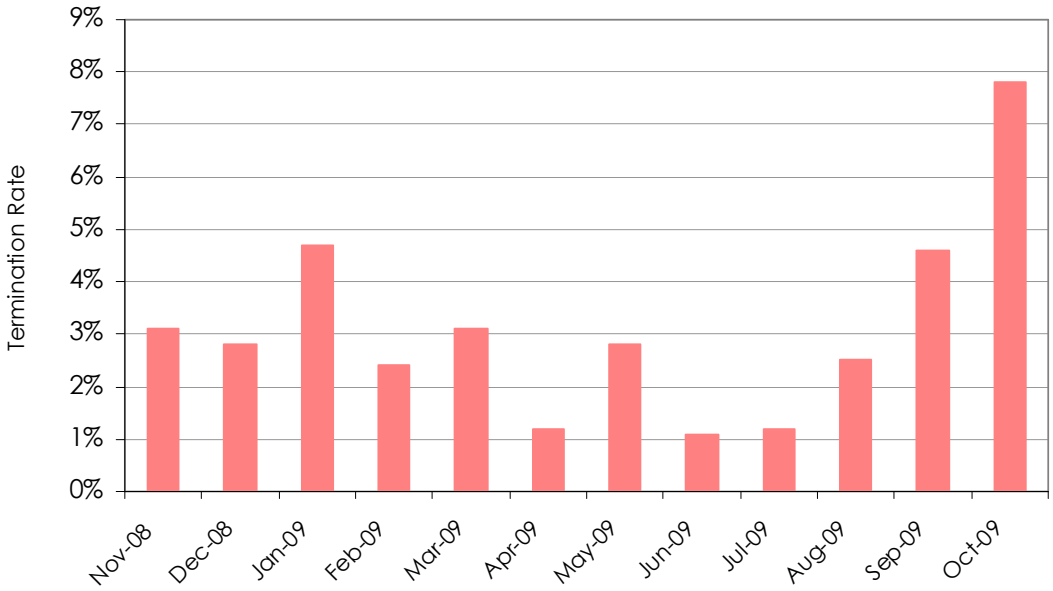
In the past turnaround times have been significantly impacted by the unreliability of some registry systems and the occasional removal from service of some registries during regular working hours in order to carry out maintenance. Most of these problems appear to have been ironed out but there still appears to be no co-ordinated approach to the operational service levels of the registries. The current guidance published by the UK Environment Agency[13] advises users to submit transfer instructions "*at least three working days before you need them to be finalised in the destination account*" due to the lack of certainty in turnaround times across the registry network.

Whilst this report was being prepared the worldwide registry network was shut down for several hours on 28-29 June as a result of a failure of the ITL system, without which no registry transfer instruction can be processed.

The number of transactions that are entered but fail validation seems rather high, averaging 3% and peaking in October 2009 at almost 8%.

[13] Environment Agency (2009)

Chart 2.8: ITL Transaction Termination Rates



Source: ITL Administrator (2009), Annual Report

2.6 Implications of the changes to infrastructure post-2012

At the time of writing, proposals to significantly change important parts of the EU ETS are under discussion. The key changes are:

- To establish auctioning as the underlying principle for the allocation of allowances by national governments and to establish a common auction platform for the EU;
- To replace the separate national GHG registries with a single registry for the whole of the EU.

These are discussed separately in the following sections.

2.6.1 Single Auction Platform

The directive establishing the EU ETS[14] in 2003 determined that, starting in 2013, member states should auction all allowances which are not issued free of charge. It also set out objectives which were to be met in the auctioning process. The detailed regulations specifying how the auction process is to be administered are now in draft[15] and under discussion. At the time of writing, the first vote on the directive was expected on 14 July.

[14] Directive 2003/87/EC

[15] The most recent public version is Auctioning Regulation – Commission proposal, 6 April 2010, but we understand it has subsequently been amended further.

At the time of writing the draft regulation proposes the following:

- A single common EUA auctioning platform will be operated through a regulated market, but the proposal allows for other auction platforms to be operated by individual member states until 2015. The UK has indicated that it expects to operate its own auctions, as have a few other member states.
- EUAs are to be auctioned in a form that is fungible and tradable on the regulated market operated by the auction platform. Consequently, EUAs will no longer carry a national identifier; they will all be European units.
- Proposed EU Aviation Allowances (from 2012) will also be auctioned through the platform.
- The auctioning platform will be connected to one or more clearing and settlement infrastructures.
- Allowances will be auctioned as two-day settlement spot contracts or five-day settlement futures (but only one method chosen).
- Auctions will be held at least weekly, based on a predictable auctioning calendar in order to limit impact on the secondary market.
- Eligibility to apply for admission to the auctions will be given to easily identifiable, well-defined categories of participants, notably those covered by the emissions trading scheme, as well as regulated financial entities such as investment firms and credit institutions.
- Equitable access to the auctioning platform will be given to small and medium sized emitters.

2.6.2 Single Union Registry

The EU has determined that in order to implement the changes required to the EU ETS after 2012 – including the inclusion of aviation in the scheme – it will be necessary to create a single Union Registry, whilst individual countries will continue to operate national registries to cover their Kyoto obligations. An EU regulation[16] specifying the requirements for the Union Registry is now in draft and under discussion. The main new features of the proposed registry are as follows:

- All functions related to the EU ETS will be carried out on the Union Registry. Thus all transfers as a result of trading activity will be processed by the Union Registry.
- The Union Registry will operate a single, central infrastructure on behalf of the national registries, which will still be responsible for opening accounts. Thus, an institution could have multiple accounts in the Union Registry depending on the number of national registries in which it has opened accounts. The services provided will, however, be identical across all the accounts, as they will be provided centrally by the Union Registry.
- National registries will remain responsible for functions required under the Kyoto Protocol, such as managing the surrender of units. Units will therefore be returned to national registries when needed for this process to be carried out.

[16] Draft Commission Regulation

- Regulated exchanges and trading venues will be able to open a trading platform holding account.
- Account holders will be able to nominate that their account is accessible through a trading platform.
- The arrangements for technical connectivity to the Union Registry are still under discussion. It is not decided yet whether there will be a Registry Electronic Interface (REI) from the beginning. Although there will be a single secure web portal, users may still require separate passwords to access accounts opened through different national registries.
- Security arrangements will allow for more sophisticated authorisation controls over transfers.
- There will be specific facilities to back out of transfers clearly made in error.
- The registry system operator will be required to "*take all reasonable steps*" to make the system available 24 hours a day, 7 days a week.
- The location of the Union Registry has not yet been decided.

3 Issues in the Market Infrastructure

3.1 Why market infrastructure is important; how it affects prospects for emission trading

The role of post-trade infrastructure in markets is vital, but often under-estimated. Post-trade infrastructure is a general term for the institutions and processes that cover the time between trading (when a set of obligations is created between a buyer and a seller) and final settlement (when those obligations are discharged). The post-trade processes are generally divided into two phases: clearing and settlement (defined in Sections 2.3.1 and 2.3.2).

The key objective of clearing is to protect each party to a trade from the failure of its counterparty. The key objective of the settlement process is to ensure that the buyer receives what they have bought and that the seller receives payment and that in both cases they can be confident that they have received full and unconditional ownership of an asset or payment. This is usually achieved through a form of DVP settlement, which ensures that the exchange of the cash and the asset are simultaneous and final.

Confidence in post-trade processes is a critical condition for liquid and efficient trading: if market participants are not confident that they will be able to enjoy the benefits of their trading activity, they will be reluctant to commit themselves to a market. If the post-trade processes are expensive or inefficient, they act as a drag on trading activity, reducing liquidity and making markets less effective as a mechanism for price discovery. Finally, the structural relationship between trading platforms and post-trade processes can determine the potential for competition in the market.

In this chapter we examine the post-trade arrangements for the carbon markets against these standards. Do they give the participants in the carbon markets confidence so that they commit themselves to trading? Do they function efficiently so that liquidity is maximised? Do they support competition?

3.2 Emission allowances compared with other financial instruments

Trading in emission allowances is used by different institutions for two main purposes:

- As a means to enable emitters of GHGs to comply with regulatory requirements;
- As a vehicle for investors and traders to trade for profit by taking on or laying off exposure to price movements in emission allowances.

In the latter capacity they give rise to similar risks to other financial instruments. Futures contracts based on emission rights, like derivative contracts based on physical commodities, are treated as financial instruments and are subject to the same regulatory regime as other derivatives[17]. Spot trading – trading for immediate

[17] See FSA (2008). They are specifically mentioned in Section C(10) of Annex I of MiFID (2004)

delivery – in carbon emission rights is not subject to financial regulation, in the same way that spot trading in physical commodities is not.[18]

One significant difference, however, is that emission units are dematerialised instruments and the process leading from trading to settlement is more similar to that for securities markets than that for crude oil or sugar. But because spot trading of emission units is treated as physical trading, the post-trade risks are not addressed in the same way as they are in other dematerialised markets, such as securities.

There is an opportunity for the emerging emissions market to learn from the experience built up by other markets over many decades. In Chapter 4 of this report we consider how the infrastructure for settlement in the carbon market measures up against the Recommendations for Securities Settlement Systems issued by the BIS Committee on Payment and Settlement Systems and the Technical Committee of International Organization of Securities Commissions ('the CPSS-IOSCO standards'), the accepted standard for best practice in securities settlement.

One consequence of the duality in attitudes to emission rights is that not everyone gives sufficient weight to their character as easily transferred assets with a cash value. This affects many aspects of the design of the registry infrastructure and, in some cases, internal controls in market firms.

However, this is not to argue that emission allowances should be classified as financial instruments, as concern has been expressed that this could have the consequence of bringing a wide range of installations within the ambit of financial regulation, when their only interest is to hold units against their emissions and in due course surrender them. On the other hand, emission allowances are increasingly traded in financial markets and they have characteristics that are much closer to those of financial instruments, such as securities, than to those of physical commodities. We therefore believe it is appropriate to assess the legal framework and institutional infrastructure against the standards that have come to be expected in other financial markets.

3.3 Issues in the market infrastructure

The key issues we have identified are:

Legal risk

- Lack of clarity over the legal status of units and registry systems;
- Lack of clarity over timing of irrevocability of instructions and finality of settlement;
- Lack of clarity in the validity of their use as collateral.

Operational risk

- Weaknesses in security for sending instructions to registries;
- The absence in most registries – including the UK – of any form of direct connectivity (API) to support STP (Straight Through Processing) by users, creating operational risk;

[18] But some markets have introduced daily futures contracts as a way of creating a spot market 'look-alike' that is nevertheless treated as a financial instrument.

- The absence in most registries of any 'four eyes' functionality and the impossibility of constituting controls in participants' own systems, given the absence of STP;
- The complexities created by the need to move units in blocks;
- The non-fungibility of different types of ERUs and CERs not being recognised in registry systems.

Counterparty risk

- The absence of DVP settlement, creating counterparty risk.

Market structure

- The extent to which market users are fully involved in decisions on future developments;
- The way the relationship between trading platforms and clearing and settlement institutions affects competition in the market.

These issues are discussed in more detail in the following sections.

3.3.1 Legal risk

There is no consistent definition across Europe of the legal nature of an emission allowance[19]. In various countries they are treated as property rights, personal rights or some form of personal licence. Only in Romania are they classified as financial instruments[20].

This variation in treatment and the fact that they do not fall into a recognised category, such as investments, means that there is uncertainty about regulation of the market and its participants, the possibility of using emission allowances as security and what would happen in circumstances where a holder of emission allowances should become insolvent.

Three particular questions arise from the point of view of considering the robustness of the market infrastructure, discussed in the following sections.

3.3.1.1 Irrevocability of instructions

At what point do instructions to transfer emission rights become final and irrevocable? To illustrate the significance of this question, suppose a firm enters an instruction into a registry in the evening of one day and the firm then goes into administration (or liquidation) overnight, before the transfer can be completed. Is it possible for the administrator (liquidator) to cancel the transaction and claim back the units as part of the assets of the failed firm? Or is the transfer process irrevocable, once it has started[21]?

In European securities markets, this question is addressed by the Settlement Finality

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[19] See FMLC (2009) Section 2.6 and Prada (2009) Section 3 (page 57)

[20] See Prada (2009) Annex VII (page 189)

[21] The Registries Regulations (2004) state "*[transfers] shall be final when both independent transaction logs successfully inform the initiating registry that they have not detected any discrepancies in the proposal sent by the initiating registry*." However, it remains unclear whether the process can be stopped at any time up to the receipt of that confirmation.

Directive[22], which contains provisions regarding:

- Transfer orders and netting (e.g. legal enforceability of transfer orders and netting, irrevocability of transfer orders, no unwinding of netting, etc);
- Insolvency proceedings (e.g. non-retroactivity of insolvency proceedings, determination of applicable law, etc);
- Collateral security (e.g. insulation from insolvency proceedings, determination of the law applicable to cross-border provision of collateral security).

However, it is unclear whether the Settlement Finality Directive applies to transactions other than in securities, even within institutions that are otherwise covered by the Directive. Since emission registries are not covered by the Directive, their transactions are not covered.

In the UK, Part VII of the Companies Act 1989 provides that the default rules of a recognised exchange or clearing house take precedence over insolvency procedures. Whilst this protects the default procedures of recognised exchanges and clearing houses in the UK, it does not apply to the UK emissions registry or to exchanges and clearing houses elsewhere.

3.3.1.2 Finality of settlement

Once a transfer of units has been completed, at what point is it final and irrevocable? Are there any circumstances in which it can be reversed? For example, if the units had previously been the subject of a fraudulent transfer, could subsequent transfers be reversed, even if they were made in good faith[23]?

3.3.1.3 Acceptability of emission allowances as collateral

An important function of financial instruments is to serve as security against the provision of credit. Credit may be extended by a bank as part of general financing arrangements or by a clearing or settlement system in the course of the clearing or settlement process.

At present the validity of a charge given over emission allowances, particularly when the security is a pool of allowances originating from different countries, remains open to question. It is not clear whether the relevant law is that of the country under which the security was given, the country where the allowances are held or the country in which they were originally issued[24]. This may result in significant differences. For example, the Dutch implementing legislation contains a provision specifically prohibiting the pledging of emission allowances[25].

Another issue is the ability to enforce the security. Emission registries do not support the registration of any form of security or pledge. The Registry Regulations[26] do allow

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[22] Directive 98/26/EC

[23] By comparison, Euroclear UK and Ireland, a securities settlement system, has specific rules determining the process to be followed if a register of holdings has to be rectified following fraud or clerical error. See CREST Rules (2009), rule 11.

[24] See the discussion in Section 3 of FMLC (2009)

[25] FMLC (2009), page 13

[26] Article 23

for the creation of an additional authorised representative, whose approval is required to submit a transfer. This facility is available in the UK Registry, for example, but since the authority of the additional representative can be revoked by the account holder at any time, it is apparently little used. Other legal structures involving escrow agents or special purpose vehicles are used instead.

The use of emission allowances as collateral within clearing and settlement systems is limited. ICE Clear Europe has accepted emission allowances as collateral (subject to some restrictions) since September 2009[27]. Normally, these arrangements would be protected by the Financial Collateral Directive[28], but as it applies to shares and debt instruments, it is not clear that it applies to emission allowances used as collateral. By contrast, although Euroclear Bank can normally use securities held for clients as collateral, when acting through its ClimateSettle service it does not accept emission allowances as collateral.

3.3.1.4 Legal risks in the future

These legal issues will become more acute with the move to a single Union Registry, as described in Section 2.6.2.

The proposal means that there will be a single Union registry and a single set of allowances across Europe. Although units will no longer be identified by the country in which they were issued, the accounts in the Union Registry will still be operated on behalf of national registries. There will therefore be at some point a dividing line between matters that fall under the jurisdiction of EU legislation and matters, such as property rights and insolvency, which fall under the jurisdiction of national law. There is a further question: Whether the national law that will apply is the law of the country in which the Union Registry is located (which is not yet decided) or the country on whose behalf it is administering accounts. Note that similar issues arise in relation to the European Central Bank's T2S project to develop a common platform for European securities settlement. This will also consist of a single technical platform administering accounts on behalf of national securities depositories. The legal issues raised by this structure have been extensively analysed[29].

These issues need to be analysed and clear procedures worked out in advance of a crisis. Once a crisis starts there is often no time for analysis. It is worth recalling that the parent company of Lehman Brothers entered Chapter 11 at 12.30 am in New York (5.30 am in London) and administrators were appointed to Lehman Brothers in London at 7.56 am. The default arrangements in securities markets have been extensively analysed and are generally well understood. Even so, there was considerable uncertainty in the market place. In order to understand their exposure to the market, Lehman's counterparties had to verify which transactions had passed the point of irrevocability – and therefore would certainly be settled – and which transactions could be cancelled – and therefore might have to be replaced in the market. The uncertainty would have been an order of magnitude greater if it was not even clear when the point of irrevocability had been reached.

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[27] ICE Clear Europe (2009)

[28] Directive 2002/47

[29] See, for example, European Central Bank (2007)

In the words of the Financial Markets Law Committee (FMLC, an independent committee of legal experts, partly sponsored by the Bank of England), "*unless there is some clarification, the issues identified could significantly impede the development of the market in carbon emission allowances*"[30].

3.3.2 Operational risk

The fact that the carbon market is at an early stage in its development means that its infrastructure lacks some of the more advanced technical features that are found in more mature markets. However, the consequence of their absence is to increase the operational risks borne by market participants. The following examples have been raised with us.

Security

Reliance on password-protected access through websites accessed over the public Internet leaves some registries vulnerable to phishing attacks of the kind that resulted in an estimated 250,000 emission rights worth some €3 million being stolen from accounts in the German Registry in January 2010[31].

Operational performance

Users have commented that, while the great majority of transactions are processed quickly and efficiently, registries can be subject to unexpected delays or even closures at short notice. For example, the fraud in the German Registry resulted in it being closed from 29 January to 3 February 2010. More recently, the ITL was closed unexpectedly on 28-29 June this year, causing all national registries to close. Other registries also close for maintenance work at short notice, not always outside normal working hours. Registries also sometimes suffer from performance problems at peak periods.

Consequently, some market participants feel it is necessary to maintain accounts in several registries so that they can be assured of being able to deliver and receive units at all times, but this imposes an overhead of repositioning units between multiple accounts.

The absence of regular, up-to-date published statistics on the volume of transactions processed, system availability and turnaround times makes it impossible for participants to judge whether their own experience is typical and to estimate how much time to allow for processing ahead of deadlines.

Anecdotally, we have heard that, although the UK Registry suffered from capacity problems in the past, processing times have become shorter and more consistent in recent years, but in the absence of definitive statistics it is impossible to verify this or compare it with performance in other registries.

Straight Through Processing

Access to registries is almost always through manual web-based interfaces, with no facility for an automated interface. Operationally this is inefficient, as data on counterparties and quantities of units, which is very probably already held in electronic form inside the user's own system, has to be re-entered manually. This

[30] FMLC (2009), page 5

[31] See Umweltbundesamt (2010)

process becomes more laborious as the process of trading means that blocks of units become fragmented, so that in order to deliver a large quantity of units, it may be necessary to assemble this quantity from many small blocks of units.

More importantly, the need for manual input significantly increases the risk of error when entering either the counterparty's account number or the quantity of units to be transferred. As there is no requirement for the transferee to match the transfer instruction (unlike most securities settlement systems), an erroneous instruction will be processed immediately. When this happens, it can be difficult to recover the units transferred in error. Indeed, there is a concern that if too large a quantity of units was surrendered for cancellation, they might never be recovered, leading to a permanent loss for the institution concerned and the market as a whole. This concern is addressed in the proposed registry regulation, which explicitly provides for reversal of certain erroneous transfers[32]: Article 51.

The one case where an STP facility exists is between CDC and the French Registry for the settlement of spot transactions originating on the BlueNext exchange in Paris (described in Section 2.3.2). The German Registry has also developed an XML API allowing for some automation.

The complexities created by the need to move units in blocks

Each tonne of CO2 equivalent in a unit is represented by a unique serial number, giving information about the country of issue, the type of unit, year of issue, project information (if a CER/ERU) and a number representing which actual tonne of CO2e it represents. So, for example, if CERs are created representing a saving of 100,000 tonnes of CO2e, are issued, the 100,000 tonnes are represented by a single entry in the register of a block having a start block value of 1 and an end block value of 100,000. If 50,000 units are then transferred, the block is broken into two new blocks, one having a start block value of 1 and an end block value of 50,000, the second having a start block value of 50,001 and an end block value of 100,000. These blocks can further be broken down by subsequent transfers, but blocks can never be increased in size by subsequent amalgamations. Over time, the blocks get smaller and smaller. In order to make a large transfer, several transactions may need to occur to meet the value of the transfer. This has to be carried out manually, adding to complexity and increasing the risk of operational error, for example, by transferring blocks that add up to more than the intended number of units.

'Four eyes' authorisation

'Four eyes' authorisation describes a process whereby an instruction is entered by one operator but must be authorised by a second operator (for example, using a second password) before it is processed. This process provides a degree of protection against clerical errors and the risk of a single password being compromised. Unfortunately, only a few registries provide this facility in their system (for example, Ireland).

If firms were able to submit instructions to registries through an automated interface, they could make up for the absence of 'four eyes' functionality in registry systems by building it into their internal systems and restricting access to the manual web interface. Unfortunately, the absence of an automated interface means this fall-back solution is not available.

[32] Draft Regulation on Registries, Section 5

Different categories of ERUs and CERs

Registries were designed to be able to accept CERs into their systems, and to allow for their transfer and surrender the same as other units. However, the EU ETS only allows certain categories of CER to be used to meet an installation's obligations. As mentioned, projects involving nuclear power or temporary forest credits are not allowed, and there are restrictions on hydro power projects exceeding 20MW of installed capacity (some are allowed, some are not). This ban and these restrictions mean that certain types of ERUs and CERs cannot be surrendered under the scheme. Consequently, many counterparties and clearing houses will only accept units eligible under the ETS. However, registry systems were not initially designed to track and manage these differences, and it is up to human operators to ensure that the correct type of ERU or CER is delivered in a transaction. This adds to manual processing and risk. Counterparty exposures will arise if unacceptable units are delivered and have to be returned.

3.3.3 Counterparty risk

Counterparty risk exists from the time a trade is executed until settlement is final. Between trade and settlement the risk is that the counterparty fails and the trade has to be replaced at a less advantageous price. For all trades executed on exchanges and for most trades executed OTC this risk is covered by clearing houses, using their usual and widely-accepted risk management techniques.

Another kind of counterparty risk can occur in the settlement process when the two parties exchange an asset for payment. Where one party delivers the asset or payment before the other, there is a risk that the counterparty could fail at a point when it held both the asset and the payment. A key function of settlement systems is to eliminate this risk either by ensuring that the payment and the transfer of the asset are simultaneous, using Delivery versus Payment (as in most securities settlement systems) or by arranging for the two assets to be held by a third party until they can be transferred (as is done by CLS Bank for foreign exchange). In many cases, the cash side of the settlement takes place in the books of a central bank (known as settling in 'central bank money') to eliminate the risk that the seller receives payment into an account at a bank that then fails.

There is very little DVP settlement in the carbon market. CDC provides DVP settlement for spot trades executed on BlueNext by settling the cash and emission rights, which have to be pre-positioned before trading, across its own accounts. Euroclear's ClimateSettle service provides DVP settlement, with cash settled in the books of Euroclear Bank. In all these cases, the cash side of the settlement is in the accounts of a commercial bank, rather than a central bank.

In all other cases, when participants settle with each other or with a clearing house such as LCH.Clearnet, one party has to move first to deliver the units or make payment to the other. Thus there is a period of time when one party is holding both cash and units. Generally, the party that is seen as stronger financially expects its counterparty to move first.

A potential complication in future is the proposal that the Union Registry should operate 24 hours a day, 7 days a week. While this has some operational advantages, it may make it more difficult to manage DVP settlement. For example, units may be transferred early on Saturday morning, leaving two days before the banking system will next be open to process the cash payment.

3.3.4 Market structure

The examples given show how the design of the market infrastructure – in this case, principally the emissions registries – affects the risk profile and efficiency of participants in the market. At present, however, there is little opportunity for market participants to influence the design of the infrastructure. Whereas infrastructure organisations in other markets commonly have some form of user groups and conduct a consultation process before implementing changes this is not the case for carbon registries or at least it does not operate in a transparent way. The UK Registry convenes a Traders Forum a few times a year to hear views on future developments, and some other registries apparently do the same, but there is no structured consultation process at the European level and none of the working documents are made public, so that they can reach a wider audience. This can be contrasted with the approach adopted by the European Central Bank for its T2S project, for which there is a formal and public consultation structure and all documentation is published. Consequently, there is a risk that the design of the new Union Registry will fail to address the concerns that users have with the current arrangements.

Another important aspect of market infrastructure is its ability to promote choice and competition for users of the market. Where trading and clearing are locked together so that users of a trading platform must use a specific clearing house, which only serves that trading platform (known as a 'vertical silo'), choice is restricted. There is an overhead in maintaining clearing memberships in multiple clearing houses, which can only be afforded by larger firms. If smaller firms only want to maintain a membership in a single clearing house, then this in effect limits their choice of trading venue.

The choice of an EU auction platform will profoundly define the future shape of the market. If the chosen auction platform is part of a vertical silo, there is a risk that it will make it more difficult for other platforms to compete, with an overall reduction in choice and competition in the market. On the other hand, if the chosen auction platform is part of an open structure, it could help to promote competition.

In European equity markets, the European Commission promoted the adoption of a Code of Conduct[33] to promote transparency and openness. It does not apply to derivative markets or spot markets, such as carbon. However, its principles are ones that should be respected in selecting the future market infrastructure for the carbon market.

[33] FESE (2006)

4 Assessment of Emissions Infrastructure Against the CPSS-IOSCO Recommendations for Securities Settlement Systems

In this chapter we provide a summary assessment of how well the settlement infrastructure for the emissions market meets the standards established by the CPSS-IOSCO Recommendations for Securities Settlement Systems[34]. We have not carried out a similar assessment for clearing houses in the emissions market: settlement of emission units is undertaken by special services or institutions created specifically for this purpose, while for clearing, emission units are generally treated simply as another asset class within an existing clearing house.

This assessment follows the headings of the CPSS-IOSCO recommendations, with the recommendation summarised in italics, followed by an assessment of the emissions market infrastructure. Of course, the emissions market is in some respects different from a securities market, so not all recommendations are relevant.

Overall, according to our assessment:

- Nine of the nineteen recommendations are not met by the emissions infrastructure;
- Nine are wholly or partially met; and
- One is not applicable.

Recommendation 1 - Legal framework: not met

Securities settlement systems should have a well founded, clear and transparent legal basis in the relevant jurisdictions.

As discussed in Section 3.3.1, this is a significant weakness in the emissions market, giving rise to potential uncertainty.

4.1 Pre-settlement risk

Recommendation 2 - Trade confirmation: generally met

Confirmation of trades between direct market participants should occur as soon as possible after trade execution, but no later than trade date (T+0). Where confirmation of trades by indirect market participants (such as institutional investors) is required, it should occur as soon as possible after trade execution, preferably on T+0, but no later than T+1.

On-exchange trading is passed to clearing houses as matched trades. Much OTC trading happens through electronic platforms, which provide trade confirmation.

Recommendation 3 - Settlement cycles: not met

Rolling settlement should be adopted in all securities markets. Final settlement should occur no later than T+3. The benefits and costs of a settlement cycle shorter than T+3 should be evaluated.

[34] CPSS-IOSCO (2001)

There is no standard settlement cycle for spot trading of emission rights, though this may emerge in the light of the auction arrangements.

Recommendation 4 - Central counterparties (CCPs): met

The benefits and costs of a CCP should be evaluated. Where such a mechanism is introduced, the CCP should rigorously control the risks it assumes.

CCPs exist for on-exchange trading and are available for OTC trading.

Recommendation 5 - Securities lending: met

Securities lending and borrowing (or repurchase agreements and other economically equivalent transactions) should be encouraged as a method for expediting the settlement of securities transactions. Barriers that inhibit the practice of lending securities for this purpose should be removed.

Borrowing and lending of emission rights is possible and is arranged bilaterally. There are no easy mechanisms for using emission rights as collateral (registries do not support taking a charge, etc) so more complicated escrow arrangements need to be set up.

4.2 Settlement risk

Recommendation 6 - Central securities depositories (CSDs): met

Securities should be immobilised or dematerialised and transferred by book entry in CSDs to the greatest extent possible.

All emission rights are dematerialised.

Recommendation 7 - Delivery versus payment (DVP): partly met

CSDs should eliminate principal risk by linking securities transfers to funds transfers in a way that achieves delivery versus payment.

No registries provide DVP settlement.

Some other institutions, such as CDC and ClimateSettle offer DVP settlement when they can control all the assets on their own books.

Recommendation 8 - Timing of settlement finality: not met

Final settlement should occur no later than the end of the settlement day. Intraday or real-time finality should be provided where necessary to reduce risks.

Timing of settlement finality is unpredictable and unclear.

Recommendation 9 - CSD risk controls to address participants' failures to settle: not applicable

CSDs that extend intraday credit to participants, including CSDs that operate net settlement systems, should institute risk controls that, at a minimum, ensure timely settlement in the event that the participant with the largest payment obligation is

unable to settle. The most reliable set of controls is a combination of collateral requirements and limits.

This is not relevant, as emissions registries do not provide credit. The recommendation applies to infrastructures like ClimateSettle (Euroclear Bank) but settlement of emission rights is only a very small part of their overall credit management policy.

Recommendation 10 - Cash settlement assets: not met

Assets used to settle the ultimate payment obligations arising from securities transactions should carry little or no credit or liquidity risk. If central bank money is not used, steps must be taken to protect CSD members from potential losses and liquidity pressures arising from the failure of the cash settlement agent whose assets are used for that purpose.

Practice varies but is not managed by the registries. CDC and Euroclear give only commercial bank money settlement.

4.3 Operational risk

Recommendation 11 - Operational reliability: not met

Sources of operational risk arising in the clearing and settlement process should be identified and minimised through the development of appropriate systems, controls and procedures. Systems should be reliable and secure, and have adequate, scalable capacity. Contingency plans and backup facilities should be established to allow for timely recovery of operations and completion of the settlement process.

Registries seem especially weak in this area. There are doubts on all scores – reliability, security and capacity. There is too little public information for participants to be able to make an informed judgement.

4.4 Custody risk

Recommendation 12 - Protection of customers' securities: met

Entities holding securities in custody should employ accounting practices and safekeeping procedures that fully protect customers' securities. It is essential that customers' securities be protected against the claims of a custodian's creditors.

This is not relevant to registries, as they do not hold emission allowances in custody.

It is relevant to secondary settlement systems, such as ClimateSettle. Euroclear Bank already has safekeeping arrangements in place under Belgian law to protect customers' securities.

4.5 Other issues

Recommendation 13 - Governance: not met

Governance arrangements for CSDs and CCPs should be designed to fulfil public interest requirements and to promote the objectives of owners and users.

User involvement in developing registry services is weak, missing out on the opportunity to use their expertise.

Recommendation 14 - Access: met

CSDs and CCPs should have objective and publicly disclosed criteria for participation that permit fair and open access.

Access is defined by regulation and is open to all.

Recommendation 15 - Efficiency: met

While maintaining safe and secure operations, securities settlement systems should be cost-effective in meeting the requirements of users.

Registries are regarded as low cost by users, but this may have been achieved at the cost of not providing high levels of safety and security.

Recommendation 16 - Communication procedures and standards: not met

Securities settlement systems should use or accommodate the relevant international communication procedures and standards in order to facilitate efficient settlement of cross-border transactions.

Registries generally do not provide any automated interfaces, with two exceptions we are aware of, both of whom have developed their own interface.

Recommendation 17 - Transparency: not met

CSDs and CCPs should provide market participants with sufficient information for them to identify and evaluate accurately the risks and costs associated with using the CSD or CCP services.

The only information currently provided on registry performance is in the ITL Administrator's report. It appears only annually and with a delay that means that it is of limited practical use.

Recommendation 18 - Regulation and oversight: not met

Securities settlement systems should be subject to transparent and effective regulation and oversight. Central banks and securities regulators should cooperate with each other and with other relevant authorities.

Registries are not subject to prudential supervision (for example, by the FSA).

Recommendation 19 - Risks in cross-border links: met

CSDs that establish links to settle cross-border trades should design and operate such links to reduce effectively the risks associated with cross-border settlements.

Cross-border transfers (that is, from one national registry to another) are generally effective and risk-free, as the process is controlled through the two transaction logs (CITL and ITL).

5 Conclusions and Recommendations

5.1 Conclusions

The initiative taken at Kyoto in 1997 to control the growth in emissions of GHGs through a market-based 'cap and trade' scheme was imaginative and forward-looking, using a market-discovered price to achieve the most efficient ways of reducing emissions.

This initiative has been taken forward most actively within Europe and has been successful on many counts. A market in carbon emissions now exists and a price is set from day to day, depending on market conditions. A large number of institutions have been established around the world for trading, clearing and settling emission rights, many of them interlinked. The global value of trading has grown to $144 billion in 2009[35]. There are also indications that the EU ETS has been an environmental success. Studies[36] suggest that the EU ETS in its first two years cut emissions by 50-100 MtCO2e/yr, or by around 2.5-5%. The fact that the market has been proven to work is a credit to the efforts of international and national authorities and the participants who have chosen to trade in the market.

Consequently, the market has a high public profile. Any perception of irregularity in the operation of the market is widely reported and could bolster the arguments of those who believe that the use of market mechanisms to address climate change has no merit.

However, many features of the market infrastructure betray its history as a compliance market rather than a financial market. There are therefore areas in which the systems and procedures differ from established best practice in the financial markets – sometimes for reasons relating to the particular nature of emissions but sometimes not.

In Chapter 3 of this report, we listed a number of risks that concern market participants under the broad headings of legal risk, operational risk and counterparty risk. It is a cause for concern that for various reasons these risks are not considered to be the responsibility of either financial regulators or the government departments developing the emissions trading scheme. It is therefore not certain how they will be addressed. To quote the Financial Markets Law Committee again,

> "*The worst case scenario would be for the market to develop without any such resolution [of legal uncertainties], because it is inevitable that there will eventually be an insolvency or default involving a market participant, leading to a need for the courts of one or more Member States to resolve the issues identified. It seems very unlikely, against the current background, that any such national resolution would be capable of producing an outcome which could apply across all Member States. At that point there must be a serious risk that the market would be seriously destabilised*[37]".

The introduction of a pan-European auction model and a pan-European registry presents an opportunity to address the needs of the market in its next phase of

[35] World Bank (2010) Table 1

[36] Referenced in Grubb, Miller, *et al* (2009)

[37] FMLC (2009), Section 4.4

evolution and to reassess the post-trade infrastructure to ensure that it will be fit for purpose when volumes increase further and the stakes are higher.

If Europe rises to this challenge, it can demonstrate to the rest of the world how to operate an efficient, secure emissions market and potentially increase its leadership in this area. If the opportunity is missed and the market infrastructure proves inefficient or fragile when more load is put upon it, Europe will have lost its first mover advantage.

The UK has taken the lead in introducing an emissions market and in auctioning allowances. It is currently home to the largest emissions market in Europe (and the world) and the biggest community of emissions market traders. If Europe should be leading the world in emissions markets then the UK should be leading Europe. In ECX/ICE Futures the UK is the clear leader in trading infrastructure but there seems to be no aspiration to lead in the provision of post-trade infrastructure.

5.2 Recommendations

We offer the following recommendations as useful steps that would help to ensure that the market evolves on the basis of a robust and effective infrastructure.

Address legal risks

The legal uncertainties need to be resolved before they are exposed by the failure of a significant market participant. To the extent that it is possible to arrive at a legal interpretation that commands widespread support, this would then enable market participants to proceed with confidence. However, if it is not possible to arrive at a clear legal interpretation, then it will be necessary to provide clarification through legislation. The introduction of a central Union Registry and the move to a single set of European units present an opportunity for an assessment of the legal framework.

We support the view of the FMLC that this work could best be taken forward within the European Commission by DG Internal Market and Services with input from DG Climate Action. The approach adopted by DG Internal Market and Services working through the Legal Certainty Group[38] could be a good model for this work.

Increase transparency of registry performance

Confidence in market infrastructure is built on knowledge. Market participants have told us that they have to operate without certainty about what reliance they can place on the most basic market infrastructure, namely, the registries. In the absence of information they operate below their optimum level of efficiency by maintaining multiple accounts or allowing extra time for transfers to be processed.

We see no reason why there should not be more openness from registries on performance, for example, by publishing regular statistics on the number of transfers processed, a breakdown of processing times and statistics on registry downtime. Most of this information is published now in the ITL Administrator's Report, but with such a lag that it is of limited usefulness. We have been told that the Regulation is a

[38] The Legal Certainty Group is a group of legal experts drawn from academia and the public and private sectors, who advise the Commission on matters of legal uncertainty in the clearing and settlement of securities. See http://ec.europa.eu/internal_market/financial-markets/clearing/certainty_en.htm

barrier to publishing this information. If this is the case, then we suggest this aspect of the Regulation should be reviewed[39].

Greater user involvement in system design

Many of the operational issues that concern users are features of the design of registry systems. These include the lack of an automated interface, inadequate controls for initiating transfers and the inability to register and enforce the use of units as collateral within registries. They could be addressed in the design of the new Union Registry by more direct involvement of users in its design. Most clearing houses and settlement systems operate some form of user group or consultative committee at which proposed changes are discussed and input is sought on design issues. We would encourage the creation of such a group for the new Union Registry.

The absence of DVP settlement in registries is important and is addressed here in the discussion of the future evolution of the market.

5.3 Future evolution of the market

In its evolution to date, the emissions market has lacked a central market place, which would define market practices. Although emission rights are issued by government authorities, trading takes place on a variety of platforms and in various forms – as futures, as forwards, as a spot market, over the counter and so on. In this, the market differs from some familiar markets such as equities (where there is usually a primary exchange where securities are listed, even if secondary market trading is fragmented over many venues), but is more similar to a market such as foreign exchange, which does not have a central market place.

The introduction of a single EU auction process (or a small number of auctions) is likely to have a significant effect. For the first time, there will be a central primary place of issuance. The market conventions adopted for the auction process are likely to shape market practice more generally. For example, the settlement cycle adopted by the auction platform(s) is expected to become the standard for the market generally.

Preserving choice and competition

At present, the existence of a variety of trading venues has almost certainly contributed to the development of the market by offering different approaches and solutions. We think it would be desirable to preserve this diversity after the introduction of an EU auction platform. Ensuring this depends on the openness of the post-trade infrastructure supporting the auction process. Put simply, if the results of the auction were cleared and settled through a structure that was only accessible through a single trading platform, there would be a risk that other trading venues would struggle to maintain liquidity. The choice and competition that exist now would be diminished.

[39] It is surprising that Annex XVI of Commission Regulation (EC) No 2216/2004 actually requires the publication of detailed information about account holders in registries, of the kind that would be of undoubted use to a potential fraudster, but forbids the publication of aggregate statistics of the kind that would be beneficial to the market.

We therefore suggest that the potential for the post-trade infrastructure to support competing trading platforms should be a key consideration in the choice of auction platform.

Delivery versus Payment settlement

One of the issues that emerged in discussions with market participants was the general absence of DVP settlement, creating counterparty exposures. In other markets, the adoption of robust DVP settlement has been a key achievement in recent decades. However, it requires a degree of integration with other parts of the financial system, such as payment systems, that is probably inappropriate for emission registries.

We see two ways in which the market could evolve.

One possibility would be for the single Union Registry to support DVP settlement in other systems by providing an automated interface, together with functionality that could ensure that the transfer of emission rights was synchronised with the movement of cash elsewhere. For example, this could be achieved by the use of some form of escrow account or the possibility to have a transfer pre-approved but on hold. This approach would create the most open infrastructure, but would require the development of specific functionality within the single registry.

Another approach would be the development of a 'two-tier' settlement infrastructure. The Union Registry would continue to operate the primary accounts and would be the place where installations held their units prior to surrender. However, another layer could develop to cater for the needs of the trading market. In this layer, units would be held and transferred on the books of another entity, which held an omnibus account in the registry. No movements would take place in the registry, except when participants moved units in or out. Such a structure is already emerging in the ClearSettle service of Euroclear and in the offerings of Clearstream and CDC.

Given the different priorities of the various institutions involved, it seems unlikely that the Union Registry will develop the kind of functionality necessary to support DVP settlement. It therefore seems more likely that, if the market is to have a robust DVP infrastructure at all, it will emerge along the lines of a two-tier settlement infrastructure. This may well be the best solution, but we hope it will develop on the basis of a full understanding of its implications and the alternatives, not through the absence of thought.

5.4 Implications for London

As London is home to the largest exchange where emission allowances are traded and to the largest firms trading them, it cannot avoid the consequences of the issues identified above. As the Lehman failure demonstrated, when a major international financial crash occurs, London will be affected more than anywhere else in Europe.

Thus, we believe it is important that the financial community in the UK – market institutions, market participants, government and regulators – keep a close watch on the issues we have identified. In most cases, the best approach would be one at European level. However, if this were not possible, it would be preferable for the UK to press ahead alone than to leave questions unanswered. This is particularly true in relation to legal issues, where, in the absence of work at the European level, it would

be possible to advance the analysis so that the areas of uncertainty were reduced and clearly highlighted.

The move to a single Union Registry appears to have mixed implications for London. The move to a single market infrastructure could contribute to the efficiency of the market and support overall growth – provided it is well designed and meets the market's requirements. However, the loss of infrastructure at the national level means that the UK will no longer have an opportunity to move ahead of other countries in developing an infrastructure responsive to users' needs. Unless there is greater user involvement at the European level, we suggest firms in London should take the initiative by forming an independent 'User Group' where they could work together to formulate their proposals for functionality that needs to be provided in the Union Registry.

In the end, however, probably the most significant change affecting the development of the emissions market will be the move to auctioning allowances in 2012. The choice of auction platform – and whether it will be one or many – is a complex decision. What matters most to London, in our opinion, is not so much whether the EU auction platform is located in London as whether the resulting system is open and efficient.

Europe has taken the lead worldwide in demonstrating that a market-based solution can achieve a reduction in emissions. In doing so it has gained a head start in developing the infrastructure to support the market. Within Europe, London has played a leading role in what nevertheless remains a fragmented and in many ways immature market. There is an opportunity now to create a modern, efficient and open market in Europe, which would be the natural focal point for a future global emissions market. It would be natural for the UK to take the lead in this development. If the opportunity is missed and the market in Europe remains immature and fragmented, then the opportunity will be lost and Europe – and especially London – will be the loser.

Glossary

Glossary of terms used in the report

API	Applications Programming Interface - an interface implemented by a software program to enable automation of activities, as opposed to manual interaction with the system
AAU	Tradable allowances that Annex 1 Parties under Kyoto may count towards compliance with their emissions target. Each AAU is equal to one tonne of CO2e
Annex 1 countries	Countries which committed to reduce GHG emissions under the UNFCCC
Annex B countries	Annex 1 countries which committed to actual GHG reduction targets under Kyoto
Cap and Trade	A market-based approach used to control pollution by providing economic incentives for achieving reductions in the emissions of pollutants
CDM	Clean Development Mechanism - Kyoto mechanism for obtaining GHG reductions in developing countries
CER	Certified Emission Reductions - GHG reduction units from CDM projects
CITL	Community Independent Transaction Log - a central transaction log which checks and records all transactions taking place within the EU ETS
CO2e	Unit of measurement used to compare the relative climate impact of the different greenhouse gases. The CO2e quantity of any greenhouse gas is the amount of carbon dioxide that would produce the equivalent global warming potential
DVP	Delivery versus Payment - delivery of securities with a simultaneous exchange of money for the securities
ERU	Emission Reduction Unit - a unit generated from a JI project
ETS	Emissions Trading Scheme - an organised system for the trading of emission units

EUA	EU Allowance - a permit to emit one tonne of carbon under the EU ETS
EU ETS	Emissions Trading Scheme operating in the EU
FMLC	Financial Markets Law Committee - an independent committee of legal experts, partly sponsored by the Bank of England
GHG	Greenhouse gas - name for group of six gases (including CO2) which have global warming impact
ITL	Independent Transaction Log - a central transaction log which checks and records all transactions taking place within the Kyoto mechanism
JI	Joint Implementation - a Kyoto mechanism allowing an Annex B country to earn ERUs from an emission-reduction or emission removal project in another Annex B country
Kyoto Protocol	International agreement resulting in certain nations agreeing binding targets to reduce CO2e emissions
NAP	National Allocation Plan - plan drawn up by governments of EU ETS participants for each trading period. NAPs fix the total amount of CO2 that can be emitted by all the installations in their country as well as the number of emission allowances allocated to each individual installation
RGGI	Regional Greenhouse Gas Initiative - a mandatory, market-based effort in the United States to reduce GHG emissions covering ten Northeastern and Mid-Atlantic states
RMU	Removal Unit - Removal units are issued by Parties to the Kyoto Protocol in respect of net removals by carbon sinks (in the land use, land use change and forestry activities)
STP	Straight Through Processing - the process of seamlessly passing financial information to all parties involved in the transaction process, without manual handling or redundant processing in real time
UK ETS	Voluntary Emissions Trading Scheme operated in the UK from 2002 to 2005
UNFCCC	United Nations Framework Convention on Climate Change - an international environmental treaty. The objective of the treaty is to stabilise GHG in the atmosphere at a level that would prevent dangerous impact on the climate system

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