



Overseas Experience With Emissions Trading Schemes

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NZ Carbon Exchange

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Emissions Trading & Policy Summit,
Wellington, NZ



Presentation Outline

- **Voluntary markets – International Perspective**
- **International Emissions Trading Schemes**
- **Supply and Demand Considerations**
- **Kyoto Markets – Structure and Price Drivers**

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Voluntary Markets

from International Perspective

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Voluntary Market

- Voluntary – all carbon offset trades that are not required by regulation

Buyer motivations	Seller motivations
<ul style="list-style-type: none">○ manage climate change○ innovative philanthropy○ PR○ prepare for or deter regulatory schemes○ on-sell at profit	<ul style="list-style-type: none">○ project developers○ aggregators / wholesalers○ retailers

- First known voluntary trades in 1989
- By 2002 regulatory market momentum
- 2006 – voluntary markets back in vogue
- 2008 and beyond - Voluntary markets role with compliance markets?

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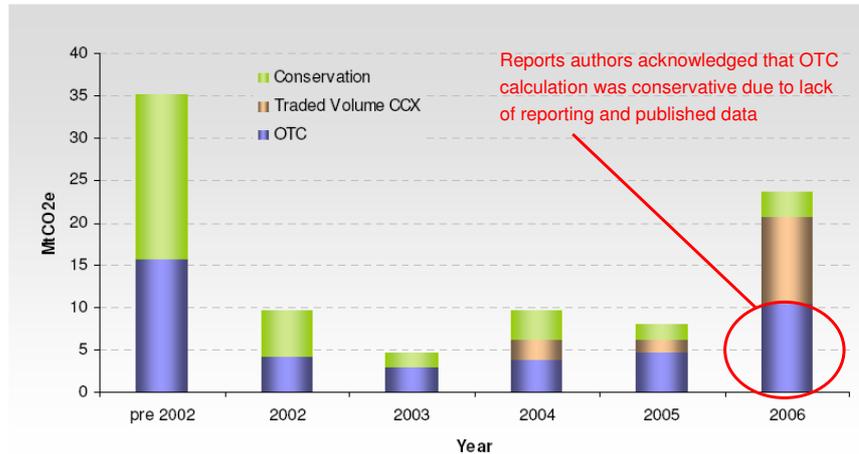
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Voluntary Market Volumes

Figure 1: Historically traded volumes in the voluntary carbon market



Source: The Katoomba Groups; Ecosystem Marketplace & New Carbon Finance State of the Voluntary Carbon Markets – July 2007

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Voluntary Market Volumes in Context of Kyoto

Table 1: Keeping Up with Kyoto? The Voluntary Markets in Context

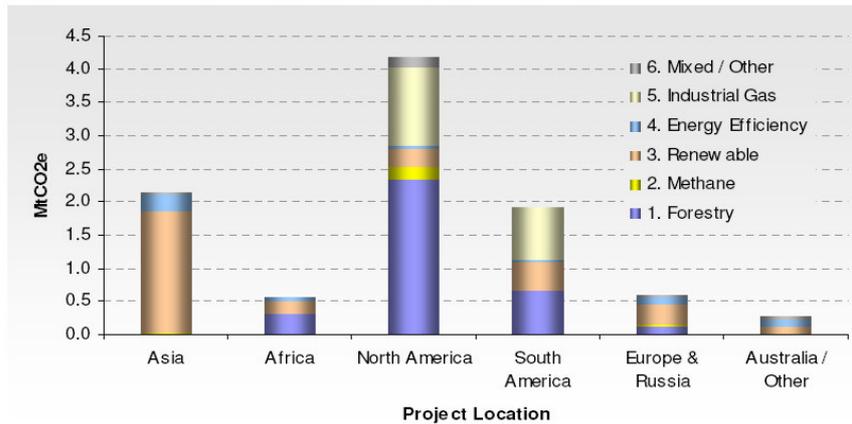
	2006 Volume (Million tCO ₂)	2006 Value (US\$ Million)
Voluntary OTC Offset Market	13.4	54.9
CCX	10.3	36.1
Total Voluntary Market	23.7	91
Other GHG Trading Schemes		
EU ETS Trading Scheme ²	1,101	24,357
Primary Clean Development Mechanism	450	4,813
Secondary Clean Development Mechanism	25	444
Joint Implementation	16	141
New South Wales	20	225

26 March 08 Source: The Katoomba Groups; Ecosystem Marketplace & New Carbon Finance State of the Voluntary Carbon Markets – July 2007
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Voluntary Market Project Types & Locations

Figure 2. Transactions by project location, 2006 (9.7Mt)



Source: The Katoomba Groups; Ecosystem Marketplace & New Carbon Finance State of the Voluntary Carbon Markets – July 2007

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Voluntary Market Myriad of Specifications & Prices

Table 2: Voluntary Standards

Some voluntary offset standards, associated project types & additionality requirements

Standard	Sponsoring Organisation	Project Types	Additionality Requirements	Verification	Market Share	Registry	Price Range
Contract Development Mechanism	UNFCCC	All minus REDD/ New HFC, Nuclear	Yes	3rd party	large	Yes	Euro 14-30
Gold Standard for voluntary emission reductions	Gold Standard Foundation	Renewable energy, energy efficiency	= CDM	3rd party	small but growing	Planned	Euro 10-20
Voluntary Carbon Standard (VCS) v2	IETA, Climate Group, World Economic Forum	List of 15 categories, LULUCF, others to be specified	Steering Committee to specify	3rd party	new, likely to be large	Planned	Euro 5-15
VER+	TUV, SUD	CDM minus large hydro	= CDM	3rd party	small but growing	Yes	Euro 5-15
ISO 14064	International Standards Organisation	Any	Specifies its own	3rd party	n/a	n/a	n/a
Chicago Climate Exchange	CCX	Any	n/a	3rd party	large in US	Yes	Euro 1.2 - 3.1
CCBA project design standards	community and biodiversity	Land use	Specifies its own		large for lulucf	n/a	Euro 5-10
Voluntary Offset Standard (VOS)	European carbon investor services (ECIS)	Any except nuclear, HFC-23, large hydro	Same as CDM excluding large hydro	Planned	n/a	Planned	n/a

➤ Wholesale vs Retail

➤ Caisse des Depot study observed price ranges from US\$1 - \$78

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Voluntary Market International Trends

- Flight to quality
- Move to internationally recognised standards (VCS, GS)
- Calls for greater regulation of standards
- Internationally recognised registries
- UK Government directive - CDM standards for Govt offsetting
- International market projected to grow to ~70Mt CO₂e in 2008

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Voluntary Market in Context of NZ ETS

- Proposed legislation point of obligation all sectors all gases by 2013
- Double counting – should I phase back voluntary offsetting as compliance market sectors are expanded through to 2013
- Voluntary offsetting cost & risks vs economic benefit
- Government acknowledges voluntary sector in legislation
- International freight and aviation

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Voluntary Market – Key Issues

- Buyer beware
- Standards, audit trail & retirement of units with reputable parties
- Carbon neutral statements
 - measuring standards and 3rd party validation
 - active carbon reduction program
 - future liability and costs of carbon neutral commitment
 - consumer protection regulations
- Double Counting – voluntary offsetting vs NZ ETS all sectors all gases



International Emissions Trading Schemes & **Experience**



International Emissions Trading Schemes & Experience

- National Schemes
 - Many in Development
 - Australia
 - US
 - Canada
 - NZ
 - Japan, ...?
 - But Experience is Limited
 - EU ETS
 - UK ETS
 - Norway ...
- Kyoto Trades
 - Government to Government
 - Japanese Industry
 - EU ETS Participants
 - NZ ETS Participants...
- Voluntary Markets
 - Chicago Climate Exchange
 - "Offsetting"

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Australia



- **Kyoto Target:**
 - 8% above 1990 Levels
 - ratified 2008
 - "on track"
 - Rudd Target 60% reduction by 2050
- **Emissions Trading**
 - NSW scheme
 - National studies
 - States & Territories
 - PM Task Force
 - Garnaut Review
 - ETS Language cautionary
 - Timeline now released



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Australia Emissions Trading Timeline

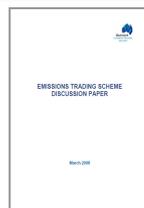


- **March to June 2008:** preliminary **consultations** on **technical issues** with industry and non-government groups;
- **July 2008:** public release of a **Green Paper**;
- **December 2008:** release of exposure **draft legislation**;
- **March - Mid 2009:** **Bill considered by Parliament**;
- **2009:** Consultation on emissions trading **regulations**;
- **3rd quarter 2009:** **Act enters into force**, regulator established;
- **2010: Emissions trading scheme will commence.**

March 17, 2008



Australia Emissions Trading - Garnaut



Garnaut Climate Change Review ETS Discussion Paper

Released 20th
March 2008

"We will carefully consider Professor Garnaut's views, as well as those of the community and business, as we develop our Green Paper on emissions trading."

Minister Penny Wong
20th March 2008

- All Sectors, All gases
 - Forestry/Ag later
- Stringency linked to International Agreement status
- International Linking
 - Sought in "judicious & calibrated manner"
- Point of Obligation determined by sector
- Allocation by auction...
 - TEEII recognised – free permits or alternatively \$
- No Price Cap
- Banking and Borrowing (from state) allowed
- Penalty + Make Good provision
- Independent Authority
- Revenue Recycling (A\$7 – 20 billion)



Canada



- **Kyoto Target:**
 - 6% below 1990 Levels
 - 1990 = 572 million tCO₂e
- **Status** (March 2008)
 - 25% above 1990 level
 - >32% above Kyoto target
 - BAU 2020 58% above 1990 levels (940 Mt)
- **Kyoto Actions**
 - Ratified December 2002
 - January 2006 - election
 - Conservatives win
 - campaign platform "scrapping Canada's Kyoto commitments"
 - February 2007 Minister Baird
 - "Canada will **not** attempt to meet Kyoto's greenhouse gas targets"

Discussion Papers "**Turning the Corner**" 10 March 2008
20% reduction on 2006 levels by 2020 (330Mt reduction)



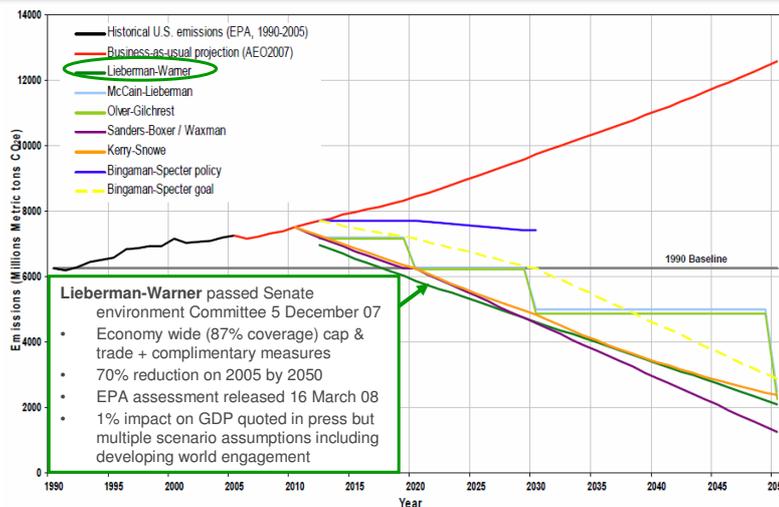
Canada Industry Emissions Trading



- **Turning the Corner – Regulated Framework for Industrial GHG Emissions**
 - Starts 2010
 - Power, oil/gas, pulp/paper, iron/steel, aluminium, cement, lime, chemicals/fertiliser...
 - Intensity Based targets
 - 18% reduction on 2006 by 2010
 - 2% reduction p.a. thereafter
 - But industrial "fixed" process emissions have a 0% target
 - Fixed caps in 2020-2025 period (US position allowing)
 - Pool of credit for early action reward
 - Domestic Offsets + CDM CERs allowed

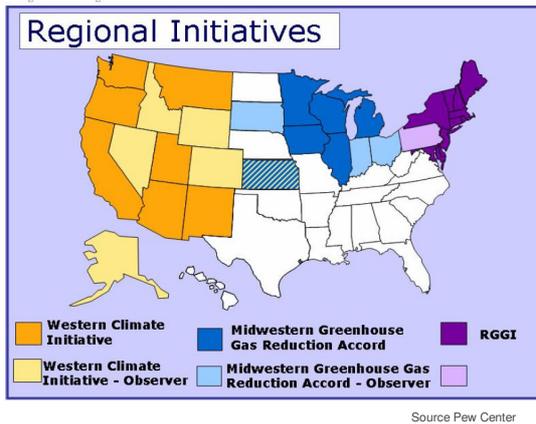


- A *Fractured Response...*
- National Level
 - Bush opposed Kyoto ratification in 2002
 - McCain-Lieberman Climate Stewardship Act (2003 and 2005) fails to get traction
 - **Republicans opposed** the Bill 49-6, while **Democrats supported** it 37-10
 - Multiple Bills in 110th Congress
- States Level
 - Multiple initiatives
- Presidential elections November 2008...





U.S. Regional Initiatives



- **Regional Greenhouse Gas Initiative (RGGI)**
 - Power Sector Only (2009-14)
 - Auction of allowances
 - Offsets allowed
 - First forward trade announced at \$7 (19 March 08)
- **Mid Western GHG Reduction Accord (MGGI)**
 - Signed 15 Nov 2007
 - ETS design due Nov 2008
- **Western Climate Initiative (WCI)**
 - 22 August 2007
 - Goal set 15% reduction on 2005 by 2020

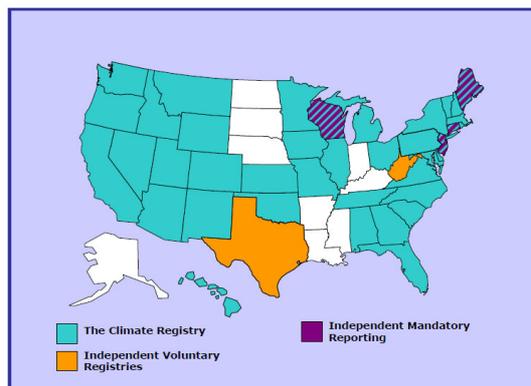
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U.S. GHG Reporting and Registry Programs



- The Climate Registry
 - 30 states signed up 8 May 2007
 - Now 39 members
 - Aim is consistent and transparent measurement between states.

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Japanese Government



- **Kyoto Target:**
 - 6% below 1990/5 Levels
 - ~1.185 billion tCO₂e
- **Status**
 - 2005 1.264 billion tCO₂e
 - **Carbon Positive:**
 - March 2006 7.8% above 1990 level...
 - reduction measures drop this to 2.1% above 1990
 - 8% of 1990 offset purchase required
~ 88*5=440 Mt
 - **Reality ~ ??? Mt**
- **Kyoto Actions**
 - **AAU Activity (incl. GIS)**
 - (MoU)
 - Hungary (Dec 07) (10MT + 30-40MT)
 - Russia (Feb 08)
 - Poland (Mar 08)
 - Ongoing discussions
 - Czech Republic, Latvia, Lithuania.



A Japanese ETS? - now considered post 2013
"Linked to Post Kyoto International Agreement". Feb 08



Japanese Business



- **Keidanren Voluntary Action Plan:**
 - 34 industrial and energy sectors
 - GHG reduction targets
 - Ends in 2010
- **JVETS (another option)**
 - Japan's Voluntary Domestic Emissions Trading Scheme - May 2005
- **Kyoto offsets allowed to meet obligations**
 - Remitted to Japanese Government
- **Business Kyoto Actions**
 - **CDM Activity**
 - CER Purchasers to 2010:
 - Iron & Steel 44 Mt
 - Power 120 Mt
 - Significant CDM Investors
 - 305 of 2137 projects (14%)
 - 17 of 74 HFC23 projects (22%)
 - GIS AAU interest from banks





Europe - The EU ETS



- EU ETS operating since 2005
 - Phase I 2005-7 (*trial*)
 - Phase II 2008-12 (*Kyoto CP1*)
 - Phase III 2013-20 (*proposals - 23 January 2008*)
 - Phase III significant design issues:
 - Sectors & Gases
 - Allocation Methods
 - International Linking

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Europe - The EU ETS Sectors, Gases and Allocation



- Sectors & Gases
 - Phase I & II ; CO₂ only
 - combustion > 20MW,
oil refining, coke, ore,
iron & steel, cement &
lime, glass, ceramics,
pulp & paper
 - **Phase III**; CO₂, N₂O, PFCs
 - Aviation (2011?),
petrochemicals,
aluminium,
ammonia (fertiliser)
 - Opt out of smaller
emitters
- Allocation Method
Phase III Changes
 - EU Wide Allocation Plans
 - 27 individual NAPs go
 - Power Sector
 - full auction from 2013
 - Industrial sectors & aviation
 - 80% gifted phased out to
0% in 2020
 - BUT
 - Certain energy intense
sectors "significant leakage
risk"
 - Up to 100% free
allocation
 - Electricity consumption
taken into account

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Europe - The EU ETS Cap & International Linking



- EU ETS Phase II
 - allows CDM-CERs & JI-ERUs
 - Linked to EU CP1 cap
- EU ETS Phase III
 - Linking with other mandatory ETS
 - capping absolute emissions
 - Not undermining integrity of EU ETS
 - **Cap and Kyoto units linking dependent on post 2012 international agreement**
- **If International Agreement:**
 - Reduction target set at **30%** on 1990 levels
 - **CERs & ERUs allowed** up to 50% of reduction target
- **If no International Agreement:**
 - Reduction target set at **20%** on 1990 levels
 - **No post 2012 CERs & ERUs allowed**
 - **International CDM project uncertainty created**

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Supply and Demand Considerations

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CDM CERs –the Common ETS Currency

Regime →	Kyoto	EU ETS Phase II	EU ETS Phase III	Japan K/JVETS	Canada	NZ ETS
Unit Type ↓						
Kyoto Units						
AAU	X					X
CER	X	X	?	X	X	X
ERU	X	X	?	X		X
* I-CER	X					
* t-CER	X					
* RMU	X					X
Regulatory						
EUA		X	X			
NZU						X
J-VETS				X		
Canada					X	

* Kyoto
Forestry
Units

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Kyoto CP1 Supply/Demand Balance World Bank - May 2007 (million tCO₂e)

Supply		
1. CDM/JI		1700
2. AAUs (low case)		6300
Total Supply		8000
Demand		
1. Countries	with Canada	without Canada
EU15	307	307
Japan	84	84
NZ	41	41
Others	17	17
Canada	1,300	-
Total	1,749	449
2. Firms (EU ETS)	634	634
Total Demand	2,383	1,083
Net Position with AAUs	5,617	6,917
Net Position without AAUs	-683	617

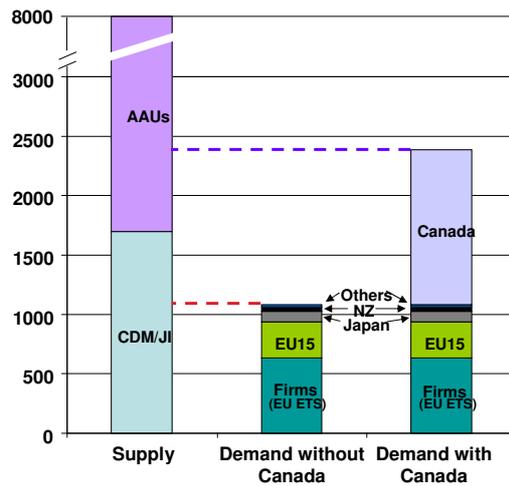
Low?

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The importance of Canada's Kyoto Position



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CER Flow Uncertainties Rising

- Delivery Rate Low
 - CDM Executive Board Constraints
 - Project shortfalls
 - International Transaction Log
- Low Hanging Fruit Taken
 - HFC₂₃
 - N₂O reductions
- Future Demand Uncertain
 - Post 2012 international agreement linkage
 - EU ETS Phase III dependency

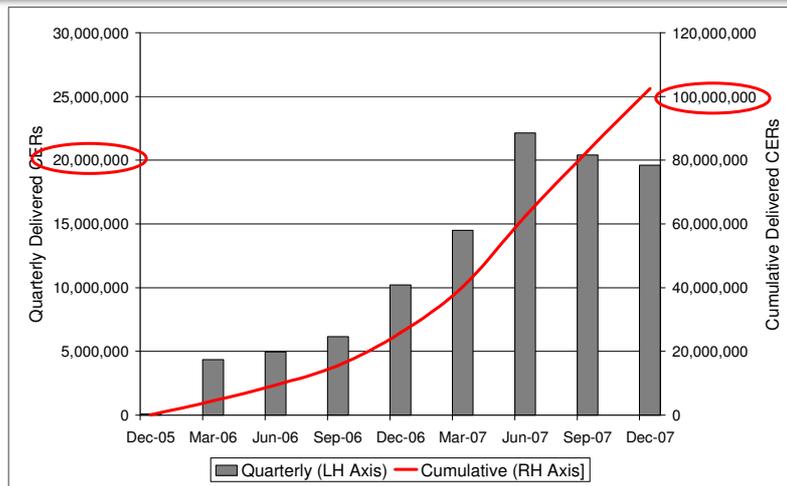
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Actual CER Issuance Rate



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Source: IGES CDM Project Database

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Forecasts of CER Delivery (million tCO₂e)

Total delivery over CP1

	Low	Mid	High
CDM CERs			
UNEP RISØ Centre		1831	
IDEAcarbon / econ	1354	1590	2228
Noble Carbon Credits		1500	
JI ERUs			
UNEP RISØ Centre		187	
JI+CDM			
World Bank 2007		1700	

Top 10 Developers over CP1

Top 10 Offset Developer	M tCO ₂ e
ENEL	112
EcoSecurities	104
Orbeo/ Rhodia	93
Climate Change Capital	79
Natsource	78
EDF	74
World Bank	57
Trading Emissions	51
Tricorona	47
Noble Carbon Credits	47
Total (Top 10)	742

Source: Reuters 18 March 08

IDEAcarbon / econ:

"Delivery will be back-loaded

- Low & Mid Scenarios: 25% issued in 2012
- High scenario: > 33% issued in 2012"

EcoSecurities:

- 456 projects cut to 402 (forecast 130 Mt)
- Missed projected deliveries
- €43.3m loss for 2007

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Kyoto Market's Structure and Price Drivers

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De-mystifying the emissions market

Experience of EU ETS in context of market sophistication

- The NZ ETS will be first and foremost a compliance market
- Obligations to quantify and purchase allowances
- Sell once your requirements are quantified, banking and future obligations are understood
- Compliance period spot and physical forward contracts
- Development of risk management tools (futures & options) will occur in time.

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Who are the participants in an emissions market?

- Buyers/ sellers
- Project developers
- Brokers
- Financial institutions that provide project finance and trading liquidity in the market
- Exchanges that provide a trading platform
- Clearing House/ Settlement service providers
- Plus verifiers, auditors and advisory companies
- Government controlled National Registry & ITL

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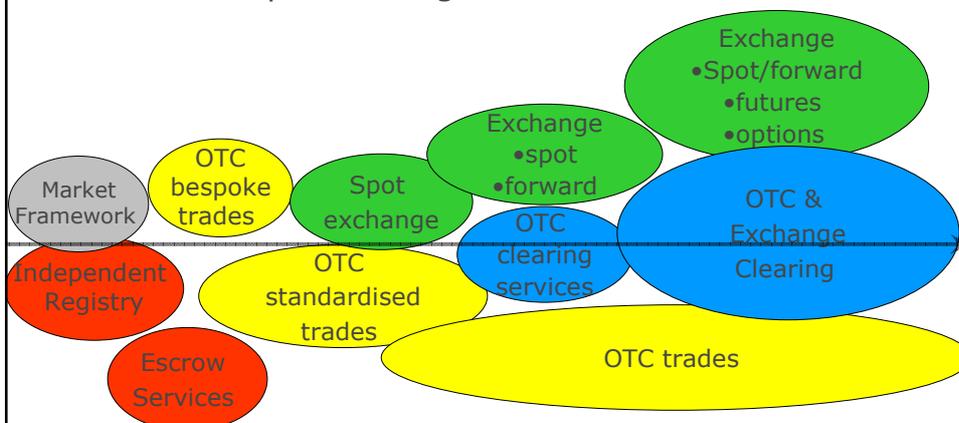
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Evolution of an Emissions Trading Market

Market Development Stages



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Instruments Traded

Physical (Compliance Market)

NZUs/ Other Kyoto Allowances

- Allocated/ auctioned allowances
- Project based allowances (primary market)
- Secondary market spot transactions
- Physical forward compliance transactions

Financial

- Futures
- Options

There are more esoteric instruments traded and settlement mechanisms but in our view these are the most widely used

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Update on International OTC Markets

- ~70% of volumes traded OTC – brokers/ bilateral
- LEBA index for structured products
- Primary and secondary market transactions
- Industry standard settlement contracts (ERPA/ EFET/ ISDA)
- Convergence of OTC trading and central settlement solutions
- LCHClearnet – EUA's & CER with margining against LEBA prices
- Clearport/ AsiaClear/ ICE Clear Europe/ ASX electricity

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Update on International Exchange Markets

- Development of futures and options
- CERs focus of product development
- Auction systems for CDM projects
- Climate Exchange Inc (ECX, CCX, Climate Spot, Montreal)
- BlueNext, Nordpool, EEX/Eurex, Climex, EEXA
- GreenExchange – NYMEX with partner banks and brokers
- Selection of international exchange carbon announcements; SGX, HKEX, ASX, Australian Climate Exchange, JSE, Korea, Beijing Climate exchange.....

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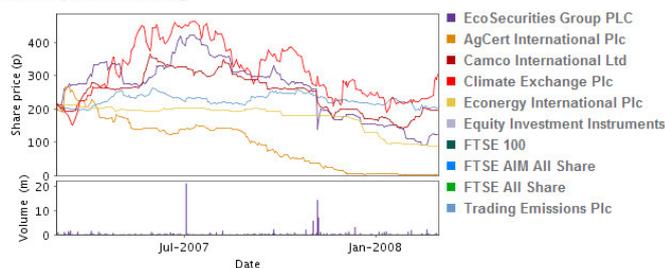
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Update on Carbon Trading & Funds

- Carbon investment indexes developing – BGCI (80% EUA/20% CER)
- Carbon funds; estimated to be ~US\$12.5 Billion currently invested
- Clean energy projects attracted US\$75Billion of funds in 2006
- CDM flow and bottlenecks have affected sector share price performance

Share price charting



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42



International Kyoto Markets

AAUs - Assigned Amount Units

- Units are assigned to governments
- GIS AAUs
- Early stage of privately traded AAU market with limited term sheets
- Supply mostly from former Soviet Bloc countries
- Unacceptable in EU ETS
- Reputation issues may exist
- Strategic asset for Governments linked to funding and energy deals

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International Kyoto Markets

CERs - Certified Emissions Reductions

- Units generated by Clean Development Mechanism projects
- Accepted in EU ETS – and indexed to EUA price
- Price driven by delivery factors
 - CDM bottleneck – up-to 50% projects being sent for further review
 - HFC 23's completed and other technologies longer lead time
 - Analysts estimating ~1.3-2.5 billion CER's 2008-2012
 - Secondary market CERs trade in a 5-6 Euro discount range to EUA's
- Significant international trading (note only 100 million actually issued)

CDM Market	Value (Euros)	Tonnes of CO ₂ e	Average Price
2007 Total CDM Market	12,000,000,000	947,000,000	12.67
2007 Secondary CER market	5,700,000,000	350,000,000	16.29
2006 Secondary CER market	571,000,000	40,000,000	14.28

Source: Point Carbon
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International Kyoto Markets

ERUs – Emissions Reduction Units

- Units generated internationally by Joint Implementation Projects
- Generated in NZ under the previous Government policy on *Projects to Reduce Emissions*
- Can be sold internationally
- Accepted in EU ETS (2008-2012)
- Term sheets agreed and finalised in ERPA contract
- Price comparable with CER's (less liquidity but potentially stronger legal jurisdictions)



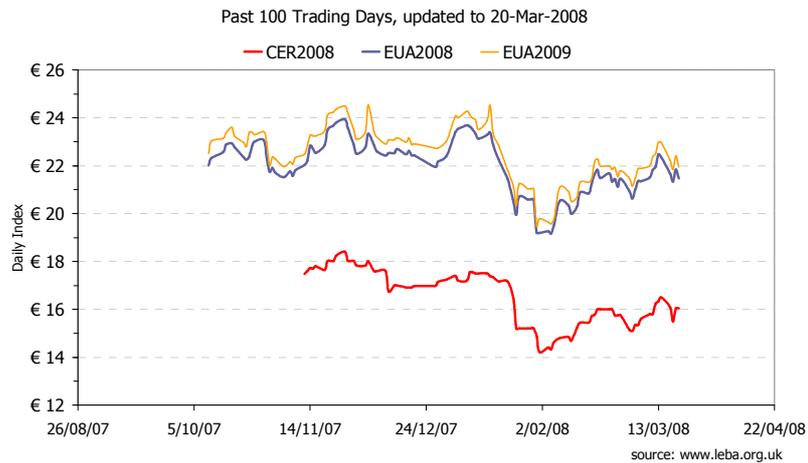
International Kyoto Markets

RMUs – ReMoval Units

- Units are held by Kyoto governments, a large number of which are likely to hold these until the end of CP1
- To date not aware of trades occurring internationally
- Unacceptable in EU ETS



Linking : EU ETS & Kyoto Unit Prices



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Current Hierarchy of Allowance Prices

- EUA
- Secondary Market CERs/ ERUs ← NZU?
- GIS AAUs & AAUs
- Primary Market CERs/ ERUs
- VERs (GS/ VCS)
- Grey Market Allowances

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EU ETS Price Drivers

- Average daily volume of EUA's 3 – 7 million tonnes

Volume and price affected by;

- National Allocation Plans
- Banking relationship with future allocation plans and auctioning
- Fuel costs and fuel switching
- Weather
- CDM mechanism in line with national CER caps (5-12%)
- Economic activity - slow down due to US & EU market conditions
- Implementation of ITL by EC may impact on ETS in 08



Price Drivers – Supply and Demand ... or in the hand of the regulator?

Domestic Design

- Sectors/Allocation methodology
- NZ generation profile (reduced fuel switching impact)
- Potential limitations on international linking tied back to domestic reductions
- Divest obligations

International Linking

- International plans (Canada/Russia/Ukraine)
- Fungibility
- International Price Taker
- Transaction costs of secondary CERs compared with CDM projects
- Credit/delivery risk



International Market Projections

Point Carbon 2008 Carbon Markets Report

- Global carbon markets worth Euro\$40 Billion in 07
- Total traded volume increased 64% to 2.7 billion tons in 07
- 3700 Point Carbon Survey Respondents;
 - on average expect a carbon price of Euro24/ton in 2010
 - and Euro35/ton in 2020
 - 72% expect there to be a global reference price for carbon by 2020
- Point Carbon predicts 2008 global carbon market will be Euro63 Billion with 4.2 billion tons carbon traded

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51



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52