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## Forest and Carbon offset investments: problems and potentials

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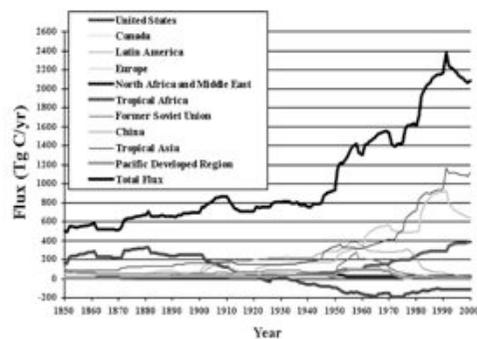
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## Outline

1. Mitigation options and problems related to forest investments as C sinks
2. The two markets:
  - The “regulated” market
  - The voluntary market
3. Some final considerations

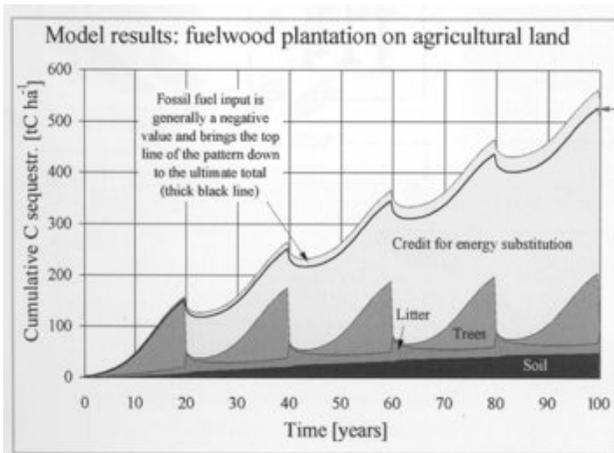
## 1. Mitigation options and problems related to forest investments as C sinks

Annual Net Flux of Carbon to the Atmosphere from Land-Use Change: 1850-2000  
(Houghton and Hackler)



## Mitigation options in the forest sector

- Increasing the forest area establishing new forest stands (AF and RF)
- Increasing Carbon stock through forest management (FM)
- Maintaining the forest area through reducing deforestation and forest degradation (REDD)
- Increasing off-site carbon stocks in wood products
- Fossil fuel substitution (Bioenergy / biofuels)



Source: Schlamadinger, 2000

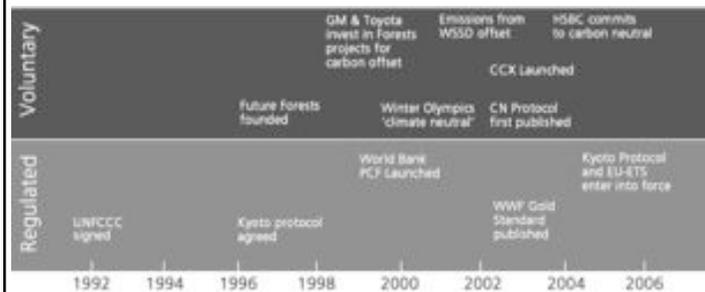
Main problems that the regulated and voluntary market of C sink project have to face:

- Non-permanence
- Baseline and C sinks monitoring, verification
- Leakage
- Additionality  
(moreover: problem of scale – large project have less transaction costs)

“additionality?”

“Afforestation is the **direct human-induced conversion** of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources”

## 2. The two markets



### A. The “regulated” market

- Increasing the forest area establishing new forest stands (AF and RF) ← Art. 3.3 KP
- Increasing Carbon stock through forest management (FM) ← Art. 3.4 KP
- Maintaining the forest area through reducing deforestation and forest degradation (REDD)
- Increasing off-site carbon stocks in wood products
- Fossil fuel substitution (Bioenergy / biofuels)

## A special instrument for C offsetting: the Kyoto Protocol “mechanisms”

- Clean Development Mechanism (CDM)
- Joint Implementation (JI)

CDM: defined in Article 12 UNFCCC provides for Annex I Parties to implement project activities that reduce emissions in non-Annex I Parties, in return for certified emission reductions (CERs).

The CERs generated by such project activities can be used by Annex I Parties to help meet their emissions targets under the Kyoto Protocol.

## CDM

- Definitions and modalities have been developed for including afforestation and reforestation activities (often referred to as “sinks”) in the CDM for the first commitment period.
- However, Annex I Parties are limited in how much they may use CERs from such activities towards their targets (up to 1% of the Party’s emissions in its base year, for each of the five years of the commitment period).

## CDM and JI implementation in the forestry sector

<http://cdm.unfccc.int/Panels/index.html>

Total Projects found: 13

Registered	Title	Host Parties	Other Parties	Methodology*	Reductions**	Ref
10 Nov 05	Facilitating Reforestation for Guangxi Watershed Management in Pearl River Basin	China	Italy Spain	AR-AM001 ver. 2	25760	0547
30 Jan 05	Mulava Soli Conservation Project	Republic of Moldova	Sweden Netherlands	AR-AM002 ver. 1	17302	1948
23 Mar 05	Small Scale Cooperative Afforestation CDM Pilot Project Activity on Private Lands Affected by Shifting Sand Dunes in Sindh, Pakistan	India		AR-AM001 ver. 4	11596	2345
29 Apr 05	Cap Phung Reforestation Project	Viet Nam		AR-AM001 ver. 4	2695	2363
05 Jun 05	Reforestation of severely degraded landmass in Khammouh District of Anhoia Pradesh, India under JIC Social Forestry Project	India		AR-AM001 ver. 2	57782	2241
11 Jun 05	CARBON SEQUESTRATION THROUGH REFORESTATION IN THE BOLIVIAN TROPICS BY SMALL-HOLDERS OF "The Peterson de Comunidades Agropecuarias de Rumenabague (FECARU)"	Bolivia	Belgium	AR-AM001 ver. 4	4341	2510
27 Aug 05	Uganda Nile Basin Reforestation Project No.3	Uganda	Italy	AR-AM001 ver. 4	5554	1576
08 Sep 05	Reforestation of croplands and grasslands in low-income communities of Paraguarí Department, Paraguay	Paraguay	Japan	AR-AM001 ver. 4	1523	2684
Review Requested	Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil	Brazil	Netherlands	AR-AM005 ver. 2	75763	2505
14 Nov 05	Afforestation and Reforestation on Degraded Lands in Northwest Sichuan, China	China		AR-AM003 ver. 3	23030	2700
18 Nov 05	"Reforestation, sustainable production and carbon sequestration project in José Ignacio Támara's city forest, Puyú, Peru"	Peru		AR-AM003 ver. 4	46669	2715
Minor corrections (Following request for review)	Humbó (Ethiopia Assisted Natural Regeneration Project	Ethiopia	Canada	AR-AM003 ver. 4	26343	2712
Requesting Registration	Assisted Natural Regeneration of Degraded Lands in Albania	Albania	Italy	AR-AM003 ver. 4	22964	2714

\* AM - Large scale, ACM - Consolidated Methodology, AMS - Small scale  
 \*\* Estimated emission reductions in metric tonnes of CO2 equivalent per annum (as stated by the project participants)

Project 0547 : Facilitating Reforestation for Guangxi Watershed Management in Pearl River Basin	
Project title	Facilitating Reforestation for Guangxi Watershed Management in Pearl River Basin <a href="#">Project design document</a> (1729 KB) <a href="#">Registration request form</a> (4160 KB)
Host Parties	China <a href="#">Approval</a> (152 KB) <a href="#">Registration</a> (152 KB) Authorized Participants: Jinghean Forestry Development Company Ltd
Other Parties Involved	N/A
Bilateral and Multilateral Funds	BioCarbon Fund Managing company: The International Bank for Reconstruction and Development (IBRD) Buyer involved directly: <a href="#">Approval</a> (118 KB) <a href="#">Registration</a> (118 KB) Sponsor involved directly: <a href="#">Approval</a> (254 KB) <a href="#">Registration</a> (254 KB)
Activity Category(ies)	14
Activity Scale	LARGE
Methodologies Used	<a href="#">JCR-AMDD01-Ver.2</a> - Reforestation of degraded land
Amount of Reductions	25,785 metric tonnes CO2 equivalent per annum
Fee level	USD 3459
Validation Report	<a href="#">Explanation of tables due account of comments</a> (14 KB) <a href="#">List of documents</a> (22 KB) <a href="#">List of interview persons</a> (19 KB) <a href="#">Model files of compensation</a> (58 KB) Other documents (descriptions provided by the DOE) <a href="#">CDU as in GPP</a> (11761 KB) <a href="#">Validation report not annex</a> (421 KB) Public availability information at time of opening the registration process at <a href="http://www.netform.us/NEA/register/Guide2.aspx?Dir=1471AEbanc1_ID=26AEbanc2_ID=391Manden1">http://www.netform.us/NEA/register/Guide2.aspx?Dir=1471AEbanc1_ID=26AEbanc2_ID=391Manden1</a> <a href="#">Compilation of all comments received</a> (14 KB)
Registration Date	10 Nov 98
Crediting Period	01 Apr 99 - 31 Mar 35 (Fixed)

## JI

- under JI, an Annex I Party may implement an emission-reducing project or a project that enhances removals by sinks in the territory of another Annex I Party and count the resulting emission reduction units (ERUs) towards meeting its own Kyoto target.
- Any JI project shall have the approval of the Parties involved and provide a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to any that would otherwise occur.
- Projects starting as of the year 2000 may be eligible as JI projects if they meet the relevant requirements, but ERUs may only be issued for a crediting period starting after the beginning of the year 2008.

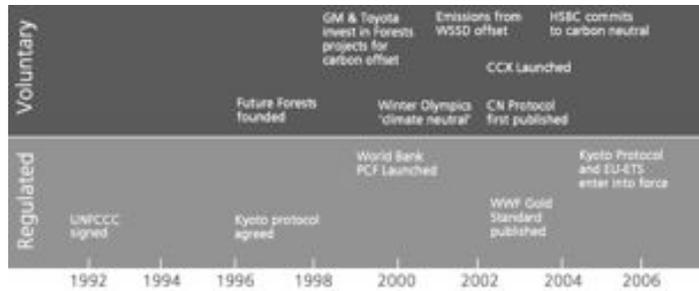
Agriculture and Forestry: not included in the EU *Emission Trading Scheme* (EU ETS) – Dir. 87/2003

*“They (i.e. the forest projects) do not bring technology transfer, they are inherently temporary and reversible, and uncertainty remains about the effects of emission removal by carbon sink”* (CE, 2003)

Extra EU developments – where the use of forestry credits from forestry projects are allowed

- United States
  - **Chicago Climate Exchange**
  - US Northeast States Regional Greenhouse Gas Initiative
  - California Climate Action Registry
  - Western Climate Initiative (WCI)
- Australia
  - New South Wales Greenhouse Gas Abatement Scheme
  - Proposed Australian ETS
- New Zealand
  - New Zealand Emissions Trading Scheme
  - Permanent Forest Sink Initiative

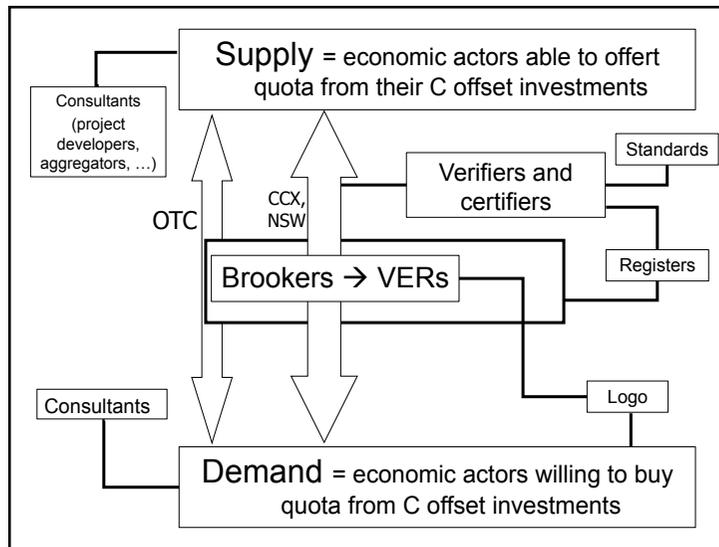
## B. The voluntary market → Voluntary Schemes



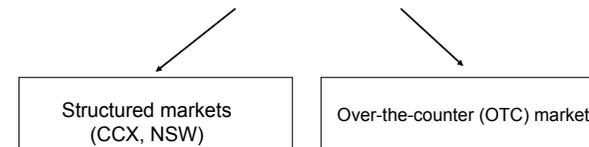
## Role of the formal “Commitments”

- **Policy commitments:** “Cities for Climate Protection” 150 cities with commitments on emission reduction from 5 to 10%
- **Corporate Commitments:** AES, BP Amoco, MAZDA, AVIS, Dupont, Shell International, Interface, Duch Electricity Generating Board (FACE Foundation) ... reduction till 10%.

“Carbon neutral”,  
“Zero emission”  
“Go Zero”



## Voluntary carbon market



CCX (like NSW) is a structured and closely monitored cap-and-trade system that organizations join voluntarily.

Outside these markets, one finds a wide range of voluntary transactions that are not driven by an emissions cap, and do not, for the most part, trade on a formal exchange. This mass of transactions is referred as the over-the-counter (OTC) market. Because this OTC market transacts on a highly fragmented deal-by-deal basis, it is extremely difficult for stakeholders to both track and navigate.

## Carbon Market: Volumes & Values in 2007-08

	2007		2008	
	Volume (MtCO <sub>2</sub> e)	Value (MUS\$)	Volume (MtCO <sub>2</sub> e)	Value (MUS\$)
<b>Project-based Transactions</b>				
Primary CDM	552	7,433	389	6,519
J1	41	499	20	294
Voluntary market	43	263	54	309
<b>Sub total</b>	<b>636</b>	<b>8,195</b>	<b>463</b>	<b>7,210</b>
<b>Secondary CDM</b>				
<b>Sub total</b>	<b>240</b>	<b>5,451</b>	<b>1,072</b>	<b>26,277</b>
<b>Allowances Markets</b>				
EU ETS	2,060	49,065	3,093	91,910
New South Wales	25	224	31	183
Chicago Climate Exchange	23	72	69	309
RGGI	na	na	65	246
AAUs	na	na	18	211
<b>Sub total</b>	<b>2,108</b>	<b>49,561</b>	<b>3,276</b>	<b>92,859</b>
<b>TOTAL</b>	<b>2,984</b>	<b>63,007</b>	<b>4,811</b>	<b>126,345</b>

Source: WB 2010

[http://wbcarbonfinance.org/docs/State\\_\\_Trends\\_of\\_the\\_Carbon\\_Market\\_2009-FINAL\\_26\\_May09.pdf](http://wbcarbonfinance.org/docs/State__Trends_of_the_Carbon_Market_2009-FINAL_26_May09.pdf)

- **VERs (Verified Emission Reductions).**  
1 t CO<sub>2</sub> = 1 VER.

Largest VERs market: **Chicago Climate Exchange (CCX).**  
1 VER = 5 \$ (3.2 €)  
(1 ETS = 35 \$; 22.1 €)



**Forestry Carbon Emission Offsets**

CCX has been a leader and innovator in developing simple, standardized rules for issuing Carbon Finance Instruments (CFIs) backed by forest carbon sequestration. Eligible projects on CCX are listed under the list of the eligible measures outlined by the Intergovernmental Panel on Climate Change (IPCC).

- Maintaining or increasing forest area, reducing deforestation and degradation
- Restoring or increasing forest area, afforestation, reforestation
- Forest management to increase storage and landscape-level carbon density
- Increasing off-site carbon stocks in wood products and enhancing product and fuel substitution

All managed forest offset projects and afforestation projects that do not allow the carbon accumulation levels must obtain project approval of the CCX Forestry Committee. Templates for project proposals and cover sheets to be submitted to the Forestry Committee can be found under the "Resources" tab below.

**CCX Forest Carbon Offset Project Categories**

- **Conservation:** the planting of new forests on lands, which historically, have not contained forests.
- **Living:** a CCFI issued for harvested wood that has existed for long period of time, in which it has earned an a carbon sink.
- **Managed Forest:** projects that sustainably manage forests such that their growth in carbon stocks exceeds their harvest.

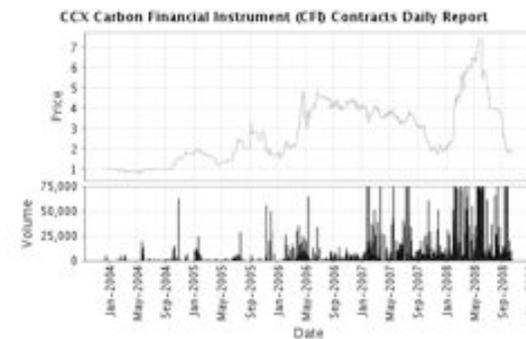
In addition, CCX has developed rules for offset issuance for newly planted tree plant and forest conservation that is combined with afforestation. Please refer to the Chapter 3 of the CCX handbook for further information.

**Related Documents**

- CCX Forest Offsets User Study: Previous Issues

<http://www.chicagoclimatex.com/>

## Prices and volumes (US\$) of VERs in the Chicago Climate Exchange



<http://www.chicagoclimatex.com/market/data/summary.jsf>







### 3. Final considerations

Regulated market:

- LULUCF projects in the 1<sup>st</sup> CP: no role in ETS, minor role in the flexible mechanisms (only AF/RF); large expectation after Copenhagen (REDD)

Voluntary market:

- Large attention to forestry; leading position played by the forest sector; many positive aspects:
    - more flexible investments
    - setting the stage for future developments in the regulated markets
- ... but many problems connected with transparency, effectiveness and verification

#### AAUs

**Assigned Amount Units.** Allowances for carbon emissions allocated to developed countries up to their target level under the Kyoto Protocol. These allowances are tradable under Kyoto's international emission trading mechanism in place from 2008 to 2012. Each AAU equates to one tonne of CO<sub>2</sub>e.

#### EUA

**European Union Allowances.** Tradable emission credits from the EU Emissions Trading Scheme. Each allowance carries the right to emit one tonne of carbon dioxide.

#### CER

**Certified Emission Reduction.** A credit generated under Kyoto's Clean Development Mechanism (CDM) for the reduction of emissions of greenhouse gases equal to one tonne of CO<sub>2</sub>-equivalent. They are designed to be used by industrialised countries to count toward their Kyoto targets but can also be used by EU companies and governments as offsets against their emissions under the EU Emissions Trading Scheme

#### ERU

**Emission Reduction Unit.** Tradable credits generated from activities to reduce greenhouse emissions in industrialised countries, particularly those of the former Soviet-bloc, under the Kyoto Protocol's Joint Implementation (JI) mechanism.

#### RMUs

**Removal Units.** Credits earned from land use, land-use change and forestry projects (LULUCF) in industrialised countries, including such projects under the Kyoto Protocol's JI mechanism

#### VERs

**Verified Emission Reductions.** Tradable credits for greenhouse emission reduction activities generated to meet voluntary demand for carbon credits by organisations and individuals wanting to offset their own emissions.