THE ROLE OF FINANCIAL MARKETS IN EMISSIONS TRADING

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Financial markets provide the infrastructure and liquidity to enable emissions trading schemes to meet their objective of reducing emission levels at least cost. This article examines how Australia's financial markets will support an emissions trading scheme, and outlines the regulatory regime which will apply to the forward market. Australia's existing financial market infrastructure is well placed to support the spot and forward markets for emissions permits and credits. This, combined with the regulatory regime which will apply to the forward market, will promote confidence in Australia's national emissions trading scheme, and in turn ensure that a transparent and robust carbon price signal is factored into decision-making throughout a carbon conscious economy.

1. DEVELOPMENT OF AN EMISSIONS TRADING SCHEME IN AUSTRALIA

Australia's National Emissions Trading Scheme (NETS) is scheduled to commence operation in 2010. Ratification of the Kyoto Protocol by the Federal Government on 3 December 2007 has given Australia a seat at the table to negotiate the international framework for emissions trading after the initial Kyoto period (2008-2012) and, subject to the design of its NETS, access to various Kyoto trading mechanisms. Australia has committed to meeting its target for the Kyoto Period (2008-2012), and has set a target to reduce greenhouse gas emissions by 60% on 2000 levels by 2050.

Emissions trading is, simply speaking, the trading of permits to emit greenhouse gases[1] and credits which result from activities which offset greenhouse gas emissions. Australia's NETS will be a "cap-and-trade" scheme. That is, total emissions are capped, permits are freely allocated and/or auctioned up to the cap, and trading is allowed to let the market find the most cost effective way to meet any necessary emission reductions. There will also be a national registry which records ownership of emission permits and fungible credits.

There are both benefits and costs to the Australian economy of linking to the existing global carbon market. Therefore, one important design feature (yet to be finalised) is the extent to which Australia's NETS will have linkages with the Clean Development Mechanism (CDM) and other Kyoto trading mechanisms in the short and longer term. The Australian Government has committed to finalise the detailed design of its NETS, including any initial linkages and an exposure draft on emissions trading legislation, by the end of 2008.[2]

The NETS will initially target 70% of Australia's emissions and the Government has committed to consult with the forestry and agricultural sectors on their inclusion and on the timetable for that

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[1] Greenhouse gases are measured in terms of their carbon dioxide equivalent in order to facilitate fungibility in an emissions trading scheme.

[2] Senator the Hon Penny Wong, Minister for Climate Change and Water, "Climate Change: A Responsibility Agenda", Speech to the Australian Industry Group Luncheon, Park Hyatt, Melbourne, 6 February 2008.

inclusion.[3] The target of 70% coverage equates to approximately 420 Mt CO_2-e[4] in 2010 and, subject to the emission reduction targets set, significantly less than 4,200 Mt CO_2-e over the first 10 years of the scheme (as the cap tightens). Figure 1 illustrates the size of the proposed NETS relative to other emissions trading schemes (ETS), the Clean Development Mechanism, the Mandatory Renewable Energy Target (MRET) scheme, the NSW Greenhouse Gas Abatement Certificate Scheme (NGACS) and the existing financial markets for Commonwealth Government Securities (CGS), Australian equities and the National Electricity Market (NEM).

In terms of Mt CO_2-e, the NETS will be approximately one-fifth the size of the European Union (EU) ETS Phase II and eight and one-half times the size of the New Zealand (NZ) ETS. It is anticipated that the value of emission permits issued over the first 10 years of the NETS will exceed CGS on issue and that liquidity in the forward markets each year will, in time, exceed the value of permits issued.

Figure 1 – The Likely Size of Australia's NETS Relative to other ETS and Financial Markets

	Issuance or Equiv.	**Secondary Market**	**Derivatives**	**Market Infrastructure (& Providers)**
Common-wealth Government Securities (CGS)	A$ 58bn	A$ 321bn	A$ 5,188bn	Sub-registry and DvP settlement services (Austraclear), futures and options (ASX), OTC trading
Australian Equities	A$2,063bn	A$1,314bn	A$1,511bn	Sub-registry and DvP settlement services (CHESS), stock exchange (ASX), futures and options(ASX) and OTC trading
National Electricity Market (NEM)	-	A$8bn	Approx. A$23bn	Payment services (Austraclear), spot market

3 Ibid.

4 Mt CO_2-e means million tonnes of carbon dioxide equivalent.

(NEM)				(NEMMCO), futures and options (ASX) & OTC trading
NSW Greenhouse Gas Abatement Certificate Schemes (NGACS)	2006: 19,907,003 certificates (representing 11.6 Mt CO_2-e of actual abatement)	A$225m (predominantly derivatives)		Stand-alone registry (IPART) & OTC trading
Mandatory Renewable Energy Target (MRET) Scheme	20% of all electricity generation by 2020	A$200m (predominantly derivatives)		Stand-alone registry (ORER) & OTC trading
Australian National Emissions Target Scheme (NETS)	Approx. 420 Mt CO_2-e pa or < 4,200 Mt CO_2-e over the first 10 years	At A$30 per tonne the size of the cap equates to approx. A$12.6bn pa or up to A$126bn over the first 10 years. The value of trade in a successful forward market would exceed the value of underlying cap.		Kyoto Compliant Registry (Australian Government), safe keeping & settlement services (Austraclear), spot and futures exchanges (ASX) & OTC trading
New Zealand Emissions Trading Scheme (NZ ETS)	Approx. 50 Mt CO_2-e pa or < 500 Mt CO_2-e over the first 10 years	At A$30 per tonne the size of the cap equates to approx. A$1.5bn pa or up to A$15bn over the first 10 years. The value of trade in a successful forward market would exceed the value of underlying cap.		Kyoto Compliant Registry (NZ Government)
European Union Emissions Trading Scheme (EU ETS) – Phase II **(2008 - 2012)**	2081 Mt CO_2-e pa (A$82bn) or 10,405 Mt/ A$312bn over the Kyoto Period	Approx. US$2bn	1,600 Mt/ US$41bn	Kyoto Compliant Registries (various national Governments), settlement services (Euroclear, LCH, other), spot and futures

				exchanges (ECX, EEX, Norpool, Bluenext, other) & OTC trading
EU ETS Phase III (2013 - 2020)	1743 Mt CO_2-e pa or 13,944 Mt/ A$418bn over Phase II	-	-	As above
Clean Development Mechanism (CDM)	The CDM mechanism is expected to generate approximately 3,000 Mt of Certified Emission Reductions (CERs) over the Kyoto Period[5]	2007: US$8.3 bn (predominantly derivatives) Annual limit in EU ETS = 278 Mt		Kyoto Compliant Registries (various national Governments), settlement services (Euroclear, LCH, Austraclear, other), spot and futures exchanges (ECX, EEX, Nordpool, ASX, other) & OTC trading

Sources: 2007 Australian Financial Markets Report, ASX, World Bank, Point Carbon

Financial markets play an essential role in the development of an ETS and their ability to reduce greenhouse gas emissions at least cost to economic growth and national competitiveness.[6] In relation to the design of Australia's NETS, the Garnaut Climate Change Review recently published an issues paper on "Financial Services for Managing Risk: Climate Change and Carbon Trading", seeking feedback on design features that will impact on the efficiency of the related financial markets and how governments can facilitate Australia becoming a regional hub for carbon markets in the Asia Pacific. [7]

In summary, the role of the financial markets in an ETS is to:

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5 The UNFCCC website reports that if all the CDM projects currently registered or requesting registration were to generate all of the CERs they are projecting, total supply would already be 1,200 Mt of CERs, while total potential volumes from projects in the pipeline stage could add a further 2,000 Mt over time (see www.cdm.unfccc.int/statistics/index.html).

6 Note that in this article "financial markets" is used in a broad sense to encompass markets and clearing and settlement facilities licensed under the *Corporation Act 2001* (Cth) (see below) and over the counter markets for derivatives.

7 Garnaut Climate Change Review, "Issues Paper 2 – Financial Services for Managing Risk: Climate Change and Carbon Trading".

- reduce transaction costs for emissions trading (ie the costs of buyers and sellers finding each other);
- facilitate price discovery and the transfer of risk in relation to emissions trading, which underpins investment decision-making; and
- minimise counter-party default and settlement risk in relation to emissions trading.

In practice, these functions are achieved by the facilitation of forward and spot trading through exchanges and "over-the-counter" (OTC) markets, and the provision of clearing and settlement services. As discussed below, given the anticipated value of emission permits to be issued and the size of the related forward markets, the NETS will require the involvement of exchanges, clearing houses and settlement services in order to operate efficiently.

2. FORWARD MARKET FOR EMISSIONS PERMITS AND CREDITS

The forward market involves agreements to buy or sell, or the option to buy or sell, or swap an asset (which can be of any kind) at a set price on an agreed future date. Forward trading can occur on an exchange through standardised futures contracts or on the OTC market by transactions negotiated through brokers or directly between counterparties.

Overseas experience indicates that liquidity in Australia's ETS will commence and predominantly reside within the forward markets. The world's largest emissions trading scheme is the European Union Emissions Trading Scheme (EU ETS). In 2006 this scheme accounted for trading in 1,101 Mt of carbon dioxide with a value of US $24.36 billion, which amounts to 81% of all trading in the global carbon market.[8] As shown in Figure 2 below, 96% of this trading occurred on the forward market with only 4% on the spot market.[9] Point Carbon has reported, using data from several sources, that trade in the EU ETS grew to 1,600 Mt of carbon dioxide with a value of US$41 billion in 2007.[10]

The main prerequisites for the establishment of a forward market in emissions permits and credits are certainty concerning the legislative framework for the NETS and the setting of emissions targets (the supply constraint). Once these matters are determined, forward markets are likely to develop in advance of the formal commencement of the NETS in 2010. For example, market participants in the EU ETS were able to start managing their exposure to Phase II of that ETS (2008-2012) in the OTC market as early as 2004 and on a futures exchange from May 2005. The establishment of a forward market will ensure a smooth transition to an ETS, as discussed below.

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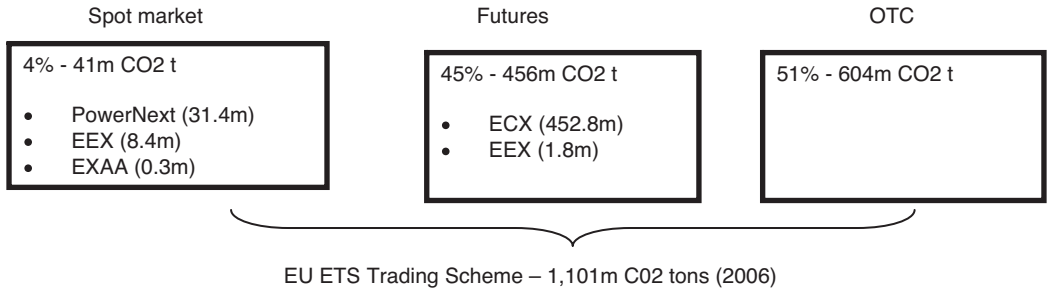
8 The World Bank, *State and Trends of the Carbon Market 2007*, May 2007.

9 The spot market involves transactions which are settled shortly after they occur by transfer of the relevant asset (in this case emissions permits or credits).

10 See www.pointcarbon.com.

Figure 2 – Liquidity Gravitates to the Forward Markets (the European Experience)



The forward market will provide price signals for the cost of emitting greenhouse gases which will facilitate decision-making across the entire economy. This includes decisions about the level of investment in cleaner electricity generation and projects to generate credits from approved offset mechanisms and, at a consumer level, the choice of goods and services including consumer appliances and mode of transport. For the commercial sector, the forward market will enable businesses to manage the cost and risk of emitting greenhouse gases, in the same way that financial derivatives are currently used to manage the risk of fluctuating interest rates, foreign exchange rates, and commodity and energy prices.

Most banks already have dedicated teams to prepare their customers for the onset of a carbon constrained world. For example, the provision of finance has and will increasingly become contingent upon banks understanding the "carbon" risks of their customers. Once the prerequisites for a forward market have been met, banks will also provide hedging products to help their customers manage their exposure to "carbon risks", such as products embedded in lending structures or derivative agreements such as swaps and options. Banks will, in turn, need to lay-off these risks to participants in the exchange and OTC markets, including other banks, proprietary trading firms and hedge funds.

It is expected that a significant proportion of trading activity in Australia's NETS will gravitate to a futures exchange. Exchange-traded futures provide market participants with the benefits of standardisation, centralised liquidity and anonymity. They also reduce the transaction costs otherwise involved in buyers and sellers finding each other. Further, trades are novated to a clearing house which significantly reduces the risk of counterparty default (see below).

The Australian Securities Exchange (ASX) proposes to offer futures over emissions permits and related credits generated from eligible offset mechanisms as soon as there is sufficient certainty concerning the legislative framework and emission reduction targets. It is proposed that the contracts will be traded on the market operated by Sydney Futures Exchange Ltd (SFE).[11] The contract specifications will be subject to the terms of the legislative framework for the NETS, but

[11] ASX and SFE merged in 2006, but the merged entity continues to operate two markets under separate market licences held by ASX Ltd and Sydney Futures Exchange Ltd.

some insight into the simplicity of a futures product offering, which mirrors successful futures products listed to support the EU ETS[12], is provided in Figure 3.[13]

Figure 3: Proposed Contract Specifications for Emissions Permit and CER Futures

Unit of trading	1,000 Emission Permits (each representing 1 tonne of CO_2-e or equivalent greenhouse gases) and/or 1,000 Certified Emission Reduction (CER) certificates
Minimum Price quotation	A$0.01 (price increments at which the contract can be traded)
Contract months	Annual contracts, eg Dec 2010, Dec 2011, Dec 2012
Expiry day	A fixed date (consistent with the date used for standardised OTC agreements), allowing sufficient time before the compliance date for the surrendering of emission permits and/or credits.
Settlement prices	The Daily Settlement Price (DSP) as determined by the ASX on the final trading day
Delivery	Delivery will occur via ASX's account in the national registry

The experience in the EU ETS, and other successful futures markets, is that liquidity and open interest (the number of open futures contracts) grow over time as market participants' confidence in the market builds together with their understanding of the risks they have to manage. In other words, *liquidity begets liquidity.*

The pre-eminent futures market supporting the EU ETS is promoted by the European Climate Exchange (ECX) and uses the existing infrastructure of the ICE Futures Europe Exchange (formerly known as the International Petroleum Exchange) and clearing house of LCH.Clearnet. Figure 4 below illustrates the growth in futures volumes and open interest in ECX Carbon Financial Instrument (CFI) futures contracts since inception.

What bodes well for the emissions futures market in Australia is the existence of a highly liquid electricity futures market. This market, which is operated by ASX, supports participants in the National Electricity Market (NEM), which will be the largest sector in the Australian economy to be impacted by the NETS. Australia's electricity generators (as well as Australia's larger resource companies) are daily users of OTC derivatives, futures exchanges and clearing houses. This sophistication in managing price and counterparty risks together with existing market infrastructure provides a solid foundation for trading in futures contracts based on emissions permits and credits. Figure 5 below illustrates the growth in futures volume and open interest in the electricity futures and options market operated by ASX.

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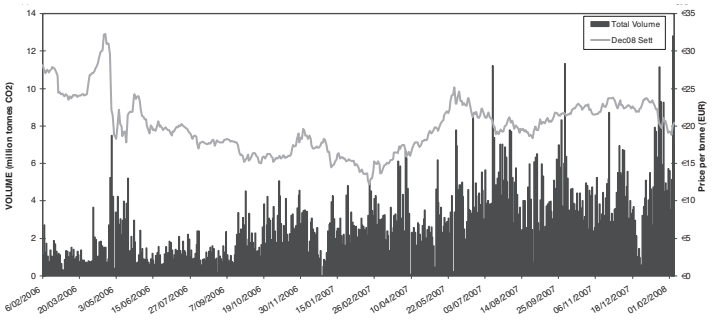
12 Exchanges may also facilitate "spot markets" through the listing of contracts that expire daily and settle on a T+1 or similar basis.

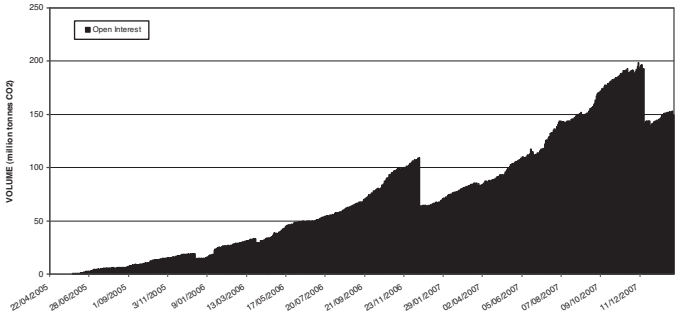
13 Note that there will need to be an amendment to the SFE Operating Rules to include these contract specifications, and this amendment will be subject to non-disallowance by the Minister under the *Corporations Act* (s 793E).

Figure 4: Price, Volume and Open Interest in ECX CFI Futures Contracts

4.1: ECX CFI Futures Contracts: Price and Volume



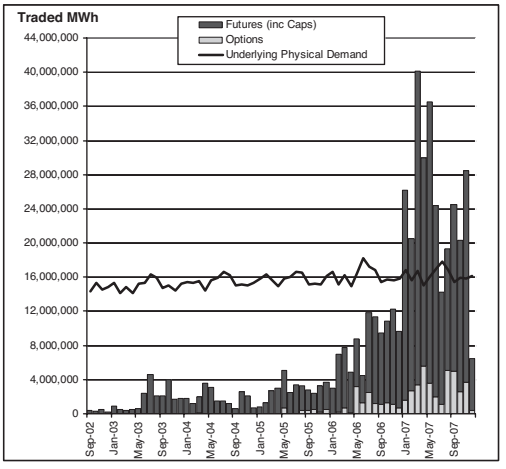
4.2: ECX CFI Futures Contracts: Open Interest



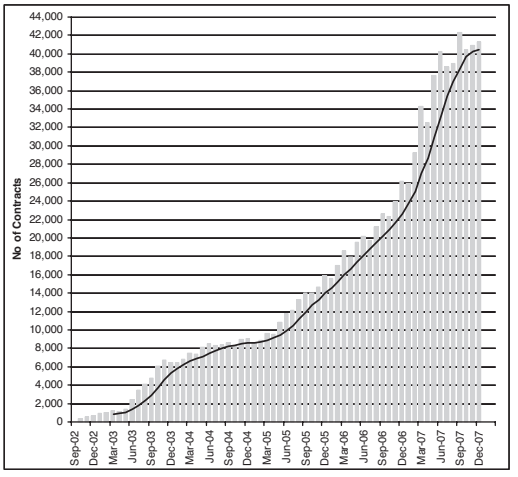
Source: European Climate Exchange (ECX)

Figure 5: Electricity Futures & Options Volumes and Open Interest at ASX

5.1: Electricity Futures & Options: Volume



5.2: Electricity Futures & Options: Open Interest



3. CLEARING AND SETTLEMENT SERVICES FOR EMISSIONS TRADING

Exchange-traded futures over emissions permits and credits will be novated to a clearing-house. Novation is a process whereby the contract between the buyer and seller is replaced by contracts between the clearing-house and the buyer and the clearing-house and the seller. Hence, the clearing-house becomes principal to all trades and liable to perform against all contracts to which it is a party. The clearing-house has risk management measures in place and imposes margins to ensure that participants meet their obligations. This significantly reduces the risk of counterparty default.

In the OTC market the risk of counterparty default depends upon the ability of counterparties to perform the contract. There may be constraints on the OTC market for emissions permits and credits in Australia due to the credit limits of counterparties. To alleviate these counterparty credit constraints ASX will accommodate the registration of OTC trades into its futures clearing house via its Exchange for Physical (EFP) and Block Trading mechanisms, just as it currently does for its electricity futures and options market.

It is also important that a settlement service exist to support Australia's NETS. Settlement involves the transfer of title and delivery of an asset in exchange for the payment of funds. The late development of stand-alone registries in the EU ETS without an interface to a settlement service for OTC trading, led to inefficiencies in the related spot and forward markets. It is also desirable that settlement occur on a delivery versus payment (DvP) basis. That is, the simultaneous transfer of title for payment. This effectively removes the risk that title is transferred but payment is not received or vice versa (settlement risk). In the absence of DvP settlement services, settlement risk will impede the liquidity in the spot and forward markets.

ASX intends to use existing Austraclear infrastructure to provide safekeeping and settlement services to support the settlement of emissions permits and credits. Austraclear is Australia's primary wholesale Central Securities Depository (CSD) and offers participants DvP settlement, exchanging cash for securities irrevocably and in real-time. Austraclear is already fully integrated into the back office processes and systems of almost all of the participants in Australia's NETS. A proposal for Austraclear to provide settlement services is set out below although note, again, that this may depend upon the legislative framework for emissions trading.

Each Austraclear participant has an account(s) that records the instruments they have lodged with the ASX Austraclear CSD. Owners of emissions permits and credits could lodge these in Austraclear's account at the register and in turn be issued with beneficial ownership of the same instruments within Austraclear. At any time beneficial owners could request lodgement of their emission permits and credits back into their own names at the register by withdrawing them from the Austraclear CSD.

Austraclear would become the legal owner of the permits or credits on the Government's register with beneficial ownership recorded through the sub-register structure (security accounts) within Austraclear, in which each holder's interests are recorded and updated as those interests change. Through this method the security account records changes in the beneficial ownership of the instrument. This assumes that the legislative framework will recognise the beneficial owners of the instrument as entitled to the benefit of them.

Note that Austraclear is not a trading system and that deals can be negotiated bi-laterally or via a broker in the OTC market, or through any appropriately licensed market.

4. EMISSIONS TRADING AND FINANCIAL PRODUCTS – LEGAL AND REGULATORY ISSUES

As discussed above, most emissions trading is likely to occur on the forward market involving either exchange-traded futures or OTC forwards, swaps or options. These products are financial products, as defined in the *Corporations Act 2001* (Cth) (*Corporations Act*), and hence are subject to the licensing and regulatory regime set out in that Act.

Financial products include "derivatives" which are defined in s 761D of the *Corporations Act* as follows:

> "a **derivative** is an arrangement in relation to which the following conditions are satisfied:
>
> (a) under the arrangement, a party to the arrangement must, or may be required to, provide at some future time consideration of a particular kind or kinds to someone; and
>
> (b) that future time is not less than the number of days, prescribed by regulations made for the purpose of this paragraph, after the day on which the arrangement is entered into;[14]
>
> (c) the amount of the consideration or the value of the arrangement, is ultimately determined, derived from or varies by reference to (wholly or in part) the value or

[14] The prescribed period is three business days for a foreign exchange contract and one business day in any other case (*Corporations Regulations 2001* (Cth), reg 7.1.04(1)).

amount of something else (of any nature whatsoever and whether or not deliverable), including, for example, one or more of the following:

(i) an asset;

(ii) a rate (including an interest rate or exchange rate);

(iii) an index;

(iv) a commodity."

The proposed exchange-traded futures contracts will be arrangements whereby one party agrees to pay another for emissions permits or credits at a specified future time. The value of the arrangement will vary by reference to the spot price for emissions permits or credits (which will be assets). Hence, it is clear that the futures contracts will be derivatives. Similarly, OTC contracts which involve the purchase of emissions permits or credits at a future date, or which otherwise involve a future payment where the value of that payment or of the arrangement varies by reference to the spot price for emissions permits or credits, will be derivatives.

Those involved in the forward market for emissions permits and credits will need to be aware of the licensing requirements and regulatory restrictions which apply to trading financial products. Note that these requirements and restrictions will not apply to the spot market for emissions permits and credits (assuming that the permits and credits will not be financial products).

In general, a person who carries on a financial services business in Australia must have an Australian Financial Services Licence (AFSL), or be an authorised representative of an AFSL holder.[15] Carrying on a financial services business includes providing financial product advice, dealing in a financial product and making a market for a financial product.[16] Hence, the following activities in relation to exchange-traded futures or OTC derivatives over emissions permits or credits may require an AFSL:

- providing advice which is intended to influence a person in making a decision about those products (eg whether to enter into a forward contract);[17]
- buying or selling those products on behalf of another, or issuing those products;[18]
- making a market for those products by regularly stating the prices at which the relevant party is willing to buy or sell those products on their own behalf.[19]

AFSL holders are regulated by the Australian Securities and Investment Commission (ASIC) and have certain obligations under the *Corporations Act*, including ensuring that financial services are provided efficiently, honestly and fairly, avoiding conflicts of interest and maintaining the competence to provide those services.[20]

The licensing regime in the *Corporations Act* will also cover the trading, clearing and settlement of exchange-traded futures and OTC derivatives over emissions permits and credits. Any facility through which offers or invitations to buy or sell these products are regularly made or accepted will require an Australian market licence.[21] Similarly, any facility that provides a regular

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15 *Corporations Act 2001* (Cth), s 911A. Note that there are certain exemptions under s 911A(2).
16 *Corporations Act 2001* (Cth), s 766A.
17 *Corporations Act 2001* (Cth), s 766B (Meaning of financial product advice).
18 *Corporations Act 2001* (Cth), s 766C (Meaning of "dealing").
19 *Corporations Act 2001* (Cth), s 766D (Meaning of "makes a market" for a financial product).
20 *Corporations Act 2001* (Cth), s 912A.
21 *Corporations Act 2001* (Cth), s 767A (What is a "financial market"?) and s 791A (Need for a licence).

mechanism for the parties to transactions in these products to meet their obligations to each other will require an Australian CS (clearing and settlement) facility licence.[22] Licensed markets and CS facilities are regulated by ASIC and subject to certain obligations under the Corporations Act. In particular, the operator of a financial market must ensure that the market is fair, orderly and transparent. The operator of a CS facility must take steps to reduce systemic risk and ensure that services are provided in a fair and effective way.[23]

Trading in financial products is also subject to restrictions on market manipulation, insider trading and other prohibited conduct. Types of conduct which will be prohibited in relation to exchange-traded futures and OTC derivatives over emissions permits and credits include the following:

- market manipulation (which affects a licensed financial market);[24]
- false or misleading statements in relation to financial products;[25]
- misleading or deceptive conduct in relation to financial products;[26]
- insider trading.[27]

In summary, the regulatory regime for financial products seeks to ensure that services are provided in an honest, efficient and competent manner, that financial markets are fair, orderly and transparent and not affected by manipulation or other improper conduct and that CS facilities reduce systemic risk and are fair and effective. The fact that the forward market for emissions permits and credits is covered by this regulatory regime should promote confidence in that market and ensure that it operates in a way which promotes the effectiveness of the NETS.

5. CONCLUSION

Australia's financial markets, including the existing market infrastructure of ASX, will underpin the success of the forthcoming NETS and its objective to reduce greenhouse gas emissions at least cost to economic growth and national competitiveness. Financial markets facilitate liquidity, price discovery, risk transfer and the clearing and settlement of trades. In particular, the transparency of the forward markets and their ability to very efficiently transfer risk will: enable firms to make informed decisions regarding their carbon foot-print; and support capital raising in Australia's debt and equity markets to fund new low emission technologies and generate a new universe of "investment opportunities" for fund managers and individual investors.

Forward trading will commence upon the provision of legislative certainty and emission reduction targets for Australia's NETS. The precedent set in most financial markets, and the EU ETS in particular, is that liquidity will predominantly reside within the forward markets. This, combined with the regulatory regime which will apply to the forward market, will promote confidence in Australia's NETS, and in turn ensure that a transparent and robust carbon price signal is factored into decision-making throughout a carbon conscious economy.

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22 *Corporations Act 2001* (Cth), s 768A (What is a clearing and settlement facility?) and s 820A (Need for a licence).
23 *Corporations Act 2001* (Cth), s 792A and s 821A.
24 *Corporations Act 2001* (Cth), ss 1041A to 1041C.
25 *Corporations Act 2001* (Cth), s 1041D.
26 *Corporations Act 2001* (Cth), s 1041H.
27 *Corporations Act 2001* (Cth), ss 1042A to 1043O.