The ABCs of the Value Proposition for International Carbon Credit Trading

Environmental Trading Conference

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Overview

- CO_2e credit markets emerge in response to a myriad of voluntary and compliance regimes
- Trading expands substantially in 2005, and under the Kyoto Protocol, credits are a necessity for some countries
- Eligibility and complexity matter in the consideration of creating credit supply
- Market integrity also matters--i.e., too much credit supply or risk of return will spoil the prices and incentives given that these are long-term investments
- International politics also matter—the tension between energy/industrial sources of supply versus agro/forestry sources
- Not surprisingly, prices and expectations vary widely across regimes and the goal of an international (or even national) commodity market may be elusive for many years
- Emerging US and international regimes may help to add stability to the global market if the potential credit glut can be absorbed

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Kyoto Opens The Door For Market Mechanisms To Achieve Compliance

The Kyoto Protocol includes flexible market mechanisms to reduce compliance costs: (1) Bubbles; (2) Joint Implementation; (3) Clean Development Mechanism, and; (4) International Emissions Trading.

- **Bubbles** – where a group of countries sums up their emissions allowance targets (Assigned Amount Units or AAUs) and redistributes them internally. The European Union (EU) member states have a collective 8% reduction target, but have redistributed AAUs (allowances) among members creating targets that range from -28% (Luxembourg) to +28% (Portugal).
- **Joint Implementation (JI)** – projects in countries with emission targets that reduce, avoid or sequester GHG emissions and create Emission Reduction Units (ERUs)
- **Clean Development Mechanism (CDM)** – projects in countries without emission targets (non-Annex B countries) that reduce, avoid or sequester GHG emissions and create Certified Emission Reductions (CERs)
- **International emissions trading (IET)** – the trading of AAUs among Annex B countries
- **Offsets** – Net changes in CO_2 emissions due to terrestrial sequestration (carbon uptake by the biosphere), provided they can be verified, are included.

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Kyoto Protocol Compliance Stimulates The Credit Markets

The national government of each Annex I Party is responsible for its Kyoto compliance; country-specific legislation, regulations and programs are adopted to achieve compliance within a given country.

National Emissions Inventory (annual)

- Anthropogenic emissions of GHGs from all sources
- GHG removal by sinks, limited to resulting from direct human-induced land-use change and forestry activities, essentially limited to afforestation, reforestation and deforestation
- Net anthropogenic emissions of GHGs (measured against the Annex I Emission Cap below)

National-Level Kyoto-Based Accounting Compliance

Emission cap of Annex I Party = AAUs + Acquired and transferred AAUs by Int'l Trading + RMUs + Acquired credits from JI and CDM (ERUs, CERs)

National Level Regulation and Programs (or may be multiple nations, such as the EU)

- National (or state) GHG cap and trade program for selected sectors of the economy, e.g. utilities, industry, transportation, etc.)
- Emission offset or credit programs for GHG reductions/sequestration from non-capped sources

may be linked to Kyoto trading units (e.g., AAUs, CERs) or may not be

- RD&D program to advance GHG mitigation technologies
- GHG related regulations (building codes, appliance efficiency standards, fuel economy for vehicles, RPS, carpool lanes/rules, etc.)
- Taxes on carbon emissions, fuels, vehicles, etc.
- Transportation and land-use planning programs

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Value Is Driven By Credit Creation And Demand

The SIMPLIFIED carbon trading "Value Chain" has four basic steps, including brokering.

	Carbon credit creation	Certification	Carbon credit marketing & trading	Carbon credit purchasing
			Brokering	
General Description	• Regional/National/ International rules that define Projects to reduce carbon emissions beyond a specific level and create excess credits for banking or sale	• Independent bodies that record and verify the creation of carbon credits for both compliance and voluntary markets	• Direct sale of credits • Aggregation of credits created by others (e.g., from "credit creation") • Pure trading	• Credit purchases by entities subject to carbon caps or entities pursuing voluntary reductions.

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The EU ETS—A Large-Scale Demonstration Of Demand

EU ETS is currently in the pilot phase (1/1/05 thru 12/31/07).

- Applies to 25 EU countries. Reduction targets vary by country, and are less stringent than those for the 1st compliance period in 2008 – 2012
- Pilot phase runs from 1/1/05 through 12/31/07 only covering CO2 – not all GHGs; allowance based system with limited use of emission credits from CDM projects, if registered and delivered.
- Active trading: 322 MtCO2 of allowances traded in 2005
- Land use, land use change, and forestry-related project credits (which are frequently based on sequestration) are not allowed during the 2005-2007 pilot phase. Credits from nuclear are not allowed.
- EU ETS, however, is an important influence on the expectations and supply in the CDM market.

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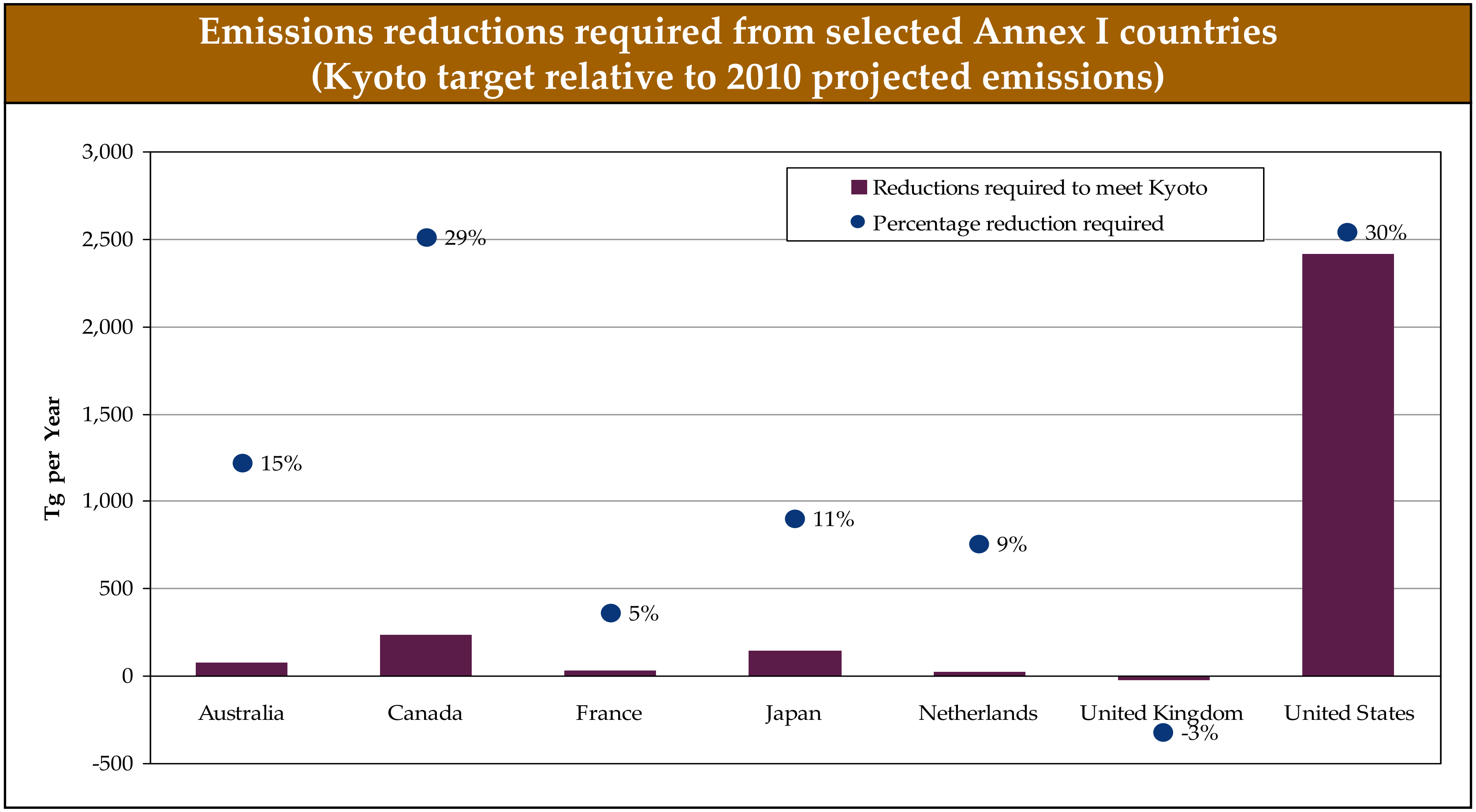
Credit Trading Is Likely To Be A Necessity For The Compliance Strategies of Several Countries



Source: http://globalis.gvu.unu.edu/.

Note: Australia and USA did not ratify Kyoto and therefore are not bound by the targets shown above.

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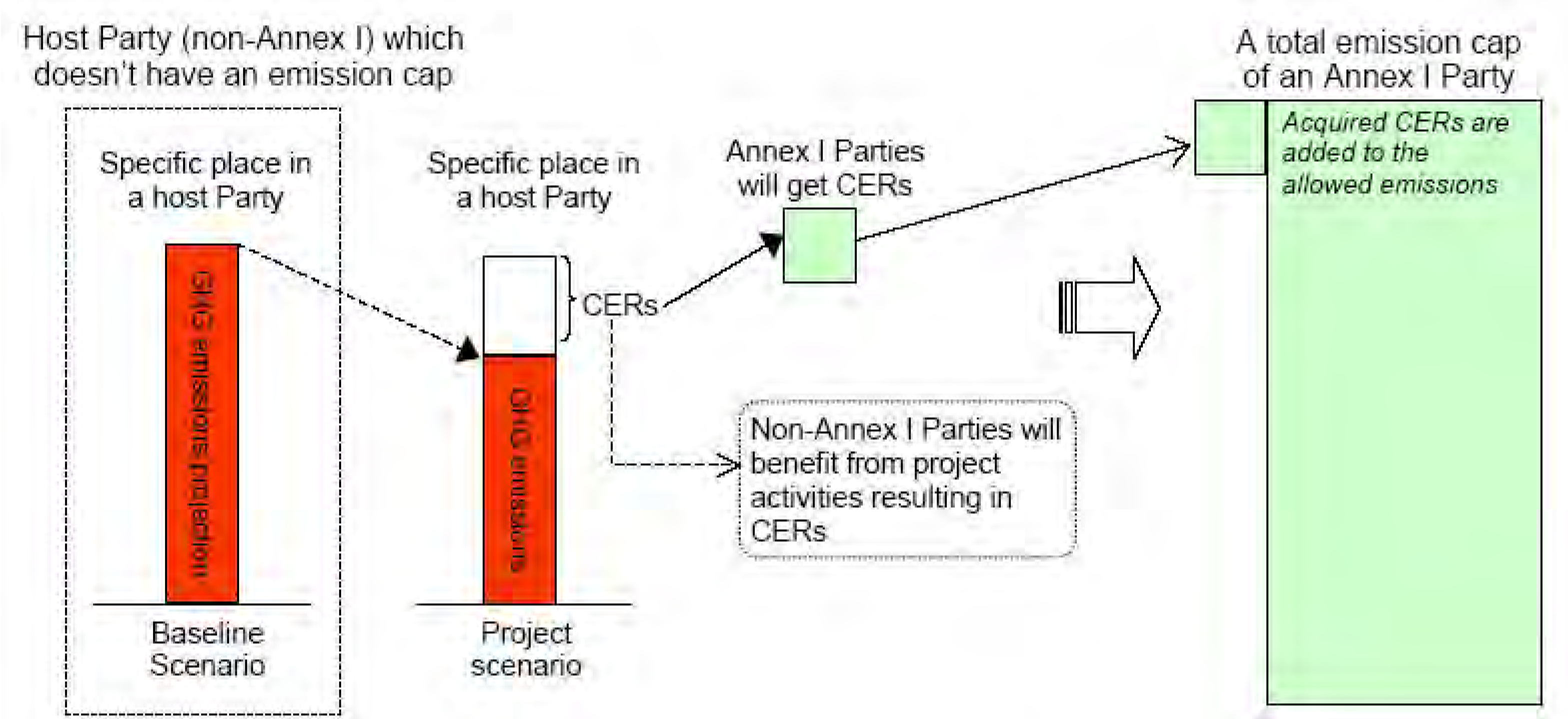
Trading and Development Opportunities are Created by Credits

The Clean Development Mechanism allows Annex I Parties to increase GHG emissions above their assigned amount; non-Annex I Parties gain revenue to help finance beneficial infrastructure projects.



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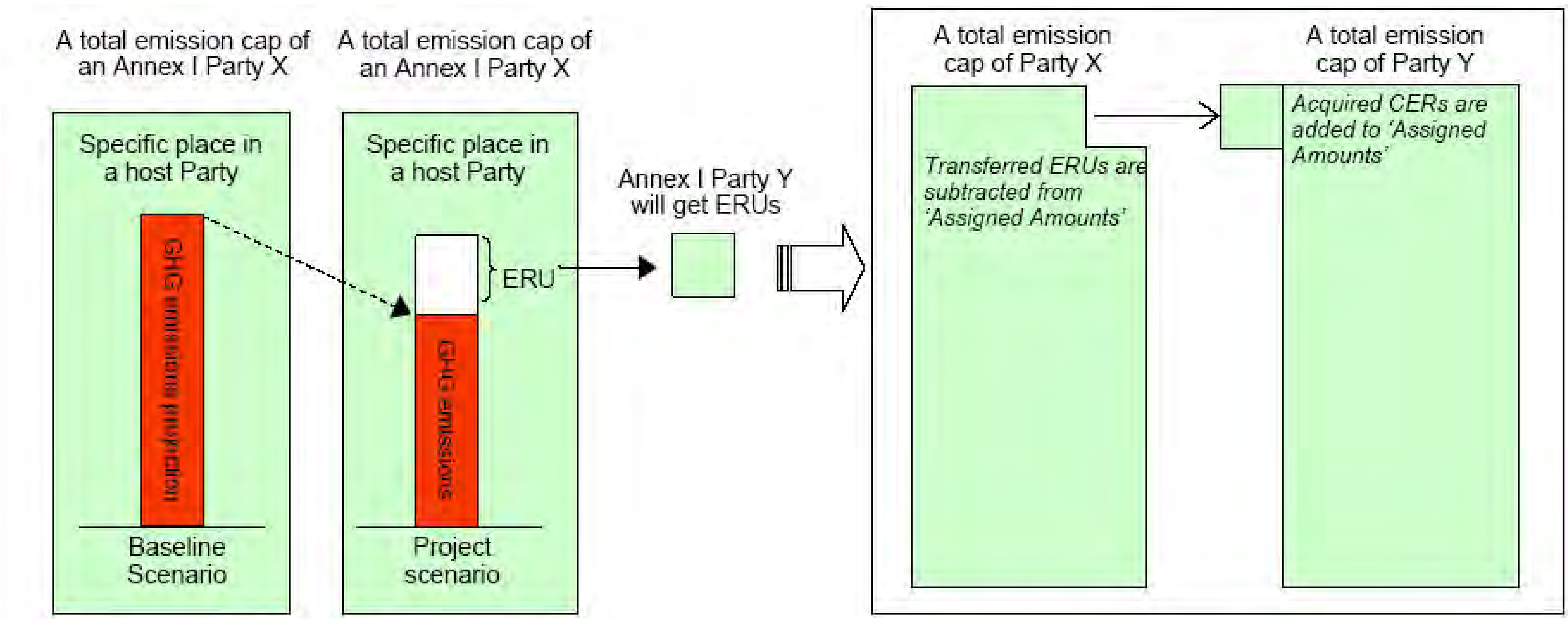
Opportunities Are Not Exclusive to Developing Countries

Joint Implementation allows Annex I Parties to fund/develop emission reduction projects in other Annex I countries and export the credit back to the country making the investment.



Note: ERU = Emissions Reduction Unit

Restraining the Supply: Eligibility

Party	Eligibility Requirements
National Government (Kyoto Party)	For an Annex I Party to participate in official KP trading, it must: • Be a party to the Kyoto Protocol • Have its assigned amount (emission target) calculated and recorded • Have a national KP emission registry • Have a national system for estimation of GHG emissions and removals • Have submitted the most recent required emissions inventories • For CDM (and JI) projects: – Demonstrate to the satisfaction of the CDM Executive Board or other reviewers, that KP trading is "supplemental" to domestic action – Afforestation/Reforestation projects in 1st Commitment Period cannot exceed 1% of Party's base year emissions
Entity, Facility, End-user, Trader	• The Party must authorize the entities to participate in Kyoto, and the Party must meet eligibility requirements (see above) • A holding account for each entity must be set up within the national registry

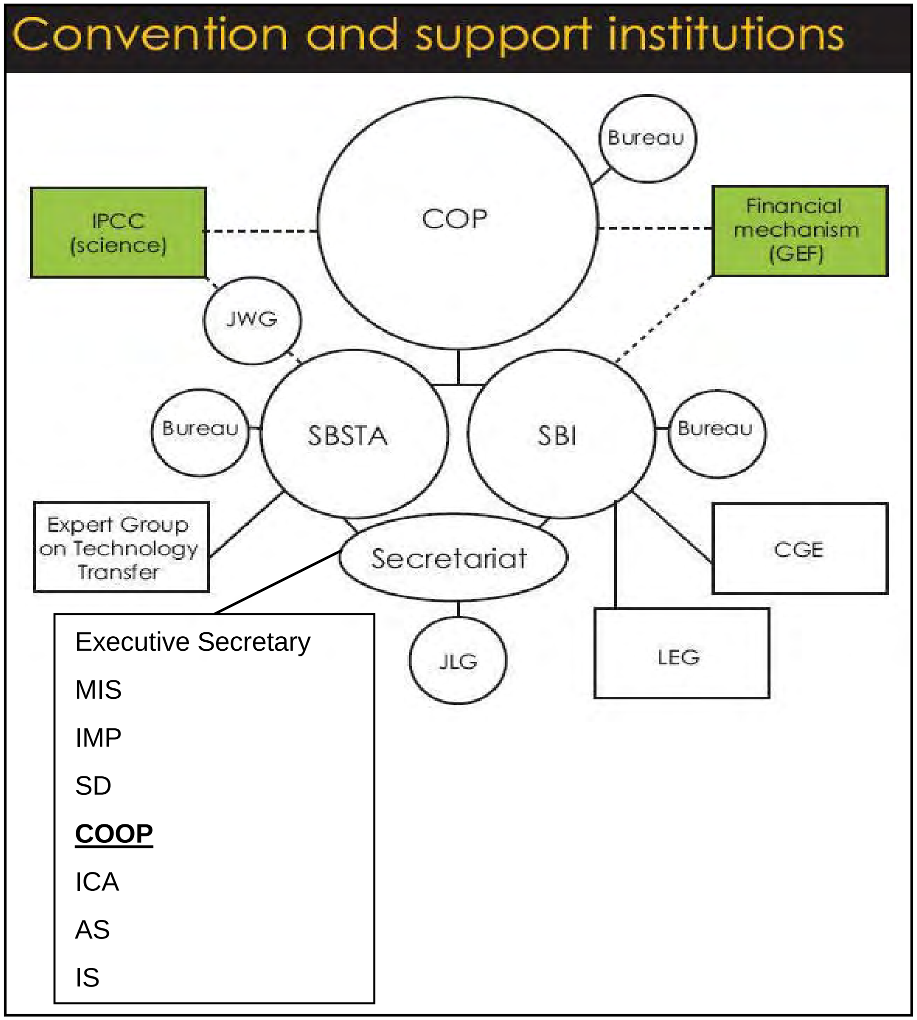
Restraining the Supply: Complexity

The process of creating CDM projects and receiving CERs that meet all Kyoto requirements is complex.

- Planning the project
- Preparing the Project Design Document
- Getting approval from the Designated National Authority and other local Parties
- Validation and registration, selection of a Designated Operational Entity
- Monitoring, Verification and Certification
- Issuance and distribution of CERs

Restraining the Supply: A Complicated Governance Structure

The UNFCCC/Kyoto governance structure is very complex; Cooperative Mechanisms implements trading and CDM/JI policies.



Definitions

AS	Administrative Services
CDM	Clean Development Mechanism
CGE	Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention
COOP	**Cooperative Mechanisms – supports the implementation of project under the CDM and JI, and emissions trading and registry systems under the Protocol. Includes the CDM Executive Board**
COP	Conference of the Parties (UNFCC ratifiers)
Exec. Secretary of the COP	Promotes overall coherence of the Secretariat's work
ICA	Intergovernmental and Conference Affairs
IMP	Implementation of Communications
IPCC	Intergovernmental Panel on Climate Change – provides scientific input
IS	Information Services
JI	Joint Implementation
JLG	Joint Liaison Group
JWG	Joint Working Group
LEG	LDC Expert Group
MIS	Methods, Inventories and Science
SBI	Subsidiary Body for Implementation helps to assess and review the Convention's implementation
SBSTA	Subsidiary Body for Scientific and Technological Advice – provides advice to the COP
SD	Sustainable Development

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Nonetheless, Over-Supply of Credits Is A Key Market Concern

Without the US, there likely will be sufficient credits to be traded between nations that ratified Kyoto to meet the Kyoto targets.

- Given this potential surplus of credits, esp, considering offsets, the way in which different countries choose to meet their own obligations will have a major bearing on the price of these credits and the relative interest in, and attractiveness of carbon sequestration, renewable energy, and other means of actively reducing GHG emissions.

	Projected 2010 Emissions Compared to 2008-2012 Kyoto Target (Tg per Year CO_2e)		
	Total Reductions Required	**Total Credits Available**	**Net Reductions Required**
Kyoto, all parties assigned GHG targets	**3,092**	**-1,652**	**1,440**
Kyoto, all parties that ratified (Annex I minus AUS &USA)	**812**	**-1,652**	**-840**

U.S. withdrawal created credit "glut"

Countries with 2002 Emissions below Kyoto Target for 2008-2012.	Countries with Projected 2010 Emissions below Kyoto Target for 2008-2012
Belarus Bulgaria Croatia Czech Republic Denmark Estonia France Germany Hungary Iceland Latvia Lithuania Luxemburg Poland Romania Russian Federation Slovakia Slovenia Sweden Switzerland Ukraine United Kingdom	Czech Republic Estonia **Germany** Hungary Iceland Latvia Poland Russian Federation Slovakia **United Kingdom**

Credit sales opportunities not just limited to Eastern Europe

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And The Return to Credit Generation Is Risky

- Some international GHG trading today is occurring **<u>in anticipation</u>** of the necessary Kyoto Protocol trading/accounting infrastructure, processes, and final policies. The risk of non-compliance under the eventual Kyoto process is assigned to either the buyer or seller, and will affect trading prices.
  - Examples: Chicago Climate Exchange; bilateral transactions for CERs (under CDM) and ERUs (under JI)
  - There is no single "Kyoto GHG" trading market – there are multiple markets which involve different geographic locations, contractual structures; trading hubs; and governing regulations. These market have some common linkages but are not fully interconnected.

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An “Imbalanced” Global Distribution of CDM?

- In 2005, CDM projects accounted for nearly 50% of the traded carbon volume.
- In 2002, China and India were projected to account for almost 60% of the non-forestry CDM projects.
- In 2005-2006, China and India accounted for nearly 70%. From 2004 to 2005/6, China’s share increased from 5 to 66%. Most of the approved projects focus on energy and industrial assets.
- Other regions, most notably Africa, Central Asia, and the Pacific, struggle to find assets to bring to the carbon markets, since land-use change projects face particularly complex approval conditions.

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The International Politics Of Expanding The Supply Through Land Management

- Current Debate --Sequestration projects allowed in CDM
  - Political constraint affects supply in the near and mid-term -- long lead time for forestry projects
  - Short window for changes in market rules -- talks for 1st EU ETS compliance period and post -2012 being held now, in 2006-2007
- Contentious issues:
  - Permanence, additionalilty, leakage, measurement and monitoring
  - sustainable development
- New frontier for land management --- future inclusion in CDM
  - Old-growth sequestration and deforestation projects
  - Promoted by Rainforest Coalition of countries--official Party Group under UNFCCC
  - Could greatly expand supply and developing country participation in Central and South America, Africa, and Pacific Islands
  - Uncertainties: measurement methodologies, socio-economic drivers, policy instruments, etc.

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Current Market Reality: Various Compliance Regimes

With various regimes, markets for GHG credits and allowances are unlikely to converge, and prices will vary based on unique market features in different jurisdictions.

	2005				2006 Q1			
	Volume ($MtCO_2$)	**Value (MUS$)**	**Average Price (US$)**	**Reported Price**	**Volume ($MtCO_2$)**	**Value (MUS$)**	**Average Price (US$)**	**Reported Price**
EU ETS	322.01	8220.16	25.53	Avg. price spiked at US$34.24 in July 2005. Ranged US$24-30 since then, mostly above US$25.	202.5	6552.24	32.36	Jan. average: US$28.70; Feb. average: US$31.43; Mar. average: US$31.64; Peaked April 18 (US$35.70) and dipped to May 2 (US$13.08)
NSW	6.11	57.16	9.36	US$8.14 - 11.10 range	5.51	86.55	15.71	
CCX	1.45	2.83	1.95	US$1.95 weighted average	1.25	2.71	2.17	Above US$3.5 (April) and on the rise.
UK ETS	0.3	1.31	4.37	Prices dropped from 4.5 pounds (about US$9) in early 2005 to 2 pounds (about US$4) in May 2005. Oversupply driving prices down.				
Overall	**329.87**	**8281.46**	**25.11**		**209.26**	**6641.5**	**31.74**	

Sources: *State and Trends of the Carbon Market - 2006; http://www.bankofcanada.ca/en/rates/exchform.html*

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Not Surprisingly, Prices Have Varied Substantially Across "Markets"

In mid-2005, market values for GHG mitigation range from less than $1/ton CO_2e to almost $50/ton CO_2e.

System	Applies to	Location	$ Metric ton CO_2 value
Norwegian Carbon Tax	Various fuels and measured sources	Norway	$49 (for use of natural gas)
EU Emission Trading Scheme	25 EU members nations and 12,000 large sources	Europe	$27.44
New South Wales GHG Abatement Scheme	Electric retailers and others large sources	New South Wales, Australia	$8.10
ERU (emission reduction unit – seller assumes registration risk)	Projects involved in Joint Implementation	Kyoto Annex I countries (which have emissions targets)	$6.04
CER (certified emission reduction – seller assumes registration risk)	Projects involved in the Clean Development Mechanism	global	$5.63
VER (emission reduction verified by a 3rd party – buyer takes registration risk)	Voluntary buyers and sellers; no guarantee of Kyoto eligibility	global	$4.23
UK Emission Trading Scheme	"Volunteer" companies (who thereby avoid 80% of Climate Levy on energy purchases)	UK	$3.02 - $6.85
CCX (Chicago Climate Exchange)	Volunteer U.S and Canadian companies pledging 1% GHG per year from 2003-2006	U.S., Canada and offset projects in South America	$1.70
Oregon Climate Trust	New power plant fee	Oregon	$0.85

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Could Additional National and International Compliance Programs Reduce Market Fragmentation and Instability?

Can these programs expand demand and supply while maintaining credit market value and growth?

Mandatory	• Regional Greenhouse Gas Initiative (RGGI) • California, Oregon, Washington considering a similar cap and trade system to RGGI
Voluntary	• The Bush Administration has set a target of reducing the U.S. GHG *intensity* in 2012 by 18% below 2002 *intensity* levels • The U.S. has entered into an agreement with China, India, S. Korea, Japan & Australia on technology to reduce GHGs without targets. • Chicago Climate Exchange (CCX) and the U.S. DOE 1605(b) registry. • New registry in a regional plan announced by officials in Midwest states • New registry announced by Bank of New York • Voluntary Carbon Standard (VCS) being formulated by IETA, the Climate Group, and the World Economic Forum • Gold Standard for Voluntary Emissions Reductions (GSV)

Note: This page does not provide a complete listing. For a good summary of mandatory and voluntary GHG programs , see www.pewclimate.org/what_s_being_done/targets/

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