Exploring the market for voluntary carbon offsets

Nadaa Taiyab

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Contents

Acronyms and abbreviations

AAU	Assigned Allocation Units
CCB	Climate, Community, and Biodiversity
CCBS	Climate, Community, and Biodiversity Standards
CDM	Clean Development Mechanism
CELB	Center for Environmental Leadership in Business
CERs	Certified Emissions Reductions
CI	Conservation International
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CSR	Corporate Social Responsibility
DEFRA	Department for Environment, Food and Rural Affairs (UK)
DFID	Department for International Development (UK)
DOE	Designated Operational Entity
EB	Executive Board
ECCM	Edinburgh Centre for Carbon Management
EU ETS	European Union Emissions Trading Scheme
ERUs	Emissions Reduction Units
FCO	Foreign and Commonwealth Office
FF	Future Forests
FSC	Forest Stewardship Council
GHG	Greenhouse gas
HFCs	Hydrofluorocarbons
JI	Joint Implementation
LDC	Least Developed Countries
LULUCF	Land Use, Land Use Change, and Forest
NGO	Non-governmental organisation
PDD	Project Design Document
UK ETS	United Kingdom Emissions Trading Scheme
VERs	Verified Emission Reductions
WWF	World Wildlife Fund

1. Introduction

The Clean Development Mechanism (CDM), created by the Kyoto Protocol, was envisioned as a mechanism that would link the carbon market and sustainable development objectives in developing countries. Through the CDM, countries with greenhouse gas (GHG) reduction targets under the Kyoto Protocol can generate emissions credits from emissions offset projects in developing countries, provided that those projects also contribute to sustainable development priorities in their host countries. The CDM has come under great criticism for not adequately delivering on these 'sustainable development' benefits. For example, the market increasingly favours low-cost, high-volume projects, such as HFC (hydro fluorocarbon) destruction or landfill to energy projects, which have few benefits to local livelihoods. Small community-based projects are often not economically viable under the CDM, due to high transaction costs and lengthy bureaucratic procedures. Furthermore, the majority of projects are concentrated in large markets, such as India and Brazil, and have virtually bypassed the least developed countries (LDCs).

Parallel with the CDM market, there has emerged a voluntary market for carbon offsets. The voluntary market consists of companies, governments, organisations, organisers of international events, and individuals, taking responsibility for their carbon emissions by voluntarily purchasing carbon offsets. These voluntary offsets are often bought from retailers or organisations that invest in a portfolio of offset projects and sell slices of the resulting emissions reductions to customers in relatively small quantities. As retailers generally sell to the voluntary market, the projects in which they invest do not necessarily have to follow the CDM process. Free of the stringent guidelines, lengthy paper work, and high transaction costs, project developers have more freedom to invest in small-scale community based projects. The co-benefits of these projects, in terms of, for example, local economic development or biodiversity, are often a key selling point.

This report explores the potential for financing these small-scale high-benefit projects through the voluntary and retail sector of the carbon market with a view to answering the following questions:

1) How does the voluntary and retail sector fit into the overall carbon market?
2) Who are the main buyers and sellers in the market?
3) What motivates buyers to voluntarily purchase carbon offsets?
4) What are buyers' main concerns and considerations?
5) How much are buyers willing to pay for offsets and in what quantities?
6) How can the market for voluntary / retail offsets be further developed?

Research consisted of interviewing offset retailers and buyers from the private sector, government, and non-profit sector as well as reviews of existing literature. The organisations interviewed are listed in Annex A.

The report provides an overview of the carbon markets followed by an in-depth look into the voluntary and retail markets. It includes a discussion of some of the associated issues and controversies, attempting to present a balanced view of both sides of the argument. Several buyers and retailers are also profiled in some detail. The final section explores the factors that are driving demand and what could be done to further develop the market. This report is not designed to be an economic analysis or a policy paper. Its objective is to gather and consolidate information on the voluntary and retail sectors in a manner that could 1) be useful

for potential buyers to better understand the market, and 2) be useful for those on the supply side as a starting point for discussions on strategies for further developing the market.

2. Overview of the carbon market

The carbon market has developed a jargon of its own, which can be difficult to understand. The following provides some background on how carbon offsets work, how they interact with the larger carbon market, and some of the existing carbon markets.

2.1 What are carbon offsets?

A carbon offset negates or 'neutralises' a ton of CO_2e (carbon dioxide equivalent) emitted in one place by avoiding the release of a ton of CO_2e elsewhere or absorbing / sequestering a ton of CO_2e that would have otherwise remained in the atmosphere. Carbon offsets are created through various types of projects, such as renewable energy, energy efficiency, destruction of various industrial gases, and carbon sequestration underground or in soils and forests. A project does not necessarily have to offset CO_2 (carbon dioxide), but can also offset a variety of other greenhouse gasses (GHGs), such as methane and hydrofluorocarbons.[1] These greenhouse gas offset projects in turn generate carbon/GHG credits or emission reductions, which can be purchased by individuals or organisations to neutralise their greenhouse gas emissions. (Emission reductions are measured in tons of CO_2 'equivalent' as the project may be offsetting a gas other than CO_2. However, 'greenhouse gas' and 'carbon' are often used interchangeably in the terminology).

Take the following example: if a company emits 20,000 tCO_2e per year it could negate its emissions by planting a certain number of trees that would effectively absorb 20,000 tCO_2e per year or invest in a wind farm or a project distributing energy efficient stoves to poor communities in developing countries.[2] By compensating for its annual carbon emissions through offset projects, the company effectively becomes 'carbon neutral'. Ideally the company would first reduce its overall emissions by lowering energy consumption or using renewable energy and only then purchase carbon credits to offset the emissions that cannot be avoided through other means.

The defining characteristic of carbon offsets is **additionality.** Additionality means that the emissions reductions must be 'additional' to those that would have otherwise occurred under a **business-as-usual** scenario. In other words, if the wind farm would have been built or the trees would have been planted regardless of the sale of the carbon credits, then those projects are not 'additional' and cannot be counted as carbon offsets. Additionality can be demonstrated in various ways, such as showing that a project would not be profitable enough or would not be able to obtain sufficient financing without the sale of the carbon credits or that a certain technology would not have otherwise been adopted.[3] Additionality is extremely

[1] The Kyoto Protocol has recognized six other gases that contribute to the greenhouse effect – CO2 (carbon dioxide, GWP 1), CH4 (methane, GWP 23), N20 (nitrous oxide, GWP 296), HFCs (hydrofluorocarbons, GWP 1,300), PFCs (perfluorocarbons, GWP 5,600), and SF (sulphur hexafluoride, GWP 22,200). The effect the non-CO2 gases have on atmospheric warming is magnified by their chemical properties. The Global Warming Potential (GWP) of these gases refers to the number of CO2 molecules that would have the same effect on the atmosphere as one molecule of that gas. For example, one ton of HFC has the same greenhouse effect on the atmosphere as 1,300 tons of CO2.

[2] Butzengeiger 2005 (Pre-publication version).

[3] Take the example of a hypothetical project proposal with an Internal Rate of Return (IRR) of 10 per cent; however, investors will not accept the project unless the IRR exceeds a hurdle rate of 12 per cent. If the sale of carbon credits will boost the IRR above the hurdle rate of 12 per cent to 13 per cent, thus making the project attractive to investors, then it could be said that the project is financially 'additional.' However, financial

important to the environmental integrity of the mechanism, as loose additionality requirements could result in a host of projects receiving carbon financing without actually reducing greenhouse gas (GHG) emissions into the atmosphere.

In order to measure the additional carbon benefits from a given project, a clear and credible baseline must be calculated. The baseline is the projected greenhouse gas emissions that would have occurred in the absence of the project – the business-as-usual scenario. The difference between the baseline emissions and the carbon emissions with the offset project equal the volume of carbon credits that can then be sold to buyers.[4] For example, if a wind plant is built to displace electricity used from a coal-fired plant, then the GHG emissions from the quantity of coal that would have been burned in the absence of the wind farm constitutes the baseline emissions scenario.

During and after implementation, the project should undergo a verification process, to prove that the promised emissions reductions have actually been realised. To ensure the highest levels of credibility, project developers can use an accredited independent third party to conduct verification.

Some other issues related to credibility are permanence and leakage. Permanence refers to a project's ability to weather variability and uncertainty in circumstances while continuing to deliver carbon emission reductions. For example, the permanence of carbon sequestered through tree planting could be compromised if the trees are burned down in a fire or cut down prematurely. Leakage occurs when events outside the project boundary, but related to the project, reduce the project's carbon benefit. For example, reforestation in one place could lead to accelerated deforestation in another place.[5] Leakage can occur with any type of project.

Emissions reductions / carbon credits can be bought and then retired or sold on to a secondary market. The price of a carbon credit depends on a number of factors, including current market prices, project risk, project quality and associated co-benefits.[6]

2.2 How do you trade carbon?

Simply put, a carbon trade occurs when one entity buys an emissions credit or allowance for a given amount of CO_2 from another entity in order to meet its target quantity of emissions. This target may be set voluntarily or through a regulatory regime. Take a hypothetical example of a company whose emissions target is 20,000 tCO_2e/year, but currently emits 25,000 tCO_2e/year. Even after internal measures to reduce energy consumption and increase energy efficiency, the company's emissions can only be lowered to 22,000 tCO_2e/year. The company then buys 2,000 tCO_2e in emissions credits or allowances from the carbon market to meet its target of 20,000 tCO_2e/year.

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additionality is not the only means of demonstrating additionality. Other barriers can include lack of technological know-how in a particular country, inadequate infrastructure, lack of labour resources and management experience, etc.

[4] baseline emissions – emissions level with project = emissions reductions

[5] For more definitions of relevant terminology see 'A common glossary of carbon offset terms,' The Climate Trust. Available at: http://www.climatetrust.org/pdfs/RFPs/Offset%20Glossary.pdf

[6] Lecocq and Capoor 2005, p. 25.

Emissions credits can be purchased through *project-based transactions*, whereby carbon credits are bought from a specific carbon offset project (as described above), or through *allowance based transactions.*[7] Emission allowances are created and allocated by regulators under a cap-and-trade regime. In a cap-and-trade regime, regulators cap the quantity of CO_2e that each participant is permitted to emit and then issue allowance units to the participants, representing their individual caps. Participants are free to buy and sell their allowances such that at the end of the compliance period, each participant holds a quantity of allowances equivalent to their actual emissions. This trading activity creates a 'carbon market.'

2.3 Why trade carbon?

Firms are extremely concerned about the cost of emission reductions on their international competitiveness. Emissions trading will, in theory, allow nations and firms to reduce their GHG emissions in the most cost effective manner possible. Companies that can achieve or exceed their targets at a low cost through internal reductions can do so and profit by selling the excess allowances. Companies for whom internal reductions to reach their targets would be quite expensive could purchase allowances on the market instead, thus reducing their costs.

2.4 The interaction between project based transactions and allowance based transactions

The inclusion of project-based transactions into the carbon market can further reduce the cost of compliance by generating credits that might be cheaper than allowances or internal reductions. Projects can also lead to other co-benefits, such as the introduction of new technology, skills training, local economic development, biodiversity protection, etc. Generally, carbon credits from offset projects can be purchased from a project developer or broker and held on to or sold on a secondary market to other market participants. Within the Kyoto regime, carbon credits from offset projects and carbon allowances are interchangeable.

2.5 Existing carbon markets

Since the signing of the Kyoto Protocol in 1997, several carbon markets have emerged, both regulatory and voluntary.

Regulatory regimes:

1) **Kyoto** (2008-12), which includes allowance trading and project based transactions through **the Clean Development Mechanism (CDM)** and **Joint Implementation (JI)**
2) **European Union Emissions Trading Scheme (EU ETS)** (2005-8)**,** EU-wide pilot scheme to help EU nations meet Kyoto targets, allows credits from CDM and JI projects to be imported into the market
3) The **New South Wales GHG Abatement scheme (2003-12)** in Australia, regulated by the state of New South Wales, creates emissions benchmarks for electricity retailers

Voluntary regimes:

[7] Lecocq and Capoor 2005, 3.

1) **United Kingdom Emissions Trading Scheme (UK ETS)**, companies can opt into scheme and receive financial incentives
2) **Chicago Climate Exchange,** a voluntary trading scheme in the US
3) **Retail market,** which generally consists of small project-based emissions reductions not used for compliance or trading[8]

Canada is also planning to set-up a national GHG emissions trading scheme for large emitters.

For detailed profiles for these trading schemes please see Annex B to F.

2.6 The Clean Development Mechanism

As discussed earlier, there is great controversy over whether the CDM will deliver on sustainable development benefits. According to one analyst,

"Even in the initial stages of CDM project preparation, it is evident that there are trade-offs between profit maximisation by investors and the sustainable development objectives of the CDM. The latter are most likely to be achieved through projects such as renewable energy schemes and such schemes would also contribute to the financing of necessary energy infrastructure investments in developing countries … . In contrast, large potential generators of CERs, such as fluorinated gases reduction projects, have no broader developmental impact, but these projects provide the lowest-cost means of generating Kyoto units."[9]

Out of the 92 projects in the process of validation or already registered, two HFC23 projects comprise 30 per cent of the expected total Certified Emissions Reductions (CERs). HFC and landfill projects together will supply three quarters of the total quantity of CERs. In terms of project type, the great majority of projects are in hydro power, biomass power, and landfill-to-gas capture. There are only three energy efficiency projects, one energy distribution project, and no solar energy projects.[10]

These types of project are attractive because they are less capital intensive than, for example, renewable energy projects; they can generate high volumes of credits because the gases they displace have higher global warming potential than CO_2; and they are generally 'quick and common practice additions to existing facilities [brown-fields]'.[11] A further problem is that the incredibly low cost of these projects could flood the market and drive down the market prices of CERs, such that other types of project become unviable.[12]

The majority of the projects are concentrated in Brazil and India, with only one project in Africa. Larger countries with more stable investment climates and greater capacity are logically more attractive to profit driven investors.

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[8] Lecocq and Capoor 2005.
[9] Humphrey 2004, p. 88.
[10] Cosbey et al. 2005. Also see UNEP-Riso CDM pipeline at www.cd4cdm.org.
[11] CDMwatch, 'Market Failure: Why the Clean Development Mechanism won't promote clean development', November 2004. Available at www.cdmwatch.org.
[12] Cosbey et al. 2005, p. 14.

It is widely understood that small-scale projects are better at delivering 'development dividends'[13] High transaction costs and long bureaucratic procedures mean that small scale projects are often not viable under the CDM process. The CDM Executive Board has adopted special rules to encourage small-scale CDM projects, involving lower registration fees and simplified documentation and auditing procedures, yet the costs still remain quite high.

For an in depth discussion on the CDM and sustainable development please refer to a recent report by the International Institute for Sustainable Development (IISD), entitled *Realising the Development Dividend: Making the CDM Work for Developing Countries*. Available at http://www.iisd.org/climate/global/dividend.asp.

[13] Cosbey et al. and UNEP-Riso, *CDM Sustainable Development Impacts,* Roskilde, Denmark 2004.

3. The voluntary and retail markets

3.1 Description

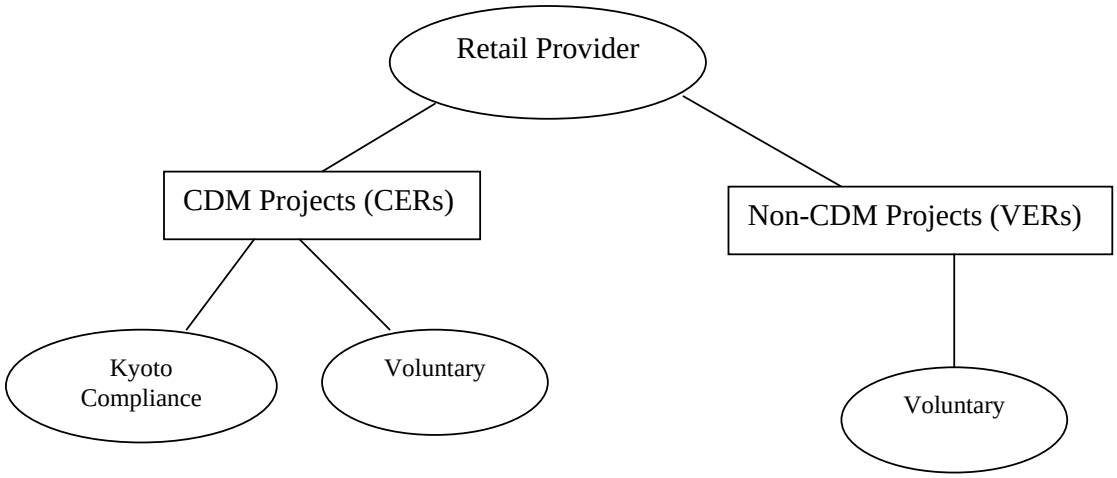
The voluntary market refers to entities (companies, governments, NGOs, individuals) that purchase carbon credits for purposes other than meeting regulatory targets. The retail market refers to companies and organisations that invest in offset projects and then sell off portions of the emission reductions in relatively small quantities with a mark-up. Offset projects can be classified into two general categories:

1) **CDM/JI** – projects that are/will be registered with CDM Executive Board and relevant authority for JI projects and will be able to generate CERs and ERUs (Emissions Reduction Units)[14]

2) **Non CDM/JI** - projects that are not seeking CDM/JI registration and therefore will not be able to be used for meeting Kyoto or EU targets. The credits generated by these projects are called VERs (Verified Emission Reductions**)**

Note that a buyer can *voluntarily* purchase credits from a CDM or a non-CDM project. The action is defined as *voluntary* so long as the credits will not be used to meet a regulatory target. Retailers can sell VERs, CERs, or ERUs for voluntary or regulatory purposes. However, the vast majority of retailers sell VERs to the voluntary market.

Box 3.1 Schematic of the Retail Market



3.2 Market size

Given the small and fragmented nature of the retail market and the lack of any centralised registration for non-CDM projects, it is very difficult to estimate the size of the market with much accuracy. Both the World Bank and Ecosystem Marketplace maintain databases of non-CDM project transactions, but they are largely incomplete due to the above reasons.

[14] The tradable units generated from CDM projects are called CERs – Certified Emission Reductions; the tradable units generated from JI projects are called ERUs – Emission Reduction Units

However, a survey of known retail providers has recently been conducted by Sonja Butzengeiger, from the Hamburg Institute, which provides some estimate of the size of the voluntary market. Questionnaires were sent to 31 service providers and 18 responses were received, including two that had discontinued their services. In 2004, the 16 remaining providers offset just over 9 million tCO_2e in total.[15] Ninety-five per cent of the emission reductions were VERs, with CERs and ERUs comprising just five per cent. However, these figures do not indicate the quantity of offsets that were actually sold and include only 60 per cent of the known providers. The market for voluntary offsets has grown rapidly since 2001 and is expected to continue to expand.[16] Prices vary enormously, from US$5 - $35 or more per tCO_2e, depending on the quality and location of the project and the mark-up imposed by the provider.

The retail market is currently quite small, but is growing rapidly. Several service providers have reported a doubling of sales each year for the past two years.

3.3 Sustainable development

The retail/voluntary market, which primarily supplies and purchases non CDM credits, has potentially more scope to invest in small-scale projects with high sustainable development benefits as project developers can avoid the bureaucratic procedures and high transaction costs associated with the CDM registration process. However, this flexibility may come at the cost of reduced credibility and inconsistent quality. While some of the existing retail providers adhere to even higher standards of additionality and sustainable development than demanded by the CDM, others employ less rigorous project standards and verification methods. As a result, buyers often find it difficult to decide on a provider.

One provider noted the frequent trade-off between community benefits and robust carbon benefits. Small-scale projects with significant direct benefits to communities, such as agro-forestry or energy efficient stoves in rural villages, are also often the riskiest in terms of achieving the projected carbon reductions and the most difficult and expensive to monitor. In contrast, large projects, such as HFC capture and land-fill to energy projects have fewer benefits to local communities, but their carbon benefits are relatively certain and predictable and they are much easier to monitor.[17] Some providers use a portfolio approach to mitigate against this risk, by investing in both community-based and large scale projects.

3.4 Project standards and verification

There are a variety of standards, protocols, and verification methods used to regulate carbon offsets, such as:

1. **CDM / JI Standard** – set by international regulatory authorities
2. **The Gold Standard** – created by consortium of NGOs for energy projects
3. **The Climate, Community, and Biodiversity (CCB) Standards** – created by consortium of NGOs and private sector for land-based sinks projects
4. **Self developed standards** – created by individual providers of VERs
5. **Labelling Schemes** – developed by some providers

[15] Butzengeiger 2005 (pre-publication version).
[16] Ibid.
[17] Interview with Bill Sneyd, Future Forests.

3.4.1 CDM / JI Standards[18]

In order to generate CERs and ERUs, CDM and JI must meet a detailed set of standards. The calculation of baseline emissions and monitoring plans, are calculated by project methodologies, which are submitted by project developers and subject to approval by the CDM Executive Board (EB). A project developer may either design a project based on an existing methodology or submit a new methodology. The CDM EB has also agreed on a set of tools for determining additionality.

A Designated Operational Entity (DOE), accredited by the CDM Executive Board, validates the Project Design Document (PDD), which includes an additionality analysis, baseline calculations, and a monitoring plan. Validation involves in depth review of the PDD to ensure that it meets existing requirements before submission of the document to the CDM EB. Upon implementation, a different DOE (from the one that conducted the validation) verifies whether the GHG reductions have actually been realised through the project. Verification includes an examination of the project documentation and on-site inspections.

Certification is a written assurance by the DOE that a project activity achieved the verified reductions in GHG emissions. Small-scale projects must still employ the services of a DOE, but are permitted to follow a simplified methodology and are subject to a lower transaction fee. *SGS, KPMG*, and *Japan Consulting Institute* are examples of accredited DOEs. Clearly this process is quite lengthy, complex, and costly, in terms of both the registration fees and the DOE's services.

Box 3.2 CDM Project Cycle

1) Preparation of Project Design Document (PDD), includes baseline calculation and monitoring plan. Methodology for baseline and monitoring either based on an existing methodology or a new methodology, submitted to CDM Executive Board (EB) for approval
2) Validation of PDD by DOE (Designated Operational Entity)
3) Registration of project with CDM EB
4) Project implementation and monitoring
5) Verification of emission reductions/avoidance by a different DOE
6) Certification of emission reductions/avoidance by DOE
7) Issuance of Certified Emission Reductions (CERs) by CDM EB

Modified from Sterk & Bunse 2004

3.4.2 Gold Standard[19]

The standards set up by the CDM Executive Board address additionality, but do not set any guidelines for sustainable development. According to the Kyoto Protocol, host countries are responsible for developing their own criteria for sustainable development and assessing whether proposed projects meet those criteria. Fearful that this arrangement would lead to an inconsistent standard of quality in terms of sustainable development, as some governments may be less stringent in their criteria, a group of NGOs, led by the World Wildlife Fund

[18] UNFCCC website, http://cdm.unfccc.int/Projects/pac/howto/CDMProjectActivity/VerifyCertify
[19] www.cdmgoldstandard.org

(WWF), have created the CDM Gold Standard. In order to meet the Gold Standard, projects must pass through three screens:

1) **Project type screen** – restricted to renewable energy and end-use energy efficiency projects (solar energy, biomass, wind, geothermal, small hydro, biogas)
2) **Additionality and Baseline screen**
3) **Sustainable Development screen** – cost and benefits associated with other environmental, economic, and social impacts; local stakeholder consultation prior to implementation

Official CDM standards alone do not include a sustainable development screen and mandatory consultation with local stakeholders. DOEs conduct Gold Standard certification following the normal CDM process, but using the additional Gold Standard guidelines. Non-CDM/JI projects can also receive Gold Standard certification by following the guidelines and receiving validation from an accredited organisation.

It is argued that Gold Standard certification will assure buyers of the projects' credibility and its contribution to sustainable development. Quality assurance also reduces reputational risk arising from criticism by NGOs and governmental bodies scrutinising companies claiming emissions credits. These benefits will theoretically translate into a price premium for sellers, as it is expected that buyers will pay more for higher quality credits. Adopting the Gold Standard certainly assures an even higher level of quality, but, of course, is even more expensive than following the normal CDM guidelines and the standards do not cover forestry projects.[20]

3.4.3 Climate, Community, and Biodiversity Standards (CCBS)[21]

A group called the *Climate, Community, and Biodiversity Alliance,* convened by the *Center for Environmental Leadership in Business,* has developed a Gold Standard equivalent for Land Use, Land Use Change, and Forestry (LULUCF) projects, called the Climate, Community, and Biodiversity Standards. LULUCF projects that reduce emissions include reforestation, conservation, agroforestry, and bioenergy projects that grow wood for energy. The objective of this initiative is to encourage the development of LULUCF projects with biodiversity and community benefits. The standards were developed over two years and involved field-testing in four continents. Projects must satisfy 15 criteria to demonstrate net benefits to the climate, biodiversity, and socio-economic development. Independent auditors evaluate the projects and can issue Silver or Gold status depending on the quality of the project.

3.4.4 Self developed standards

Not surprisingly, the majority of retail providers adopt self developed standards and verification procedures, rather than following the CDM and Gold Standard guidelines[22] (the LULUCF standards are quite new so it is unclear how popular they will be among VER providers). Self developed standards are difficult to judge because they can either be quite

[20] The Wuppertal Institute has written two policy papers on the Gold Standard, which can be downloaded at www.wupperinst.org/jiko
[21] www.climatestandards.org
[22] Wolfgang Sterk and Maike Bunse, *Voluntary Compensation of Greenhouse Gas Emissions.* Policy Paper No. 3/2004. Wuppertal Institute for Climate, Environment, and Energy, October 2004, p. 14.

weak or even more stringent than the established standards. The customer must make that assessment. Auditing is either carried out by a third party or internally. However, as Sterk and Bunse of the Wuppertal Institute, a German think tank, point out 'one feature that is indispensable is the auditing of projects by independent third parties; otherwise the compensation cannot be regarded as credible.'[23]

3.4.5 Labelling schemes

Some organisations have created labelling schemes for companies that want to market their voluntary carbon reduction programmes. The *Climate Neutral Network*, an independent NGO created by an alliance of companies, has created the Climate Cool™ certification, whereby whole enterprises or individual products or services can obtain the label by reducing emissions internally and then offsetting the rest. *Future Forests (FF)*, a UK based retailer, has trademarked the term CarbonNeutral™ and developed a protocol, consisting of standards that companies have to meet in order to declare themselves CarbonNeutral™. The protocol slots in pre-existing standards wherever possible. For example, the companies' initial emissions assessment must be conducted according to the World Resources Institute / World Business Council for Sustainable Development's carbon accounting protocol or UK government guidelines and the offset projects in which the company chooses to invest must meet certain guidelines. Verification of the protocol itself is conducted by SGS. The trade marking of the term 'carbon neutral' has raised protest from others in the industry.

3.5 Some pros and cons of land-based sinks

There is controversy about the credibility of land-based sinks (forestry) projects as carbon offsets. As a result, the share of forestry projects in the CDM market has shrunk dramatically over the past few years. The following are a few of the arguments that have been presented by advocates and opponents of sinks.

PROS

- 20-25 per cent of anthropogenic emissions released into the atmosphere are caused by land use change and therefore climate change mitigation must address land use and deforestation.
- Forestry projects can also have additional socio-economic and environmental benefits, such as biodiversity conservation.[24]
- It is argued that LULUCF projects provide the only means for the very poor, particularly in Africa, to access the carbon markets.

CONS

- It is impossible to guarantee that the trees will not be burned or otherwise destroyed at some point in the future, thus releasing the CO_2 back into the atmosphere.

[23] Ibid., p.16.
[24] For more information see: Reid et al. (2004) 'Using Wood Products to Mitigate Climate Change: A Review of Evidence and Key Issues for Sustainable Development', International Institute for Environment and Development, 2004.

- Forestry projects will distract attention from the real problem, which is the world's fossil-fuel based energy system.
- Difficulty in accurately measuring carbon sequestration from trees.
- Negative environmental effects and displacement of local populations that have been caused by large mono-culture plantation projects in the past.[25]

In light of these controversies, some providers and buyers only consider energy-based projects to be credible offsets. Other retailers, such as Climate Care and Future Forests, are aiming to build an overall portfolio comprised of 20-25 per cent land use projects and 75-80 per cent energy-based projects to reflect the contribution of land use change and fossil fuel energy to climate change as a whole. The portfolio approach also mitigates against the risk that the carbon benefits of some projects may not be realised in full.

Another point of controversy is the practice of some providers, such as Future Forests, to sell offsets from tree planting projects in the UK that were already subsidised by government grants, leading critics to question the financial additionality of the offset project. According to FF, certain new woodlands in the UK are eligible for government grants; however, these grants do not cover the full costs of planting those trees. The carbon credits fill that gap in financing. It is further argued that most projects do not depend solely on carbon to fund all their costs. For example, renewable energy offset projects generate revenue from both the carbon credits and from the sale of electricity.

With regard to the issue of carbon accounting, some voluntary sinks projects use 100 year ex-ante accounting for forestry projects, meaning that the carbon reductions for the next 100 years are sold before they actually occur, which seems quite risky. This practice is defended on the basis that most of the costs are incurred in the early years of a forestry project; therefore, 'ex-post' accounting - selling the reductions after they have occurred over the life of the project - is simply not economically viable. It is further argued that a good screening process and the right incentives reduce the project risks considerably.

The EU ETS currently does not permit emissions reduction credits from forestry sinks projects to be used to meet emissions targets in Phase 1 of the scheme. Proponents are lobbying heavily to change that policy and have taken steps to boost the credibility of sinks projects by creating, for example, the CCB Standards, described above.

[25] Sterk and Bunse 2004, p. 12.

4. Buyers and sellers in the retail market

4.1 Retailers

The retail market for carbon offsets is quite small and fragmented. There are an estimated 30 to 40 providers worldwide, most of them based in Europe, the USA, and Australia.[26] (This research has not found any retail providers in developing countries, although it is possible that they exist). Some retailers are brand new organisations created to capitalise on this new market, whereas others are existing conservation organisations that have also begun selling carbon offsets from their projects.

Retailers tend to target a wide variety of market segments, including individuals, businesses, government departments or whole cities, and international events. Some are for-profit and others are non-profit. Their websites will generally have a carbon calculator, where individuals can calculate emissions from flying, driving their cars, or their total yearly emissions. Offsets for air travel seem to be the most popular marketing tool. Individuals might also receive a certificate in return for their purchase. Businesses are often given the option to use some sort of labelling scheme or logo to demonstrate that they have bought offsets or gone carbon neutral from that retailer. Some retailers also offer carbon management consulting services for businesses, including carbon emission measurement or carbon neutral marketing strategies.

The sustainable development benefits of the projects on offer from retail providers vary tremendously. Project types vary from projects with little benefits to local communities, to projects in which communities are key participants, to projects that address biodiversity and communities. Energy-based projects vary from large renewable energy projects to energy efficient cooking stoves in very poor communities. Although some providers specialise in energy-based projects, the majority of retailers appear to focus on forestry projects. It is argued that trees are easier to sell to the general public, as trees are a more tangible and understandable counter to global warming.

Aside from varying levels of quality, another problem with the retail market is the size of the mark-up added on to the VERs and the percentage of revenue that is spent on marketing and administrative costs rather than the project itself. One retailer only spends 25 per cent of revenues on the projects themselves, while spending 25 to 30 per cent on marketing and advertising. Some non-profit retailers, in Germany for example, must, by law, spend 70 per cent of revenues on project activities, leaving no more than 30 per cent for administrative costs.

The voluntary market also presents an interesting dilemma for private sector retailers. For-profit organisations must try to maximise revenues and minimise costs, which logically means charging the highest price for offsets that the market will bear and spending as little as possible on projects and other expenses. On the other hand, it could be argued that purchasers of voluntary offsets are not buying a 'product' so much as they are giving to a cause. The calculation of carbon emissions is simply a way of defining the size of their contribution.

[26] Butzengeiger 2005. Braun and Stute 2004.

This charitable instinct thus demands that as much of the contribution as possible goes towards the project itself rather than the profits of a company.
A counter argument has been made that a company or individual buying carbon emissions reductions is not making a charitable donation, but paying for a service. The service provided by the retailer is not just the offset, but also access, convenience, and quality assurance. The reasoning continues that charitable donations are made to causes towards which one has no responsibility, whereas we are all responsible for climate change and thus should pay to mitigate our portion of the problem. If a retailer was found to be spending an unacceptably low proportion of its revenues on the actual project, then customers would take their business elsewhere. Finally, as retailers achieve greater economies of scale, the proportion of revenues spent directly on projects relative to other costs will increase significantly.[27] Nevertheless, several offset providers have chosen to set themselves up as non-profits rather than private companies, on the grounds that their primary aim is to mitigate climate change rather than maximise profits.

Please see Annexes H and I for a detailed discussion of individual retail providers and a simplified matrix of providers.

4.2 Brokers

Also of interest are carbon brokers, which provide GHG trading services to companies. Brokers also match buyers and sellers for CDM and JI projects and might provide their clients with carbon mitigation strategy consulting services. They generally charge a 7.5 per cent commission.[28]

Examples of brokers include:

- Trexler Climate and Energy Services
- Natsource
- Ecosecurities
- CO_2e

4.3 Buyers

The buyers of voluntary carbon offsets can be categorised into five main segments – businesses, non-governmental organisations, government agencies, international conferences, and individuals.

4.3.1 Business

An increasing number of companies have taken on voluntary commitments to reduce their carbon emissions or become 'carbon neutral.' A typical carbon management strategy includes measures such as reducing energy consumption, enhancing energy efficiency in their operations and/or production methods, and purchasing larger quantities of renewable energy. Investments in carbon offsets tend to be the last 'piece of the puzzle' to either meet emissions targets or to become fully carbon neutral. Carbon offsets are not only popular with 'green firms,' but they are also being used by firms who want to improve their 'green' image.

[27] Interview with Future Forests.
[28] Interview with Future Forests.

Larger firms, particularly those in Annex 1 countries[29], or those under the EU ETS, may opt to purchase compliance offsets (CERs or ERUs) that can be legally counted against their total carbon emissions. Even without regulatory constraints, larger firms may also choose to voluntarily purchase compliance grade offsets to ensure the highest level of credibility.

Corporate Social Responsibility (CSR) - Climate and 'carbon management' has gradually gained prominence within the overall CSR agenda. Demonstrating a commitment to reducing carbon emissions and purchasing offsets is a way for firms to boost their 'green' image as an environmentally responsible company. Purchasing offsets with 'development benefits' can be particularly important in this context as they can be marketed as charitable, poverty alleviating investments as well. Being able to defend a 'business case' for carbon neutrality or reduction and high level commitment from senior management has also been cited as an important factor in deciding to purchase offsets.

Swiss Re, among the largest global re-insurance companies, is one of the leaders in voluntary action to mitigate climate impact. Swiss Re has voluntarily declared a ten-year commitment to becoming fully greenhouse gas neutral by reducing its emissions by 15 per cent and offsetting the rest through investments in the World Bank Community Development Carbon Fund. Swiss Re expects to offset a minimum of 37,000 tCO_2e per year. Other re-insurance companies such as ***Munich Re*** advertise policies to reduce their carbon footprint, but do not appear to be purchasing offsets or taking on firm voluntary reduction targets.

In December 2004, ***HSBC*** made headlines by becoming the first major bank to commit to becoming carbon neutral. They have planned a three-pronged approach of energy efficiency, green energy, and carbon offsets. Both CERs and VERs are being considered, with the main criteria being credibility – that the offset must be genuinely additional. The sustainable development benefits of the project are also an important factor. HSBC expects to spend approximately $7,000,000 to offset 700,000 tons of carbon at an estimated $7/$tCO_2e$.

Often companies may not include offsets as part of their carbon reduction strategy. Some do not feel that the additional benefits to their public image from offsetting or going carbon neutral are sufficient to justify the added expense, while others may not have enough knowledge or information on the options. However, as more high profile companies adopt carbon-offsetting policies, it is possible that offsetting could, in future, become a popular trend or be integrated as a key component of corporate social responsibility.

Marketing – Carbon offsets are also being used as a marketing tool for brand enforcement and loyalty. Some firms choose to pay for the offsets themselves, while others pass on the costs to the customer.

BP leads the energy sector in its public commitment to climate change and is noted for its innovative internal carbon trading scheme that resulted in a 20 per cent emissions reduction between 1998 and 2001. BP does not offset its remaining carbon emissions, but has developed the BP Global Choice scheme in Australia, which allows customers to purchase offsets for their vehicle fuel use. The price charged per ton of CO_2e is approximately AU$5-$6 (US$3.75-$4.50). ***Honda*** has also announced plans to offset three months worth of emissions for each new car purchased.

[29] These are the 36 industrialised countries and economies in transition listed in Annex 1 of the UNFCCC.

Carbon offsets are especially popular with 'green' companies. ***Interface Carpets***, for example, markets a 'Cool Carpet,' whereby customers can opt to purchase carbon offsets equivalent to the full life cycle of their carpet. The ***Cooperative Bank*** in the UK offsets 1 ton of carbon each year for every customer's household mortgage and also offers 'carbon conscious' car loans at no charge to the customer. In 2004, the Cooperative Bank paid £225,000 to neutralise 42,980 tons of carbon through Climate Care. 'Ethics' and environmental responsibility is a key component of the Cooperative Bank's overall policies.

In the travel industry, *Key Travel*, a popular UK travel agency specialising in charities, non-profits, and universities, has recently developed, at the request of its clients, an online carbon calculator. The carbon calculator will estimate tons of CO_2 emitted from current bookings and past flights, allowing individuals and whole organisations to calculate their historical aviation emissions. A link is provided to the Edinburgh Centre for Carbon Management (ECCM) for customers interested in purchasing offsets from the Plan Vivo scheme.[30] The price is quoted at £4.50/ tCO_2e. The scheme, launched in March 2005, has met with great enthusiasm from customers; however, according to ECCM, few customers have actually donated.

Anticipation of future regulation – According to industry insiders, another motivating factor for firms to purchase voluntary offsets is anticipation of future regulation. Some industries and companies might wish to demonstrate their willingness to voluntarily reduce carbon emissions to mitigate the impact and severity of future regulation.[31]

This could have been the motivation for a several energy companies in the US, such as ***Cinergy*** and ***American Electric***, to invest several million dollars in tree planting projects domestically and internationally in some developing countries.

International aviation would be a logical target as well. International aviation emissions are currently not covered by the Kyoto Protocol. An interesting statistic to consider is that if the aviation sector were to grow by a modest 3 per cent per year and the UK met its target of a 60 per cent emissions cut by 2050, the emissions from outbound aviation from the UK would then equal the UK's total emissions in that year. The UK government has been attempting to work with the airline industry to create an investment fund for offset projects.

4.3.2 Non-profit organisations

Non-profit and charitable organisations are a natural market for voluntary offsets with sustainable development benefits. Buying into voluntary offsets is essentially about taking 'personal responsibility' for the impact of one's actions on the climate. It makes sense for environmental organisations to offset their carbon to show that they are 'walking their talk.' Purchasing offsets is also a way for non-profits to manage reputational risk. For example, international non-profits with large travel budgets, claiming to alleviate poverty and suffering could be accused of contributing to it indirectly through the climate impact of their air travel.

However, some organisations oppose the use of carbon offsets or question their relevance, claiming that they provide nothing more than a band-aid to and distraction from the real

[30] See Annex H for more information.
[31] Interview with Climate Care.

problem of fossil fuel use. Furthermore, the cost of offsetting is so low that it will probably not induce people to fly less.

Some organisations may not have a formal offset policy, but may strongly encourage staff to voluntarily offset their own emissions and provide information on how to do so or may launch campaigns to convince staff members to ride bicycles and use public transportation.

Does it meet my mission? - A special concern for charities is justifying the expense of offsets with regard to their overall mission. For example, a development or humanitarian organisation with a legally defined objective of 'alleviating poverty and suffering' would have to demonstrate to their trustees and donors that paying money into offset projects directly or indirectly meets that objective. One could argue that the effects of climate change will be on the poorest and most vulnerable groups in the poorest countries; therefore, an organisation interested in helping the poor would want to take personal responsibility for mitigating its own carbon footprint. Furthermore, offset projects in low-income countries with tangible benefits to the local community would have the double benefit of meeting development objectives and climate change mitigation.

4.3.3 Government

Various governments, eager to demonstrate their responsibility, have been developing plans to purchase carbon offsets, particularly for air travel. In the UK, the *Department for Environment, Food and Rural Affairs (DEFRA),* the *Foreign Commonwealth Office (FCO),* and the *Department for International Development (DFID)* announced plan to offset their air travel emissions. Due to the nature of their work, the FCO and DFID are large air travel customers, accounting for two-thirds of government air travel. DEFRA's annual air travel expenditure is far smaller; however, its interest in offsets stems from its environmental mandate.

DFID and the FCO are considering a scheme for exchanging air miles for 'earth miles,' whereby airlines would invest a proportion of revenues from flights sold to DIFID in offset projects in developing countries. DEFRA might adopt a different strategy, whereby it would pay additional monies on top of the price of the air ticket for the offset investments. According to DEFRA, the department spends £1.9mm on air travel and has mileage data on approximately 85 per cent of that expenditure. The quantity of CO_2 emitted is two to three thousand tons, which translates into 8,000 tCO_2e after accounting for the additional radiative forcing effect of carbon burned at higher altitudes. DEFRA expects to pay approximately £5 / tCO_2e.

Neither DEFRA, FCO, or DFID have announced an offset provider. Nevertheless, credibility and associated sustainable development benefits have been stated as important criteria in the decision-making process. They are considering a range of options, including VERS and CERs, but may lean towards CDM projects as they may be more credible.

In addition to government departments, various cities, such as Rotterdam and Portland have made pledges to reduce CO_2 emissions or become CO_2 neutral.

Table 4.1 Cities and their CO_2 emission reduction targets

City	CO_2 emissions reduction target
Adelaide, Australia	Zero net emissions by 2012 in buildings Zero net emissions by 2020 in transport
Freiburg, Germany	25% below 1992 levels by 2010
Gwangju, Korea	20% below [year] levels by 2020
The Hague, Netherlands	City government "CO_2 neutral" by 2006 Whole city "CO_2 neutral" in long term
Portland (OR), USA	10% below 1990 levels by 2010
Sapporo, Japan	10% below 1990 levels by 2012
Vancouver (BC), Canada	20% below 1990 levels by 2012

Source: http://www.martinot.info/solarcities.htm

4.3.4 International conferences and events

It has become increasingly popular for international conferences and events to declare themselves carbon neutral, by offsetting international travel emissions and energy use during the conference or event itself.

For example, the government of the UK has pledged to invest £50,000 in an offset project in Africa to neutralise the travel and energy use of the G8 conference in Edinburgh (July 2005). A tender has been sent out to several offset providers that invest in both CDM and non-CDM projects. The Association of British Travel Agents also committed to offset the emissions made by their 1,500 delegates to their annual industry meeting in Cairo through Climate Care. The Earth Summit in Johannesburg set up a voluntary carbon fund through Future Forests to which delegates could contribute. Even the Australian Grand Prix this year has agreed to plant 750 trees through GreenFleet to offset the 200 tCO2e it expects to generate.

4.3.5 Individuals and celebrities

An increasing number of individuals are buying offsets to neutralise their holidays, cars, and/or homes. It is difficult to quantify the size of this market. For individuals, the main motivation for offsetting carbon is a sense of personal responsibility. As a modern lifestyle is unavoidably 'high in carbon emissions', unless one is willing to endure significant personal inconvenience, offsets are also a way to assuage guilt and feel like one is 'doing something.' Since tons of carbon dioxide is a rather abstract notion, the story behind the carbon becomes very important. Associated biodiversity and community benefits can allow an individual to feel as if they are also contributing to, for example, wildlife habitat conservation or helping the poor in developing countries.

Pop bands and rock stars are also showing some enthusiasm for carbon neutrality. In 2003, the Rolling Stones made their international tour carbon neutral by donating money to two forestry projects in Scotland through Future Forests.[32] The ECCM calculated that tour would sell 160,000 tickets and produce 2,080 tons of CO_2. This translates into one tree planted for every 60 fans coming to a total of 2,800 trees at a cost of $37,700 or 20 cents per ticket. Tour sponsor T-Mobile picked up the cost of this programme. Other celebrities and bands, such as Pink Floyd, Coldplay, Lenoardo Di Caprio, and Brad Pitt have followed suit.

[32] 'Carbon Neutral Stones' Institute of Environmental Management and Assessment, September 4, 2003. Available at http://www.iema.net/print.php?sid=2810

4.4 Buyer concerns and considerations

Credibility is probably the principal consideration for firms, organisations and governments with regard to voluntary offsets. Without a central verification and registration body and a set of enforceable standards, it is difficult for companies to assess the quality of the offsets being provided, in terms of their reliability, additionality, and permanence. Firms and governments, in particular, fear criticism from civil society in the event that the project in which they have invested is found to be of poor quality.

Sustainable development – Although some are content with simple tree planting, many voluntary offset buyers are extremely concerned with sustainable development benefits. The degree of importance attached to the co-benefits of the offset projects depends on the circumstances and objectives of the particular firm, organisation, or individual. For example, an international development organisation might seek projects in developing countries only and be extremely concerned with the associated community benefits. A company interested in its CSR image could use community benefits to 'put a human face' on their offset investment, thereby weaving a more interesting story to their customers and shareholders. The Australian Formula 1 Grand Prix, on the other hand, might only be interested in the climate mitigation aspect of its offset investment. Ideally, organisations and firms would like offset projects to bear some relation to their mission and/or operations.

Price – Cost-effectiveness is clearly an important concern for firms and organisations planning to buy large amounts of offsets. Nevertheless, buyers and potential buyers are willing to pay a higher price for higher quality offsets, rather than reaching for the lowest cost option. It is fair to say that buyers that value the sustainable development benefits are willing to pay a higher price for them, within reason, of course.

Availability of information – Many potential buyers have expressed frustration over the lack of information regarding the available options in the voluntary market, in terms of both who the sellers are and an analysis of their quality. Some have suggested that there should be some type of consumer report describing and analysing the existing retail providers.[33]

4.5 What is driving the market?

Although carbon offset providers have been operating since the 1990s, the market for voluntary carbon offsets has experienced its most rapid growth in the past two years. Several factors have contributed to this increase in interest. First, there has been a rise in **environmental reporting**, which has raised awareness among the general public and business community of both issues and offenders. The increasing prominence of the **corporate social responsibility agenda** has led to more firms becoming concerned about sustainability and the projection of a responsible image to the public. Many large firms will include an analysis of their climate impact and mitigation strategies in their annual sustainability reports or in the CSR section of their websites. **National and international policy developments**, such as Kyoto coming into force and the launching of the EU ETS, have also been important for raising awareness of climate change issues.[34] Overall, heightened public awareness of the importance of climate change issues and impacts, as well

[33] A report (German) was written in 2004, profiling the major retail providers. Marcel Braun and Elisa Stute, 'Anbieter von Dienstleistungen fur den Ausgleich von Treibhausgasemissionen', Bonn/Berlin, January 2004. Available at www.germanwatch.org/rio/thg-ad03.htm.

[34] Interview with Tom Morton, Director, Climate Care (June 2005).

as awareness of offsets as a viable mitigation strategy, appear to be key factors driving the market.

5. Looking ahead

Actions that can be taken to develop the market further can be broadly categorised into increasing awareness and increasing the credibility of the voluntary market.

'Awareness' includes awareness amongst members of the public about climate change and awareness of the existence of offsets as a viable option. Industry insiders have cited endorsement of voluntary offsets by 'opinion formers' and, in particular, endorsement by the government as important factors. Interestingly, DEFRA recently published a press release urging holidaymakers to go green by offsetting their flight emissions. Others have noted the importance of endorsement by NGOs, some of whom have been very critical of the concept of offsetting emissions.

A second issue of great importance in terms of the voluntary market is credibility. As discussed, it is very difficult for potential buyers to assess the credibility and quality of various providers and projects as there are no internationally accepted standards for voluntary offsets. Any standard would have to strike a delicate balance between being stringent enough to provide credibility, while simultaneously being simple enough as not to be impossibly costly and complicated to implement.

Increased availability of information on who the providers are and what types of projects are available would be of use to buyers. Buyers are also sometimes confused as to which project types are best suited to their objectives. For example, some buyers are only interested in purchasing projects with robust carbon benefits, while others are more concerned with community development. As discussed earlier there are often trade-offs that have to be made between these two objectives. Increased transparency in terms of allocation of revenues by the providers would also help buyers feel more comfortable about how their contribution is being spent.

To conclude, it is clear that although the voluntary market is small and fragmented, it is growing rapidly. Policy developments in the regulatory sector, such as the ratification of Kyoto and the EU ETS, appear to have boosted rather than dampened the voluntary markets. Policy developments have raised the profile of climate change in the media and helped fuel the sentiment that individuals and organisations need to take more responsibility for their impact on the climate. As current regulatory regimes in Europe and Australia and the ones planned elsewhere only cover large emitters, there is plenty of scope for companies, organisations, and individuals to be active in the voluntary market. A recent report by the Climate Trust argues that companies that do not take action on climate change will be risking their 'brand value,' as climate change becomes an increasingly important issue for consumers. However, the extent to which purchasing offsets becomes, for example, an integral part of a company's carbon management strategy or standard practice for holiday makers is yet to be seen.

ANNEX A: ORGANISATIONS INTERIVIEWED

Organisation	Category	Offset Policy
AEA Technologies / Future Energy Solutions	Private Sector	Energy consulting company
AfricaPractice	Private Sector	Communication firm that promotes investment in Africa. Currently developing a CDM guide to Africa.
BG-Group	Private Sector	Natural gas provider
Business For Climate / Face Foundation	Non-profit	Provider of voluntary offsets, focus on forestry projects
Climate Care	Private Sector	Voluntary offset provider. Focuses on energy projects in developing countries that have sustainable development benefits
Center for Environmental Leadership in Business / Conservation International	Non-profit	Conservation organisation, develops offset projects with strong emphasis on biodiversity protection
Department for Environment, Food and Rural Affairs	UK Government	Plans to offset employee travel
E3G	Private Sector	Environmental and energy consulting
Ecosystem Marketplace	Non-profit	Source of information on environmental markets
Edinburgh Centre for Carbon Management		Carbon management consulting company. Carbon offset project development (Plan Vivo)
Future Forests	Private Sector	Voluntary offset provider
Greenpeace	Non-profit	Environmental NGO
Hamburg Institute	Non-profit	Economics research institute, has published policy paper on voluntary offsets
HSBC	Private Sector	Large multinational bank that has committed to becoming carbon neutral
Key Travel	Private Sector	Travel agency for NGOs, religious organisations, universities. Provides online carbon calculator and link to offset provider for clients
New Economics Foundation	Non-profit	Alternative economic policy think-tank
Oxfam	Non-profit	Non-profit committed to humanitarian relief and development in developing countries
The Climate Movement	Non-profit	Coalition of NGOs to create public campaign on climate change
World Bank / Carbon Market Research	International Organisation	Publishes yearly report on “State and Trends of the Carbon Markets” and maintains database on CDM transactions
World Business Council for Sustainable Development	Non-profit	International coalition of companies committed to sustainable development. Developed protocol for GHG accounting and reporting for companies. Also developing accounting protocol for offset projects.

ANNEX B: KYOTO MECHANISMS[35]

Description

- The Kyoto Protocol was signed in 1997 and came into force in February 2005
- Industrialised nations and economies in transition, so-called Annex-1 countries, agreed to cut their GHG emissions during 2008-12 by, on average, 5 per cent of their emission levels in 1990.
- Six greenhouse gases are included in the scheme: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perflurocarbons, and sulphur hexafluride.
- Developing countries, or non-Annex 1, are not subject to emissions targets in the first commitment period.
- The status of the regime post-2012 and the willingness of developing countries to take on emissions targets are highly uncertain.

The Kyoto Protocol provides three 'flexibility' mechanisms to reduce the cost of meeting targets:

1) **Emissions Trading** – countries that have satisfied their obligations can sell their excess carbon allowances to other countries.

2) **Joint Implementation (JI)** – purchase of emissions credits from GHG offset projects in Annex 1 countries (generally designed for economies in transition)

3) **Clean Development Mechanism (CDM)** – purchase of emission credits from projects in non Annex-1 countries (developing countries)

Trading units

AAU – Assigned Allocation Units (country allowances)
ERU – Emission Reduction Unit (credits arising from JI projects)
CER – Certified Emissions Reduction (credits arising from CDM projects)

- 1 ERU, CER, or AAU represents 1 ton of CO_2e. AAUs, ERUs, and CERs can be traded and used interchangeably.
- At present, AAUs are not being traded. Although credits from JI and CDM projects are being bought and sold, as of July 2005, no actual CERs or ERUs have formally been issued by the relevant international body. Many of the CER and ERU transactions are structured as futures or options, pending the approval of the project and issuance of the actual credits.

Project mechanism

The CDM and JI are the two project mechanisms provided for in Kyoto. In order to give CDM (and therefore projects in developing countries) a head-start, emissions reductions from CDM projects will be valid dating back from 2000, whereas JI credits cannot be generated until 2008. 'Land use, Land Use Change and Forestry' (LULUCF) projects are limited to reforestation and afforestation and are capped at 1 per cent of base year emissions. Due to long lead times required for project development, many of these projects will have to be

[35] Modified from Ecosystem Marketplace Carbon Markets backgrounders (www.ecosystemmarketplace.com)

initiated by 2006 in order to earn credits during the first Kyoto compliance period (2008-12). An Executive Board for the CDM has been set up to register and approve projects. Unfortunately, due to a lack of funding the board cannot meet as frequently as necessary and has registered only a handful of projects.

Market size and valuation

Although the emissions levels of most industrialised countries are currently far above their Kyoto targets, these increases are offset by significant decreases in other countries, particularly Russia and the eastern European nations. According to emissions levels of 2002, a simple transfer of AAUs, also known as 'hot air,' between parties would be sufficient to meet Kyoto targets, implying zero demand for emission reductions from CDM and JI projects. However, it is unclear whether countries with surplus allowances will sell their AAUs or whether other countries will be willing to purchase AAUs, due to the potentially negative public image of being a buyer of hot air' that would result. One solution that has been discussed is the possibility of 'greening' the AAUs by re-investing the revenues from their sale into GHG-reduction measures.[36]

At present, it is estimated that the shortfall of mitigation from Annex 1 countries will be between 869 megatons (Mt) of CO_2e and 1,098 MtCO_2e in 2010. The share of this gap to be filled by CERs is estimated at between 217 and 640 Mt CO_2e per year.[37] As of 6 April 2005, there were 88 CDM projects in the process of validation and as of July 2005, only 12 projects had been registered. Together, these projects aim to abate 131.6Mt CO_2e by 2012 or 26.3 Mt CO_2e per year averaged over five years. Ninety-six more projects are awaiting approval of their methodologies. Given the slow rate of project registration, it is expected that demand will outstrip supply during the compliance period. Financial flows to CDM projects are estimated at $1 billion per year. The price of CERs ranges from $3 to $7 per t$CO_2$e. It is difficult to speak of an overall 'price' for CERs, as prices vary according to the characteristics of the individual contracts and which party, the buyer or the seller, takes on the risk that the project will not be registered.

Market participants

Currently 141 countries in the world have ratified the Kyoto Protocol, representing more than 55 per cent of the world's total GHG emissions. The USA and Australia have refused to ratify the Kyoto Protocol. Annex-1 countries are in the process of establishing their own compliance mechanisms and trading schemes, such as the EU ETS. At this stage, developing countries only participate by hosting CDM projects.

The major buyers of carbon credits are the World Bank Carbon Funds, CERUPT (Dutch carbon fund), the Spanish Carbon Fund, and the Japanese GHG Reduction Fund.

[36] Butzengeiger 2005.
[37] Cosbey et al. 2005.

ANNEX C: EU EMISSIONS TRADING SCHEME[38]

Description

The European Union Emissions Trading Scheme is a pilot programme among EU member states to help them meet Kyoto targets and to provide companies and governments with experience in carbon trading. The scheme operates under a cap-and-trade system. Each member state must allocate allowances to the 'installations' covered by the scheme through a National Allocation Plan, approved by the European Commission. The scheme covers 12,000 point sources of CO_2 or 'installations,' representing 45 per cent of total EU emissions. Five sectors are explicitly covered by the scheme: electricity generation, pulp and paper, oil refineries, building materials (such as cement and glass), and ferrous metals. It is estimated that the scheme will allow the EU to achieve its Kyoto targets at a cost of EUR 2.9 – 3.7 billion annually, less than 0.1 per cent of the EU's GDP. Without the scheme, compliance costs could reach EUR 6.7 billion a year.

Tradable units

EUA – European Union Allowance
ERU – Emission Reduction Unit (Kyoto)
CER – Certified Emission Reduction (Kyoto)

Project mechanism

The Linking Directive allows CERs and ERUs to be imported into the scheme and used for compliance. As of June 2005, this mechanism has yet to come into effect. Credits generated from forestry and large hydro projects are excluded from the EU ETS.

Market size and valuation

Between January and June 2005, 65 million tCO_2e were traded on the EU ETS. Point Carbon predicts that, in 2010, EUR 16 billion and 1,700 mm tCO_2e will be transacted. Prices have soared since the inception of the scheme from EUR 7 per EUA in January 2005 to up to EUR 35 in July 2005. The high prices have been attributed, in part, to rising gas prices. EUA prices are also affected by weather conditions, fluctuations in industrial activity, and regulatory developments. The penalty for non-compliance is quite high, at EUR 40 / tCO_2e during phase one and 100 EUR / tCO_2e during phase two.

Members

All 25 EU member states are participants, including several thousand companies.

[38] Modified from Ecosystem Marketplace Carbon Markets backgrounders (www.ecosystemmarketplace.com)

ANNEX D: NSW EMISSIONS TRADING SCHEME[39]

Description

The State of New South Wales, Australia's most populous state, created the New South Wales GHG Abatement scheme to reduce GHG emissions from electricity generation. The scheme imposes mandatory GHG benchmarks on all New South Wales electricity retailers and certain other parties from 2003 to 2012. Participants can reach their benchmarks by surrendering abatement certificates at the end of each year. Abatement certificates are tradable and can be created by accredited abatement certificate providers. The objective of the scheme is to reduce GHG emissions from electricity generation by 5 per cent between 2003 and 2007 and remain stable till 2012, creating a potential market for 10mm tCO_2e in offsets by 2005, rising to 20mm tCO_2e by 2012.

Tradable units

NGAC – New South Wales GHG Abatement Certificates

1NGAC = 1 ton CO_2e

Project mechanism and sustainable development

Abatement certificates can be created through the following activities: 1) low-emission electricity generation, 2) activities resulting in reduced demand for electricity (demand side abatement), 3) or carbon sequestration through forestry projects.[40] However, projects cannot be implemented in developing countries; all activities must be undertaken within Australia. The forest projects may either be reforestation or afforestation and must meet the sinks regulations in Kyoto. As of February 2005 there were 127 accredited projects, two involving carbon sequestration. Sustainable development in the context of developing countries is not relevant here.

Market prices and valuation

Prices for NGACs have ranged from AU$10 to AU$14. The scheme creates a price cap through a fixed penalty of AU$10.50 levied per ton of excess CO_2 over the benchmarks. However, penalties are not tax deductible whereas purchases of abatement certificates are deductible, resulting in an effective price as high as AU$15/ton. The penalty will be adjusted later on according to the Consumer Price Index. In two years, over 10 million NGACs have been registered. In 2004, 5 million certificates were traded in more than 50 separate deals, amounting to a total volume of AU$50-$70mm.

Market participants

Approximately 24 NSW energy companies are included in the scheme as well as ten other companies, mostly from the aluminium and paper industries, that have elected to participate.

[39] Modified from Ecosystem Marketplace Carbon Markets backgrounders (www.ecosystemmarketplace.com)
[40] Ecosystem Market Place website.

ANNEX E: CHICAGO CLIMATE EXCHANGE[41]

Description

The Chicago Climate Exchange (CCX) is a voluntary cap and trade scheme in the USA, Canada, and Mexico, whereby participants pledge to reduce their greenhouse gas (GHG) emissions by 4 per cent below the average of their 1998-2001 emissions baseline by 2006. The pilot programme will run from 2003 to 2006. Targets can be met through internal reductions, purchasing allowances from other companies, or through emission reduction projects. No more than 5 per cent of the total four-year reduction can come from offsets.

Trading units

XA – Emission Allowances
XO – Emission Offsets

Market prices and valuation

The CCX is relatively small. During 2004, an estimated 2.3 mm tCO_2e, valued at about $2 million was traded in 241 deals.[42] During that period, prices ranged from US $0.71 to US $2.06 per tCO_2e, with most transactions occurring at around $1 per ton. According to Ecosystem Market Place analysis, these prices are much lower than those found in the regulated carbon markets, such as the EU ETS, NSW, and Kyoto, in part because the CCX is voluntary and also because of the large volume of inexpensive agricultural sequestration offsets being offered, which would not be permitted under the other schemes.

Project mechanism

Offset projects can be conducted in either the USA or Brazil. Eligible offset projects in the USA are: 1) landfill and agricultural methane capture, and 2) carbon sequestration in forests and soils. In Brazil, eligible categories are: 1) fuel switching, 2) landfill methane destruction, 3) renewable energy and forestry projects. Forestry projects can include reforestation, afforestation, or conservation activities. Projects have to be verified by a third party. Verifiers include: BVQi and SGS for forestry projects, Det Norske Veritas and First Environment for methane projects, and SES for soil and agricultural methane projects.

Market participants

The CCX currently has 33 members, ranging from cities, universities, and companies in power, paper, transport, and other industries.

[41] Modified from Ecosystem Marketplace Carbon Markets backgrounders (www.ecosystemmarketplace.com).
[42] Lecocq 2005, p. 33.

ANNEX F: UK EMISSIONS TRADING SCHEME[43]

Description

The UK ETS is a voluntary emissions trading programme, created to give the UK government and UK companies experience in carbon trading. Companies join in exchange for a 90 per cent discount on their climate change levy. The financial incentive is withheld if a member does not meet its target.

Trading units

Allowances – tCO_2e

Project mechanism

The scheme does not include a project based mechanism. Only credits may be traded

Market size and valuation

In 2004, a mere 524,000 tCO_2e were traded. In the first quarter of 2005 the market shrank to 107,000 tCO_2e. Prices ranged from £1.68 – £3.80.

Market participants

There are only 38 participants in the UK ETS. Over the lifetime of the scheme (2002-2006), 11.88m tonnes of CO_2e emissions releases will have been avoided.

[43] Modified from Ecosystem Marketplace Carbon Markets backgrounders (www.ecosystemmarketplace.com)

ANNEX G: RETAIL OFFSET PROVIDER MATRIX

Name (Location)	Type of Project	Project Location	Verification	Price / Tonne
500ppm (Germany)	Energy (+SD benefits); CDM and non-CDM	Developing countries	CDM Gold Standard; DOE verification	Unclear
American Forests (US)	Forestry	USA	Unclear	Unclear
Atmosfair (Germany)	Energy - renewables, energy efficiency (+SD); CDM projects	Developing countries	CDM Gold Standard; DOE verification	EUR 15/ tCO_2e (US$18)
Bonneville Environmental Foundation (USA)	Renewable energy	USA	Unclear	Unclear
Climate Care (UK)	Energy (small scale, community-based); some forestry	Developing countries; very small amount in UK	Independent third party	£6.50 / tCO_2e (US$11.70)
Conservation International (USA)	Forestry - reforestation and avoided deforestation (+biodiversity and SD)	Developing countries	Unclear	US$5 / tCO_2e avoided deforestation; US$8-12 / tCO_2e for restoration or compliance based carbon
EAD Environmental (USA)	Energy (esp. renewable energy); some underground sequestration	Mostly USA	Unclear	US$5-$7.50 / 500kWh of electricity use
Face Foundation / Business For Climate (Netherlands)	Forestry (SD + biodiversity)	Developing Countries	CDM standards; FSC standards; DOE verification	EUR 13 / tCO_2e (US$15.60) individuals, EUR 10 / tCO2e (US$12) companies
Future Forests (UK)	Forestry; some energy	Mainly UK; some developing countries	Independent third party verification; audit by KPMG on sample basis	£13-£16 / tCO_2e (US$23.40-$28.80) individuals; £100,000 + (US$180,000) for large company with offices around Europe
Green Fleet (Australia)	Forestry	Australia	Unclear	app. AU$9.30/ tCO_2e (US$7.00)
Grow-a-Forest (UK)	Forestry (tree planting)	UK	Internal	£15 / tCO_2e (US$27)
MyClimate (Switzerland)	Energy (+SD)	Developing countries	CDM Gold Standard; verified by team of experts from Swiss Federal Institute of Technology	app. EUR 30 / tCO_2e (US$36)
Native Energy (USA)	Energy + SD	USA – Native	Unclear	US$15 / tCO_2e

		Americans		
Plan Vivo / ECCM (UK)	Community agro-forestry	Developing countries	ECCM verifies; also sometimes use SGS	£3.50 - £6.00 / tCO_2e (US$6.30-$10.80)
Primaklima (Germany)	Forestry	2/3 Germany, 1/3 developed and developing countries	Unclear	App. EUR 1.50 / tCO_2e (US$1.80)

DOE	Designated Operational Entity – auditing agency accredited by CDM Executive Board (e.g. SGS)
ECCM	Edinburgh Centre for Carbon Management
SD	Sustainable Development

ANNEX H: DISCUSSION OF SELECTED RETAILERS

Founded in 1999, ***Future Forests (UK)*** is the largest and oldest retail offset provider in the UK and is a for-profit firm. Future Forests invests in GHG offset projects in the UK and internationally and has attracted large private sector clients and high profile celebrities, such as the Rolling Stones and Cold Play. Future Forests offset 120,000 tCO_2e in 2004 and 750,000 tCO_2e in total. Future Forests also provides consulting services and Carbon Neutral™ labelling. Future Forests has been subject to a great deal of criticism for its focus on forestry sinks projects and some of its accounting practices. Driven by client demand, Future Forests has begun moving away from forestry projects, and currently has 50 per cent of its portfolio in energy-based projects, with plans to increase that proportion to 80 per cent in the next few years. In 2004, Future Forests spent 25 per cent of its revenues directly on project costs, 25 per cent on marketing and advertising, 25 per cent on verification, and the remaining 25 per cent on overhead and salaries. The firm projects that as they achieve economies of scale the proportion of revenues spent on projects will increase.[44]

On the low sustainable development end of the spectrum are companies such as ***Greenfleet (Australia)***. GreenFleet, offers to plant 17 trees to offset the average yearly emissions for one car for a price of AU$40 (US$ 30), the equivalent of AU$9.30 / tCO_2e**.** Since 1997, Greenfleet has planted 2,000,000 trees (the equivalent of 117,000 cars) in various parts of Australia. Greenfleet claims co-benefits such as increased habitat for native species, reduced erosion, and improved water quality.

Founded in 1991, ***PrimaKlima (Germany)*** is a non-profit organisation that invests in tree planting projects in developed and developing countries. However, 2,000 of the 3,200 hectares of the reforested land are located in Germany. PrimaKlima claims to have planted a total of 7 million new trees and offsets more than 31,000 tCO_2e/ year. It charges a one-off payment of **EUR 75 to sequester 1 ton of CO_2 every year for fifty years**, the equivalent of approximately, **EUR 1.50 / ton CO_2e**. Sustainable development and biodiversity conservation do not appear as stated objectives for the project activities.

In contrast, ***Plan Vivo*** is an agroforestry system through which smallholder farmers can plant trees on their land and sell the emissions reductions. The methodology was developed in Mexico and has been since implemented in Mozambique and Uganda by various local NGOs. The ***Edinburgh Centre for Carbon Management (ECCM)*** provides some technical assistance to the projects. Emissions reductions are bought directly from the programme, via the ECCM. A large proportion is bought by retailers, such as Future Forests (UK)**,** who resell the credits with a mark-up. Plan Vivo emissions reductions cost approximately £3.50 - £6.00 / tCO_2e, depending on the project. The benefit of Plan Vivo is that only a very small amount of the revenue is used for administration and marketing, with most of the money going directly to the beneficiaries. A certain number of the trees that are grown are allowed to be harvested according to sustainable management practices, resulting in a more diversified income stream for the participating farmers.

Conservation International (CI) (USA), as part of the ***Center for Environmental Leadership in Business (CELB),*** offers a portfolio of multiple benefit carbon offset projects in Madagascar, Ecuador, the Philippines, and Brazil that focus heavily on biodiversity

[44] Interview with Future Forests.

protection and, secondarily, on community benefits. The Center for Environmental Leadership in Business, founded by Conservation International and Ford Motor Company, helps large companies offset their environmental impact by investing in conservation projects. The CELB / CI currently has four voluntary projects in operation that will offset 16mm tCO_2e over a 30 year period. Clients pay \$5/tCO_2e for avoided deforestation projects and \$8-12/tCO_2e for restoration or compliance based projects.

The ***FACE Foundation,*** in the Netherlands, began in 1990 as an alliance between Dutch power companies to offset emissions from a future coal-fired power plant. The power plant was not built. Nevertheless, the FACE foundation received funding from the power companies to plant 55,000 hectares of forests worldwide. In the late 1990s, the alliance fell apart and FACE Foundation turned to retail carbon as a new source of funding. FACE teamed up with ***Triodos Bank*** to create ***Business For Climate***, which is a for profit organisation that sells emissions reductions from FACE Foundation projects to individuals, companies, and governments. Their customers include the City of Rotterdam, a company offering VISA card offsets, and power companies. The projects follow the same criteria and undergo the same rigorous verification procedures as CDM and JI projects. The projects are located in Uganda, Malaysia, the Czech Republic, Ecuador, and Costa Rica. Community involvement and local economic development are key factors in their projects. In Uganda, FACE is planting trees in national parks in cooperation with the Ugandan wildlife authority and the local community. In Ecuador, local farmers are given assistance to plant trees on land unsuitable for agriculture and harvest them sustainably, according to ***Forest Stewardship Council (FSC)*** guidelines. Individuals are charged **EUR 13/tCO_2e** and companies **EUR 10/tCO_2e**.

Atmosfair (Germany), ***Climate Care (UK),*** and ***MyClimate (Switzerland),*** are examples of offset providers committed to providing high quality energy-based offsets located in developing countries, with sustainable development benefits. ***Atmosfair*** is a non-profit organisation created through a joint initiative between the Forum anders Reisen, an association of German tour operators, Germanwatch, a German environment and development NGO, and the German Federal Environment Ministry. Atmosfair is interesting in that it is a retailer that exclusively develops CDM projects that also meet ***Gold Standard*** criteria, in order to ensure the highest standards of credibility. It emphasises that offsets do not legitimise air travel, but simply offer some form of compensation when flying is unavoidable. Projects include solar kitchens in India and waste-to-electricity projects in Brazil, which it plans to replicate elsewhere once the technology is fully tested and ready to be disseminated. The organisation is very new, founded in the summer of 2004, and, as of January 2005, had received over EUR 45,000 in revenue from more than 1,500 customers.

In contrast, ***Climate Care (UK)***, specifically does not develop CDM projects, as it aims to create carbon reductions that cannot be used to meet national targets and that would not have occurred in the absence of Climate Care. Climate Care primarily focuses on energy-based projects with high sustainable development benefits in developing countries. A local organisation verifies the project in each country. Climate Care is a for-profit company, but owned by a trust (Climate Care Trust) rather than shareholders, as the primary objective of the company is to reduce carbon in the atmosphere rather than maximise profits. Climate Care facilitates transparency of its operations by publishing an annual report on its website with financial statements. According to the 2004 annual report, approximately 40 to 45 per cent of revenues were spent on projects, a margin which is likely to increase as the company grows. Climate Care reports a doubling of sales each year for the past two years.

MyClimate (Switzerland), an NGO founded in 2002 as a spin-off from the ***Swiss Federal Institute of Technology (Switzerland)***, offers offsets for air travel and advisory services on carbon management, project development, and environmental communication. Its target markets include individuals, travel agencies, and companies. Projects meet CDM criteria and follow Gold Standard guidelines; however, the projects are too small to meet the transaction costs necessary to register under CDM. MyClimate invests only in renewable energy or energy efficiency projects in developing countries, but specifically states that it does not support forestry sinks projects due to the risk that the carbon might be released back into the atmosphere in the long term. Projects include solar power water heaters in Eritrea and Costa Rica, biomass in India, and methane to sewage in South Africa. Local sustainable development and strict additionality rules are claimed to be foremost priorities for MyClimate. A 'team of experts' from the Swiss Federal Institute of Technology is responsible for verifying the projects. The cost to the customer is EUR 7 / 1000 km for short-haul flights and EUR 4.5/ 1000 km for long-haul flights, roughly yielding **EUR 23/tCO_2e.**

MyClimate is represented by 500ppm in Germany and Sustainable Travel International in the USA. ***500ppm (Germany)*** offers services in compliance management, carbon trading for companies facing regulatory targets and offsets. Its transaction platform is called ***Klimabalance (Germany).*** Offset projects must either be in renewable energy or energy efficiency and must have a 'clear and positive impact on sustainable development.'[45] Projects can be CDM or non-CDM, in cases where the project size is too small to support the high transaction costs of CDM registration, but in either instance must comply with the Gold Standard. 500ppm offers companies use of the MyClimate label to market their offset investments. ***Sustainable Travel International's (USA)*** objective is to provide education and outreach services to lessen the impact of tourism on the climate and local communities. Its website allows individuals, businesses, and travel agencies to purchase offsets from MyClimate. The cost is approximately **US$15/t$CO_2$e,** with ***80 per cent*** of the revenues going directly to project activities.

Rather than focusing on the aviation market, ***EADEnvironmental (USA),*** offers individuals and businesses a means to offset their electricity consumption through 'Renewable Energy Certificates' and 'Environmental Action Certificates.' The Renewable Energy programme supports the development of renewable energy, especially wind power. The Environmental Action programme funds projects such as underground carbon sequestration in Texas, conservation of prairie lands in Illinois, and a the conversion of an existing natural gas plant in Argentina into a high efficiency combined cycle plant. Prices range from **US$5 - $7.50 / 500kWh** of electricity use. EADEnvironmental estimates that the average American household consumes 10,000 kWh / year of electricity, which implies a cost of US$100-$150 per household to offset total annual emissions. Its target customer base is generally in the north eastern part of the US, including universities, such as Harvard and Welesleyan, the Town of Westport, and the Democratic National Convention.

[45] 500ppm website. www.500ppm.com

REFERENCES

Braun, Marcel and Elisa Stute (2004) 'Anbieter von Dienstleistungen fur den Ausgleich von Treibhausgasemissionen', Germanwatch-Hintergrundpapier, Bonn/Berlin, GermanWatch website, January. 2004. www.germanwatch.org/rio/thg-ad03.htm.

Butzengeiger, Sonja (2005) 'Voluntary compensation of GHG-emissions: Selection criteria for offset projects' HWWI Policy Paper, Hamburg Institute of International Economics, June 2005.

Butzengeiger, Sonja 'Voluntary compensation of GHG-emissions: Will it matter? An analysis of interactions with major international climate policy systems' Hamburg Institute of International Economics, June 2005.

Carbon Trust (2005) 'Brand value at risk from climate change,' summary of research done by Lippincott Mercer, published by the Carbon Trust, Carbon Trust website, February, 2005. http://www.wupperinst.org/download/1078-compensation.pdf

The Climate Trust 'A common glossary of carbon offset terms,'. The Climate Trust, Portland Oregon. Available at: http://www.climatetrust.org/pdfs/RFPs/Offset%20Glossary.pdf

CDM Watch (2004) 'Market Failure: Why the Clean Development Mechanism won't promote clean development', CDM Watch website, November, 2004. www.cdmwatch.org.

Cosbey, Aaron, Jo-Ellen Parry, Jodi Browne, Yuvaraj Dinesh Babu, Preety Bhandari, John Drexhage, Deborah Murphy (2005) 'Realizing the Development Dividend: Making the CDM Word for Developing Countries', Phase 1 Report – Prepublication Version, IISD website, May, 2005. www.iisd.org/climate/global/dividend.asp

Ecosystem Marketplace website www.ecosystemmarketplace.com

Humphrey, John (2004) 'The Clean Development Mechanism: How to Increase Benefits for Developing Countries,' *IDS Bulletin* 35.3: Climate Change and Development, p. 88.

International Institute for Sustainable Development (IISD), *Realising the Development Dividend: Making the CDM Work for Developing Countries*. Available at http://www.iisd.org/climate/global/dividend.asp.

Institute of Environmental Management and Assessment (2003). 'Carbon Neutral Stones,' Available at http://www.iema.net/print.php?sid=2810.

Lecocq, Franck and Karan Capoor (2005) 'State and Trends of the Carbon Market 2005'. Washington DC: The World Bank Carbon Fund and the International Emissions Trading Association.http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2005/08/18/000090341_20050818152911/Rendered/PDF/332360CarbonMarketStudy2005.pdf.

Reid, Hannah, Saleemul Huq, Aino Inkinen, James MacGregor, Duncan Macqueen, James Mayers, Laurel Murray and Richard Tipper (2004) 'Using Wood Products to Mitigate

Climate Change: A Review of Evidence and Key Issues for Sustainable Development', IIED website, January, 2004. www.iied.org/forestry/research/projects/climate.html

Sterk, Wolfgang and Maike Bunse (2004) 'Voluntary Compensation of Greenhouse Gas Emissions', Policy Paper No. 3/2004, Wuppertal Institute for Climate, Environment, and Energy website, October, 2004. www.wupperinst.org/download/1078-compensation.pdf

UNFCCC 'Verify and Certify ERs of a CDM project activity'. United Nations Framework Convention on Climate Change website,
http://cdm.unfccc.int/Projects/pac/howto/CDMProjectActivity/VerifyCertify

UNEP-Riso (2004) 'CDM Sustainable Development Impacts', Roskilde, Denmark.

UNEP-Riso (2005) 'CDM pipeline' at www.cd4cdm.org.