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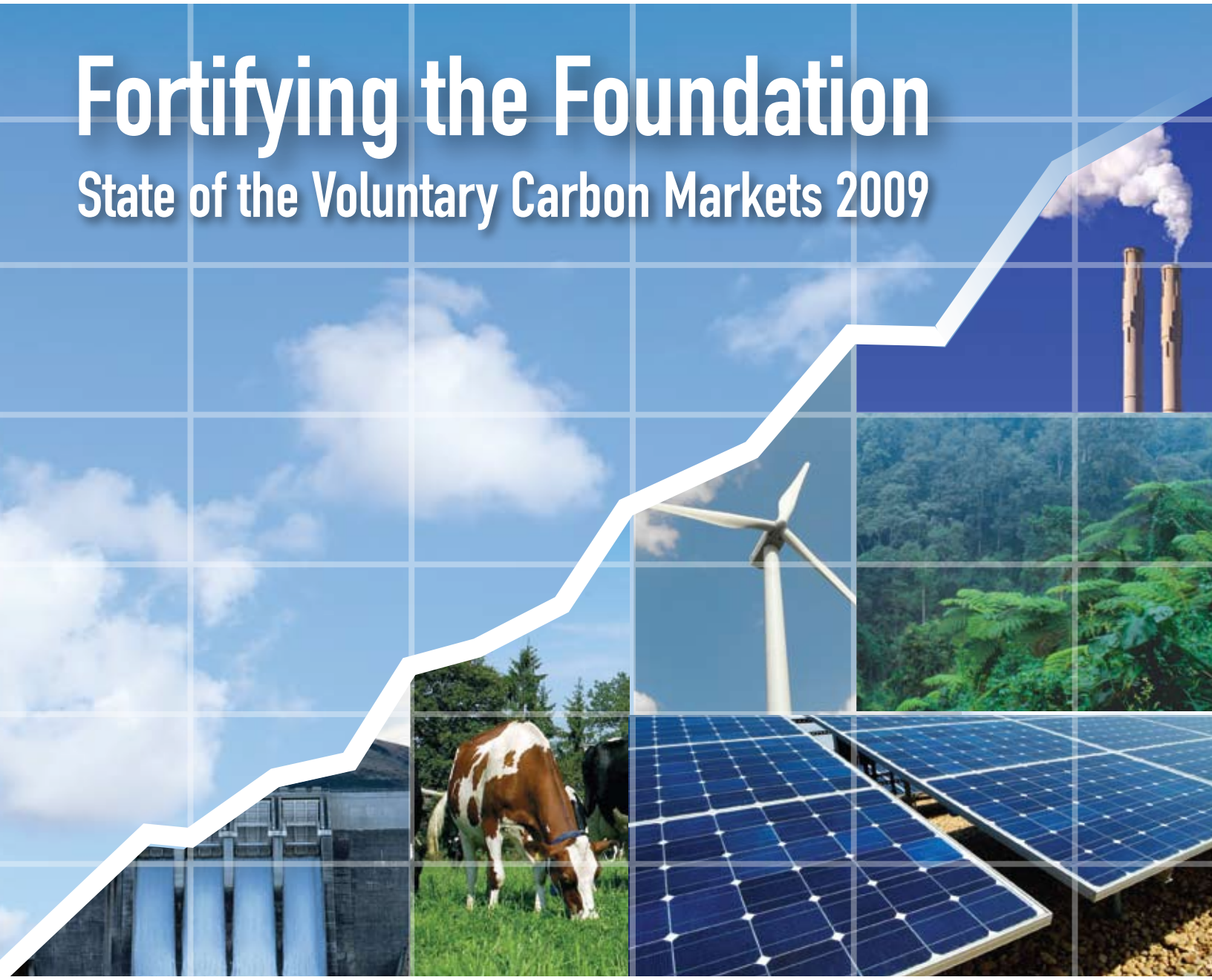
# Fortifying the Foundation

## State of the Voluntary Carbon Markets 2009



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# Fortifying the Foundation:

# State of the Voluntary Carbon Markets 2009

A Report by Ecosystem Marketplace & New Carbon Finance

Katherine Hamilton, Milo Sjardin, Allison Shapiro,
and Thomas Marcello

20 May, 2009

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**Acknowledgments:**
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## About Ecosystem Marketplace and New Carbon Finance

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

Ecosystem Marketplace's work on the voluntary carbon markets is financially supported by the United Nations Foundation, the Surdna Foundation, the United Kingdom's Department for International Development, and the Blue Moon Fund.

**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.

New Carbon Finance is a service of New Energy Finance. New Energy Finance is a specialist provider of financial information and associated services to the renewable energy and energy technology industry and its investors. The combination of New Energy Finance and New Carbon Finance brings together a truly global research resource with over 130 full-time staff and with permanent research bases in the U.K., U.S., China, South Africa, Brazil, India and Australia, as well as a wide range of associates and contact networks.


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## Executive Summary

This report was created to answer fundamental questions about the voluntary carbon markets such as transaction volumes, credit prices, project types, locations, and the motivations of buyers in this market. Over the past several years, these markets have not only become an opportunity for citizen consumer action, but also an alternative source of carbon finance and an incubator for carbon market innovation. As the voluntary carbon markets have rapidly gained traction, the answers, to these questions have become increasingly important to investors, policymakers, and environmentalists alike. For example, since the last edition of this report, we have seen various U.S. climate bills make reference to voluntary carbon offset standards, the Japanese government launch a voluntary carbon-offsetting scheme, and the U.K. government issue an official definition of "carbon neutral."

Proving the legitimacy of carbon offset projects remains a major issue in the marketplace, leading to a so-called "flight to quality." Last year saw further establishment and greater functionality of voluntary offset standards; the emergence of new registries; the forging of new partnerships between infrastructure providers; the formation of coalitions to encourage self-regulation; and increased market transparency. At the same time, existing and potential voluntary market consumers became more sophisticated as literature and education around offset quality increased. All of this points to a further maturation of the market in 2008. However, the voluntary carbon markets, like any other commodity market, were not immune to the over-arching forces of the economy and regulatory developments.

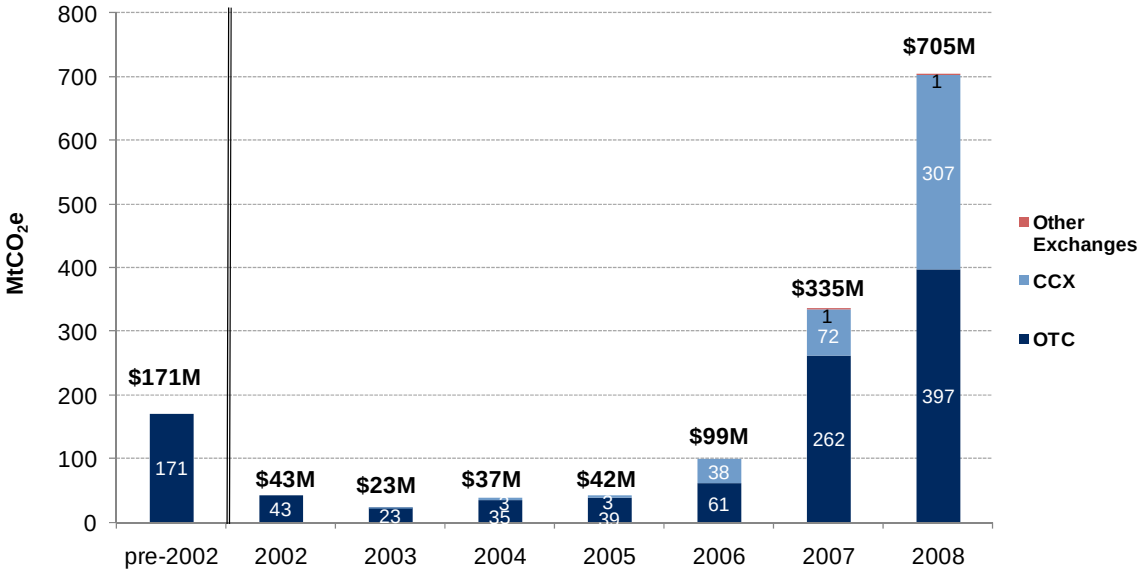
Below we outline the aggregated results of our survey of the state of the voluntary carbon markets in 2008. For the analysis of the "over-the-counter" (OTC) side of the voluntary carbon markets, we obtained data from over 182 suppliers from 28 different countries involving all stages of the supply chain: developers, aggregators, brokers, and retailers. This report is based on the information collected from these suppliers. Hence, numbers throughout this report may not contain every single OTC transaction in the marketplace and should be considered conservative. Alternatively, all data on the Chicago Climate Exchange (CCX) was obtained directly from the exchange and hence presents a greater degree of completeness.

### Voluntary Carbon Markets Nearly Doubled in 2008, Reaching 123.4Mt$CO_2$e

We tracked 123.4 million metric tonnes of carbon dioxide equivalent (Mt$CO_2$e) transacted in the global voluntary carbon markets in 2008, a near doubling of 2007 transaction volume (87% growth). Of the two main components that comprise the voluntary carbon markets—the CCX and the OTC—the CCX was responsible for the larger share of the market, trading 69.2Mt$CO_2$e (56%) versus 54.0Mt$CO_2$e (44%) in the OTC market.[1] Not only was 2008 the first year that the CCX overtook the OTC market in terms of tracked volume, it also overtook the OTC market in terms of growth. CCX trades tripled in 2008 (202%), whereas the OTC market grew by 26%—a clear break from the trend in 2007, when the OTC market tripled, while the CCX only doubled.

[1] Note that the remaining 0.2 Mt$C0_2$e was traded on other exchanges besides the CCX.

### *Historic Values for the Voluntary Carbon Markets*




*Source: Ecosystem Marketplace, New Carbon Finance.*

### *Transaction Volumes and Values, Global Carbon Market, 2007 and 2008*

| Markets | Volume ($MtCO_2e$) | | Value (US$ million) | |
|---|---|---|---|---|
| | 2007 | 2008 | 2007 | 2008 |
| Voluntary OTC | 43.1 | 54.0 | 262.9 | 396.7 |
| CCX | 22.9 | 69.2 | 72.4 | 306.7 |
| Other exchanges | 0 | 0.2 | 0 | 1.3 |
| **Total Voluntary Markets** | **66.0** | **123.4** | **335.3** | **704.8** |
| EU ETS | 2,061.0 | 2,982.0 | 50,097.0 | 94,971.7 |
| Primary CDM | 551.0 | 400.3 | 7,426.0 | 6,118.2 |
| Secondary CDM | 240.0 | 622.4 | 5,451.0 | 15,584.5 |
| Joint Implementation | 41.0 | 8.0 | 499.0 | 2,339.8 |
| Kyoto [AAU] | 0.0 | 16.0 | 0.0 | 177.1 |
| New South Wales | 25.0 | 30.6 | 224.0 | 151.9 |
| RGGI | - | 27.4 | - | 108.9 |
| Alberta's SGER[(a)] | 1.5 | 3.3 | 13.7 | 31.3 |
| **Total Regulated Markets** | **2,919.5** | **4,090.0** | **63,710.7** | **119,483.4** |
| **Total Global Markets** | **2,985.5** | **4,213.5** | **64,046.0** | **120,188.2** |

*Source: Ecosystem Marketplace, New Carbon Finance.*

*Notes: (a) Assume a CA$10 price for Alberta offsets and Emission Performance Credits based on interviews with market participants.*

The strong growth of the CCX in 2008 is attributed to strong trading activity in the first two quarters of the year on the back of introduced climate change legislation in the United States. At the same time, the OTC market was not immune to the global recession and experienced slower activity in the second half of 2008, as companies turned their attention away from environmental impacts and cut discretionary spending.

Of the 54.0Mt$CO_2$e transacted in the OTC market, we were able to confirm that only 12.4Mt$CO_2$e were retired. Retirement is critical in the voluntary markets because it represents the impact of the market from an environmental perspective. Our retirement numbers are particularly conservative given the challenge of confirming the data. However, according to this estimate 23% of the total OTC traded volume was used to directly offset emissions in 2008, and a credit passed hands (also known as the "churn rate") an average of 4.4 times.

**Voluntary Credit Prices Increased a Further 20%, Resulting in a Total Market Value of US$705 million**

We estimate that the voluntary carbon markets were valued at US$705 million[2] in 2008, more than twice their value in 2007 ($335 million). Despite the OTC market taking a smaller share of the transaction volume than the CCX, most of this value increase was driven by OTC credits, as they traded at a price premium of 66% in 2008 over CCX credits. The average price of a voluntary carbon credit transacted on the OTC market was \$7.34/t$CO_2$e in 2008, up 22% from \$6.10/t$CO_2$e in 2007 and up 79% from \$4.10/t$CO_2$e in 2006. This compares to an average price of \$4.43/t$CO_2$e on the CCX. The OTC market transacted an estimated $396.7 million (56% of the total market), whereas the CCX market transacted an estimated $306.7 million (44%).

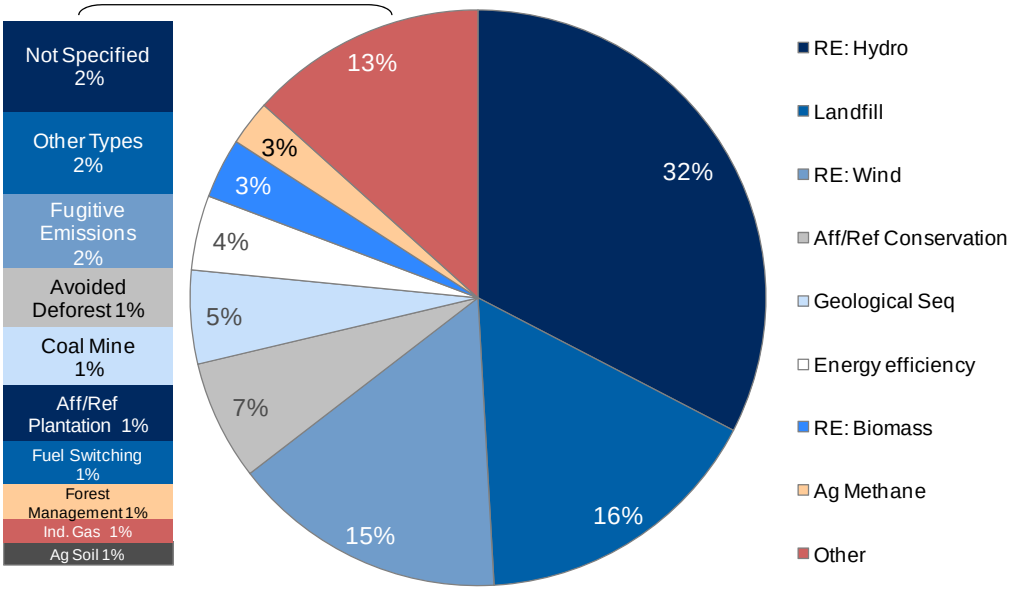
Similar to last year, credit prices increased along the market's value chain, reflecting the transaction costs associated with credits passing into new hands and the general decline of transaction volume along the value chain. We found that prices increased from an average of \$5.1/t$CO_2$e for project developers to \$5.4/t$CO_2$e at the wholesale level to \$8.9/t$CO_2$e at the retail level.

**Asia and North America Remained Dominant as Credit Sources**

Sources of voluntary offsets on both the CCX and the OTC market are extremely diverse in both project type and location. With regard to OTC project type, renewable energy credits dominated this year, increasing their market share from 27% in 2007 to 51%, mostly from hydropower (32%), wind energy (15%) and biomass energy (3%). The dominance of this project type comes from its general appeal to voluntary buyers and particularly high credit production from a number of Turkish VER projects and Asian pre-registered CDM projects. Landfill gas capture was the second most popular category, capturing 16% of the market (up from 5% in 2007), mostly resulting from a shift towards pre-compliance motives in the U.S. carbon market. In contrast, energy efficiency, fuel switching, and coal mine methane all declined in popularity.

[2] All monetary values in this report are in US$.

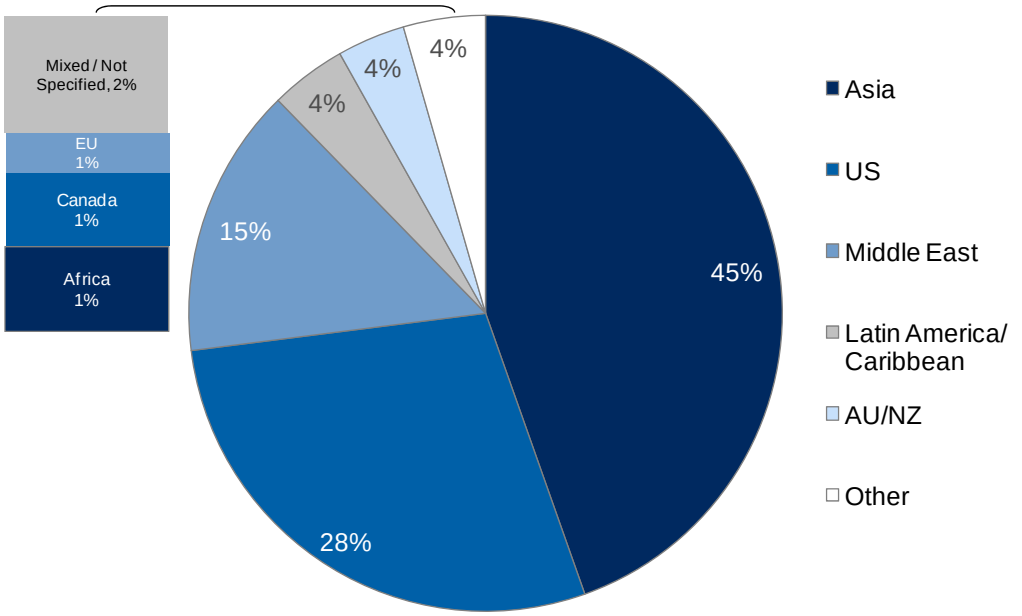
***Transaction Volume by Project Type, OTC 2008***




*Source: Ecosystem Marketplace, New Carbon Finance.*

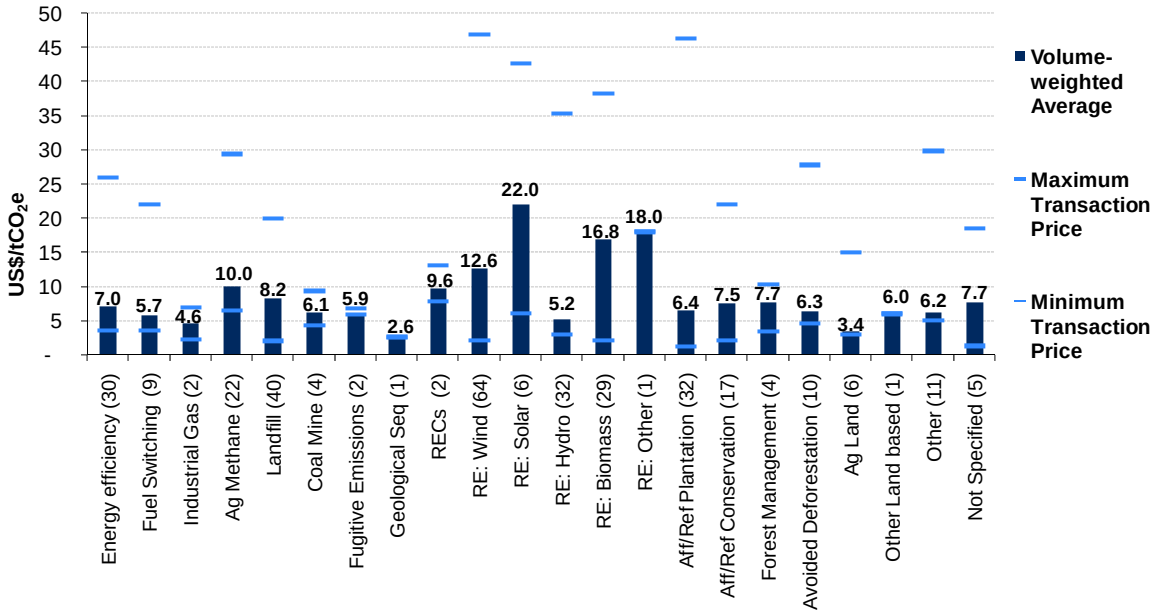
Consistent with its prominence in the CDM market and in line with 2007, Asia was the most popular project location, sourcing 45% of transacted credits in the OTC market. The largest single country, supplying credits was the United States, which was the credit source for 28% of OTC transactions. The Middle East also emerged as a key source of credits, supplying 15% of OTC transaction volume in 2008 as a result of a few large projects in Turkey, which we've included in the Middle East for the purpose of this report. Credits from the EU, Canada, Australia and New Zealand declined significantly on the back of concerns about double-counting emissions reductions as offsets in the voluntary markets and emissions reductions under Kyoto compliance schemes.

***Transaction Volume by Project Location, OTC 2008***




*Source: Ecosystem Marketplace, New Carbon Finance.*

***Credit Price Ranges and Averages by Project Type, OTC 2008***




*Source: Ecosystem Marketplace, New Carbon Finance.*

*Note: Numbers within parentheses indicate number of observations.*

### Credit Prices Ranged between $1.20/tCO$_2$e and $46.90/tCO$_2$e

OTC credit prices in 2008 covered a wide range ($1.20 to $46.90/tCO$_2$e), but not quite as wide a range as the year before ($1.80 to $300/tCO$_2$e). Project types claiming the highest average prices in 2008 were renewable energy projects, of which solar ($21.98/tCO$_2$e), geothermal (RE: other, $18.00/tCO$_2$e), and biomass energy ($16.84/tCO$_2$e) claimed the highest spots. At the low end of the range were geological sequestration ($2.58/tCO$_2$e), agricultural soil sequestration ($3.35/tCO$_2$e), and industrial gas credits ($4.57/tCO$_2$e).

This year we also collected price data according to the country of project location. Though it was difficult to discern any strong regional trends, on average, credits from New Zealand, South Africa, Malaysia, and Australia fetched a premium over other countries, earning $19.20, $15.40, $14.40, and $13.30 per credit respectively.

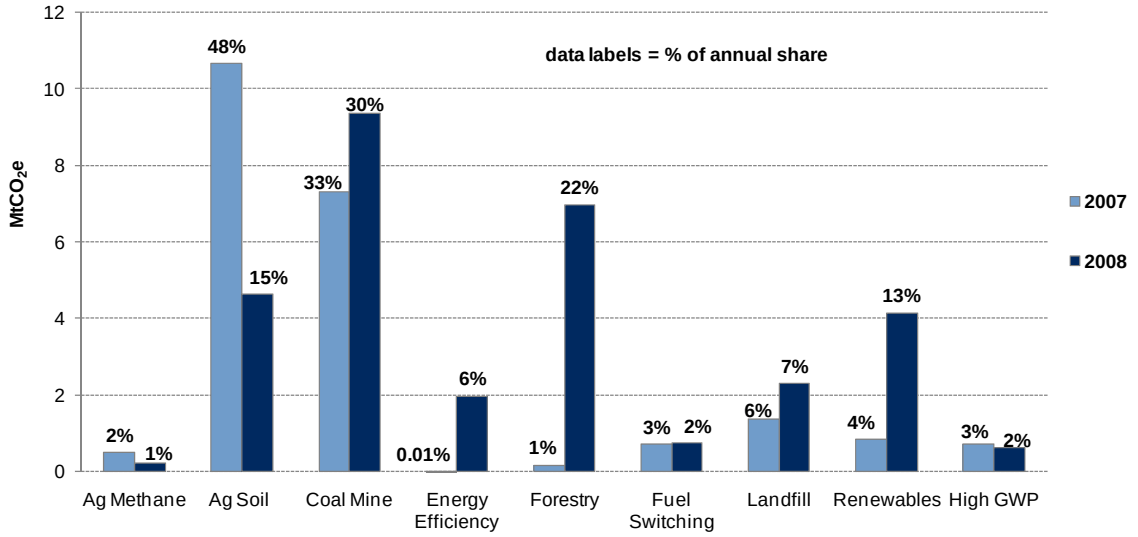
### CCX Projects Expanded their Geographical Horizons

This year we also obtained registration information on offset credits registered on the CCX Registry. While this information cannot be directly compared with our OTC data, as registered credits are not necessarily transacted, it does shed light on project type and location trends on the CCX. For instance, newly-registered CCX offsets generated from forestry and renewable energy projects took a tremendous jump in 2008 (21 and 9 percentage points up, respectively), whereas the new registration of offsets from agricultural soil projects declined (down 33 percentage points).

In terms of project location, the major trend seen on the CCX was the increased number of credits from Asia and Latin America. This year, these two regions were responsible for

19% and 21% of total registered credits, up from a 4%-share each in 2007. In contrast, North American countries (Canada and the U.S.) supplied only 60% in 2008, down from 79% in 2007.

***Chicago Climate Exchange (CCX) Registered Project Types, 2007 and 2008***

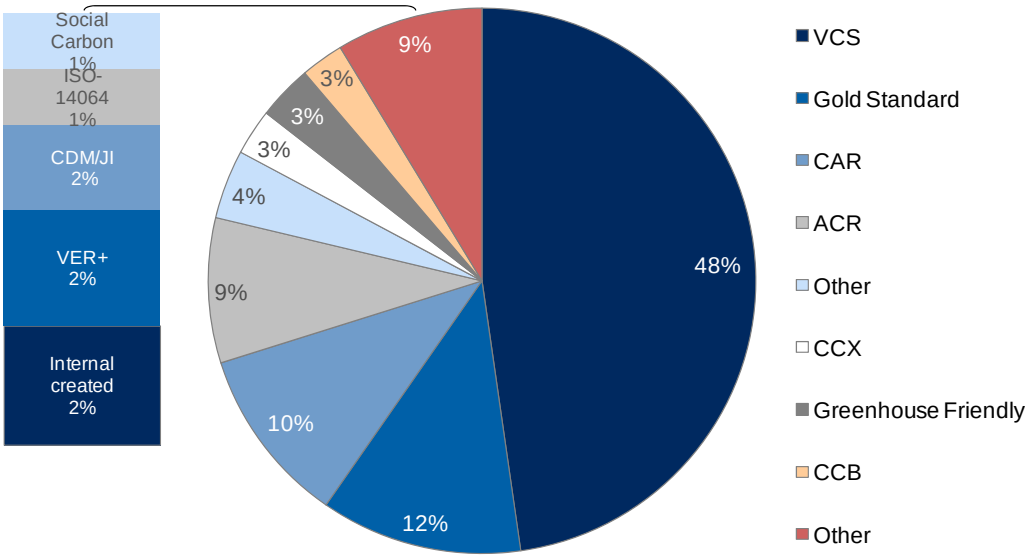



*Source: Chicago Climate Exchange.*

**The Voluntary Carbon Standard Solidified its Leadership Position, Capturing 48% of Credits Verified to a Third Party Standard**

If the relevance of third-party verification in the voluntary carbon markets was ever in doubt in 2007, it was solidified in 2008. No less than 96% of credits were third-party verified in 2008, up 9 percentage points from 2007.

***Standard Utilization, OTC 2008***

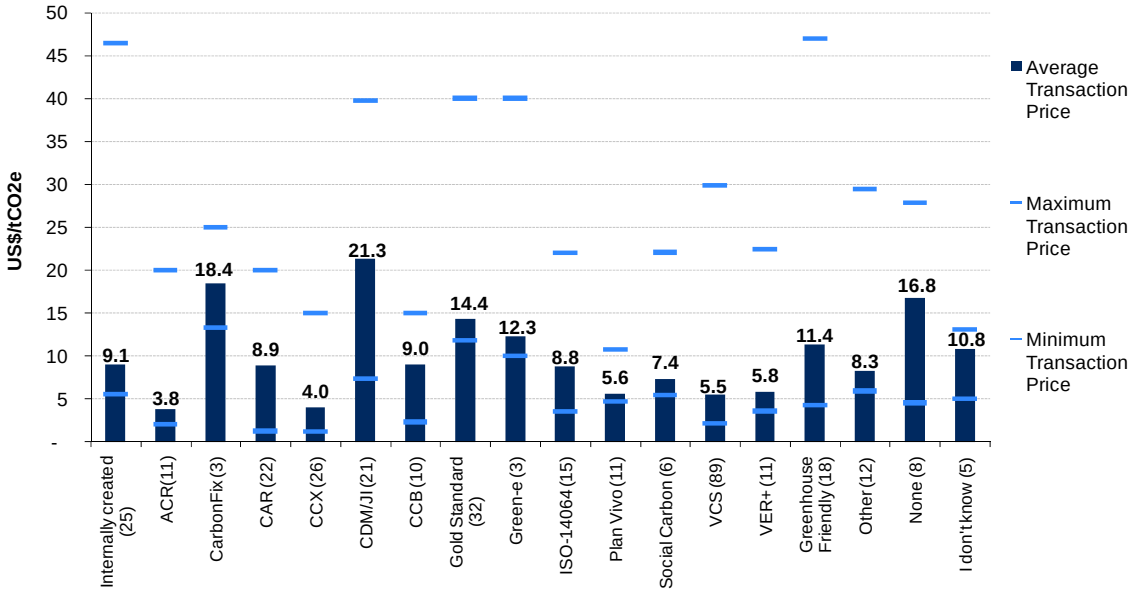



*Source: Ecosystem Marketplace, New Carbon Finance.*

Last year also saw further consolidation amongst the many standards in the market. Of the 18 identified standards, the most utilized OTC standard by transaction volume was the Voluntary Carbon Standard (48%), followed by the Gold Standard (12%), the Climate Action Reserve Protocols (10%), and the American Carbon Registry Standard (9%). Defying the small interest from last year's respondents, both CAR and the ACR increased on the back of higher pre-compliance activity in the U.S. with landfill gas projects being prominent with these standards.

Losing most OTC market share in 2008 were the CDM/JI, VER+, and the Voluntary Offset Standard (VOS). CDM/JI credits were the second most popular credit type in 2007 (16%) on the OTC voluntary markets, but they dropped to only 2% of the market in 2008. VER+ was another popular standard in 2007 which lost substantial market share (from 9% to 2%).

***Credit Prices and Price Ranges by Standard, OTC 2008***




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

## Large Numbers of Standards Fetched Above-Average Prices

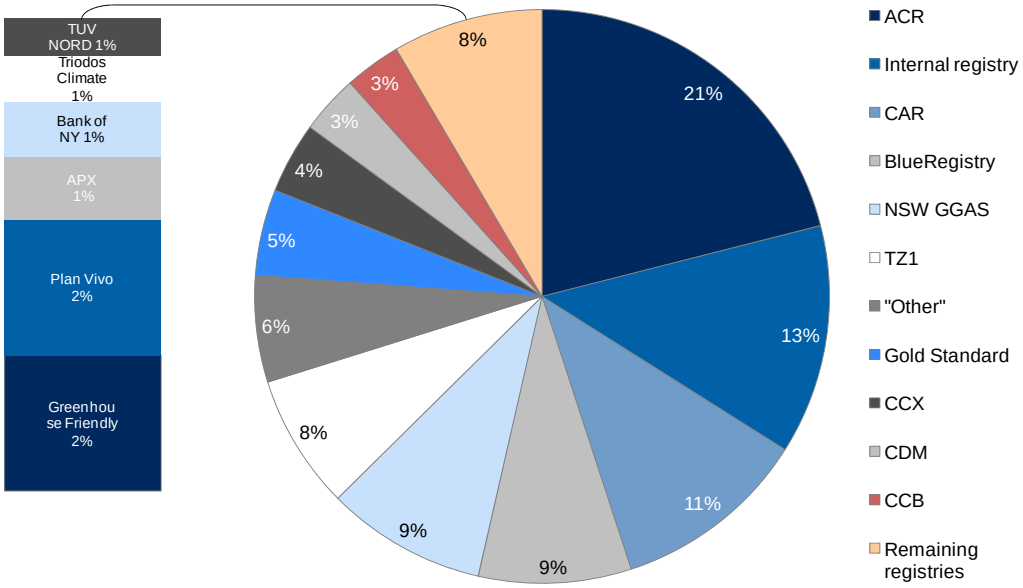
Similar to project type, the verification standard utilized is a major determinant of transaction prices. Although their volumes dropped significantly, CDM/JI credits maintained their price premium, averaging of $21.31/tCO$_2$e. Above-average premiums (>$7.34/tCO$_2$e) were also paid for CarbonFix, Gold Standard, Green-e, GHG Friendly, CCB Standards, Climate Action Reserve, ISO, Social Carbon and even internally created standards.

The CCX and the ACR were at the bottom of the price spectrum at average transaction prices of less than $4.0/tCO$_2$e. This average discount is mostly related to the low carbon prices on the CCX itself and inexpensive reductions achieved via geological sequestration, the most popular ACR project type in 2008.

## While Gaining Attention, Registry Usage Still Limited in 2008

A newer infrastructure element of the voluntary OTC market, but one that is receiving increasing attention is the third-party credit-accounting registry. In 2008, at least 29% of voluntary transactions were tracked in a third-party registry. Despite the increase in third-party credit verification and consolidation of standards, this 29% represents a small reduction from the 31% of transaction volume tracked in third-party registries in 2007. We attribute this decline to the lack of a dedicated VCS registry, by far the most popular standard in the market last year. However, it should be noted that of the credits eligible for registration—issued offsets in which emissions reductions have already occurred—64% were transacted via a third-party registry. Therefore we anticipate registry usage to increase substantially going forward.

***Uptake of Registries, OTC 2008***




*Source: Ecosystem Marketplace, New Carbon Finance.*

As of the publication of this report, there are at least 18 third party registries serving the voluntary carbon markets. In 2008, the most popular third-party registries in terms of OTC transaction volume tracked were the American Carbon Registry (21%), followed by the Climate Action Reserve (11%), the New South Wales Greenhouse Gas Abatement Scheme Registry (9%) and the BlueRegistry (9%). An additional 13% of OTC transactions were tracked in internal registries. The popularity of suppliers' internal registries is attributed to the unavailability of a VCS registry. The dominance of the ACR is in part related to reporting bias, as the ACR was one of only a handful of registries active in 2008 and supplied its own transaction (as opposed to just issuance) data.

With respect to our 2007 results, most of the registry usage follows the market's trends with regard to third-party standards. Notable changes from last year include the rise of the American Carbon Registry (which took 21% of the 2008 market vs. only 5% of the 2007 market), the Climate Action Reserve (11% in 2008 vs. 2% in 2007), and the NSW GGAS Registry (9% in 2008 vs. 2% in 2007). The CDM/JI registry and CCX Registries each experienced significant declines in market share between 2007 and 2008.[3]

[3] This statement refers to the CDM/JI and CCX registries' prominence in the OTC market, only. Each registry remains the sole registry provider of its respective market.

### Although Investment Has Become an Important Motive, CSR and PR Remain the Dominant Driving Forces in the Market

Private companies continue to dominate the buy-side of the voluntary market (66% of volume), with purchasing for investment/resale now the largest overall motivation (35%) instead of retirement (29%). This suggests a higher contribution from intermediaries in the market. Voluntary purchasing by both NGOs and individuals has significantly decreased in 2008 to a mere 1% and 2% respectively, which could represent a reduced interest in voluntary offsetting on the back of negative media publicity as well the onset of the global economic recession in 2008.

Despite the increased importance of investment, however, sellers continue to perceive that Corporate Social Responsibility (CSR) and public relations/branding are the two main driving forces for voluntary purchases. This means that, although many analysts perceive pre-compliance buying as a rising force in the market, our survey results indicate that it remains secondary to the pure voluntary market.

This year's results also confirm that a compliance market does not eliminate the voluntary carbon market, with European buyers purchasing over half (53%) of volumes, up from 47% in 2007. Given the non-existence of a large U.S. compliance market, the United States was responsible for both the greatest demand (39%) as well as supply of credits (28%) of any single country.

### Market Participants Expect Continued Growth with Volumes Reaching almost 350Mt$CO_2$e in 2015

On average, suppliers projected an average annual growth of 15% per year from 2009 through 2020 with volumes for the global voluntary market anticipated to increase to 257Mt$CO_2$e in 2012 and 476Mt$CO_2$e in 2020. Participants expected the 2009 market to grow by 21%, which is low relative to the historic average of 95% (2003-2008), but still a good growth rate in the midst of a recession.

When asked about standards they plan to use in 2009, more suppliers (52% of survey respondents) intend to use the Voluntary Carbon Standard (VCS) than any other standard. In 2007, suppliers also reported the VCS as their most-preferred standard for use in 2008, which proved to be correct, as the standard took 48% of the OTC market last year. About 34% of suppliers indicated they will utilize the CDM in 2009, 32% the Gold Standard, 28% the Climate Action Reserve, and 27% the Community, Climate & Biodiversity (CCB) Standards. Note that individual organizations may use multiple standards so percentages do not add up to 100%.

The most popular choices for future registry use were the Climate Action Reserve, the Gold Standard registry, the APX registry, TZ1, and the CDM/JI registry. The popularity of CAR, Gold Standard, VCS, and CDM/JI is consistent with these standards' intended future utilization. The popularity of TZ1 and APX is consistent with a strong interest in the VCS, since these registries both serve the VCS as well as several other standards.