



Venice International University,
Venice, 11 December 2009

Forest and Carbon offset investments: problems and potentials

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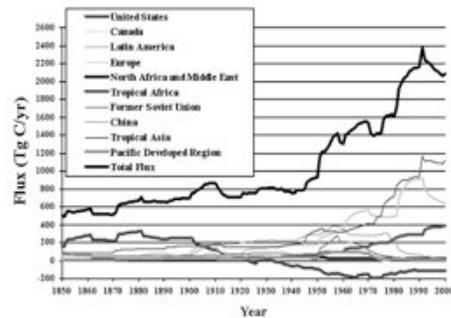
University of Padova - Italy

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

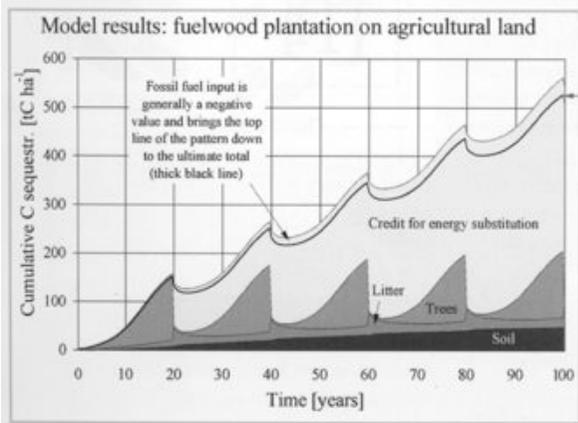
1. Mitigation options and problems related to forest investments as C sinks

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

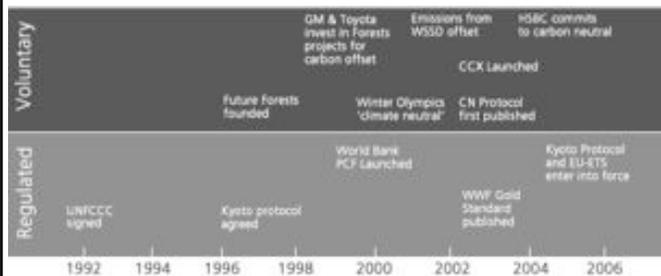
Main problems that the regulated and voluntary market of C sink project have to face:

- 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

The screenshot shows the UNFCCC website's interface for CDM and JI implementation. The main content area is titled "Panels / Working Groups / Teams" and lists various panels and teams involved in the process. A search bar is visible at the top left. The URL <http://cdm.unfccc.int/Panels/index.html> is displayed at the bottom of the page.

Registered	Title	Host Parties	Other Parties	Methodology *	Reductions **	Ref
10 Nov 06	Facilitating Reforestation for Changler Watershed Management in Pearl River Basin	China	Italy Spain	AM-AM001 ver. 2	2576	6947
30 Jan 06	Morbine Soil Conservation Project	Republic of Moldova	Sweden Netherlands	AM-AM002 ver. 1	17624	1948
23 Mar 06	Small Scale Cooperative Afforestation CDM Pilot Project Activity on Private Lands Affected by Shifting Sand Dunes in Srisa, Nagano	India		AM-AM001 ver. 4	1139	3345
28 Apr 06	Cao Phong Reforestation Project	Viet Nam		AM-AM001 ver. 4	280	2363
08 Jun 06	Reforestation of severely degraded lands in Khammam District of Andhra Pradesh, India under ITE Social Forestry Project	India		AM-AM001 ver. 2	5732	2241
11 Jun 06	CARBON SEQUESTRATION THROUGH REFORESTATION IN THE BOLIVIAN TROPICS BY SMALLHOLDERS OF "The Federation de Comunidades Agrarias de Tulumayo (FECAAT)"	Bolivia	Belgium	AM-AM001 ver. 4	4341	2910
21 Aug 06	Uganda Nile Basin Reforestation Project No 3	Uganda	Italy	AM-AM001 ver. 5	8004	1578
28 Sep 06	Reforestation of croplands and grasslands in low income communities of Paraguari Department, Paraguay	Paraguay	Japan	AM-AM001 ver. 4	1523	2684
Review Requested	Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil	Brazil	Netherlands	AM-AM005 ver. 2	7570	2569
18 Nov 06	Afforestation and Reforestation on Degraded Lands in Northwest Sichuan, China	China		AM-AM003 ver. 3	2320	3700
18 Nov 06	"Reforestation, sustainable production and carbon sequestration project in José Ignacio Tabares's dry forest, Puerto Plata"	Dominican Republic		AM-AM003 ver. 4	4889	2715
Minor corrections following Request for Review	Humbi Ethiopia Assisted Natural Regeneration Project	Ethiopia	Canada	AM-AM003 ver. 4	2693	2712
Resubmitted Registration	Assisted Natural Regeneration of Degraded Lands in Albania	Albania	Italy	AM-AM003 ver. 4	2264	2714

* AM - Large scale, ACM - Conventional Methodologies, 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 Project design document (1726 KB) Registration request form (4160 KB)
Host Parties	China Requester (102 KB) Requester (102 KB) Authorized Participants: Guangxi Poverty Development Company Ltd
Other Parties Involved	None
Bilateral and Multilateral Funds	RedCarbon Fund Managing company: The International Bank for Reconstruction and Development (IBRD) Rel. involved directly: IBRD (1716 KB) IBRD (1716 KB) Spain, involved directly: IBRD (204 KB) IBRD (204 KB)
Activity Categories	14
Activity Scale	LARGE
Methodologies Used	JIS-MOQDET ver. 2 - Reforestation of degraded land
Amount of Reductions	20,790 metric tonnes CO2 equivalent per annum
Fee level	USD 3458
Validation Report	Validation of JIS-MOQDET account of comments (14 KB) List of documents (22 KB) List of interested parties (19 KB) Numbers of consultations (14 KB) Other documents (consultations provided by the DOE) JIS-MOQDET ver. 2 (1781 KB) Validation report.mxl_address (421 KB) Public availability information at time of opening the registration process of MR (www.validators.de/REGISTRATION/Gui2.asp?E=147&idnews=1_Consultations_C2038&mode=1) Completion of all comments received (14 KB)
Registration Date	10 Nov 08
Crediting Period	01 Apr 09 - 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)

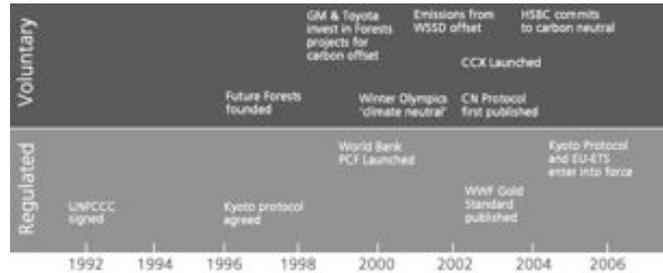
Extra EU developments – where the use of forestry credits from forestry projects are allowed

- New Zealand
 - New Zealand Emissions Trading Scheme
 - Permanent Forest Sink Initiative
- Australia
 - New South Wales Greenhouse Gas Abatement Scheme
 - Proposed Australian ETS
- United States
 - None of the proposed bills exclude LULUCF credits
 - Bills of Senator Feinstein and Senators Lieberman and Warner explicitly include LULUCF credits
 - US Northeast States Regional Greenhouse Gas Initiative
 - California Climate Action Registry
 - Western Climate Initiative (WCI)

B. The voluntary market

→ Voluntary Schemes

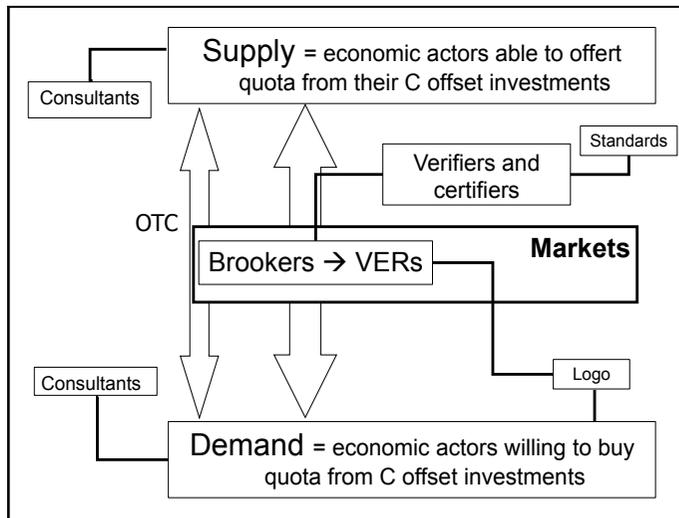
- Voluntary Carbon Standard (Climate Group, IETA, WEF)
 - Climate, Community and Biodiversity Standard
 - Chicago Climate Exchange
- OTC (Over the Counter)



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 is a structured and closely monitored cap-and-trade system that organizations join voluntarily.

Outside of CCX, 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 at a Glance, Volumes & Values in 2006-07

	2006		2007	
	Volume (MtCO ₂ e)	Value (MUS\$)	Volume (MtCO ₂ e)	Value (MUS\$)
Allowances				
EU ETS	1,104	24,436	2,061	50,697
New South Wales	20	223	25	224
Chicago Climate Exchange	10	38	23	72
Sub total	1,134	24,699	2,109	50,994
Project-based transactions				
Primary CDM*	537	5,804	551	7,426
Secondary CDM	25	445	240	5,451
JIT†	16	341	41	499
Other Compliance & Voluntary Transactions	33	146	42	265
Sub total	611	6,536	874	13,641
TOTAL	1,745	31,235	2,983	64,635

* Clean Development Mechanism, † Joint Implementation

Source: WB "State and Trends of the Carbon Market 2008".

- **VERs (Verified Emission Reductions).**
1 t CO₂ = 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 Financial Instruments (CFIs) to support forestry carbon sequestration. Eligible projects on CCX have met one or two of the following measures selected by the program's Environmental Review or Climate Change (ECC) Committee:

- Maintaining or increasing forest area, including reforestation and degradation
- Reforestation or increasing forest area, afforestation, reforestation
- Forest management to increase stand, and disturbance and/or carbon density
- Increasing of tree 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 rates 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" link below.

CCX Forest Carbon Offset Project Categories

- Afforestation: the planting of new forests on lands, which historically, have not contained forests.
- Long-Lived Forest: managed wood that has existed for long periods of time, in which it has functioned as a carbon sink.
- Managed Forest Production projects that sustainably manage forests such that their growth in carbon stocks exceeds their harvest.

In addition, CCX has developed rules for offset issuers for widely accepted tree plant and forest management that is consistent with afforestation. Please refer to the Chapter 8 of the CFI rules for further information.

Recent Documents

- CCI Forest Offsets Case Study: Pioneer Woods

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

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



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

cyberium



How to become a carbon neutral organisation

To help avoid the environmental penalty, a company or organisation often chooses to become carbon neutral. By making steps to offset or compensate for their carbon emissions. The best way to undertake this complex job is to get assistance able to do it for you.

First calculate your carbon footprint

In the system of carbon offsetting, organisations such as "Carbon Friends" do not approximate, they carbon neutral initiatives made to be based on an accurate assessment of a company's greenhouse gas emissions.

Some companies monitor and keep accurate internal records of emissions, others may require assistance with the assessment of their emissions. They will then need to offset their carbon footprint. The owner of the address provided at some of our carbon offsetting sites can do this for you. See www.cyberium.co.uk/carbonneutral.htm for more details on our carbon offsetting services.

Forestry

Forests play an important role in the global carbon cycle, and so planting trees is an important part of most carbon neutral or offsetting activities. About 60% of a woodland's biomass is stored in the ground as dead wood, and the atmosphere each year, or about 10% of the total carbon stored in the forest.

During the 1980s extensive tree-planting schemes were established in 14 EU Member States. Member States which set both national and regional greenhouse gases targets to combat climate change were encouraged.

Future Forests is a new organisation which helps companies offset their carbon emissions. It works with the European Centre for Forest Management (ECFM) on the Europe project. This is a first step for organisations looking to offset their carbon emissions. It is a first step in contributing to the greenhouse effect and to the reduction of the climate change impact on the environment.

They recommend the following requirements for suitable forestry carbon offset projects:

- credible addition of planting sites
- accurate assessment of existing carbon stocks
- development of woodland management plans
- protection of biodiversity
- monitoring of changes in carbon stocks

With the ECFA, Future Forests works on the amount of forest cover necessary to offset a particular level of carbon dioxide, and then sets in place a monitoring and verification system.

This is a good standard in forestry offset to support the carbon market rules. This means the programme has multi-level sustainability, benefits, judicial support and a lot of other.

www.cyberium.co.uk/carbonneutral.htm



Vatican to Become World's First Carbon Neutral Sovereign State

Phaenaklimawelt's New Vatican Climate Forest Initiative to Fully Green the Holy See

San Francisco - July 12, 2007 - By agreement with the Vatican, Phaenaklimawelt's is now pleased and honored to announce that the Vatican plans to become the world's first entirely carbon neutral sovereign state, and it has accepted Klimawelt's acceleration efforts to achieve this historic goal. In a brief ceremony on July 10th the Vatican declared that it had graciously accepted Klimawelt's offer to create a new Vatican Climate Forest in Europe that will initially offset all of the Vatican City State's CO2 emissions for this year.

His Most Reverend Eminence Cardinal Paul Pappalardo president of the event and stated, "As President of the Pontifical Council of Culture I am honored to receive this donation from the leaders of Phaenaklimawelt. This donation means an entire section of a national park in central Europe will be reforested. In this way, the Vatican will do its small part in contributing to the elimination of polluting emissions from CO2 which is threatening the survival of this planet. Phaenaklimawelt's New Vatican Climate Forest Initiative to Fully Green the Holy See

Short video of the Vatican acceptance ceremony. High resolution videos are available in the media center.

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Dedicate a tree: Leonardo DiCaprio



Leonardo DiCaprio has become the first American to become a CarbonNeutral citizen. This means Leonardo has agreed to work with Future Forests to offset his personal contribution to carbon dioxide (CO2) emissions in the Earth's atmosphere.

An independent environmentalist, Leonardo seeks for action with Future Forests as a valuable way of helping to protect the earth's climate. Future Forests have forestry projects around the globe. Forests help reduce CO2 emissions because trees soak up carbon dioxide (CO2) and convert it into bioenergy (oxygen and wood). Future Forests is also involved with alternative energy projects in several other countries (see CO2-Save for more details).

CarbonNeutral Citizen - what does it mean?

We calculated that Leonardo produces 11 tonnes of the "greenhouse gas" carbon dioxide, from his cars and home and more, per year. This is approximately half the CO2 emissions produced by the average U.S. citizen in one year.

Leonardo has chosen to offset his Carbon Neutral Citizenship by having trees planted by Future Forests, in Mexico. In addition to planting trees, Leonardo is also participating in alternative energy initiatives, a solar-heated oven in Germany and in Biomass Co-firing in India.

Future Forests is establishing Leonardo DiCaprio forests in four locations around the globe: Mexico, India, South America and Europe. This has also been planted in three more forests, for including trees to offset your CO2 emissions. Choose from any of these four forests.

An acknowledgment of your tree dedication, we will send you a special certificate created by Leonardo, printed on 100% recycled paper, sent a page of your chosen site. Click on the photo down to view a sample certificate.

The Day After Tomorrow - Microsoft Internet Explorer

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FUTURE FORESTS & CARBON NEUTRAL

All come apart during the living we looked around at all the lights, generators and tracks and we realized, the very process of making these products is contributing to the problem of global warming! We didn't even realize CO2 into the atmosphere during the hard but we discovered that we could do something to make up for it, we could visit the film, CarbonFootprint.

Roland Emmerich, Mark Gordon & Jeffrey Ackermanoff

Through a mix of energy conservation and tree planting, Future Forests is helping us offset the greenhouse gases released during the making of The Day After Tomorrow. Many of the cast and crew have become CarbonNeutral as well. It's only a small part of the solution to a very big problem, but it's a start. The movie is fiction, we'd like to keep it that way.

ROLAND EMMERICH DIRECTOR

The issue of global climate change is the only problem big enough to hit all of the countries of the world to stop fighting and work together to save the planet.

Future Forests is a company dedicated to making it quick and easy for people and companies to find out how much carbon dioxide they produce to provide them with straightforward ways of reducing their emissions, and offering options for "neutralizing" what can't be reduced. Visit Future Forests at www.futureforests.com for other products to provide them with straightforward ways of reducing their emissions, and offering options for "neutralizing" what can't be reduced.

Find out what you can do to help **futureforests**

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What is CarbonNeutral?

CarbonNeutral is the first carbon offsetting program in the world. It allows companies, events, and individuals to offset their carbon footprint by investing in high quality, renewable energy projects. CarbonNeutral is a member of the Carbon Trust and is a leading provider of carbon offsetting services.

The CarbonNeutral Company

Inside our shop

Carbon Neutral Company
(ex Future Forests) <http://www.carbonneutral.com/>

AzzeroCO2

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AzzeroCO2 sostiene cittadini, imprese ed Enti pubblici nell'integrare un percorso di adeguamento delle emissioni di gas ad effetto serra, in tal senso le riduce proponendo interventi diretti in qualità di ESCO, e neutralizza le emissioni residue grazie a progetti che utilizzano fonti rinnovabili, interventi di risparmio energetico e interventi di forestazione in Italia e all'estero. Tutte le attività si fondono su una solida base scientifica, massima trasparenza e una comunicazione efficace.

Calcola e neutralizza le tue emissioni

Il costo del ritardo negli obiettivi di Kyoto in Italia: 1.244.136.466 €

AzzeroCO2 è partner del Comune di Cuneo e Torre Branca 2008. Niente a recitare. INQUANTO la carbonio è zero CO2.

AzzeroCO2, Via Genova 21 Roma 00184 t.06.4870946, info@azzero.co.it

TreeSmart

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What is TreeSmart?

TreeSmart is a carbon sequestration program aimed at removing carbon dioxide from the atmosphere that has been created by the transport sector. It does this by helping to establish and maintain eucalypt plantations destined for eventual harvesting and replanting. [more](#)

Who is TreeSmart?

The TreeSmart program is run by a private company (TreeSmart Australia Pty Ltd) set up for the express purpose of running the TreeSmart program on a "profit for purpose" basis. The TreeSmart program concept was developed by the The Urban Transport Institute and Green & Gold Tree Farms. [more](#)

Frequently Asked Questions

<http://www.treesmart.com.au/>

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<http://servizi.lifegate.it>

3. Final considerations

Regulated market:

- LULUCF projects in the 1st 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 CO₂e.

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 CO₂-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.