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Forging A Frontier

State of the Voluntary Carbon Markets 2008

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Forging a Frontier: State of the Voluntary Carbon Markets 2008

A report by Ecosystem Marketplace & New Carbon Finance

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About Ecosystem Marketplace and New Carbon Finance

Ecosystem Marketplace, a project of the non-profit Forest Trends, is a leading source of information on environmental markets and payment schemes for ecosystem services. In particular, we are interested in market-based approaches to the conservation of water-related ecosystem services, carbon sequestration, and the myriad benefits of biodiversity. 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 markets for ecosystem services become a fundamental part of our economic and environmental systems, helping give value to environmental services that have, for too long, been taken for granted.

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New Carbon Finance is the leading provider of information, analysis and insights into the North American, European and global carbon markets. New Carbon Finance constantly strives to provide the most accurate projections of future carbon market prices using proprietary fundamental analysis and models. The research underlying this report provides a crucial quantitative platform that will substantially enhance the understanding of the fast moving voluntary carbon market.

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Glossary

AB 32	Assembly Bill 32: California's Global Warming Solutions Act
ACG	Asia Carbon Group
CARB	California Air Resources Board
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza
CER	Certified Emission Reduction
CCAR	California Climate Action Registry
CCBA	Climate, Community, and Biodiversity Alliance
CCB	Climate, Community, and Biodiversity Standards
CCX	Chicago Climate Exchange
CCFE	Chicago Climate Futures Exchange
CFTC	Commodities Futures Trading Commission
CDM	Clean Development Mechanism
CFC	Chlorofluorocarbon
CFI	Carbon Financial Instrument
CNN	Carbon Neutral Network
CO ₂	Carbon dioxide
Defra	Department for Environment, Food and Rural Affairs (UK)
ECCM	Edinburgh Center for Carbon Management
ECIS	European Carbon Investor Services
ECX	European Climate Exchange
EM	Ecosystem Marketplace
ERT	Environmental Resources Trust
EU ETS	European Union Emission Trading Scheme
ERU	Emission Reduction Unit
FTC	US Federal Trade Commission
GHG	Greenhouse Gas
GE	General Electric
GWP	Global warming potential
IIED	International Institute for Environment and Development
JI	Joint Implementation
KWh	kilowatt hour
LULUCF	Land Use, Land Use Change and Forestry
MAC	California Market Advisory Committee
MtCO ₂ e	Millions of tonnes of carbon dioxide equivalent
MWh	megawatt hour
NCF	New Carbon Finance
NGAC	New South Wales Greenhouse Abatement Certificate
NGO	Non- governmental Organization
NO _x	Nitrogen oxide
N ₂ O	Nitrous oxide
NREL	US National Renewable Energy Laboratory
NSW GGAS	New South Wales Greenhouse Gas Abatement Scheme
OTC	Over-the-Counter (market)
PG&E	Pacific Gas & Electric
REC	Renewable energy credit
RGGI	Regional Greenhouse Gas Initiative
SO ₂	Sulfur dioxide
tCO ₂ e	Tonne of carbon dioxide equivalent
TREC	Tradable renewable energy credit
UNFCCC	United National Framework Convention on Climate Change
US EPA	United States Environmental Protection Agency
VER	Verified (or Voluntary) Emission Reduction
VCS	Voluntary Carbon Standard
VCU	Voluntary Carbon Unit
WBCSD	World Business Council for Sustainable Development
WCI	Western Climate Initiative
WRI	World Resources Institute
WWF	World Wildlife Fund

Executive Summary

Over the past two years, numerous writers and analysts have likened the voluntary carbon markets to the “wild west.” In 2007 market trends highlight that this frontier has become a settlement zone. Customers are increasingly savvy about the opportunities and pitfalls in the carbon offset domain and stakeholders are aggressively working to forge the rules of the game and structures to enable smooth transactions.

While interest in carbon offsets and, in turn, the growth of the voluntary carbon markets has accelerated dramatically, quantitative data regarding these markets has been sorely lacking. With the goal of filling a significant information gap, last year Ecosystem Marketplace and New Carbon Finance teamed up to undertake a comprehensive, quantitative analysis of the voluntary carbon markets. The result was our first annual *State of the Voluntary Carbon Markets 2007*. The report answered fundamental questions about the size, players, project types, prices, and transaction volumes of the voluntary markets.

The answers to these questions are becoming increasingly important to market actors ranging from community land owners in the developing world to bankers and carbon traders in the world’s financial capitals. While the voluntary carbon markets may not be as large or profitable as their regulated brethren, voluntary markets have proven themselves to be innovative, nimble—and controversial. These often misunderstood voluntary carbon markets represent consumer demand for action on climate change and have the potential to be an immediate resource as the international community struggles to implement a fully effective climate change framework. In addition, in some cases they’re even setting the stage for future developments in the regulated markets (e.g. voluntary markets have been transacting deals in avoided deforestation since before 1990, while the Kyoto carbon markets are just now beginning to consider how they may eventually deal with the issue of avoided deforestation).

To understand how the voluntary carbon markets work, and how this report is structured, it is critical to know that the voluntary carbon markets can be divided into two distinct components: the Chicago Climate Exchange (CCX) and a more disaggregated over-the-counter (OTC) market. CCX is a structured and closely monitored cap-and-trade system that organizations join voluntarily. Outside of CCX, one finds a wide range of voluntary transactions that are not driven by an emissions cap, and do not, for the most part, trade on a formal exchange. Throughout the report we refer to this mass of transactions as the over-the-counter (OTC) market. Because this OTC market transacts on a highly fragmented deal-by-deal basis, it is extremely difficult for stakeholders to both track and navigate. It is for this reason that Ecosystem Marketplace and New Carbon Finance have invested considerable resources in conducting this market-wide quantitative survey and analysis of the OTC market.

This second annual report, *Forging a Frontier: State of the Voluntary Carbon Markets 2008*, is based on transaction data collected from 150 organizations, including project developers, wholesalers, brokers and retailers, selling carbon credits to voluntary buyers. It also includes transaction data gleaned from several carbon credit registries in the OTC market.

Gold Rush? Volumes and Values

This year we tracked **42.1 million tonnes** of carbon dioxide equivalent (MtCO₂e) transacted on the OTC market in 2007. Combined with the **22.9 MtCO₂e** transacted on the CCX in 2007, we were able to confirm a total volume of **65.0 MtCO₂e** transacted in the voluntary carbon market in 2007. Relative to the volumes observed in 2006, this represents a tripling of transactions for the OTC market, from the 14.3 M [http://](#) traded in 2006, and more than doubling of volumes on the CCX.¹ Since this report is fully based only on completed and confirmed transactions, these volumes should be considered conservative. In other words, the actual volume of credits transacted in the voluntary market is without a doubt higher than this amount.

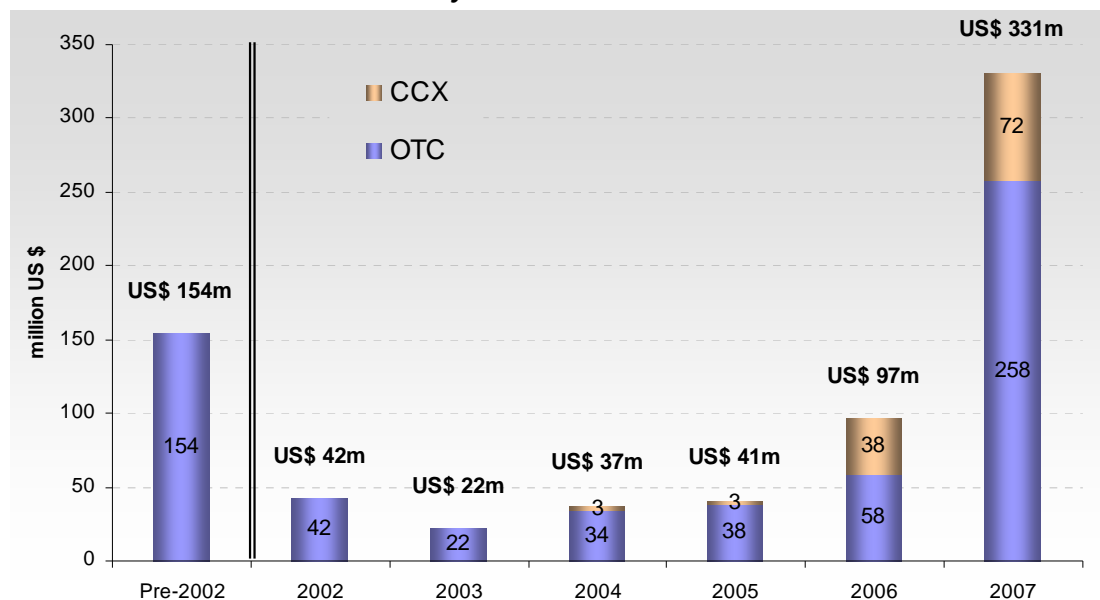
¹ Last year we accounted for 13.4 MtCO₂e transacted on the OTC market in 2006. Because we were able to gather information from additional suppliers this year, we’ve now accounted for 14.3 MtCO₂e transacted on the OTC market in 2006.

Transaction Volumes and Values, 2006 and 2007¹

Markets	Volume (MtCO ₂ e)		Value (US\$million)	
	2006	2007	2006	2007
Voluntary OTC Market	14.3	42.1	58.5	258.4
CCX	10.3	22.9	38.3	72.4
Total Voluntary Markets	24.6	65.0	96.7	330.8
EU ETS	1,1044	2,061	24,436	50,097
Primary CDM	537	551	6,887	6,887
Secondary CDM	25	240	8,384	8,384
Joint Implementation	16	41	141	495
New South Wales	20	25	225	224
Total Regulated Markets	1,702	2,918	40,072	66,087
Total Global Market	1,727	2,983	40,169	66,417

Source: Ecosystem Marketplace, New Carbon Finance, World Bank

Of the 42.1 MtCO₂e of credits traded on the OTC market in 2007, respondents were only able to confirm that **10.7 MtCO₂e** were directly destined for retirement. According to this number, 25% of the total traded volume was used to directly offset emissions and was not sold as a resale investment. The remaining 75% of the volume merely changed hands and could be resold in the future. However, because a significant percentage of sales brokers or suppliers could not confirm whether credits were retired, this number should be considered conservative. It is likely that in practice, more transactions ended in retirement. For example, by looking at the type of buyers reported by respondents it seems as though only 29% of transacted volumes were sold to customers with the intention of selling them again in the future. By deduction, the other 71% of credits would be used directly for retirement.

Transaction Values on the Voluntary Carbon Market²


Source: Ecosystem Marketplace, New Carbon Finance

According to the price and volume data collected in this survey we estimate the international OTC market to be worth \$258 million in 2007. Together with the CCX, which was valued at \$72.4 million, the global voluntary markets were worth a total of \$331 million in 2007. This

¹ Where numbers do not add up in this and other tables, values reflect rounded numbers.

² Note: Values for years prior to 2006 were derived by using transacted volumes and an average price equal to the 2006 average: \$4.1/tCO₂e. As the average prices prior to 2006 are not known, this is merely an estimate. Volume for 2007 based on 118 data points.

value is approximately 240% greater than our 2006 market value (\$97 million, revised upwards from \$91 million as a result of data received this year) and therefore represents more than a tripling of the market size from 2006 to 2007.

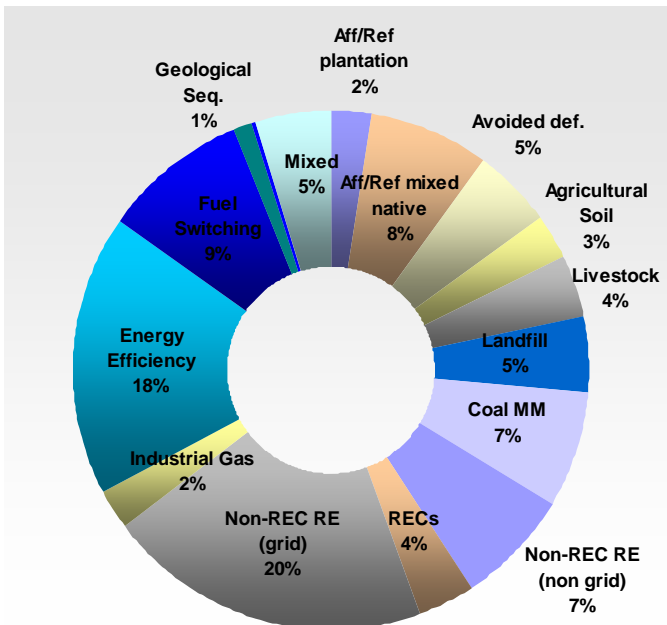
Despite this rapid growth, the voluntary carbon markets remain only a small fraction of the size of the regulated markets (c.2.2%), which according to the World Bank transacted 2,918 MtCO₂e in 2007. That said, the voluntary markets did experience a higher (volume) growth rate of 165% compared to 71% in the regulated markets.

Origin of an Offset

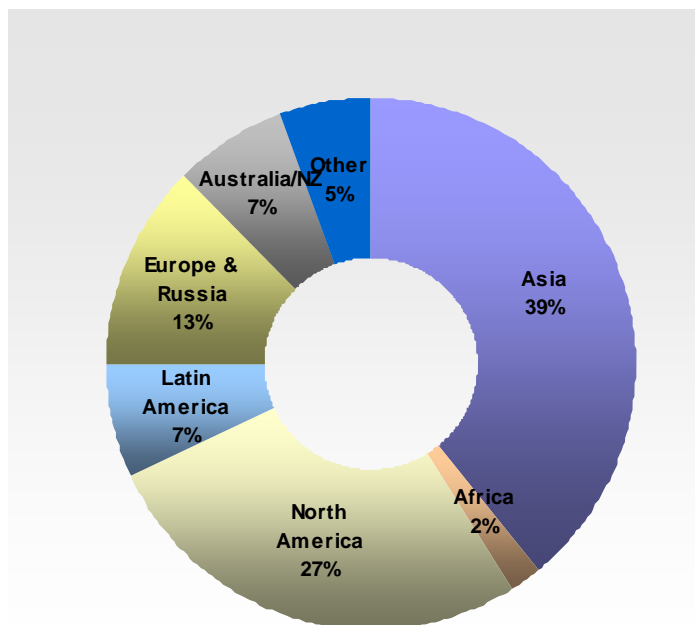
The sources of offset credits in the voluntary markets are extremely diverse, with numerous project types holding important slices of market share. In the OTC market, renewable energy (31%), energy efficiency (18%), and methane destruction (16%), and forestry land based projects (18%) were the most dominant project types in 2007. This is somewhat different to 2006 when the top three project types were forestry (37%), renewable energy (32%), and industrial gas projects (20%). The biggest difference is a significant decline in renewable energy projects sold. The decline in popularity of industrial gas projects reflects the consumer demand for project types with sustainability benefits attributes, which HFC projects are lacking. Generally, OTC market consumers are orientating to less-controversial and “charismatic” project types that have public appeal. However, not all OTC market consumers are driven by these motivations. As noted above, some companies (representing 29% of the volume supplied in 2007), particularly those in the United States, are also investing in carbon offsets with the hope of potentially selling them, for compliance purposes.

For the CCX, we were only able to obtain data for project type and location of offset credits for credits issued to date, rather than those actually sold in 2007. The CCX, between its launch in 2003 and December 2007 issued the most credits from soil carbon (46%), coal mine methane (30%), and landfill methane (9%) and therefore represents a significantly different project type breakdown than the OTC market. Because carbon credits are more commoditized on the CCX the ‘story behind the credit’ is generally less relevant on the exchange.

Transaction Volume by Project Type, OTC 2007



Transaction Volume by Project Location, OTC 2007



Source: Ecosystem Marketplace, New Carbon Finance

Source: Ecosystem Marketplace, New Carbon Finance

In 2007 there was also a major shift the primary location of project activity in the OTC market, with Asia, Europe (including Russia) and Australia increasing the number of credits sold, while North America, Latin America maintained the number of credits sold and the number of credits

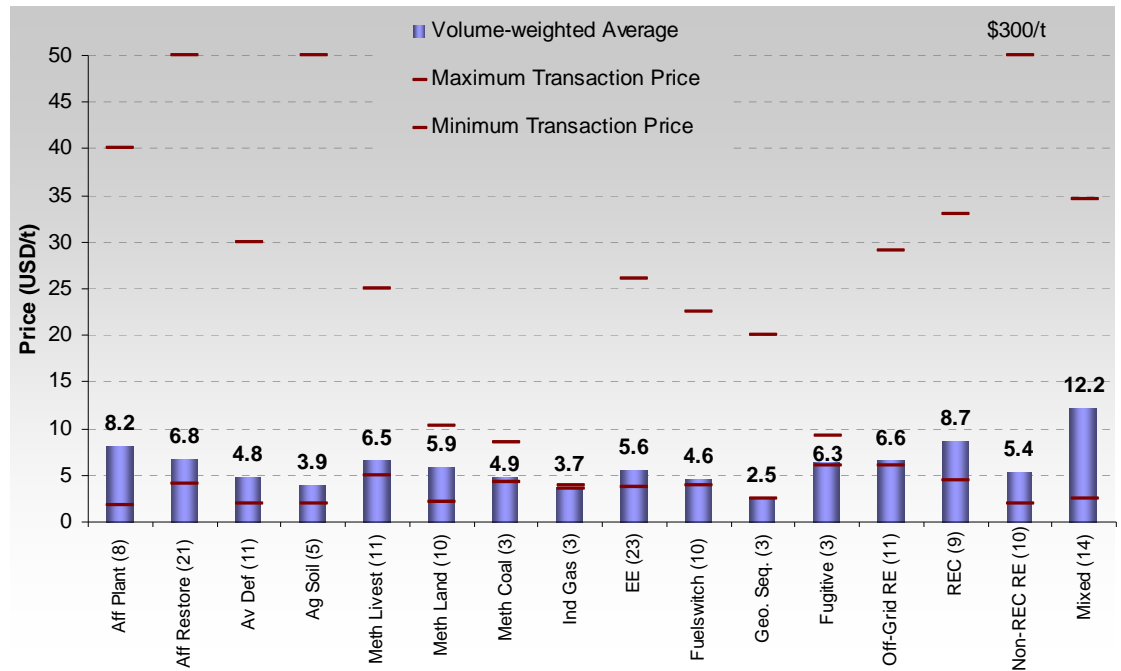
coming out of Africa actually decreased. Asia's share of projects has increased to 39%, up from 22% in 2006, Europe's has risen to 13% from just under 6% in 2006, and Australia has increased from 3% to 7%. Meanwhile, while producing the same number of credits, North America's share has fallen from 43% to 27% and Latin America's from 20% to 7%. In some cases, this shift reflects a move in 2007 to originate VERs from projects waiting to be approved under the Clean Development Mechanism (CDM), but that have already begun operations and are generating emission reductions. As most CDM project activity is based in Asia, in particular China and India, the pre CDM VER origination route has followed this pattern.

Credit Prices

According to this survey, the range of prices for credits in the OTC market again showed huge variation ranging from \$1.80/tCO₂e to one particularly high transaction at \$300/tCO₂e. The volume weighted price of credits transacted in the OTC market in 2007 however increased by 50% compared to 2006, rising from \$4.1/ tCO₂e to \$6.1/ tCO₂e. One of the main causes of this price increase is the significant contraction in the share of low value industrial gas projects in 2007. On the CCX, the (weighted) average price was nearly half the OTC figure at \$3.15/tCO₂e with prices falling within a narrower range of \$1.62/tCO₂e to \$4.20/tCO₂e.

The prices of other project types have shown no clear direction between 2006 and 2007, although there is consistency in the types of credits that the market values most highly. Forestry projects, in particular those involving afforestation/reforestation, have remained some of the highest priced project types across 2006 and 2007 with weighted average prices of \$6.8 to \$8.2/ tCO₂e. Methane projects also continue to be valued highly with weighted average prices in 2007 of around \$6.0/ tCO₂e, as do renewable energy projects with prices of around \$7-8/ tCO₂e. The lowest-priced credits continue to originate from industrial gas projects (\$3.70/ tCO₂e), and geological sequestration (\$2.50/tCO₂e).

Credit Prices by Project Type, OTC 2007



Source: Ecosystem Marketplace, New Carbon Finance. Note: Numbers in parentheses indicate number of data points. The weighted average prices in this chart are not directly comparable with the price chart in last year's report. This chart shows the weighted average prices across the value chain, whereas last year's chart showed only prices from retailers, which are higher than the value chain average.

Customers: Going Green or Making Green?

In terms of demand for OTC voluntary offset credits, survey respondents (excluding CCX and several brokers) cited private businesses as purchasing 80% of credits on the OTC.. As noted above, around 50% of credits were purchased by private businesses for retirement (ie to actually offset emissions), and 29% were purchased for investment/resale. Non-governmental organizations (NGOs) accounted for 13% of demand of credits transacted, and individuals

purchased approximately 5%. Remarkably, governments were only responsible for 0.4% of the purchases.

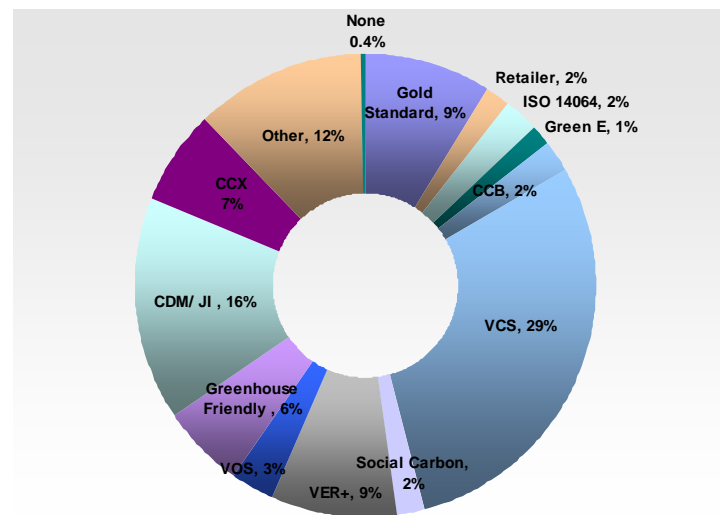
This year's survey has also highlighted a significant shift in the location of voluntary buyers. According to our survey respondents 34% of credits were sold to buyers in North America in 2007. This is in contrast to 2006 when 71% of credits were destined for buyers in North America. The demand has been picked up by Europe which represented 47% of the volume bought in 2007 (up from 28% in 2006), and Australia and New Zealand which now represent 8% of buying activity (up from 1% in 2006). The weighty number of credits purchased by Europeans clearly signals that a strong compliance market, such as the EU Emissions Trading Scheme, does not necessarily need to be a threat to the development of the voluntary market.

Corporate responsibility and public relations/branding efforts were cited (again) as the most common motivations behind carbon offset purchases. Also, similar to last year's survey, price and convenience were noted as being the least important factors when buying offsets whereas considerations such as additionality, certification, reputation and environmental and social benefits matter the most. Consumer emphasis on these latter considerations explains the appeal of "charismatic" projects such as renewable energy, energy efficiency and forestry/land use.

2007: Year of the Standard

In 2007, concerns about the quality of offset credits transacted on the voluntary carbon markets were a key issue. A range of articles in the mainstream press highlighted various quality issues (in particular, the importance of additionality) in the market. In response, suppliers embraced a range of tools for producing high quality credits and proving their legitimacy. Case in point: the emergence of standards and registries was one of the most noticeable trends in 2007. We were not able to obtain information on verification to a specific standard in a large percentage of transactions, but we believe that as much as 50% of the transactions conducted in 2007 involved credits verified to a specific third party standard. The Voluntary Carbon Standard, CDM, CCX, VER+ and Gold Standard were cited as the most frequently used standards.

Transaction Volume by Standard Used, OTC 2007



Source: Ecosystem Marketplace, New Carbon Finance

In a similar vein, an increasing, but still limited, number of suppliers have begun using carbon credit registries. The majority of credits transacted were not listed in OTC registries but rather were registered under the CDM and the CCX. The Blue Registry was cited as the most frequently utilized OTC registry.

2008 and Beyond

As for what the future holds, the first several months of 2008 have continued to build on the trends established in 2006 and 2007. Our observation is that the market will continue to grow at a rapid pace. For example, the CCX has already reported 180% growth in the first quarter of 2008 and is on its way, if current growth is maintained, to reaching 80 MtCO₂e traded this year. We also expect the OTC also to continue its 2007 growth rate. With more and more companies establishing offset strategies and preparing for inevitable carbon legislation in

countries where federal legislation does not yet exist, traded volumes in 2008 could easily exceed the 150 MtCO₂e level.

In parallel with increased transactions it is already clear that stakeholders will continue to build market infrastructure, such as standards and registries. Responding to a survey question on the standards they planned to use in 2008, suppliers' top choices were the Voluntary Carbon Standard, the Gold Standard, the VER+, and the Climate, Community, and Biodiversity (CCB) Standard. Numerous respondents also cited plans to utilize credit accounting registries in 2008. In a select number of cases, investors are now already building exchanges for the "OTC" market, which could further change the shape of this frontier market.

We look forward to continuing to track this dynamic marketplace and presenting you with detailed information in next year's annual *State of the Voluntary Carbon Markets* report.

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1 Introduction

In the budding field of organizational management and “team-building” studies, experts say all newly formed teams –whether they be groups of business-people, sports teams, or even groups working together towards a common objective—go through several distinct phases of development. Each of these phases has certain characteristics, and each of these phases looks broadly the same, regardless of the team in question. So common are these phases that organizational psychologists have given them each a name: they call them “storming, norming, forming, and performing.”

While it is debatable whether these phases really do exist or not, the concept is compelling. Each group of people working towards a common objective first goes into a phase where there is a period that, to the outside observer seems chaotic, where team members appear to work at cross-purposes, and where leadership is unclear. Shortly thereafter, the group begins to come together, where leadership emerges, and where the task becomes clearer. After that, the group begins to organize, to dole out responsibilities, to specialize, to more effectively address the task at hand. Finally, the team begins performing, working more efficiently to accomplish the task at hand.

The reason we allude to organizational psychologists is that their insights, it would seem, can help shed some light on where the voluntary carbon markets are today, and where they might be headed into the future. As we noted in last year’s report, the voluntary carbon markets are old, older than most people realize, and have been operating (modestly) since 1988. Their first 17 years, however, they operated in almost total darkness and relative silence; the province of a select few policy and environmental “wonks.” The last three years, however, have seen something totally different as activity in the voluntary markets has mushroomed. More players have entered the markets, offsetting has stepped into the media limelight, and hundreds of millions of dollars have been transacted.

In part, this interest has come on the coat-tails of the regulated carbon markets, and in particular of the EU Emissions Trading Scheme (EU ETS) which last year transacted over \$50 billion. In part, however, it has been yet another result of the growing concern over the global threat posed by climate change. Whatever the reason, the reality is that light has begun to shine into the darkness that has shrouded the voluntary carbon markets for more than a decade. As the voluntary carbon markets are better understood and more analyzed, they appear to be transitioning through the various stages of team-building. In terms of organizational management, 2005 and 2006 were clearly years of “storming,” when the market was disaggregated, chaotic, with no clear rules and little evident leadership. Dozens of newspaper and magazine articles are testimony to the fact that the storming has not gone unnoticed.

This past year, however, has been somewhat different. Based on the findings presented in this year’s report, we can safely say that markets appear to have entered their “norming” phase. As you will see in the data below, 2007 was in many ways a pivotal year, a year when standards began to emerge (if not coalesce), where rules were developed and proposed, and where the whiff of leadership can be detected. Those who did not observe (or live through) the voluntary carbon markets in 2006 may be excused for thinking that 2007 was a chaotic year. But those who look carefully at last year’s “State of the Voluntary Carbon Markets 2007” will detect a discernible change, a hint of establishment and self-organization.

And it is precisely this ability to compare, to contrast, and to pull out trends that makes this year’s report so intriguing; it provides us with yet another series of data points on which to judge, analyze, and even dare to make predictions. Last year’s report answered fundamental questions about the size, players, project types, prices, and transaction volumes of the voluntary markets. This year we can answer the same question, and make comparisons and document growth. Now we can say with a much greater degree of confidence than we ever could, that the voluntary carbon markets have grown by more than 165% in the past year.¹

¹ Ecosystem Marketplace and New Carbon Finance, “State of the Voluntary Carbon Markets, 2007,” July 2007. Available online at <http://www.ecosystemmarketplace.com/documents/acrobat/StateoftheVoluntaryCarbonMarket17July.pdf>.

The information provided over the following pages is the result of contacting over 300 organizations, collecting transaction data from over 150 suppliers, scouring carbon credit registries, and signing numerous non-disclosure agreements in an effort to obtain as much proprietary data as possible. While, we hope this report will be a useful tool and have attempted to shine as much light as possible on the marketplace, we still caution that it does not provide complete clarity. Due to the difficulty of identifying organizations selling carbon credits on the OTC market-- not to mention convincing people to share confidential data-- we are acutely aware that we were not able to log all transactions in 2007 and were not able to include all significant transactions.

The upside is that we plan to continue to collect data on the voluntary carbon markets and write this report on an annual basis. We hope that, like this year compared to last year, our data will become increasingly robust.

2 Capturing the Data: Methodology

Summary Points:

- This report is based on OTC market sales and retirement data, information from brokerage firms' transaction data, and publicly available information from carbon credit accounting registries.
- About 150 suppliers (73% of confirmed suppliers to the OTC market) from 13 countries responded to this year's survey.
- Most respondents were based in the United States, followed by the United Kingdom (UK), Australia, Canada, and New Zealand, in that order.
- This response distribution seems to match the OTC marketplace trends at the retailer, broker, and wholesaler levels. The lack of respondents in developing countries highlights the challenge of obtaining data from project developers based in these areas.

This report is based on data collected from suppliers, brokers, and carbon credit accounting registries in the OTC voluntary carbon market. The bulk of data was collected via an online survey posted publicly between January 21 and March 30, 2008. We also utilized transaction figures from several brokerage firms, such as Evolution Markets, CantorCO₂e, and TFS, as well as publicly-available data from the registries of Environmental Resources Trust (ERT), Carbon Neutral Company, TÜV SÜD's BlueRegistry, New Zealand-based The Registry Company (Regi), and the Chicago Climate Exchange (specifically, its Registry Offsets Report).

In this market-wide study, our goal was to collect as much transaction data as possible on sales to voluntary carbon offset buyers. We circulated the online survey for suppliers at several levels. First, we directly contacted a "master" list of known offset suppliers around the world, which includes conservation organizations, project developers, brokers, online retailers, wholesalers etc. We also posted an announcement about this report and a link to the survey in industry publications, like the Ecosystem Marketplace V-Carbon news, the International Institute for Environment and Development's (IIED) Climate-L list serve, the Katoomba Group newsletter, and the New Carbon Finance (NCF) carbon market headlines.

After this process, we received survey information from 150 different organizations that sold or facilitated the transaction of carbon offsets to voluntary buyers in or before 2007. All survey-specific information was confidential and this report only presents aggregate data. For a list of non-anonymous survey respondents that classified themselves as "carbon offset sellers", see Appendix 1.

2.1 Response Rate

Utilizing a list of confirmed suppliers to the OTC market in 2007, we estimate to have captured data from about 73% of suppliers of credits into the OTC market. Inevitably there are numerous suppliers we do not know exist or were unable to confirm sold credits to voluntary buyers, so this number should not be considered a market-wide response rate. Since respondents had the option of skipping questions, the response rate also varied by question and is noted throughout the report when relevant.

Many suppliers were especially reticent to share price and volume data. About 63% of respondents shared volume data. We have utilized this volume data in connection with the answers to questions throughout this report. Because many of the calculations in this report are weighed by respondents' transaction volumes, responses from suppliers who did not disclose 2007 transaction volumes were not included in many final figures, as it could not be ascertained how significant their answers were to the OTC market.

While, we clearly have not collected volume data from all suppliers, we believe we've captured the bulk of transaction volume since we followed up extensively with organizations likely to be supplying high volumes of credits.

It seems we captured the most data from retailers, brokers and wholesalers. We were less successful with project developers. Since most retailers market their offsets online, this section of the market was especially traceable. Alternatively, we found it most difficult to track and contact project developers, especially those whose primary service is something other than supplying carbon offsets, or who are located outside of the United States, the European Union, or Australia. Hence, this segment of the value chain may be under-represented in this report, although those transactions that went through brokerage firms will have been included.

Moreover, we were unable to access information from several relevant carbon funds due to confidentiality reasons. As this is an annual report, it will become increasingly simple to track and gain information from a wide range of suppliers in the future.

2.2 Accounting Methodology

For the purpose of this report, we defined the “voluntary carbon markets” as encompassing any transaction involving credits created for the voluntary markets (such as Voluntary Emission Reductions or Carbon Financial Instruments) as well as transactions in which suppliers sold regulatory market credits (such as Certified Emission Reductions) to voluntary buyers.

The numbers presented throughout this survey are measured in metric tonnes of carbon dioxide equivalent (tCO₂e).

Data presented in the following pages is based purely on information volunteered by marketplace participants. We chose not to extrapolate on the data provided. We also did not apply a ‘quality criteria’ screen and in general included all claimed carbon credit transaction in the analysis. After reviewing the survey, however, we did contact a variety of respondents to confirm or clarify their responses.

Because we collected data from brokers and registries as well as suppliers, we risked counting some transactions twice. To minimize the chance of ‘double counting,’ we asked respondents to specify whether they utilized a broker to sell credits, sold credits on the Chicago Climate Exchange (CCX), or registered transactions on any third party credit accounting registry. When we identified an overlap, the transaction was counted only once.

It is important to note that we only used registries to track *actual* sales and, except in the case of the CCX, have not included emissions reductions registered but not yet transacted. For example, in 2007, about 5.7 MtCO₂e of emissions reductions were registered on ERT’s Greenhouse Gas Registry, but less than 1 MtCO₂e were actually sold. Therefore, we only included the emissions reductions that were actually sold in the data and analysis presented herein.

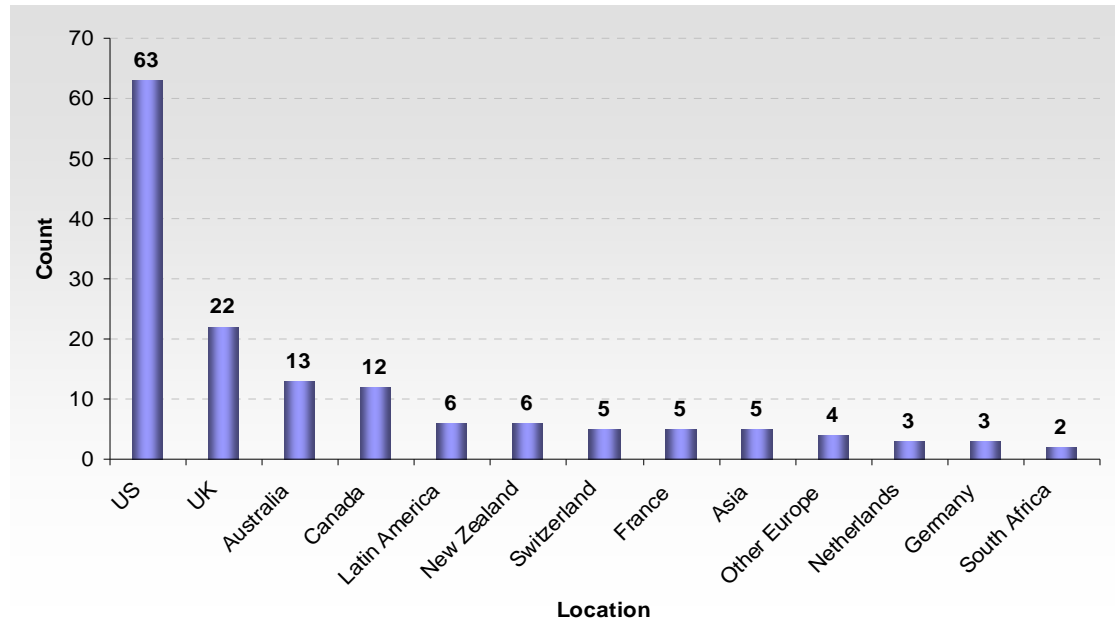
The majority of this report is concerned with measuring transactions in the marketplace, rather than the individual “lives” of credits. For example, if a credit was sold by a project developer to a retailer who then in turn sold the credit to a final buyer, and we were able to track both transactions, we counted each individual transaction. Within this report, the individual ‘lives’ of credits are accounted for at retirement (Section 5.3), at which point a credit can no longer be resold.

All financial figures presented in this report are based in US dollars unless otherwise noted.

2.3 Response Distribution

As illustrated by Figure 1, the majority of survey respondents were based in the United States. After the United States (US), the country with the second most respondents was the United Kingdom (UK), followed by Australia, Canada, and New Zealand.

Figure 1: Survey Participant Location, 2007¹



Source: Ecosystem Marketplace, *New Carbon Finance*

This response distribution seems to match the OTC marketplace trends at the retailer, broker, and wholesaler levels. For example, given the absence of any large-scale regulated markets, it should be expected that carbon offset providers are particularly prevalent in the United States. The relatively high number of UK respondents coincides with the growth of British eco-awareness and the fact that London has been a hub for suppliers primarily focused on serving regulatory buyers. The number of Australia-based providers is not surprising, since voluntary carbon offsets have been encouraged by an Australian federal government program and like the US did not, in 2007, have a federal cap on carbon dioxide (CO₂) emissions.

While the locations of respondents matches the locations of the bulk of intermediary sellers in the marketplace, as noted in Section 2.2, we believe there are far more project developers generating and selling to voluntary buyers across the globe, especially in Latin America and Asia, than we were able to survey. One limitation for suppliers in non-English speaking regions may have been that the survey was only provided in English.

¹ Based on 149 data points.

3 Voluntary Carbon Markets: The Basics

Summary Points:

- The voluntary carbon markets can be broken down into two categories: the Chicago Climate Exchange (CCX) and the “Over-the-Counter” (OTC) market.
- The Chicago Climate Exchange (CCX) is the world’s only voluntary cap-and-trade system.
- This report primarily focuses on the OTC market, which is based on bilateral deals, and operates outside of an exchange.
- A select number of governments have instituted voluntary emissions reduction and offset purchasing programs.

In general, the worldwide carbon markets can be divided into two segments: the voluntary markets and the regulatory (compliance) markets. As the name implies, the voluntary carbon markets include all carbon offset trades that are not required by regulation. At the broadest level, the voluntary carbon markets themselves can be divided into two main segments: the voluntary, but legally binding, cap-and-trade system that is the Chicago Climate Exchange (CCX), and the broader, non-binding, over-the-counter (OTC) offset market.

Since the CCX is already tracked, the majority of this report is focused on the fragmented OTC voluntary market. In addition, we have tried to provide as much information on the CCX as possible but beyond volume and price information we had limited access to specific information on CCX offsets. Therefore our analysis of the CCX reflects only publicly-available information on the exchange.

3.1 The Chicago Climate Exchange (CCX)

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.”¹ The CCX is driven by a membership-based cap-and-trade system. Members voluntarily join the CCX and sign up for its legally binding reductions policy. Like the Kyoto markets, the CCX trades six different types of GHGs converted into one common unit of tCO₂e.

There are three levels of membership in the CCX:

- **Full Members** are entities with significant direct greenhouse gas (GHG) emissions who have committed to reducing their emissions 1% per year from a baseline determined by their average emissions from 1998 through 2001. The current goal (Phase II) is for members to reduce their total emissions to 6% below the baseline by 2010. Hence, members who have been participating for the past four years must only reduce an additional 2% between now and 2010, while new members need to reduce 6% during this time.²
- **Associate Members** are entities with negligible direct GHG emissions, such as office-based institutions, businesses, and service organizations. Associate Members commit to report and fully offset 100% of their indirect emissions associated with energy purchases and business travel from year of entry through 2010.
- **Participant Members** are project developers, offset providers, offset aggregators, and liquidity providers, the last of which trades on the Exchange for purposes other than complying with the CCX emissions reduction schedule.

The CCX’s unit of trade is the Carbon Financial Instrument (CFI), which represents 100 tCO₂e. CCX CFIs can be either *allowance-based credits*, issued by emitting members in accordance with their emission baselines and the exchange’s reduction goals, or *offset credits* generated from qualifying emissions reduction projects. Offset based credits can only be used to offset

¹ The Chicago Climate Exchange (CCX) website. Available online at <http://www.chicagoclimatex.com>.

² Ibid

4.5% of members' total emissions to meet the required cap reductions, so the vast majority of credits traded on the CCX are allowance-based.

While all CCX credits are transacted voluntarily, the exchange briefly had links to the regulated markets. In 2006, for instance, at least 1,000 European Union Allowances (EUAs) were transferred into the CCX by a multi-national member (only one transaction of this kind has been publicly disclosed). However, at the end of 2006, EUA prices for 2007 contracts plummeted, and this link between the two markets was suspended in 2007. In addition to EUAs, CCX members can also use CERs for compliance. However, given that secondary CER prices are currently trading at much higher prices than CFIs on the CCX, this option has not been exercised.

The CCX is owned by Climate Change PLC. This holding company also launched the European Climate Exchange (ECX), which has since become a major exchange for allowances generated by the European Union Emissions Trading Scheme (EU ETS), the Chicago Climate Futures Exchange (CCFE) and the Montreal Climate Exchange. In anticipation of the Northeastern US states' Regional Greenhouse Gas Initiative (RGGI), CCX announced the development of the New York Climate Exchange and the Northeast Climate Exchange. In anticipation of an upcoming California cap-and-trade system, the CCX also plans to create a California Climate Exchange.

3.2 The Over-the-Counter Market (OTC)

Outside of the CCX, one finds the wide range of voluntary transactions that make up a voluntary market not driven by any sort of emissions cap. Because this market is not part of a cap-and-trade system, where emission allowances can be traded, almost all carbon offsets purchased in this voluntary market originate from project-based transactions. Because it does not operate via a formal exchange, we have labeled it as the voluntary Over-the-Counter (OTC) market. This OTC market is also often referred to as the voluntary offsets market. However, it is important to note that offset credits also exist on the CCX.

Credits sourced specifically for the OTC market are often generically referred to as Verified (or Voluntary, depending on the source) Emission Reductions (VERs), or simply as carbon offsets.¹ However, voluntary buyers may also purchase credits from the compliance markets or the CCX.

Because the OTC market demand is not driven by a cap, especially in the retail market, the demand curve for offset purchases has as much in common with the markets for Fair Trade or organic cotton as it does with the regulated carbon markets. Buyer motivations include wanting to manage their climate change impacts, an interest in innovative philanthropy, public relations, the need to prepare for (or deter) upcoming regulation, and/ or plans to resell credits at a profit. (See Section 9 for a more complete analysis of buyer motivations).

Suppliers in the offset market include retailers selling offsets online, conservation organizations hoping to harness the power of carbon finance, developers of potential JI or CDM projects with credits that - for a range of reasons - cannot currently be sold into the regulated markets, project developers primarily interested in generating VERs, and aggregators of credits. 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 carbon to aggregators, retailers, or final customers.
- **Aggregators/Wholesalers:** Only sell offsets in bulk and often have ownership of a portfolio of credits.
- **Retailers:** Sell small amounts of credits to individuals or organizations, usually online, and have ownership of a portfolio of credits.

¹ 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 Board. Once registered these credits will generate CERs.

- In some cases VERs also pass through **brokers**, who do not own credits but facilitate transactions between sellers and buyers.

Within the voluntary OTC market, these definitions are often blurred, and organizations frequently operate in more than one category type. Many suppliers, for instance, are also engaged in business activities other than selling VERs. For example, most major brokerage firms dealing in VERs also transact in the regulated markets or in other emissions markets. Alternatively, for several major non-profits supplying offset credits, the voluntary carbon market is only one of numerous finance streams enabling conservation projects.

There is a range of value chain patterns in the OTC market. At the most simple level, a final buyer purchases credits and retires credits from a project developer. At the most complex level, an offset credit will pass in a brokered deal between a project developer and an aggregator, and then be sold to a retailer, who then sells it to the final buyer. In and before 2006, it is likely that most credits were purchased directly from project developers or were retired and sold by retailers who purchased them from project developers. However, in 2007 it appears that supply chains became increasingly complex.

3.3 Government Voluntary Purchasing Programs

In several cases, governments have instituted voluntary emissions reduction and carbon offset purchasing programs. When deciding whether to include these programs in this analysis of the voluntary carbon markets, we screened and categorized these programs based on whether they contributed to a country's regulatory requirements or supported pure voluntary buys. For example:

Japan's Keidanren Voluntary Action Plan on the Environment: Japan's Kyoto commitment is to reduce GHG emissions to 6% below its 1990 levels within the first commitment period from 2008 to 2012. One aspect of the country's reduction strategy is the Keidanren Voluntary Action Plan, which encompasses 58 different Japanese business associations¹ and includes 35 industry participants from the energy, mining, and construction industries.² Member companies in the Keidanren Voluntary Action Plan have committed to stabilizing their collective emissions to 1990 levels by 2010.³ Despite lacking legally binding emissions reduction requirements, the Keidanren Voluntary Action Plan is positioned as a Kyoto Protocol Target Achievement Plan.⁴ Offset credits are, in theory, purchased voluntarily. However, the only viable offsets are from Kyoto mechanisms (Clean Development Mechanism / Joint Implementation), with purchases being accounted for on a national registry system and used to meet Kyoto commitments. Hence, we have not included Keidanren purchases in our quantitative analysis of the voluntary carbon markets.

The Australian government's **Greenhouse Challenge Plus** program was created to help Australian companies improve energy efficiency and reduce GHG emissions. Like the United States' Environmental Protection Agency's (US EPA) Climate Leaders program, this program includes emissions reduction progress reporting and technical assistance. A particularly unique aspect of the Greenhouse Challenge Plus program is the Greenhouse Friendly Initiative, which certifies credits from emissions abatement programs as well as 'carbon neutral' claims. Although this initiative is part of a government program, we have chosen to include as much information as possible from this program in our analysis of the voluntary carbon markets because the program is based on purchases made by non-regulated entities. It is thus purely voluntary, as GHG emissions are not yet regulated at a national level. Furthermore, the program allows entities to utilize credits that are not part of a regulatory system.

¹ Richard D. Morgenstern and William A. Pfizer, "How Well Do Voluntary Environmental Programs Really Work?" *Resources for the Future*. Winter 2007. Available online at http://www.rff.org/Documents/RFF-Resources-164_VoluntaryPrograms.pdf.

² KIKO Network, "False or True? The Keidanren Voluntary Action Plan In Japan: A Typical Example of 'Pledge and Review' System," December 2007. Available online at http://2050.nies.go.jp/3rdLCSWS/related/related2_KimikoHirata.pdf.

³ Ibid p. 3

⁴ Ibid p. 3

4 The Regulatory Context

Summary Points:

- The Kyoto Protocol is the legally binding, international agreement that launched the largest global compliance carbon market. 180 countries have agreed to its target of 5.4% reductions below 1990 emissions levels by 2012.
- Countries that ratified Kyoto can achieve their targets via three “flexibility mechanisms”: Emissions trading, Joint Implementation (JI), and the Clean Development Mechanism (CDM).
- Although the US did not ratify Kyoto, many legally binding state and regional GHG reduction initiatives exist or are coming into existence in the US, including: the Regional GHG Initiative (RGGI), California’s Global Warming Solutions Act (AB 32), the Western Climate Initiative, and the Midwestern Regional GHG Reduction Program (MRP).
- An Australian state-level emissions reduction program, the New South Wales GHG Abatement Scheme (NSW GGAS), is the world’s second largest regulated, cap-and-trade GHG market (25.4MtCO₂e and \$224 million transacted in 2007).

As the name suggests, voluntary carbon markets are defined by a lack of regulatory drivers. They do, however, operate alongside their regulated market cousins, and are heavily influenced by them. Hence, understanding the basics of the regulatory markets is key to exploring the voluntary side of carbon trading. Below is a brief outline of these regulated markets.

4.1 The Kyoto Protocol

The Kyoto Protocol is a legally binding agreement under which 180 industrialized countries¹ (as of late April 2008) have agreed to reduce their collective GHG emissions to a level 5.4% below their 1990 emissions levels by 2012. It is under the Kyoto regime, which came into effect in 2005, that the world’s largest GHG markets have evolved.² These markets are based on a cap-and-trade model with three major “flexibility mechanisms”: Emissions Trading, Joint Implementation, and the Clean Development Mechanism. These mechanisms are the foundation of the regulated international Kyoto carbon market:

- **Emissions Trading** is an allowance-based transaction system that enables developed countries and countries with economies in transition to purchase carbon credits from other developed countries and economies in transition to fulfill their emission reductions commitments. The mechanism has resulted in the European Union Emission Trading Scheme (EU ETS), which involves all EU member states and is the currently the world’s largest multinational GHG emissions trading scheme. Credits traded under the system are called European Union Allowances (EUAs). According to the World Bank, in 2007 the EU ETS market traded 2,060.8MtCO₂e, and the market was valued at \$50,097.4 million.³
- **Joint Implementation (JI)** allows emitters in developed countries (referred to as Annex 1 countries under the Kyoto Protocol) to purchase carbon credits via “project-based” transactions (meaning from greenhouse gas reduction projects) implemented in either another developed country or in a country with an economy in transition. Emissions from these JI projects are referred to as Emission Reduction Units (ERUs). According to the World Bank, in 2007, 41.1MtCO₂e of ERU credits were transacted, and the market was valued at \$494.8 million⁴.

¹United Nations Framework Convention on Climate Change (UNFCCC), “Kyoto Protocol Status of Ratification,” last updated 28 April 2008. Available online at http://unfccc.int/kyoto_protocol/background/status_of_ratification/items/2613.php.

²Six GHGs are listed under the Kyoto Protocol: carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons.

³World Bank. *State and Trends of the Carbon Market 2008*, May 2008.

⁴Ibid

- **The Clean Development Mechanism (CDM)**, like JI, is a project-based transaction system through which industrialized countries can accrue carbon credits. Unlike JI, however, CDM credits are acquired by financing carbon reduction projects in developing countries. Carbon offsets originating from registered and approved CDM projects are called Certified Emissions Reductions (CERs). This mechanism is the critical link between developed and developing countries under Kyoto and is the flexible mechanism participants in the voluntary market most often seek to emulate. Accepted CDM projects have become a major influence on 'setting the bar' for offset projects in developing countries. CERs and ERUs can also be sold on the voluntary markets. In 2007, 550.9MtCO₂e of primary CDM credits were transacted, and the CDM market was valued at \$6,886.6 billion. Some of these credits were further sold into a burgeoning secondary market which traded 240.0MtCO₂e of secondary CDM credits, valued at \$8,383.6 million.¹

4.2 The United States

The United States did not ratify the Kyoto Protocol, and the federal government does not currently regulate carbon dioxide (CO₂) or any other GHGs regulated under Kyoto as climate change-related pollutants. Having ratified the Montreal Protocol, the US does regulate ozone depleting GHGs, such as Chlorofluorocarbons (CFCs), which are being phased out entirely on the international scale.

To compensate for the lack of national CO₂ regulation, several states have initiated their own regulations alone or in conjunction with others. Legislation is quickly evolving at the national and multi-state level as more states step up to the plate on climate legislation and members of Congress announce new legislative proposals on a monthly basis. As of March 2008, legislators in the 110th US Congress introduced more than 195 bills, resolutions, and amendments addressing climate change.² Currently, GHG emissions markets exist or may soon exist under the following regimes:

- In 1997, Oregon enacted the **Oregon Standard**, the first regulation of CO₂ in the United States. The Oregon Standard requires that new power plants built in Oregon reduce their CO₂ emissions to a level 17% below those of the most efficient combined cycle plant, either through direct reduction or offsets. Plants may propose specific offset projects or pay mitigation funds to The Climate Trust, a non-profit created by law to implement projects that avoid, sequester, or displace CO₂ emissions.³
- On the East Coast, ten states (Connecticut, Delaware, Maryland, Massachusetts, Maine, New Hampshire, New Jersey, New York, Rhode Island, and Vermont) are developing the **Regional Greenhouse Gas Initiative (RGGI)**, a regional strategy to reduce CO₂ emissions utilizing a cap-and-trade system. Although RGGI will not officially launch until January 2009, the first auction of emission permits is set for September 2008 and brokers report that forward transactions are already taking place on this market. Member states anticipate auctioning close to 100% of their annually allocated allowances, which represent approximately 171MtCO₂e/yr. The emissions cap will initially apply to power plants in member states that use fossil fuels to generate over half their electricity and have energy production capacities above 25MW. The cap's applicability is much broader for power plants that commenced operations after 2004, and includes power plants with fossil fuels constituting over 5% of their annual total heat input.⁴ The program may be extended to include other GHGs and offsets from projects and project-based transactions.⁵ Member states have agreed to allocate the revenues of at least 25% of allowances to "consumer benefit programs." States maintain autonomy over allocating the remaining 75% of allowances.

¹ Ibid

² Pew Center on Global Climate Change, "Climate Action in Congress: US Climate Change Legislation." Available online at http://www.pewclimate.org/what_s_being_done/in_the_congress.

³ The Climate Trust, "About Us," Available online at http://www.climatetrust.org/programs_powerplant.php.

⁴ Regional Greenhouse Gas Initiative (RGGI), "Overview of RGGI CO₂ Budget Trading Program," October 2007. Available online at http://www.rggi.org/docs/program_summary_10_07.pdf.

⁵ RGGI, "About RGGI." Available online at <http://www.rggi.org/about.htm>.

The scheme has a sliding scale that permits the use of flexible mechanism credits based on market prices: the lower the price of emissions reduction credits, the more restrictive the use of those credits. If the average price of credits across the United States remains under \$7/short tCO₂e (as opposed to a metric tonne), then the scheme only allows participants to cover up to 3.3% of their emissions using credits from emissions reduction projects, which must be located within the United States. If the average price in the US goes above \$7/short tCO₂e, then offsets can be used for up to 5% of emissions, and if prices rise above \$10/ short tCO₂e, participants can use offsets for 10% of their emissions. Under this last scenario, offsets may be used from US-based projects as well as from the EU ETS and the Kyoto Protocol's CDM.¹ Companies operating under the scheme will likely possess a surplus of emission permits after the 2009 launch because participants emitted 11.8MtCO₂e less than the established cap in 2007, but the scheme is considered an important testing ground as it will be the first regional GHG cap-and-trade system on United States soil².

- California's **Global Warming Solutions Act (AB 32)** is the first US state-wide program to cap all GHG emissions from major industries and which includes penalties for non-compliance. Under the Act, California's State Air Resources Board (CARB) is required to create, monitor, and enforce a GHG emissions reporting and reduction program. The California Market Advisory Committee (MAC) was created in December 2006 to provide recommendations on the implementation of the Act. In the implementation of AB 32 Governor Schwarzenegger authorized CARB to establish market-based compliance mechanisms to achieve reduction goals. The MAC's current recommendations include: the eventual incorporation of all GHG-emitting sectors of the economy into the cap-and-trade system, a first-seller approach whereby responsibility is assigned to the utility that initially sells electricity into the state, an allocation design that combines free and auctioned pollution permits, with the amount being auctioned increasing over time, and the promotion of linkages with other emerging cap-and-trade systems.³
- The **Western Climate Initiative (WCI)** includes California and five other states (New Mexico, Oregon, Washington, Arizona, and Utah) as well as three Canadian provinces (British Columbia, Manitoba, and Quebec). It was formed in February 2007, and member states have committed to a 15% GHG emissions reduction goal below a 2005 baseline by 2020. The plan is expected to have coverage of approximately 886MtCO₂e/yr by 2012.⁴
- A third regional cap-and-trade program is also in the making -- the **Midwestern Regional GHG Reduction Program (MRP)**. This program consists of the following members: Iowa, Illinois, Kansas, Minnesota, Wisconsin, Michigan, and Manitoba (Canada). The Midwestern Greenhouse Gas Accord was signed in November 2007, and aims to incorporate an approximate emissions target of 16% below 2005 levels. The program is scheduled to start in 2012 and will incorporate a regional cap-and-trade system covering most sectors of the economy. The scheme aims to cover approximately 1,107MtCO₂e/yr by 2012 and is slightly larger than the WCI.
- By March 2008, thirty-nine US states, the District of Columbia, three Native American tribal nations, six Mexican states, and six Canadian provinces signed onto **The Climate Registry**.⁵ Like the California Climate Action Registry, this multi-state-and-tribe registry was created to facilitate regulatory or voluntary reporting and to "provide an accurate, complete, consistent, transparent and verified set of greenhouse gas emissions data from reporting entities, supported by a robust accounting and verification infrastructure."⁶ While the Registry is not currently being utilized by a cap-and-trade system, it could very well influence any future federal initiative.

¹ RGGI, "Overview of RGGI CO₂ Budget Trading Program," October 2007. See prior citation for URL.

² New Carbon Finance

³ California Environmental Protection Agency, "Expert Advisors Release Final Cap-and-Trade Report: Recommendations Intended to Complement California's Ongoing Efforts to Reduce Emissions," 29 June 2007. Available online at http://www.climatechange.ca.gov/notices/news/2007-06-29_MAC_FINAL_RELEASE.PDF.

⁴ "Western Governors, Premiers Set Greenhouse Gas Reduction Goal," Environmental News Service, 22 August 2007. Available online at <http://www.ens-newswire.com/ens/aug2007/2007-08-22-05.asp>.

⁵ The Climate Registry, "About the Registry." Available online at <http://www.theclimateregistry.org/members.html>.

⁶ The Climate Registry, "Principles & Goals." Available online at <http://www.theclimateregistry.org/principlesgoals.html>.

4.3 The New South Wales Greenhouse Gas Abatement Scheme

The New South Wales (NSW) Greenhouse Gas Abatement Scheme (GGAS) is an Australian mandatory state-level program designed to “reduce greenhouse gas emissions associated with the production and use of electricity; and to develop and encourage activities to offset the production of greenhouse gas emissions.”¹ GGAS was launched in 2003, two years before the EU ETS. The scheme establishes annual statewide greenhouse gas reduction targets of 7.27 tCO₂e per capita, and then requires individual electricity retailers and certain other parties who buy or sell electricity in NSW to meet mandatory benchmarks based on the size of their shares of the electricity market.²

If a regulated emitter exceeds its target, it has the choice of either paying a penalty of AU \$11.50 (about US\$9) per tCO₂e or purchasing New South Wales Greenhouse Abatement Certificates (NGACs), which are generated by emissions abatement projects carried out within the state. NGACs can be generated by approved providers with projects that lead to low emissions electricity generation, improved energy efficiency, or biological CO₂ sequestration; or that reduce onsite emissions not directly related to electricity consumption.³ The initiative does not accept credits, such as CERs or ERUs, from outside of the state. According to the World Bank, outside the Kyoto markets, the NSW GGAS is the world’s largest, regulated cap-and-trade GHG market, with about 25.41MtCO₂e traded in 2007 and an estimated value of US\$224.10million.⁴

¹ New South Wales Greenhouse Gas Abatement Scheme (NSW GGAS), “Scheme Introduction.” Available online at http://www.greenhousegas.nsw.gov.au/overview/scheme_overview/overview.asp.

² NSW GGAS, “Greenhouse Gas Abatement Scheme.” Available online at <http://www.greenhousegas.nsw.gov.au>.

³ Ibid

⁴ World Bank, *State and Trends of the Carbon Market 2008*, May 2008.

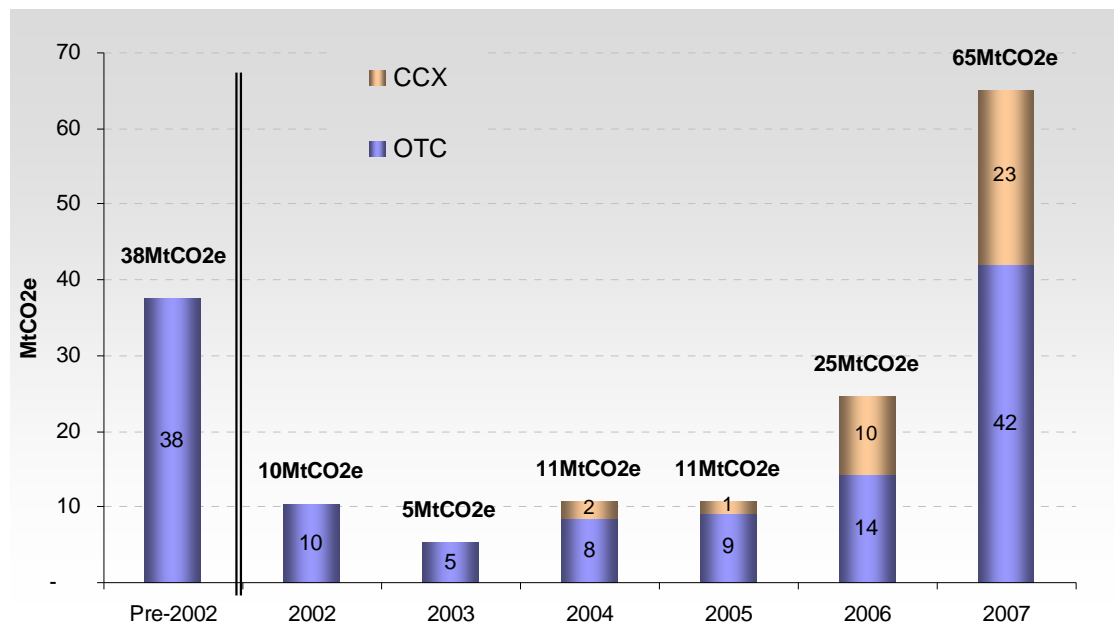
5 Gold Rush? 2007 Size and Growth

Summary points:

- We recorded a total of 65.1 MtCO₂e transacted (\$331 million) on the voluntary carbon markets. At least 42.1 MtCO₂e were transacted (\$258.4 million) on the international OTC market and about 22.9 MtCO₂e were transacted (\$7.4 million) on the CCX.
- Between 2006 and 2007 transaction volume on the CCX market doubled and the OTC market more than tripled.
- The average prices of a carbon credit transacted on the OTC market and the CCX were \$6.10/ tCO₂e and \$3.15 / tCO₂e respectively.
- While non-profits remain a strong presence as suppliers in the voluntary market, the share of total credits sold by for-profit entities increased substantially in the last year, from 60% in 2006 to 90% in 2007. (Before 2006, non- and for-profits split market supply almost 50/50.)

We were able to track a total volume of 65.1MtCO₂e transacted in the voluntary carbon markets in 2007. About a third of this volume, 22.9MtCO₂e, was exchanged on the CCX.¹ A confirmed 42.1MtCO₂e were transacted in the OTC market. As illustrated in Figure 2, the voluntary carbon markets transaction volume increased 165% in 2007. This growth is led by a doubling of volume on the CCX and more than tripling on the OTC market.

Figure 2: Voluntary Carbon Market Volumes²



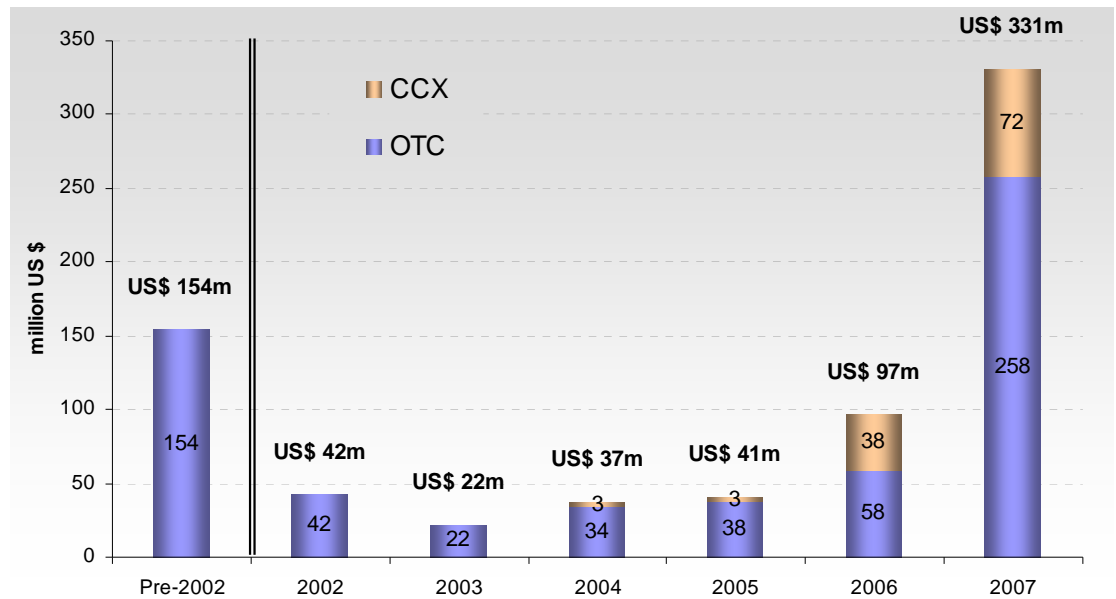
Source: Ecosystem Marketplace, New Carbon Finance

In 2007, the average price of a carbon credit transacted on the OTC market was \$6.10, up 49% from the 2006 average of \$4.10. Prices ranged from as a low as \$1.80 to as high as \$300/ tCO₂e. On the CCX, the average credit price was \$3.15, with prices ranging from a low of \$1.62 to a high of \$4.20. Utilizing this price data, we estimate the international OTC market's 2007 value at \$258.4 million. Together with the CCX, which was valued at \$72.4 million, we value the global voluntary markets at \$330.8 million in 2007. This value more than triples our 2006 calculated market value of \$96.7 million (growth of 240%).

¹ CCX website. See prior citation for URL.

² Volume for 2007 based on 118 data points.

Figure 3: Voluntary Carbon Market Values¹



Source: Ecosystem Marketplace, New Carbon Finance

As noted in Section 3.1, only a certain percentage of the credits exchanged on the CCX are project-based credits. The CCX does not separate out the number of project-based credits from allowance-based credits exchanged and the CCX has not been able to provide insight in the numbers behind the transactions. It is therefore impossible for us to determine the volumes on the CCX that are actually offset project related. The only thing we can say for certain is that part of the 22.9Mt exchanged on the CCX in 2007 may have come from the estimated 25Mt of offset credits issued by the CCX before December 2007.

For the OTC market, these volume and size estimates are conservative due to a number of factors including:

- the number of suppliers we were not aware of and therefore did not receive the survey
- the number of suppliers active in the market who did not respond to the survey
- the fact that 37% of survey respondents did not disclose volume data

However, through the survey responses we believe to have captured data from most large volume suppliers, and hence the calculated volumes will be very close to the actual transactions done in the marketplace.

5.1 Historical Growth: Expanding Horizons

Transactions in the OTC voluntary market occurred as early as 1988—sixteen years before the first Kyoto transaction. In the years before 2002, we were able to confirm 37.6MtCO₂e transacted on the OTC market, which at that point was the only carbon market game in town. Since our survey grouped all pre-2002 transaction volumes into one question, we were unable to track earlier market patterns.

In 2004, the launch of the CCX was a critical addition to the voluntary carbon markets. By 2006, CCX volume, including both allowance- and offset-based transactions, made up a significant fraction of the voluntary carbon markets. The CCX has continued to see its volume increase rapidly, but because of the explosion in OTC volume, its overall market share dropped from 40% of the total voluntary carbon markets volume in 2006 to 35% in 2007.

In addition to detailed data on 2007 transactions, because several additional organizations participated this year, the survey requested historic, in addition to 2007, transaction volumes to

¹ Note: Values for years prior to 2006 were derived by using transacted volumes and an average price equal to the 2006 average: \$4.1/tCO₂e. As the average prices prior to 2006 are not known, this is merely an estimate. Volume for 2007 based on 118 data points.

be disclosed by each participant. Hence, we were able to record more data on transactions in and before 2006 than we were last year. For example, last year we recorded 13.4MtCO₂e transacted on the OTC market in 2006 and 6.5MtCO₂e transacted in 2005. This year we accounted for 14.3MtCO₂e transacted in 2006 and 9.3MtCO₂e transacted in 2005. The increase in the number of transactions we were able to account for is displayed in Table 1.

Table 1: New Voluntary OTC Market Volumes Recorded

Year	Transactions recorded in 2007 (MtCO ₂ e)	Transactions recorded in 2008 (MtCO ₂ e)	Change (MtCO ₂ e)
2006	13.4	14.3	+0.9
2005	6.5	9.3	+2.8
2004	7.3	8.4	+1.1
2003	4.5	5.4	+0.9
2002	9.5	10.3	+0.8
Pre- 2002	35.2	37.6	+2.4

Source: Ecosystem Marketplace, New Carbon Finance

5.2 Keeping Up with the Kyoto's: The Voluntary Markets in Context

In 2007, according to World Bank data, the international regulated markets transacted 2,959.2MtCO₂e, valued at \$66,421.5 million. The voluntary markets remain only a small fraction (about 2.2% volume-wise) of the size of the regulated markets. While it is clear that voluntary carbon markets alone are not big on their own to address climate change, the voluntary markets are not insignificant in size. For example, the voluntary OTC market alone is larger than the New South Wales market, which actually decreased in size. Moreover, the voluntary markets' growth rate, 165%, was actually considerably higher than the regulated markets' growth rate of 71%.

Table 2: Transaction Volumes and Values, 2006 and 2007

Markets	Volume (MtCO ₂ e)		Value (US\$million)	
	2006	2007	2006	2007
Voluntary OTC Market	14.3	42.1	58.5	258.4
CCX	10.3	22.9	38.3	72.4
Total Voluntary Markets	24.6	65.0	96.7	330.8
EU ETS	1,103.9	2,060.8	24,435.6	50,097.4
Primary CDM	537.0	550.9	6,886.6	6,886.6
Secondary CDM	25.0	240.0	8,383.6	8,383.6
Joint Implementation	16.2	41.1	141.4	494.8
New South Wales	20.2	25.4	225.4	224.1
Total Regulated Markets	1,702.2	2,918.2	40,072.7	66,086.5
Total Global Market	1,726.7	2,983.2	40,169.4	66,417.2

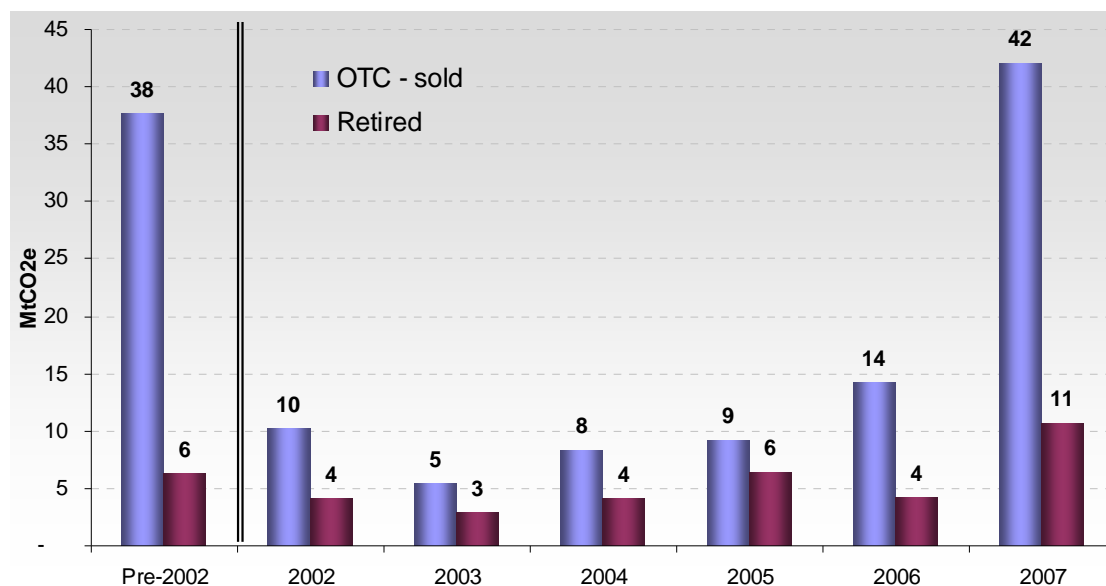
Source: Ecosystem Marketplace, New Carbon Finance, World Bank

5.3 Retirement: A VER's Life Goal

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 GHG emissions, the carbon credit is then retired and cannot be sold again. More and more, these retired offsets are being stored in "retirement registries." The tracking of retired credits is important because it represents the impact of the market from an atmospheric perspective and the fundamental demand behind the market.

When surveying suppliers, we asked for the volume of credits not only supplied to the marketplace but also the volume of credits retired for customers. Of the 150 survey respondents, we accounted for retired credits from 62 (41%) and assumed that all online carbon offset retailers are retiring 100% of sales. This assumption is based on the fact that, for these retailers, retiring the credit is the crux of the transaction and the responsibility of the supplier.

Figure 4: Transaction Volumes and Retirement¹



Source: Ecosystem Marketplace, New Carbon Finance

In 2007, we accounted for 10.7MtCO₂ retired by voluntary buyers, which are included in the total transaction volume estimates. The increase of credits retired is similar to volumes traded, with both retired credits and trading volumes growing at more than 150% between 2006 and 2007. Comparing the number of credits retired to the total number of credits transacted, the OTC turnover (or churn) rate, meaning the number of times a credit was transacted before retirement, was around 3.9 in 2007, which is slightly higher than the 3.4 turnover rate we recorded in 2006.

Before 2006, the secondary market on the OTC was extremely limited, and hence a transaction in the marketplace was almost synonymous with retirement (with the exclusion of pre-2002 data although this may be considered less reliable). This higher turnover rate is likely a result of the increasing number of intermediaries in the supply chain and increasing number of speculative ‘pre compliance’ / investment-focused buyers in the marketplace. Hence, this trend is likely to continue in the next couple of years.

However, it is important to note, that in reality this turnover rate is likely much lower than 3.9. Confirming retirement represents another challenge in the data collection process. For instance, in many cases, a supplier sells an “active” credit, and retirement is in the hands of the final buyer and cannot be confirmed by the supplier. Likewise, most brokers were unable to confirm if credits they transacted were retired. Hence, even in comparison to total transactions, these retirement volumes should be deemed conservative. For example, in another question in the survey, suppliers noted that only 30% of credits purchased by customers were purchased for investment or re-sale.

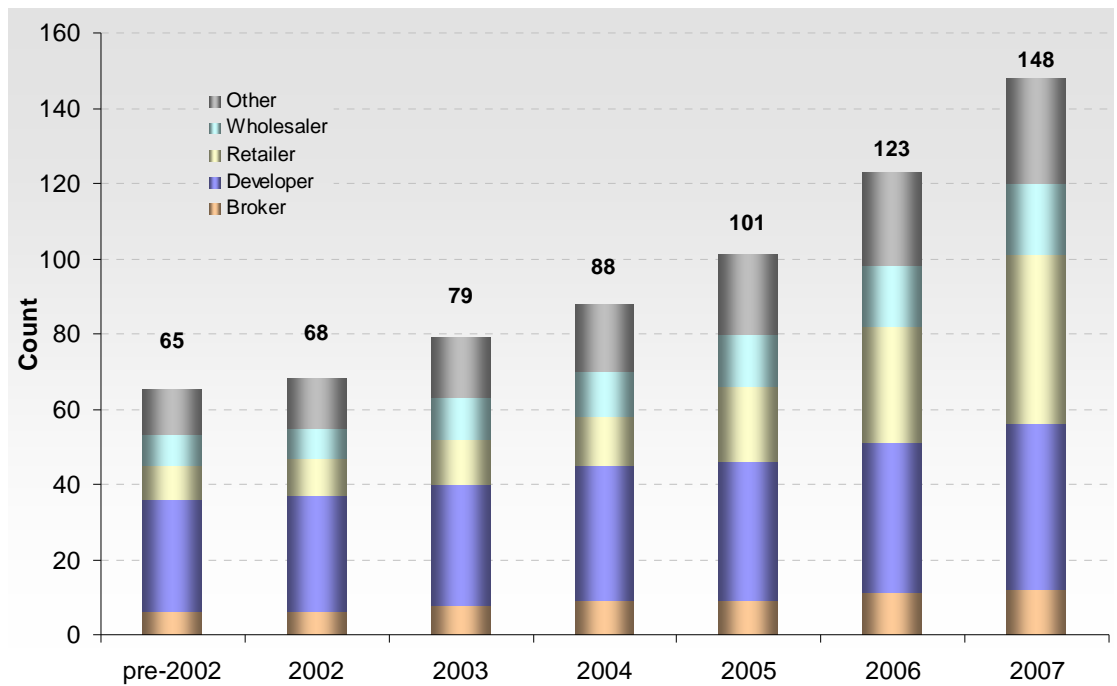
5.4 Varied Vendors: Suppliers in the Market

While volume data has been lumpy over the past few years, the number of suppliers offering wares to voluntary OTC buyers has risen in a stair step fashion as illustrated in Figure 5.

In the survey, we asked suppliers to check both their primary business activity and any additional business activity they cover. The options were retailer, wholesaler/ aggregator, broker, or project developer (See Section 3.2 for definitions). Respondents could also choose to select “Other” and provide a description of their business activities. Respondents selecting “Other” described themselves as hedge funds, investment banks, facilitators, NGOs, and several other business types.

¹ Value for 2007 based on 118 data points.

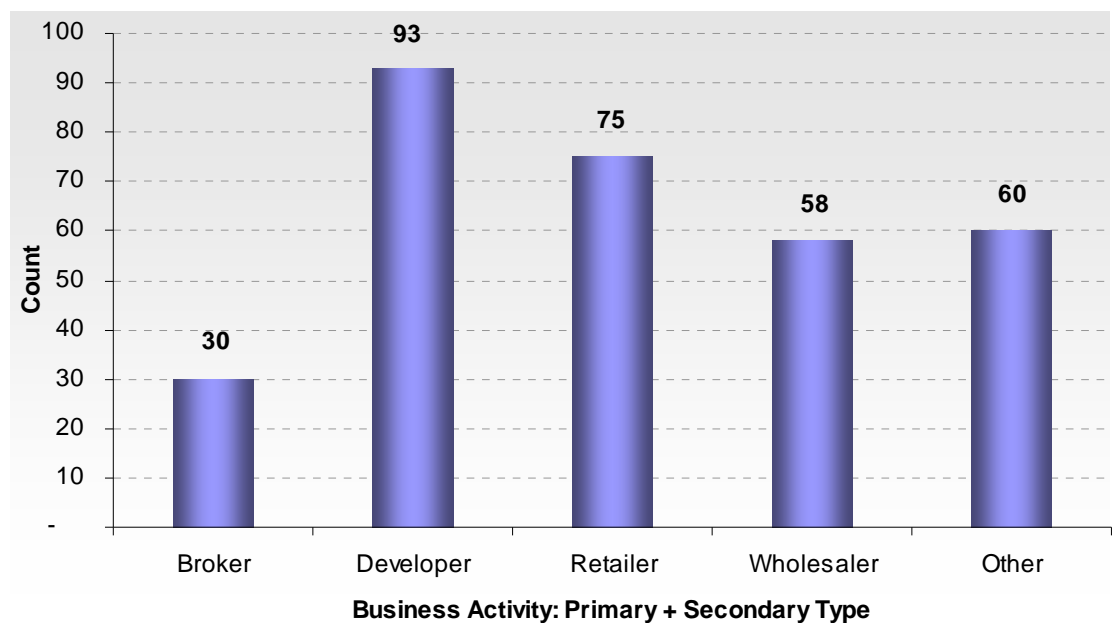
Figure 5: OTC Suppliers by Primary Business Activity¹



Source: Ecosystem Marketplace, New Carbon Finance

Figure 6 illustrates the total number of organizations (that responded to the survey) operating in each business category. Because suppliers selling into the OTC market may wear several hats, the total number of organizations across the supply chain (316) exceeds the number of survey respondents (150). As expected, the number of project developers and retailers is larger than any of the other categories, and brokers constitute the smallest group, as this category is generally dominated by a few large companies.

Figure 6: Business Activity: Primary + Secondary Type, 2007²

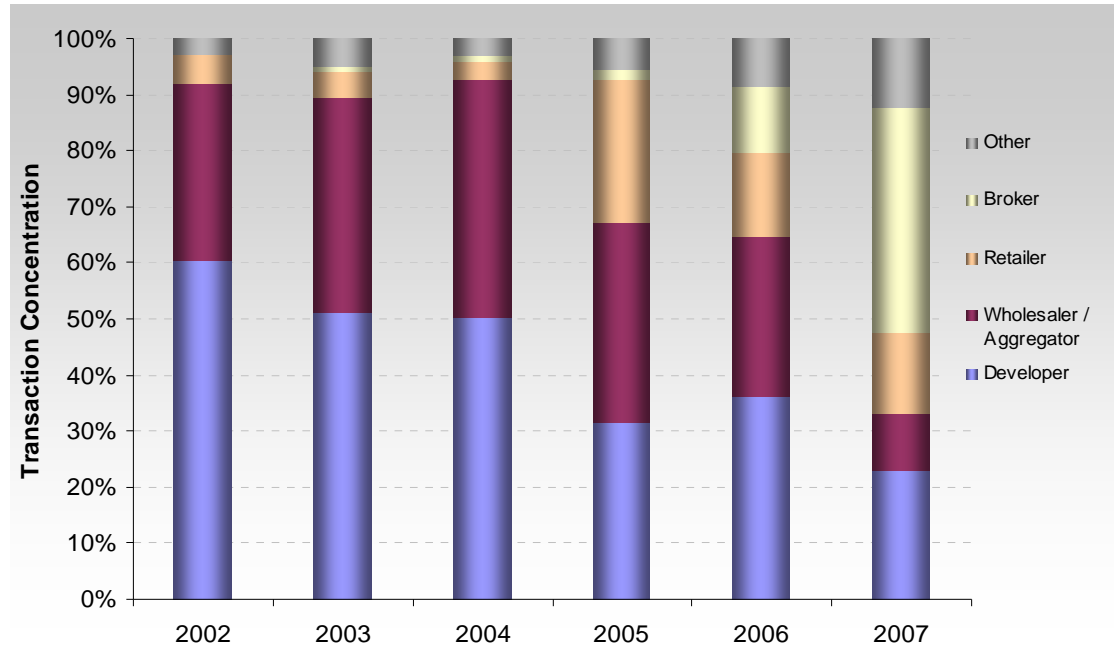


Source: Ecosystem Marketplace, New Carbon Finance

¹ Number for 2007 based on 148 data points.

² Based on 148 data points.

Figure 7: Transaction Concentration by Primary Organization Type¹



Source: Ecosystem Marketplace, New Carbon Finance

Figure 7 illustrates the annual transaction volume broken down by respondents' primary business activity. A clear trend can be identified in the increased involvement of brokers in the supply chain. Whereas before 2006 most of the volume went through project developers and wholesalers, in 2007 brokers accounted for 40% of recorded transactions. Because of the large amounts of data we obtained from brokerage firms and relatively low response rate from project developers, this figure also illustrates a certain amount of response bias in the survey numbers and is likely skewed away from project developers and more heavily weighted towards brokers.

5.5 Passing Hands: Prices by Supplier Category

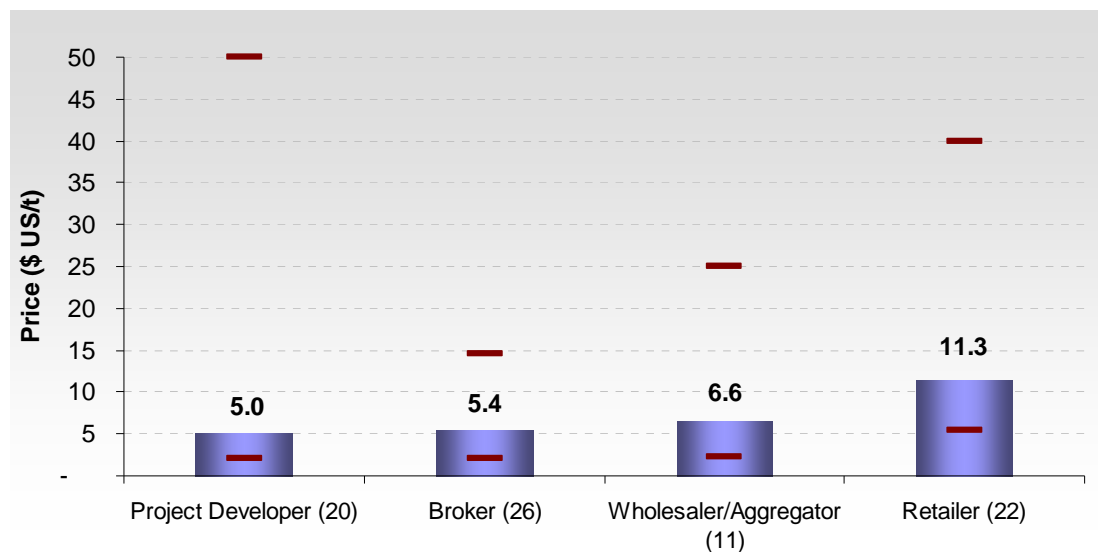
Between 2006 and 2007, the average price of a credit sold on the OTC market rose from \$4.10/tCO₂e to \$6.10/tCO₂e. Utilizing price and primary business activity data, we were able to break down this average selling price in 2007 by supplier category (see Figure 8 below including the minimum and maximum price indicated by category).

The general price increase is reflected across the supply chain, except in the case of brokers, whose average credit transaction was priced at \$6.00 in 2006 and declined to \$5.40 in 2007. This lower brokerage price obtained from this year's survey seems to be more realistic compared to last year, as brokers are generally involved in transactions between project developers and wholesalers or retailers, so their quoted prices should therefore be in between these two price points. In last year's survey, brokerage prices were above the average price of wholesalers/aggregators. The average project developer price rose from \$3.88/tCO₂e to \$5.00/tCO₂e. Likewise, the average retailer price rose from \$8.04/tCO₂e in 2006 to \$11.3/tCO₂e in 2007.

As in the supply chain for most consumer products, carbon offset consumers generally pay more for a small batch of carbon credits purchased from a retailer than they would if making a bulk purchase or contacting the project developer directly. Hence, it makes sense that consumers purchasing directly from a project developer paid the lowest price while customers purchasing smaller batches of credits online in the comfort of their homes from a retailer paid the highest price.

¹ Numbers for 2007 based on 148 data points.

Figure 8: Price by Primary Business Activity, OTC 2007 (including Price Ranges)¹



Source: Ecosystem Marketplace, New Carbon Finance. Note: Numbers within parentheses indicates number of data points.

These price increases may highlight a number of trends. It seems increased demand for voluntary credits has significantly increased, as illustrated by the volume figures in the first section, and demand has moved beyond the relatively inexpensive “low-lying fruit” of the industrial gas sector, towards the more expensive methane and renewable energy sectors. At the same time, buyers are increasingly seeking highly additional credits that have been verified to a third party standard, which means these credits are more costly to produce.

5.6 Mission Driven: The Role of NGOs

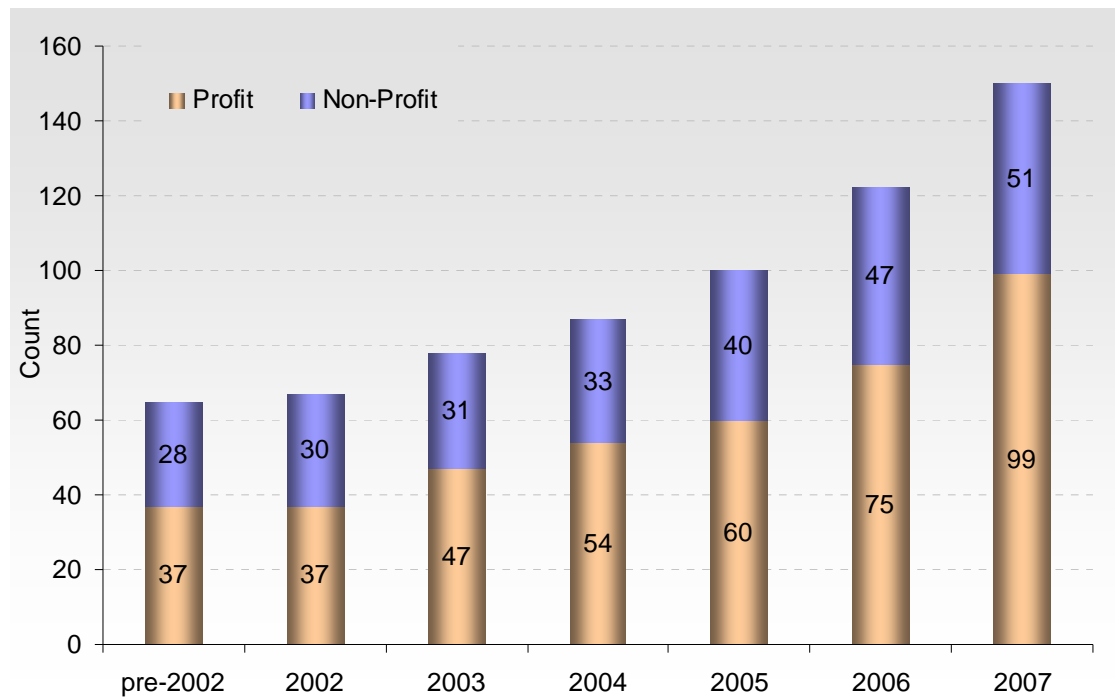
Driven by “do gooder” purchases, the voluntary carbon markets encompass both philanthropic and commodity market drivers. Under this wide umbrella, both non-profit and for-profit organizations supply carbon offsets. Of the 150 organizations contributing data to this report, 51, up from 47 in 2006, were non-profits, which have historically been pioneers in this field. For example, well known non- governmental organizations (NGOs) such as The Nature Conservancy, Care International, and Conservation Fund have harnessed the carbon markets over the years, both in the form of philanthropic donations and for-profit investments to finance conservation projects. However, the percentage of recorded credits transacted by non-profits has decreased in the past year.

In 2007, 90% of all voluntary transactions were supplied by for-profit entities, up from 60% in 2006. Even in terms of volumes retired, for-profits dominate the voluntary markets, supplying close to 80% of the volume of credits retired. Before 2006, non-and for-profits split market supply almost 50/50.

Of the 51 non-profit respondents supplying credits to voluntary buyers (Figure 9), 18 organizations transacting a total of 3.4MtCO₂e noted they retired offsets in exchange for tax-deductible donations. In general, these non-profits do not transfer ownership to the donor but rather focus on instantly retiring the credits. Several non-profits emphasized that they utilize both tax deductions and sales or investment models. However, when a transaction does allow for transfer of ownership, in general the deal is not structured as a tax-deductible donation. Such tax deductions are relevant in the marketplace because they influence the final price of an offset credit--an important factor for final buyers in this competitive marketplace.

¹ Based on 79 data points.

Figure 9: Suppliers by Profit vs. Non-Profit Organization Type¹



Source: Ecosystem Marketplace, *New Carbon Finance*

Despite this potential pricing issue, most market players interviewed seem to agree that space exists for both the non- and for-profit actors. In some cases, these two sectors have worked together. For example, in November 2007, Ducks Unlimited (DU), Equator Environmental, LLC and New Forests Inc. joined forces to finance conservation easements in the Great Plains. The companies provided financing and expertise to help DU purchase easements and carbon credits in the Prairie Pothole Region and, in turn, to gain ownership rights enabling them to sell the ensuing carbon offsets. Jeff Ringleman from Ducks Unlimited describes the partnership as “a win-win like never before.”²

¹ Numbers for 2007 based on 148 data points.

² Ducks Unlimited, “Carbon Credits Finance New Approach to Large-Scale Conservation.” Available online at <http://www.ducks.org/news/1430/CarbonCreditsFinance.html>.

6 Origin of an Offset

Summary Points:

- In general, credits transacted on the OTC are born from specific GHG-reducing projects (unless they are generated from CCX or EU ETS-based allowances)
- Offset-generating projects are very diverse. In 2007, the largest share of the offset market was occupied by energy efficiency, renewable energy, methane destruction, and forestry/land-based projects.
- There was a sharp increase in market share occupied by renewable energy (up 12% points), energy efficiency (up 13% points), and methane destruction (up 14% points) projects in 2007. Collectively, these project types totaled 61% of the market in 2007.
- Market share decreased for RECs (down 13% points), industrial gas destruction (down 18% points), and afforestation/reforestation mixed native (down 23% points) projects in 2007.
- In 2007, offset prices ranged from \$1.80 to about \$300/tCO₂e. Mixed native and plantation afforestation/reforestation projects (\$6.80 and \$8.20 respectively) and RECs (\$8.70) charged the highest prices. The least expensive credits came from industrial gas and geological sequestration projects (\$3.70 and \$2.50 respectively).
- In 2007, most credits transacted on the OTC market came from Asia (39%), with North America in second place (27%). New Zealand and Australia-sourced credits increased significantly to 7% of market share, up from near zero in 2006.
- The highest priced offset credits, on average, originated in Africa (\$13.70), and the lowest average prices in the U.S. (\$4.50) and the E.U. (\$5.20).
- Survey respondents reported selling more credits from medium-sized (20,000 to 100,000 tCO₂e/year) projects than any other project type.

Almost all credits in the voluntary OTC markets, with the exception of those sourced from the CCX or the EU ETS allowances, are offset-based credits born from specific projects around the world, each reducing GHG emissions in its own way. These projects come in wildly diverse forms, from industrial gas destruction to wetland conservation to wind farms.

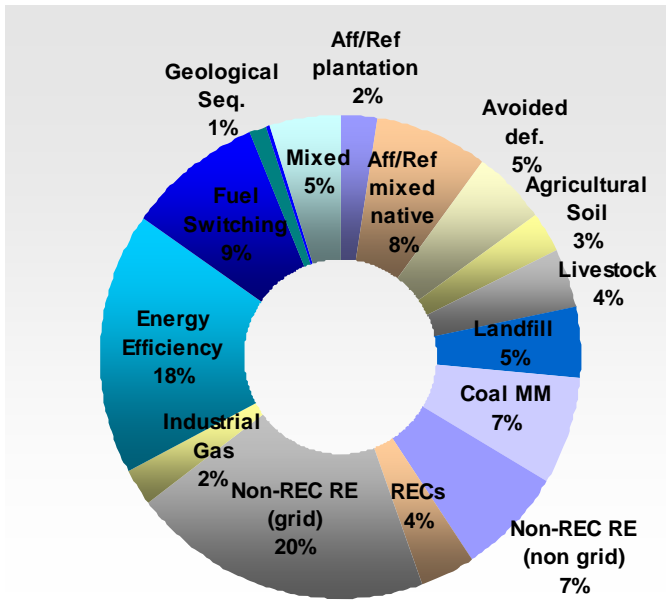
When a company buys offsets to meet compliance requirements, such as under the EU ETS, it is usually simply interested in a commoditized GHG emission reduction. The story behind the allowance-- how it was generated, its environmental and social co-benefits, etc – doesn't matter much to the customer. In the OTC market, on the other hand, the story behind a credit is becoming an increasingly relevant component of its value.

6.1 Project Types OTC Market: Across the Elements (Earth, Air, Water, and Fire)

As shown in Figures 10 and 11, in 2007 the sources of offset credits in the OTC market were extremely diverse, with numerous different project types holding significant market share. Energy efficiency, renewable energy, methane destruction, and forestry/land based projects were the most dominant project types in 2007.

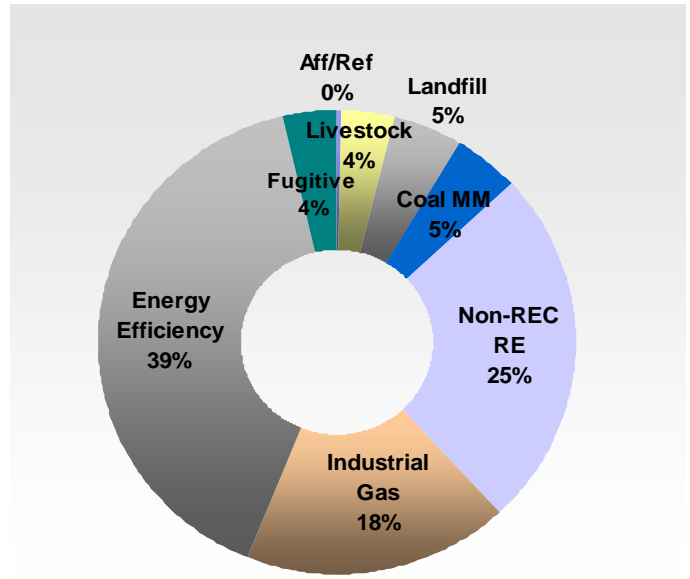
Consumer preference for non-controversial but “charismatic” project types that also have public appeal is a critical factor driving the breakdown of OTC market project types. Last year saw dozens of news articles, many of them critical, in the mainstream press on voluntary carbon offset purchases. While market players have, in turn, questioned the validity and research used to justify behind many of these articles' claims, no one denies their influence the voluntary market. Due to such news articles and the mainstreaming of offsets, OTC offset consumers are now even more likely to want know the story behind an offset.

Figure 10: Project Types – Voluntary OTC Credits sold in 2007¹



Source: Ecosystem Marketplace, New Carbon Finance

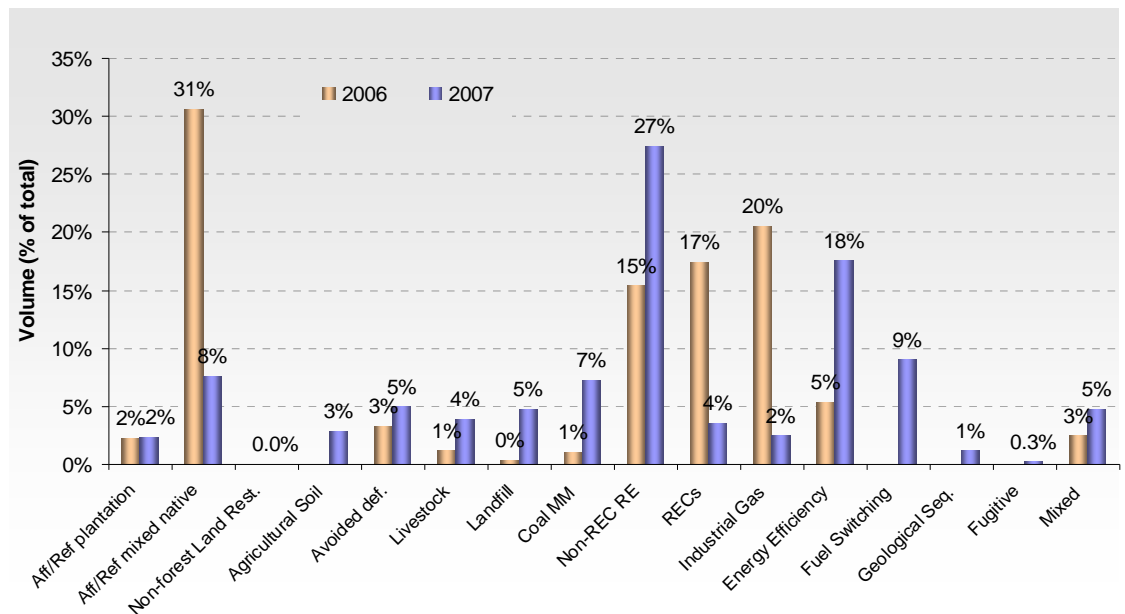
Figure 11: Project Types – CDM/JI credits sold in 2007²



Source: World Bank

At the same time, consumers seem to have a preference for “positive story” projects that also link to long-term reduced dependence on fossil fuels. Sean Carney of CantorCO₂e describes a “fundamental change” in consumer knowledge as a major factor influencing preferences for different project types. “People are becoming much more educated about offsets, which has led to increased popularity among particular offsets standards and project types.”

Figure 12: Project Type and Market Share, OTC 2006 and 2007³



Source: Ecosystem Marketplace, New Carbon Finance

¹ Please note that the total volumes in this section may not add up to the overall total as not all respondents were able to provide detailed information on project type and country of origin. Based on 110 data points.

² World Bank, *State and Trends of the Carbon Market 2008*.

³ Numbers for 2007 based on 110 data points.

As illustrated in Figure 12, there were several major shifts in the market between 2006 and 2007. In particular, the market share of industrial gas destruction projects declined dramatically, from 20% of the market in 2006 to only 2% in 2007. The percent of Renewable Energy Certificates (RECs) and Afforestation/Reforestation (mixed native) based credits also saw considerable decreases, dropping 13% and 23% points respectively. Methane (livestock, landfill, coal mine methane) and energy-efficiency projects picked up the slack and gained significant market share. Avoided deforestation increased only marginally to 5% of the volume in 2007 versus 3% in 2006.

In this year's survey, several project type categories were added and therefore have no associated 2006 values for comparison, despite the fact that these projects, including non-forest land restoration, agricultural soil, fuel switching, geological sequestration and fugitive emissions, may have been generating credits in 2006. In addition, since non-REC renewable energy was only one category last year, we have aggregated the 2007 values for grid-connected and non grid-connected renewable energy projects for comparison purposes.

6.1.1 Making Waves: Energy Efficiency & Renewable Energy

In 2007, 8.8MtCO₂e of renewable energy-based offset credits (31% of the market) were transacted in the OTC voluntary market – more than any other project type. In the survey questionnaire, we split renewable energy-based offsets into three categories: grid-connected renewable energy (20%), non grid-connected (7%), and RECs (4%). The majority of non-REC renewable energy credits were sourced from projects in Asia. A very small (4%) decreased percentage were sourced from U.S. renewable energy certificates (see Section 6.3).

Energy efficiency projects were another significant source of offsets at 18% of the total volume or 5.0 MtCO₂e transacted. The sharp increase in the number of voluntary credits generated by energy-efficiency and renewable energy projects is likely driven by the growth of the CDM, market uptake of the Gold Standard, and consumer preference for non-controversial, emotionally-appealing projects.

Many of the credits coming from energy efficiency and renewable energy projects are likely to be VERs generated from pre-CDM projects (projects that have not yet been registered with the CDM Executive Board, the UN body overseeing the CDM approval process). According to World Bank data (Figure 11), 25% of CDM credits sold in 2007 originated from renewable energy projects, and 39% originated from energy efficiency projects. Emissions reduction projects cannot produce CDM-eligible Certified Emission Reductions (CERs) until after registration with the CDM Executive Board. Hence, developers of pre-CDM projects are increasingly verifying pre-registration credits and selling them as VERs.

Market uptake of the Gold Standard for VERs may be another factor driving the popularity of renewable energy and energy efficiency projects. One of the first major standards in the marketplace, the Gold Standard only accepts renewable energy and energy efficiency projects. Therefore, consumers seeking Gold Standard credits, which are branded as the “crème de la crème” of credits with sustainable development co-benefits, may only purchase energy efficiency/ renewable energy credits.

On the demand side, the increased market share of renewable and energy efficiency projects is in tune with the apparent trend that consumers in 2007 increasingly preferred non-controversial, easy to explain, emotionally-appealing project types, especially those that could represent long-term solutions to our reliance on fossil fuels. For instance, numerous major, well-publicized purchases in 2007 involved credits originating from renewable energy projects. For example the internet giant Yahoo! Purchased offsets from hydropower in rural Brazil and wind turbines in India. Chris Page, Director of Climate and Energy Strategy for Yahoo!, explained the rationale behind the choice of helping finance renewable energy in Brazil. “Investing in a clean power project here seemed critical and timely... Only recently, the village school was powered by a small diesel generator – dirty, noisy, threatening to young lungs, and not very reliable.”¹

¹ Chris Page, “Going Green comes from the top,” 6 March 2008. Available online at <http://ycorpblog.com/author/chris-page>.

6.1.2 RECs: An Alternating Current

Renewable Energy Certificates (RECs) are a market-based tool developed to finance renewable energy projects “free of the constraints of the energy grid.” The REC market operates separately from the carbon markets in countries such as the United States, Canada, Europe, and Australia. Also referred to as Tradable Renewable Certificates (TRECs) or Green Tags, RECs are tradable certificates representing the environmental attributes from the generation of one kilowatt hour (kWh) of on-grid renewable energy. RECs were designed as a policy tool to facilitate support of renewable energy projects “free of the constraints of the energy grid.” They are a subset of the renewable energy market and a separate commodity from the power itself. Like the carbon markets, regulated and voluntary REC (or equivalent) markets exist.

RECs are traditionally sold on a per-megawatt-hour (MWh) basis (one MWh equals 1,000kWh) but are sometimes converted into tonnes of carbon dioxide (tCO₂) avoided, then sold into the voluntary carbon markets as carbon offsets. The intersection between the REC and carbon offset markets has been and remains a contentious issue. Stakeholders debating the credibility of integrating of the two markets have been primarily focused on three key points:

- **Conversion factors:** Since renewable energy is measured in kWh, calculating the amount of fossil fuel “backed off” the grid by a kWh of renewable energy is a key step in converting RECs to carbon offsets. It is critical that suppliers utilize a conversion factor that matches the geographic location of the REC produced.
- **Additionality:** Unlike the carbon markets, the REC markets do not utilize additionality tests. Critics of using RECs as carbon offsets believe a REC must pass an appropriate additionality test in order to be sold as a carbon offset.
- **Ownership:** Ambiguity concerning ownership in the REC market raises concerns that the environmental benefits associated with a REC could be ‘double counted’ when RECs are sold into the carbon offset market.¹

For the purpose of this report, our goal was to track only the voluntary carbon markets, not the entire REC market. Therefore, we only collected data from REC suppliers who advertised or provided clear disclosure that their RECs were allocated as carbon offsets. Our analysis includes only RECs sold in tCO₂e units (like carbon offsets) so that their contribution to the carbon offset market could be easily quantified. In this context, the number of RECs sold as carbon offsets decreased from 1.7MtCO₂e in 2006 to 1.0MtCO₂e in 2007. The percentage of REC-based offset transactions in the OTC market dropped from 17% in 2006 to 4% in 2007.

This decrease in share relative to the total size of the offset market should not reflect a decrease in growth of the voluntary REC or green power market. According to the National Renewable Energy Lab (NREL), US voluntary REC sales increased 75% by volume between 2005 and 2006, and voluntary green power markets in general have grown at an average rate of 50% over the last several years.² While NREL’s final numbers on the 2007 green power markets will not be released until later this year, Lori Bird, Senior Analyst at NREL, predicts that this robust rate of growth will have continued in 2007. NREL’s preliminary estimate is that nearly 12 billion kWh of that as RECs were sold in 2007 in the United States and that the green power market, again, grew by around 50%.³

Two factors are likely influencing the number of RECs converted to carbon credits. First, the controversy associated with the conversion of kWh to tCO₂e may be influencing customer interest in RECs. Second, it seems more consumers are choosing to “match kWh to kWh” and only utilizing RECs to offset electricity purchases. Several guidance documents may be influencing their choice. For instance, in an effort to clarify the appropriate use of RECs, the US Environmental Protection Agency’s (EPA) Climate Leaders Program and the Green-e Energy Program have suggested that it is appropriate for RECs to be used as offsets for an

¹ Michael Gillenwater, *Redefining RECs (Part 1): Untangling Attributes and Offsets*, Discussion Paper, Version 2, August 2007. Available online at http://www.princeton.edu/~mgillenw/REC-OffsetPaper-Part1_v2.pdf.

² Lori Bird, Leila Dagher, and Blair Swezey (National Renewable Energy Laboratory), “Green Power Marketing in the United States: A Status Report (Tenth Edition),” Technical Report NREL/TP-670-42502, December 2007. Available online at <http://www.nrel.gov/docs/fy08osti/42502.pdf>.

³ Ibid

entity's electricity purchases when consumers can match kWh- to-kWh, or in other words, to offset only "indirect emissions," which are defined as "Scope 2" emissions under the WRI/WBCSD GHG Protocol.

Consumers directly purchasing RECs based in kWh within these guidelines are not technically engaging in the voluntary carbon markets. However, while traditional kWh REC sales are not captured in this report's quantification of the voluntary carbon markets, a huge percentage of voluntary REC purchases do seem to be driven by climate concerns. For example, major REC retailers such as Sterling Planet and Renewable Choice Energy have noted considerable demand for RECs driven by GHG driver concerns. Marcus Krembs, Director of GHG Management Programs at Sterling Planet, noted that "GHG mitigation is one of the primary drivers of REC purchases... Several of our Fortune 100 customers have purchased RECs primarily to move towards their greenhouse gas reduction goals."

Looking forward, a recently-released Green-e Climate Protocol for Renewable Energy is likely to be one set of guidelines utilized by suppliers seeking to legitimize REC-based offsets for any type of emissions. The Protocol was created to bring additional credibility to the market for GHG emissions reductions derived from renewable energy projects. It includes additionality, GHG accounting, and ownership requirements to address the criticisms addressed above.¹ Lars Kvale of Green-e explains that the Protocol aims to help "suppliers understand how to utilize RECs as offsets, just like methane, renewable energy, or any other project type."

6.1.3 Putting Lipstick On a Pig?: The Rise of Methane

While many of the project types most transacted on the OTC market are clearly 'charismatic', projects involving destroying methane emissions from landfills, livestock manure, and coal mines may seem, at first glance, less appealing to the general voluntary OTC buyer. However, these seemingly "unsexy" projects have gained a strong foot-(or hoof) hold in the 2007 OTC market for both pure voluntary and pre compliance buyers with 4%, 5% and 7% of the market for livestock, landfill and coal mine projects respectively.

Numerous factors contribute to the rise of methane reduction projects in the marketplace. From a supplier's perspective, methane projects tend to be relatively simple from an accounting perspective. Due to methane's high global warming potential, carbon credits are also relatively inexpensive to generate.

From a demand perspective, it seems that methane has its own type of charm. Retailer promotional material, government initiatives, and numerous mainstream press news articles have helped educate consumers about coal mine, landfill, and especially livestock methane destruction projects. Since the majority of methane projects are US-based, an additional appeal for many US consumers is that these projects are located close to home. For example, in 2008 Senator Hillary Clinton's presidential campaign purchased offsets sourced at a Pennsylvania dairy farm from the retailer Native Energy.²

Several market players have also noted that market uptake of US-based methane projects could also be driven by US pre-compliance buyers. Two of the California Climate Action Registry (CCAR)'s three accepted protocols, which are likely to be eligible under any future Californian cap-and-trade program, are protocols for landfill gas and livestock methane projects. On the East coast, landfill and livestock methane projects are also eligible to be recognized by RGGI, and methane projects will probably be allowed to generate credits within any future federal cap-and-trade program.

6.1.4 Forests: Still Standing in the Voluntary Markets

Historically, biological carbon sequestration projects, in particular forestry projects, have been a mainstay of the voluntary carbon markets. Some of the first carbon offsets were generated via reforestation, and this project type dominated the market for offsets until 2004. Based on last year's survey results, 36% of 2006 OTC transactions involved forest-based offset credits, making forestry credits the most traded credit type on the market in that year.

¹ Green-e, "The Green-e Climate Protocol for Renewable Energy: Version 1.0," October 2007. Available online at http://www.green-e.org/docs/climate/Green-e_Climate_Protocol_for_RE.pdf.

² Dina Cappiello, "Are campaigns really carbon neutral? (04/09/2008), Dina Cappiello, " *ClimateWire*, 9 April 2008.

Several factors influence the uptake of forest based credits on the voluntary markets. Reduced emissions from deforestation and degradation (REDD) is not an approved methodology under the CDM and only one reforestation/afforestation project was registered under the CDM by the end of 2007. While forestry-based carbon sequestration projects are an accepted source of credits under NSW GGAS, the credits must be sourced from local projects in order to be accepted into that scheme. In other words, outside of Australia, the voluntary markets are the primary source of demand for forest-related sequestration credits and the only source of demand for REDD.

At the same time, many (though not all) forest projects may be valued more highly on the OTC market for their bundled social and environmental co-benefits. For companies buying credits for the sake of public relations, the tangibility of land conserved and general understanding of the role of trees in the carbon cycle adds to their appeal.

However, forest-based projects are also been controversial. 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 plagued this category of projects in the voluntary carbon markets. This controversy is one explanation for the decreased market share of land-based projects in the OTC voluntary markets.

Under the canopy of biological carbon sequestration projects, the breakdown of recorded transactions is:

- Afforestation/Reforestation Plantation/Monoculture: 13%
- Afforestation/Reforestation Native Restoration: 42%
- Avoided deforestation: 28%
- Agricultural soil: 16%
- Other biological sequestration (such as wetlands preservation): 0.1%

We phrased these categories somewhat differently in last year's report (fewer categories), but they can still be compared with this year's survey.

- The number of plantation and avoided deforestation credits transacted continued to increase and accounted for roughly the same percentage of credits in 2007 (2% and 5%, respectively) as in 2006 (2% and 3% respectively).
- We recorded 0.8MtCO₂e (3% of OTC market) of agricultural soil projects— listed as a project type for the first time this year— in the 2007 OTC market.
- Only one project involving non-forest land restoration, located in Africa, was identified this year, with a credit share of less than 0.02% of the market.
- The number of afforestation/reforestation native credits actually decreased. The percentage of credits from this type of project in the marketplace dropped from 31% in 2006 to only 8% of transacted credits in 2007. Still, it represents the single largest category (in terms of market share) of biological carbon sequestration projects.

In December 2007, the role of REDD in an international GHG emissions reduction regime was a key topic at the United Nations' Framework Convention on Climate Change (UNFCCC) conference in Bali, Indonesia. The Action Plan resulting from the Bali meetings encouraged voluntary action and formally included REDD among other mitigation activities as potential mechanisms for reaching emissions reduction targets. The decision of whether and how REDD will fit into the international climate mitigation strategy was delayed until the next UN Conference of the Parties (COP 15) convention in 2009 in Copenhagen.

However, this international endorsement of the need to reduce emissions from deforestation has sent waves across the voluntary markets. For example, Merrill Lynch recently announced plans to invest \$9 million in a REDD project in Aceh, Indonesia managed by Conservation Carbon. Over the next several years, the voluntary carbon markets will likely become testing ground for REDD. Dorjee Sun, CEO of Carbon Conservation commented, "Pre-Bali, no one wanted to touch avoided deforestation... Now people are starting to recognize avoided deforestation as the next big thing."

6.1.5 HFC: OTC's Three Letter Word

Between 2006 and 2007, the biggest project type shift was a major drop in the OTC market share of offsets sourced from industrial gases. Last year's report questioned whether industrial gases were "a disappearing low hanging fruit", and indeed it seems the credits have been picked—or deemed rotten. In 2006, 20% of the credit transactions we recorded (2 MtCO₂e) were from industrial gas destruction projects. In 2007, this number dropped dramatically to only 2% of credits transacted, but due to the increased volumes transacted in this year still managed to reach 0.7 MtCO₂e traded.

To some extent, this decrease may be due to a limitation in supply. In the United States, for example, only a handful of companies create high Global Warming Potential (GWP) industrial gases. However, for the most part this decrease in industrial gases, and in particular HFC-23, seems to be due to changing consumer preferences. One broker, Andy Kruger from Evolution Markets, while noting HFC destructions can represent very real and additional carbon decreases, described HFC as "a three letter acronym people don't want to hear as voluntary buyers..."

Several factors seem to be influencing the market perception of industrial gases. In 2007, in order to squelch perverse incentives and non-additional offsets, the CDM Executive board placed limitations on credits for HFC destruction to plants built between 2000 and 2004. Concerns at the CDM level inevitably overflowed to the voluntary market. At the same time there, were some concerns that plants deemed illegitimate under CDM would instead sell HFC destruction as VERs. Hence, it seems the OTC market was wary of this project type.

As noted in section 6.1.1., at the same time, many OTC consumers seem to prefer to send their funds to purely 'green' industries, such as renewable energy, rather than creating an additional income stream for industries that generate GHGs. Likewise, the story behind HFC destruction is not appealing for many voluntary buyers.

Amidst such concerns, suppliers continue to note that high-quality industrial gas projects do exist, but are difficult to sell to OTC buyers. "The main problem with HFC credits is that they are ugly. Voluntary buyers want pretty credits," explained Waldemar Perlik of MGM International. However, beauty may be in the eye of the beholder. Several suppliers emphasized the importance of continuing to reduce the impact of such high GWP gases, and reiterated their potential value under a future US federal cap and trade program.

6.2 Prices by Project Type

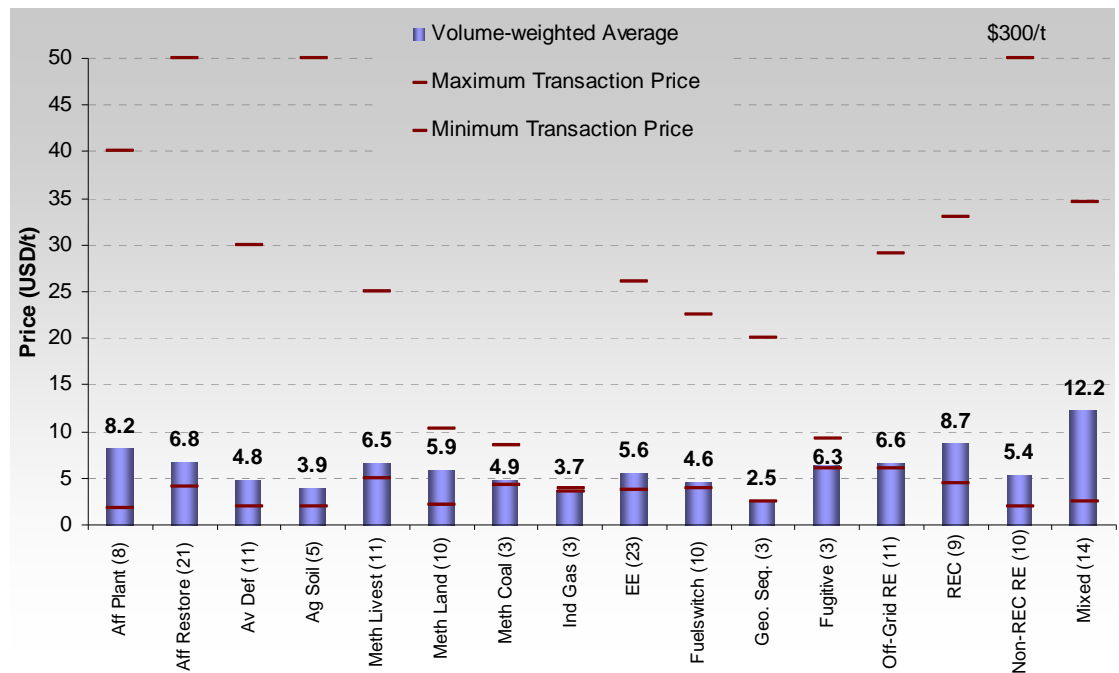
We recorded a range of prices for almost every project type. Across the market, the lowest price we found was \$1.8/tCO₂e and the highest about \$300/tCO₂e. This high price, which was charged for Gold Standard-certified Te Aitipi wind farm credits transacted on the New Zealand-based TradeMe, is an anomaly in the marketplace. Figure 13 shows credit prices according to project type, utilizing volume-weighted averages from supplier data *at all levels of the supply chain*.

The most expensive offset credits came from native and plantation reforestation/afforestation projects, where prices averaged \$6.80 and \$8.20 per tCO₂e, respectively. This is not surprising since these projects are often relatively expensive to develop.

RECs also tended to garner a higher price, \$8.70/tCO₂e. This is likely because RECs are most often transacted at the retail level in units of tCO₂e, whereas when they are sold in the REC market in terms of kWh, they are generally sold at lower prices.

The lowest-priced credits tended to originate from industrial gas projects and geological sequestration: \$3.70 and \$2.50/tCO₂e respectively. This is not surprising, for a couple of reasons. Due to the high GWP of industrial gases, they are a highly cost-effective means of generating credits. Likewise, geological sequestration is a high volume, low-cost means of creating carbon credits for the voluntary carbon markets. (Geological sequestration is not a project type under the CDM).

Figure 13: Project Prices by Project Type, OTC 2007¹



Source: Ecosystem Marketplace, New Carbon Finance. Note: Numbers within parentheses indicate number of data points.

6.3 The CCX

As noted in Section 3.1, the Chicago Climate Exchange (CCX) is a voluntary cap-and-trade system that incorporates both allowance- and offset-based credits. However, members cannot use CCX offsets to meet more than 50% of the annual emissions reduction commitment.

In 2007, CCX issued and registered an approximate 15-20 MtCO₂e of project-based offset credits (we only have data for the period July 2007 to January 2008 indicating issuances of 10Mt and the CCX was unable to provide us with data on the first half of 2007). From the launch of the CCX in 2003 until April 2008, 28.8 MtCO₂e of offset credits in total have been issued and registered². It is important to note that credits issued by the CCX are not necessarily sold on the CCX since, as highlighted in Section 3.1, they can also be sold on the OTC market. In addition, they may be sold in any year and therefore do not reflect the offset credits sold in 2007 through the CCX.

While the CCX website lists the names, locations, and project types of all of its offset suppliers, the exchange does not provide any detailed volume breakdowns by seller or project locations. Moreover, the CCX was unable to share a breakdown of the origin (project type or location) of offset credits *issued* or actually *sold* in 2007. A CCX representative emphasized that this data is difficult to obtain because offset credits within the CCX are commoditized into generic CFI's, and hence it is difficult to trace information on their origins. This level of commoditization is one of several differentiating factors between the CCX and the OTC offset market.

Figure 14 presents the project-specific data we have available from both the CCX and the OTC market. Despite the fact that this is not an entirely correct comparison (credits sold versus credits registered) it does illustrate a number of key differences between the two markets:

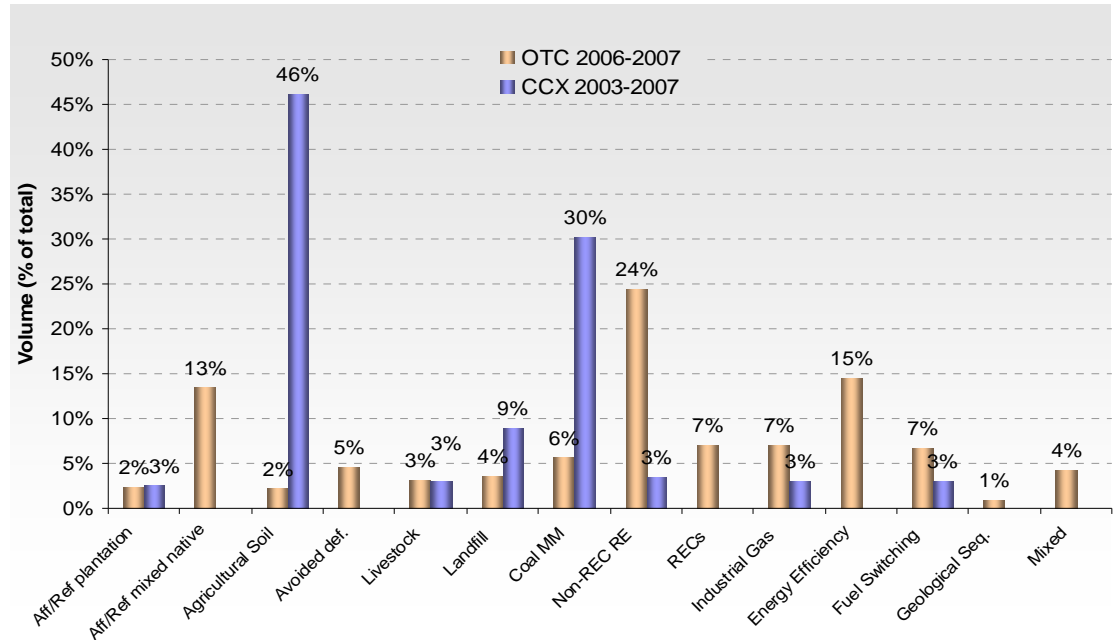
- Soil carbon projects make up almost half of offsets registered on the CCX (46%). Alternatively, this project type is almost non-existent on the OTC market (2%).

¹ Based on 155 data points.

² CCX offset and project type market data. Available online at <http://www.chicagoclimatex.com/offsets/projectReport.jsf>.

- Likewise, coal mine methane is another major source of offset credits in the CCX (30%), but only a small percentage of credits sold on the OTC market (6%).
- Whereas renewable energy and energy efficiency projects are major sources of credits on the OTC market (24% and 15%), they represent an extremely small percentage of CCX-issued credits (3% and 0%).

Figure 14: Transaction Volume by Project Type, OTC versus CCX for Years Available⁵³



Source: Ecosystem Marketplace, New Carbon Finance, CCX

Generally, these differences can be explained by the different sources of demand driving the OTC versus the CCX market. Much like players participating in a regulated market, CCX members are buying offsets to meet their voluntary cap-and trade-commitments. Hence, the co-benefits of a credit is irrelevant as long as it meets the CCX eligibility criteria and can be used for compliance. Because in 2007 the average OTC offset price (\$6.10/ MtCO₂e) was higher than the average CCX price (\$3.15/ MtCO₂e), suppliers with credits that could easily be sold to OTC buyers were more likely to sell them on the OTC market.

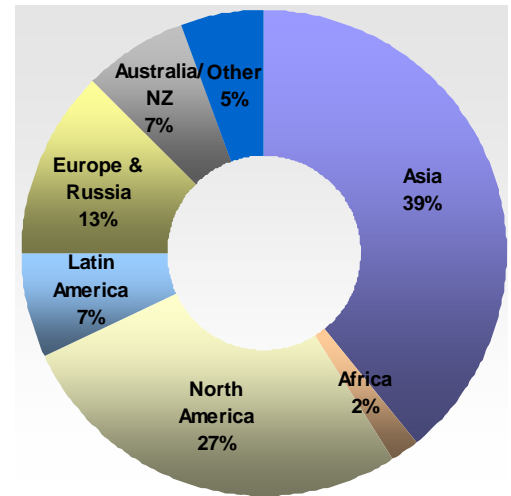
⁵³ OTC figures for 2007 based on 110 data points.

6.4 Project Locations OTC Market: The Atmospheric Melting Pot

Thinking globally is a fundamental concept behind the carbon markets, which are based on the idea that a global market is a key means of achieving cost-efficiencies in global emissions reductions. Hence, it both the regulated and voluntary markets, credits are sourced from around the world.

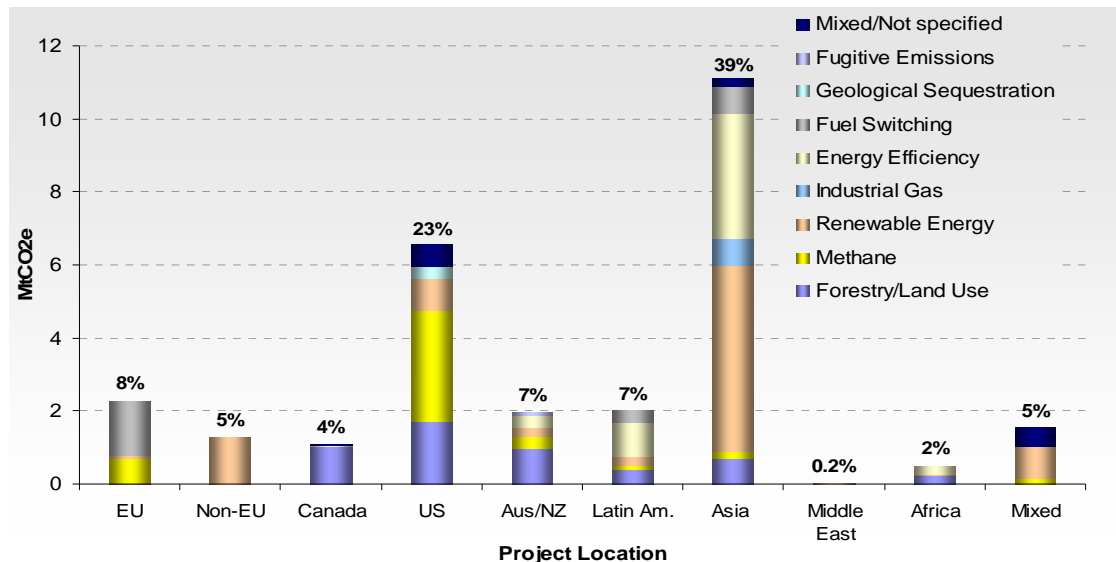
In 2007, Asia held the largest share of credits transacted by any single region in the OTC market at 39%. North America had the second-highest origination of VER credits at 27%, although this was down substantially on 2006 when it accounted for 43% of OTC transacted volumes. New Zealand and Australia, while still not major sources of credits, increased their production of VERs dramatically between 2006 and 2007, from near zero to 7% of the market. A somewhat similar case is true for Canada, which went from being the geographic source of less than 1% in 2006 to 4% of total credits transacted in 2007. Likewise, the EU increased its market share by 5 percentage points (from 3% to 8%). The volume of credits originating from Latin America remained equal between 2006 and 2007, but given the increase in overall volume, its market share dropped from 21% to 7%. We recorded only a small number of credits sold in the OTC market originating in the Middle East, including Turkey. The absolute number of credits sourced from Africa actually decreased in 2007.

Figure 15: Transaction Volume by Project Location, OTC 2007⁵⁴



Source: Ecosystem Marketplace, New Carbon Finance

Figure 16: Project Type by Project Location, OTC 2007⁵⁵



Source: Ecosystem Marketplace, New Carbon Finance

6.4.1 Eastern Origin: A Burst of Credits from Asia

The huge number of VERs generated from Asian projects closely parallels the large number of CDM projects in this region. While China and India have been dominating the CDM market for the past several years, these suppliers are now turning to the voluntary markets – especially

⁵⁴ Based on 110 data points.

⁵⁵ Based on 110 data points.

as a source of demand for their pre-CDM emission reductions. In 2007, Asian projects generated the largest share of credits (39%) transacted in the OTC market.

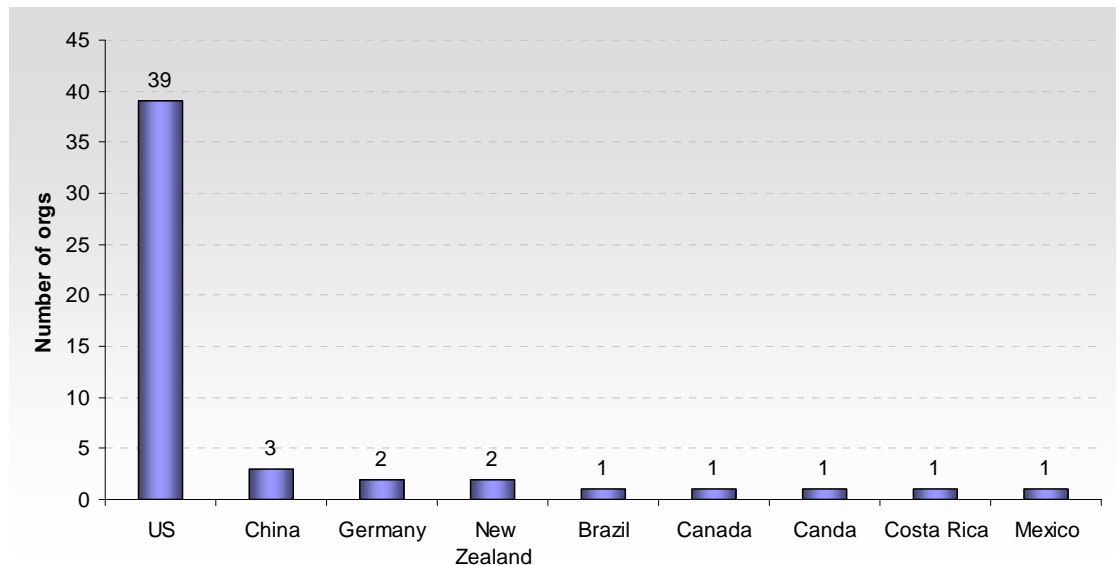
As is the case in the voluntary markets, Asia dominated the CDM market. In 2007, 78% of CDM credits sold were based in China and India (73% and 5% resp.)⁵⁶. These Asia-based suppliers seem to be harnessing the value of their pre-CDM credits via the voluntary carbon markets. Shelagh Whitley of Camco explained, “CDM project developers are now seeing value in the voluntary market where it didn’t exist before.” The launch of the Asia Carbon Exchange for VERs in mid-2007 further highlights this trend.

6.4.2 North America: Born in the USA

In 2006, we recorded more OTC credits originating in the United States than in any other part of the world, but this changed in 2007. Although the actual volume of credits “born in the USA” increased by 58% between 2006 and 2007, its market share decreased from 43% to 23%. Overall, North America produced fewer OTC credits than Asia in 2007, but it remained a major source (27%) of carbon credits transacted on the OTC market. Not surprisingly, North America is also likely to be the primary source of offset credits registered on the CCX given the distribution of offset providers that register credits within CCX (see Figure 17). Note that we could not verify the exact figures given insufficient data points from the CCX.

Since the US does not currently have a regulated market, the large number of US-based credits is noteworthy. Moreover, in anticipation of a federal US cap-and-trade system, a number of European carbon trading companies have launched US operations, while US-based carbon companies have arisen to prospect the country’s pre-compliance offsets.

Figure 17: Location of Organizations Registering Credit with CCX, 2007



Source: Ecosystem Marketplace, New Carbon Finance, CCX

6.4.3 Australia/ New Zealand: The Land Down Under

In 2007 we tracked 2.0 MtCO₂e originating in Australia and New Zealand on the OTC market. This is a bold increase from 2006, when we tracked less than 0.22 MtCO₂e coming from these countries, despite significant outreach on our part to the region, via the Australian Greenhouse Friendly program. The number of organizations sharing data for this report more than doubled, from 8 last year to 18 this year. The increase in credit sale volumes from Australia and New Zealand in 2007 matches a major increase in customers from this region (1% in 2006 to 7% in 2007). It also echoes the region’s growing eco-awareness and the 2007 build-up to federal regulation. Climate change was a significant issue in the 2007 Australian national elections. At

⁵⁶ World Bank, *State and Trends of the Carbon Market 2008*.

the end of the year, the newly-elected Prime Minister of Australia, Kevin Rudd, ratified the Kyoto Protocol.

6.4.4 Africa: Untapped Potential

While it seems that the African continent should be an attractive place for voluntary project developers – offering additionality, emotionally-appealing projects, and the possibility of significant societal benefits – we recorded a very low number of credits sourced from Africa in 2007. It is actually the only region that registered a moderate *decline* in terms of absolute volume (-0.05MtCO₂e) as well as in market share (from 6% to 2%) between 2006 and 2007. Currently, it seems that Africa is experiencing the same fate in the voluntary market as in the CDM market, with little investment going into the region, and investors and project developers preferring regions that are more amenable for offset projects. However, dozens of projects are in the pipeline, especially land-based projects.⁵⁷ As one consultant noted, “It just takes a long time to develop projects in this area of the world.”

6.4.5 Latin America: Simply CDM?

Since Latin America accounts for 11% of credits of the CDM, one would expect that an equal share of pre-CDM VERs would also be sold into the OTC market. This is not the case. Instead, significantly more credits transacted on the OTC market came from Asian than from Latin American projects last year. In 2007, only 2.0MtCO₂e (7% of total market) transacted on the OTC market originated in Latin America. One theory that has been proposed to explain this difference is the more efficient issuing of CDM credits in Latin America versus Asia, which may reduce the appeal of selling Latin America-generated credits into the OTC market. As Eron Bloomgarden, US Country Director at EcoSecurities, explained, “Historically, the DNAs (designated national authorities) in many Latin American countries in places like Mexico or Honduras created fewer constraints and were operational before their Asian counterpart institutions in, say, the Philippines, Thailand and even in India or China.” This means that the registration process has been in general quicker, resulting in fewer CDM projects generating emission reductions (that end up as VERs) before they are actually registered and have the chance to produce CERs.

6.3.6 Middle East: The Great Unknown

We tracked very few credits sourced in the Middle East, including Turkey. This was somewhat surprising. While we identified only a handful of credit providers based in the Middle East, we expected to find VERs coming out of Turkey. Since Turkey is not a Kyoto Protocol signatory, it is not eligible under the CDM. Hence, it is often mentioned as a source of VERs. However, we recorded only 0.05 MtCO₂e (0.2% of total market) transacted on the OTC market last year. This limited number of VER sales may simply be a reflection of the limited data we were able to collect. Another potential explanation is that Turkish projects were still gearing up to produce VERs in 2007. The latter point is reinforced by information collected from international project developers planning to source VERs and currently investing in projects.

6.5 “Think Globally, Act Locally”: A 2007 Demand Trend

When most people think of the benefits of carbon markets, they think about economies of scale – the bigger the market, the greater the efficiencies. In other words, they think “global.” However, a seemingly growing trend in the voluntary carbon marketplace may be turning this “global think” on its head, instead heeding the classic environmental mantra to “think globally” but “act locally.” A clear trend in 2007 and 2008 is that an increasing number of OTC customers, especially those in the US and Australia, prefer to buy offsets from projects close to home.

For example, Aspen, Colorado residents now have the opportunity to purchase credits from projects in and around the city via the local government’s “Canary Tag” voluntary offset

⁵⁷ Alice Ruhweza and Sissel Waage, “The State of Play: Payments for Ecosystem Services in East and Southern Africa,” 30 July 2007. Available online at http://ecosystemmarketplace.com/pages/article.opinion.php?component_id=5108&component_version_id=7498&language_id=12.

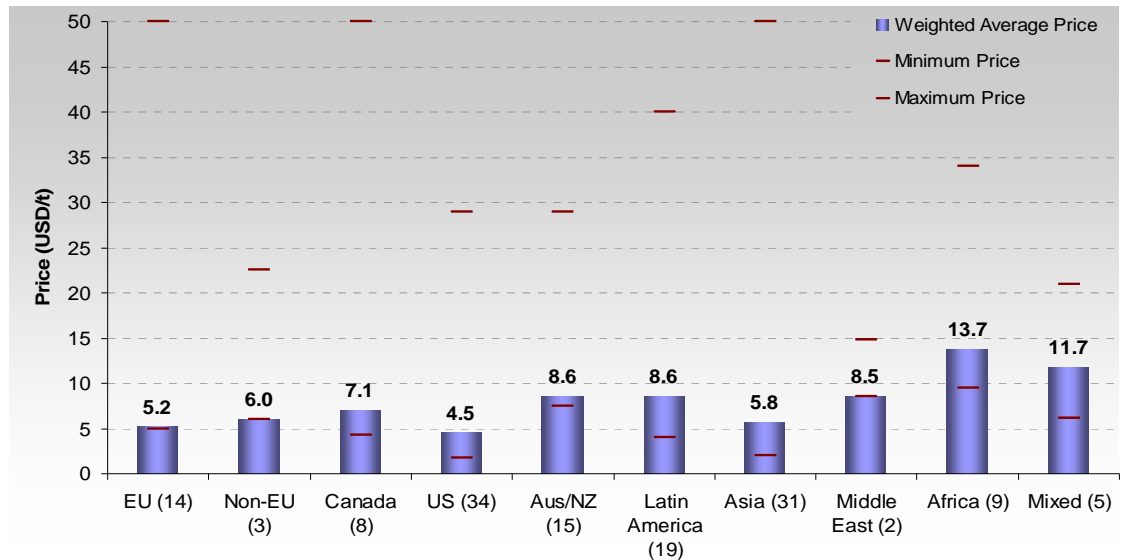
program, which "invests in local, state and regional carbon offset projects that would not otherwise be possible and will help reduce greenhouse gases."⁵⁸ Likewise, many US politicians have chosen to offset their offices or campaigns via US-based projects. In late 2007, the government of San Francisco announced plans to launch the San Francisco Carbon Fund, a program that will fund GHG emissions reductions within the city, where energy efficiency projects and solar panel installations for low-income housing are underway. Regarding the appeal of local projects, Jared Blumenfeld, Director of San Francisco's Environment Department, noted, "By developing our own program and funding local projects, we have the ability to assure that the offsets actually happen, benefit the local community, and help achieve our aggressive greenhouse gas reduction goals."

6.6 Price Trends by Project Location

Again this year, survey respondents specified price not only by project type but also by project location. Like our analysis of credit prices by project type, our weighted average prices by project location includes prices charged by suppliers at *all stages of the supply chain*. In 2007, on average, the highest-priced credits originated in Africa. This is likely due to the high transaction costs still associated with implementing projects in this region of the world. After Africa, the second highest average prices recorded came from credits generated by projects in Australia/New Zealand, Latin America, and the Middle East.

In last year's survey, credits originating in the European Union were about 32% more expensive than those originating in for example Australia. However, results from this year's survey showed that credits from projects in the EU and US were the least expensive of any region in 2007— a major shift although it should be noted that last year's prices were only provided for retailers whereas this year the prices per location are across the board due to insufficient data. On average, EU credits were only slightly more expensive than US credits, despite the dollar's decline in value. This conflicts with the common assumption that it is less expensive to generate credits in developing countries, but may indicate that projects done in developing countries obtain a premium value.

Figure 18: Project Prices by Project Location, OTC 2007⁵⁹



Source: Ecosystem Marketplace, New Carbon Finance. Note: Number within parentheses indicates number of data points.

6.7 Vintages: Perishable Goods?

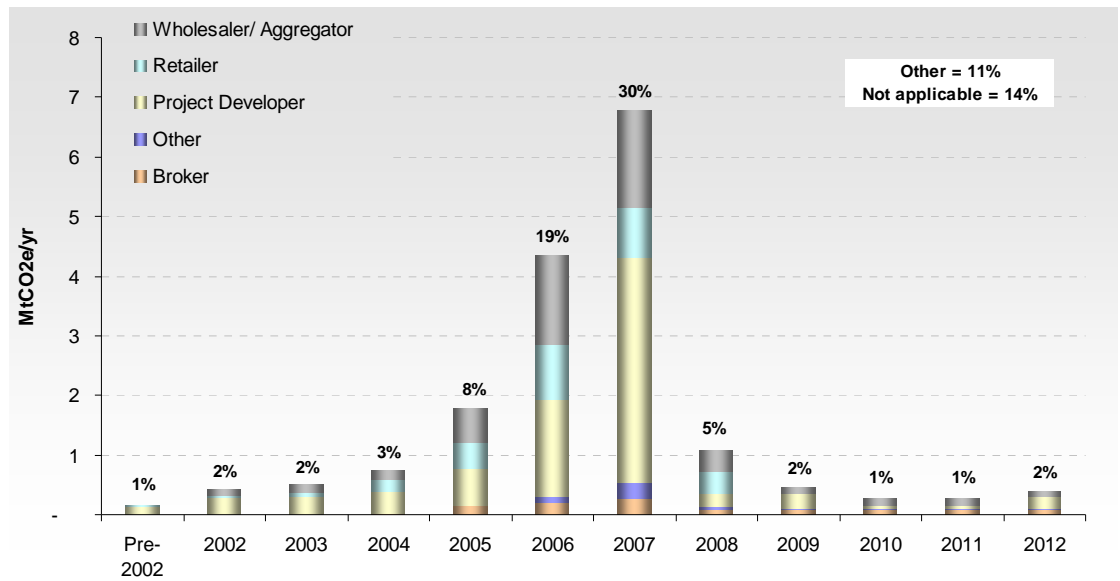
This year, for the first time in our survey, suppliers also had the option of breaking down the vintages of their credits sold in 2007. Not surprisingly, the bulk of credits (49%) sold in 2007 came from 2006 and 2007 vintages, but a significant number (16%) of credits sold represented

⁵⁸ City of Aspen, Canary Tags." Available online at <http://www.aspenzgreen.com/offsets.cfm>.

⁵⁹ Based on 140 data points.

emissions reductions that occurred before 2006. About 11% of sales were recorded as “ex-ante” – sales made in advance of actual offset generation, i.e. after 2007.

Figure 19: Credit Vintage by Primary Business Activity, OTC 2007⁶⁰



Source: Ecosystem Marketplace, New Carbon Finance

While we only presented the option to record vintages up to 2012, several suppliers of afforestation or reforestation projects, where ex-ante accounting is the norm, noted that their emissions reductions would actually occur over a far longer period of time, from 35 to over 100 years, depending on the supplier. While organizations selling forestry based credits were the majority of ex ante sales, they were not the only type of project that developers were supplying future vintages. The rest of the forward sales came from a range of methane destruction, renewable energy, and industrial gas projects.

In the CDM or CCX markets, it is very common to “bank” older vintage credits, but several OTC suppliers noted that consumers often find these older vintages less appealing to customers who prefer newer vintages. The retailer Terrapass, for instance, advertises on its website that “our credits happen in the same year you buy them.”⁶¹

6.8 Project Size

In 2007, offset projects generating credits sold into in the voluntary markets ranged from large-scale anaerobic digesters used to reduce methane emissions to small biogas stoves used in village huts. Based on CDM definitions of small scale activities (less than 15,000 tCO₂e/year) and feedback from several suppliers, we set the definitions of size as follows:

- Micro (less than 5,000 tCO₂e/year)
- Small (5,000 to 15,000 tCO₂e/year)
- Medium (20,000 to 100,000 tCO₂e/year)
- Large (over 100,000 tCO₂e/year)
- Very large (over 500,000 tCO₂e/year)

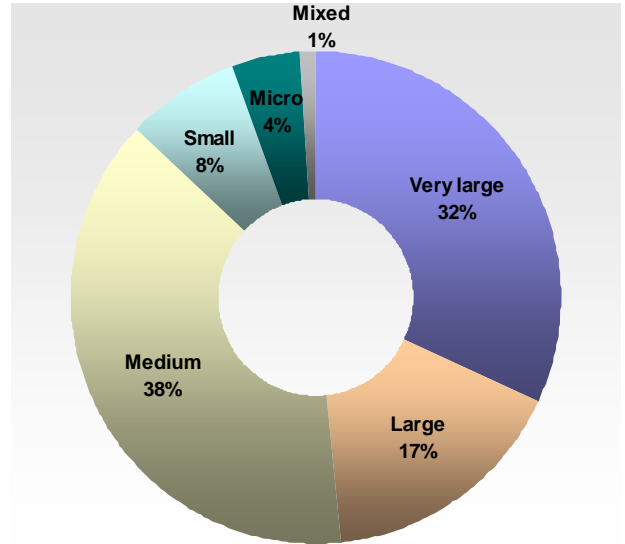
⁶⁰ Based on 82 data points.

⁶¹ Terrapass website. Available online at <http://www.terrapass.com>.

The breakdown by project size changed very little between 2006 and 2007. The most noticeable change was that there was an increase in “medium” sized projects— from 22% of credits in 2006 to 38% of credits in 2007. This gain came from a significantly decreased number of “mixed” projects and a slight decrease in the market share of large (22% to 17%) and small (10% to 8%) sized projects.

The majority of credits transacted in the OTC market originated from medium sized projects. However, more individual transactions were conducted that involved credits sourced from micro projects than from any other project size. The large number of credits generated from micro, small- and medium-sized projects has important implications for the sustainable development benefits of the voluntary carbon markets. Specifically, it suggests that the voluntary markets may be able to provide the capital to enable smaller credit-generating operations (especially those in developing countries) that may be unable to bear the relatively high transaction costs per credit needed to enter the market.⁶³

Figure 20: Transaction Volume by Project Size⁶²



Source: Ecosystem Marketplace, *New Carbon Finance*

⁶² Based on 98 data points.

⁶³ Donna Clarke, “Scaling Down Carbon Finance,” *Environmental Finance*, 2002/2003.

7 2007: Year of the Standard

Summary points:

- 2007 saw a rise in the number of third party standards.
- Retail-specific standards are fading away in desirability, in favor of more broadly recognized, third party standards. About 87% of credits transacted in the OTC market in 2007 were verified by a third party.
- About 14% of credits sold on the voluntary OTC market were CDM-issued CERs, and about 7% of credits sold on the voluntary OTC market were CCX-issued credits.
- The most utilized OTC market project standards were (in order): the Voluntary Carbon Standard (VCS), VER+ and Gold Standard for VERs.
- Meeting a third party standard does not appear to garner a credit a premium in the marketplace. Some of the highest prices credits on the market do not utilize any standard.

The creation of standards and registries is a fundamental step in the settling of the OTC frontier. While the regulated markets and CCX were launched with such foundations already built, the OTC market is incorporating these structures as it grows organically – a process that Ricardo Bayon, founder of EKO Asset Management Partners, deems “a natural revolution.” Once in place, the standards being built in the marketplace can be used as building blocks for registries. In turn, evolving registry infrastructure is critical for the movement of carbon credits across emerging exchanges.

7.1 What’s in a Name?: Sources of Credits in the OTC Market

The majority of credits (66%) transacted on the OTC market were non-CCX voluntary offset credits. As noted in Section 3, these credits are often generically referred to as Verified (or, in some cases, Voluntary) Emission Reductions (VERs).⁶⁵ However, credits sold on the voluntary OTC market can also be sourced directly from regulatory or CCX project-based credits, as well as regulatory or CCX allowance-based credits. For example, several US-based retailers sell and retire CCX-sourced offset credits. Alternatively, the UK retailer Pure advertises that it only sells Kyoto-compliant credits, such as CDM credits.

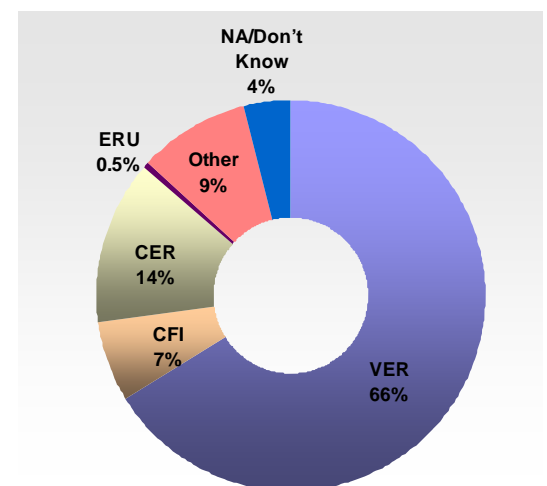
The CDM and the CCX have their own screening process, so the choice of suppliers to utilize these credits can also be considered a choice to use these markets’ third party verification standards. The OTC market in 2007 included credits transacted from the following markets:

- 14% CDM Certified Emissions Reductions (CERs)
- 7% CCX sourced Carbon Financial Instruments (CFIs)
- Less than 0.5% of JI Emission Reduction Units (ERUs)
- Few EU ETS Allowances (EUAs)

Third party standards are important to both buyers and sellers on the OTC market because they help establish legitimacy and fungibility of VERs. In 2007, the rise of third

Figure 21: Credit Types Traded, OTC 2007

⁶⁴



Source: Ecosystem Marketplace, *New Carbon Finance*

⁶⁴ Based on 58 data points.

⁶⁵ When verified to a specific standard, VERs may be branded with yet another acronym. For example, credits verified to the Voluntary Carbon Standard are branded as Voluntary Carbon Units (VCUs).

party standards seems to have led to more VERs in the marketplace. The share of VERs transacted on the OTC market increased by about 8% points in 2007 from 2006.

7.2 Overview of Standards, Protocols and Certification Programs

7.2.1 Setting the Bar: Offset Project Standards

The California Climate Action Registry's Climate Action Reserve⁶⁶

The California Climate Action Registry (CCAR) was established by California statute as a non-profit voluntary registry for GHG emissions. Over the last four years, CCAR has also begun to develop project protocols that allow for the quantification and certification of GHG emission reductions. These protocols now serve as a "verifiable" quasi-standard for voluntary carbon offsets. CCAR currently has approved reduction protocols for livestock and landfill methane projects in the US and forest carbon sequestration in California. CCAR recently launched the Climate Action Reserve, co-developed with APX Inc, which will create more project protocols and also serves as a registry for credits verified to the CCAR protocols.

The CCAR protocols became particularly relevant in the US voluntary carbon market in 2007, when the California Air Resources Board, directed by California's Assembly Bill (AB) 32 to design a mechanism for reducing emissions, formally endorsed CCAR's forest sector project protocols as eligible carbon offset project types.

CarbonFix Standard⁶⁷

The CarbonFix Standard (CFS) was launched in late 2007 and only pertains to forestry projects. Adherence to the CFS requires third party certification from CFS-approved auditors. CFS emphasizes sustainable forestry management and ensures that CFS carbon credits are derived from projects maintained in such a manner. The CFS operates in a transparent manner, posting all documents online except for financial calculations and the prices of CO₂ certificates sold. CFS also provides customers with a way to purchase CFS certified credits on its website directly from project developers, charging a fee of 3% of the sales price.

Chicago Climate Exchange Offsets Program⁶⁸

The Chicago Climate Exchange (CCX) has its own standards for offset projects accepted into the voluntary cap-and-trade system. To screen applicants, the exchange has standardized rules for seven different types of projects: agricultural methane, landfill methane, agricultural soil carbon, forestry, renewable energy, coal mine methane, and rangeland soil carbon management. Requirements for each project type are outlined on the CCX website. One screening criteria, for instance, is project start date; agricultural methane or soil carbon projects initiated after 1999 or forestation projects initiated after 1990 may qualify as approved offsets. Projects that meet initial screening criteria may submit proposals to the CCX Committee on Offsets for review and preliminary approval. After approval, all project developers must obtain independent third party verification from an approved verifier before registering offset credits on the exchange.⁶⁹

Climate, Community, and Biodiversity Standards⁷⁰

The Climate, Community, and Biodiversity Standards (CCB Standards) are a set of project-design criteria for evaluating land-based carbon mitigation projects and their community and biodiversity co-benefits. These standards can be applied to CDM or voluntary market projects. The development of the CCB Standards was spearheaded by the Climate, Community, and Biodiversity Alliance (CCBA), an international partnership of corporations, research institutions, and non-governmental organizations such as Conservation International, The Nature Conservancy, Weyerhaeuser, Intel, and CATIE. As a "project design" standard, CCB Standards can be used at the project-design phase for third party validation that the project has the potential to produce not only emissions reduction credits, but also community and biodiversity benefits. The CCB Standards also provide a means of verifying these benefits once a project is being implemented, but they do not include their own carbon accounting standard at this

⁶⁶ The Climate Registry website. Available online at <http://www.theclimateregistry.org>.

⁶⁷ CarbonFix Standard website. Available online at <http://www.carbonfix.info>.

⁶⁸ CCX website. See prior citation for URL.

⁶⁹ CCX, "Offset Project Registration, Verification & Crediting Procedure." Available online at <http://www.chicagoclimatex.com/content.jsf?id=104>.

⁷⁰ Climate, Community & Biodiversity Alliance website. Available online at <http://www.climate-standards.org>.

time. The CCBA therefore recommends that the CCB Standards be applied on top of an existing standard designed for carbon accounting, such as the CDM or the Voluntary Carbon Standard.

Greenhouse Friendly⁷¹

Greenhouse Friendly is the Australian government's voluntary carbon offset program for encouraging GHG emissions reductions at several levels, including "providing businesses and consumers with the opportunity to sell and purchase greenhouse-neutral products and services."⁷² The initiative provides two different services: Greenhouse Friendly Abatement Provider (offset project) certification and certification of "carbon neutral" products and services.⁷³

Criteria for Greenhouse Friendly project certification include: being Australia-based, generating "additional, permanent and verifiable greenhouse gas emission reductions or sequestration," and "clearly demonstrating that the abatement generated is additional to business as usual."⁷⁴ Greenhouse Friendly "carbon-neutral" accreditation requires the preparation of an independently verified life cycle assessment, an emissions monitoring plan, annual reports, and the use of Greenhouse Friendly approved carbon offsets.

The Gold Standard for VERs⁷⁵

The Gold Standard seeks to define the high-end market for carbon credits arising from renewable energy and energy efficiency projects that contribute significantly to sustainable development. The standard specifically excludes forestry and land-use projects. The Gold Standard was an initiative of the World Wildlife Fund (WWF) and developed with a variety of other NGOs, businesses and governmental organizations who believed that the CDM did not adequately screen projects for their contribution to sustainable development. While the Standard was originally created to supplement CDM projects, it now also certifies voluntary offset projects. In 2008, the Standard joined forces with the private firm APX to develop and manage the Gold Standard VER registry.

ISO 14064 Standards⁷⁶

The ISO 14064/65 standards are part of the International Organization for Standardization (ISO) family of standards. The protocol currently includes four components:

- **Organization Reporting:** guiding organization's quantification and reporting of GHG emissions (ISO 14964 Part 1);
- **Project Reporting:** guiding project proponents' quantification, monitoring, and reporting of GHG emissions reductions (ISO 14064 Part 2);
- **Validation and Verification:** guiding the validation and verification of GHG assertions from organizations or projects (ISO 14064 Part 3);
- **Accreditation of Validation and Verification Bodies:** guiding the accreditation or recognition of competent GHG validation or verification bodies (ISO 14064 Part 4).

Much like the World Resource Institute (WRI) /World Business Council for Sustainable Development's (WBCSD) GHG Protocol, the ISO standards were not created to support a particular GHG program, but were instead designed to be "regime neutral" so that they could be used as the basis for any program. Unlike the WRI/WBCSD GHG Protocol, which specifically includes tools and accounting methods, ISO 14064 does not spell out the exact requirements. Also, ISO does not certify or register GHG emissions or credits.

Plan Vivo⁷⁷

Plan Vivo is a standard specifically designed for community-based agro forestry projects that describes itself as "a system for promoting sustainable livelihoods in rural communities,

⁷¹ Australian Government Department of Climate Change, "Greenhouse Friendly." Available online at <http://www.greenhouse.gov.au/greenhousefriendly>.

⁷² Ibid

⁷³ Australian Government Department of the Environment and Heritage, *Greenhouse Friendly Guidelines*, August 2006. <http://www.greenhouse.gov.au/greenhousefriendly/publications/gf-guidelines.html>.

⁷⁴ Australian Government Department of Climate Change, "Approving Abatement Projects." Available online at <http://www.greenhouse.gov.au/greenhousefriendly/abatement/index.html>.

⁷⁵ The Gold Standard website. Available online at www.cdmgoldstandard.org.

⁷⁶ International Organization for Standardization website. Available online at <http://www.iso.org>.

⁷⁷ Plan Vivo website. Available online at <http://www.planvivo.org>.

⁷⁷ Ibid

through the creation of verifiable carbon credits.”⁷⁸ The system was created eight years ago by the Edinburgh Center for Carbon Management (ECCM) and is now managed by the non-profit organization BioClimate Research and Development (BR&D). Plan Vivo currently has three fully-operational projects in Mexico, Uganda, and Mozambique that are producing carbon for the sale of Plan Vivo carbon offsets.⁷⁹ According to the organization’s web site, the Plan Vivo system aims to ensure that its projects deliver the following benefits: social benefits, biodiversity benefits, transparency, additionality, foundations for permanence, an ethical option, and scientific and technical partnerships.

Social Carbon

The Social Carbon methodology and certification program is created and owned by the Brazilian NGO Ecológica. The methodology is based on a sustainable livelihoods approach focused on improving “project effectiveness by using an integrated approach which values local communities, cares for peoples’ potential and resources, and takes account for existing power relations and political context.”⁸⁰ The methodology was first created to ensure “higher quality Kyoto Protocol carbon projects.” However, the program methodology is now also used for voluntary market projects. The Social Carbon methodology has been used in hydrology, fuel switching, and forestry projects in Latin America and Portugal since 2000. The Ecológica Institute plans to release a registry for Social Carbon projects in mid-2008. Recently, the NGO also launched the for-profit Social Carbon Company, which donates a percentage of its profits back to Ecológica. While the company was created to develop and sell credits from Social Carbon projects, the Social Carbon standard is still designed to remain a third party standard that can be licensed by any project developer.

Voluntary Carbon Offset Standard⁸¹

In June 2007, a group of more than 10 banks and financial institutions organized under the European Carbon Investor Services (ECIS) and including ABN Amro, Barclays Capital, Citigroup, Credit Suisse, Deutsche Bank, and Morgan Stanley announced they were creating a standard for carbon credits in the voluntary markets.⁸² The voluntary offset standard is aimed at bringing “the voluntary market up to the level of the regulated and standardized procedures of the compliance market.” The standard is broadly very similar to the CDM and JI, only it applies methodologies to an “eligible geographical area beyond those countries that have ratified the Kyoto protocol” and is focused largely on the United States and Australia’s pre-compliance markets. Notably, it excludes carbon credits arising from the destruction of industrial gases such as HFC-23.

VER + Standard

In May 2007, project verifier TÜV SÜD announced the launch of its VER+ Standard, which will certify both carbon neutrality and carbon credits from voluntary offset projects. The standard will be based on CDM and JI methodology. Martin Schröder of TÜV SÜD describes the standard as “streamlined” Kyoto. In tandem with VER+, TÜV SÜD also created the Blue Registry, which aims to be a platform for managing verified emission reductions from a variety of other standards, including the CCX and Voluntary Carbon Standards.

The Voluntary Carbon Standard⁸³

The latest version of the Voluntary Carbon Standard (VCS) was launched in November 2007 by the Climate Group, the International Emissions Trading Association, and the World Economic Forum. The VCS aims to standardize, increase fungibility, and stimulate innovation in the voluntary offset market. Mark Kenber, Policy Director at The Climate Group, described the standard as creating a basic “quality threshold” in the market. Credits certified via the VCS are then called Voluntary Carbon Units (VCUs). “Version 1” of the VCS was released in March 2006, as both a consultation document and a pilot standard for use in the market. The final version of the standard was launched in the fall of 2007. Projects verified to the pilot version were grandfathered into the 2007 system.

⁷⁸ Ibid

⁷⁹ Ibid

⁸⁰ Social Carbon website. Available online at <http://www.socialcarbon.com>.

⁸¹ International Carbon Investors & Services (INCIS) website. Available online at <http://www.carboninvestors.org>.

⁸² Fiona Harvine, “Banks take step toward carbon credit regulation, 2007,” *Financial Times Limited*, 28 June 2007. Available online at <http://ft.com/cms/s/c2bde6a4-2514-11dc-bf47-000b5df10621.html>.

⁸³ Voluntary Carbon Standard website. Available online at: <http://www.v-c-s.org>.

WBCSD/WRI GHG Protocol for Project & Corporate Accounting

The World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI) Protocol for Project Accounting (WBCSD/WRI GHG Protocol) is a widely accepted set of guidelines used by project developers and incorporated into numerous standards, such as the CCAR Protocols and the ISO 14064 standards. The GHG Protocol “aims at harmonizing GHG accounting and reporting standards internationally to ensure that different trading schemes and other climate related initiatives adopt consistent approaches to GHG accounting.”⁸⁴ This Protocol was created along with a GHG Corporate Accounting and Reporting Standard. Neither the GHG Protocol nor the Corporate Standard is a certification system or verification standard in itself.⁸⁵

Supplier Specific Standards

Within the OTC market many suppliers utilize their own set of screens or standards for both developing offset projects and deciding which offsets are viable purchases. In some cases suppliers have branded or such standards or made them publically available. For example, in 2007 General Electric (GE) and AES joined forces to launch a Greenhouse Gas Services venture with its own Standard of Practice.⁸⁶

7.2.2 Not Just for Projects: Standards for Suppliers

Defra’s Code of Best Practice for (UK) Consumers & Voluntary Code of Best Practice on Carbon Offsetting⁸⁷

In early 2008, the United Kingdom’s Department for Environment and Rural Affairs (Defra) launched a Code of Best Practice for Offset Providers based in the UK and “designed to give consumers clarity and confidence when they choose to offset.”⁸⁸ A key feature of the plan is the suggestion to customers to only purchase Certified Emission Reductions (CERs), EU Allowances (EUAs), and Emission Reduction Units (ERUs) from “robust and verifiable” regulated markets rather than VERs from the voluntary markets.⁸⁹ However, Defra noted that an endorsement of “high-quality Voluntary Emission Reductions (VERs) from the non-regulated market” is also under consideration.⁹⁰

Green-e Climate⁹¹

Green-e Climate was launched in early 2008 and developed primarily to provide certification services for retail providers retiring carbon credits to sell as carbon offsets to customers. This program requires certification by endorsed project-based standards (including the CDM, the Gold Standard, and the VCS). Green-e Climate certification for carbon offset products aims to ensure that carbon credits are additional as well as independently certified and verified, that project developers and sellers follow accurate accounting practices, and that sellers disclose relevant information about offset sources.

7.3 The Rise of the Third Party: Trends in 2007

The role and rise of third party standards is considered by many market players to be THE major trend of 2007. Suppliers embraced the idea of standards as a means of proving their legitimacy, and buyers increasingly asked for certified credits as one means of avoiding “fool’s gold.” Several standards, including the VCS and the VER+, were launched in 2007. Other already-established standards or protocols further defined their roles in the market, and stakeholders continued to debate the need for and advantages of additionality tests as well as the relative merits of rigor versus flexibility.

⁸⁴World Business Council for Sustainable Development and World Resources Institute (WBCSD, WRI), “GHG Protocol Initiative: For Project Accounting.” Available online at

<http://www.ghgprotocol.org/templates/GHG5/layout.asp?MenuID=849>.

⁸⁵WBCSD and WRI, “GHG Corporate Accounting and Reporting Standard.” Available online at <http://www.ghgprotocol.org/templates/GHG5/layout.asp?type=p&MenuID=ODk2>.

⁸⁶Greenhouse Gas Services, “Greenhouse Gas Services’ Standard of Practice.” Available online at http://www.ghgs.com/pdf/factsheets/GGSStandards_FS_Final.pdf.

⁸⁷Defra, “Climate Change: Carbon Offsetting – Code of Best Practice,” 19 February 2008. Available online at <http://www.Defra.gov.uk/environment/climatechange/uk/carbonoffset/codeofpractice.htm>.

⁸⁸Defra, “Consultation on establishing a voluntary Code of Best Practice for the provision of carbon offsetting to UK customers,” 18 January 2007.

⁸⁹Defra, “Climate Change: Carbon Offsetting – Code of Best Practice.” See prior citation for URL.

⁹⁰Defra, “Step forward on reducing climate change impacts from products,” 25 May 2007. Available online at <http://www.Defra.gov.uk/news/2007/070530a.htm>.

⁹¹Green-e website. Available online at: <http://www.green-e.org>.

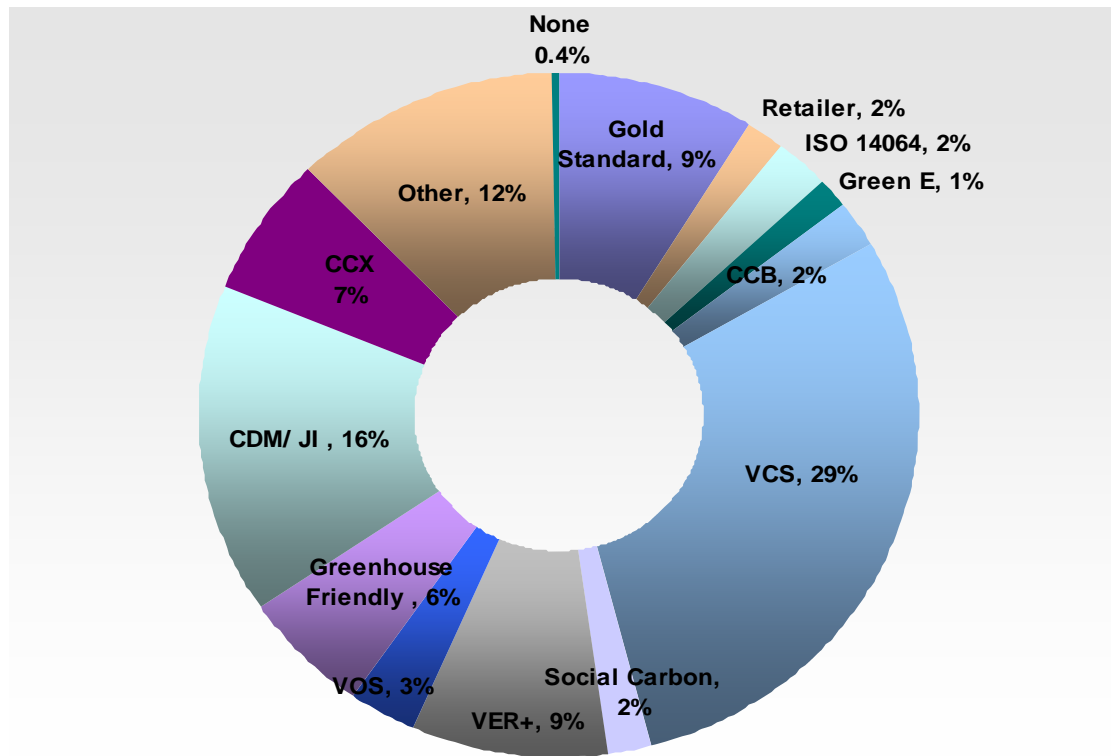
7.3.1 Standards Utilized in 2007

In our survey, we asked suppliers to specify the percentage of credits that were verified and sold according to carbon offset standards. The ten specific OTC carbon offset standards (described in Section 7.2.1), with the exception of the Carbon Fix Standard which was not active in 2007, could be chosen, as well as CDM/JI, CCX, and the option to select “Retailer-Specific Standard,” “Other,” “None,” or “Not applicable/ I don’t know.”

Figure 22 illustrates the various standards under which OTC credits were transacted in 2007. Note that the figures shown only represent the subset of respondents that actually answered this particular question and provided us with the volume transacted in 2007. By far, the most popular standard appears to be the VCS, which was applied to more than 6.5MtCO₂e of offsets. Two years in the making, this highly-anticipated standard was designed to be a baseline standard specifically designed for the OTC market. While the final version of the standard was launched in the fall of 2007, projects verified to the pilot version of the standard, released in March, 2006, were grandfathered into the 2007 system. Hence, many credits sold in 2007 may have matched the pilot (Version 1) of the standard rather than the final version.

CCX and CDM/JI were the second and third most frequently cited option, at 7% and 16% of the total recorded transactions, respectively. Within the list of OTC third party standards, credits verified to the Gold Standard for VERs and VER+ each accounted for 9% of recorded transactions. Because VER+ utilizes the CDM protocol, this standard has been particularly popular with CDM project developers verifying pre-CDM VERs.

Figure 22: Types of Standards Used, OTC 2007 (Actual Responses)⁹²



Source: Ecosystem Marketplace, New Carbon Finance

The relatively large share of credits shown as being sold under the “Other” category in Figure 22 is likely due to the fact that suppliers rarely checked specifically that they were not using a third party standard, and hence chose the response “Other” rather than “None” or “Retail” as their answers to the survey. Hence, in the majority of cases (though not all), “Other” can be considered credits sold without a third party standard. In addition, a total of 17 MtCO₂e of volume transacted could not be traced to any of the below categories as the respondent did

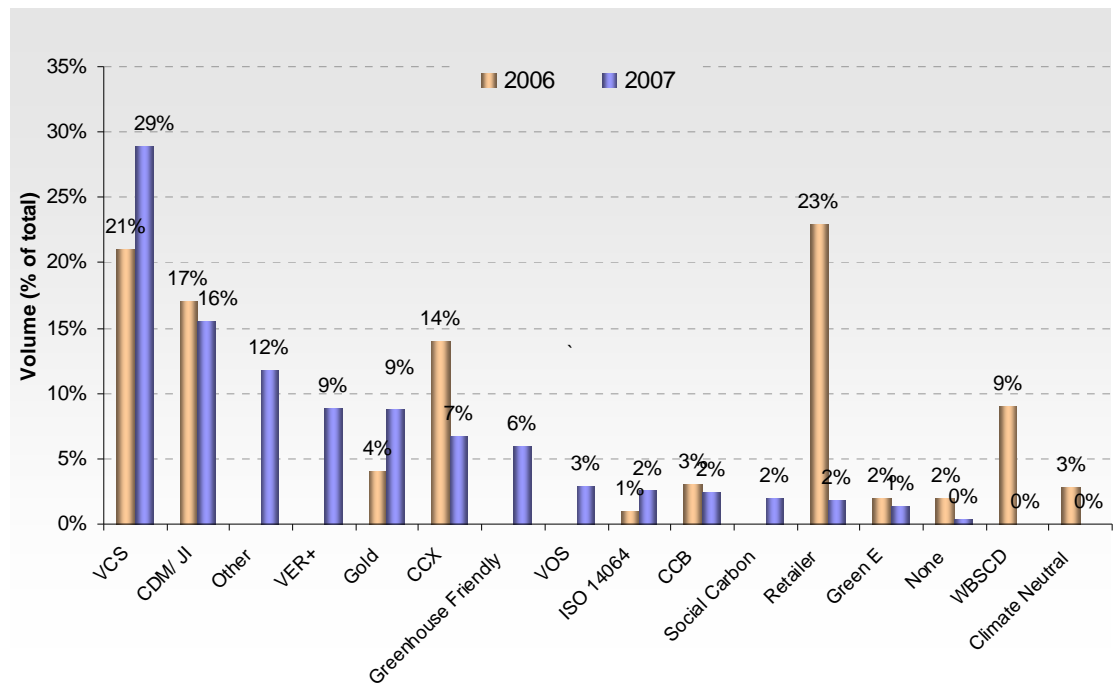
⁹² Based on 115 data points.

not answer this question. If these volumes plus the ones in the “None” and “Other” categories would be classified as not having used any standard in 2007 this would represent 48% of the transaction volume versus 52% that did use a standard.

Figure 23 illustrates the changes in the use of standards in the marketplace between 2006 and 2007. Key trends include:

- The number of suppliers claiming retail-specific standards decreased significantly. These standards are being abandoned as retailers seeking to ensure the legitimacy of their credits now have the option of an array of developed third party standards. Some of these, however, may be counted in the “Other” category.
- The Carbon Neutral Network (CNN), which created one of the first certification schemes for the voluntary carbon market - the Climate Cool logo and certification - is no longer in operation. According to the website, “CNN management is currently working to transfer the Climate Cool program to another non-profit organization that has the resources to support and develop the program.”⁹³
- The VCS, VER+, Voluntary Offset Standard, and Green-e GHG standards were all launched in the marketplace during 2007. The VCS has maintained its top position among the voluntary standards.
- As credits began moving through the Gold Standard pipeline and entering the market, the number of claimed verified Gold Standard credits transacted increased. According to supplier responses, the percentage of Gold Standard credits in the OTC market increased from 4% in 2006 to 9% in 2007.

Figure 23: Uptake of Standards in the OTC Market, 2007 Usage Compared to 2006 ⁹⁴



Source: Ecosystem Marketplace, New Carbon Finance

Another key change is that almost no suppliers designated the WRI/WBCSD GHG Protocol as a standard. This change can be seen as a sign of maturation in the standards market since the protocol was designed as a set of guidelines, not a standard, for both project and corporate accounting, and was as such to be incorporated into other standards. Neither the GHG Protocol nor the Corporate Accounting and Reporting Standard is a certification system or verification standard itself.⁹⁵ The fact that respondents did not list the protocol as a standard used to verify credits does not mean the protocol has become irrelevant in the OTC market.

⁹³ Climate Neutral Network website. Available online at <http://climatenetwork.org>.

⁹⁴ Numbers for 2007 based on 115 data points.

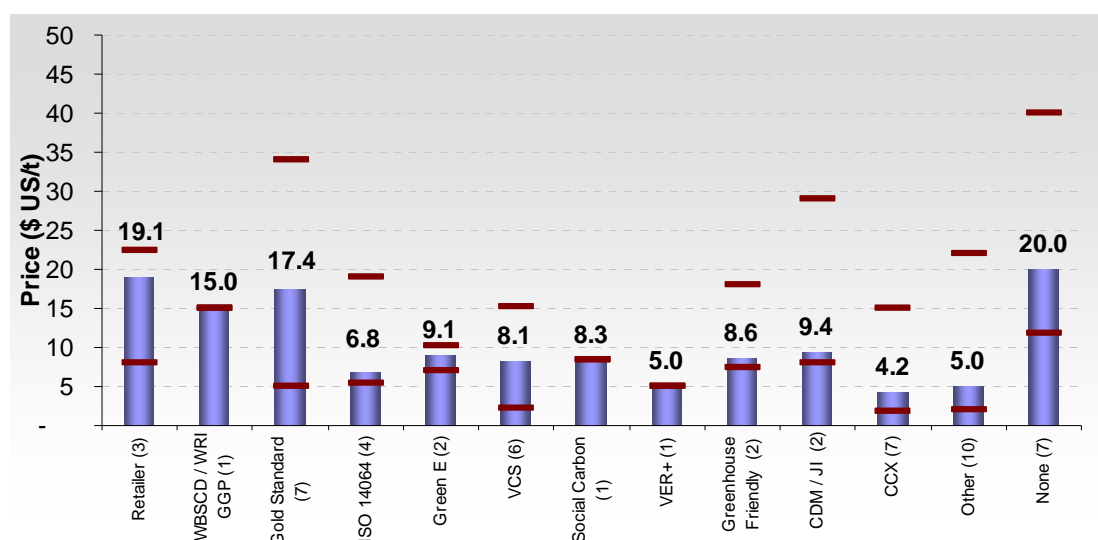
⁹⁵ WBCSD and WRI. “GHG Protocol Initiative: For Project Accounting.” Available online at <http://www.ghgprotocol.org/templates/GHG5/layout.asp?MenuID=849>.

Instead, the concepts outlined in the protocol have already been incorporated into many offset standards in the marketplace.

7.3.2 The Price of Consistency

The price premium of various standards is a critical question for many suppliers in the marketplace. Hence, as presented in Figure 24, we have attempted to pull out the price ranges of credits verified to the various standards sold on the OTC market in 2007. This was only done for those suppliers that indicated that more than 90% of their volume was verified by one particular standard and had also provided an average price they received for any credits sold. The median was found using a volume weighted average. Unfortunately, due to the structure of the survey questions, we had limited access to appropriate data and the figures therefore represent a limited set of data points.

Figure 24: Credit Prices by Standard, OTC 2007⁹⁶



Source: Ecosystem Marketplace, New Carbon Finance. Note: Number within parentheses indicates number of data points.

We compared the price ranges obtained from survey responses with price ranges presented for seven different standards in the recently released report, “Making Sense of the Voluntary Carbon Market A Comparison of Carbon Offset Standards,” produced by the World Wildlife Fund (WWF), Tricorona, and Stockholm Environment Institute. In general, the WWF report cites higher prices than we were able to deduct from survey responses. Anja Kollmuss, lead author of the report, explained that this data came from interviewing traders and administrators of the different standards. “It is, of course, very difficult to get price information. This is one reason we have presented such a large range.”

Table 3: State of the Voluntary Carbon Market 2008(SVCM) vs. WWF Price Ranges (US\$)

	CDM	GS	VCS	VER+	CCX	CCBS	Plan Vivo
WWF Low	41.1	13.7	6.9	6.9	1.4	6.9	3.4
WWF Median	30.2	20.6	13.7	13.7	2.1	10.3	8.2
WWF High	19.2	27.4	20.6	20.6	2.7	13.7	13.0
SVCM Low	8.1	5.0	2.2	5.0	1.9	n/a	n/a
SVCM Median	18.6	11.6	5.7	5.0	5.2	n/a	n/a
SVCM High	29.0	21.0	8.4	5.0	15.0	n/a	n/a

Source: Ecosystem Marketplace, New Carbon Finance, World Wildlife Fund

While it is generally thought that credits verified to a third party standard earn a premium in the market, we found that some of the highest-priced credits are not actually utilizing a standard at

⁹⁶ Based on 46 data points.

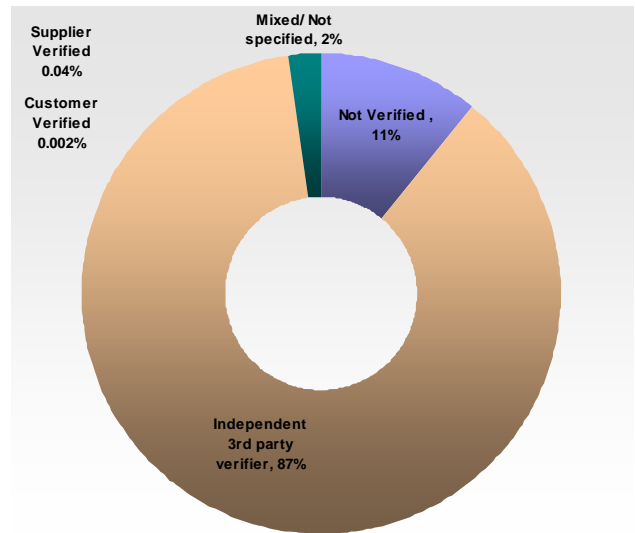
all. For the most part, we believe that these high priced credits originated from afforestation/ reforestation projects and were sold at the retail level.

As a legitimacy and fungibility tool in the marketplace, third party verification and standards could be considered ‘priceless.’ However, they are not without costs. For example, the cost of validating a project using the CCB Standard ranges from \$5,400 to \$15,400. Likewise, the cost of having a credit validated and issued by the VER+ ranges from \$7,700 to \$23,100⁹⁷. Hence, while it appears that credits verified to a third party standard may sometimes earn a premium over non-verified credits, buyers are paying not only for value, but also for the associated costs. In some cases, especially for smaller projects in developing countries, these costs may therefore still create CDM-like hurdles for developers and simply take too much funding away from the goal of the project – GHG emission reductions.

7.4 Putting the V in VER

Third party verification that emissions reductions are actually occurring is a key requirement of the CDM and for most standards. Such third party verification is not, however, required in the OTC market, and is not always utilized (although, its utilization is increasing in the OTC market). Our numbers indicate that the overwhelming majority (87%) of credits in the OTC market are third party verified. In 2007, about 11% of credits were not verified at all, only 0.04% of credits were verified by the seller, and less than 0.002% of credits were verified by the buyer (Figure 25).

Figure 25: Credits Verified, OTC 2007 ⁹⁸



Source: Ecosystem Marketplace, New Carbon Finance

Similar to the results in the Standards section an approximate 17.1 MtCO₂e of the transaction volume in 2007 could not be traced back to any answer as this information was not provided. If we assume that these were all not verified 47% of the market would not use any verification method and only 53% does. Obviously this is not entirely accurate, but reflects the uncertainty range due to the incompleteness of data.

7.5 Survival of the Fittest: Standards in 2008

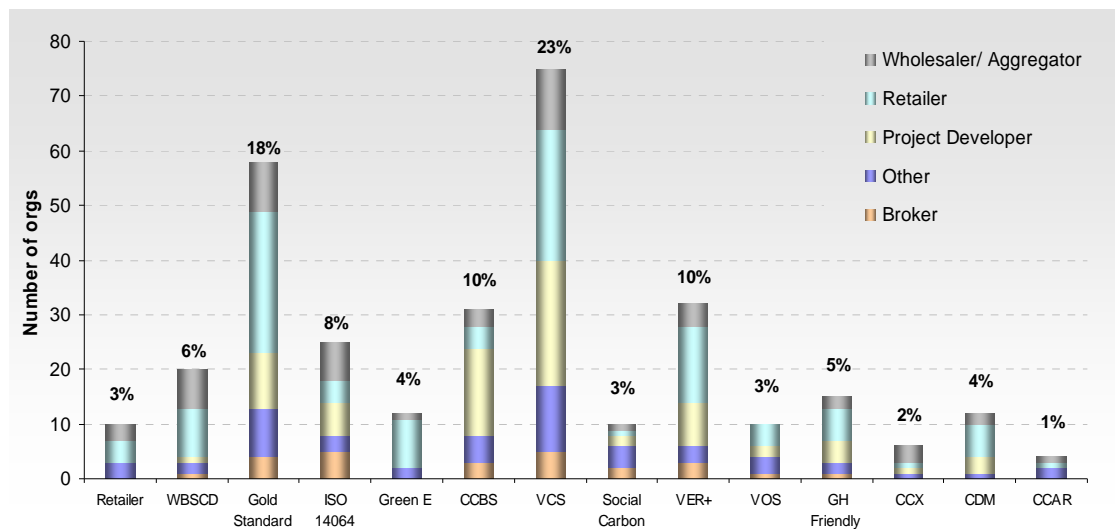
Because the majority of standards in the marketplace in 2007 were new as of that year, and to identify future trends, we also asked respondents to note which standards they were planning to use in 2008. Suppliers had the option of checking as many standards as desired. Their selections are shown in Figure 26. Unlike many of the findings in this report, which weigh supplier responses by transaction volume, this analysis gives each organization equal weight.

Once again, more organizations planned to use the VCS than any other standard with almost one quarter of the market. The Gold Standard, despite having limitations on project-type eligibility, was the second most popular choice (18%), and VER+ and CCBS the third most frequently checked option (both at 10%).

⁹⁷ Anja Kollmuss, Helge Zink, and Clifford Polycarp, *Making Sense of the Voluntary Carbon Market: A Comparison of Carbon Carbon Offset Standards*, March 2008. Available online at http://assets.panda.org/downloads/vcm_report_final.pdf.

⁹⁸ Based on 114 data points.

Figure 26: Future Standards that Suppliers Plan to Use in 2008⁹⁹



Source: Ecosystem Marketplace, New Carbon Finance

Only 6% of suppliers said they planned to use credits from the CDM or the CCX. As third party standards created specifically for the OTC are made available and adopted, and as they presumably help to further establish the legitimacy and fungibility of VERs, the percentage of VER credits sourced directly for voluntary buyers should continue to grow.

7.6 Government Oversight

In addition to verification standards evolving within the voluntary carbon markets, government programs have been put into motion in both Europe and the United States throughout 2007 and 2008 to help 'tame' the OTC market. For example, while it seems the vast majority of suppliers are not planning to utilize Kyoto-based credits; several government initiatives are working to push the market towards this option.

For example, Defra's Code of Best Practice for Offset Providers (described in Section 7.2.2) arose to ensure the legitimacy of carbon offsets and currently endorses only Kyoto-based offset credits. In a similar vein, in mid-2007 Norway announced plans to launch a government website where voluntary offset consumers can purchase and retire Kyoto certified offset credits.¹⁰⁰

Across the pond, there were no structured programs with guidelines for the voluntary markets. However, governments kept an eye on offset suppliers. In mid-2007, the US House of Representatives Selection on Energy Independence and Global Warming held a hearing to examine carbon offsets. In 2008, in response to criticism surrounding offsets purchased by the House of Representatives from the CCX, members of Congress interested in the US voluntary carbon offsets market requested an inquiry by the US Government Accountability Office.¹⁰¹ This inquiry is currently underway. In addition, several California politicians have called for regulating the voluntary markets.

Also in the US, the Federal Trade Commission (FTC) recently convened a workshop on investment in and guidance for setting and evaluating green advertising claims in the carbon offset and Renewable Energy Certificate (REC) markets. The goal of the event was not to investigate the marketplace as a whole, but rather to focus on a specific issue – appropriate advertising claims and create "better guidance to marketers seeking to make truthful claims and provide guidance to consumers in making purchasing decisions." How the FTC will provide guidelines for RECs and offsets in its Guide for the Use of Environmental Marketing Claims is still to be determined.

⁹⁹ Based on 130 data points.

¹⁰⁰ Ibid.

¹⁰¹ Jonathan L. Ramseur, "Voluntary Carbon Offsets (Excerpted from Congressional Research Service Report RL34241)." Available online at <http://sharp.sefora.org/issues/voluntary-carbon-offsets>.

Table 4: Standards in the Voluntary Carbon Market

Standard	Description	Env. & Social Benefits	Reporting/ Registration	Includes LULUCF Method'y?	Geographical Reach	Start Date	Projects/ Credits Verified
Gold Standard for VERs	Certification for offset projects & carbon credits	Yes	VER registry in development	RE & EE projects	International	1 st validated 2006, 1 st verified 2007	10 VER projects verified
The VCS	Certification for offset projects & carbon credits	No	Use Bank of New York; other registry TBD	Yes, Methodologies TBD	International	Expected mid-2007	Unknown
Green-e Climate	Certification program for offset sellers	No	Registry Incorporated	Accepts other standards with LULUCF	Aimed at N.A., International possibilities	Expected mid-2007	3 companies
CCB Standards	Certification program for offset projects	Yes	Projects on Website	Only LULUCF	International	1 st project certified in 2007	9 projects
CCX	Internal system for CCX offset projects & CCX carbon credits	No	Registry Incorporated w/ trading platform	Yes	International	2003	28Mt CFI's registered.
Plan Vivo	Guidelines for offset projects	Yes	No	Community based agro forestry	International	2000	3 projects
Greenhouse Friendly	Certification program for offset sellers & carbon neutral products	No	No	Yes	Australia	2001	4,373,877 registered (259,202 in 2007)
CCAR	A Registry Protocol	No	Reporting protocols used as standards	Yes, first protocol	Forestry-California; Livestock- US	1 st protocol in 2005	2 projects
VER+	Certification program for offset projects carbon neutral products	No	TÜV SÜV Blue Registry	Includes a JI or CDM meth's	International	Expected launch mid-2007	706,107 VERs registered
ISO 14064	Certification program for emissions reporting offset projects, carbon credits	No	No	Yes	International	Methodology Released in 2006	Unknown
VOS	Certification for offset projects & carbon credits	No	TBD	Follow CDM or JI meth's	International	TBD	Unknown
Social Carbon	Certification for offset projects & carbon credits	Yes	Creating its own registry system	Reforestation & Avoided deforestation	South America & Portugal	1 st Methodology applied in 2002	10 projects representing 350,000 tonnes
DEFRA	Proposed consumer code for offsetting & accounting	No	Does not include a registry	If CDM/ JI approved	UK	TBD	Unknown

Source: New Carbon Finance, Ecosystem Marketplace, Standards Websites

8 Registries: Tracking the Trades

Summary points:

- Registries provide a host of market services, including tracking credit sales and ownership, increasing market efficiency through information sharing, and protecting against “double counting.”
- Registries are typically classified into two categories: emissions tracking registries, which track buyer entities’ emissions and reductions, and carbon credit accounting registries, which report on transactions of credits, allowances, and offsets.
- 2007 saw the premier of several new project registries, and at least several more are in the works.
- The most utilized registries in 2007 were the CCX, CDM/JI, and TUV SUD BlueRegistry.

Building on the establishment of standards, a new feature of the voluntary carbon market infrastructure is sprouting up across the globe, namely, carbon credit registries. These registries are designed to track credit transactions and ownership as well as reduce the risk that a single credit can be sold to more than one buyer. When dealing with a commodity as intangible as a carbon credit, such registries are crucial, but they have not been prevalent in the OTC market until recently. As the builders of registries have broken ground to construct registry infrastructure over the past year, OTC buyers and sellers have become increasingly aware of their relevance and role in the marketplace.

In 2007, we believe the market uptake of nascent registries on the OTC was limited, but this seems to be changing. Several new registries have been launched during the first four months of 2008, including the New Zealand-based registry and exchange TZ1, the California Climate Action Registry’s Climate Action Reserve, and The Gold Standard’s Registry for VERs (the latter two set up by APX). These registries are already paving the way for some exchanges designed for the OTC market such as the Climex and the Asia Climate Exchange.

8.1 Emissions Tracking versus Carbon Credit Accounting

Dozens of GHG registries exist around the world, but not all of them serve the same purpose. In general, existing registries can be divided into two different categories: *emissions-tracking registries* and *carbon-credit accounting registries*.

Emissions-tracking registries track organizations’ GHG emissions and reductions, primarily pre-regulation or early action emissions reductions, and help entities set baselines. Joel Levin of the California Climate Action Registry (CCAR), an emissions-tracking registry, notes that this type of registry is “measuring the beans, not tracking the trades.” Because these registries help companies establish baselines and account for emission reductions, emissions tracking registries are a critical tool for regulated or voluntary cap-and-trade systems.

Emission-tracking registries include: the United States’ Department of Energy 1605(b) Program, the Canadian Greenhouse Gas Challenge, the World Economic Forum Global Greenhouse Gas registry, and The Climate Registry in the United States. Only a few of these emissions tracking registries, however, also have systems for registering actual carbon credit transactions.

Alternatively, **carbon credit accounting registries** are designed specifically to “track the trades.” Mitchell Feierstein of Cheyne Capital describes the carbon markets as creating “a substantial new commoditized, fungible asset class.” Carbon-credit accounting registries keep track of this asset class. For example, accounting registries track only verified emission reductions after they have become carbon credits, often utilize serial numbers as an accounting tool, and generally incorporate screening requirements such as third party verification to a specific offset standard.

Carbon-credit accounting registries include: The Bank of New York’s Global Registry and Custody Service, the verifier TÜV SÜD’s BlueRegistry, and the New Zealand-based Regi (not

to be confused with the US Regional Greenhouse Gas Initiative) and TZ1. Other carbon credit accounting registries are designed to underscore an exchange, such as the Chicago Climate Exchange (CCX) Offset Registry and the Asia Carbon Registry. In addition, some suppliers, such as the Carbon Neutral Company, and third party standard organizations such as the Gold Standard Voluntary Registry, have also created their own registry. The Environmental Resources Trust's (ERT) GHG Registry and CCAR cover both categories, tracking both corporate emissions reductions and carbon credits.

8.2 Carbon Credit Accounting Registries: A Look at Their Architecture

Key differences between carbon credit accounting registries include the type of standards by which they screen credits, how transparent the registry is, different levels of legal liability, and the "ethos" behind how they seek to contribute to the voluntary carbon markets.

Most OTC market registries depend on third party standards as a fundamental tool for screening and classifying credits. The markets' several registries have embraced different standards. The recently launched New Zealand-based TZ1 will accept credits verified to the VCS and potentially the Gold Standard. Alternatively, TÜV SÜD's Blue Registry only lists credits certified to the VER+ standard, but plans on extending its registry services to encompass a wide array of standards such as the VCS, the CCX standard, and the Gold Standard. The Bank of New York's Custodial Registry only accepts credits certified to the VCS, and ERT's GHG Registry currently does not specify whether registered credits are screened by a specific standard.

The majority of GHG registries are designed as public or partially public databases. For example, stakeholders interested in tracking the sales or purchases of a particular company registered on ERT's GHG Registry website will find that most of the information is publicly available. Alternatively, the Bank of New York's registry is structured less like a public database and more like a private bank account. Alex Rau of Climate Wedge notes this issue is critical to many investors. "Would you want your bank account open to the public?" he asks.

Table 5: A Carbon Credit's Home Sweet Home: A Quick Guide to Credit Accounting Registries

	Bank of New York	Environmental Resources Trust	Blue Registry	CCX Registry	Triodos Climate Clearing House	California Climate Action Registry	Asia Carbon Registry	Regi	Australia n Climate Registry	GHG Clean Projects Registry
Serial Numbers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard/ Verification Requirements	Voluntary Carbon Standard	ERT Approved	VER+ Standard; Plans to incorporate other standards	CCX Board Approved	Triodos Approved	CCAR Protocols	"Approved standards available on the market"	Provisional Gold Standard ISO14064 ;Greenhouse Gas Protocol; CDM: JI	ACX approved process, third party accreditation	ISO 14064
Transparency	standards public; Account info not disclosed	standards unclear; majority of account info public	standards public; Account info public	CCX Standard; Exchange data public; Account info not disclosed	standards unclear; Account info not disclosed	standards public; majority of account info public	standards public; Unclear if account info public	standards public Account Info public	standards unclear; Transaction info disclosed. Account info not disclosed.	standards public. Account info public.
Start Date	2006	1997	2007	2003	2001	Reduction Registry 2003; Certified credit registry 2007	2007	2007	2007	2008
Total Credits Registered (as of April 2008)	Unknown	345Mt reduction; 17Mt VERs	1Mt VERs	28Mt Offset credits	2Mt VERs	308Mt reduction; VERs Upcoming	Unknown	3,080	7,500	957, 600

Source: Ecosystem Marketplace, New Carbon Finance

The cost of listing credits on an OTC registry varies widely and is often difficult to pin down, especially when factoring in the way different registries bundle their services. ERT's GHG Registry, for example, charges anywhere between \$2,000 and \$6,000 for opening an account, plus an annual renewal fee ranging from \$1,500 to \$5,000 and a \$.035/ tCO₂e administrative transaction and software system fee. Compare this with the New Zealand-based Regi, where account registration for buyers and sellers is free, per-project verification costs a mere \$149 with transaction fees around \$0.23 per credit transferred, and about \$0.04 is charged for each credit retired with a fixed cost of \$1.12 for each transfer. Regi keeps its costs, and thus its fees, down by only accepting credits already inspected by a qualified "Certification Entity" under the VCS or a "Designated Operational Entity" (DOE) under the Kyoto Protocol's CDM. Not surprisingly, the cost of listing credits is also affected by how services are bundled. For example, while ERT's registry process is significantly more expensive than Regi's, it can include third party verification, whereas Regi only accepts credits that have already passed inspection by a certification service.

8.3 Beyond Scaffolding: Harnessing Registry Infrastructure

While the credit accounting registries represent another cost, they also represent another layer of security in this "buyer beware" marketplace. The following section maps the range of carbon credit accounting registries currently in the marketplace. Several of these registries had not been launched by the close of 2007 and therefore are not included in the survey results.

8.3.1 Examples of Third Party Registries

Asia Carbon Registry (ACR) (<http://www.asiacarbon.com>)

The Asia Carbon Group (ACG) developed the Asia Carbon Registry for VERs in 2007. ACG provides carbon advisory, finance, and asset management services under several different initiatives, namely the ACX-Change and Asia Carbon Asset Development Facility. The Registry plans to accept credits utilizing a variety of standards, including the VCS and the Gold Standard. The scope of registry services includes electronic listing, transferring, and eventually retiring VERs.

Environmental Resources Trust GHG Registry Program (<http://www.ert.net/ghg/index.html>)

The Environmental Resources Trust (ERT) GHG Registry is the longest-standing registry in the voluntary carbon markets. Created in 1997, the registry tracks both "qualified emissions reductions" and actual carbon credits. Both buyers and suppliers can register tonnes, the credits from which they may either re-sell or retire. The ERT registry provides third party validation and verification services with standards varying on a case-by-case basis. In March, 2007, ERT selected APX to provide technological support for its GHG Registry Program.

GHG CleanProjects Registry (http://www.ghgregistries.ca/cleanprojects/index_e.cfm)

The Canadian GHG CleanProjects Registry's chief objective is to list and de-list GHG reduction projects that result in Verified Emission Reduction-Removal credits (VERRs) for the voluntary and regulated markets. Participants in this Canadian registry may attach a unique serial number to each VERR representing one tCO₂e. However, serialization of verified emissions reduction volume is not required. The VERR classification requires adherence to the ISO 14064 standards.

The Registry Company "Regi" (www.regi.co.nz)

The Registry Company, known as "Regi" is operated by M-Co, a private company that works in electricity markets. While the website is tailored to players in New Zealand's voluntary carbon market, it also will consider foreign account requests on a case-by-case basis. Regi accepts Voluntary Carbon Standard and Gold Standard credits. Regi has a high level of transparency, and the general public can visit Regi's website and view the Certificate Summary Listing to find information on offset providers, project names, credit types and volume, and transaction status.

Triodos Climate Clearing House (<http://www.triodos.com/com/climate>)

Triodos Climate Clearing House is a project of Triodos Bank, a European bank focused on financing "enterprises which add social, environmental and cultural value." It claims to track "CO₂ credits in a transparent, accountable, and efficient manner" and was created, in part, to

assure that credits cannot be double-counted. The organization does not explicitly state a requisite for third party verification or certification, but it does state that qualified projects include “afforestation, renewable energy, and energy efficiency” activities. Account holders include the Carbon Neutral Group and the Dutch Face Foundation.

8.3.2 Examples of Exchange, Standard, Verifier, and Supplier Specific Registries

The Bank of New York’s Global Registry and Custody Service for Voluntary Carbon Units (http://www.bankofny.com/CpTrust/abo_prs_472.htm)

The Bank of New York’s custodial registry was created to become a means of accounting for the Voluntary Carbon Standard’s Voluntary Carbon Units (VCUs), and aims to streamline and legitimize the trading process of VCUs. This centralized, electronic, and private accounting system stores VCUs, assigns each a unique serial number for tracking and verification purposes, and provides clear parameters for defining account ownership. The registry requires certification under the VCS and account information is not publicly disclosed.

TÜV SÜD’s BlueRegistry (<https://www.netinform.de/BlueRegistry>)

TÜV SÜD, a company that validates and verifies both Kyoto and voluntary emission credits, created the BlueRegistry, a database of certified VERs and renewable energy credits. Initially, the database is exclusive to VER+ credits and renewable energy certificates. However, TÜV SÜD aims for the registry to become a “master” registry for voluntary carbon credits, including CCX CFIs and Voluntary Carbon Standard VCUs. The BlueRegistry is designed to be transparent, and maintains publicly available information on factors such as credit-type, credit ownership and vintage.

The California Climate Action Registry’s Climate Action Reserve (<http://www.climateregistry.org>)

The California Climate Action Registry (CCAR) was established by California law as a non-profit voluntary registry for GHG emissions aimed at protecting and rewarding companies that reduce emissions regulation requires them to do so. Building on its emissions reporting system, CCAR, working with APX Inc, launched the Climate Action Reserve on April 14, 2007 to track and register voluntary projects verified to CCAR protocols. CCAR currently has approved protocols for livestock methane and forest activities and will soon release a natural gas transmission and distribution reporting and certification protocol.

The Chicago Climate Exchange Registry (<http://www.chicagoclimatex.com>)

The Chicago Climate Exchange (CCX) registry is an accounting system for the CCX’s cap-and-trade scheme. Suppliers seeking to include their credits in the registry must first become members and then have their offsets approved by the CCX Committee on Offsets, which then assigns serial numbers to ensuing third party-verified credits. Because both emission reduction allowances and project-based offset credits are traded on the CCX, the registry is both an emissions reductions tracking program and a carbon credit accounting system. The registry is somewhat transparent, providing publicly-available information regarding the offset provider/aggregator, project type and location, as well as transaction volume.

Retailer Registries

This year 26% of respondents noted they were utilizing their own organization’s specific registry. A select number of these registries are public. For example, the Carbon Neutral Company created its own online registry, which posts detailed information on projects contracted. Dom Stichbury of the Carbon Neutral Company notes that the company does not see its private online registry as a substitute for a third party, multi-company registry. Instead the “registry was created to be as open as possible about the projects that we’ve contracted ... and to contribute to increased transparency in the voluntary markets.”

8.3.3 Examples of Registries Launched (or soon to be launched) in 2008

Globe Carbon Registry (<http://globecarbonregistry.com>)

In mid-2008, Canada-based Globe Advisors plans to launch the Globe Carbon Registry. Still in development, the registry will be designed to attach serial numbers to offset credits, track ownership transfer, and retire credits against end user emissions. While the registry is intended to focus on accepting credits verified to established third party standards, it will also

accept credits verified to a 'custom standard' and provide users with information on the criteria utilized.

Gold Standard Registry for VERs (<http://goldstandard.apx.com>)

In 2008, the Gold Standard Foundation joined forces with APX to create a registry that creates, tracks, and enables the transfer of Gold Standard certified VERs, ERUs, and CERs. The registry aims to be a low-cost and transparent electronic database. Information about the status of credits (such as whether they are re-sellable or retired) can be accessed by stakeholders who register on the website. The registry features the serialization of each Gold Standard VER credit, a double-entry accounting framework, and full ownership and transaction tracking for VERs, ERUs, and CERs.

TZ1 Registry (<http://www.tz1market.com/registryevolution.php>)

The TZ1 Registry was created to complement the TZ1 Carbon Exchange and aims to act as a "meta registry" that connects the systems of other major voluntary carbon market registries. Credits will be assigned a serial number, and in addition to tracking trades, the registry will include an externally-audited retirement facility for VERs or Kyoto credits. Organizations listing information on the registry will be able to choose the level of transparency in their accounts.

8.3.4 Tracking the Trackers: Registries in the OTC Marketplace

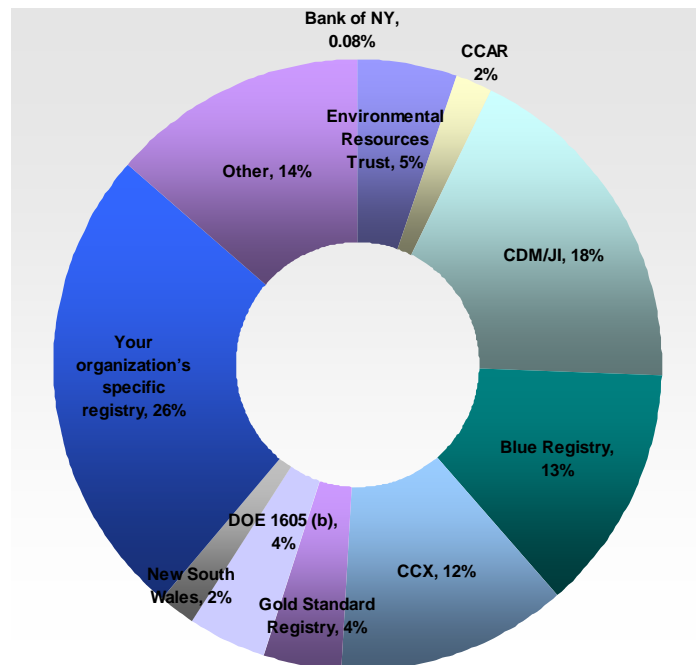
In order to measure OTC suppliers' usage of registries, and to avoid double counting transactions in our own data collection process, we asked respondents to specify which registries they were utilizing, if any, and the amount of credits registered on each system. The registry options we offered were: Environment Resources Trust, Bank of New York, California Climate Action Registry, CDM/JI, CCX, NSW GGAS Registry, BlueRegistry, Gold Standard Registry, and the US Department of Energy's 1605b registry. While the US Department of Energy's 1605b registry is not technically a credit accounting registry, we included it in this list because it allows US-based entities to list tonnes of carbon dioxide sequestered/reduced via land-based projects. The only respondents utilizing this last registry were those supplying forestry offsets.

We also offered the option for respondents to check the category "Other" and provide a registry that was not on our list. The 11 respondents who made this selection noted that their credits were listed in: the GHG CleanProjects Registry, Regi, and the Australian Greenhouse Friendly Program. Several respondents also noted plans to use upcoming registries once they become available, such as the VCS, the Gold Standard Registry (now available), and Social Carbon registries.

Figure 27 illustrates survey respondents' use of registries. To show the actual percentage of credits on the different registries, supplier responses were weighed according to their transaction volumes. The figure

does not include information gathered from the registries themselves because it is not always possible to identify credit *transactions* across the registries (rather than pure registrations). For the number of credits registered on the different registries, see Table 5. This year, only 57% of

Figure 27: Transactions by Registry Usage (Only Shown for Those with Registry), OTC 2007¹⁰²



Source: Ecosystem Marketplace, *New Carbon Finance*

¹⁰² Based on 115 data points.

respondents chose to answer this question. Of these respondents 31 organizations indicated that all credits were listed on only one registry or no registry at all, while 13 indicated that the credits were split between different registries depending on the projects that generated them. According to supplier responses weighed by their transaction volume, the lion's share of credits transacted is in a supplier-specific registry (26%).

In reality, since most credit accounting registries are fairly nascent, it is likely that the majority of the 43% of respondents who did not answer this question is not utilizing a registry. Under this assumption and including those respondents that have indicated 'no registry' was used (originally 11%), a staggering 58% of credits transacted on the OTC in 2007 were not listed in a registry. The chart on the right may therefore only illustrate the distribution for the remaining 42%.

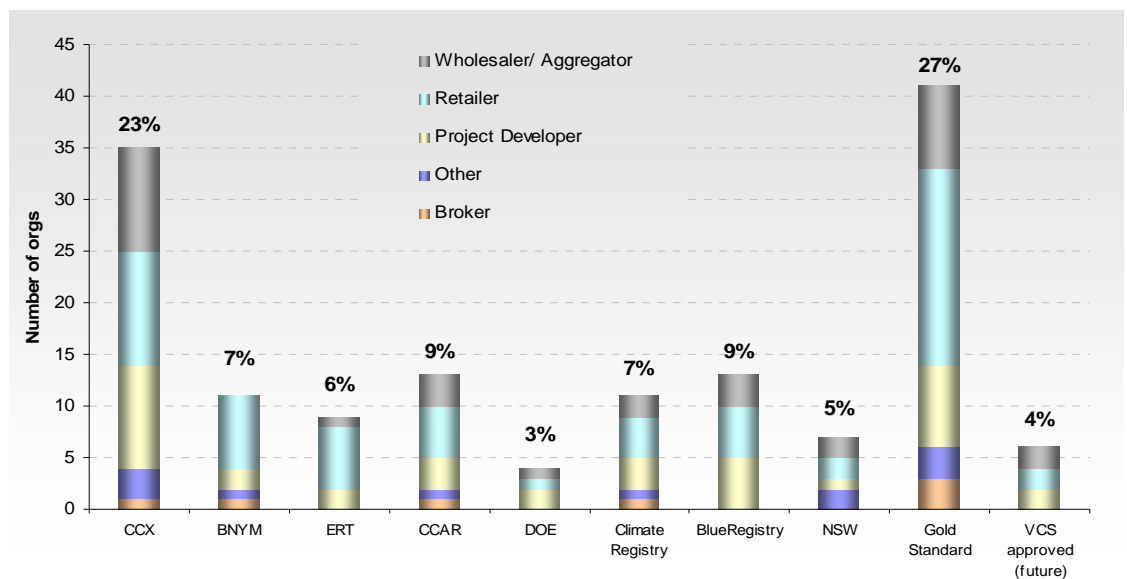
It was also not surprising to see that the established CCX and CDM/ JI registries were the most frequently utilized third party registries for credits transacted in the OTC markets. The share of credits registered on these systems does not quite match up with the figures in the Standards and Credits sections (see Section 7). This is because numerous respondents skipped this question, resulting in a distribution skewed towards those that used the CCX and CDM registries. Moreover, the fact that the chart only illustrates those transactions that were certainly using a registry will provide higher percentage figures here than in the Standards and Credits sections

Outside of the CCX or CDM, transacted credits were most frequently listed on the BlueRegistry, mainly as a result of the number of large players using the VER+ standard. The ERT GHG Registry (5%) and Gold Standard Registry (4%) also enjoyed notable use, even though the Gold Standard registry wasn't launched until 2008. Although it was not launched in 2007, we decided to include the Gold Standard Registry in this year's report because it announced plans to create a registry for the credits it had certified in 2007. Many suppliers therefore, expected to store credits , even pre-2007 vintages , on the registry.

8.3.5 For the Record: Supplier Interest in Registries

As the number of suppliers utilizing third party registries increases, so will the competition between registries themselves to house VER credits. Because the majority of registries in the marketplace were new in 2007, we also asked respondents to note which registries they planned to use in 2008. Suppliers had the option of checking as many registries as desired. Their selections are shown in Figure 28. Each organization was given equal weight in this analysis.

Figure 28: Future Registries that Suppliers Plan to Use in 2008¹⁰³



Source: Ecosystem Marketplace, New Carbon Finance

¹⁰³ Based on 130 data points.

There was a significant disconnect between the standards that respondents favored and the registries they planned to use in 2008. For example, while the VCS was hands-down the favored standard, only 4% of respondents said they planned to use a VCS registry this year. This is likely due to the fact that there is very little certainty as to whether or when the VCS registry will be launched, or whether it will simply utilize another third party registry. On the flip side, while only 2% of respondents said they planned to use CCX as a standard, a high 23% said they planned to use the CCX registry. Responses regarding the Gold Standard were slightly less puzzling. About 18% of respondents indicated they planned to use the Gold Standard in 2008, and about 27% respondents noted they planned to use the Gold Standard registry. We believe these response discrepancies around registries represent the significant level of confusion in the market concerning this relatively new feature in the marketplace.

9 Driving Demand: The Customers

Summary points:

- Like last year, the vast majority of credit buyers in the 2007 voluntary markets were private businesses (79%). Approximately two-thirds of their credits were purchased to immediately offset emissions, with the remaining third bought for investment purposes.
- NGOs comprised 13% of the buyers, individuals 5%, and governmental entities less than 1%.
- In 2007, buyers from the EU represented the greatest share of demand (47%) for credits on the voluntary markets. North American buyers purchased 37% of credits. Demand for credits by customers in Asia, Latin America, and Africa remains low.
- Like last year, corporate responsibility and public relations/branding efforts remained the main purchasing motivations of buyers in the voluntary markets in 2007. Two-thirds of customers purchasing offsets in 2007 did so to offset institutional emissions.
- “Additionality” - the demonstrable ability to reduce emissions beyond the levels that would otherwise have occurred – remained the primary criteria for selecting an offset provider in 2007, consistent with 2006. Environmental and social co-benefits were also ranked highly.

Amidst the standards, registries and media attention, at the end the voluntary carbon markets exist to serve the needs of entities seeking to voluntarily offset their emissions. As noted previously, a clear trend in 2007 was that customers are increasingly savvy about offsets and are getting more specific about the type of offset credits they want to purchase. One supplier sighed that, “voluntary buyers are getting pickier and pickier each month.” In order to understand the motivations behind customers’ offset purchases, we asked survey participants to tell us about this most vital link in the demand chain. We asked not only why customers were buying offsets, but also where these customers were based, what sector of society they constituted, and what types of GHG-spewing activities inspired them to seek out carbon offsets in the first place.

9.1 Who’s buying?

In order to identify the types of customers creating demand in the marketplace, we asked respondents to categorize their customers by the percentage of credits sold. We then used a weighted average based on supplier volumes to estimate the percentage of credits purchased by different types of buyers (see Figure 29).

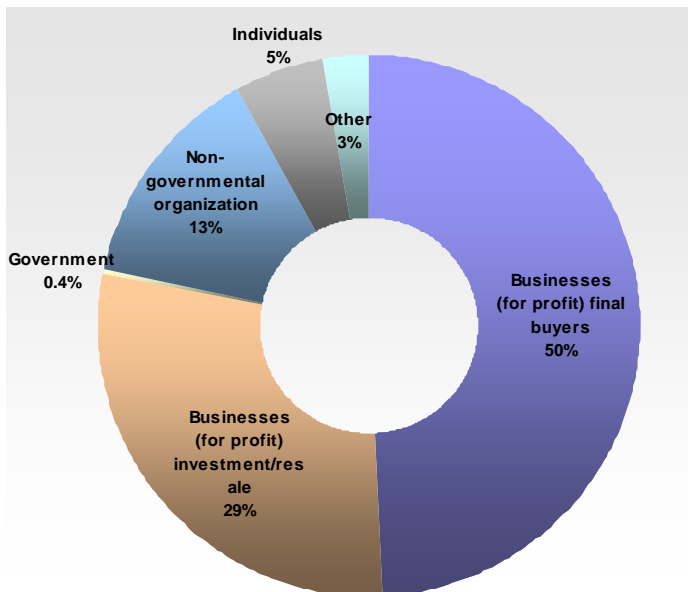
In 2007, NGOs stepped up demand from 2% to 13% of credits transacted. This increase in demand matches NGOs’ desire to “walk the talk” by offsetting emissions from airline travel, electricity use, and other activities. Alternatively, the decreased demand from governments (from 12% to 0.4%) is somewhat perplexing, as it is known that numerous government agencies began their offset purchases in 2007.

In 2007 individuals purchased 5% of credits on the OTC market. While their market share may be small, the number of credits purchased by individuals equals a relatively large number of transactions. This is because the credit size of individual purchases tends to be relatively small. For example, an individual offsetting a round-trip flight between London and New York City would purchase roughly offsets equal to 3tCO₂.

Companies are also increasingly starting to offer carbon offsets to individual customers bundled with other goods, or as an incentive to purchase goods from a specific supplier. For example, in 2007, California’s Pacific Gas & Electric Co (PG&E) launched its ClimateSmart program, which gives customers the option to pay extra to offset their electricity emissions. In 2008, a shopping website, climatecooler.com, which is endorsed by Natural Resources Defense Council, Environmental Defense, and National Wildlife Federation, has taken an even more innovative approach. When individuals purchase goods at regular prices from the website, which has partnered with over 350 online stores ranging from eBay to Godiva

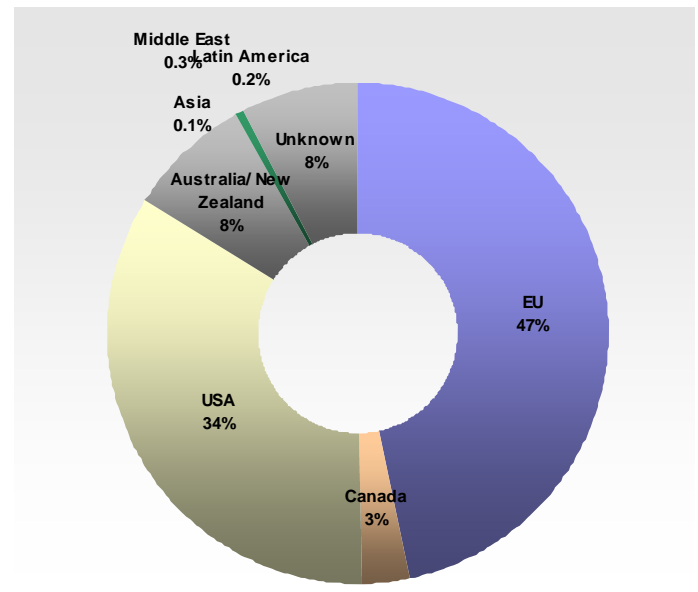
Chocolatier, the company automatically offsets the GHG emissions produced in the process of manufacturing, shipping and selling the purchased product-- at no extra price to the customer.

Figure 29: Transaction Volume by Type of Buyer, OTC 2007¹⁰⁴



Source: Ecosystem Marketplace, New Carbon Finance

Figure 30: Transaction Volume by Customer Location, OTC 2007¹⁰⁵



Source: Ecosystem Marketplace, New Carbon Finance

9.2 Customer Location

In addition to specifying the types of customers purchasing offsets, respondents also specified the location of their customers (Figure 30). In 2007, the greatest share of customers from a single region (47%) hailed from the European Union. The US remained a major source of customers, but the share of demand made by Americans declined to only 34% of credits on the OTC market, compared to 68% in 2006. Canada only represented 3% of the buyer's location.

The third largest share of customers came from Australia/New Zealand, where a customer base grew from less than 1% in 2006 to 8% in 2007. This increased demand parallels an increased number of suppliers in Australia and New Zealand, as well as a significantly greater number of credits sourced from "down under".

The demand from Asia, the Middle East, Latin America, and Africa remained very low in 2007. Considering that carbon offsets could be considered a "luxury good" (at least in the short term) from a voluntary buyer's perspective, this lack of demand is not surprising. For the most part, eco-tourism-related customers working to appeal to wealthy 'green' clientele seem to be leading the offsetting trend in developing countries. For example, in 2008, China's first 'carbon neutral' (luxury) hotel opened in Shanghai.¹⁰⁶

There are signs that more offsetting will be done by companies based in developing countries in the near future. For example, the United Nations Environment Program recently launched a Carbon Neutral Network for companies pledging to go "carbon neutral." Current corporate members of the network include a bank headquartered in South Africa, a cosmetics company based in Brazil, and a power company in Singapore.¹⁰⁷

¹⁰⁴ Based on 109 data points.

¹⁰⁵ Based on 116 data points.

¹⁰⁶ URBNHotels, "urbn hotels, shanghai." Available online at <http://www.urbnhotels.com/idea-environmentally-friendly.html>.

¹⁰⁷ Climate Neutral. Available online at http://www.climateunited.unep.org/cnn_members.aspx?m=152.

9.3 Going Green or Making Green? Customer Motivations

To further understand the incentives of voluntary buyers, we asked respondents to rank (from 1-5, with 5 being most important) the purchasing motivations of their customers. The list of proposed responses to this question on this year's survey was modified slightly from last year's, and included the following purchasing motivations as options:

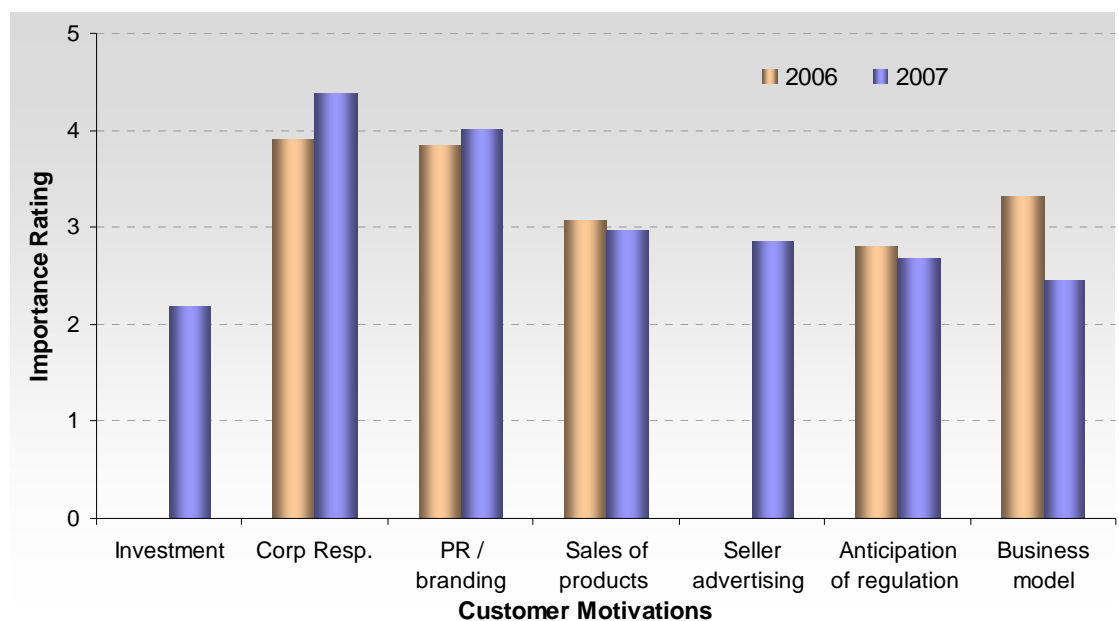
- Investment (new category)
- Corporate responsibility/environmental ethics
- Public relations/branding
- Sales of carbon neutral products
- Seller advertising (new category)
- Anticipation of regulation
- Climate change-influenced business model (such as re- insurance agencies or ski companies)
- Other

The results of this question are shown in Figure 31, and breakdown according to supplier category is listed in Table 6. Consistent with the results of last year's survey, suppliers indicated that corporate responsibility and public relations/branding efforts were the primary motivations behind the OTC market, as companies sought to offset emissions for goodwill.

Anticipation of regulation is often cited as another major force behind the voluntary markets, but respondents rated this option as a relatively low motivating factor for their customers. The likelihood of the voluntary markets' survival if regulation is enacted the United States is a key question for some stakeholders in the voluntary carbon markets. The low importance placed on pre-compliance purchases by suppliers, as well as the growth of the OTC market in Europe, point to a likelihood that the OTC voluntary market will continue to grow and thrive even in the absence of US federal regulation.

Currently, it is difficult to separate purely voluntary buys from pre-compliance buys. For example, we cannot tell if the 29% of customers purchasing VERs for investment purchases are doing so with US regulation in mind or to resell credits in whichever market is the most lucrative. Moreover, instead of dealing with the OTC market, many of the GHG emitters likely to be regulated under impending US regulation have become CCX members, and thus seem to be utilizing the exchange as their cap-and-trade practice ground.

Figure 31: Customer Motivations for Buying Offsets (supplier responses), 2006 and 2007¹⁰⁸



Source: Ecosystem Marketplace, New Carbon Finance

¹⁰⁸ Numbers for 2007 based on 124 data points.

Table 6: Customer Motivation Rankings by Supplier Category (supplier responses)

	Investment	Corp Resp.	PR / branding	Sales of products	Seller advertising	Anticipation of regulation	Business model
Developer	3.2	4.2	4.0	2.5	2.8	3.0	2.1
Wholesaler	2.4	4.6	4.2	3.2	2.9	2.8	2.8
Retailer	1.3	4.5	4.0	3.3	3.0	2.3	2.5
Broker	3.0	3.5	3.5	2.8	1.3	3.2	1.0
Other	1.9	4.4	4.0	3.0	3.1	2.8	3.1
TOTAL 2007	2.2	4.4	4.0	3.0	2.8	2.7	2.5
TOTAL 2006		3.9	3.8	3.1		2.8	3.3

Source: Ecosystem Marketplace, New Carbon Finance

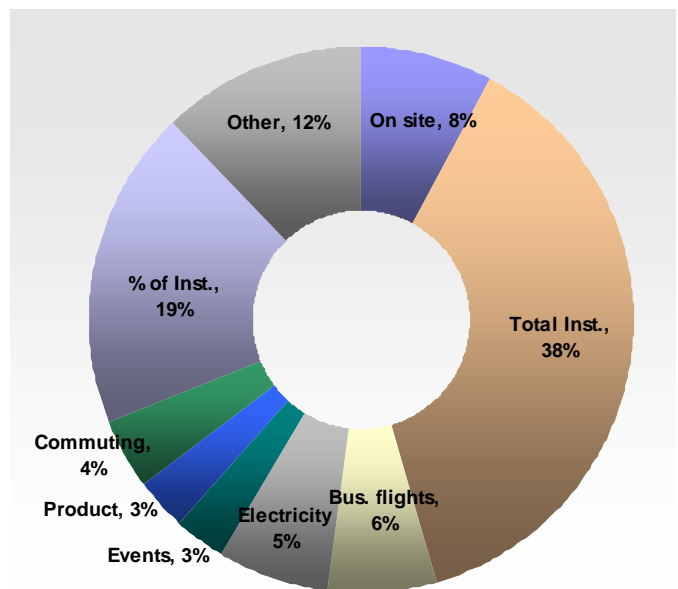
Because not all suppliers sell only to final buyers, this year we gave respondents the option of selecting “investment”. While in most cases, the ratings of different criteria did not vary considerably across the supply chain, on the investment rating we found a wide variance in suppliers’ perception of this motivation depending on the respondent’s niche in the supply chain. Retailers tended to believe that investment for resale was one of the least important drivers, while project developers and brokers listed it in the middle of their priority ranking, just after corporate responsibility and public relations/branding. This is logical if one considers that project developers and brokers may be more likely to deal with large institutional buyers such as investment banks and other financial institutions, and would therefore be more likely to be involved with transactions for pure ‘investment’. On the other hand, retailers tend to deal with smaller players, which are generally motivated by corporate responsibility or personal ethics.

9.4 Types of GHG Emitting Activities Offset

Respondents were also asked to describe the type of emitting activities that their customers had chosen to offset or were considering offsetting. The options were:

- Total institutional emissions
- A set percent of institutional emissions
- Onsite emissions from industrial activities or energy production
- Business-related flights
- Commuting/vehicle use
- Events
- Electricity use
- Product life cycle emissions
- Other

Figure 32: Transaction Volume by Type of Emissions Offset, OTC 2007¹⁰⁹



Source: Ecosystem Marketplace, New Carbon Finance

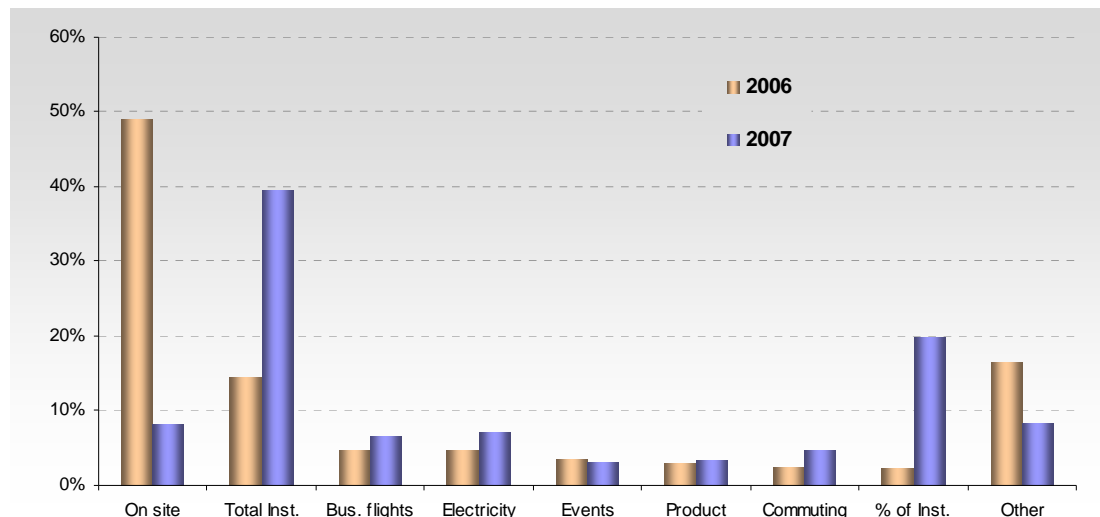
In 2007, two-thirds of entities purchasing offsets did so to offset either their total organizational emissions, a portion of their total organizational emissions, or onsite emissions (Figure 32). In 2007, the largest share (38%) of offsets purchased for any single “type” of activity was occupied by organizations seeking to offset their total institutional emissions. This matches the trend for companies to go ‘carbon neutral.’ Last year, hundreds of organizations, from local radio stations to international banks, announced initiatives to offset all of their accounted emissions. In turn, the share of customers

¹⁰⁹ Based on 83 data points.

choosing to offset their total institutional emissions nearly tripled between 2006 and 2007, from 14% to 38% (Figure 33).

The portions of credits purchased specially to offset travel activities (including commuting and business flights), as well as events, products, and electricity use, remained about the same between 2006 and 2007.

Figure 33: Trends in Types of Emissions Offset (supplier responses), 2006 and 2007¹¹⁰



Source: Ecosystem Marketplace, New Carbon Finance

9.5 Making the Cut: Supplier Purchasing Criteria

With the exception of project developers, most suppliers are also buyers in the voluntary OTC market. To learn about the criteria suppliers use when selecting a carbon credit, we asked respondents to rank (from 1-5, with 5 being most important) different “sourcing criteria.” The options provided in the survey were:

- Price
- Additionality assurance
- Specific certification
- Reputation of seller/project
- Seller advertising/communications
- Convenience
- Environmental co-benefits
- Social co-benefits
- Other

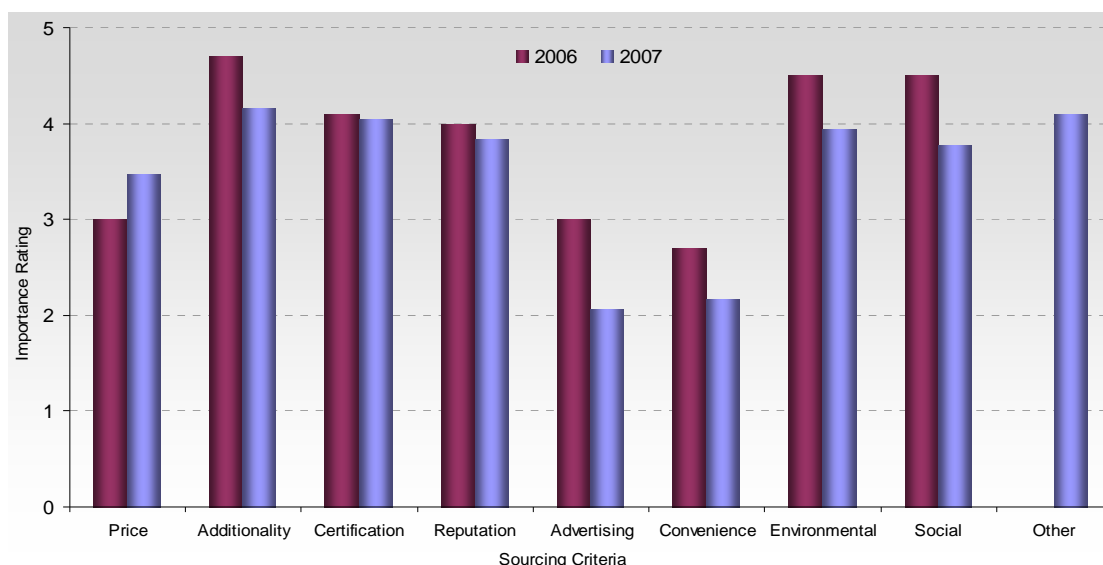
Overall, suppliers ranked the criteria relating to offset quality most highly (Figure 34). Both this year and last year, suppliers ranked “additionality” (the demonstrable ability to reduce emissions beyond the levels that would otherwise have occurred) as one of the most important purchasing criteria. Likewise, “certification” (third party verification to a specific standard) earned top ranking. The high value placed on these factors coincides with the recent push for standards and emphasis on additionality.

Environmental and social co-benefits were also ranked as highly important. This ranking matches with the high number of final buyers in the OTC market interested in corporate responsibility and public relations, and the fact that the OTC market is considerably less commoditized than CCX or the regulated markets.

On average, price was rated as less important than the criteria related to quality. For suppliers scanning the globe for appropriate projects, “convenience” and “advertising” were the least important factors. It is likely that these criteria would be much higher for final buyers.

¹¹⁰ Numbers for 2007 based on 83 data points.

Figure 34: What Buyers Look for When Buying Offsets (seller responses), 2006 and 2007¹¹¹



Source: Ecosystem Marketplace, New Carbon Finance

Interestingly, the criteria that buyers find important are pretty much consistent across all parts of the supply chain, as shown in the table below. Additionality, certification, environmental and social all score very close to or above 4 whereas advertising and convenience scores around 2 across the board. The only criterion that has the largest variation across the supply chain is 'other'. This one is particularly important for project developers, wholesalers and brokers. Naturally, answers for this category varied greatly between participants, but the following were referred to most frequently: location and type, methodology, and the existence and demonstrability of co-benefits (poverty reduction, biodiversity, and education).

Table 7: Buyer Rankings by Supplier Category (supplier responses)

	Price	Additionality	Certification	Reputation	Advertising	Convenience	Environmental	Social	Other
Developer	3.4	3.6	4.6	3.6	1.2	1.8	3.4	3.8	5.0
Wholesaler	3.4	4.7	4.1	4.2	2.2	2.2	3.9	3.6	4.5
Retailer	3.3	4.3	3.8	3.8	2.4	2.3	4.3	4.0	3.2
Broker	3.7	4.1	4.3	3.9	2.3	2.3	3.9	3.5	4.6
Other	3.6	4.1	3.4	3.7	2.3	2.3	4.2	3.9	3.2
2007	3.5	4.2	4.0	3.8	2.1	2.2	3.9	3.8	4.1
2006	3.0	4.7	4.1	4.0	3.0	2.7	4.5	4.5	-

Source: Ecosystem Marketplace, New Carbon Finance

¹¹¹ Numbers for 2007 based on 112 data points.

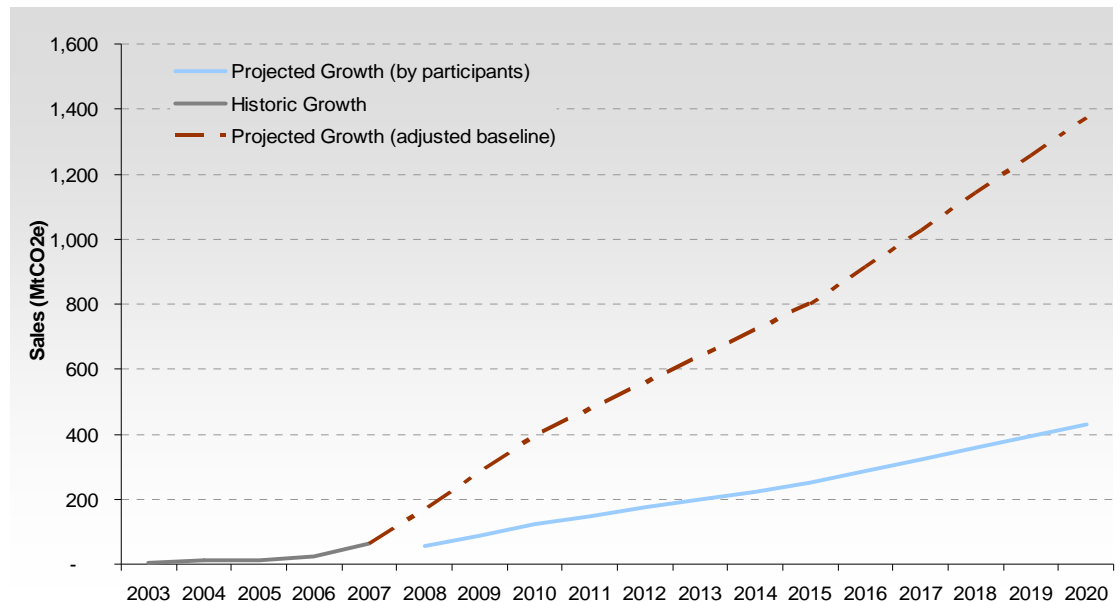
10 Back to the Future: Predicted Growth

Summary points:

- In 2008, suppliers have been conservative in their predictions of future growth of the voluntary carbon markets. For instance, suppliers predicted a 2008 credit volume that was less than our calculation of credit volume transacted in 2007.
- Suppliers estimated that the volume of credits traded on the voluntary carbon markets in 2020 would be larger than was traded in the EU ETS in 2005 (by 100MtCO₂e).
- In only the first four months of 2008, CCX trading volume growth is already 240% higher than the first four months of 2007, suggesting another robust trading year for the voluntary carbon markets.
- Media coverage of interest in and growth of the regulatory and voluntary carbon markets remains strong.

The big question on many stakeholders' mind is not the volumes transacted in 2007, but what the volumes will be in years to come. Hence, in the survey, we asked respondents not only about last year's transactions but also for their voluntary carbon market growth predictions. About 55 respondents were willing to share their readings of the crystal ball.

Figure 35: Future Growth for the Voluntary Carbon Markets¹¹²



Source: Ecosystem Marketplace, New Carbon Finance

Noting last year's recorded transaction volume of 23.7 MtCO₂e, this year we asked suppliers to predict absolute market-wide transaction volumes expected at pre-defined years: 2008, 2010, 2015, and 2020. This was a different, and theoretically more intuitive, approach from last year, when we asked for percentage growth figures. In our analysis of responses, each respondent's answer was given equal weight regardless of its share of market volume.

10.1 Projected Growth by Participants

In Figure 35 the solid blue line represents suppliers' estimates of market growth in the voluntary (OTC + CCX) markets as a whole. Since this is not an unbiased (or disinterested) survey sample, it would have been reasonable to assume that supplier predictions would be particularly high. However, given 2007 transacted volumes, supplier predictions seem overly conservative. For 2008 volumes, respondents actually predicted an average lower volume of credits transacted (53MtCO₂e) than we recorded in 2007 (65MtCO₂e)! For 2010, respondents predicted a volume of 122MtCO₂e. In 2020, they predicted volumes to be around

¹¹² based on 55 data points

428MtCO₂e. To put this into perspective, respondents predict that the global voluntary market in 2020 will be somewhat larger than the EU ETS was in 2005 (322 MtCO₂e).¹¹³

This year's projections were significantly lower than last year's, most likely due to the fact that we asked for absolute volumes rather than percentages. Yet, currently last year's supplier projections still seem conservative. On average suppliers (mean scenario excluding extreme responses) predicted that the markets would be almost half the size, 39MtCO₂e, than the 65MtCO₂e of transactions we were able to record in 2007. As far as longer-term projections are concerned, last year suppliers expected that 2007 volumes could grow to 334MtCO₂e by 2012 whereas this year respondents predicted that 174MtCO₂e would be transacted in 2012.

10.2 Projected Growth with Adjusted Baseline

Given that the 2007 volume figure had already exceeded the respondents' projection for 2008 volume we decided to also provide a scenario with an adjusted baseline. This scenario, depicted by the brown dashed curve, anticipates a growth rate for 2008 similar to that of 2007 (240%), and assumes the same growth rate for the years beyond 2008 as derived from survey respondents' (absolute volume) projections. According to this scenario, volumes will reach 340MtCO₂e by 2010 and almost 1,400MtCO₂e by 2020.

At least in 2008, this scenario, which projects 148MtCO₂e to be traded this year, seems more realistic than suppliers' estimates for 2008 of 53MtCO₂e. For example, 26.7MtCO₂e has already been transacted on the CCX alone in the first four months of 2008, and transactions are therefore on track to reach an annual volume of 80MtCO₂e in 2008. With the expected continued growth in the OTC market total volumes exceeding 150Mt could easily be reached.

In the longer term however, this scenario's projections could be overly optimistic. According to this model, 2012 volumes will reach 557MtCO₂e, which still seems realistic. However, a 2020 figure of 1,372MtCO₂e, especially when taking future United States' regulation into consideration, could be an overestimate as growth is expected to level off after 2012.

10.3 Living in the Present: 2008

As noted above, in the first quarter of 2008, the CCX has already transacted 26.7MtCO₂e. Meanwhile, new suppliers and buyers continue to enter the market on the OTC side. While collecting 2007 transaction data, we came across more than a dozen companies who were new to the market and just beginning to sell VERs this year. On the demand side, press releases from companies announcing plans to go 'carbon neutral' continue to flow across our desks. At the same time, the voluntary carbon markets continue to see 'ink' in mainstream news sources. One New York Times journalist commented, "We as journalists follow the story, and the story right now and for some time to come will be carbon."

¹¹³ World Bank, *State and Trends of the Carbon Markets 2006*.

11 Sponsors:

11.1 Premium Sponsors

APX (www.apx.com)

APX is the leading infrastructure provider for environmental and energy markets in renewable energy and greenhouse gases, including carbon commodities. Providing a bank and mint for environmental commodities, the APX Environmental Market Depository™ is trusted to create, track, manage, and retire renewable energy certificates (RECs), energy efficiency and conservation certificates, carbon offset credits such as verified emissions reductions (VERs), and greenhouse gas emission allowances. The company is the system of choice for all major renewable energy markets in North America and greenhouse gas markets worldwide.

EcoSecurities (www.ecosecurities.com)

EcoSecurities is one of the world's leading companies in the business of originating, developing and supplying emission reductions. The last 10 years has seen EcoSecurities involved in the development of many of the global carbon market's most important milestones, including developing the world's first Clean Development Mechanism (CDM) project to be registered under the Kyoto Protocol, and the first to be issued with carbon credits. Today, the company is working on over 400 projects in 36 countries using 18 different technologies, with the potential to generate 142 million carbon credits.

Evolution Markets (www.new.evomarkets.com) structures transactions and provides brokerage and merchant banking services for the global green markets and the clean energy sector. We excel in developing innovative, cost effective strategies. Clients come to Evolution Markets to get deals done quickly, creatively, and cost-effectively because we understand that success in the environmental and energy marketplace is about speed, innovation, and knowledge. Using a unique approach called EvoFinance™, we provide a single source for comprehensive financial services solutions. A global company, Evolution Markets has over 80 brokerage and merchant banking professionals worldwide, and offices in New York, London, San Francisco, Calgary and Buenos Aires.

MGM International (www.mgminter.com)

MGM is a project development, investment and commercialization firm whose objectives are the identification, design, negotiation, as well as execution and support of projects that contribute to reducing anthropogenic GHG emissions. Our multidisciplinary staff based in Argentina, Brazil, Chile, China, Colombia, Egypt, India, Mexico, Sweden, Ukraine, and the United States brings together the often unusual combination of top academic credentials and years of practical experience.

11.2 Sponsors

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.

Blue Source (www.ghgworks.com) works with companies to develop projects that reduce greenhouse gas emissions, creating North America's largest portfolio of carbon offsets. Whether their clients are creating plans for carbon capture and storage, installing methane capture equipment related to mining operations or landfills or purchasing offsets from the portfolio, as suppliers or buyers, Blue Source is helping businesses achieve their value in the carbon economy. Blue Source offers multiple approaches for addressing climate change. Because the solution is not the same for every company, Blue Source has a broad range of project development capabilities and offers diverse sources of offsets in its portfolio. Blue Source has offices in Salt Lake City, Calgary, Houston, Denver, Raleigh, San Francisco and New York.

CantorCO2e (www.cantorco2e.com) is a global provider of financial services to the world's environmental and new energy markets, offering transaction and consulting services to clients engaged in using energy and managing emissions across the world. CantorCO2e serves environmental credit buyers and sellers in all of the world's principal emissions markets, including the Kyoto markets (CDM, JI and European emissions trading), the US compliance markets, and the voluntary carbon market. We help entities transact via electronic trading screens, recorded telephone lines, auctions, and negotiated contracts. We advise equity investment funds on carbon finance, introduce investors to projects, and structure forward sales to enable project developers to fund their investments. CantorCO2e is headquartered in London and San Francisco and has over 60 emissions trading professionals located in fourteen offices across five continents.

Equator LLC (www.equatorllc.com) is an environmental asset management, timberland property management, and emission credit sales and trading firm with offices in New York, USA, and Sao Paulo, Brazil. Equator specializes in the generation and management of high-quality carbon credits and environmental assets derived from reforestation, forest conservation, and sustainable land management. Equator uses state-of-the-art financial structuring techniques and leverages its extensive energy-sector distribution networks to create diversified revenue streams to benefit governments, timberland owners, and local communities.

Sterling Planet, Inc. (www.sterlingplanet.com) is an environmental energy company and sustainability pioneer. The company began operations in 2001 as the nation's first retail provider of Renewable Energy Certificates (RECs). Broadening its reach beyond the retail RECs market, Sterling Planet develops new renewable energy and greenhouse gas reduction projects and offers integrated products and services to a broad client base, delivering supply- and demand-side solutions. The company's solutions for customers seeking to achieve some measure of carbon neutrality, or reduced environmental footprint, include Sterling White Tags(r) energy efficiency certificates, and Sterling Climate(tm) greenhouse gas (GHG) emission reductions, also known as carbon offsets.

TÜV SÜD (www.tuev-sued.com) is an internationally leading technical service organization with over 13.000 employees and present at more than 600 locations worldwide. Under the UNFCCC, TÜV SÜD is the only Designated Operational Entity (DOE) accredited for all scopes of the CDM. Having accompanied over 1000 projects through validation and verification, TÜV SÜD was elected „best verifier of Kyoto projects“ by the magazine „Environmental Finance“. Beside its market leadership in JI and CDM, TÜV SÜD is one of the key verifiers in the Voluntary Carbon Market. Having developed the robust standard VER+ and providing the BlueRegistry for VERs, TÜV SÜD demonstrates its commitment to transparency and credibility of voluntary emission reductions.

Appendix 1: Survey Respondents

Organization Name	Website
3C Group	http://3c-company.com
3C The Carbon Credit Company	
3Degrees	http://www.3degreesinc.com/
A2G Carbon Partners	http://www.atwog.com/
Action Carbone	http://www.actioncarbone.org/main_fr.php
AGL Energy	http://www.agl.com.au/Pages/AGLHome.aspx
AgRefresh [AP-GARM SC, LLC]	http://www.agrefresh.org/
Agrinergy Consultancy Pvt Ltd	http://www.agrinergy.com/
AgriTec Systems, Inc.	http://www.agritecsystems.com/index.html
AIDER	http://aider.com.pe/
Ambiental Pv Ltd.	http://www.ambientalpv.com/
AMCG Ltd. (dba name GroPower)	http://www.gropower.net/
Asja	http://www.asja.biz/
Atrium Carbon Fund LP	http://www.ricedairy.com/Sectors/carbon.aspx
Auscarbon International	http://www.auscarbon-intl.com.au/
Baartman-Biko Environmental Forest Research Institute	http://www.fris.sk/en/index-en.htm
Balance Carbon Pty Ltd	http://www.balancecarbon.com/
Baseline Emissions Management Inc.	http://www.bluesourcecan.com/
Beartooth Capital Partners	http://www.beartoothcap.com/
Blue Source, LLC	http://www.ghgworks.com/
Blue Ventures Carbon Offset	http://www.bvco.org.uk/
Bonneville Environmental Foundation	http://www.b-e-f.org/
BP targetneutral	http://www.targetneutral.com
Camco	http://www.camco.net/
CantorCO2e	http://www.cantorco2e.com/
Carbon Balanced by World Land Trust	http://www.carbonbalanced.org/
Carbon Caring	http://www.carboncaring.com/
Carbon Clear Limited	http://www.carbon-clear.com/
Carbon Footprint Ltd	http://www.carbonfootprint.com/
Carbon Impacts	http://www.carbonimpacts.co.uk/
Carbon Market Solutions Ltd	http://www.carbonmarketsolutions.com/
Carbon Passport Ltd	http://www.carbonpassport.com/
Carbon Planet	http://www.carbonplanet.com/
Carbon Pool Carbon Conservation	http://www.carbonpool.com/
Carbon Reduction Fund	http://www.carbonreductionfund.org/
Carbonfund.org	http://www.carbonfund.org/
Carbonzero	http://www.carbonzero.co.nz/
C-Green Aggregators Inc.	http://www.c-green.ca/
Clean Air Action Corp	http://www.cleanairaction.com/
Clean Air Conservancy	http://www.cleanairconservancy.org/
Clear Offset	http://www.clear-offset.com/
Climat Mundi	http://www.climatmundi.fr/
Climate Care	http://www.climatecare.org/
Climate Clean	http://climateclean.net/

Climate Neutral Group	http://www.klimaatneutraal.nl/
Climate Positive	http://www.climatepositive.org/
CO2 Australia Limited	http://co2australia.com.au/
CO2 Neutraal BV	http://www.co2neutraal.net/
CO2logic	http://www.co2logic.com/
Conservation International	http://www.conservation.org/
CoolClimate LLC dba AtmosClear	http://www.atmosclear.org/
Core Carbon	http://www.corecarbongroup.com/
Correct Carbon Ltd	http://www.correctcarbon.co.uk/
Credit Suisse	http://www.credit-suisse.com
Delta Institute	http://www.delta-institute.org/
Direct Energy	http://www.directenergy.com/
DrivingGreen	http://www.drivinggreen.com/
Ducks Unlimited	http://www.ducks.org/
DuPont	http://www2.dupont.com/
E+Co	http://www.eandco.net/
EcoLogic Development Fund	http://www.ecologic.org/
EcoSecurities	http://www.ecosecurities.com/
ECOsystems Ltd	http://www.ecosystems-ltd.com/
Enecore Carbon Limited	http://enecore.com/
EnerGHG India	
Enpalo	http://www.enpalo.com/
Environmental Credit Corp.	http://www.envcc.com/
ERA Ecosystem Restoration Associates Inc.	http://www.econeutral.com/
Flatlander Environmental Services Ltd.	http://www.flatlander.ca/enviro/home.php
Foth Infrastructure & Environment	http://www.foth.com
Greater Lebanon Refuse Authority	http://www.gogira.org/
Green Mountain Energy Company	http://www.greenmountainenergy.com/
Greenland Carbon Trading Private Limited	http://www.greenland-enterprises.com/
GreenLife	http://www.greenlife.com/
Greenoxx NGO	http://www.greenoxx.com/en/ngo.htm
Grupo Ecológico Sierra Gorda and Bosque Sustentable	http://www.grupoecologico.com/
Leonardo Academy/Cleaner and Greener Program	http://www.cleanerandgreener.org/
LiveCooler	http://www.livecooler.org/
LiveNeutral	http://www.liveneutral.org/
Meridian Energy	http://www.meridianenergy.co.nz/
MGM International	http://www.mgminter.com/
MoveNeutral	http://moveneutral.com/
myclimate	http://www.myclimate.org/
Native Energy	http://www.nativeenergy.com/
Natsource	http://www.nativeenergy.com/
Neco	http://www.neco.com.au/
NEOGENPOWER.COM	http://www.neogenpower.com/
NetGreen, Inc	http://www.netgreenunlimited.com
Offset the Rest Limited	http://www.offsettherest.com/
Offsetters Climate Neutral Society	http://www.offsetters.ca/
OneCarbon	http://www.onecarbon.com/
orbeo	http://www.orbeo.com/

Origin Energy	http://www.originenergy.com.au/
Paso Pacifico	http://www.pasopacifico.org/
Pax Natura Foundation	http://www.paxnatura.org/
PEAR Carbon Offset Initiative, Ltd.	http://www.pear-carbon-offset.org/
Plan Vivo Foundation	http://www.planvivo.org/
Planetair	http://planetair.ca/
Prime Consulting Services Limited	http://www.primeconsulting.co.nz/
PROFAFOR S.A.	http://www.profafor.com/
Pure the clean planet trust	http://www.puretrust.org.uk/
Renewable Choice Energy	http://www.renewablechoice.com/
Shift2Neutral	https://www.shift2neutral.com/
SILVACONSULT AG	http://www.silvaconsult.ch/
SKG SANGHA	http://www.skgsangha.org/
Social Carbon Company	http://ecologica.ws/
South Pole Carbon Asset Management	http://www.southpolecarbon.com/
Southern Metropolitan Regional Council	http://www.smrc.com.au/
Standard Carbon LLC	http://www.standardcarbon.com/
Sterling Planet	http://www.sterlingplanet.com
Taiwan Emission Trading Association	http://www.teta.org.tw/EN/
Terra Global Capital, LLC	http://terraglobalcapital.com/
TERRAPASS	http://www.terrapass.com/
The CarbonNeutral Company	http://www.carbonneutral.com/
the c-change trust	http://www.thec-change trust.org/
The Climate Trust	http://www.climatetrust.org/
The Conservation Fund - California Program	http://www.conservationfund.org/west/california
The Conservation Fund - Go Zero program only	http://www.conservationfund.org/gozero
The Global Carbon Reduction Fund	http://www.carboncontrol.org
The Gold Standard	http://www.cdmgoldstandard.org/
The Nature Conservancy	http://www.nature.org/
The PACE Centre	
The Pacific Forest Trust	http://www.pacificforest.org/
The Trust for Public Land	http://www.tpl.org/
The Woodland Trust	http://www.woodland-trust.org.uk/
Tradition Financial Services TFS	http://www.tfsbrokers.com/
TreeBanking, Inc.	http://www.treebankinginc.com/
Treeflights	http://www.treeflights.com/
Trees for Travel	http://www.treesfortravel.nl/
Trees, Water & People	http://www.treeswaterpeople.org/
Tricorona	http://www.tricoronagreen.com/
TÜV SÜD Industrie Service GmbH	http://www.tuev-sued.de/
United Nations Development Program	http://www.undp.org/
Wildlife Conservation Society	http://www.wcs.org/
WVO Energy	http://wvoenergy.com/
Zerofootprint	http://www.zerofootprint.net/
ZeroGHG	http://www.zeroghg.ca/

Appendix 2: Volumes by Project Type and Location

ktCO ₂ e	EU	Non-EU	Canada	US	Aus/NZ	Latin Am.	Asia	Middle East	Africa	Mixed	Total	% of Total
Forestry/Land Use	43	1	1,023	1,722	973	381	701	0	234	0	5,077	18%
Aff/Ref plantation	0	0	0	146	0	189	188	0	150	0	673	2%
Aff/Ref native	40	1	273	1,361	0	123	313	0	46	0	2,158	8%
Avoided defor.	0	0	0	210	973	5	200	0	33	0	1,422	5%
Land Restoration	0	0	0	0	0	0	0	0	5	0	5	0%
Soil	3	0	750	4	0	63	0	0	0	0	820	3%
Methane	647	0	0	3,030	330	135	180	0	0	157	4,478	16%
livestock	11	0	0	972	0	91	30	0	0	0	1,105	4%
landfill	0	0	0	651	330	44	150	0	0	157	1,332	5%
coal	636	0	0	1,406	0	0	0	0	0	0	2,042	7%
RE	88	1,287	5	871	244	239	5,129	47	15	877	8,801	31%
Off-grid (Non-REC) RE	13	1,157	0	0	30	87	754	12	0	0	2,053	7%
RECs	75	130	0	321	1	32	434	0	15	0	1,008	4%
Grid (Non-REC) RE	0	0	5	550	213	120	3,940	35	0	877	5,740	20%
Industrial Gas	0	0	0	0	0	0	700	0	0	0	700	2%
Efficiency	1	0	20	21	343	926	3,441	0	247	4	5,003	18%
Fuel switch	1,500	0	0	0	0	327	745	0	2	0	2,573	9%
Geo. Seq.	0	0	0	330	0	0	0	0	0	0	330	1%
Fugitive	0	0	0	0	83	0	0	0	0	0	83	0%
Mixed	0	0	43	587	13	0	200	0	10	504	1,357	5%
Total	2,278	1,288	1,092	6,561	1,986	2,008	11,095	47	507	1,541	28,403	
% of Total	8%	5%	4%	23%	7%	7%	39%	0%	2%	5%		

Source: Ecosystem Marketplace, New Carbon Finance