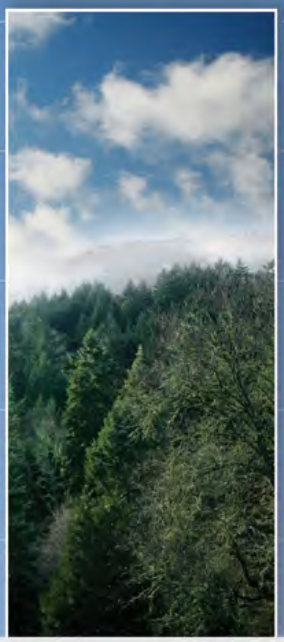
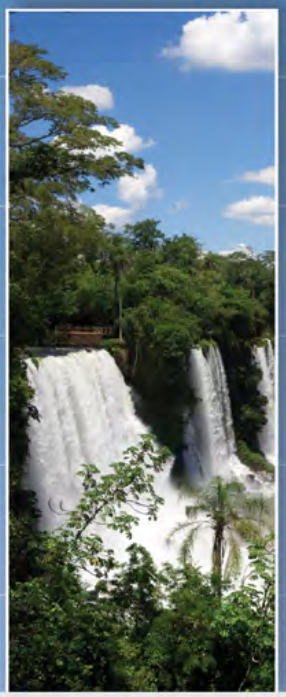
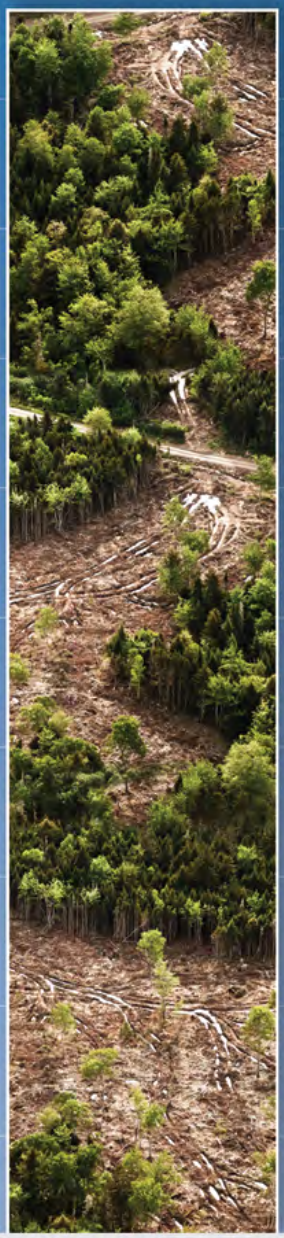
Ecosystem Marketplace

State of the Forest Carbon Markets 2009

Taking Root and Branching Out



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Acknowledgements:

This report is public and freely available due to the financial contributions from Ecosystem Marketplace sponsors: World Bank BioCarbon Fund, Bio-Logical Capital, Ecosystem Restoration Associates and Baker & McKenzie, as well as our donors: the United States Agency for International Development (USAID), the David and Lucile Packard Foundation, Norwegian Agency for Development Cooperation, the United Kingdom's Department for International Development and the Surdna Foundation.

This study would not be possible without the data shared by individuals representing more than 100 organizations. The following pages also represent a compilation of the resources, insights and knowledge of dozens of individuals. They include, in no particular order: Ellysar Baroudy, Mirko Serkovic, Dan Zarin, Julie Witherspoon, Grant McCargo, Frank Hicks, **Robert Falls, Alex Langer,** Martijn Wilder, Richard Saines, David Diaz, Till Neeff, Peter Weir, Martin Schroeder, Sebastian Hetsch, Martin Burian, Nick Cameron, Timothy Ogden, Ilona Millar, Maya Stuart-Fox, Milo Sjardin, David Diaz, Zoe Kant, Pedro Moura Costa, Martin Schroeder, Charlotte Streck, Claire Miller, Kelly Moore Brands, Michael Coren, Jonathan Shopley, Michael Jenkins, Suzy Dobbertin, David Tepper, Jacob Olander and Michael Richards. Thank you also to the entire staff at Forest Trends for your continued support and contributions.

Cover & layout by Wenceslao Almazan.

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State of the Forest Carbon Markets 2009:

Taking Root & Branching Out

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January 14, 2010

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Executive Summary

The role of forests in the carbon markets

Forestry projects jump-started the global carbon offset market in the early 1990s, when environmental non-profits and industrial companies initiated partnerships to conserve and plant forests with the aim of balancing greenhouse gas emissions (GHG) by capturing carbon in trees. Although forestry transactions were the first-ever carbon offsets, they were soon sidelined in emerging global GHG regulations and a narrow band of forestry offsets were recognized under the Kyoto Protocol.

This left the voluntary markets to pick up the slack. Some buyers have been drawn to this tangible, land-based offset category and others have veered away from the complexities and risks of forest carbon offset projects. Over time, however, the role of forests in mitigating climate change has increasingly gained credence – thanks largely to the resolution of scientific disputes over how to measure and monitor the amount of carbon captured in trees, as well as growing political consensus on the need to reduce emissions as quickly and cost-effectively as possible.

This acceptance has begun to impact global climate policy. In 2007, at international climate change negotiations, the Bali Action Plan laid out a strategy for developing consensus on how to recognize reducing emissions from deforestation and degradation (REDD). In 2009, the Copenhagen Accord explicitly stated the need to develop mechanisms that would reward sustainable land-use practices that capture carbon in trees. Around the same time, land-based carbon offsets were explicitly included in the text of proposed US climate bills. These regulatory developments have the potential to stimulate tremendous demand for land-based carbon credits.

Currently, the forest carbon market is diverse on both the supply and demand fronts. Many offsets have been developed and purchased purely for the sake of philanthropy, while others have been created as commodity products to be sold as units of trade on global regulated and voluntary markets. In this context suppliers employ significantly varying project designs, methodologies and implementation strategies to create credits.

Tracking projects across markets and time

This report was created to increase transparency in the forest carbon marketplace and answer fundamental questions about the supply of forestry-based carbon credits, such as transaction volumes, credit prices, hectares influenced and tenure rights. It outlines the aggregate numbers from our survey of 61 project developers[1] and 34 intermediaries representing 226 projects across 40 countries. This report is entirely based on information volunteered by these project developers and intermediaries. Hence, numbers presented are not completely exhaustive, and should be considered conservative.

[1] In some cases information came from "project proponents" partnered with project developers.

Ecosystem Marketplace tracked projects generating credits over the past 20 years in both the voluntary and compliance markets. The voluntary category includes the Over the Counter (OTC) and Chicago Climate Exchange (CCX) markets. The compliance category includes the New South Wales Greenhouse Gas Reduction Scheme (NSW GGAS), as well as the Kyoto Protocol-driven Clean Development Mechanism (CDM), Joint Implementation (JI), New Zealand Emissions Trading Scheme (NZ ETS) and Kyoto Assigned Amount Units (AAUs). Because, we are comparing transactions across markets and standards, it is important to note that assets transacted vary considerably. For example, a temporary Certified Emissions Reduction (tCER) under the CDM may be a different asset than a Voluntary Carbon Unit (VCU) under the Voluntary Carbon Standard. However, these assets are generally referred to as carbon dioxide tonnes (tCO_2).

Transactions of forest carbon credits on the rise

Respondents reported a total volume of 20.8 million tonnes of carbon dioxide ($MtCO_2$) transacted in the global forest carbon market from 226 projects. In addition to these transactions, the Mbaracayú Forest Reserve and GHG reduction in Paraguay also reported a transaction of 47 $MtCO_2$ (13.1 million tonnes of carbon) to the American electric power company Applied Energy Services (AES) for $2 million[2] in 1990[3]. Because this early deal represents a significant outlier from our other project data, it is separated from data analysis throughout this report. Including this deal in overall numbers, the forest carbon marketplace has seen transactions totaling more than 67.8 $MtCO_2$.

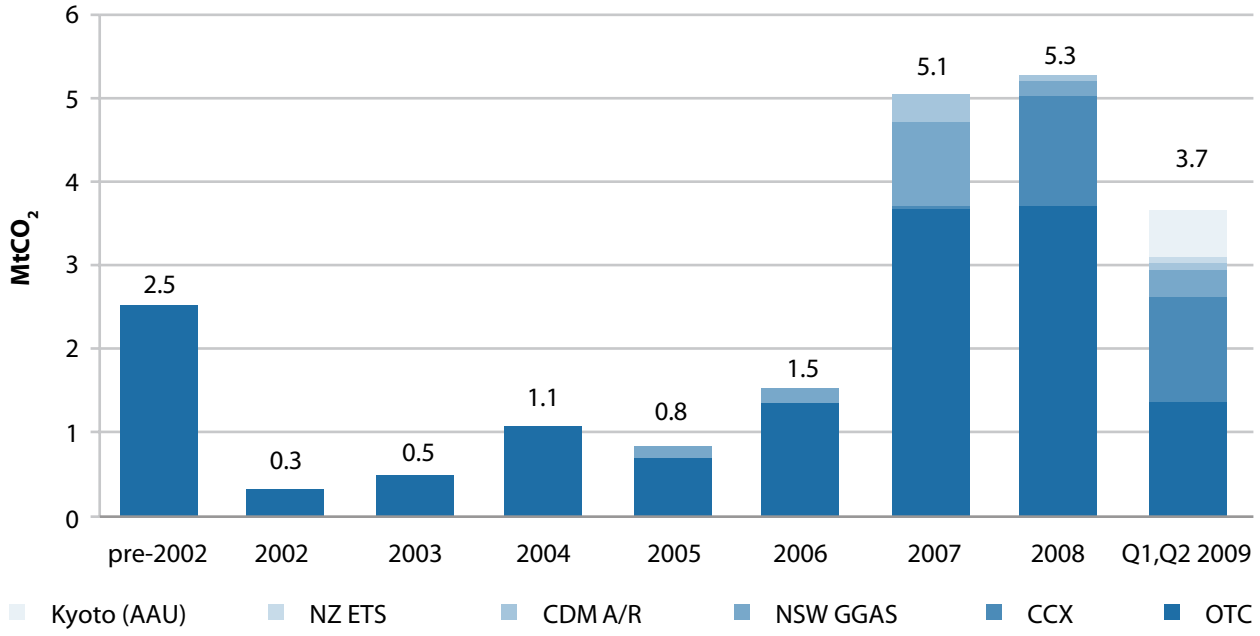
[2] All dollars in US$ unless otherwise specified

[3] Steve Zwick, "Mbaracayú: Lessons in Avoiding Deforestation," http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page_id=5493&section=home

Table 1: Volume and value of forest carbon market

Markets	Volume ($MtCO_2$)		Value (million US$)	
	Historical Total	2008	Historical Total	2008
Voluntary OTC	15.3	3.7	129.7	31.5
CCX	2.6	1.3	7.9	5.3
Total Voluntary Markets	**17.9**	**5.0**	**137.6**	**36.8**
New South Wales	1.8	0.2		
CDM A/R	0.5	0.1	2.9	0.3
NZ ETS	0.1		0.7	
Kyoto (AAU)	0.6		8.0	
Total Regulated Markets	**2.9**	**0.2**	**11.6**	**0.3**
Total Global Markets	20.8	5.3	149.2	37.1

Figure 1: Historical transaction volume in the forest carbon markets



Of the 20.8 $MtCO_2$ reported from 226 projects, almost all, 79%, of these credits were transacted by project developers in the primary market. Intermediaries reported only 2.0 $MtCO_2$ transacted in the voluntary OTC secondary market, where offsets are resold.

Historically most forest deals (73% or 15 $MtCO_2$) have occurred in the OTC voluntary carbon markets. The CCX has been the scene for 12.5% of transactions (2.6 $MtCO_2$). The NSW GGAS followed close behind with 8.7% (1.8 $MtCO_2$) of transactions. Combined, Kyoto Protocol driven markets transacted 1.3 $MtCO_2$ (6.25%). CDM sales represented a total of roughly half a million tonnes, or 4% of the global forest carbon markets.

Before 2005, the OTC market was the only game in town until NSW GGAS began trading its first forest carbon credits in 2005.

The CCX voluntary market launched in 2004, and it registered its first forest carbon credits in 2007. Afforestation-reforestation (A/R) activities in developing countries under the Clean Development Mechanism (CDM) began picking up at the start of the first Kyoto Protocol commitment period of 2008-12, as did forestry projects in the New Zealand Emission Trading Scheme (NZ ETS).

Overall, volumes remained relatively low until 2006. In 2007, the volume transacted rose sharply, by 228%, to reach a new level of 5.1 $MtCO_2$. The year 2008 saw just a slight increase over 2007 levels, up to 5 3 $MtCO_2$. This growth trend appears likely to continue in 2009, with project developers reporting 3.7 $MtCO_2$ already transacted in the first two quarters of the year.

In 2008 and the first two quarters of 2009, the voluntary carbon markets continued to account for the bulk of forest carbon transactions – specifically, 95% in 2008 and 72% in 2009. In the first half of 2009, the newly-launched NZ ETS accounted for 1.4% of the global forest carbon market. Such transactions are poised to continue over the rest of the commitment period and beyond – provided a new international agreement can be reached that facilitates the generation and trading of such credits.

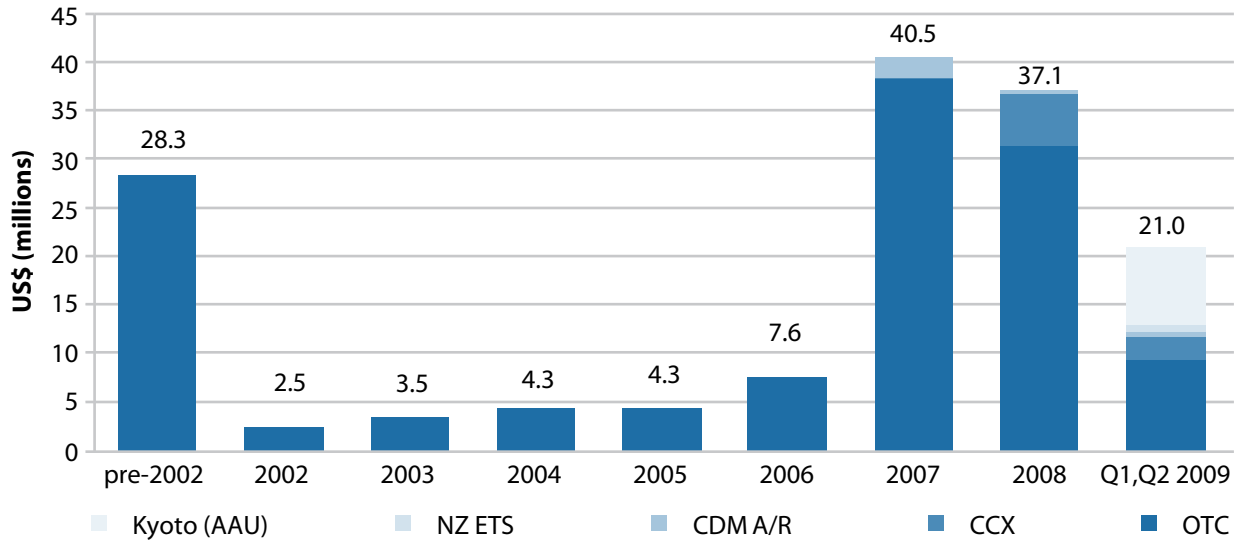
Suppliers transacted over $149.2 million in forest carbon credits

Overall, prices for forest carbon credits ranged from $0.65/tCO$_2$ to more than $50/tCO$_2$. Over time, the volume-weighted average price was $7.88/tCO$_2$. The compliance markets (NSW GGAS, CDM, AAUs and NZ ETS) have commanded the highest prices overall, with a volume-weighted price average of $10.24/tCO$_2$, followed by the voluntary OTC market at $8.44/tCO$_2$. Average prices for tCERs, which must be replaced or reissued at the end of their crediting period, were significantly lower ataveraged $4.76/tCO$_2$. The least expensive credits were traded in the CCX at $3.03/tCO$_2$.

The total historical market value we tracked through the first half of 2009 was $149.2 million, of which $137.6 million arose from the voluntary market and $11.6 million from the compliance markets. In the voluntary market in 2008, CCX accounted for 26% of the voluntary market in transaction volume but only 14.4% in value, indicating the far lower prices ($1.96-4.06/tCO$_2$) available for CCX forestry credits. The Kyoto (AAU) credits arising from the New Zealand ETS in the first half of 2009 captured the bulk of the regulated market value., with a minimum price of relatively high price of roughly €10/tCO$_2$ ($14.050). Average prices for tCERs, which must be replaced or reissued at the end of their crediting period, were significantly lower at $4.76.

Most of the market value (66%) was generated recently from 2007 through the first half of 2009, due to higher volumes and prices. Emerging interest in the voluntary carbon markets overall, along with maturing standards and infrastructure, contributed to this increase in value. The year 2008 saw a slight rise in credits transacted from 2007, but overall value declined 8.4%, in line with a drop in average prices.

Figure 2: Historical values in the forest carbon markets



Over 2.1 million hectares influenced by carbon finance

We tracked a total of 226 forest carbon projects that had transacted credits. OTC projects made up 90% of the total number of projects, with an additional 6% under the CCX. Only 4% of projects, a total of nine projects, transacting credits (including forward sales) were from regulated markets; five of these were from NSW GGAS, three from Kyoto-related A/R projects, and one from New Zealand ETS.

Project developers reported a total area of 2.1 million hectares influenced by forest carbon sequestration or avoided emission activities. OTC projects covered 1.7 million hectares (83% of the total area), CCX projects covered 306,552 hectares (14.6% of total area) and compliance market projects covered a mere 54,600 hectares (2.6% of total area).

Figure 3: Area influenced by projects (hectares)

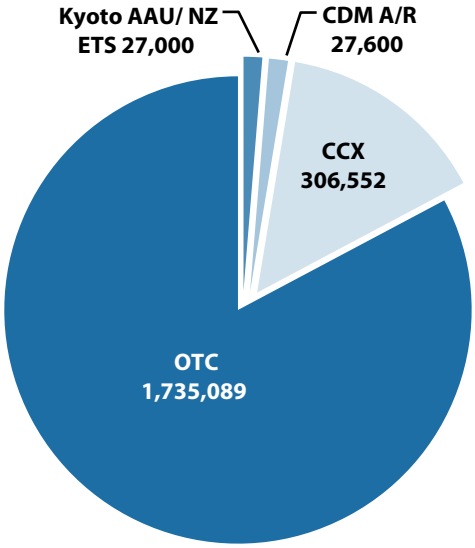
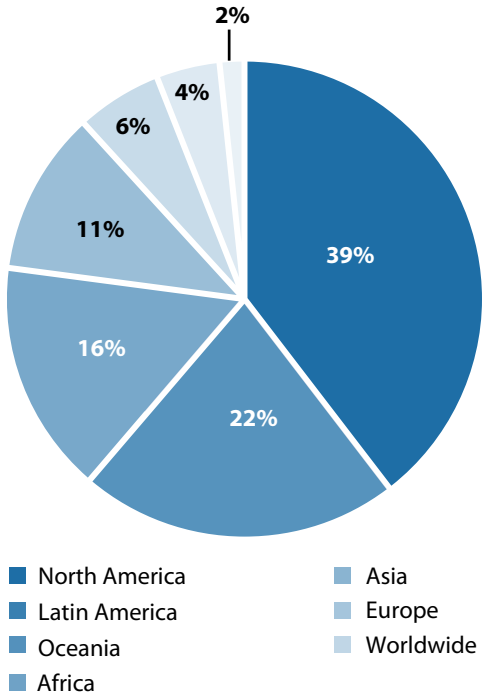


Figure 4: Historical transaction volume by project location

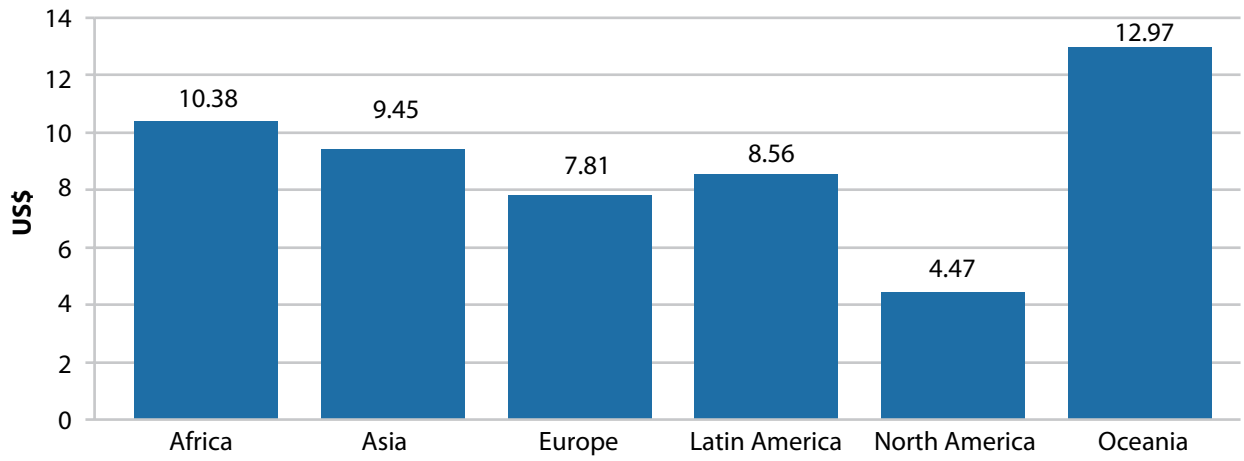


Credits originated from projects in 40 countries

North America (7.2 $MtCO_2$) and Latin America (3.9 $MtCO_2$) topped the list of places where the most transacted credits originated, accounting for 40% and 22%, respectively. Oceania, which mainly consisted of projects in Australia, followed with 16% of the volume transacted. Africa was the source of 11% of transactions, with Asia and Europe making up 6% and 4%, respectively.

When the total value for each region is considered, the ranking across markets is as follows: $37.8 million for Oceania, $35.5 million for Latin America, $32 million for North America, $20.9 million for Africa, $9.9 million for Asia and $6 million for Europe. Although Oceania was the third-largest region by volume of credits sold, it was the top region when total value was considered.

Figure 5: Volume-weighted avg. price by location



North America appears to have been the top region for sourcing carbon credits in 2008, generating 42% of the volume transacted that year, followed by Africa and Latin America with 26% and 21%, respectively. In the developing world, the dominant source of forest carbon credits appears to have shifted from Latin America in 2007 to Africa in 2009. In 2008, there was a lull in credits from Australia due to policy uncertainties, with landholders awaiting the introduction of the proposed national emissions trading scheme. Europe trailed behind with only 1% of the market share.

A diversity of forest and project types in the marketplace

Most forest carbon credits transacted were historically sourced from A/R projects (63%) followed by REDD projects at 17% and Improved Forest Management (IFM) projects at 13%. In 2008, A/R remained the top source for credits (53%). Projects with a combination of REDD, A/R and IFM, moved to second place accounting for 24% of the volume, followed by IFM (20%). In the voluntary markets, the majority (60%) of A/R or IFM projects reported planting indigenous trees.

Figure 6: Historical transaction volume by project type

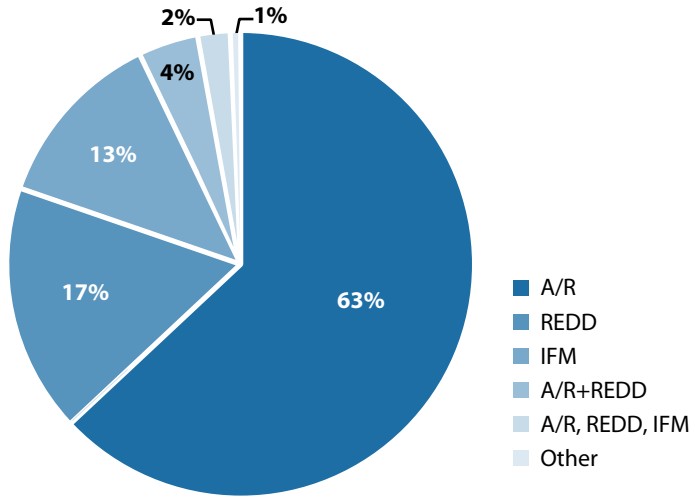
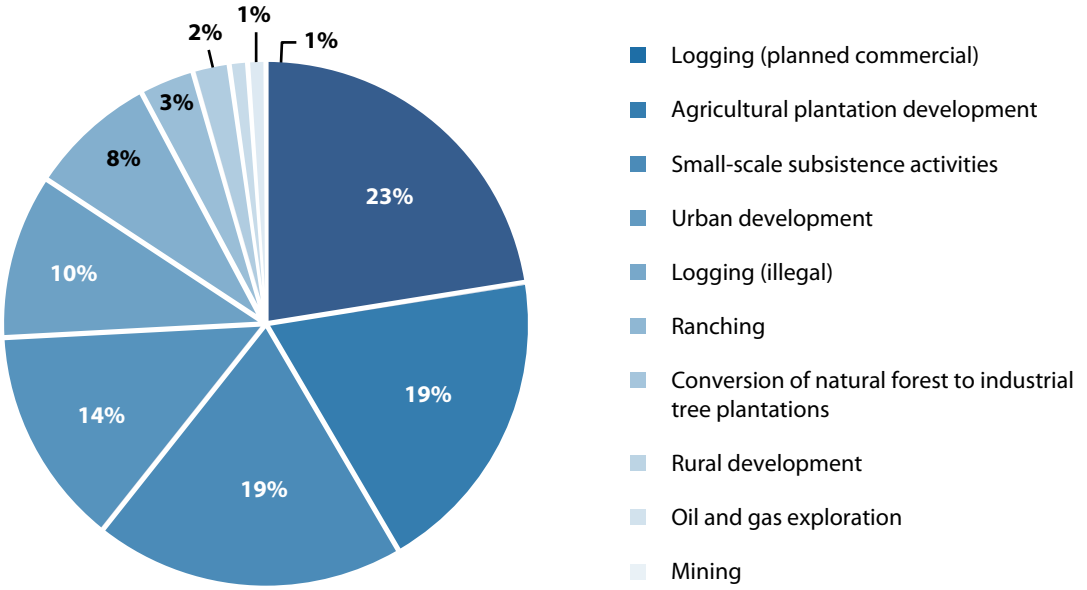


Figure 7: Overall deforestation pressures



Forests generating carbon credits are often, though not always, influenced by deforestation and degradation. Respondents reported that about 69% of projects were influenced by deforestation or degradation pressures. Of the respondents who indicated no threat or did not respond to this question, 63% of their projects were based in Europe, North America or Australia. Overall, the top drivers of forest destruction were logging, agriculture, small-scale subsistence activities and urban development. Latin American projects cited the most diverse set of pressures. North American forest project sites were more exposed to planned commercial logging, agricultural plantation development and urban development. In particular, African projects listed small-scale subsistence activities as a key onsite pressure.

Use of standards increasing

Over the past 20 years, as the forest carbon markets have evolved, the methodologies, measurement and market infrastructure have become increasingly sophisticated. The projects tracked in this report vary significantly, with time being the biggest factor in influencing design and implementation. However, vast differences still exist between projects in development today, which are dotted across the spectrum of commodity to philanthropy.

Standards are increasingly utilized for establishing quality benchmarks and consistency. The OTC forest carbon offsets market exhibits an intensifying use of standards, particularly those that emphasize the co-benefits of forest carbon projects and third-party verification. Over time, 86% of all OTC forest carbon offsets originated from projects involving an internal or third-party standard. Certification to third-party standards increased significantly from a mere 15% of offsets in 2002 to a whopping 96% in the first half of 2009, and account for 70% of all OTC offsets transacted over time.

Standards broadly fall into two categories: those that focus on the quality of measuring and monitoring carbon, and those that focus on qualities beyond carbon (the 'co-benefits' referred to above).

Across markets, 23% of all offsets coming from projects validated to a third-party standard were reported as complying with the Climate, Community, and Biodiversity (CCB) Standards. This amounts to 3.7 $MtCO_2$ of GHG reductions. The prevalence of CCB Standard offsets points to an historic demand for forestry offsets with environmental and social co-benefits, but does not necessarily correlate with verified GHG emission reductions or issued credits. CCB Standard certified projects may or may not also comply with a standard more formally associated with carbon content.

Another 16% of the offsets were listed on the CCX and conformed to the CCX standard. Other popular certification schemes include the NSW GGAS (11% of all certification, or 1.8 $MtCO_2$); SGS-COV Standard (10% or 1.6 $MtCO_2$); and Greenhouse Friendly (6% or 1.0 $MtCO_2$). Transacted credits registered CDM projects accounted for approximately 3% of the marketplace. Another 12% of credits were certified to internal standards, while 10% of offsets across all markets were not certified to any standard.

In 2008 and the first half of 2009, CCX certified 30% and 43% respectively (1.3 $MtCO_2$ in both years) of all forest carbon offsets. Credits originating from CCB Standard validated projects also remained popular, comprising 24% and 18% of all third-party certified offsets (1.1 $MtCO_2$ in 2008 and 523,997 tCO_2 in 2009). Offsets certified to the ISO 14064 standard dramatically increased their market share from 5% in 2008 (205,208 tCO_2) to 17% in the first half of 2009 (500,500 tCO_2). Also noteworthy is the increase of NSW GGAS credits, increasing from 4% (167,559 tCO_2) of all third-party certified offsets in 2008 to 11% (313,362 tCO_2) in the first half 2009.

On the cusp of change

At the end of 2009, the market for forest carbon stands in an uncertain position on the verge of potentially enormous growth. Already countries have committed politically in international negotiations to reducing emissions from deforestation and degradation (REDD) and several have also committed financing. At the same time, the Clean Energy Jobs and American Power Act awaiting it's fate in the United States' Senate explicitly calls for domestic forestry offsets and includes financing for REDD.

It is not possible to say what shape US climate regulation will take – or what sort of global mechanisms for funding REDD will emerge from current international negotiations. Amidst this scene of opportunity and risk, investors are still eyeing forest carbon, though many are waiting on more definite regulatory signals before taking a financial leap. Even without market certainty, infrastructure and measurement tools continue to mature rapidly. Such tools, along with years of lessons learned accumulated, will inevitably serve as the foundation for forest carbon finance in years to come.

Glossary

AAU	Assigned Amount Units
ACR	American Carbon Registry
AFOLU	Agriculture, Forestry, and Other Land Uses
ALM	Agricultural Land Management
A/R	Afforestation/Reforestation
ARR	Afforestation, Reforestation & Revegetation
CAR	Climate Action Reserve (also known as The Reserve)
CCAR	California Climate Action Registry
CCBA	Climate, Community, and Biodiversity Alliance
CCBS	Climate, Community, and Biodiversity Standards
CCX	Chicago Climate Exchange
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CFS	CarbonFix Standard
CRT	Climate Reserve Tonne
ECCM	Edinburgh Center for Carbon Management
ECOSUR	El Colegio de la Frontera Sur
EPA	US Environmental Protection Agency
ERU	Emission Reduction Unit
ERPA	Emissions Reduction Purchase Agreement
ERT	Emission Reduction Tonne
EU ETS	European Union Emission Trading Scheme
GHG	Greenhouse Gas
ICRAF	World Agroforestry Centre
IFM	Improved Forest Management
ISO	International Organization for Standardization
IUCN	World Conservation Union
JI	Joint Implementation
lCERs	Long term Certified Emission Reduction
LULUCF	Land Use, Land-Use Change and Forestry

$MtCO_2$	Millions of tonnes of carbon dioxide equivalent
NCOS	National Carbon Offset Standard
NGO	Non-Governmental Organization
NSW GGAS	New South Wales Greenhouse Gas Abatement Scheme
OTC	Over-The-Counter (market)
REDD	Reducing Emissions from Deforestation and Degradation
REDD+	Plus includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
RGGI	Regional Greenhouse Gas Initiative
RMUs	Removal Units
SCM	Social Carbon Methodology
SGS COV	SGS Carbon Offset Verification
tCERs	Temporary certified emission reduction
tCO_2	Tonne(s) of carbon dioxide equivalent
The Reserve	Climate Action Reserve
UK ETS	UK Emissions Trading Scheme
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCU	Voluntary Carbon Units
VER	Verified Emission Reduction
WBCSD	World Business Council for Sustainable Development
WCS	Wildlife Conservation Society
WRI	World Resources Institute
WWF	World Wildlife Fund

I. Introduction

During the last three years, the role of forests in climate change mitigation has moved from a niche issue to center stage for policy makers, investors, researchers and conservation groups across the globe — with good reason. The Intergovernmental Panel on Climate Change (IPCC), for example, reported that land use changes account for about 20% of global anthropogenic emissions, more than the entire global transportation sector.[1]

At the same time, several high-impact studies have identified forest conservation as a cost-effective option for reducing global GHG emissions. *The Stern Review*, *The Eliasch Review,* and studies by McKinsey and Company and others support the thesis that halting deforestation is a critical, and cost-effective, step towards reducing greenhouse gas emissions.[2] Yet, current international agreements have not addressed means of halting deforestation and forests continue to disappear at a rate of 13 million hectares per year.[3]

However, we hope to be at the cusp of change. In December 2009, international negotiators met in Copenhagen to hash out a new climate change agreement. The meetings did not end with binding commitments. However, strong political support, accompanied by financial commitments for reduced emissions from deforestation and degradation (REDD), were bright spots in the negotiations.

Forests are also taking root in US climate legislation. Over the past couple of years, significant climate bills have also been debated in the US Congress. Like the Copenhagen meetings, these bills have not resulted in new regulations -- but have explicitly included support for land-based carbon projects. The latest bill on the Senate floor, the Clean Energy Jobs and American Power Act, explicitly includes domestic forestry offsets and funds for REDD projects in developing countries.

Despite growing awareness and interest in catalyzing markets for conservation, there is little data or analysis available on the actual scope and impact of carbon finance on forests. We believe this currently lacking information is critical, and increasing the transparency of this marketplace will allow climate policies to operate more effectively and efficiently.

This first annual *State of the Forest Carbon Market* report presents new trends in global forest carbon offset markets that have not, until now, been comprehensively documented. In compiling this report, we have collected transaction data from more than 100 organizations to answer questions about the volumes of credits transacted, types of projects, and hectares influenced by carbon finance. In so doing, we've aimed to track an opaque marketplace, uncover the impact of carbon finance on forests, and elucidate trends.

[1] Intergovernmental Panel on Climate Change , 2007. *Climate change 2007: the physical science basis. Contribution of working group 1 to the fourth assessment report of the Intergovernmental Panel on Climate Change.* http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg1_report_the_physical_science_basis.htm

[2] *See* Sir Nicholas Stern, *Stern Review: The Economics of Climate Change* 216-217 (UK Dept. of Energy & Climate Change 2006), *available at* http://www.hm-treasury.gov.uk/stern_review_report.htm; Johan Eliasch, *Climate Change: Financing Global Forests* 69, (UK Dept. of Energy & Climate Change 2008), *available at* http://www.occ.gov.uk/activities/eliasch.htm; Per-Anders Enkvist, Tomas Nauclér, and Jerker Rosander, *A cost curve for greenhouse gas reduction*, McKinsey & Co., Feb. 2007, 41, *available at* https://www.mckinseyquarterly.com/A_cost_curve_for_greenhouse_gas_reduction_1911.

[3] U.N. Food and Agriculture Organization of the United Nations, "The Global Forest Resources Assessment 2005," http://www.fao.org/newsroom/en/news/2005/1000127/index.html

The following information is built on two previous research initiatives by Ecosystem Marketplace: the annual *State of the Voluntary Carbon Markets* report and the Forest Carbon Portal. The first *State of the Voluntary Carbon Markets* was created with the goal of shining 'a small light into the black hole' and was the first publicly-available, market-wide report to quantify the voluntary carbon markets.[4] At the end of 2008, Ecosystem Marketplace launched the Forest Carbon Portal, a website dedicated to news, resources and analysis of the markets for forest carbon. The site includes a Project Inventory, which lists and describes over 55 forestry projects transacting offsets.

Over the past six months we have analyzed an array of projects over time and geography and collected information from as many suppliers as possible. Excavating, cataloguing, and interviewing stakeholders from deals as early as 1990 has not been a simple task. We are acutely aware it is not possible to track all projects or transactions in this fragmented marketplace. Hence, we caution readers that the following pages, despite significant outreach, do not represent a completely comprehensive view of transactions.

Given the unprecedented policy momentum behind climate legislation, and the incorporation of forest carbon in particular, 2010 may be remembered as a critical benchmark year for this market. We look forward to producing this report on an annual basis, and tracking new projects as they generate credits. If you are a project developer and would like to be included in next year's report or on the Forest Carbon Portal, please contact us at general@forestcarbonportal.com.

[4] Katherine Hamilton, Milo Sjardin, Allison Shapiro, and Thomas Marcello, *State of the Voluntary Carbon Markets 2009*, Ecosystem Marketplace and New Carbon Finance, May 20, 2009, *available at* http://www.forest-trends.org/documents/files/doc_2343.pdf.

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II. Methodology

This report is designed to track transactions of forestry-based carbon credits. It is primarily based on data collected from forest offset project developers transacting credits before mid-2009. It includes analysis the voluntary Over-the-Counter (OTC) market, the Chicago Climate Exchange (CCX), the New South Wales Greenhouse Gas Abatement Scheme (NSW GGAS), as well as the Kyoto Protocol-driven Clean Development Mechanism (CDM), Joint Implementation (JI), and New Zealand Emissions Trading Scheme (NZ ETS).

This analysis is limited to forest projects generating carbon credits. It does not include an analysis of government payments for environmental services, such as the Costa Rican National Financing Fund (FONAFIFO), forestry projects that measured carbon sequestered but did not actually transact carbon credits, or other land use project types.

II.1 Accounting Methodology

For the purpose of this report, we defined a transaction as an interaction where both funds and rights to credit ownership changed hands. In a market with a diversity of projects and contracts, the point at which a carbon credit was sold varied between projects, especially between those selling ex-ante credits (credits sold prospectively, before they are created) versus ex-post credits. This includes both sales of credits and deals where philanthropic donors support projects and in turn have received rights to claim retired offsets. A sale of the future right to carbon credits, even if the credit has not yet been issued, would qualify as a transaction under this definition.

The carbon credit numbers presented throughout this survey represent metric tonnes of carbon dioxide equivalent (tCO_2).

We aimed to encapsulate all market transactions and did not extrapolate transaction volumes or create 'quality criteria' screens on projects. To help ensure the data presented is as accurate as possible, we did investigate new sources and contacted dozens of respondents to confirm or clarify their responses. However, it was not possible to verify all data reported.

II.2 Data Sources

The bulk of this report is based purely on information volunteered by project developers and/or project proponents. However, to ensure we presented as much information as possible on some markets, in some cases we included data from other sources:

- The voluntary OTC market analysis is primarily based on surveys from over 50 project developers. When calculating total voluntary OTC transactions, we have also included information collected from 34 intermediaries from the Ecosystem Marketplace and New Carbon Finance *State of the Voluntary Carbon Markets* report. For determining total transaction volumes, if a credit was sold by a project developer to a retailer who then in turn sold the credit to a final buyer in 2008, and we were able to track both transactions, we counted each individual transaction.

- The Chicago Climate Exchange section is based on a transaction analysis from six surveyed offset suppliers, as well as registration data provided by the CCX.
- The New South Wales Greenhouse Gas Abatement Scheme includes data from surveyed project developers, as well as the GGAS registry.
- The Clean Development Mechanism and Joint Implementation sections are based on data from surveyed project developers as well as information shared by the World Bank's BioCarbon Fund and Prototype Carbon Fund.
- The New Zealand Emissions Trading Scheme is based on information gathered from the New Zealand Trading Registry.

II.3 Survey Respondents

Overall, we collected data from 61 project developers, or project proponents partnered with developers, representing 226 projects as well as 34 intermediaries. Due to the fragmented nature of the market and confidentiality issues surrounding transaction data, it was not possible to capture information from all suppliers. Because survey respondents had the option of skipping questions, the response rate varied by question.

III. OTC Markets: Fertile Ground For Forests

Historically, 73% of forestry offsets transactions occurred in the voluntary carbon markets. The voluntary carbon markets include all carbon offset trades not driven by regulation. This includes transactions involving credits created specifically for the voluntary markets (such as Verified Emission Reductions or Carbon Financial Instruments) as well as transactions in which suppliers sold regulatory market credits (such as Certified Emission Reductions, or CERs) to voluntary buyers. Credits sourced specifically for the 'Over-the-Counter' (OTC) market are often generically referred to as Verified Emission Reductions (VERs), or simply as carbon offsets.[5]

The voluntary carbon markets are composed of two distinct components: the Chicago Climate Exchange (CCX), which is a voluntary but legally binding cap-and-trade system, and the broader, non-binding OTC offset market. The CCX defines itself as 'the world's first and North America's only voluntary, legally binding, rules-based greenhouse gas emission reduction and trading system.'[6] It is driven by a membership-based cap-and-trade system. The CCX is further discussed in Section IX.

The OTC market includes all voluntary transactions outside the CCX. These transactions occur between sellers and buyers without a requirement to reduce emissions under a cap-and-trade system. We have labeled it the voluntary 'Over-The-Counter' market because most market transactions do not occur on formal exchanges. Almost all carbon credits in the voluntary OTC market originate from emissions reduction projects and are thus offsets.

III.1 Supply and Demand in the OTC Market

The OTC market is driven by 'pure voluntary' and 'pre-compliance' buyers. Pure voluntary buyers purchase credits to offset their own emissions and thus retire their credits immediately upon purchase.

Historically, the majority of demand for forestry credits has been from purely voluntary buyers. These voluntary buyers often choose forestry offsets because they are easier to communicate, equate to tangible land use change, and may be bundled with social and environmental co-benefits. Without a cap and with an emphasis on public relations and ethics, the demand curve for these voluntary offset purchases has as much in common with the markets for 'green goods,' such as Fair Trade or organics, as it does with the regulated carbon markets. Likewise, some investors have gravitated towards forest carbon due to its multiple benefits. 'We particularly like that forest carbon projects can have benefits above and beyond sequestration,' notes Grant McCargo, CEO of Bio-Logical Capital.

According to a recent survey of 141 corporate buyers of forestry offsets on their attitudes toward carbon offsets from forestry projects, conducted by Ecosecurities, the Climate Community & Biodiversity Alliance (CCBA) and Greenbiz, the top reasons for choosing forestry credits were: community and environmental benefits

[5] The term VER is also used specifically to refer to credits generated by aspiring CDM projects that have not yet been registered by the CDM Executive Board. Once registered, these projects will generate CERs.

[6] Chicago Climate Exchange, http://www.chicagoclimatex.com.

generated from forestry projects; the scale of the deforestation and climate change problem; and, the tangibility of offsets with carbon stored in the biomass of trees.[7]

While forestry is a top choice for some buyers seeking to offset emissions, the same issues that kept forestry and other land-based projects from playing a major role in the Kyoto markets, such as permanence, leakage, investment risks and accounting questions, have also hindered this category of projects in the voluntary carbon markets. Since 2004, forestry offsets have continued to lose market share in the voluntary OTC market.[8]

Pre-compliance buyers purchase VERs with the hope of receiving early-actor credit under a regulatory scheme or to purchase credits at a lower price and then sell them at a higher price under a future compliance regime. These buyers historically comprised a smaller segment of demand for forest carbon. However, the past two years have seen a surge of interest in forestry credits among pre-compliance buyers. Internationally, the possibility of post-Kyoto, market-based REDD mechanisms has led to dozens, if not hundreds, of new proposals for REDD projects. Proposed US federal climate legislation is also enticing groups to invest in forestry and agriculture offsets sectors as a way to capitalize on future US demand.

Depending on their position in the supply chain, sellers can be categorized into four major types:

- **Project developers:** Develop GHG emissions reduction projects and may sell the credits to aggregators, retailers or final customers.
- **Wholesalers:** Intermediaries that sell offsets in bulk and have ownership of a portfolio of credits.
- **Retailers:** Intermediaries that sell small amounts of credits to individuals or organizations, usually online, and have ownership of a portfolio of credits.
- **Brokers:** Do not own credits, but facilitate transactions between sellers and buyers.

There are a range of value-chain patterns in the OTC market. At the most simple level, a final buyer purchases credits and retires them from a project developer. At a more complicated level, an offset credit will pass in a brokered deal between a project developer and an aggregator and is then sold to a retailer who then sells it to the final buyer.

As noted in the methodology section, most information in this report is directly from project developers, who transacted the majority of credits, especially before 2006. However, in the Voluntary OTC Value and Volume section of the report, we also analyzed total transactions by intermediaries to present market-wide transaction volumes. In these cases, we have combined information from wholesalers and retailers into a single 'intermediary' category.

III.2 Value and Volume

Summary points:

- 15.3 $MtCO_2$ of forestry offsets were transacted on the OTC voluntary market. Project developers representing 78 different projects executed primary sales representing 13.2 $MtCO_2$ in credits. The remainder, 2.0 $MtCO_2$, we tracked as sold by intermediaries.
- We estimated the value of the forestry OTC transactions at $129.7 million in total. Credits sold by project developers made up about $111.9 million and intermediary sales equated to $17.8 million.

[7] Biz, *The Forest Carbon Offsetting Trends Survey 2009*, London, UK: Ecosecurities, 2009 *available at* http://www.ecosecurities.com/GetAsset.ashx?AssetId=24136.

[8] Katherine Hamilton, Milo Sjardin, Allison Shapiro, and Thomas Marcello, *State of the Voluntary Carbon Ma rkets 2009*, Ecosystem Marketplace and New Carbon Finance, May 20, 2009, *available at* http://www.forest-trends.org/documents/files/doc_2343.pdf.

- Across the supply chain, project developer prices ranged from \$1 to \$50/tCO_2 with an overall volume weighted price of \$8.44/tCO_2. Credits sold by intermediaries ranged from \$1/tCO_2 to \$30/tCO_2 with an overall volume weighted price of \$8.89/tCO_2.
- Of the 15 3 $MtCO_2$ transacted, respondents reported retiring 6.1 $MtCO_2$.
- Historically, non-profit developers supplied 53% (7.0 $MtCO_2$) of the total volume of forest carbon offsets, followed by the private sector (40% or 5.3 $MtCO_2$) and the public sector (7% or 0.9 $MtCO_2$).

Across time and the supply chain, we tracked about 15.3 $MtCO_2$ of forestry offsets transacted on the voluntary OTC market. The vast majority, 13.2 $MtCO_2$ of these credits, were primary sales sold by the project developers representing 209 different projects. The remainder, about 2.0 $MtCO_2$, were sold by intermediaries.

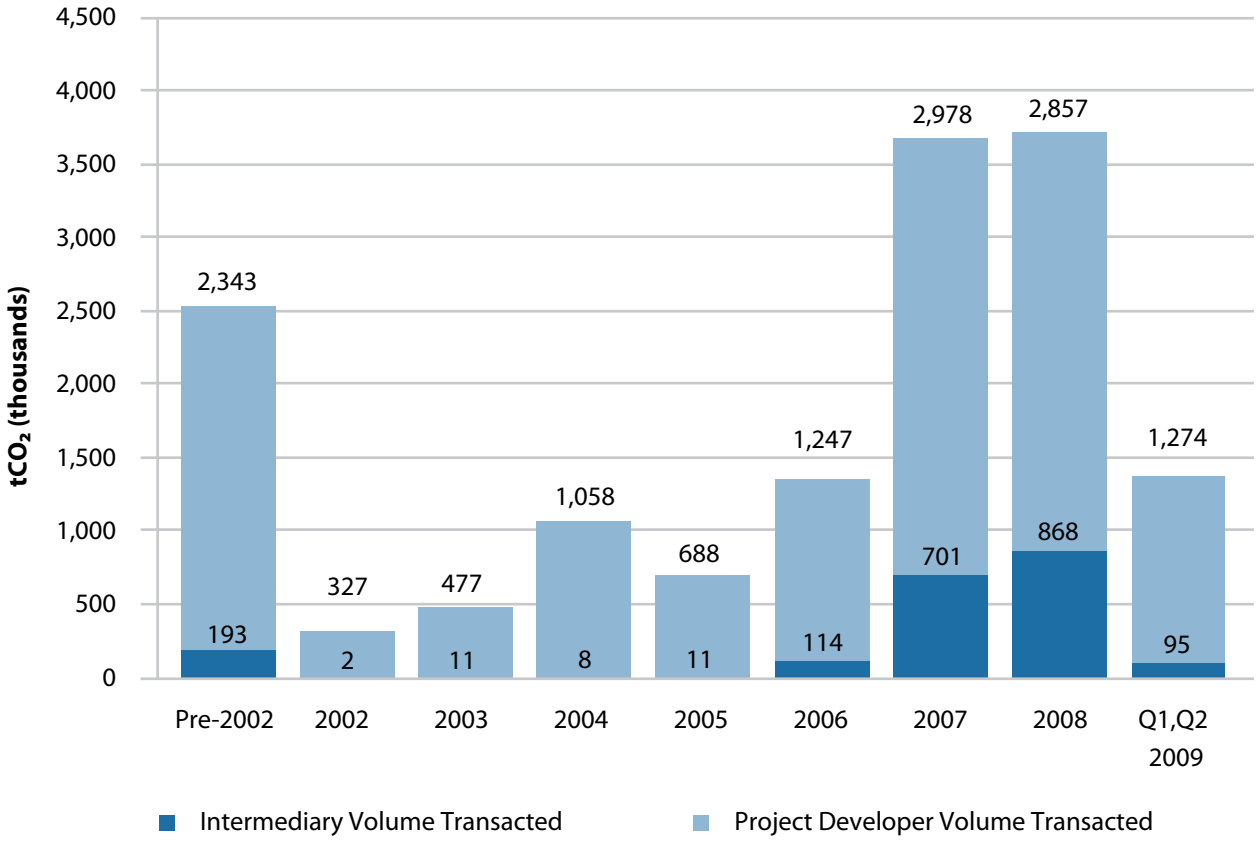
III.2.1 The Role of Legacy Projects

The world saw a significant number of voluntary transactions of forestry offsets well before the first trades under the Kyoto markets or the CCX in 2005 and 2003, respectively. Respondents reported 24 active projects transacting nearly 2.67 $MtCO_2$ before 2003.

We tracked 13 projects transacting credits before 2002. One project, the Mbaracayyú Forest Reserve and GHG reduction in Paraguay, developed by Fundación Moises Bertoni (FMB) and The Nature Conservancy (TNC), reported a transaction of 47 $MtCO_2$ (13.1 million tonnes of carbon) to AES for \$2 million in 1990.[9] The project obtained the financing from AES to create a 64,000 hectare private reserve in a region threatened by illegal logging and agriculture.

[9] Steve Zwick, "Mbaracayú: Lessons in Avoiding Deforestation," http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page_id=5493&section=home

Figure 8: Voluntary OTC market transaction volumes



Credits were calculated estimates of the entire reserve's biomass, over a 35-year crediting period. The early deal was negotiated at \$0.15/ tCO_2 of carbon, which represents a price of just over \$0.04/ tCO_2.

The Mbaracayú Forest Reserve project is one of five forestry projects that AES invested over \$10 million in with the aim of offsetting emissions from power plants.[10] Three were linked to specific power plants in the United States.[11]

Of the five projects that AES invested in, Mbaracayú was the only one for which an offset transaction was reported. Likewise, we found references to 14 other forest carbon projects planned or implemented before 2002, including the four other AES projects, where we could not confirm credits transacted.[12]

Project developers cite numerous 'lessons learned' from these early projects. For example, James Gray from CARE Central America, which did report offset transactions, describes their AES-financed projects in Guatemala as "a testing ground…There was so much to learn and in the end carbon offsets weren't the main focus of these really diverse community forestry projects."

Because the Mbaracayú project – which was developed based on total sequestration value of the reserve - is a considerable outlier in terms of volume and price compared to data from the other 226 projects and dramatically skews the resulting averages, it is not included throughout the overall data analysis. As project partners FMB and TNC emphasize, "in 1990, this was an entirely new and creative approach to climate mitigation and forest projection, but we have to take into account that the project began before current concepts and methods for calculating, valuing and transferring offsets were developed."

The 12 projects transacting credits pre-2002 that are included throughout this analysis include a large REDD project transaction in 1998 when The Nature Conservancy (TNC) brokered another deal with American Electric Power, PacifiCorp, BP (now BP Amoco) and the Government of Bolivia, receiving funding to conserve 642,184 hectares in Bolivia. The Noel Kempff Mercado Climate Action REDD project transacted the reporting rights to all the credits that will arise from the project over the 30-year project crediting period. To date slightly over 1 million have been verified and the current estimate of the total over the 30-year crediting period is 5.8 million $mtCO_2e$, subject to monitoring and verification. Zoe Kant, Carbon Project Specialist, at TNC explains, "We've learned an incredible amount from this project, which has served as a prototype for future REDD activities."

Post-2002 offset transactions, have experienced a positive growth trajectory. After reaching the 1 $MtCO_2$ mark in 2004, the volume of credits transacted slipped back to around 700,000 tCO_2 in 2005, but then nearly doubled in 2006 and reached a pinnacle of around 3.68 $MtCO_2$ in 2007 and 3.7 $MtCO_2$ in 2008. As of mid-2009, despite the recession, project developers have already transacted nearly half the volume of the previous year, 1.4 $MtCO_2$.

[10] Sharon Belanger, "AES Social Responsibility," AES Corporation, Oct. 20, 1999, http://pdf.wri.org/2001summit_belangeraes.pdf.

[11] Pedro Moura-Costa and Marc D. Stuart, "Forestry-based Greenhouse Gas Mitigation: A Short Story of Market Evolution," *Commonwealth Forestry Review* 77 (September 1998): 191-202, http://www.ecosecurities.com/Assets/3164/Pubs_Forestry-based%20greenhouse%20gas%20mitigation%20A%20short%20story%20of%20market%20evolution.pdf

[12] Pedro Moura-Costa and Marc D. Stuart, ibid.

Table 2: Voluntary OTC market transactions

	Volume ($MtCO_2$)			Value (million US$)		
	Pre-2007	2007	2008	Pre-2007	2007	2008
Voluntary OTC Across All Project Types[1]	14 3	43.1	54	58.5	262.9	396.7
Forest Project Developers	6.1	2.9	2.9	48.1	34.8	20.4
Forest Intermediaries	0.3	0.7	0.9	2.4	3.5	11.1
Combined Forest Transactions	6.4	3.6	3.7	50.5	38.3	31.5

[1] *Katherine Hamilton, Milo Sjardin, Allison Shapiro, and Thomas Marcello, State of the Voluntary Carbon Markets 2009, Ecosystem Marketplace and New Carbon Finance, May 20, 2009, available at http://www.forest-trends.org/documents/files/doc_2343.pdf.*

III.2.2 Forest Carbon as a Project Type the Voluntary OTC Carbon Market

We have tracked 187 $MtCO_2e$ tracked across project types in the overall voluntary OTC markets. Historically, forestry projects have sourced 11% of credits transacted. While the volume of forestry credits has increased over time, market share has actually decreased. Pre-2002 forestry credits comprised 45% of the OTC market across project types, while market share dropped to 8% in 2007 and 7% in 2008. Changes in market share are a result of the diversity of project types increasing, su ch as renewable energy and methane destruction.[13]

[13] Ibid

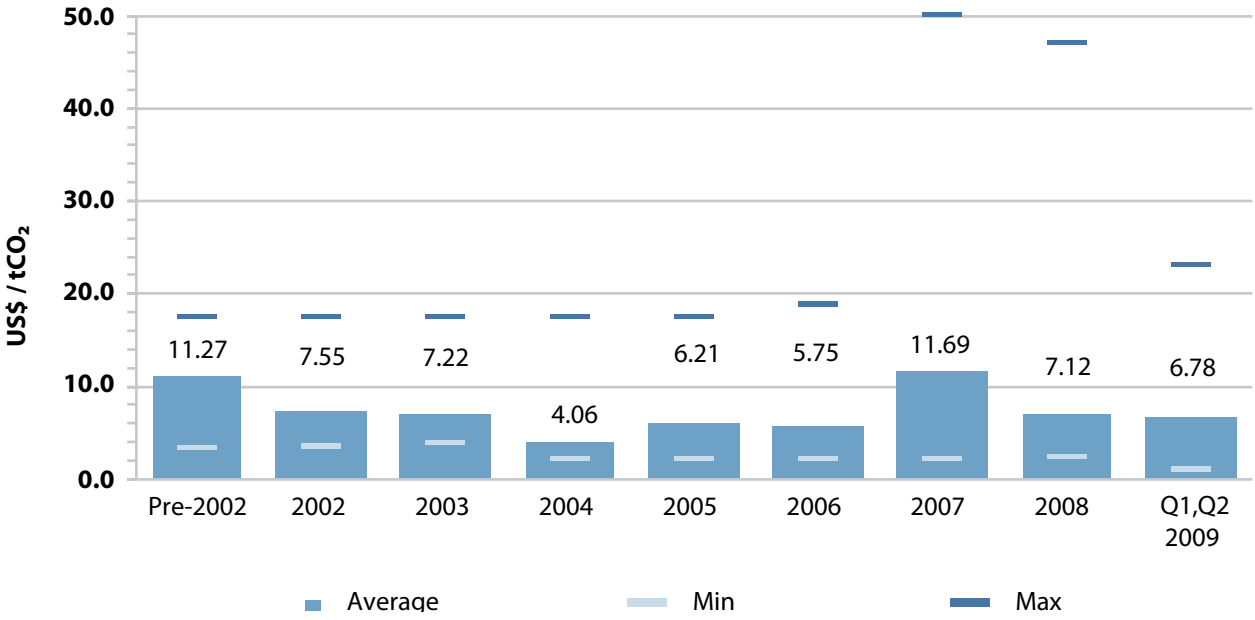
III.2.3 Prices and Market Value

Project developer offset prices ranged from $1 to $50/$tCO_2$ with an overall volume weighted price of $8.44/$tCO_2$. Credits sold by intermediaries ranged from $1/$tCO_2$ to $30/$tCO_2$, with an average weighted price of $8.89/$tCO_2$. While there has been a considerable range of prices, overall, both project developer and intermediary prices have remained relatively steady since 2002 with the annual, volume-weighted, average project developer price ranging from $4.06/$tCO_2$ to $11.69/$tCO_2$, and the intermediary price from $3.63/$tCO_2$ to $12.79/$tCO_2$.

In 2008, the overall weighted average project developer selling price for a forestry offset was $7.12/$tCO_2$. Across project types, the average project developer credit price in 2008 was $5.10/$tCO_2$.[14] This higher average for forestry projects likely results from the large number of project developers directly selling and marketing their own credits.

[14] Ibid.

Figure 9: Volume-weighted price average and range



Using volume weighted average price data, we estimate the value of the forestry OTC transactions at $129.7 million in total. Credits sold by project developers made up about $111.9 million and intermediary sales equated to $17.8 million. While sales volumes peaked in 2008, the total value peaked in 2007 at around $38.3 million. In 2008, we tracked $31.5 million in sales. Despite the recession, by the first half of 2009, the market at $9.4 million was worth nearly a third of the value of the previous year.

Figure 10: Historical growth in market value

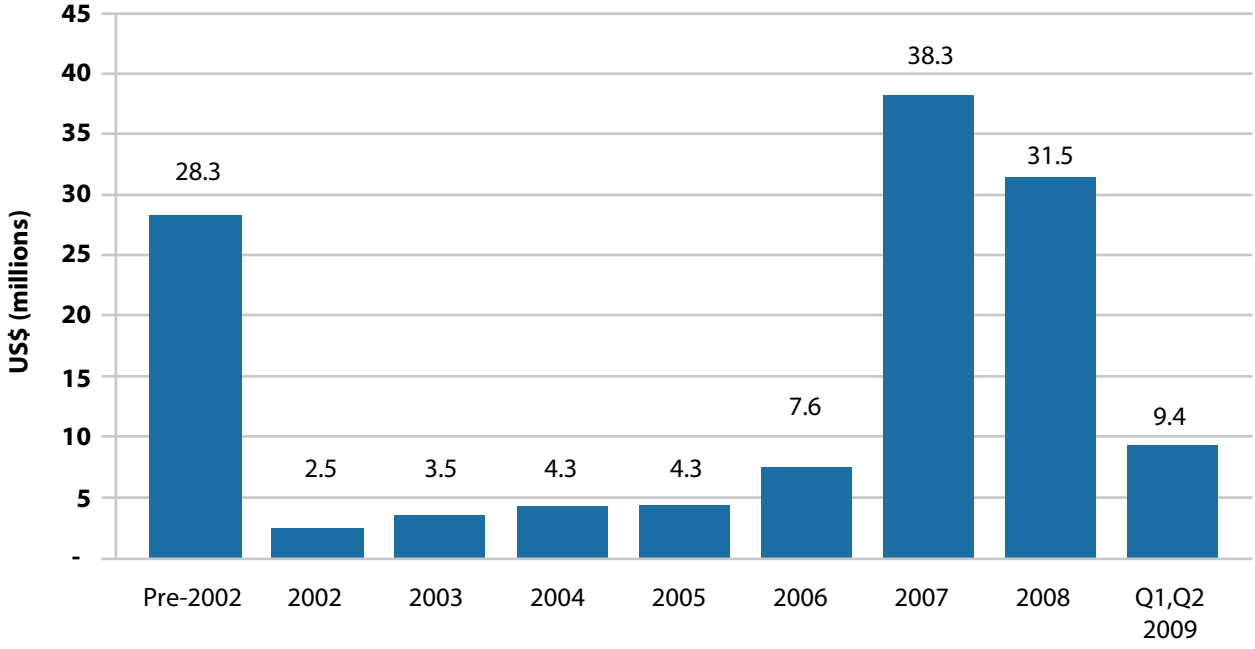
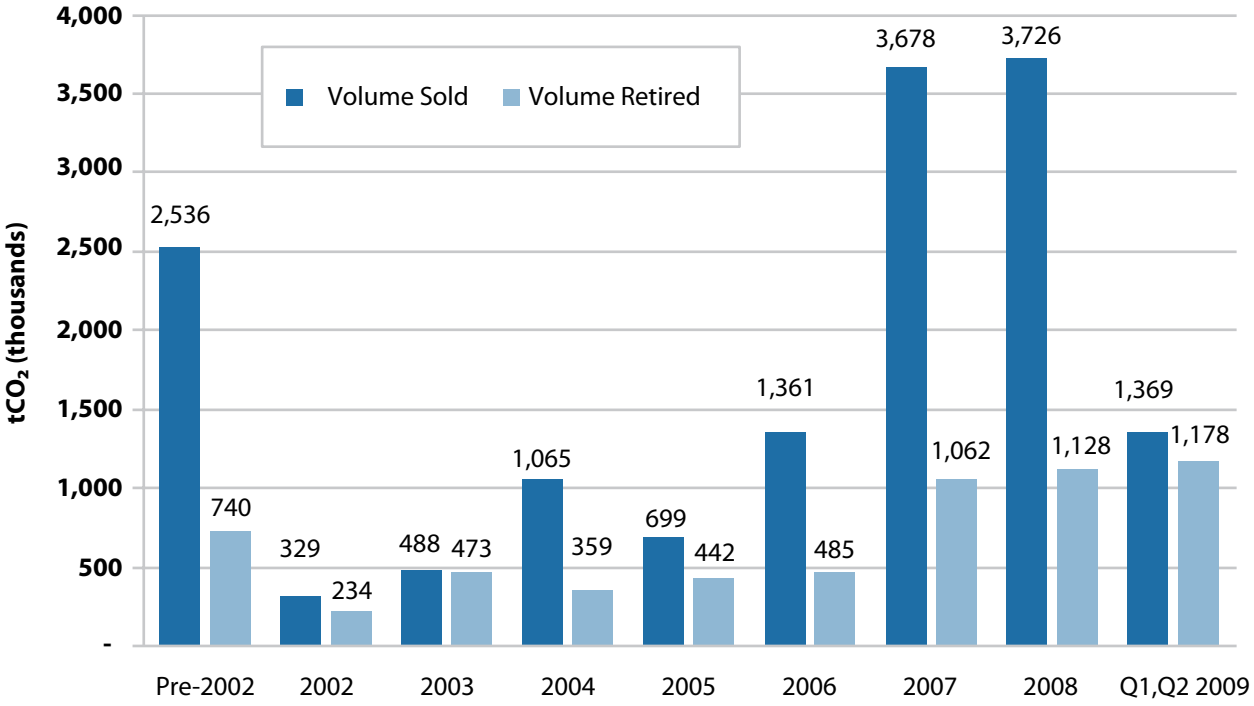


Figure 11: Growth in volume of credits transacted and retired



III.2.4 Retirement

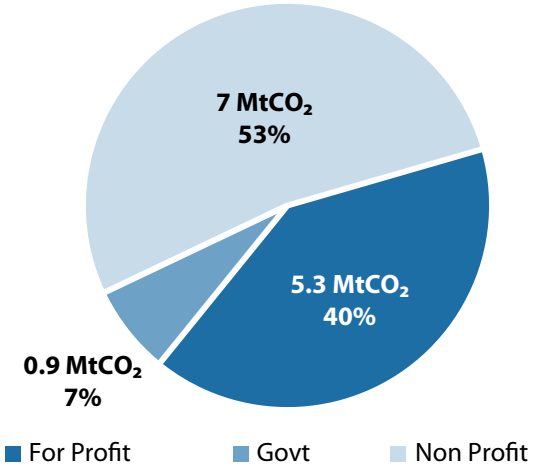
A carbon credit in the voluntary market does not fulfill its life's goal of offsetting another

GHG emission until it is 'retired' by a supplier or final buyer. When an entity purchases carbon credits to offset its emissions, the carbon credit must be retired and cannot be sold again. Retirement is critical in the voluntary markets because it represents the market impact from an environmental perspective and relates to the fundamental demand in the market for offsetting GHG emissions. Hence, we also tracked the volume of credits retired for customers. Of the 15.3 $MtCO_2$ sold in 78 projects, we accounted for 6.1 million tonnes that had been retired. This number should be considered especially conservative since many suppliers do not know the fate of the sold credits.

III.2.5 Non-profit versus For-profit Suppliers

Suppliers in the offset market range from conservation organizations to investment banks to retailers selling offsets online. Both non-profit and for-profit entities supply forestry-based offsets. We identified 54% as non-profit organizations, 39% as for-profit organizations, and 6% as the public sector.

Figure 12: Total volume sold by organization type



Largely due to their early role in market development, non-profits provided over half of offset credits. Before 2002, the non-profit sector transacted three-quarters of the credits on the market. Between 2002 and 2007, the non-profit sector still dominated the market but the for-profit sector increased its market share. In 2008, for-profit companies reported transacting 553,658 tCO_2, non-profits 1.4 $MtCO_2$ and governments 860,800 tCO_2. In mid-2009, the non-profit sector had already traded 655,954 tCO_2, nearly half the volume of the previous year, and for-profit sector transactions of 617,745 tCO_2 had surpassed the previous year's volume by 12%.

Market value shares are spread relatively evenly for the non-profit and private sectors. The private sector made up nearly half the market value at $54.5 million while non-profit sector sales equated to $49.2 million. Public sector trades were worth $8.1 million. The lower value figures for the non-profit sector, despite capturing the lion's share of the market, are a result of a lower volume-weighted price average than the private sector at $7.07/$tCO_2$. The non-profit sector commands the lowest price of the three sectors, with the public sector selling at a volume-weighted average price of $8.61/$tCO_2$ and the private sector selling at $10.21/$tCO_2$. As far as retirement, the private sector retired nearly two-thirds of credits sold while the non-profit sector retired only 39% of credits transacted. We did not track any credits retired originating from public sector developers.

III.3 Forest Project Types in the OTC Voluntary Market

Forest carbon credits originate from three major project types: REDD, A/R and IFM:

- REDD refers to reducing emissions by preserving existing threatened forests, i.e. by avoiding their deforestation and degradation. Deforestation refers to direct human-induced, long-term conversion of forested land to non-forest land.[15]

[15] The Biocarbon Fund, *Methodology for estimating reductions of GHG emissions from mosaic deforestation*, Washington: BioCarbon Fund, December 15, 2008, *available at* http://wbcarbonfinance.org/docs/REDD_mosaic_methodology_15_Dec_2008.pdf.

Summary Points:

- Of the three major types of forest carbon projects, A/R projects transacted the highest volume of credits (59% or 7.8 $MtCO_2$), followed by REDD at 24% (or 3.1 $MtCO_2$), and finally IFM at 8% (or 1.1 $MtCO_2$).
- A/R credit sales account for nearly half the forest carbon market's value ($52.2 million at an average $6.72/$tCO_2$). The value of REDD projects falls behind at $41.6 million (at $13.33/$tCO_2$). Though IFM projects account for only 8% of historic sales volumes, their high credit price (at $9.29/$tCO_2$) increases their overall value to $10 million.
- A/R + REDD (mixed) projects have transacted a volume of 753,336 tCO_2, valued at $5.5 million (at a volume weighted average $7 36/$tCO_2$) over time.
- In 2008 and the first half of 2009, the price for REDD credits was well above average at $11.43/$tCO_2$ and $9.43/$tCO_2$, consecutively. A/R sales volumes in the first half of 2009 have almost matched all of the A/R projects' 2008 volumes.

- Degradation refers to gradual, direct human-induced loss of forest carbon stocks, for example through logging, grazing, fire or fuelwood collection. Under REDD, we also included projects listed as "avoided deforestation" projects.
- Afforestation refers to the process of establishing and growing forests on bare or cultivated land, which has not been forested in recent history.[16] According to the UNFCCC definition, afforestation projects occur on land that has not been forested for 50 years or more.[17] Reforestation means regrowing forests in areas where forests have been previously harvested. The Kyoto Protocol's CDM limits reforestation activities to those occurring on lands that did not contain forest on December 31, 1989. When categorizing project types, these two project types are typically grouped with reforestation and referred to as one category: Afforestation/Reforestation (A/R).
- IFM refers to activities implemented to enhance carbon stocks on forest lands.

Of the total 207 projects that responded to this question, seven executed multiple project type activities, which resulted in two additional 'project types': A/R+REDD+IFM and A/R+REDD. Throughout this section, REDD will refer to projects exclusively creating REDD credits, A/R to those exclusively creating A/R credits, and IFM to those exclusively creating IFM credits.

A/R projects are the most common source of credits, with 183 projects (represented by 38 project developers) accounting for 59% of the volume transacted or 7.8 $MtCO_2$. The 11 REDD projects reporting transactions in the OTC voluntary carbon market comprised just 5% of the total number of projects but accounted for 24% of the volume transacted, selling 3.1 $MtCO_2$ to date. IFM projects are the third most common, with five projects accounting for 4% of the volume transacted or 1.1 $MtCO_2$. The six A/R+REDD projects and the one A/R+REDD+IFM project accounted for 6% and 3% of the volume transacted, respectively.

[16] The World Bank Group, "Glossary of Terms," World Bank Carbon Finance, http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTCARBONFINANCE/0,,contentMDK:21849022~menuPK:5232839~pagePK:64168445~piPK:64168309~theSitePK:4125853,00.html

[17] CDM Executive Board, *Glossary of CDM Terms*, August 19, 2009, available at http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf.

Figure 13: Total volume by project type

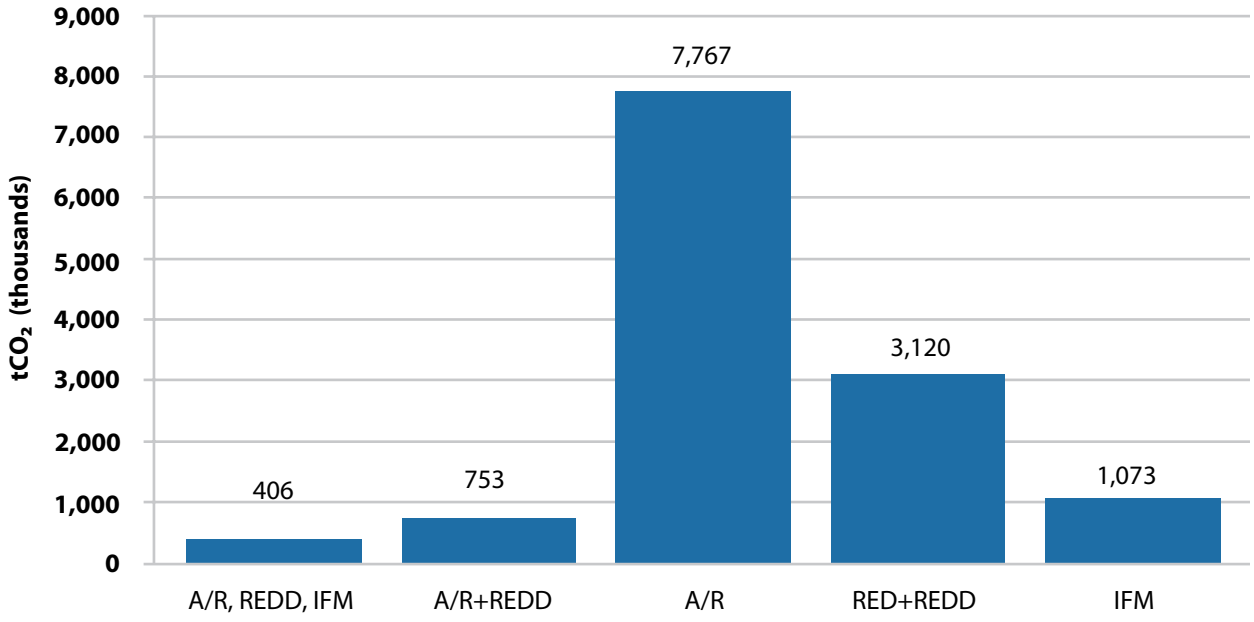
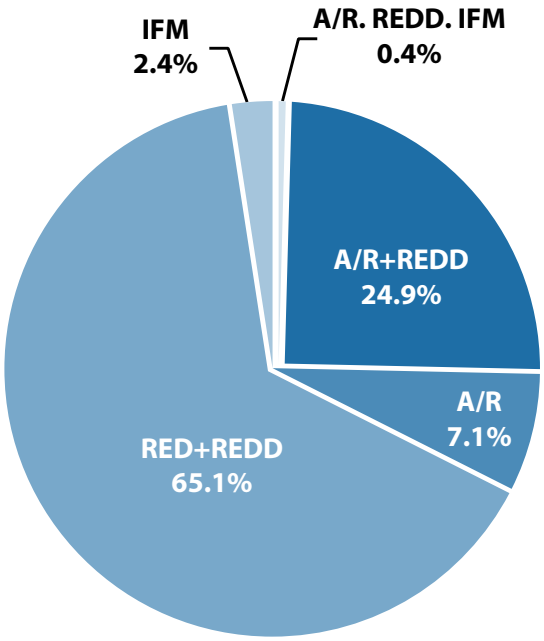


Figure 14 Hectares by project type



III.3.1 REDD Projects

REDD projects transacted the second highest volume of credits in the voluntary OTC market, 3.1 $MtCO_2$, or 24% of the total volume transacted and generated $41.6 million. All of these credits come from just 11 projects, meaning that REDD projects on average produce a much higher credit stream than any other project type. Five of the 11 projects were in Latin America and the rest in North America, Africa, Asia, and Oceania (Australia). In total, respondents reported REDD projects covering 1,122,940 hectares.

The majority of REDD credits (1.6 $MtCO_2$) were transacted prior to 2002. Following this early wave of transactions, the REDD market did not experience activity again until 2006, when one project generated a small volume of credits. Four projects generated credits in 2007 and only three in 2008. Interest in REDD project development soared in 2008, after the 2007 UNFCCC Bali negotiations reached a global consensus on the need to halt deforestation. However, due to political uncertainties and the time needed for project development, this interest has yet to translate into a surge in offset sales. Eveline Trines, director of Silvestrum, notes, 'REDD is easy if you say it fast. The reality check is that figuring out this investment will take time, particularly because of the social and political dimensions.'

REDD credits have ranged from $9.43/$tCO_2$ to $17/$tCO_2$. The weighted price average of $13 33/$tCO_2$ is higher than any other project type. However, if the 1990 Mbaracayu Forest Reserve project is included in the analysis, average weighted REDD prices drop to $2.68/$tCO_2$.

REDD prices hit a high of $17/$tCO_2$ in 2006 and have since experienced a downturn. The weighted average price was $11.43/$tCO_2$ in 2008 and $9.43/$tCO_2$ in the first half of 2009.

III.3.2 Afforestation/Reforestation Projects

We tracked 183 projects that generated either afforestation or reforestation credits. Compared to other project types, the A/R projects transacted the highest credit volumes. Together, these projects have sold 7.8 $MtCO_2$, or 59% of the total volume. Respondents reported 122,390 hectares of A/R projects.

Annual transaction volumes have increased through the years, except for a sharp decline in 2005 (458,604 tCO_2) and a less significant drop in 2008. However, credit generation appears to be rebounding in 2009 (1.1 $MtCO_2$), with sales in the first two quarters nearly matching total sales in 2008.

A/R projects account for nearly half of the total value ($52.2 million out of $111.9 million) generated by forest carbon projects, leading over REDD projects by more than $10.6 million. Prices for A/R projects have averaged $6.72/$tCO_2$ across all years, with a high of $9.85/$tCO_2$ in 2007, a dip to $5.89/$tCO_2$ in 2008, and slight increase to $6.34/$tCO_2$ in the first two quarters of 2009.

III.3.3 IFM Projects

Historically, IFM projects resulted in 1.1 $MtCO_2$ transacted, or 8% of total credit volume. While IFM projects did not generate any credits until 2003, they have since produced between 100,000 and 250,000 tCO_2 reductions annually. In 2008, project developers sold 213,200 tCO_2 from five IFM projects.

Overall, IFM projects were the source of almost $10 million in transactions. IFM credits fetched the second-highest weighted average price of all credits ($9.29/$tCO_2$), just behind REDD ($13.33/tCO_2), and followed by A/R+REDD credits at $7.36/$tCO_2$. The average annual price for IFM credits peaked in 2006 ($11.96/$tCO_2$) and has since decreased.

III.3.4 Mixed Projects

Projects combining A/R+REDD have generated 753,336 credits from six projects, covering 429,552 hectares, across Mexico, Ecuador, Brazil, Uganda, Madagascar and the United States. A/R+REDD credit volume leapt to 517,898 credits in 2008, while no previous year exceeded 100,000 credits.

Transactions from A/R+REDD projects totaled $5.5 million, with an average price of $7.36/$tCO_2$. Credits garnered an average annual price of $8 38/$tCO_2$ in 2002, then slid to $3.82/$tCO_2$ the following year before slowly rallying to $19.48/$tCO_2$ by 2007. The price slipped back to $6/$tCO_2$ in 2008 and has since rebounded to $10.86/$tCO_2$ as of mid-2009.

Only one project, Scolel Te in Mexico run by Mexican environmental NGO AMBIO, fits the A/R+REDD+IFM category. The Scolel Te project has transacted 406,409 tCO_2. The project sold an average of 40,000 credits annually between 2002 and 2008 and covers 7,500 hectares, less than 1% of all land area covered by forest carbon projects.

III.4 Species of Forests in the Voluntary OTC Markets

Summary points:

- Survey respondents chose tropical moist forests as the most popular forest type (15 projects), followed by temperate coniferous (10 projects) and temperate broadleaf/mixed (six projects).
- Most tropical moist forests involve REDD, and four out of five IFM projects selected the temperate coniferous forest type. A/R projects were less exclusive, covering a wider range of forest types.
- Projects affecting tropical moist and sparse forests spiked in 2008 – around 57% of sparse tree projects and 53% of all tropical moist projects occurred in 2008 – and dropped off significantly in 2009.
- About 76% of projects were planted with "mostly indigenous" species and generated 82% of credits sold.

To gain further insights into the type of landscapes supported by carbon finance, we asked project developers to select the forest type of their project as well as an indigenous vs. exotic classification. The forest type options were: temperate coniferous, temperate broadleaf/mixed, tropical moist, tropical dry, sparse trees, forest plantations, agroforests, and other forest type.

This question received responses from project developers from 58 projects, for which the most common forest types were tropical moist (15 projects), temperate coniferous (10 projects), and temperate broadleaf/mixed (six projects). The remaining forest types received two to six hits each.

Figure 18 shows the relationship between forest and project type, with each color indicating a different forest type. The majority of projects implemented in tropical moist forests involve REDD. Four out of five IFM projects selected the temperate coniferous forest type, with one project occurring in a tropic moist environment. A/R projects affect the widest range of forest types and they are the only projects that exist in temperate broadleaf/mixed forests.

III.4.1 Exotic versus Indigenous Species on A/R and IFM Projects

A frequently cited concern is that carbon finance could encourage exotic, fast-growing monoculture plantations that are inappropriate for local site conditions, at the expense of high-value natural forests and the diverse needs of local communities. To begin scratching the surface of this issue, we asked project developers of A/R and IFM not only to identify their forest type but also more specifically whether their projects cover indigenous or exotic species.

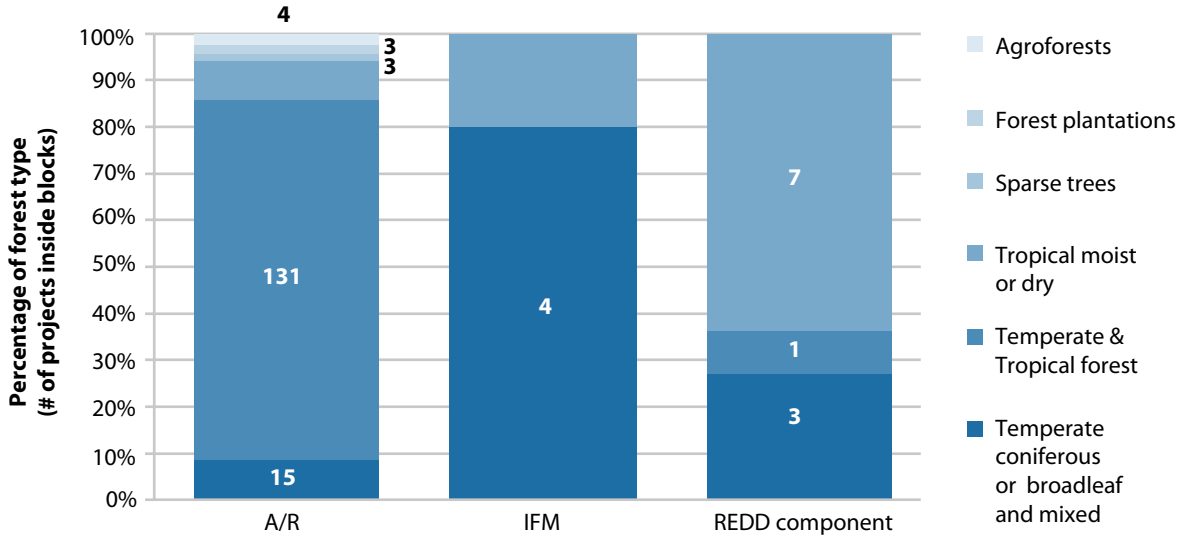
We received responses from 44 project developers out of the total of 62 project developers representing projects with A/R or IFM components. We grouped responses into three categories: mostly indigenous species (>85% of the project area planted with indigenous species), mostly exotic species (>85% of the area planted with exotic species), and mixed (a mixture of indigenous and exotic species planted).

The majority of projects (76%) were planted with mostly indigenous species and 18% were planted with mixed species, leaving just 7% with mostly exotic species. In terms of transactions volume, the bulk of credits sold (82%) were sourced from projects that planted mostly indigenous species. About 9% of the credits sold came from mixed species plantings and 8% from purely exotic species plantings.

The use of indigenous species is the result of several factors, including a prevalent buyer preference for credits originating from native forests. For example, a study by EcoSecurities, ClimateBiz, Conservation International (CI), and the CCBA found that the majority of potential buyers of forestry offsets were attracted by more natural forests and favored avoided-deforestation projects followed by reforestation with native tree species.[18]

[18] EcoSecurities in partnership with CCBA and Climate Biz, *The Forest Carbon Offsetting Trends Survey 2009*, London, UK: Ecosecurities, 2009 *available at* http://www.ecosecurities.com/GetAsset.ashx?AssetId=24136.

Figure 15: Forest type by project type



III.5 Project locations in the voluntary OTC markets

Summary points:

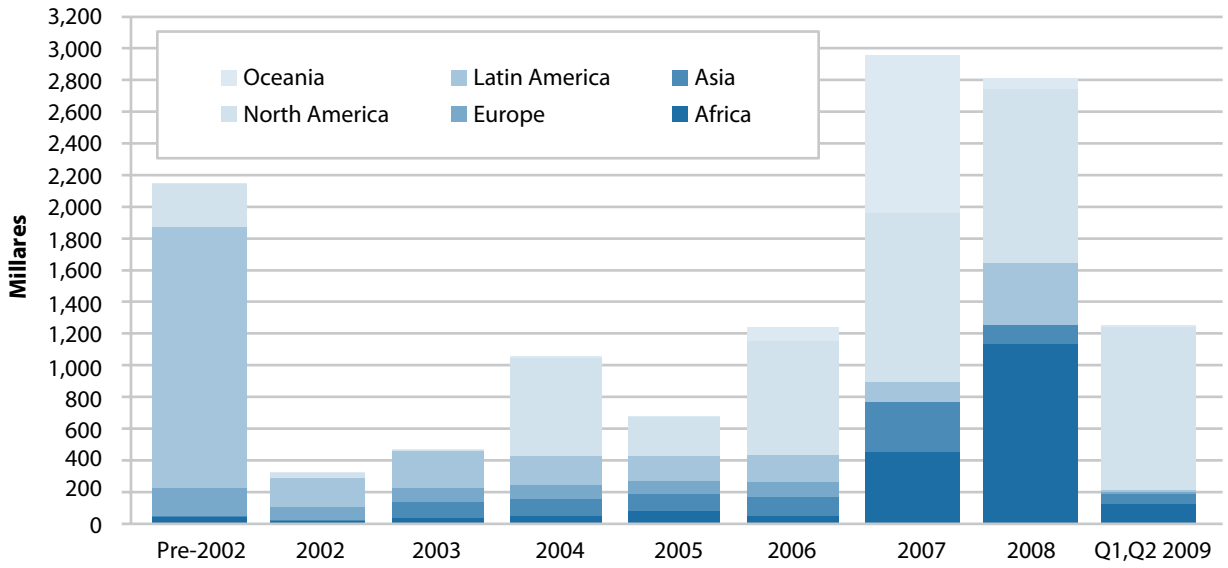
- About 38% (5.1 $MtCO_2$) of transacted offsets came from North America, 23% (3.1 $MtCO_2$) from Latin America and 15% (2.0 $MtCO_2$) from Africa.
- In terms of transaction value over time, Latin America takes the top prize with $29.6 million at a volume-weighted average price of $9.59/$tCO_2$, followed by North America ($26.2 million at $5.13/$tCO_2$) and Africa ($20.9 million at $10.38/$tCO_2$).
- Regions with the largest reported hectare areas influenced by carbon finance are Africa (795,015 hectares), Latin America (669,952 hectares) and Asia (196,744 hectares), with North America at the opposite end of the spectrum (32,917 hectares).

In most years, offsets from Oceania and Europe have commanded the highest volume-weighted average price, though the price of European offsets dropped from $19.80/$tCO_2$ in 2008 to $1.00/$tCO_2$ in the first and second quarter of 2009.

Project developers have implemented forest carbon offset projects across the globe, and respondents reported projects in 40 countries. About 38% of offsets came from 18 projects in North America – less than 10% of the world's forestry projects. Latin America comes in a close second with 23% of the world's forestry offsets (3.1 $MtCO_2$) from 19 projects, and Africa is third with 15% of the total (2.0 $MtCO_2$) coming from 15 projects.

The earliest projects occurred in Latin America. In fact, Latin America maintained a lead in annual volume of credits sold over all other regions until 2004, when North America moved into first place and maintained the lead until 2007. Due to one large transaction, Africa overtook North America in 2008, but North America regained the top position in the first half of 2009.

Figure 16: Total sales volume by region



As a high volume player, North American weighted average credit prices historically average \$5.13/tCO_2. Oceania has the highest average prices (\$14.80/tCO_2) over time, followed by Africa (\$10.38/tCO_2), Asia (\$9.91/tCO_2) and Latin America (\$9.59/tCO_2).

The two regions with the most projects are also the largest forestry offset markets in terms of total transactional value, with Latin America in the top slot (\$29.6 million), followed by North America (\$26.2 million). Around 68% of Latin America's historic transaction value is attributed to transactions that occurred before 2002. Africa comes in third with respect to both the number of projects and total value (\$20.9 million), followed by Oceania with a total transactional value of \$17 3 million.

As far as reported hectares, the regions with the largest areas influenced by carbon finance are Africa (795,015 hectares), Latin America (669,952 hectares) and Asia (196,744 hectares). Most notably, North America reported just 32,917 hectares despite high transaction volume, value and number of projects. European projects covered only 664 hectares. This discrepancy in hectares can be partially explained by several mega projects connected with national parks or government-owned land in Latin America, Africa and Asia. Alternatively, in North America most reported projects were privately owned, smaller-scale projects. It is also important to note that information shared by respondents on hectares compared to transaction volumes in some cases varied significantly.

III.5.1 North America

North American forestry projects have generated the greatest transaction volume of 5.1 MtCO_2 in reductions. North America took a relatively early lead in developing forestry offsets, with at least three projects selling credits in 2002. Since 2004, transactions to voluntary buyers have continued to steadily grow. In 2008 project developers transacted 1.1 MtCO_2 with an average price of \$5.01/tCO_2.

In the first half of 2009, North America produced nearly the same volume (1.0 MtCO_2) as in all of 2008. Recent proposed cap-and-trade legislation in the US has elevated the buzz around forest carbon offset projects in this region. For example, the Clean Energy Jobs and American Power Act, otherwise known as the Kerry-Boxer bill, is awaiting its fate in the Senate. The bill includes provisions for the conditional use of forestry offsets, including improved forest management and reduction of emissions from deforestation and forest degradation, against industrial emissions.[19] The bill also permits recognition of 'early action credits' issued under regulatory or voluntary GHG emission offset programs that require credited emissions reductions, avoidance or sequestration to be permanent, additional, verifiable and enforceable, and to meet certain transparency, third-party verification, and registration requirements.[20]

In addition to actual credit sales, it is clear that a significant amount of early pre-compliance investment is already occurring. Alex Langer of Ecosystem Restoration Associates explains, 'So much money is sitting on the sidelines just waiting for regulatory certainty.'

However, not all transactions in North America were for pre-compliance. In fact, in 2008 several large forestry deals delivered and retired credits into the hands of purely voluntary buyers based in Europe and North America.

[19] Clean Energy Jobs and American Power Act, S. 1733, 111th Congress, §731-740 (2009). The bill was passed by the Senate Environment and Public Works Committee on November 5, 2009. *See* The Library of Congress, "THOMAS Bill Summary for S.1733", http://thomas.loc.gov/cgi-bin/bdquery/D?d111:52:./temp/~bd4mNx::|/bss/|.

[20] Ibid.

III.5.2 Latin America

Over half (53%) of Latin America's forestry-based offsets were transacted prior to 2002, and these offsets accounted for a staggering 70% of all forestry offsets worldwide in that period. This is largely because non-profit organizations active in the region, such as TNC, Plan Vivo, and the Face Foundation, had partnered with corporations and communities to develop innovative ways of conserving forests in a region with relatively established land tenure and government stability.

Post-2002, the number of credits transacted has remained steady but the region's market share has decreased over time. In 2008, Latin America saw a rise in transactions up to 384,958 tCO_2, or 13% of all reductions globally, compared to 175,304 tCO_2e in 2002 – or 54% of the market at the time. However, in the first two quarters of 2009, Latin American project developers transacted just 9,087 tCO_2 (at an average price of $11.48), which is less than 1% of total global volume for this period.

This limited supply may reflect the political climate in the region. Recently, Ecuador underwent a major constitutional reform, which included an article that limits the appropriation of ecosystem services. Brazil's Federal Government has also been critical of a market-based approach to REDD based on direct payments to land-owners, and has instead been promoting a fund-based approach to aggregate contributions from abroad (and also from market-based schemes) and distributing them via a central authority. At the same time, many entities are waiting to develop projects until international financing mechanisms for REDD are settled.

III.5.3 Africa

Across markets and project types, a limited amount of carbon finance has reached Africa. In 2008, the continent produced about 4% of primary CDM credits[21] and less than 2% of transacted credits in the broader OTC voluntary market.[22] Because of low industrialization, many stakeholders have seen forestry as the best source of carbon finance for the region.

Considerable money and time invested in African forestry projects seems to be paying off. We tracked 15 forestry projects actively selling carbon-offset projects with a total of 2.0 $MtCO_2$ in transactions. More than 86% of the region's forest carbon offset transactions occurred after 2006, with total volume jumping from 51,910 tCO_2 in 2006 to 458,627 tCO_2 in 2007 and 1.1 $MtCO_2$ in 2008. In the first half of 2009, transactions slowed to just a reported 131,215 tCO_2, but stakeholders predict continued development.

The average price per credit for African forestry credits ($10.38/$tCO_2$) is the second highest regional average. However, prices for African projects have experienced significant volatility. The average annual price per credit peaked in 2007 at $15.24/$tCO_2$, while other annual averages ranged from $6- $11/$tCO_2$. In 2008, credits sold for an average of $9.28/$tCO_2$.

III.5.4 Oceania

In Oceania, six out of seven credits were originally generated in Australia. To date, seven projects have covered a land area of only 34,097 hectares, small in comparison to the 795,015 hectares in Africa that have generated offsets for the OTC market. It is expected that Oceania's projects will sequester 3.1 $MtCO_2$ over their lifetime.

The historic value of Oceania's forest carbon offset market is a story of quality (or should we say price) over quantity. Oceania trails Africa, Latin America and North America in offset sales volume, transacting a total of 1.2 $MtCO_2$

[21] World Bank, *State and Trends of the Carbon Market 2009 report*, (Washington, DC: World Bank), May 26, 2009, *available at* http://wbcarbonfinance.org/docs/State___Trends_of_the_Carbon_Market_2009-FINAL_26_May09.pdf.

[22] Katherine Hamilton, Milo Sjardin, Allison Shapiro, and Thomas Marcello, *State of the Voluntary Carbon Markets 2009*.

forestry offsets – a mere 9% OTC market share by volume. Despite the low volumes, these credits have generated 15% of market share by value because forest carbon projects from this region have been sold for an average of $14.80/tCO_2$ across all years, more than $4 per credit higher than any other region.

Oceania's OTC market derives most of its historic value from forest carbon offsets sold in 2007, when the region's offsets exhibited a high average price ($15.30/tCO_2$) and peaked in volume (993,274 tCO_2). In 2007, Oceania's OTC voluntary offset market was valued at $15 million, generating 88% of the region's total historic market value including regulated markets. In 2008, however, Oceania's average credit price fell to $10.57/$tCO_2$, and increased again to $13.20/tCO_2$ in the first half of 2009. Despite the increase in price, the region's OTC market value fell significantly in 2008 ($711,729) and in the first and second quarters of 2009 ($84,973), as volumes dropped to 67,350 tCO_2 and 6,436 tCO_2, respectively.

III.6.5 Asia

Across project types, Asia, as the source of 17 $MtCO_2$, led the world in creating credits transacted in the OTC voluntary carbon market in 2008. Very few of these credits, however, were forestry-based, with the bulk coming from renewable energy projects.[23]

Overall, the region transacted 7% (957,227 tCO_2) of the world's forestry-based offsets. Respondents reported 11 forestry projects transacting a total of 120,575 tCO_2 in 2008. From 2003 to 2006, annual transaction volumes hovered just above 100,000 tCO_2. In 2007, credit volumes spiked, with sales from one large project pushing the annual total to 311,000 tCO_2.

Offsets originating in Asia have sold for an average price of $9.91/tCO_2$. Credits sold in 2006 and 2007 fetched the highest prices ($12.88/$tCO_2$ and $12.75/tCO_2$, respectively) while most other years experienced prices in the $7-$8/tCO_2$ range. In 2008, the average credit price was $7.73/tCO_2$.

While historical sales have been limited, it seems the market for Asian projects is set to grow. With the potential for REDD in the regulated carbon markets, private sector companies and non-profits have begun staking claims across high deforestation areas, such as Indonesia. For example, the Chinese State Forestry Administration and China Green Foundation are building a 'Green Carbon Fund' to create VER credits from local A/R projects and REDD pipeline research by CIFOR identified more than 35 projects in Indonesia alone.[24]

III.5.6 Europe

The European region is home to forests that have been managed sustainably for decades. However, activities that preserve or expand these forests do not usually translate into forestry offsets, largely because most forests are publicly-owned and their sequestration is already factored into national greenhouse gas inventories under the Kyoto Protocol. Nations that sequester large amounts of carbon through sustainable land use can free up additional AAUs, and any voluntary offsets from forestry come from countries that choose to allow for domestic JI projects in the land-use sector, according to Anna Lehmann, Senior Climate Change Officer for Policy and Regulatory Affairs, at Sindicatum Carbon Capital.

'If you want to sell VERs from European forestry projects, the country in which you're operating has to cancel an equivalent number of AAUs,'

[23] Katherine Hamilton, Milo Sjardin, Allison Shapiro, and Thomas Marcello, *State of the Voluntary Carbon Markets 2009*, Ecosystem Marketplace and New Carbon Finance, May 20, 2009, *available at* http://www.forest-trends.org/documents/files/doc_2343.pdf.

[24] Erin Sills, Erin Myers Madeira, William Sunderlin, Sheila Wertz-Kanounnikoff, *The Current Landscape of REDD+ Demonstration Projects (Draft)*, *available at* http://www.forest-trends.org/documents/files/doc_2343.pdf.

she says. 'Most countries aren't willing to do that, because they may want to use those allowances down the road.'

Transaction figures from the European region reflect these obstacles. To date, Europe has transacted just 624,182 tCO_2 and most of these projects were sold prior to or just after the 2005 launch of the EU ETS, when concerns over double-counting became apparent. Projects stretch across 664 hectares, and it is projected that current projects will sequester a total of 500,000 tCO_2. In addition to weak demand for European-based credits, small project size may also explain these low volumes. For example, the number of European projects (6) was on a par with that of Oceania (7), yet Oceania transacted 88% more volume historically.

Because the bulk of European forestry projects have sold at the retail level, they have fetched some of the highest priced credits, especially in recent years. In 2007, offsets sold for an average of \$46.39/tCO_2, though this value dropped to \$19.80/tCO_2 in 2008.

III.6 Land Tenure

Summary points:

- The largest number (4.9 $MtCO_2$ or 36.8%) of transacted credits were reported from government-managed land, almost a quarter (22%) of which were generated on state-managed protected areas in 2008.
- Another 27.8% (3.7 $MtCO_2$) of credit volume sold came from land involving collective or customary rights
- About 22% (2.9 $MtCO_2$) of all credits over time come from privately owned land.

Land tenure refers to the rights that an individual or group has with respect to a given area of land and the resources therein. Land tenure systems 'define how access is granted to rights to use, control, and transfer land, as well as associated responsibilities and restraints.[25] Generally speaking, these systems determine who may use natural resources and how such resources may be used.

Tenure is a vital issue in the forest carbon market because forest carbon credits are inextricably tied to rights in land. A forest carbon credit supplier promises to perform, or refrain from performing, certain activities on a particular area of land. If the supplier lacks the right to perform such activities in the first place, the promise is invalid (an illegal promise to act) or worthless (a promise to refrain from doing something the supplier had no right to do).

Uncertain tenure is a pervasive problem in many forest areas, affecting who may participate in and benefit from forest carbon projects. Those that may be excluded from the market due to tenure issues include local communities that lack official tenure, the holders of informal or customary rights, or those that have formal tenure but lack documentation. In many places, poor, forest-dependent communities fall into one or more of these uncertain tenure categories, making it difficult – if not impossible – for these communities to access forest carbon revenues.

A close examination of land tenure helps us to describe relationships between market participants and to identify the beneficiaries of forest carbon projects. To better understand land tenure in the voluntary OTC market, we asked project developers to identify the official land/forest tenure and use rights within their project areas. Based on their responses, we identified

[25] Food and Agriculture Organization of the United Nations, *Land Tenure and Rural Development*, Rome: FAO, 2002, *available at* ftp://ftp.fao.org/docrep/fao/005/y4307E/y4307E00.pdf .

the following land tenure classifications:

1. **Privately-owned land** – Project area includes only land owned by individuals, NGOs, or foundations.

2. **Land owned and managed by government** – Project area includes land owned and directly managed by the central or local government.

3. **Corporate entity/concession managed state production forests** – Project area includes only land leased by government to corporate entities/concessions for production purposes.

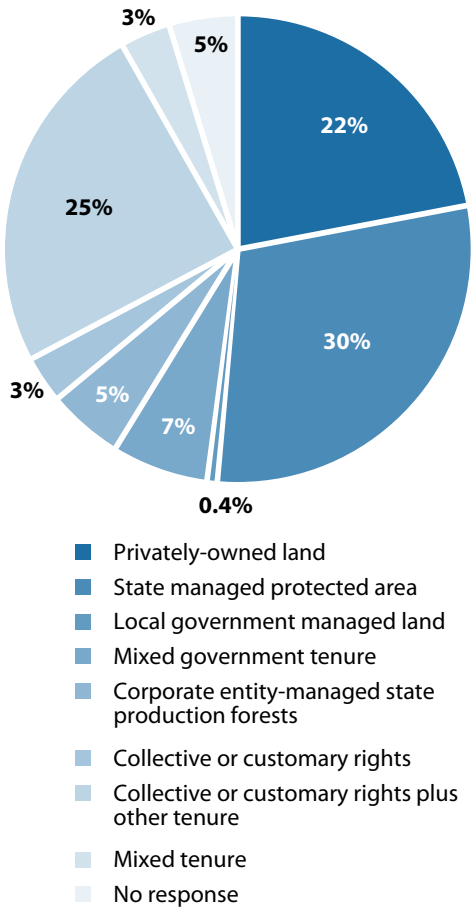
4. **Land involving collective or customary rights** – Project area includes land in which communities or farmers hold collective rights to the use of the land/forest as officially acknowledged by the government, plus land under other tenure. The community's or farmers' rights could arise from traditional or customary land use practiced on the area that has been officially acknowledged. Other tenure-holders associated with collective rights holders are government-managed protected areas and individual farmers/private landowners.

5. **Mixed tenure** – Project area includes land under private ownership as well as areas under one or more other tenure classifications, but not lands subject to collective or customary rights.

Almost all respondents (98%) reported a tenure classification for project areas. A large number (4.9 $MtCO_2$ or 36.8%) of credits transacted by project developers came from government-managed land. Land involving collective or customary rights produced another substantial portion of the credits (27.8%), the bulk of which were generated before 2002 (52%). Privately owned land generated 22% (2.9 $MtCO_2$) of transacted credits on a small portion of the land relative to other classifications.

Although only 3.2% of the project developer credits were reported from land held by communities or farmers under collective or customary rights, an additional 24.6% of credits came from projects that reported collective or customary rights along with another tenure classification. Only 5.2% of project developer credits came from state production forest lands managed by concessions or corporate entities in Africa and Asia.

Figure 17: Proportion of transacted credits reported under each tenure classification



III.7 Tenure Totals and Trends

III.7.1 Government-managed Land

The largest tenure category – with nine projects, 4.9 $MtCO_2$ transacted, and 36.8% of credit volume sold – was government-managed land. Within this group, most transacted credits (six projects, 3.9 $MtCO_2$, and 29.8% of the total credits) came from state-managed protected areas. International NGOs or big project developers have been assisting governments to set up carbon projects in protected areas as long-term financing of park management and to generate environmental co-benefits. This tenure subcategory has generated substantial numbers of transacted credits each year since 2004 and accounted for more than 60% of transacted credits in both 2004 and 2006.

State-managed protected areas continued to be strongly represented in recent years, accounting for 38% of all credits in 2008 (1.1 $MtCO_2$) and through the first two quarters of 2009 (487,477 tCO_2). Mixed government-managed land accounted for 6.7% of all credits sold. However, the number of credits reported from this subcategory has been increasing each year since 2005, both in terms of absolute credit volumes and in terms of the proportion of total credits sold – this subcategory more than doubled its 2008 totals in the first two quarters of 2009.

III.7.2 Land Involving Collective or Customary Rights

There were 16 projects involving communities or farmers with officially-acknowledged collective or customary use rights on the land that transacted a total of 3.7 $MtCO_2$ or 27.8% of all credits over time.

About half (1.9 million) of the credits reported from this group were sold before 2002. Since that time, transacted credits remained between 100,000 and 200,000 each year through to 2006, jumped to half a million in 2007, and fell to 312,773 in 2008. Transactions in the first two quarters of 2009 were on track to match 2002-06 levels at 109,161 credits.

In addition to being the second-largest land tenure type, land involving collective or customary use rights accounted for more than a third (38%) of the total project area. The particularly large land area reported for this tenure category came from a single project covering 642,183 hectares (36% of the total reported area for all projects) that involved lands under collective or customary rights as well as state-managed protected areas.

Projects on collectively-held lands arose from Latin America (7), Africa (6), Asia (2) and North America (1). Projects on government-managed lands came out of North America (4), Africa (2), Asia (2) and Oceania (1). The two projects on concession lands were located in Africa and Asia.

Given calls for increased community management of forest offset projects[26] and trends towards enhanced tenure rights for forest communities[27], the proportion of forestry offsets generated by land subject to collective or customary rights seems likely to increase in the future.

III.7.3 Privately-owned Land

With 28 projects transacting 22% (2.9 $MtCO_2$) of all reported credits, privately owned land accounted for the third-largest tenure category. Since before 2002, privately owned land historically generated less than 200,000 transacted credits per year. However, 2007 saw

[26] *See, e.g.*, Ashwini Chhatre and Arun Agrawal, *Trade-offs and synergies between carbon storage and livelihood benefits from forest commons*, PNAS, October 6, 2009, *available at* http://www.icarus.info/wp-content/uploads/2009/11/ChhatreAgrawalPNAS2009main.pdf.

[27] William D. Sunderlin, Jeffrey Hatcher, and Megan Liddle, *From Exclusion to Ownership? Challenges and Opportunities in Advancing Forest Tenure Reform*, Rights and Resources Initiative, July 2008 *available at* http://www.rightsandresources.org/documents/index.php?pubID=736.

a large jump in this category – up to 1.4 million credits – which fell to just more than 500,000 credits in 2008, and to 33,661 credits in the first two quarters of 2009.

Almost all projects on privately-owned land were small in size, indicating the small scale of privately owned projects. The number of hectares reported was also relatively limited. The area under private ownership that transacted credits covered only 6.6% of the total hectares reported.

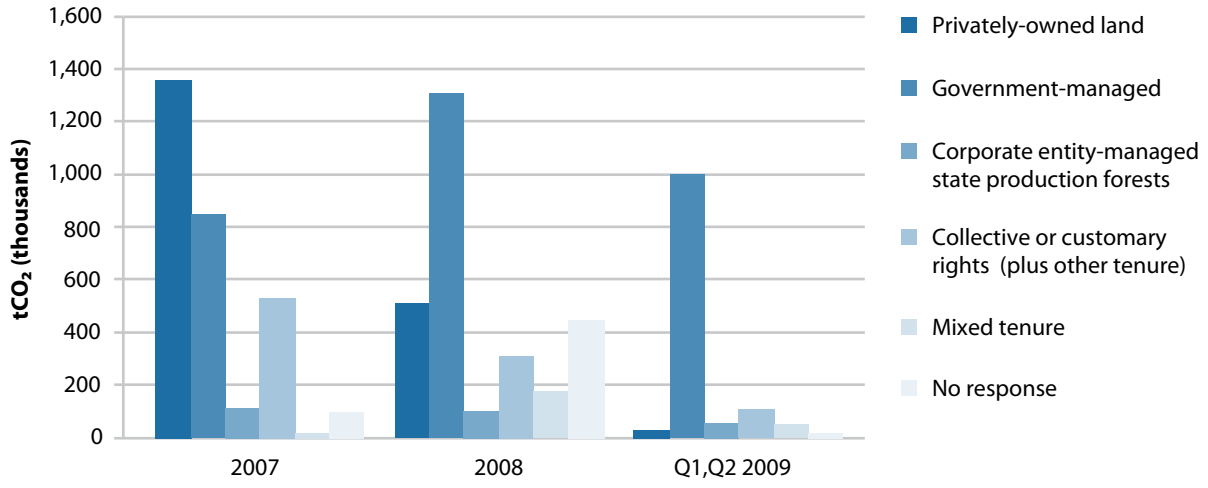
III.7.4 Corporate Entity/Concession-managed State Production Forests

International project developers are assisting corporate entities or concessions in state-owned production forest lands in the tropics to set up carbon projects as an additional income source while contributing to climate change mitigation. However, only 5.2% of project developer credits came from state production forest lands managed by concessions or corporate entities in Africa and Asia. Regulations are still evolving in these regions and there is not much knowledge or interest exhibited by the corporate sector yet in this new opportunity. Reported credits from the concessions have remained steady at around 100,000 per year since 2003.

III.7.5 Mixed Tenure

Project developers reported 133 projects under a mixed tenure regime – twice as many projects as were reported for all other tenure categories combined – that together transacted only 459,500 credits, or 3.5% of the total. The bulk of these credits were reported to have been transacted in two reporting periods: pre-2002 (190,900 credits) and 2008 (175,400 credits). These many small projects covered a negligible amount of the total land area.

Figure 18: Transacted credits by tenure category



III.8 Deforestation and Degradation Drivers

Summary points:

- The most common drivers of deforestation and degradation on project sites were grazing and fuel wood collection (24%), agricultural plantation development (19%), planned commercial logging (16%), illegal logging (12%), ranching (10%) and urban development (7%).
- Small-scale subsistence activities (grazing and fuel wood collection) were a threat mainly in the developing regions of Africa, Latin America and Asia.
- Latin American projects registered high for all of the above pressures.

Many forest carbon projects occur in areas with past or present deforestation and degradation pressures. Where the pressures are high, forested sites would likely be deforested or degraded in the absence of these projects, thus releasing substantial volumes of carbon into the atmosphere. Similarly, barren lands with high degradation pressures are likely to remain degraded in the absence of the project activity which provides an economic incentive for growing trees that sequester and thus remove carbon from the atmosphere.

We asked project developers to describe the current and expected sources of deforestation or degradation in their project areas. Out of 46 respondents, project developers representing 16 projects reported that the most common drivers of deforestation and degradation were small-scale subsistence activities including grazing and fuelwood collection. Agricultural plantation development was also a common source of deforestation or degradation in project area forests, affecting 13 projects (19%), followed by planned commercial logging in 11 project areas (16%). Also of concern were illegal logging affecting eight project areas (12%), ranching (seven projects, 10%) and urban development (five projects, 7%).

Figure 19: Deforestation/degradation pressures on site

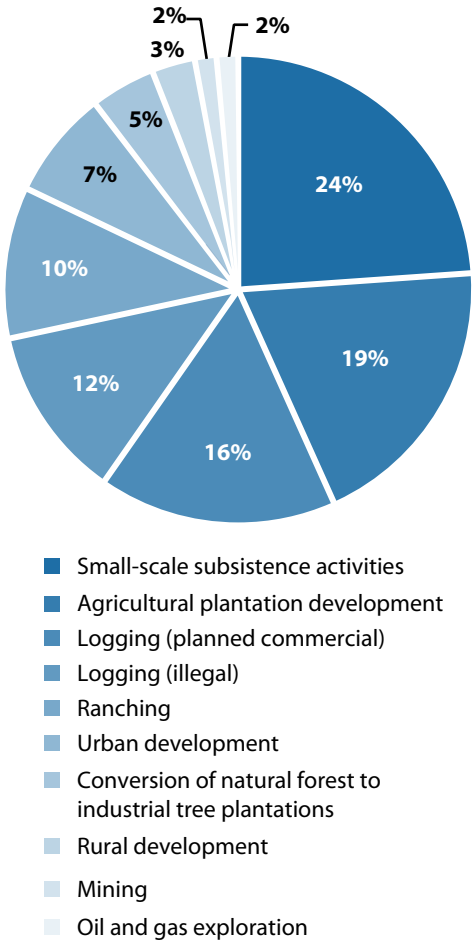
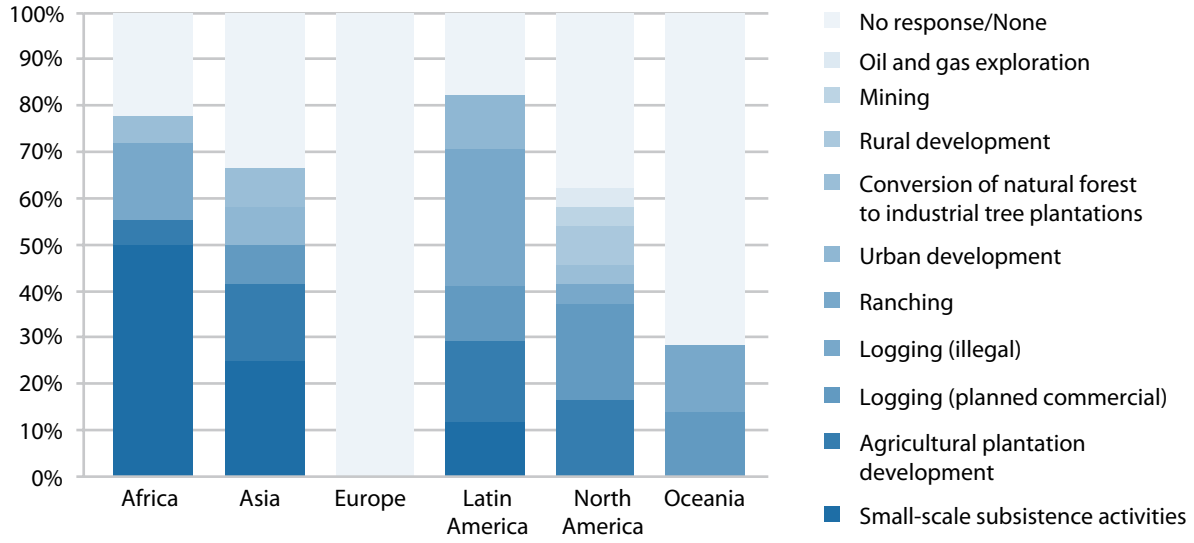


Figure 20: Deforestation/degradation drivers



Small-scale subsistence activities were a threat mainly in the developing regions of Africa, Latin America and Asia. Agricultural plantation development was listed in the same regions as well as North America, with more Latin American and North American projects facing such pressures.

Latin American projects registered high for all of the above pressures. North American forest project sites were more exposed to planned commercial logging and agricultural plantation development, but listed several other pressures as well. Nine of the 14 African projects that responded listed small-scale subsistence activities as one of the key pressures on the site, and illegal logging was reported by three projects. In Asia, the pressures on the project sites were mainly small-scale subsistence activities and agricultural plantation development; logging (legal and illegal) and conversion of natural forests to plantations were also mentioned. Project sites in Oceania, which is mainly Australia, were susceptible to planned logging and ranching.

III.9 Standards and Methodologies

Summary points:

- Historically, 70% of credits transacted on the voluntary OTC market have been sold from validated projects or verified to a third-party standard, 15% have been verified to internal standards, and 14% did not specify use of a standard.
- Historical and current data shows an increasing use of third-party standards to validate and verify carbon credits from forest carbon offset projects, jumping from 42% of credits reporting a third-party standard before 2002 to 96% of credits in the first half of 2009.
- Social and environmental benefits – such as enhanced biodiversity, improved water quality and better livelihoods for forest communities – are important to forest carbon market players, as shown by the significant use of the CCB Standards, which was reported as the validation standard (alone or in tandem with other standards) for 40% of credits.

Over the past 30 years, the methodologies, measurements and rigor for developing forestry offset projects have varied tremendously. However, in the past several years and especially 2008, the OTC voluntary carbon markets have become increasingly standardized.

In order to impose quality controls on the market, a variety of standards exist to evaluate forest carbon projects with respect to permanence, additionality and leakage, as well as other factors. Some address GHG emissions dimensions only, while others look at environmental or sustainable development criteria. Overall, this market has seen an increased use of third-party validation and verification standards over time, reflecting the central importance of standardizing and legitimizing forest carbon offsets.

As a preliminary matter, it is important to distinguish between *validation* and *verification* in the carbon offsets context. Project validation is the process of evaluating the circumstances of projects, the project plan and any methodologies determining if the project is well designed and likely to be effective. It is 'an assessment of the design of a land-based carbon project against [the standard's] criteria.'[28] Validation takes place at the end of the formal project proposal process and prior to verification and generation of offset credits.

Verification, on the other hand, is the process of certifying the project's actual efficacy in delivering benefits according to its design and monitoring plan. Verification cannot occur until sufficient time has passed for benefits to accrue. The CCBA, for example, conducts verifications every five years, beginning five years after the project begins. Unsurprisingly, the CCBA has not yet had the opportunity to verify any credits, though it has validated a significant portion of the projects reported to Ecosystem Marketplace for this report.

[28] CCBA. 2008. Climate, Community & Biodiversity Project Design Standards Second Edition 8. CCBA, Arlington, VA. December, 2008. *Available at*: www.climate-standards.org.

Another important distinction is between those standards that validate or verify carbon benefits, and those that evaluate other environmental or social benefits generated by forest carbon projects. For example, the CCBS validates and verifies the social and environmental benefits generated by forest projects, but does not quantify or register GHG emissions reductions or removals. CCBS-validated credits destined for the carbon market are often validated against another standard that quantifies GHG emissions reductions, like the Voluntary Carbon Standard (VCS), and may be registered with a stand-alone registry.

When evaluating the proportion of credits that were validated or verified to a third-party standard, this report does not distinguish between standards quantifying GHG emissions reductions and those evaluating social or environmental benefits.

III.9.1 Examples of Forest Carbon Offset Standards

American Carbon Registry Forest Project Standard

In 1996, experts at the Environmental Defense Fund founded the Environmental Resources Trust (ERT) and launched the GHG Registry, now known as the American Carbon Registry (ACR).[29] ACR was the first private voluntary greenhouse gas emissions registry in the United States, and in 2007, both ERT and ACR joined Winrock International. ACR provides carbon technical services for greenhouse gas accounting, protocol development, offset and corporate GHG inventory registration and OTC offset transactions and retirements.[30] The Forest Carbon Project Standard, launched in March 2009, is available for A/R, IFM and REDD projects within the US or non-Annex I countries.

[29] American Carbon Registry, "About Us," American Carbon Registry , http://www.americancarbonregistry.org/aboutus/about

[30] Ibid.

To address permanence, ACR offers three tools: a buffer pool, an insurance policy to replace the credits, and replacing the loss with other credits. Projects choosing the buffer pool shall use the Voluntary Carbon Standard (VCS) buffer tool. VCS or CDM tools are also to be utilized to address leakage. In total, ACR accepts methodologies from CDM, US EPA Climate Leaders, VCS and WRI/WBCSD GHG Protocol, as well as CCBS for co-benefits. ACR uses the Markit Environmental Registry, and credits verified to the standard are branded as Emissions Reduction Tonnes. Information on offsets registered, transferred, tracked and retired is available to the public.

CarbonFix Standard

The CarbonFix Standard (CFS) is a product of the non-profit association CarbonFix, which was founded in 1999 and registered in Germany in 2007 to support the potential for climate forestation projects. The standard applies to afforestation and reforestation, but not to improved forest management and avoided deforestation – or REDD – activities. To utilize the CFS, projects must be in areas that have not been forested 10 years prior to the start date, and 30% of credits are required to be retained as a buffer to account for project shortfalls. In terms of methodology, CFS only accepts its own, which is based on IPCC good practice guidelines and aligned to the extent possible with the CDM. For those project developers who want to maximize environmental and social benefits without duplicating validation costs, CFS recognizes the certification schemes of the Forest Stewardship Council (FSC) and the Climate Community and Biodiversity Standard (CCBS).

The latest, Version 3.0, was released in August 2009.[31] It includes an improved approach to combined certification with CCBA and FSC, the ability to certify carbon credits ex-ante and post, and a new eligibility criterion allowing land that was recently destroyed by force majeure to be eligible for CO_2 crediting.[32] CarbonFix has its own registry and delivers a unique certificate ID for each project. CarbonFix has started to use Markit as a third-party registry.[33]

Climate Action Reserve (CAR)

CAR emerged from the California Climate Action Registry (CCAR), a non-profit organization which emerged in 2001 through an initiative by the State of California to oversee entity emissions reporting and offsets in that state. In September 2009, CAR's Forest Project Protocol 3.0 was adopted to verify the carbon sequestration benefits of forestry projects in avoided conversion of forest land to other uses, improved forest management and reforestation of land.[34] This latest version includes tools to address forest project definitions and requirements, quantifying and ensuring the permanence of net GHG reductions and removals, and so forth.[35] Credits verified to the standard are branded Climate Reserve Tonnes (CRTs), or 'carrots' for short.[36] CRTs are only issued ex-post, and are held in the Reserve's own registry powered by APX.

The CAR forest protocol takes a deliberately standardized approach, relying heavily on US Forest Service regional data and other official datasets for the calculation of baselines and

[31] CarbonFix e.V. *Carbon Fix Standard Version 3.0*, August 2009, *available at* http://www.carbonfix.info/chameleon//outbox/public/189/CarbonFix-Standard-v30.pdf

[32] Carbon Fix e.V., "Newsletter of the Carbon Fix Standard Issue No. 10," Carbon Fix Standard, http://www.carbonfix.info/News/Newsletter/Newsletter-No10.html

[33] Paulo Lopes, "Review of Carbon Fix Standard," http://reducecarbon.wordpress.com/v-carbonfix-standard/.

[34] Carbon Positive, "Climate Action Reserve (CAR)," carbonpositive, http://www.carbonpositive.net/viewarticle.aspx?articleID=1661.

[35] Paulo Lopes, "Review of California Climate Action Reserve (CCAR)," http://reducecarbon.wordpress.com/v-review-of-california-climate-action-reserve-ccar/.

[36] Carbon Positive, "Climate Action Reserve (CAR)," carbonpositive, http://www.carbonpositive.net/viewarticle.aspx?articleID=1661.

establishing additionality.[37] The CAR protocol requires a 100-year crediting period and projects must enter into a project implementation agreement with the Reserve. Project developers must adhere to sustainable forestry and natural forest management requirements. Avoided conversion projects must also establish a conservation easement and are only eligible on private land or land that has been transferred to public ownership. Issues of permanence are addressed by requiring landowners to commit to maintaining carbon stocks for 100 years, and through the maintenance of a buffer pool.

The Climate, Community and Biodiversity Standards (CCBS)[38]

The CCBS were developed by the Climate, Community and Biodiversity Alliance (CCBA), a unique partnership of research institutions, corporations and NGOs. CCBS are international in scope, focusing on land-based climate change mitigation projects including primary or secondary forest conservation, reforestation, agroforestry plantations, REDD etc.

The CCBS are focused on social and environmental impacts ('co-benefits') and do not include a mechanism for generating emissions reductions certificates. To generate carbon credits, the CCBS are often paired with the VCS or another carbon offset verification standard.[39] The CCBS criteria include social and environmental safeguards to avoid harm and also require projects to improve the livelihoods of local communities and the conservation of biodiversity.

The second edition of the CCBS was launched in December 2008. In this latest edition, criteria for working with communities have been extended, and a new 'Gold Level' standard has been created, rewarding those projects designed to assist communities or species adapt to climate change, to provide benefits to the poorest members of society or to conserve areas of highest biodiversity value.

While the CCBS are designed for site-based projects, the CCBA and CARE International are facilitating an initiative to develop REDD+ Social & Environmental Standards that may be applied to government-led REDD+ programs that make a significant contribution to human rights, poverty alleviation and biodiversity conservation. These new standards apply to policies and measures implemented at national, state, or provincial level and do not replace the current CCBS for site-level projects.

Greenhouse Friendly

The Greenhouse Friendly initiative has been operating since 2001 to certify carbon neutral products and services and approve abatement credits for sale on the voluntary market. It has been an effective and successful avenue for participation in the voluntary carbon market in Australia.[40] Before Australia ratified the Kyoto Protocol, Greenhouse Friendly helped the nation to meet emissions reductions goals for 2008-2012 targets.[41]

Greenhouse Friendly includes a certification label and was designed to help Australian businesses to market greenhouse neutral products or services, deliver greenhouse gas abatement and give Australian consumers greater purchasing choice.[42]

[37] Ibid.

[38] Climate, Community and Biodiversity Alliance, "Home," CCB Standards, http://www.climate-standards.org/index.html

[39] Paulo Lopes, "Review of Climate, Community and Biodiversity Standard," http://reducecarbon.wordpress.com/v-review-of-climate-community-and-biodiversity-standard-ccbs/

[40] Commonwealth of Australia, "Greenhouse Friendly™," Australian Government Department of Climate Change, http://www.climatechange.gov.au/greenhousefriendly/.

[41] United Nations Department of Economic and Social Affairs Division for Sustainable Development, *Case study of a successful Australian national industrial development* http://www.un.org/esa/sustdev/csd/casestudies/c2_australia.pdf

[42] Ibid.

Introduction of the Australian Government's cap-and-trade mechanism, the Carbon Pollution Reduction Scheme, will override the voluntary Greenhouse Friendly standard. The broad sectoral coverage of the scheme means less scope to pursue offset activities, limited only to those emissions sources not covered by the scheme. The implications are that abatement in sectors covered by the scheme will no longer be additional to 'business as usual'. For these reasons Greenhouse Friendly will wind down on July 1, 2010. Applications for new abatement providers closed on May 27, 2009, and abatements generated up to July 1, 2019 by current Greenhouse Friendly providers can still be sold and purchased after this date.[43]

ISO 14064

ISO 14064 is a GHG project accounting standard developed by the International Organization for Standardization (ISO) beginning in 2002 and launched in the spring of 2006. The standard is meant to be applicable regardless of a country's current climate policy, and does not apply restrictions on project types, size, location and crediting period.[44]

The ISO 14064 standard consists of three parts, which can be used independently or as an integrated set. The first part (14064-1) specifies requirements for designing and developing organization or entity-level GHG inventories. The second part (14064-2) details requirements for quantifying, monitoring and reporting emission reductions and removal enhancements from GHG projects. The third part (14064-3) provides requirements and guidance for GHG information validation and verification.[45]

Unlike standards approving scientific methodologies, ISO 14064 offers only general guidance. For instance, ISO mentions that additionality must be taken into account but does not require a specific tool or test. Tools used are defined by the GHG program or regulation under which ISO 14064 is used. ISO 14065 was recently developed to address specific principles and requirements for greenhouse gas validation and verification. ISO 14066 and 14067 are both currently under development to address competence requirements for greenhouse gas validation teams and verification teams and quantification of the carbon footprint of products.[46]

Plan Vivo Standards

Plan Vivo was developed in 1994 by the Edinburgh Centre for Carbon Management (ECCM) in partnership with El Colegio de la Frontera Sur (ECOSUR). The actual standards are administered by the Plan Vivo Foundation, formerly BioClimate Research and Development, a registered charity based in Scotland.

In general, project developers/coordinators using these standards tend to be environmental and aid NGOs.[47] Plan Vivo accepts a range of Land Use, Land-Use Change and Forestry (LULUCF) projects, including afforestation, reforestation, agroforestry, restoration, conservation, improved forest management and REDD. Unlike other standards, Plan Vivo does not provide methodologies. Rather, each project must devise its own to be adapted to the specific realities of the project, and reviewed by external experts. Projects are issued a Plan Vivo Certificate with a unique serial code for each tonne of carbon dioxide sequestered or reduced. In addition, Plan Vivo has begun to use the Markit Environmental Registry to issue, track and retire certificates.

[43] Commonwealth of Australia, "Greenhouse Friendly™," Australian Government Department of Climate Change, http://www.climatechange.gov.au/greenhousefriendly/.

[44] Stockholm Environment Institute, "ISO 14064-2," Carbon Offset Research & Education, http://www.co2offsetresearch.org/policy/ISO14064.html

[45] Global Warming, "ISO 14064," http://www.global-greenhouse-warming.com/ISO-14064.html

[46] ISO, "ISO/DIS 14066," International Organization for Standardization, http://www.iso.org/iso/catalogue_detail.htm?csnumber=43277.

[47] Carbon Positive, "Plan Vivo Standards," carbonpositive, http://www.carbonpositive.net/viewarticle.aspx?articleID=1620.

Projects generally originate with a small community or group of landowners, following a bottom-up approach to increase communities and land over time. In line with the grassroots approach, the Foundation aims to increase local capacity through knowledge, skills and resources transfer to developing countries. Plan Vivo also requires a minimum 10% buffer reserve of credits, with the norm generally around 20%. In addition, Plan Vivo sets a goal for at least 60% of carbon revenues directed towards communities with a minimum of $6/tCO_2$ needed to achieve this.[48]

Projects are managed by local NGOs that act as project developers/coordinators, coordinating sales with carbon buyers, as well as monitoring and community consultation. The latest version of Plan Vivo Standards was released in August 2008 and replaces all previous versions.

Société Générale de Surveillance Carbon Offset Verification Standard

SGS (Société Générale de Surveillance) is an international inspection, testing and monitoring organization. Within the carbon markets, SGS primarily serves to validate offset projects. However, before 2009, the company also offered the SGS Carbon Offset Verification Standard for forest carbon projects. Currently, the standard is no longer available and instead the company works to verify credits to other standards including the California Climate Action Registry (CCAR), the Chicago Climate Exchange (CCX), and the Voluntary Carbon Standard (VCS). Reports issued earlier may be re-assessed within requirements of these specific GHG programs.

SOCIALCARBON

SOCIALCARBON is a standard designed to enhance social and environmental co-benefits of carbon offset projects, as well as to increase active participation of stakeholders. The SOCIALCARBON Methodology (SCM), developed by the Ecologica Institute (Brazil) in 2000, is the key element of the Standard and is comprised of a set of analytical tools that assess the social, environmental and economic performance of projects. At the base of the methodology is the sustainable livelihood approach, which guarantees that projects reducing greenhouse gas emissions can also encompass issues of sustainable development. To achieve this, it includes basic guidelines, a conceptual framework and indicators (ranging from worst to ideal scenarios). Through use of these tools and continual monitoring, developers can demonstrate a project's contribution to sustainable development.

SOCIALCARBON is generally used in conjunction with another standard, such as the VCS, ISO 14064-2, TUV NORD Climate Change Standard or the CDM, and therefore does not set its own project type, size, location, crediting period, baseline or monitoring methodologies restrictions.[49] Instead, developers must prove that projects comply with other SOCIALCARBON-approved standards (VCS, ISO, CDM, CCAR, etc.).[50] Credits certified to the standard produce SOCIALCARBON-certified VERS (together with another VER standard) and CERS (together with the CDM), which are assigned a unique serial number to address the risk of double-counting.[51]

All projects and VERs that have successfully completed the approval process are then posted to the Markit-managed SOCIALCARBON Registry.[52]

[48] Carbon Positive, "Plan Vivo Standards," carbonpositive, http://www.carbonpositive.net/viewarticle.aspx?articleID=1620.

[49] Social Carbon, Social Carbon Standard Version 4.0, August 2009, available at http://www.socialcarbon.org/Guidelines/Files/New/SOCIALCARBON_STANDARD.pdf.

[50] Social Carbon, Social Carbon Standard Version 4.0

[51] Stockholm Environment Institute, "Social Carbon," Carbon Offset Research & Education, http://www.co2offsetresearch.org/policy/SocialCarbon.html.

[52] Carbon Positive, "Feasibility tool for REDD developers," carbonpositive, http://www.carbonpositive.net/viewarticle.aspx?articleID=1713.

The Voluntary Carbon Standard (VCS)

Efforts to develop the Voluntary Carbon Standard (VCS) were initiated by The Climate Group, the International Emissions Trading Association and the World Economic Forum in late 2005. Version 1 was released in March 2006 as a pilot standard and Version 2 emerged as a consultation document in October 2006. VCS 2007 was released in November of that year (2007) and the final rules for the VCS AFOLU were released and incorporated into the standard in November 2008, with the release of VCS 2007.1. VCS' Agriculture, Forestry and Other Land Use (AFOLU) scopes cover afforestation, reforestation and revegetation (ARR), agricultural land management (ALM), improved forest management (IFM) and reducing emissions from deforestation and degradation (REDD). Credits verified to the standard are branded as Voluntary Carbon Units (VCUs). All VCUs are listed in the VCS Project Database.

The VCS Registry System currently consists of the VCS Project Database and three international companies that are contracted to act as registries -- APX Inc., Caisse des Dépôts, and Markit Environmental Registry; the system could be expanded in the future to include additional registries. The VCS Registries issue, hold, transfer and retire VCUs, and interact directly with the VCS Project Database to upload project documentation and obtain unique serial numbers for each VCU.[53] Although the VCS was created as a base carbon accounting standard, developers have the option of 'tagging' their VCUs with other standards such as the CCBS or SOCIALCARBON to provide proof that projects generate co-benefits including enhanced community development and improved biodiversity.

VCUs are credited on an ex-post basis, and additionality can be determined using a project-based approach, as under the CDM, as well as with performance benchmarks and technology tests. The VCS accepts methodologies and protocols developed under approved GHG programs, which currently include the CDM and CAR, as well as methodology elements (i.e., methodologies, tools) developed under the VCS double approval process which includes a public consultation and approval by two independently accredited validators, one of which is contracted by the developer of the methodology and the other by the VCS Association.[54] VCS' approach to ensuring permanence requires 10-60% of credits to be withheld as a buffer reserve, covering unplanned losses of trees.[55] There are four REDD methodologies being developed under the VCS double approval process: REDD Methodology Modules (Avoided Deforestation Partners), Baseline and Monitoring Methodology for Project Activities that Reduce Emissions from Deforestation on Degrading Land (Terra Global Capital, LLC), Methodology for Estimating Reductions of GHG Emissions from Mosaic Deforestation (World Bank, BioCarbon Fund), and Methodology for Estimating Reductions of GHG Emissions from Frontier Deforestation (Amazonas Sustainable Foundation).[56]

III.9.2 Overall Trends

Historically, the majority of projects (68%) used an internal standard and only 18% of projects were verified to third-party standards. Around 70% of *credits* transacted on the voluntary OTC market, however, have been verified to a third-party standard, while only 15% have been verified to internal standards. This means that the large number of projects (141) using internal standards generated far fewer credits than the 34 projects verified to third-party standards.

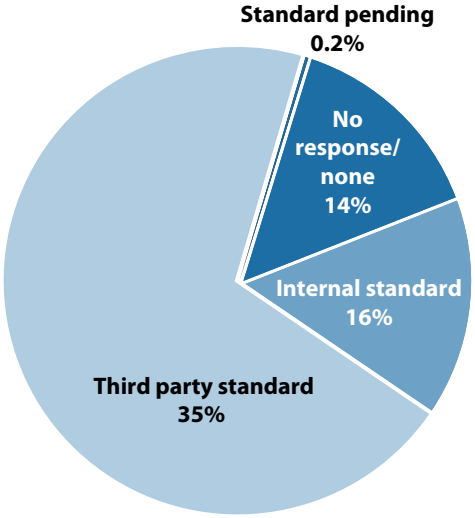
[53] Ibid.

[54] Carbon Positive, "Voluntary Carbon Standard," carbonpositive, http://www.carbonpositive.net/viewarticle.aspx?articleID=1365

[55] Voluntary Carbon Standard, Voluntary Carbon *Standard: Guidance for Agriculture, Forestry and Other Land Use Projects*, VCS Association, November 18, 2008, available at http://www.v-c-s.org/docs/Guidance%20for%20AFOLU%20Projects.pdf.

[56] VCS Association, "Methodology Elements," VCS, http://www.v-c-s.org/public_comment.html

Figure 21: Use of standards in the voluntary OTC market, total



Respondents reported an increasing use of third-party standards over time. From 2002-2004, the proportion of credits with third-party standards jumped from 42% to 87%. In 2008, internal standards were used to certify 34% of transacted credits, bumping the third-party figure down to 64%. In the first half of 2009, 96% of reported credits utilized some third-party standard.

III.9.3 Trends by Standard

Among the 70% of credits from projects validated or verified to third-party standards over time, the top utilized projects by standard were the CCBS (14 projects), the VCS (10 projects) and CAR (four projects).[57] By transaction volume, the most reported standards were the CCBS and the Voluntary Standard, which, when combined, accounted for 49% of all verified credits or those coming from a third-party validated project. One reason for their popularity is that project developers often used these standards in conjunction with others. Historically, other commonly used standards included SGS-COV (17%), Greenhouse Friendly (11%), and ISO-14064 (10%).

[57] It is important to note that the not all of these credits have actually been verified to third-party standards or issued into a registry. In fact, many credits reported were not yet listed in coinciding registries.

Figure 22: Use of standards in the voluntary OTC market, by year

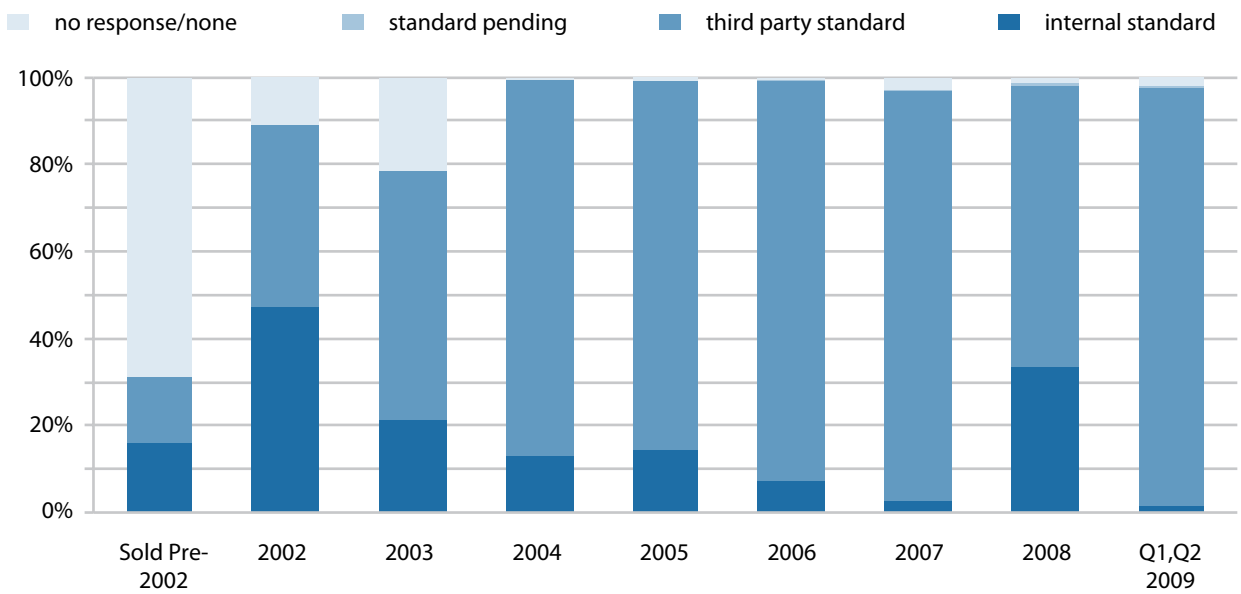
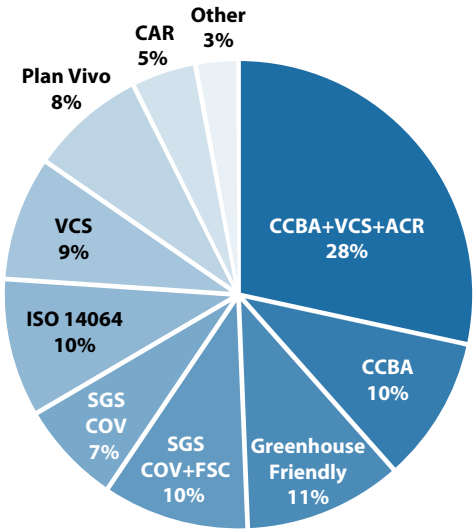


Figure 23: Historical breakdown of third-party standards



The popularity of the CCBS as a validation standard is one notable feature of the OTC voluntary market. As described above, the CCBS is a project design standard that validates and verifies the environmental and social benefits generated by forest projects, but does not quantify or register GHG emissions reductions and removals. Consequently, projects that aim to produce credits for sale on the carbon markets will often use the CCBS in conjunction with one or more standards that validate and verify carbon benefits. CCBS's prevalence in the forest carbon market demonstrates an interest in co-benefits such as enhanced biodiversity, as well as a recognition that forest carbon projects are more likely to succeed if they have the support of local communities.

The Voluntary Carbon Standard, a major standard in the broader voluntary carbon market as well, just approved its first forestry project under its agriculture, forestry, and land use guidelines on July 17, 2009.[58] VCS was the lone standard reported for only 9% of all credits, but was used alongside SGS COV for another 7%, and alongside the CCBS and the American Carbon Registry to validate 28% of the credits.

SGS's Carbon Offset Verification (COV) was the reported standard for 1.6 million credits, or 17% of the historical total. A steady number of credits – between 100,000 and 250,000 – were reported under SGS COV each year since 2002. The standard was created by a verifier over ten years ago. With the emergence of other third-party standards, SGS has not stopped utilizing its internal standard. SGS COV was never the only reported standard, but was used in conjunction with VCS validation in one project, and Forest Stewardship Council certification.

Greenhouse Friendly began certifying projects in 2001 and was a popular standard in the Australian voluntary market. In 2007, almost 1 million credits – about a third of all credits reported for that year – used Greenhouse Friendly. However, the use of Greenhouse Friendly has dropped off steeply, as the standard will phase out to make room for Australia's Carbon Pollution Reduction Scheme, a mandatory carbon regulation scheme with broad sectoral coverage. Greenhouse Friendly is scheduled to wind up operations in mid-2010.[59]

Projects reporting credits verified to ISO 14064 have generated increasing numbers of credits each year since 2005. In the first two quarters of 2009 alone, over half a million credits were reported to be using ISO 14064 – more than a third of 2009's credits so far and more than twice the number of ISO 14064 credits reported in 2008.

III.9.4 2008 and 2009 Analysis

The numbers in 2008 looked somewhat different from historical numbers, with the combination of the CCBS, VCS, and American Carbon

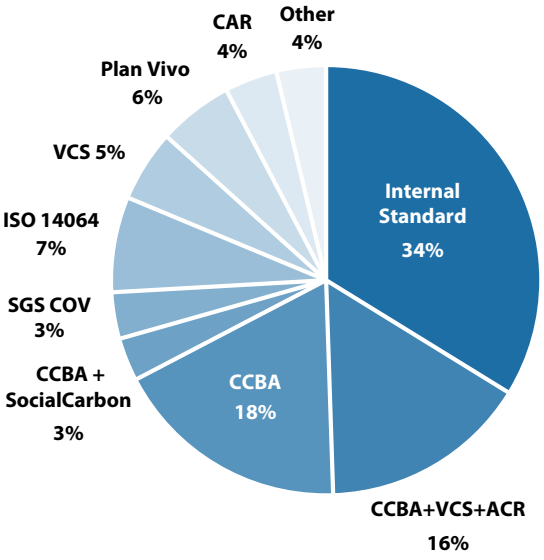
[58] Steve Zwick, "Green Resources is First to Achieve Validation for Tree-Planting under VCS," Ecosystem Marketplace, July 22, 2009, *available at:* http://ecosystemmarketplace.com/pages/article.news.php?component_id=6919&component_version_id=10500&language_id=12.

[59] Commonwealth of Australia, "Greenhouse Friendly™," Australian Government Department of Climate Change, http://www.climatechange.gov.au/greenhousefriendly/.

Registry Forest Product Standard accounting for only 16% of 2008 credits. Notably, the CCBS was the only validation standard reported for 18% of credits (compared to 10% of the overall credits over historical time that used only the CCBS). ISO 14064 accounted for only 7% of credits, and the most popular choice by a substantial margin was internal validation (34% of credits). Plan Vivo was close on ISO's heels with 6% of credits. CAR Protocol credits, while gaining significant interest from US pre-compliance buyers, comprised only 4% of total volume.

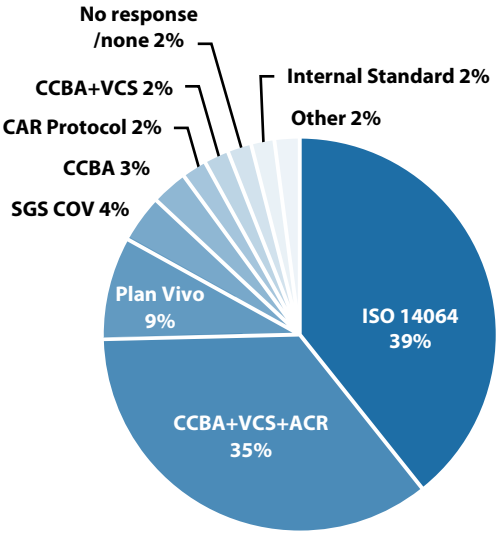
Compared with historical data, in 2008 the percentage of credits not reporting credits validated or verified to a standard dropped from 14% (total historical) to 1.2% of credits transacted by project developers. However, due to several large transactions, the number of transacted credits developed to an internal standard was actually higher (34%) than historical numbers (15%).

Figure 24: Use of standards in 2008



The first two quarters of 2009, during which 1 3 million credits were generated, were dominated by two validation schema: ISO 14064 (39% of credits) and the combination of CCBS, VCS and the American Carbon Registry (35% of credits). Plan Vivo (8% of credits) and SGS COV (4% of credits) also generated notable credit volumes during this period.

Figure 25: Proportion of 2009 credits using each reported standard



The rise of standards associated with the measuring, verification, and reporting of emission reductions is fundamentally influencing the shape of the forest carbon market. Over time, such standards will likely increase buyer confidence and market liquidity in the voluntary market.

While the majority of standards certify voluntary transactions, these standards will likely play an integral role in the evolution of regulated markets. As noted in the previous section, the Kerry-Boxer Bill includes specific text not only on land-based offsets but also the voluntary Climate Action Reserve Protocol. In addition, a proposed amendment to the bill contains language that

would include additional voluntary standards, such as the Voluntary Carbon Standard. This language has piqued the interest of early actors looking to earn credit under a US cap and trade scheme, but until Congress passes legislation, speculation will persist over which standards will meet the bill's criteria.

Across the globe, the Australian Government's Department of Climate Change announced that its National Carbon Offset Standard (NCOS) will recognize credits verified to both the VCS and the Gold Standard. The NCOS aims to attract businesses - particularly farmers - to the voluntary market by providing guidance on what constitutes a genuine and additional voluntary offset. With the Carbon Pollution Reduction Scheme faltering in the Senate, however, it may be too early to tell how the voluntary standard will play into a national carbon scheme.

On the REDD front, the CCBA and CARE International recently released a REDD+ Social & Environmental Standards Initiative. The new standard aims to help governments institute equitable REDD programs on a national level. It also promises to protect the rights of indigenous peoples and local communities while generating significant social and biodiversity co-benefits.[60]

When asked about the impact of standards on the forest carbon market, Jonathan Shopley, founder of the Carbon Neutral Company, describes the recent "leaps of progress in the underpinnings of the market and degrees of professionalization." These movements highlight both the commoditization of the OTC voluntary carbon markets and the influence of this relatively small marketplace on the potentially vast regulated arena. To some extent, the pre-compliance positioning of standards also highlights a division between philanthropic and profit-driven transactions; voluntary buyers simply interested in promoting conservation may not require the same infrastructure as those hoping to trade credits.

[60] Kirsty Galloway McLean, "CCB: REDD + Social and Environmental Standards," November 30, 2009 http://thereddsite.wordpress.com/2009/11/30/ccb-redd-social-and-environmental-standards/

IV. The Chicago Climate Exchange: Leaping Into the Forest Landscape

- The CCX registered a total of 11.5 $MtCO_2$ of forests carbon offsets representing 14% of all credits registered on the CCX from 2004 to mid-2009.
- Respondents reported 2.6 $MtCO_2$ of carbon offsets sold from 2004 to mid-2009.
- The total value of tracked CCX forest carbon credit sales is $7.9 million. In 2008, the tracked value peaked at $5 3 million. Sales volume in the first half of 2009 was about the same as all of 2008, but prices were low; thus the value was about half, $2.5 million, by mid-2009.
- Historically, the average CCX forest credit price is $3.03/$tCO_2$, the lowest price across the various markets.

When former Chicago Board of Trade boss Richard Sandor conceived the Chicago Climate Exchange (CCX) in the 1990s, he aimed to build a central marketplace for buyers and sellers of carbon offsets. When the United States did not ratify the Kyoto Protocol, Sandor found himself with a blueprint for an exchange but no products to list on it. He responded by overseeing the design of voluntary credits – which he dubbed 'Carbon Financial Instruments' (CFIs) – and the subsequent creation of standards, a registry, and an entire community of users.

The exchange launched in 2003, and today bills itself as '**the world's first and** North America's only voluntary, legally binding, rules-based greenhouse gas emission reduction and trading system.'[61] Once CCX members agree to the exchange's legally-binding but voluntary reductions policy, they can use its trade-matching engine to execute buys and sells.

The CCX has several types of membership. Those groups supplying credits on the exchange include:

- **Members:** Entities with direct GHG emission reductions that have made a legally-binding commitment to the CCX Emission Reduction Schedule.
- **Offset providers:** Owners of title to qualifying offset projects that sequester, destroy or reduce GHG emissions. Offset providers register and sell offsets directly on the CCX.
- **Offset aggregators:** Entities that serve as administrative representatives of multiple offset-generating projects, on behalf of the project owners. Offset projects involving less than 10,000 tCO_2 per year are registered and sold through an offset aggregator.[62]

CCX members trade six different types of greenhouse gases converted into CFIs, a common unit that represents 100 tCO_2. CFIs may be either allowance-based credits, which are issued to emitting members based on their emissions baselines and the exchange's reduction targets, or offset credits, which entities generate by creating clean development projects in accordance with CCX standards. About 85% of the credits traded on the CCX are allowance-based, but almost half of the exchange's forestry-based credits are offsets.

[61] Chicago Climate Exchange, http://www.chicagoclimatex.com.

[62] Chicago Climate Exchange, "Membership Categories," http://www.chicagoclimatex.com/content.jsf?id=65.

Forestry offsets on the CCX are supplied by 13 different providers and aggregators. Aggregators play a central role in recruiting geographically disparate landowners for inclusion in CCX 'project pools,' which offer a common contract and registration process to landowners with similar crediting periods. Of the 13 forestry offset providers listed on the CCX, eight are for-profit, four are non-profit and one is unknown.

Suppliers cited diverse viewpoints on the costs and benefits of aggregation – while one supplier pointed to excessive transaction costs, others said that the relative ease of aggregation was a selling point for the CCX. 'We're trying to increase access to the market, work with dozens of landowners and have a project as small as two-thirds of an acre,' explains Ryan Anderson of the non-profit Delta Institute. 'This is possible because of lower CCX transaction hurdles'.

IV.1 Forestry Project Types/Methodologies

CCX accepts forestry offsets for A/R projects and sustainable forest management, and is in the process of creating a REDD Protocol. Once an offset provider or aggregator has enrolled in the Sustainably Managed Forest Protocol, they also have the option of seeking registration for long-lived wood products.

Projects are eligible only if they occur within the US or in non-Annex I countries, and are beyond actions required by regulation or 'common practice.' There is not an emphasis on financial additionality. To ensure permanence, CCX requires a buffer pool of 20% and landowners must commit to maintain the forest for at least 15 years – a period much shorter than other standards. Like several other CCX suppliers, John Ramey of Valley Wood, describes this relatively short contract as the most 'palatable and marketable' option for landowners interested in selling offsets.

IV.2 Registration Analysis

CCX uses its own registry, where all credits transacted on the CCX are registered in the system and issued a serial number. Registration occurs after a project is third-party verified and the report is approved by CCX and the Financial Industry Regulatory Authority (FINRA), a self-regulatory body backed by the securities industry. A credit may be sold on the exchange once it is registered, but registration does not necessarily equate to sales.

A list of entities that have registered credits in the CCX are listed on the exchange's website, and the CCX was willing to share aggregated *registration* data for this report. It was not, however, willing to share actual *transaction* data.

Since its launch, the CCX has registered a total of 11.5 $MtCO_2$ of forest carbon credits. Forests are the third most registered project type after soil carbon and coal mine methane equaling about 14% of all credit types registered. In addition to offset credits, the CCX has also listed about 12.1 $MtCO_2$ of allowance-based credits. These credits originate from nine commercial forestry companies that have opted to bring their forest stock into their corporate emissions calculations and therefore utilize forests as part of their allowance allocation. We were unable to obtain price or actual transaction data on these allocation credits.

Over the past two years, registration of forestry offsets has increased dramatically. More than 7.5 million were registered in 2008 and an additional 3 3 million were registered in the first half of 2009. The rise of forestry has coincided with a drop in soil credits registered. Throughout 2007, the vast majority of land-based credits on the CCX were generated from soil carbon activities, and only 625,700 tCO_2 of forestry credits had been registered. In 2008, CCX soil registration dropped, while registration of forestry credits

peaked as 19 more project pools registered credits. Murali Kanakasabai, Vice President and Senior Economist at the CCX, attributes this jump in forestry to the release of new project protocols, recruitment of additional third-party verifiers, and a streamlined project approval process.

Thus far, offset credits registered have come from either afforestation or IFM projects. About 10 3 $MtCO_2$ of GHG reductions were derived from managed forests and 1.2 $MtCO_2$ originated from afforestation projects. No credits from REDD or long-lived wood projects were registered on the CCX in 2008 (or any previous year), though both are now eligible categories.

Projects generating credits are based in five countries: Brazil, Chile, Costa Rica, Uruguay and the United States. The earliest projects registered credits in 2006 and were based in Costa Rica and the US. In 2008, projects from Uruguay, the US, Chile and Brazil registered credits. As illustrated above, more than half (51%) of credits came from a project in Uruguay with the next largest batch (27%) growing up in the US.

Silvia Gomez Caviglia, Executive Vice-President of Uruguay's Greenoxx Global Environmental Program, describes their decision to enter CCX. 'We were first developing projects under the CDM, but found it was very costly and bureaucratic,' she says. 'So, like most people working on forestry, we ended up looking towards the voluntary market.'

Like wine, a credit's vintage refers to the year in which the emission reductions occurred. Under the CCX, emission reductions do not necessarily occur in the same year they are registered.

While most registrations occurred in 2008 and 2009, the vintages of the credits are actually spaced relatively evenly between 2004 and 2007.

Figure 26: CCX forest registrations by country by year

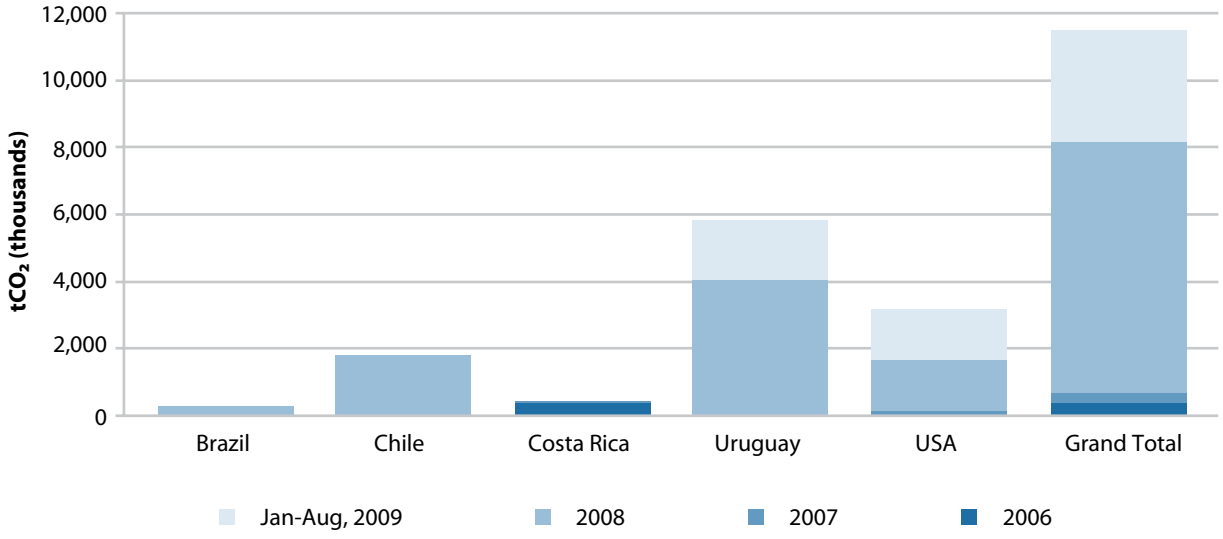


Table 3: CCX forest registrations by vintage by year

Year	CCX Vintage 2003	CCX Vintage 2004	CCX Vintage 2005	CCX Vintage 2006	CCX Vintage 2007	CCX Vintage 2008	Grand Total
2006	165,400	102,200	91,200	400			359,200
2007	39,500	63,400	55,500	85,800	22,300		266,500
2008	1,514,900	1,461,700	1,640,800	1,323,900	1,541,400	26,100	7,508,800
Jan-Aug,2009	227,400	214,000	56,800	585,000	386,400	1,849,500	3,319,100
Grand Total	**1,947,200**	**1,841,300**	**1,844,300**	**1,995,100**	**1,950,100**	**1,875,600**	**11,453,600**

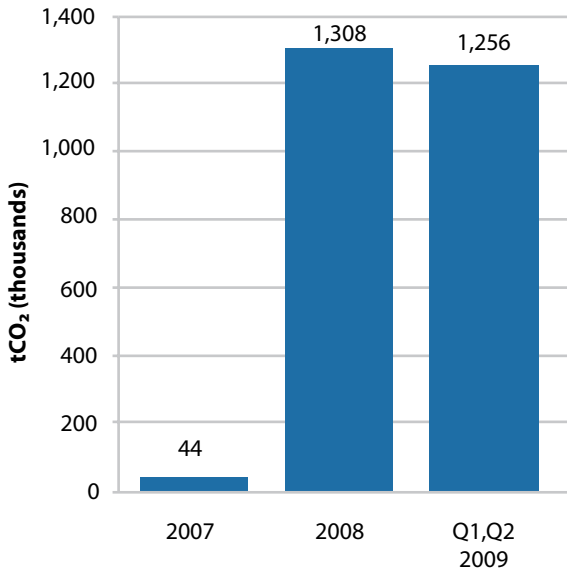
IV.3 CCX Sales Analysis

Registration precedes – but does not necessarily lead to – credit transactions. To analyze the CCX in the same manner as we have presented the OTC market, we collected registration data and also contacted all 10 suppliers of forestry offsets listed on the CCX website. Six aggregators representing 14 project pools responded to requests for data.

The combination of these 14 project pools covers about 306,552 hectares, and respondents estimate a total of 12,080,130 tCO_2 sequestered from the projects. Overall, 2.1 $MtCO_2$ transacted credits originated from 270,836 hectares in the US, and the rest (550,500 tCO_2) were from 35,716 hectares in Latin America.

Of the 11.5 $MtCO_2$ offset credits registered, we were able to track a total of 2.6 $MtCO_2$ credits sold by these six offset suppliers or aggregators. Suppliers confirmed about 1.1 $MtCO_2$ credits as retired. Because all data was collected from one point in the supply chain, these numbers represent a single sale per credit. The first sales of forestry credits took place in 2007, with suppliers transacting 44,300 credits. In 2008, however, sales rose nearly 3000%, reaching about 1 3 $MtCO_2$. By the first half of 2009, sales had already reached 1.3 $MtCO_2$, nearly the same amount as the previous year.

Figure 27: Annual CCX sales volume



Just over half of all forestry credits (54%) sold on the CCX are from afforestation projects, with the remainder coming from IFM projects. As far as the type of trees managed, about 61% of the credits sold originated from areas planted with mixed species, 16% from areas with mostly indigenous species and 2% from areas planted to exotic species.

Historically, the volume weighted average CCX forestry credit transaction price is \$3.03/tCO_2. This average represents the lowest price across the various markets. However, it is significantly higher than the historical average CCX credit price of \$1.20/tCO_2.

Between 2007 through mid-2009, overall CCX prices have ranged from a low of \$0.65/tCO_2 to a peak of \$7.05/tCO_2 in 2008, with prices reaching their highest values ever in June 2008. In 2007, the average reported forest offset price was \$2.60/tCO_2. In 2008 and the first half of 2009, it was \$2.69/tCO_2 and \$1.93/tCO_2 respectively.

Utilizing price and volume, we estimate the total value of tracked sales at \$7.9 million. In 2008, the tracked value reached a peak of \$5 3 million from \$134,375 in 2007, the first year we tracked forestry credit sales. In the first half of 2009, sales volumes were about the same as the entire previous year. However, due to lower prices the value was less than half at \$2.5 million.

IV.4 CCX Outlook

The Delta Institute's Anderson described CCX as a 'very good policy sandbox.' Indeed, when the CCX was launched in 2004, it was designed as a pilot carbon trading program with commitments up to 2010. At the cusp of its own expiration date, the exchange has yet to announce an official next phase. US federal legislation is cited as a key influential factor, but CCX Director of Communications Brookly McLaughlin is mum on the exchange's plans.

'CCX will continue to provide a voluntary market and help its members make the transition to a mandatory market in the United States', she says, continuing, 'Details will be announced at the appropriate time and will be based on developments in Washington on both the legislative and regulatory front.'

V. New South Wales Market: Down Under Market Uncertainty

- Since the New South Wales Greenhouse Gas Abatement Scheme (NSW GGAS) launched in 2003, it has issued 2.7 $MtCO_2$ in abatement certificates as offsets for reforestation activities. This represents just 2.8% of the 91.4 million certificates issued since 2003.
- About 299,647 (11%) of issued forest certificates were retired.
- The largest number of certificates for reforestation (698,765 $MtCO_2$) was issued in 2007. Over time, 2.6 $MtCO_2$ – that is 97% of all reforestation certificates – were issued to one provider, Forests NSW.
- Reforestation credits are the most actively traded credit type in the GGAS. Approximately 1.8 million reforestation certificates have been transferred in 2,765 trades,[63] a little over 50% of the total 5,472 credit transfers under the GGAS.

NSW GGAS was established in January 2003 and is the world's second largest mandatory carbon market. This Australian state-level program is aimed at reducing greenhouse gas emissions associated with the production and use of electricity.[64] It establishes annual state-wide GHG reduction targets and requires electricity retailers and other traders to meet the progressively tougher targets based on their share of the electricity market.

The scheme includes offsets, referred to as 'Abatement Certificates,' for meeting the mandatory targets. The GGAS Carbon Sequestration Rule enables forestry managers to create abatement certificates for sequestering carbon.[65] The Carbon Sequestration Rule specifies the acceptable parameters for calculating carbon stock changes, but the specific methodology is up to the Sequestration Pool Manager. One model available to pool managers is the Australian Government's National Carbon Accounting Toolbox (NCAT).[66]

Much like under Kyoto, the reforestation activity must take place on land that was predominantly non-forest prior to January 1, 1990. Only carbon sequestration that takes place after January 1, 2003 is eligible for creation of GGAS abatement certificates. After abatement certificates are created, the provider must ensure the continued storage of the quantity of carbon dioxide specified for a minimum 100 years. Permanent storage can be achieved by preserving the forest without harvesting or through rotational harvesting of plantations in a sequestration pool.

A credit generating project must be managed by a GGAS-certified Sequestration Pool Manager. The pool manager does not necessarily have to own the parcels of land that make up the sequestration pool. Instead, he or she can be an 'agent' through which the land owner can contribute to the creation of abatement certificates. The manager owns or controls the carbon sequestration rights on the parcels of land where the forestry activity takes place and must demonstrate adequate procedures to minimize risks to the forests.

[63] Independent Pricing and Regulatory Tribunal (IPART), New South Wales, *Compliance and Operation of the NSW Greenhouse Gas Reduction Scheme during 2008. Report to Minister*, (July 2009) *available at* http://www.greenhousegas.nsw.gov.au/Documents/SchRep08.pdf.

[64] New South Wales Greenhouse Gas Reduction Scheme. http://www.greenhousegas.nsw.gov.au/.

[65] Independent Pricing and Regulatory Tribunal (IPART), "GGAS Abatement certificate providers," http://www.greenhousegas.nsw.gov.au/acp/forestry.asp.

[66] Australian Government Department of Climate Change, "National Carbon Accounting System," http://www.climatechange.gov.au/government/initiatives/national-carbon-accounting.aspx.

Table 4: Reforesation credits created and retired by vintage under the NSW GGAS

NSW GGAS	2004	2005	2006	2007	2008	Total
Credits created[1]	166,005	538,471	587,853	698,765	675,197	2,666,291
Credits retired[2]	2,140	287,055	7,744	2,708	0	299,647
Credits transferred*	0	142,320	178,046	986,884	167,559	1,474,809

[1] *Independent Pricing and Regulatory Tribunal (IPART), GGAS. Compliance and Operation of the NSW Greenhouse Gas Reduction Scheme during 2008. Report to Minister. July 2009. http://www.greenhousegas.nsw.gov.au/Documents/SchRep08.pdf*

[2] *The NSW GGAS registry www.ggas-registry.nsw.gov.au November 24, 2009*

V.1 Registration Analysis

As the GGAS 'compliance regulator,' the Independent Pricing and Regulatory Tribunal (IPART) assesses proposed abatement projects, accredits parties to undertake eligible projects, creates and transfers abatement certificates, monitors performance and compliance, and manages the NSW GGAS registry.

The registry performs most typical tracking functions, recording abatement certificates created (issued), transferred (change in ownership) and surrendered (equivalent to retired). Because the registry does not provide a trading function, however, the certificates are traded independently in the market. The registry does track the ownership of credits and records change in ownership as a transfer. However, a transfer is different from a transaction because it does not always equate to sales; for example, a transfer of credits from a subsidiary company to its parent entity.

Carbon sequestration activity registered under the scheme was limited. GGAS created or issued certificates to only five of the seven accredited providers, adding up to a total of 2.7 million credits since launch of the scheme.[67] These forestry credits constitute just a fraction (2.8%) of the total 91.4 $MtCO_2$ issued under the NSW GGAS from 2003 to 2009. Only a small percentage (11%) of the forestry credits created were surrendered or retired, as compared to the 68% of total credits retired under the GGAS. Several landowners explained the underwhelming participation of forestry owners as a result of onerous registration procedures, as well as the higher prices that forestry projects command on the voluntary carbon market.

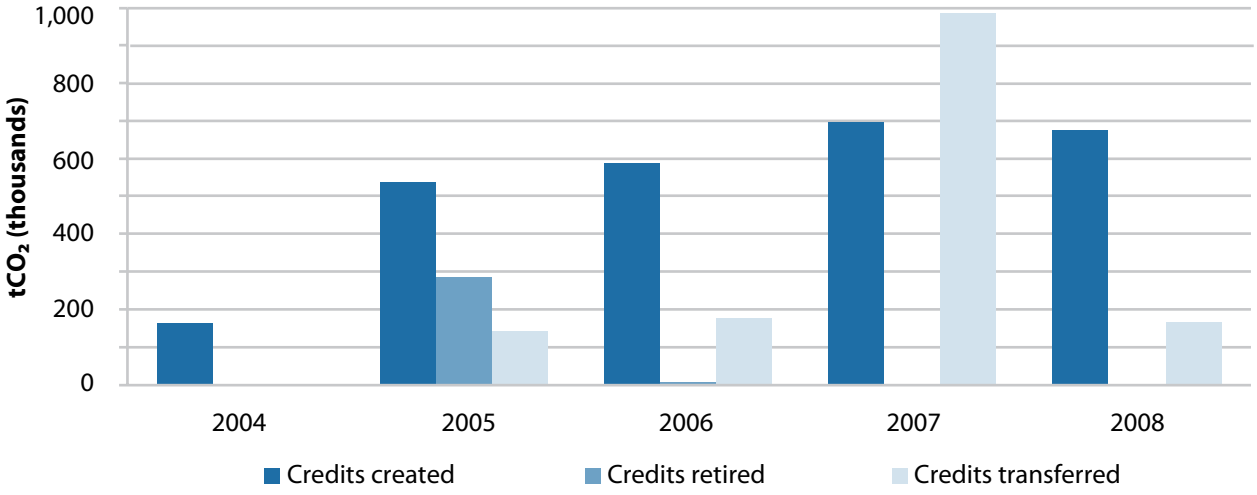
As Table 4 shows, the number of GGAS forest sequestration credits created increased gradually from 2004 to peak at 698,765 in 2007, and then tapered off at 675,197 in 2008. Of the total credits issued since 2004, more than 97% (2,588,000) were held by a single provider, the NSW Forestry Commission, trading as Forests NSW. Forests NSW is a public trading enterprise engaged in managing more than two million hectares of public native and planted forests within New South Wales – making Forests NSW the state's largest native and plantation forest manager.[68]

What GGAS reforestation credits lacked in quantity, they made up for in activity. Since the commencement of the GGAS, 1.8 million reforestation credits or certificates

[67] Independent Pricing and Regulatory Tribunal (IPART), New South Wales, *Compliance and Operation of the NSW Greenhouse Gas Reduction Scheme during 2008. Report to Minister*, (July 2009) *available at* http://www.greenhousegas.nsw.gov.au/Documents/SchRep08.pdf.

[68] New South Wales Department of Primary Industries, "Forests NSW," http://www.dpi.nsw.gov.au/forests/about-forests-nsw.

Figure 28: Reforestation credits under NSW GGAS, by vintage



have been transferred in 2,765 trades.[69] These include multiple transfers of a single certificate. Reforestation credits transferred constitute a mere 1.6% of the total 110.9 million credits transferred between parties. However, the 2,765 reforestation credit transfers amount to 50% of the total 5,472 credit transfers under the GGAS. In other words, reforestation credits have been the most actively traded credit type over the life of GGAS.

Transfers began in 2005, rose dramatically by 454% to 986,884 credits in 2007 and declined sharply in the next year. Transfers began to pick back up in 2009, when credits registered as transferred in the first half of 2009 were almost double the 167,559 credits in all of 2008.

V.2 Transactions Analysis

Under GGAS, credits recorded as registered or transferred are not necessarily sold. To analyze the GGAS in the same manner as we have presented the OTC market, in addition to assessing registry data, we also gathered more detailed transaction data from the seven accredited forestry abatement certificate providers registered under the GGAS.[70] These included six private enterprises and one public enterprise, Forests NSW.

About 40% of the 2.6 million credits registered were sold in the GGAS market. Due to the limited number of data points and confidentiality concerns, we are not able to report project level information, such as hectares and price. When assessing credit volumes transacted historically across markets in the Executive Summary, we therefore use the transfer of ownership data provided in the registration analysis in Section V.1 as a rough proxy of credits sold.

V.3 Future Outlook

In 2006, the NSW Government decided to extend the GGAS to 2021 or until the establishment of a national emissions trading scheme. This means that the NSW Government has indicated its intention to terminate GGAS once a national emissions trading scheme is implemented at the federal level. The delay of the Federal Government's emissions trading scheme, the Carbon Pollution Reduction Scheme (CPRS),[71] has created uncertainty about the future of GGAS throughout the year.

[69] Independent Pricing and Regulatory Tribunal (IPART), New South Wales, *Compliance and Operation of the NSW Greenhouse Gas Reduction Scheme during 2008. Report to Minister*, (July 2009) *available at* http://www.greenhousegas.nsw.gov.au/Documents/SchRep08.pdf.

[70] Government of Australia, "The NSW GGAS & ESS Registry," www.ggas-registry.nsw.gov.au.

[71] Australian Government Department of Climate Change, "Forestry and the Carbon Pollution Reduction Scheme" http://www.climatechange.gov.au/government/initiatives/cprs/who-affected/reforestation.aspx.

As a consequence, the number of new GGAS accreditations tapered off in 2008 as the newly-elected Labor Federal Government developed and finalized its proposal for a national emissions trading scheme commencing by July 2011.[72] The proposed CPRS is a cap and trade scheme that would serve as the Government's primary tool for achieving national emissions targets. It would regulate 75% of national carbon emissions sources and is fully linked with international emissions trading schemes to provide access to overseas markets.

Eligible landowners can voluntarily register to participate in the scheme and receive Australian Emissions Units for net carbon sequestered on approved reforestation projects from July 1, 2010, and/or surrender units to cover any emissions released from forest clearing. They can then sell their excess units to domestic emitters with scheme liabilities.

Similar to GGAS, the current version of the CPRS allows for domestic offsets via reforestation of land that was not forested on December 31, 1989.[73] As per latest amendments to the CPRS,[74] eligible avoided deforestation projects and regrowth forests on deforested land (legally cleared between 1990 and December 31, 2008) would also be allowed to create offsets from July 1, 2011 subject to the development of robust methodologies.

All of the above afforestation, reforestation and avoided deforestation activities permitted to create offsets under the proposed CPRS are in line with Australia's commitments under Article 3.3 of the Kyoto Protocol (see Section VI). Article 3.3 of the Kyoto Protocol mandates that developed countries have to account for all afforestation, reforestation and deforestation activities that started on or after January 1, 1990. When the activities result in net GHG removals at the national level between January 1, 2008 and December 31, 2012, the country can earn credits and trade them in the Kyoto market if national regulations and operational procedures permit them to do so. Following the lead of New Zealand, Australia is the second country proposing to generate and trade forestry credits directly linked to Article 3.3 of the Kyoto Protocol.

CPRS accommodations for forest offsets could prove to be a significant boon to the once heavily deforested land mass. Analysis by the Australian Bureau of Agriculture and Resource Economics suggests that a carbon price could increase the area of agricultural land used for timber plantations to up to 4.5 million hectares and the area of environmental planting to up to 21.8 million hectares by 2050, depending on the price of carbon and various other factors.[75]

These estimates are considered overly optimistic by the Australian forest industry.[76] As one offset provider shared, there is a lot of interest from the forestry sector in terms of the potential opportunities arising from the CPRS, but whether the early interest will translate into real activity on the ground depends on the final scheme negotiated, the design, the regulations, the caps and targets.

[72] Independent Pricing and Regulatory Tribunal (IPART), New South Wales, *Compliance and Operation of the NSW Greenhouse Gas Reduction Scheme during 2008: Report to Minister*, (July 2009), *available at* http://www.greenhousegas.nsw.gov.au/Documents/SchRep08.pdf.

[73] Australian Government Department of Climate Change, "Forestry and the Carbon Pollution Reduction Scheme" http://www.climatechange.gov.au/government/initiatives/cprs/who-affected/reforestation.aspx.

[74] Ibid, *Details of proposed CPRS changes*, (24 November 2009), *available at* http://www.climatechange.gov.au/~/media/publications/cprs/CPRS_ESAS/091124oppnofferpdf.ashx.

[75] Australian Bureau of Agriculture and Resource Economics, *"Opportunities for forestry under the Carbon Pollution Reduction Scheme (CPRS): an examination of some key factors,"* http://www.abareconomics.com/interactive/09_ins/a1/.

[76] Australian Plantation Products and Paper Industry Council, Reforestation the right response, December 15, 2008, http://www.a3p.asn.au/admin/assets/pdf/Media%20releases/2008/A3P%20-%20Media%20Release%20-%20Reforestation%20the%20Right%20Response.pdf.

However, in December 2009, Australia's Senate rejected the proposed CPRS legislation for a second time.[77] Another vote is scheduled for early 2010. In the wake of the latest CPRS defeat, the Queensland Premier announced the possibility of reviving plans for a state-level carbon scheme.[78]

Richard Smith of Landcare CarbonSMART Pty Ltd., a registered GGAS abatement provider, says, 'Forest landowners and investors in Australia are in a holding position at the moment, waiting for legislative certainty in the form of the CPRS. Given the linkage of the domestic ETS with international markets, developments internationally are also important in setting a domestic carbon price. Reforestation credits are one of the few domestic offsets under the proposed cap-and-trade scheme and are expected to be favored by investors due to the ability to fix a carbon price over the medium-term and provide additional environmental benefits such as biodiversity.'

'There have already been a few forward transactions in anticipation of the CPRS in Australia which have in effect been structured as forward sales of units under the CPRS,' said Ilona Millar of the global law firm Baker and McKenzie; 'if the CPRS fails to pass, they will look at transacting in the voluntary markets.' Two companies, Carbon Conscious and CO2 Australia, have signed large deals. Carbon Conscious was hired to plant 30 million eucalyptus trees for Origin Energy Ltd and 10 million more for BP.[79] The Origin Energy project could sequester about 6 $MtCO_2$, totaling about AUS$169 million over the 15-year life of the project. CO2 Australia has signed 30-50 year carbon offset project deals with Newmont Asia Pacific, Wannon Water, ACTEW and Woodside, among others.[80] The total value of the carbon credits from the ACTEW and Woodside plantings are estimated at AUS$6.6 million and AUS$100 million respectively.

[77] Naturenews, "Australia rejects carbon trading," December 2, 2009, http://www.nature.com/news/2009/091202/full/news.2009.1119.html.

[78] Point Carbon, "Queensland eyes carbon trading," December 2, 2009, http://www.pointcarbon.com/news/asia/.

[79] Carbon Conscious, "Recent Articles," http://www.carbonconscious.com.au/site/awdep.asp?dealer=57583&depnum=12662.

[80] CO2 Australia Press Centre. http://www.co2australia.com.au/index.php?sectionID=6695&pageID=6700

VI. Kyoto Markets: Rocky Terrain

The Kyoto Protocol is a legally binding international agreement that launched the world's largest greenhouse gas emission reduction market.[81] It came into effect in 2005; and as of November 2009, 189 countries[82] had signed up. Under the Protocol, 37 so-called "Annex 1" countries, which include developed countries and countries with economies in transition, agreed to reduce their GHG emissions to an average by at least 5% below 1990 levels over the first commitment period 2008-12.

The Kyoto markets are based on a cap-and-trade model with three major "flexibility mechanisms:" the Clean Development Mechanism (CDM), Joint Implementation (JI), and Emissions Trading. These mechanisms are the foundation of the regulated international Kyoto carbon market. Two of these mechanisms, the CDM and JI, directly allow for the development of carbon credits from LULUCF activities.[83] Additionally, Articles 3.3 and 3.4 of the Kyoto Protocol allow developed countries to potentially receive credit for carbon stock changes in land use.

The Clean Development Mechanism (CDM) allows emitters in developed countries to purchase carbon offsets (Certified Emission Reductions or "CERs") from approved and registered emission-reduction projects, including afforestation and reforestation (A/R) projects, in developing countries. Developed countries can use CDM A/R offsets to meet their emission-reduction commitments – but only up to 1% of their base-year emissions, multiplied by five (roughly 183 $MtCO_2$ in total).[84]

Joint Implementation (JI) allows emitters in developed countries to purchase carbon credits (Emission Reduction Units or "ERUs") from approved and registered GHG-reduction projects, including LULUCF projects, implemented in other developed countries or in countries with economies in transition.

Articles 3.3 and 3.4 of the Kyoto Protocol allow developed countries to generate Removal Units for net carbon stock increases through specific LULUCF activities. Other developed countries can purchase these RMUs to fulfill their emission-reduction commitments.

In theory, these mechanisms offer a variety of options for Kyoto-based finance to seed and maintain forests. In reality, forests have played a niche role at best in these markets: overall, the Kyoto markets were valued at around $125 billion in 2008, but LULUCF credits accounted for less than 1% of this transaction value.[85]

VI.1 The Clean Development Mechanism

As noted above, the Clean Development Mechanism (CDM) recognizes afforestation and reforestation projects in developing countries.

[81] Six GHGs are regulated under the Kyoto Protocol: carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. Carbon dioxide (CO2) is the primary GHG emitted and thus GHG markets are commonly referred to as carbon markets.

[82] UNFCCC, *Kyoto Protocol Status of Ratification*, November 6, 2009, *available at* http://unfccc.int/files/kyoto_protocol/status_of_ratification/application/pdf/kp_ratification_chad_20091106.pdf.

[83] UNFCCC, "LULUCF under the Kyoto Protocol," http://unfccc.int/methods_and_science/lulucf/items/4129.php.

[84] Frank Jotzo and Axel Michaelowa, *Estimating the CDM market under the Bonn agreement*, HWWA Discussion Paper 145, Institute of International Economics, 2001, *available at* http://www.econstor.eu/dspace/bitstream/10419/19406/1/145.pdf.

[85] The World Bank, *State and Trends of the Carbon Market 2009*, Washington, D.C., May 2009, *available at* http://wbcarbonfinance.org/docs/State___Trends_of_the_Carbon_Market_2009-FINAL_26_May09.pdf.

To be eligible, projects must have started on or after January 1, 2000 on land that was not forested as of January 1, 1990. Projects select one of two crediting period options: a fixed 30-year crediting period, or a shorter period (up to 20 years) that can be renewed twice.

The Kyoto Protocol addresses the potentially reversible and impermanent nature of forest carbon sinks by issuing two kinds of CDM carbon credits – temporary certified emissions reductions (tCERs), which expire after 5 years, and long-term certified emission reductions (lCERs), which expire after 60 years. The majority of project developers have chosen to enter into an agreement to sell tCERs that expire at the end of the Protocol commitment period following the one in which they were issued. A project may apply for re-issuance in subsequent commitment periods. Alternatively, developers can choose for lCERs to be issued that expire at the end of the project crediting period.

VI.1.1 CDM registration analysis

By the end of 2009, 10 CDM A/R projects had been registered by the CDM Executive Board, one each in Moldova, Vietnam, Uganda, Paraguay, Peru and Bolivia, and two each in India and China.[86] Credits will be issued only after verification of emissions reductions, a process commonly conducted in five-year intervals. Since the first CDM AR project was registered in 2006, no tCERs or ICERs have been issued to date.

The 10 registered projects cover a total area of 41,063 hectares and are expected to generate 383,201 tCO_2 in emissions reductions each year[87] Point Carbon puts the number higher, at 2,064,529 tCO_2 of emissions reductions by 2012.

One project, the Moldova Soil Conservation Project, covers 20,290 hectares or 49% of the total area, four projects range from 2000-10,000 hectares, and the remaining five are less than 400 hectares each. The most active CDM A/R validator has been TÜV SÜD, which validated five projects while JACO CDM and Bureau Veritas each validated two and SGS validated one project.

Most of the projects (eight) were conducted on lands held by local communities or small farmers and one project spanned community and state lands. Besides climate mitigation and environmental enhancement goals, these projects aimed to provide forest products for local use and/or improve local livelihoods.

The first project registered was the "Facilitating Reforestation for Guangxi Watershed Management in the Pearl River Basin" project in China.[88] This project developed and used the very first approved CDM methodology, AR-AM0001. It involves the reforestation of 4,000 hectares of degraded barren land.

Through this project, communities and individual farmers sequester carbon, enhance other environmental services, and generate additional income. The project targets a net GHG removal of 710,104 tCO_2 over the 30-year fixed crediting period. The World Bank BioCarbon Fund contracted a purchase of the project's credits.

As of December 2009, three additional projects were in various stages of CDM registration and 59 were in the validation pipeline.[89] Several stakeholders estimate that another 10-20 will be registered in 2010.

[86] Another LULUCF project "Assisted Natural Regeneration of Degraded Lands in Albania" was registered by the CDM on January 2, 2010.

[87] Clean Development Mechanism, http://cdm.unfccc.int/Projects/projectsearch.html.

[88] Project Design Document for the CDM AR Project "Facilitating Reforestation for Guangxi Watershed Management in the Pearl River Basin" in China, http://cdm.unfccc.int/UserManagement/FileStorage/H5218OI0ZWU4CTWLPLKEIETBIODYED.

[89] UNFCCC, "Validation," http://cdm.unfccc.int/Projects/Validation/index.html.

VI.1.2 Analysis of CDM Afforestation/ Reforestation transactions

While no LULUCF credits have yet been issued under the CDM, several project developers have signed Emission Purchase Agreements, exchanged rights to future credit ownership and received initial payments. For our assessment of transaction volumes and values for the CDM AR market, we analyzed projects that had signed Emission Reduction Purchase Agreements (ERPAs), contracting away rights to future tCERs or lCERs, and had already received some financing.

One of the largest purchasers of LULUCF CDM credits is the World Bank's BioCarbon Fund (BioCF), which was created to "demonstrate projects that sequester or conserve carbon in forest, agro and other ecosystems", as well as "deliver cost-effective emission reductions, while promoting biodiversity conservation and poverty alleviation in developing countries".[90] The Fund can purchase carbon credits from projects under the Clean Development Mechanism and Joint Implementation and also invests in pilot projects that aim to reduce emissions from deforestation and forest degradation (REDD) and from soil carbon as cost-efficient strategies to mitigate climate change. Currently, the BioCF has ERPAs signed with 18 CDM AR projects and three REDD projects in the two tranches of its portfolio, with a few more under development. Tranche One has a total capital of $53.8 million and Tranche Two has a total capital of $36.6 million.

[90] The World Bank's State and Trends of the Carbon Market reports considers all such projects as having sold credits, irrespective of whether payments have been made or whether projects have been listed on the CDM validation pipeline.

Thus far, CDM A/R volumes are less than 1% of the overall CDM market. The World Bank estimates that the primary CDM market transacted 551 $MtCO_2$ in 2007 and 389 $MtCO_2$ in 2008.[91] We tracked 343,347 forestry-based tCERs transacted in 2007 and 76,438 in 2008. Hence, forestry transactions were equivalent to 0.06% of primary CDM market volumes in 2007 and 0.02% in 2008. A/R projects account for an even smaller share of total CDM value: $2.1 million, or 0.03% of total value, in 2007 and $338,620, or 0.01% of total value, in 2008.

Similarly, CDM A/R transaction volumes were only about 3% the size of the voluntary carbon markets overall and about 2.1% in 2008. CDM A/R values equated to about 2% of voluntary forest carbon values historically and 1 3% in 2008. This is in part due to the low value of tCER credits compared to non-LULUCF CERs, the costs of reissuing or replacing credits as they expire, and significant investment risks associated with pioneering LULUCF projects.

VI.1.3 Analysis of CDM A/R Emissions Purchase Agreements

To shed further light on the state of forestry under CDM, we also analyzed all contracts signed with entities such as the BioCarbon Fund, even if payments had not been confirmed.[92] We added these ERPA projects to the transacted projects above to gain supplementary quantitative and qualitative information on CDM AR projects.

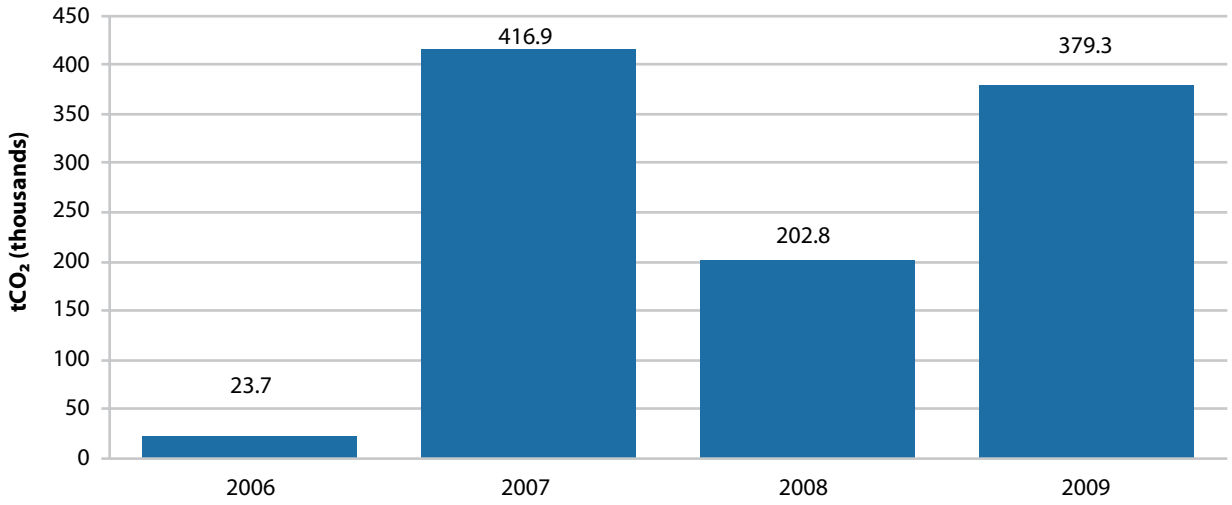
[91] The World Bank, *State and Trends of the Carbon Market 2009*, Washington, D.C., May 2009

[92] The World Bank's State and Trends of the Carbon Market reports considers all such projects as having sold credits, irrespective of whether payments have been made or whether projects have been listed on the CDM validation pipeline.

Table 5: CDM A/R transactions (through June 30, 2009)

	2007	2008	2009	Total
Volume (tCO_2)	343,347	76,438	105,121	524,906
Value (US$)	2,084,157	338,620	493,017	2,915,795

Figure 29: Tracked CDM A/R ERPA contracts



In total, signed LULUCF CDM ERPAs brought the volume of tracked agreements to 1.0 $MtCO_2$ with a value of $5.2 million. The largest volume and value per annum occurred in 2007 with 416,934 credits, worth $2.4 million total. Average prices ranged from $4-5 per tCO_2, with a slight rise in 2007 to $5.70. The ERPA contract volumes have actually been increasing since 2006.

To date, LULUCF projects cover at least 81,861 hectares with expected net emission reductions of 17 $MtCO_2$. Most of the projects are operating on areas smaller than 8,500 hectares. About 50% of the projects expect annual net emission reductions of less than 16,000 tCO_2, qualifying them as small-scale CDM A/R projects if developed by low-income communities or individuals. However, only a quarter have used the simplified baseline and monitoring methodologies for small-scale CDM A/R projects.

Most of the projects are in the tropics – primarily in tropical moist and to a lesser degree in tropical dry environments, reflecting the fact that developing countries eligible to host CDM projects are mainly located in these areas. A few projects that are located in the temperate biome are in Eastern Europe and Asia.

The majority of CDM A/R projects supported by carbon funds occur on community or small farmer-managed lands, in line with the goal of such funds to assist poor communities and farmers, and enhance sustainable development while mitigating climate change. In three instances, joint projects were based on protected areas or to prevent further deterioration of highly-degraded public and community lands.

In terms of the type of trees planted, 55% of projects used a mix of indigenous and exotic species, hoping to rehabilitate degraded lands

Table 6: Tracked CDM A/R ERPA volumes and values

CDM ERPAs	2006	2007	2008	2009	Total
Volume (tCO_2)	23,735	416,934	202,829	379,288	1,022,786
Weighted average price (US$)	3.05	5.73	4.43	4.69	4.76
Value (US$)	1,098,975	2,391,015	898,530	1,778,861	5,167,381

and generate products of economic value (timber, fruits and other) to support local livelihoods. Most remaining projects (39%) planted at least 85% indigenous species, with the intention of restoring protected areas or rehabilitating severely degraded lands.

VI.1.3 Hurdles for LULUCF under the CDM

Concerns about impermanent reductions, accuracy of monitoring, and market flooding have led to onerous CDM rules and temporary crediting. These structures, in addition to relatively high investment risks, and slower delivery of credits, have resulted in limitations for both supply and demand.[93]

On the supply side, "One main hurdle for CDM A/R projects has been the complex regulations, guidelines and templates," said TÜV SÜD auditor Sebastian Hetsch. "It has been a long learning process, but project proponents are getting more experienced now." Tellingly, the CDM A/R rules were not launched until 2003, two years after the general CDM rules were adopted and while the first CDM project was registered in 2004, the first forestry project was not registered until 2006.

Investors have been deterred by unusually high levels of financial risk. "Overall investing in reforestation projects is a risk given the long crediting periods and very low amounts of carbon sequestration in the first years," said TÜV SÜD auditor Martin Schröder.

At the same time, buyer demand for LULUCF credits has been lukewarm, primarily due to the fact that such credits are excluded from the EU ETS and the temporary crediting structure. The EU ETS linking directive, which regulates the use of CDM and JI within in the EU ETS, provides that emitters "are to refrain from using CERs and ERUs generated from nuclear facilities," and "from land use, land use change and forestry activities." Groups have lobbied to change the LULUCF exclusion with no success. With the participants in the EU ETS (European industry) precluded from using forestry credits, Kyoto member governments have been the foremost potential buyers of forestry credits.

In response to widespread dissatisfaction with temporary CERs, numerous LULUCF stakeholders have advocated a change in policy. For example, Till Neeff of EcoSecurities Plc notes that, "in order to enable a meaningful contribution of forestry in emission abatement, the temporary crediting must be replaced by alternative and equally sound mechanisms for ensuring permanence of forestry carbon reductions, such as mandatory set-asides or insurances".

VI.1.2 CDM Reforestation/Afforestation methodologies

Over the past several years, the CDM has played a central role in methodology development, influencing not only compliance but also voluntary carbon markets. Indeed, the creation of LULUCF methodologies is arguably the CDM's largest contribution to the forestry sector.

As of December 2009, the CDM Executive Board had approved 15 A/R methodologies.[94] These include seven large-scale, two consolidated, and six simplified small-scale methodologies. The two consolidated methodologies have subsumed two previous large-scale methodologies. In addition to these methodologies, there are 13 approved tools for such things as demonstrating additionality, identifying baseline scenarios, determining when soil carbon can safely be ignored, and estimating emissions from nitrogen fertilization.

[93] General experiences in AR CDM validations. 2008. Presentation by Martin Schroeder, TÜV SÜD, http://www.tuev-sued.de/uploads/images/1217329692954310780432/AR_CDM_experiences.pdf.

[94] UNFCCC CDM, "Approved AR methodologies," http://cdm.unfccc.int/methodologies/ARmethodologies/approved_ar.html.

A/R projects must use baseline and monitoring methodologies that have been approved by the CDM Executive Board. Project proponents can:

- use a methodology that has already been approved by the Board,
- may (i)submit a new methodology for consideration,
- or (ii)submit a variation on an existing methodology. In either case, the methodology or variation must be approved before it is used.

Small-scale afforestation and reforestation projects that generate less than 16,000 tCO_2 per year and are developed or implemented by low-income communities or individuals, as determined by the host country, can use simplified baseline and monitoring methodologies.

Project participants must demonstrate that the net carbon sequestered through the afforestation or reforestation activity is real and measurable, and additional to any sequestration that would have occurred in the baseline scenario. The CDM standard also requires delineating the project boundary, determining legal title to the land and carbon credits, accounting for leakage and non-permanence, creating a monitoring plan, and considering environmental and socio-economic impacts.[95]

Approved methodologies can be revised and even withdrawn by the CDM Executive Board. A project registered using a methodology that is later withdrawn or revised can continue to use the methodology until the end of the current crediting period. In addition, a project that has reached the late stages of validation (the public comment period or later) can continue to use a revised or withdrawn methodology as long as the project is submitted for registration within eight months of the revision or withdrawal.

[95] CDM-AR-PDD Version 4 and CDM-SSC-AR-PDD Version 2 can be found online at http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html.

The different methodologies exist to accommodate varying baseline scenarios and project goals. Baseline scenarios differ based on both land type (wetland, settlement, grassland, land with inherent low potential to support biomass) and land use (agricultural or pastoral use, unmanaged grasslands in reserves).

A total of seven projects, the majority of registered or soon-to-be registered projects, use the first three approved general methodologies for reforesting or restoring degraded lands. Six of these seven projects are using the two withdrawn methodologies: AR-AM0001 and AR-AM0003. The eighth project, "Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil", uses the A/R methodology for industrial or commercial use. All five small-scale projects use AR-AMS0001 linked to reforestation of grasslands or croplands.

VI.2 Kyoto Protocol Articles 3.3 and 3.4

Articles 3 3 and 3.4 allow developed countries the option to use net domestic changes in GHG emissions through specific LULUCF activities to meet their reduction commitments. Developed countries must account for emissions from all "Article 3.3 activities", which include afforestation, reforestation and deforestation that began on or after January 1, 1990. Developed countries may can opt to account for emissions from any or all "Article 3.4 activities", which include forest, cropland, and grazing land management and revegetation activities. Countries must choose in advance whether they want to account for LULUCF activities on an annual basis or at five-year intervals. If accounted for activities result in net GHG removals between January 1, 2008 and December 31, 2012, the country can earn Removal Units (RMUs) which can be traded in the Kyoto market if national regulations and operational procedures permit.

Table 7: Approved CDM A/R methodologie

CDM A/R Methodologies	Meth-Number	Current Status	# of projects using method*
Large-Scale			
Reforestation of degraded land Version 3	AR-AM0001	Withdrawn	2 (Version 2)
Restoration of degraded lands through A/R Version 3	AR-AM0002	Active	1 (Version 1)
A/R of degraded land through tree planting, assisted natural regeneration and control of animal grazing Version 4	AR-AM0003	Withdrawn	1 (Version 3) 3 (Version 4)
A/R of land currently under agricultural use Version 4	AR-AM0004	Active	
A/R implemented for industrial and/or commercial uses Version 4	AR-AM0005	Active	1 (Version 2)
A/R with Trees Supported by Shrubs on Degraded Land Version 3	AR-AM0006	Active	
A/R of Land Currently Under Agricultural or Pastoral Use Version 5	AR-AM0007	Active	
A/R on degraded land allowing for silvopastoral activities Version 4	AR-AM0009	Active	
A/R implemented on unmanaged grassland in reserve/protected areas Version 4	AR-AM0010	Active	
Consolidated			
Afforestation and reforestation of degraded land Version 3	AR-ACM0001	Active	
A/R of degraded land without displacement of pre-project activities Version 1	AR-ACM0002	Active	
Small-scale			
Small-scale A/R implemented on grasslands or croplands Version 5	AR-AMS0001	Active	4 (Version 4) 1 (Version 5)
Small-scale A/R implemented on settlements Version 2	AR-AMS0002	Active	
Small-scale A/R implemented on wetlands Version 1	AR-AMS0003	Active	
Small-scale A/R implemented for agroforestry Version 2	AR-AMS0004	Active	
Small-scale A/R implemented on lands having low inherent potential to support living biomass Version 2	AR-AMS0005	Active	
Small-scale A/R implemented for silvopastoral use Version 1	AR-AMS0006	Active	

** For the 13 projects registered or about to be registered as of December 31, 2009.*

Twenty-eight countries chose to account for Article 3.3 LULUCF activities once at the end of the first commitment period, and eight chose to account annually.[96] Twenty-two of the thirty-six countries elected to account for the Article 3.4 forest management activity, with seventeen selecting one-time accounting at the end of the commitment period and five selecting annual accounting. Thus, a majority of the countries selected a five-year accounting term and can issue RMUs for any net GHG removals from LULUCF activities only in year 2013 or later.

VI.3 Joint Implementation (JI) LULUCF

A developed country can implement JI LULUCF projects in another developed country or within a country with an economy in transition. The country within which the project is located should already be accounting for emissions under the JI project activity at the national scale as required under Articles 3 3 and 3.4 of the Kyoto Protocol. However, the project accounts for its own emissions. For this reason, JI LULUCF involves a combination of national-level accounting and project-based accounting, and the JI projects must conform to definitions and rules under Articles 3 3 and 3.4. All LULUCF-sector activities as set out in these two Articles (afforestation, reforestation, avoided deforestation, forest management, cropland management, grazing land management and revegetation activities) may be carried out as JI projects. In theory, Removal Units (RMUs) generated from such projects from 2008 onwards can be converted to Emissions Reduction Units (ERUs) and transferred from host to investor country. In reality this conversion has proved challenging.

Countries may follow one of two eligibility processes to participate in JI projects. "Track 1" allows countries to establish their own rules for project eligibility, monitoring and verification, while "Track 2" defers to the guidelines of the Joint Implementation Supervisory Committee (JISC) and projects need independent verification of the emission removals.

JI standards require setting a baseline scenario, proving additionality, accounting for leakage and environmental impacts, and specifying a monitoring plan. Project participants must demonstrate that emission removals are additional to those that would have occurred in the baseline scenario (i.e., conditions that would have been present had the JI project not taken place).[97]

Only one JI LULUCF project has been registered so far: the "Romania Afforestation of Degraded Agricultural Land Project" implemented by the Romania National Forest Administration (NFA).[98] NFA is afforesting 6,728 hectares of state-owned, degraded agricultural lowlands in seven counties. The project will stabilize soils and provide ecological restoration through the planting of semi-naturalized species in the southwest and native species in the southeast. The project is expected to generate 410,046 tCO_2 from 2008-2012, but no ERUs have yet been issued.[99] The project expects to sell over 1,018,161 tCO_2 (to be converted to ERUs (from RMUs) and AAUs) to the World Bank Prototype Carbon Fund and other buyers throughout the 15-year crediting period (although the actual volume of emissions credits will likely be lower due to losses resulting from large flooding of

[96] UNFCCC, *Annual compilation and accounting report for Annex B Parties under the Kyoto Protocol*, October 21, 2009. Advance Version, available at http://unfccc.int/resource/docs/2009/cmp5/eng/15.pdf.

[97] *Joint Implementation Project Design Document Form Version 01* in effect as of June 15, 2006 (JISC 3, Annex 1) available online at http://ji.unfccc.int/Ref/Documents/JI_PDD_form.pdf.

[98] UNFCCC, "Romania Afforestation of Degraded Agricultural Land Project," http://ji.unfccc.int/JIITLProject/DB/UUPQK3EXX9F5KBJQ4PGDO6WWTDLRD7/details.

[99] UNEP, "CDM/JI Pipeline Status of JI projects," http://cdmpipeline.org/ji-projects.htm

the area). The project has already signed an ERPA for part of the volume with the Prototype Carbon Fund.[100]

No other LULUCF projects are listed in the JI validation pipeline. However, via interviews we identified two other potential JI LULUCF projects. JIFor, a multinational research consortium, is developing the JI forest management project "Dvinsky Forest Conservation Project", hosted by Russia. The project aims to move forward as soon as the Russian JI Procedures are operational. Another project in the works with a JI LULUCF component is Forest Conservation Project by WWF Germany and WWF Russia. The project received large-scale funding under the International Climate Initiative of the German Ministry of Environment. In terms of JI LULUCF, Russia may be a country to watch: "Russia, with its large concession forest areas, has substantial potential for developing large JI forestry projects; but national rules and operational procedures are still being defined," says Martin Burian of GFA ENVEST, who has been working on JI procedures for forestry projects.

VI.5 The New Zealand case

New Zealand launched a unique national Emissions Trading Scheme (NZ ETS) in September 2008 that allows landowners to generate and trade reforestation and avoided deforestation credits that are compliant with Kyoto Protocol Article 3.3. Forestry is an important economic sector in New Zealand with large land areas and potential for planting trees and earning carbon credits. Including forestry in the New Zealand ETS via an innovative practical design[101] has resulted in strong participation and generation of carbon credits from the start. Australia also plans to generate and allow trading in Kyoto-compliant reforestation and avoided deforestation credits as part of its proposed Carbon Pollution Reduction Scheme to be launched in July 2011 if it passes through the Senate. Further details can be found in the New South Wales market section of this report.

The Kyoto-compliant carbon forestry options for forest land owners in New Zealand include reforestation and avoided deforestation activities under the New Zealand Emissions Trading Scheme[102] and the Permanent Forest Sink Initiative (PFSI).

Post-1989 forest under NZ ETS: Under the New Zealand Emissions Trading Scheme (NZ ETS), forests established as a result of afforestation and reforestation activities since 1989 ("post-1989 forest land"[103]) can be registered and granted credits for net carbon stock increase from January 1, 2008 onwards in the form of New Zealand Units (NZUs). Forest owners must surrender units when carbon stocks decrease or they choose to opt out of the scheme. The NZUs can be traded in the domestic markets or converted into Assigned Amount Units (AAUs) for trade in the international Kyoto market.

Pre-1990 forest under NZ ETS: The Government will allocate NZUs at the rate of 18, 39 or 60 units per hectare to owners of exotic forests established prior to 1990, which remained in forest in 2007 ("pre-1990 forest"[104]), depending on the area and purchase date of the land. Approximately 38% of the units will be transferred in the first Kyoto commitment period (2008-2012) and the balance after 2012. Landowners can trade these units in the domestic markets or convert them into Kyoto

[100] *Joint Implementation Project Design Document Form Version 01*

[101] Peter B. Lough and Alastair D. Cameron, "Forestry In the New Zealand Emissions Trading Scheme: Design and Prospects for Success," CCLR 3 (2008): 281-291.

[102] New Zealand Ministry of Forestry and Agriculture, "Forestry in the Emissions Trading Scheme," http://www.maf.govt.nz/sustainable-forestry/ets/.

[103] Post-1989 forest land refers to land that was not forested on 31 December 1989, or land that was forested on 31 December 1989 but deforested between 1 January 1990 and 31 December 2007. http://www.climatechange.govt.nz/emissions-trading-scheme/participating/forestry.html.

[104] Pre-1990 forest land refers to areas that were forested as at 31 December 1989 and remained forested on December 31, 2007. http://www.climatechange.govt.nz/emissions-trading-scheme/participating/forestry.html.

AAUs and trade them in international markets. With some exceptions, landowners who deforest (harvest and convert to other use) the land after January 1, 2008 will have to surrender NZUs for the carbon emitted.

Permanent Forest Sink Initiative (PFSI):[105] Landowners reforesting land that was not forested on December 31, 1989 enter into a covenant with the Government for a minimum period of 50 years and submit forest sink plans that describe what they did or will do to actively establish a permanent forest. Restricted harvesting is permitted on a continuous forest cover basis for the first 99 years, after which clearfelling is permitted. Kyoto-compliant carbon credits (AAUs) can be earned for net carbon sequestered by the eligible forests from January 1, 2008 onwards. However, forest owners must surrender units when carbon stocks decrease or they choose to opt out of the scheme after 50 years. A mandatory assessment is required for the first Kyoto commitment period (2008-2012) by March 31, 2013.

The NZ ETS addresses the issue of permanence[106] by:

- Imposing liabilities on participants for any decrease in carbon stocks. Forest owners have to surrender units earned or allocated in the event of subsequent declines in stocks.
- Monitoring compliance via its national Land Use and Carbon Analysis System (LUCAS) and taking appropriate punitive action when needed.
- The Government's retaining responsibility for the emissions and reversals of carbon stocks from afforestation, reforestation and deforestation activities overall since 1989 under the Kyoto Protocol.

[105] Ministry of Forestry and Agriculture, Sustainable Forestry, PFSI. http://www.maf.govt.nz/forestry/pfsi/.

[106] Peter B. Lough and Alastair D. Cameron. 2008. Forestry In the New Zealand Emissions Trading Scheme: Design and Prospects for Success.

As a result, forestry participants can receive permanent and bankable NZUs that have integrity because no matter what happens to the forest after the NZUs are issued, any emissions will be accounted for.

VI.5.1 Registration and transaction analysis

The NZ Emissions Unit Register provides information on registered participants, area and credits issued. Credits issued do not equate to credits sold, so in the transactions analysis, we present information gathered from the participant who had already sold credits by June 2009.

As of May 2009, the Ministry of Forestry and Agriculture had received 174 ETS applications from potential participants for afforestation activities on post-1989 forest land.[107] Of these applicants, 166 were approved to undertake AR activities on a registered land area of 52,581 hectares.[108] Registered participants submitted 45 emissions returns by June 2009 for carbon sequestered in 2008. The Ministry approved all claims and transferred 692,583 NZUs into participants' accounts[109] in this first year of the ETS's operation. No avoided deforestation credits were allocated to pre-1990 forest holders, pending the issue of the Forestry Allocation Plan.

Also, as of May, 2009,[110] 20 participants had submitted applications to establish and retain forests on 4,700 hectares of land (2,900 hectares indigenous and 1,800 hectares exotic forest) for a minimum 50-year term under the Permanent

[107] NZ MAF Sustainable Forestry Bulletin Issue – May 6, 2009, http://www.maf.govt.nz/sustainable-forestry/news/bulletin/issue6.htm.

[108] New Zealand Ministry of Economic Development Emissions Trading Registry,Climate Change Response Act 2002: Participant Register, https://www.eur.govt.nz/eats/nz/docs/ETS_Participant_Register.pdf.

[109] Ibid, Section 89 of the Climate Change Response Act 2002: Chief Executive Reporting, available at https://www.eur.govt.nz/eats/nz/Docs/Section_89_CE_Reporting.pdf.

[110] New Zealand Ministry of Economic Development, "New Zealand Emission Unit Register," https://www.eur.govt.nz/eats/nz/.

Table 8: Participants, forest area and credits issued in NZ forest carbon initiatives by May/June 2009

	# of participants	Forest area (ha)	Credits issued minus surrendered
A/R on post-1989 forest land	166	52,581	692,583
PFSI	10-20	4,700	2,089

Forest Sink Initiative. Ten applications had been approved, while another 10 were being processed. A small volume of Kyoto-compliant AAUs equal to 2,089 tCO_2 were issued under this initiative in the first year.

In the very first year of the ETS' operation, 176-186 participants signed up to undertake and benefit from Kyoto-compliant forestry activities in New Zealand, as compared to the seven participants who signed up under Australia's New South Wales GGAS in its six years of operation. Roughly 695,000 forestry credits were issued on the NZ ETS in the first year, equaling 26% of the credits generated over five years on the NSW GGAS and much more than the zero credits issued under CDM AR.

In collaboration with the Forest Stewardship Council, NZ-based Ernslaw One executed the first and largest transaction in developed country forest carbon credits in mid-2009.[111] The company holds one of the largest Kyoto-compliant forest areas registered under NZ ETS and received credits for carbon sequestered in 2008. Some NZUs (50,000 units) were traded domestically on the NZ ETS, while a large volume (570,000 units) were converted into AAUs and sold to a European buyer for Kyoto compliance at secondary CER rates (~10 to 14 Euros).

[111] "Lungs for the world" by Martin Gibson. Article in the Gisborne Herald. 5 August 2009, http://www.gisborneherald.co.nz/article/?id=13318.

We did not track any other transactions. However, this leaves 72,583 credits issued on NZ ETS that could potentially have been transacted by the 44 other registered participants in the New Zealand domestic or Kyoto compliance markets through 2009. The small volume of PFSI AAUs (2,089 tCO_2) could also have been transacted in the Kyoto market through 2009.

The 620,000 credits sold by Ernslaw One is one of the largest volumes transacted by a single project overall across markets. About 10 other projects transacted more than 500,000 credits in the New Zealand's markets. At \$14/tCO_2, at a minimum, this large volume of NZU-underpinned forestry credits, which are not considered temporary, was able to command a higher price than temporary credits transacted in the CDM (weighted average price \$4.7/tCO_2), CCX (average and weighted average price \$1.9/tCO_2) and OTC (average price \$10.8/tCO_2, weighted average price \$6.8/tCO_2) markets in 2009.

VI.5 Hurdles for LULUCF under Articles 3.3 and 3.4 and JI

Under JI and Articles 3.3 and 3.4, only two countries have transacted credits thus far: New Zealand with its ETS and Romania with one approved JI LULUCF project. This is due to a combination of factors. LULUCF projects have faced similar hurdles under JI and CDM, including institutional, procedural and capacity limitations. Moreover, countries seek-

ing to sell JI credits also tangle with complex national accounting rules under Article 3.4 and 3.4, which create what Charlotte Streck of Climate Focus describes as an "accounting riddle." Although there is strong potential for LULUCF projects to improve degraded land in numerous Eastern European and Russian countries, the mechanism is still "being fine tuned."[112]

Further limitations to generating forest carbon credits under Articles 3.3 and 3.4 of the Protocol have been issues of timing. The first commitment period under the Kyoto Protocol began in 2008. For countries that chose to account annually for their LULUCF emissions under Articles 3.3 and 3.4, LULUCF and JI LULUCF activities could not be issued until after verification of net GHG removals at the end of 2008. Countries that chose to account for their emissions reductions after five years will have to wait until 2013 to generate any credits. This timing presents a significant obstacle: while CDM projects can claim credits even if the Kyoto Protocol phases out, JI is limited to this first commitment period if no alternative agreement is reached.

While JI has been barren ground for forest projects, the concept of LULUCF in Annex 1 countries still seems to be alive. As demonstrated by the first trades out of New Zealand and the advance deals struck in Australia, Kyoto-compliant forestry credits from developed countries appear to have robust and rising markets outside the EU ETS. Moving forward, JI may hold critical lessons for REDD national and sub-national accounting.

[112] Robert O'Sullivan and Bernhard Schlamadinger, *ViewPoint: LULUCF projects under JI: Will they be impossible?* published in PointCarbon; CDM & JI monitor, January 24, 2007 *available at* http://www.climatefocus.com/downloads/publications/CJM240107.pdf.

"Considering the complexity, it is not at all surprising it has taken this long for forestry projects to be developed under JI", notes Ellysar Baroudy of the BioCarbon Fund. "This system is critical to examine and draw lessons learned from, especially as REDD+ is being discussed in the context of a national framework."

VI.6 Outlook for Forests Post- Kyoto

With three years to go before the end of the first Kyoto Protocol commitment period, the future of forests in a post-2012 marketplace remains uncertain. The fate of REDD and LULUCF are largely still to be determined in UNFCCC negotiations. Currently, it seems many investors are waiting for greater clarity on regulations to move forward.

At the conclusion of the 2009 Climate Change Conference in Copenhagen, Denmark, the UNFCCC officially took note of the "Copenhagen Accord,"[113] a non-binding agreement drafted by heads of government from key countries, including the United States, Brazil, China, India, and South Africa.[114] This move allowed the UNFCCC to formally acknowledge the Accord over the objections of Venezuela, Sudan, Cuba, Nicaragua, and Bolivia. All other countries, including the world's largest greenhouse gas emitters, agreed to the Accord.[115]

[113] United Nations, *United Nations Framework Convention on Climate Change Conference of the Parties Fifteenth session, Copenhagen Accord*, December 18, 2009, draft decision *available at* http://unfccc.int/files/meetings/cop_15/application/pdf/cop15_cph_auv.pdf (hereinafter "Copenhagen Accord").

[114] Jake Schmidt, "Key countries agree to Copenhagen Accord," Grist.org, Dec. 20, 2009, http://www.grist.org/article/key-countries-agreed-to-copenhagen-accord/.

[115] Dan Lashof, "Copenhagen Accord: Breakdown or Breakthrough?," NRDC Switchboard, Dec. 19, 2009, http://switchboard.nrdc.org/blogs/dlashof/copenhagen_accord_breakdown_or.html.

The Accord is not a direct successor to the Kyoto Protocol. It sets neither emission-reduction nor deforestation-reduction targets. It does, however, outline general areas of agreement as well as officially recognizing REDD-plus, which encompasses reduced emissions not only from avoided deforestation and degradation, but also from forest carbon stabilization, conservation, maintenance and enhancement:

> *"We recognize the crucial role of reducing emissions from deforestation and forest degradation and the need to enhance removals of greenhouse gas emission by forests and agree on the need to provide positive incentives to such actions through the immediate establishment of a mechanism including REDD-plus, to enable the mobilization of financial resources from developed countries."*

Non-Annex I countries have until the same deadline to submit mitigation plans. In terms of funding, the Accord advocates that developing countries receive USD$100 billion per year by 2020 to support mitigation (including REDD+), adaptation, technology development and transfer and capacity building. This funding would come from "a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance."

VI.6.2 REDD in Copenhagen

The sub-groups responsible for advising the Conference of the Parties (COP) about technical and policy matters related to REDD also released decisions during the 15th Conference of the Parties.

The Subsidiary Body for Scientific and Technical Advice (SBSTA) is responsible, as the name indicates, for scientific and technical advice around REDD and other subjects. Its decision recommends that REDD baselines be established based on historical emissions, which should be adjusted based on national circumstances.[116] The decision also recognizes "the need for full and effective engagement of indigenous peoples and local communities in, and the potential contribution of their knowledge to, [REDD] monitoring and reporting." The SBSTA does not attempt to settle the issue of whether accounting for emissions reductions should occur on a national or a sub-national (project) basis, referring only to the establishment of "robust and transparent national forest monitoring systems and, if appropriate, sub-national systems as part of national monitoring systems."

The Ad Hoc Working Group on Long Term Cooperative Action (AWG-LCA) is responsible for advising the COP on policy matters relating to REDD. Its decision naturally devotes more attention to the issue of whether accounting should occur at a national or sub-national level, advocating a phased approach to REDD.[117] Specifically, direct project-level payments for REDD, as part of sub-national strategies, are to occur only after development of national strategies, policies, and capacity-building.[118]The AWG-LCA also invokes the rights of indigenous peoples, explicitly mentioning the UN Declaration on the Rights of Indigenous Peoples.

Overall, movement on REDD seemed positive in the Copenhagen negations, though it remains unclear how and when REDD will be incorporated into the international climate change framework in a meaningful way. The

[116] UNFCCC COP Subsidiary Body for Scientific and Technological Advice, Draft decision FCCC/SBSTA/2009/L.19/Add.1, Dec. 11, 2009, *available at* http://unfccc.int/resource/docs/2009/sbsta/eng/l19a01.pdf.

[117] UNFCCC COP Ad Hoc Working Group on Long-Term Cooperative Action Under the Convention, Draft decision FCCC/AWGLCA/2009/L.7/Add.6, Dec. 15, 2009, *available at* http://unfccc.int/resource/docs/2009/awglca8/eng/l07a06.pdf.

[118] "The activities undertaken by Parties referred to in paragraph 3 above[should][shall] be implemented in phases, beginning with the development of national strategies or action plans, policies and measures and capacity-building, followed by the implementation of national policies and measures, and national strategies or action plans and, as appropriate, subnational strategies." AWG-LCA, supra note Error! Bookmark not defined..

negotiators will continue to work on untangling all of the issues in the coming year, with the January 31st 2010 deadline representing a key moment in the process.

VI.6.3 LULUCF in Copenhagen

REDD aside, negotiators in Copenhagen debated how to treat land use, land use change, and forestry (LULUCF) more broadly, not only under the CDM, but also under Articles 3.3 and 3.4 of the Kyoto Protocol.

Concerning the CDM, negotiators discussed making two critical referrals to the SBSTA: (1) to consider including additional LULUCF activities, such as re-vegetation and forest, cropland, grazing land and wetland management, under the CDM and (2) to consider alternative approaches to addressing the risk of non-permanence in natural systems. Neither referral made it into the text that was ultimately adopted, but these discussions are likely to continue into the coming year.

In terms of LULUCF in Annex I countries and issues that arise under Articles 3 3 and 3.4 of the Kyoto Protocol, negotiators in Copenhagen focused on two issues: (1) which land use changes must be taken into account when determining an Annex I country's emissions under its cap and (2)how to set land use baselines. Neither issue was resolved in the draft decision published by the Ad Hoc Working Group on Further Commitments for Annex I Countries under the Kyoto Protocol (AWG-KP), which is responsible for advising the COP on what should come next in terms of Annex I commitments after Kyoto's first accounting period ends in 2012.[119]

[119] UNFCCC COP Ad Hoc Working Group on Further Commitments for Annex I Countries under the Kyoto Protocol (AWG-KP), Draft decision FCCC/KP/AWG/2009/L.15, Dec. 16, 2009, *available at* http://unfccc.int/resource/docs/2009/awg10/eng/l15.pdf.

Copenhagen clarified few of the many uncertainties surrounding the future of REDD and LULUCF within the international climate change framework a. Going forward, Burian of GFA ENVEST indicated that CDM projects can claim credits beyond 2012 even if the Kyoto Protocol phases out, whereas JI is limited to the first commitment period if no alternative agreement is reached. In any case, LULUCF has played a limited role in Kyoto thus far – less than 1% of Kyoto-compliant credits have been sourced from approved LULUCF sources – and investment in this area is unlikely to increase in the current uncertain policy climate, given the long preparation and crediting periods required.

VI.4 Financing for REDD

Currently, government and global donors are carrying the bulk of the REDD capacity-building burden – with the encouragement of the COP – making it worthwhile to examine some of these efforts to fund REDD readiness activities in developing countries.

A prominent multilateral demonstration activity on REDD+ is the World Bank's Forest Carbon Partnership Facility (FCPF),[120] which aims to build capacity for REDD+ in tropical and subtropical developing countries, and to test a two-tiered program of performance-based incentive payments in certain countries. First, the FCPF's *Readiness Mechanism* provides technical assistance and capacity building to about 37 countries for REDD+ readiness. Second, a subset of the countries that have made significant progress towards REDD+ readiness will receive financing from the FCPF's *Carbon Finance Mechanism* for the implementation of pilot REDD+ emissions reductions programs.

[120] About the Forest Carbon Partnership Facility (FCPF), http://www.forestcarbonpartnership.org/fcp/node/12.

The Readiness Fund has US$112 million contributed by 11 donor participants, out of a target $185 million in funding, while the Carbon Fund has been pledged US$55 million by five entities, out of its target of US$200 million.

Another prominent program is The UN-REDD Programme, which is a partnership between three UN agencies – the Food and Agriculture Organisation, the UN Development Programme, and the UN Environment Programme – that supports development and implementation of national REDD strategies.[121] Its first set of nine pilot countries in Africa, Asia and Latin America are supported by US$75 million in funds contributed by the governments of Norway, Spain and Denmark.

Various countries are also supporting REDD via bilateral aid – official development assistance that flows from the donor country to the recipient. In recent UNFCCC meetings in Copenhagen, the United States, Australia, France, Japan, Norway and Britain pledged a total of $3.5 billion for REDD capacity-building.[122] The structure and vehicle for these funding streams is yet to be determined. In 2009 Norway was the largest bilateral donor via its International Climate and Forest Initiative, which allocates up to three billion Norwegian Kroner a year for REDD in developing countries.[123] At the same time, the German government has promised up to 1.34 billion Euros for forest conservation for 2008-2012, and more beyond.[124] Australia has stepped up with a pledge of AUS$200 million, to be jointly administered by the Australian Department of Climate Change and AusAID. A key element of the Australian initiative is practical action on REDD through collaborative forest carbon partnerships with Indonesia and Papua New Guinea.

[121] About the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD), http://www.un-redd.org/UNREDDProgramme/tabid/583/language/en-US/Default.aspx.

[122] Juliet Eilperin, *Hope and funding for saving forests around the world*, Washington Post, Dec. 20, 2009, available at http://www.washingtonpost.com/wp-dyn/content/article/2009/12/19/AR2009121902262.html?hpid=topnews#.

[123] Norwegian Ministry of the Environment, "The Government of Norway's International Climate and Forest Initiative," http://www.regjeringen.no/en/dep/md/Selected-topics/climate/the-government-of-norways-international-/why-a-climate-and-forest-initiative.html?id=547202.

[124] German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, "Minister Gabriel welcomes pledge of billions for international nature conservation," http://www.bmu.de/english/press_releases/archive/16th_legislative_period/pm/41665.php.

Appendix 1: Forest Carbon Offset Supplier List[1]

AgraGate Forestry	http://www.agragate.com
AMBIO	http://www.ambio.org.mx/
Asociación Accidental "Cetefor Sicirec"	http://www.arbolivia.org/
Borealis	http://www.borealisoffsets.com/
Bosque Sustentable, A.C.	http://www.sierragorda.net
Carbon Friendly Solutions	http://www.carbonfriendly.com/
Carbon Conservation	http://www.carbonconservation.com/
Climat Mundi	http://www.climatmundi.fr/lng_EN_srub_3-Home.html
co2 operate bv	http://www.co2operate.nl/
CO2OL	http://www.co2ol.de/
Conservation International	http://www.conservation.org/
DeltaCarbon	http://www.deltacarbon.org/
Ducks Unlimited	http://www.ducks.org/
Ecologica Forestry/Ecologica Institute	http://www.ecologica.ws/
Ecologica Institute	http://www.ecologica.org.br/
Ernslaw One	http://ernslaw.co.nz/
Envirotrade Ltd.	http://www.envirotrade.co.uk/html/home.php
ERA Ecosystem Restoration Associates, Inc.	http://www.eraecosystems.com/
Face Foundation	http://www.face-thefuture.com/
ForestFinance	http://www.forestfinance.de/
Forests NSW	http://www.dpi.nsw.gov.au/forests
Fundación Amigos de la Naturaleza (FAN)	http://www.fan-bo.org/
Fundacion Moises Bertoni	http://www.mbertoni.org.py/
Greenoxx NGO	http://www.greenoxx.com/en/ngo.htm
Landcare Research New Zealand Ltd	http://www.landcareresearch.co.nz/
Madagascar Ministry of the Environment and Forests	http://www.meeft.gov.mg/
Sempervirens Fund	http://www.sempervirens.org/
The Climate Trust	http://www.climatetrust.org/
The Conservation Fund	http://www.conservationfund.org/
The Equilibrium Fund	http://www.theequilibriumfund.org/
The Nature Conservancy	http://www.nature.org/
Tree Flights	http://www.treeflights.com/
Valley Wood, Inc.	http://Valleywoodforestry.com/
World Land Trust	http://www.worldlandtrust.org/

[1] Note: This table features only those suppliers who shared volume data for our 2009 survey and elected to be listed.

Sponsors

The World Bank
Carbon Finance Unit
www.carbonfinance.org

The World Bank BioCarbon Fund (http://wbcarbonfinance.org/Router.cfm?Page=BioCF) has mobilized a fund to demonstrate projects that sequester or conserve carbon in forest and agro-ecosystems. The Fund, a public/private initiative administered by the World Bank, aims to deliver cost-effective emission reductions, while promoting biodiversity conservation and poverty alleviation. The Fund is composed of two Tranches: Tranche One started operations in May 2004, has a total capital of $53.8 million; Tranche Two was operationalized in March 2007 and has a total capital of $36.6 million. Both Tranches are closed to new fund participation.

The BioCarbon Fund considers purchasing carbon from a variety of land use and forestry projects; the portfolio includes Afforestation and Reforestation under the Clean Development Mechanism (CDM), and Reducing Emissions from Deforestation and Degradation (REDD) and agricultural carbon in the voluntary market.

biological CAPITAL

Bio-Logical Capital (BLC) (http://biologicalcapital.com/) is an emerging leader in the ecosystem services industry. BLC acquires and manages diverse land development projects designed to integrate social and natural ecosystems.

BLC creates multistream revenue opportunities for its partners and investors through:

- The generation of carbon and related ecosystem credits
- The growth of sustainable forestry and agriculture projects
- The production of renewable and alternative energy sources
- The development of eco-tourism sites

The company's holistic, integrated business approach, its diversified portfolio, and its real estate expertise make it unique in the ecosystem services industry. Bio-Logical Capital actively participates in sourcing, development, financing, and management of each investment to ensure success.

ERA Ecosystem Restoration Associates (http://www.eraecosystems.com/) is a Canadian based pioneer in forest restoration and conservation based carbon offset programs. Through this programming initiatives, ERA produces significant, measurable carbon sequestration benefits that are validated and verified to the ISO 14064-2 standard and marketed to purchasers interested in offsetting their greenhouse gas footprints as a means of mitigating the effects of climate change. ERA is producing EcoNeutral® offsets from the company's "Community Ecosystem Restoration Program" (CERP) in the Lower Fraser Valley, near Vancouver, British Columbia. The project began in September 2005 under an Agreement between ERA and the District of Maple Ridge. To date, ERA has generated over 800,000 tonnes of validated and verified VER carbon offsets from the community ecosystem restoration project to supply the voluntary carbon offset market. ERA clients and product users include; Rolling Stone Magazine, Shell Canada Ltd, HSE - Entega, and The Globe Foundation of Canada.

Baker & McKenzie (www.bakernet.com) has been at the forefront of the development of global carbon markets and climate law and policy for more than a decade,. With particular strength in the developing countries of Latin America and Asia as well as established markets in Europe and the US, we have represented and continue to advise the market makers on market-leading deals. Trusted for our expertise and valued for our experience, we regularly work on transactions with our clients that are first-to-market, including being among the first to draft carbon contracts and serving as lead counsel on the largest public and private carbon transactions the market has seen.

Donors

The David and Lucile Packard Foundation was created in 1964 by David Packard, the co-founder of the Hewlett-Packard Company, and Lucile Salter Packard. Throughout their lives in business and philanthropy, the Packards sought to use private funds for the public good, giving back to a society which enabled them to prosper. Guided by the business philosophy and values of its Founders, the Foundation invests in and takes smart risks with innovative people and organizations to improve the lives of children, enable the creative pursuit of science, advance reproductive health, and conserve and restore earth's natural systems."

DFID, the Department for International Development leads the British government's fight against world poverty. One in five people in the world today, over 1 billion people, live in poverty on less than one dollar a day. In an increasingly inter-dependent world, many problems - like conflict, crime, pollution, and diseases such as HIV and AIDS - are caused or made worse by poverty. DFID supports long-term programmes to help tackle the underlying causes of poverty. DFID also responds to emergencies, both natural and human-made.

The Norwegian Ministry of the Environment's climate policy has the primary objective to play a part in establishing a global, binding, long-term post-2012 regime that will ensure deep enough cuts in global greenhouse gas emissions. Norway's goal is for the average rise in global temperature to be limited to no more than 2°C above the pre-industrial level with the help of such a regime. The Climate and Forest Initiative must give the greatest possible support to efforts to achieve this goal. Promoting sustainable development and poverty reduction is an overriding objective of Norwegian foreign and development policy. It is therefore also an objective of the Climate and Forest Initiative, in addition to the climate-related goals listed below. According to the World Commission on Forests and Sustainable Development, 350 million of the world's poorest people, among them 60 million indigenous people, depend almost entirely on forests for their subsistence and survival - while another billion people depend on the forest as an important part of their livelihoods and as a safeguard against poverty.

The Surdna Foundation believes the next decade will bring enormously challenging, complicated, and sometimes disruptive social, economic and cultural changes. To meet these challenges, we will serve the public good by operating a Family Foundation that funds, shapes and promotes effective, long-term solutions. We will analyze issues fully, examine the larger systems which affect them, involve grantmakers and grant recipients, define the results we want to achieve, fund separately and collaboratively, work enthusiastically, take risks to find the best solutions, and learn systematically from our successes and failures.

USAID is an independent federal government agency that receives overall foreign policy guidance from the Secretary of State. Their work supports long-term and equitable economic growth and advances U.S. foreign policy objectives by supporting: economic growth, agriculture and trade; global health; and, democracy, conflict prevention and humanitarian assistance. USAID provides assistance in five regions of the world: Sub-Saharan Africa; Asia; Latin America and the Caribbean, Europe and Eurasia; and The Middle East. With headquarters in Washington, D.C., USAID's strength is its field offices around the world. They work in close partnership with private voluntary organizations, indigenous organizations, universities, American businesses, international agencies, other governments, and other U.S. government agencies. USAID has working relationships with more than 3,500 American companies and over 300 U.S.-based private voluntary organizations.

Forest Trends is a Washington D.C.-based international non-profit organization that was created in 1999 by leaders from conservation organizations, forest products firms, research groups, multilateral development banks, private investment funds and philanthropic foundations. Our mission is four-fold: to expand the value of forests to society; to promote sustainable forest management and conservation by creating and capturing market values for ecosystem services; to support innovative projects and companies that are developing these markets; and to enhance the livelihoods of local communities living in and around those forests. We do this by analyzing strategic market and policy issues, catalyzing connections between forward looking producers, communities and investors, and developing new financial tools to help markets work for conservation and people. Our approach integrates the fundamental dimensions of ecology, economy and equity because our goal is to have an impact on a scale that is meaningful globally and for a diverse set of stakeholders.

Ecosystem Marketplace

Ecosystem Marketplace, a project of the non-profit organization Forest Trends, is a leading source of information on environmental markets and payments for ecosystem services. Our publicly available information sources include annual reports, quantitative market tracking, weekly articles, daily news, and newsletters designed for different payments for environmental services stakeholders. We believe that by providing solid and trustworthy information on prices, regulation, science and other market-relevant issues, we can help payments for ecosystem services and incentives for reducing pollution become a fundamental part of our economic and environmental systems, helping make the priceless valuable.

Ecosystem Marketplace's work on forest carbon markets is financially supported by the David and Lucile Packard Foundation, Norwegian Agency for Development Cooperation, the United Kingdom's Department for International Development and the Surdna Foundation.

This publication is also made possible by the generous support of the American people through the United States Agency for International Development (USAID), under the terms of the TransLinks Cooperative Agreement No.EPP-A-00-06-00014-00 to The Wildlife Conservation Society. TransLinks is a partnership of WCS, The Earth Institute, Enterprise Works/VITA, Forest Trends and the Land Tenure Center. The contents are the responsibility of the authors and do not necessarily reflect the views of USAID or the United States Government.

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