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CARBON FUNDS IN 2010:

INVESTMENT IN KYOTO CREDITS AND EMISSIONS REDUCTIONS

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Launched in 1999 with the creation of the World Bank's Prototype Carbon Fund, the development of carbon funds has increased rapidly since 2005. In 2009, the sector numbered 96 funds investing in emissions reduction projects, compared with 66 funds in 2007. These 96 carbon funds declared a total capitalisation of 10.8 billion euros in 2009, representing a 54% increase in capital since 2007. The majority of carbon funds are private (48% compared with 29% public funds), buy credits directly (52% compared with 23% of funds investing in CDM/JI projects), and invest according to a regulatory compliance objective (55% compared with 42% of funds which only declare a financial profitability objective).

In January 2010, carbon funds had financed a total reduction in greenhouse gas emissions estimated at 113 million tonnes, as the result of CDM projects (around 112 $MtCO_2$) and JI projects (around 1 $MtCO_2$). They expect a total emissions reduction until around 685 million tonnes by 2012 from CDM projects (645 $MtCO_2$) and JI projects (40 $MtCO_2$). Integrating delivery risk factors, expected emissions reductions would most likely be around 300 million tonnes by 2012. Carbon investment funds are the biggest credit buyers from CDM projects (nearly a third of credits issued), followed by industrial investors (a quarter), financial intermediaries (a fifth) and energy companies (a seventh). They are also the third biggest credits buyers from JI projects.

In 2009, the carbon funds sector completed the first stage in its development: the "first generation" of investments in the most profitable emissions reduction projects – relating to elimination of HFC and N_2O gases – is now over. While most of the credits obtained by carbon funds between now and 2012 will come from these types of projects, funds are moving their investments into projects tackling hydroelectric, wind power, flaring and energy recovery from landfill gas, as well as reductions in methane from coal mines.

The challenge now is to find new investment opportunities in emissions reduction projects. These project mechanisms will develop in three directions in the future: some "first generation" HFC and N_2O-type reduction projects will disappear to be replaced by regulatory standards; project mechanisms in the agro-forestry sector, which are difficult to regulate using cap-and-trade systems, will increase; and the framework of emissions reduction project mechanisms will change in favour of reformed, programmatic, sectoral CDMs and domestic offset projects.

The lack of clarity over post-2012 climate policies and the future of CDM and JI, increasing competition between purchasers of credits and the decline in large, highly profitable projects, make the development of carbon funds more uncertain.

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The authors assume full responsibility for any errors or omissions.

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Annexe I and Annexe B: In practice, Annex 1 to the UNFCCC and Annex B of the Kyoto Protocol are used almost interchangeably. These are the countries in Annex B which have obligations to reduce or limit their emissions and Annex I countries can invest in projects (Kyoto JI and CDM) or host JI projects - the lists differ only by Belarus and Turkey, which are listed in Appendix 1 but not Annex B.

AAU: Assigned Amount Unit

CDM: Clean Development Mechanism

CER: Certified Emission Reduction

ERPA: Emissions Reduction Purchase Agreement

ERU: Emission Reduction Unit

EUA: European Union Allowance

EU ETS: European Union Emissions Trading Scheme

DNA: Designated National Authorities

DOE: Designated Operational Authorities

GHG: Greenhouse gas(es)

JI: Joint Implementation

LULUCF: Land Use, Land Use Change and Forestry

PDD: Project Design Document

UNFCCC: United Nations Framework Convention on Climate Change

I. INTRODUCTION

The carbon funds sector has undergone numerous changes since the first Caisse des Dépôts Mission Climat reports, published in 2005, and updated in 2007. The report's aims are to provide an overview of carbon investment funds active in 2010, to analyze their investment strategy for new greenhouse gas emissions reduction projects by assessing the potential reductions from projects whose carbon credits are bought by carbon funds, and finally to examine the development prospects for emissions reduction project mechanisms.

Carbon funds are investment vehicles which raise public and/or private capital to purchase carbon credits on the primary market that are generated by project mechanisms for reducing greenhouse gas emissions established by the Kyoto Protocol. These credits are either obtained by funding emissions reduction projects in non-Annex B countries via the Clean Development Mechanism (CDM), in which case they are called Certified Emission Reduction units or CERs, or they come from emissions reduction projects in another Annex B country, via the Joint Implementation (JI) mechanism, in which case they are called Emission Reduction Units or ERUs. These carbon credits can then be used to ensure compliance by Annex B countries and industrial facilities, subject to restrictions under the European Emissions Trading Scheme, up to a maximum of 13.4% for the period 2008-2012.

Carbon funds differ from other credits buyers in their legal status, their governance and the investment's time horizon. There are various types of carbon funds, from structures which invest directly in projects to reduce greenhouse gas emissions to financial players buying credits on secondary market. These investors have a wide range of different motives and strategies.

The number of investment funds purchasing carbon assets resulting from Kyoto projects has risen significantly since the first fund was launched by the World Bank in 1999. Their total capitalisation had reached more than 10 billion euros by 2009. Mainly set up by governments before 2005, since then carbon funds have increasingly been developed by the private and financial sector. This showed a sharp increase in investment intentions in 2009 in a context of increasing uncertainty about the post-2012 period. In 10 years, carbon funds have become an important part of the carbon finance sector.

The report only focuses on carbon funds which invest in CDM and JI projects on the primary market, set up in response to the Kyoto Protocol and which receive credits in return for emissions reductions achieved by those projects. It therefore excludes funds which focus solely on buying and selling carbon credits on the secondary market, as well as those which only buy assigned amount units (AAUs) created by the Kyoto Protocol.

The first part of the study analyzes how carbon investment funds work and the second part analyzes the dynamic development of the sector and the characteristics of these funds. The third part of the study then proposes an assessment of CDM/JI projects whose carbon credits are bought by at least one carbon fund. The report makes an estimate of the emissions reductions financed by carbon funds in comparison with other buyers of CDM/JI credits. Finally, the study provides an overview of the development prospects for project mechanisms in a not-too-distant and still uncertain future: the post-Kyoto period after 2012.

II. How do carbon funds work?

The development of carbon funds began in 1999 with the Prototype Carbon Fund, the first pioneering fund set up by the World Bank to finance projects reducing greenhouse gas emissions. The sector has grown significantly over the last 10 years.

This section examines the activity of carbon funds active on the primary carbon credits market. How is carbon funds' activity different? What are the characteristics of the demand for credits? Is supply sufficient to meet this demand?

A. What carbon funds do

Carbon funds are investment vehicles containing public and/or private capital whose objective is to purchase carbon credits on the primary market from project mechanisms for reducing greenhouse gas emissions established by the Kyoto protocol. Carbon funds respond to demand for carbon credits from industrialized countries covered by the Kyoto Protocol and industrial companies that are subject to the European Emissions Trading Scheme which are obliged to reduce their greenhouse gas emissions for the period 2008 to 2012.

Carbon funds work with a range of players to identify projects and agree contracts to purchase credits: investors (private and public institutional investors, companies, etc.), project owners, lawyers, management companies and brokers. To promote project origination, carbon funds develop local networks with project owners in CDM/JI target countries. These project owners are at the origin of the investment process since they identify the CDM/JI projects which generate carbon credits. Carbon funds benefit from both their engineering expertise for the project's technologies and the accounting methods used to calculate potential emissions reductions as a result of the project. They also benefit from project owners' experience of registering CDM/JI projects with the UNFCCC secretariat.

Carbon funds differ from other credits buyers in their legal status, their governance and the investment's fixed time horizon.

Legal status and governance

A carbon fund is a legal structure which distinguishes between investors, equity providers and the management company delegated to manage the fund. The governance of the fund, established between the investors and the management fund, is mainly carried out via an investment committee. The investment committee's role depends on the investment fund.

Some carbon funds have an investment committee that examines each investment project proposed by the management company's operational teams and issues recommendations. The investors and the management company work closely together. Other carbon funds have policies developed by the investment committee which outline the management company's investment procedure. In these cases, the management company is autonomous in its investment activity. The investment committee then meets every six or 12 months.

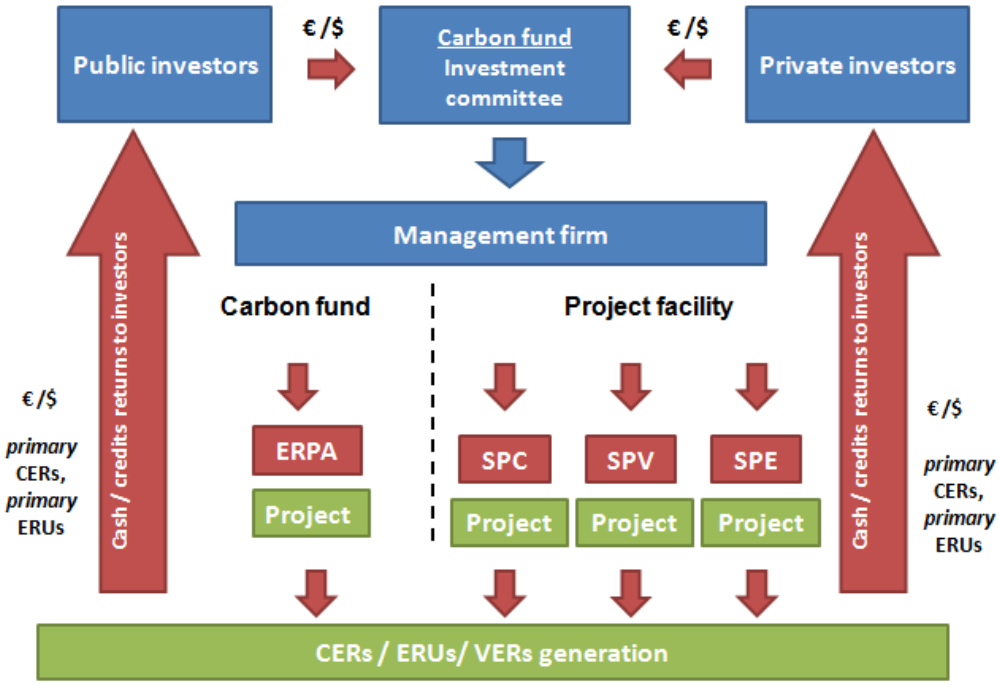
Investment procedures

There are three stages in a carbon investment fund's time horizon: one (or more) subscription stages (fund-raising period), an investment stage and a disinvestment stage.

Once projects are approved and emissions reductions have been checked, the credits are delivered to fund managers then distributed among the various investors or sold on the secondary market. Depending on the fund's investment policy, investors receive compliance credits in proportion to their investments, liquidities or both types of dividend.

There are various types of carbon funds, from structures which invest directly in projects to reduce greenhouse gas emissions to financial players solely buying carbon credits using a standardized purchase contract (Emissions Reductions Purchase Agreement or ERPA). Their investment objectives also vary: legal compliance, financial profitability of the investments and/or voluntary offsetting of their emissions.

Figure 1 – Structure of a carbon fund



** In many cases, an entity is specially created for the purpose of the CDM/JI project. Known as a Special Purpose Vehicle (SPV), Special Purpose Entity (SPE) or Special Purpose Company (SPC), this may be a joint venture or a limited company. The purpose of creating such an entity is essentially to separate the project's assets from those of the sponsors, for legal, fiscal and financial reasons. This entity is at the heart of the project's funding structure.*

Source: CDC Climat Research.

B. Carbon funds – specific Kyoto credits buyers

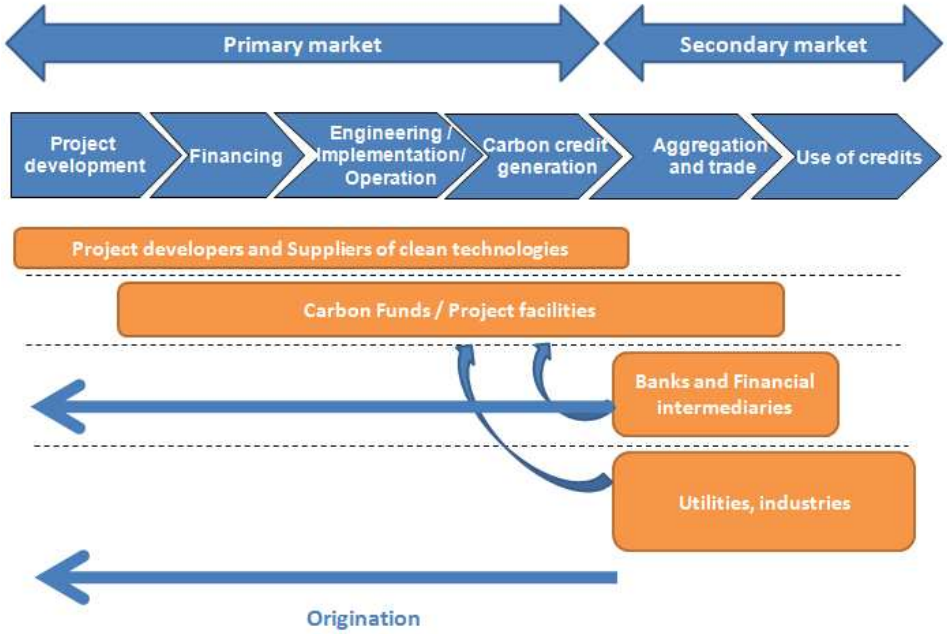
Carbon credits may be purchased on the primary market by various players at various times. Figure 2 presents the stages in the process of generating carbon credits, from project development to purchase of credits and the use of these credits by the end purchaser subjected to regulatory restrictions.

These various stages involve a range of players, all potential carbon credits buyers. On the primary market, there are seven categories of purchaser of carbon credits: carbon funds, industrial companies, energy companies, banks, financial intermediaries, project owners and other buyers. A broader grouping can be applied, distinguishing between companies operating within emissions trading schemes; financial investors covering carbon funds, banks and financial intermediaries; and finally professional developers of CDM/JI projects.

Carbon funds differ from other credits buyers due to:

- the involvement of large investment amounts to fund large-scale emissions reductions projects;
- the benefit of the manager's expertise in the selection and development of projects;
- advance funding for projects, with a lower purchase price for the emissions reductions according to the project's risk profile.

Figure 2 – Primary and secondary markets for CDM/JI project mechanisms



** Industrial companies and energy providers often buy primary credits from dedicated funds. For example, EDF Trading invests in projects and buys credits on behalf of EDF and its subsidiaries via its EDF carbon fund. They can also buy credits on the secondary market from project development companies and financial intermediaries, such as EcoSecurities Group Plc. and AgCert.*

Source: CDC Climat Research.

Table 1 – Buyers of carbon credits: the key players

Carbon funds	Italian Carbon Fund (ICF), ECF, CDCF, Japan Carbon Finance
Industrial companies	Cargill International, Mitsui & Co, Shell Trading, Ford Motor Company
Energy providers	EDF Trading, ENEL, Tokyo Electric, RWE, Edison Italy
Banks	Citi Group, Goldman Sachs, Merrill Lynch
Financial intermdiaries	Carbon Asset Management Sweden, Carbon Capital, Noble Carbon, Management, Swiss Carbon Asset…
Project development companies	Agcert, Camco, SouthPole, Ecosecurities, Balance CO_2
Other credit buyers	Cabinet de conseil, programme humanitaire

Source: CDC Climat Research based on data from Environmental Finance 2010.

Whatever category they are in, buyers of carbon credits are motivated by regulatory compliance obligations or the demand for voluntary offsetting, or/and by financial profitability. They all work on the assumption that the price of carbon credits for the period 2008-2012 will rise. Investors seek to avoid paying a high price for the carbon credits that they need to achieve compliance and/or make a profit by reselling their carbon credits at a later date for a higher price.

Until the Kyoto Protocol was ratified by Russia in 2004, the number and volume of investments from private funds had remained relatively low. Uncertainty surrounding implementation of the Kyoto Protocol had made private investors reticent to make a solid commitment to this market. The pioneering of carbon funds by the World Bank and then their development as a result of government credit purchasing schemes, particularly in the Netherlands and Japan, played a key role in building confidence among private players. The launch of the European Emissions Trading Scheme finally provided the catalyst for the entry of private industrial and financial players into the credits market.

Three trends have developed over recent years:

- *Growing presence of financial investors*. Since 2005, many large banks and financial intermediaries have become increasingly attracted by the profitability perspectives of carbon finance, including Goldman Sachs, JP Morgan and Merrill Lynch.
- *Mergers and restructuring among primary market players mainly due to the international financial crisis*. Since 2008, some carbon credits buyers such as investment banks and financial intermediaries have entered the market or extended their activities by acquiring project owners. For example, in 2009, the takeover of Ecosecurities by Carbon Acquisition Company Ltd, an indirect fully-owned subsidiary of JP Morgan Chase & Co, and the takeover of originator OneCarbon by Orbeo, a joint venture between Société Générale and Rhodia.
- *New carbon credit purchasing strategies*. Since 2008, some investors have preferred to purchase carbon credit portfolios, containing a complete range of already purchased credits, rather than finance new CDM/JI projects, a process that can take up to three years until delivery. The economic crisis led several companies to sell their portfolios of carbon credits already registered with the UNFCCC in order to obtain cash.

C. Guaranteed demand for carbon credits until 2012

Demand for carbon credits concentrated on Europe

Demand for carbon credits results from international and national regulations obliging economic players to cut greenhouse gas emissions as well as others who want to offset their greenhouse gas emissions. This demand for carbon credits comes mainly from the industrialized countries that signed the Kyoto Protocol and industrial facilities subject to emissions trading systems, currently mainly in the European Union.

Demand from industrialized countries in the international Kyoto market

The Kyoto Protocol, adopted in 1997, follows on from the United Nations Framework Convention on Climate Change (UNFCCC) adopted in Rio in 1992. It defines the legally binding targets for capping emissions in the 38 industrialized countries listed in its Annex B. These countries must reduce their total greenhouse gas emissions by 5.2% compared with their 1990 levels over the commitment period 2008-2012. A distinction was drawn between Annex B countries in relation to this commitment when, in 2008, they were allocated a volume of quotas, called assigned amount units (AAUs), equivalent to their emissions target over the commitment period.

In order to contribute to reducing emissions in the countries and sectors where they are the cheapest, Annex B countries are also able to use project mechanisms to acquire carbon credits. These credits are either obtained by funding emissions reduction projects in non-Annex B countries via the Clean Development Mechanism (CDM), in which case they are called Certified Emission Reduction units or CERs, or they come from emissions reduction projects in another Annex B country, via the Joint Implementation (JI) mechanism, in which case they are called Emission Reduction Units or ERUs. CERs and ERUs can be used in the same way as AAUs to ensure that Annex B countries are compliant.

Demand from industrial companies covered by emissions trading schemes

The main demand for credits comes from the European Union Emissions Trading Scheme (EU ETS) for CO_2 quotas. Its framework Directive EC/87/2003 includes the ability to import around 1400 million credits up until 2012 to ensure the compliance of European industrial companies. An emission trading scheme is due to be launched in New Zealand in July 2010 and is likely to lead to demand for Kyoto credits from 5 to 15 Mt/year. The development of other emissions trading schemes, particularly in the United States and Australia, may significantly increase demand for credits.

Demand for voluntary offsetting

This demand comes from public and private players wanting to offset their greenhouse gas emissions from economic activities not regulated by a cap-and-trade scheme or a tax. These carbon credits may result from emissions reductions by CDM/JI projects or certification under other private or public standards. Emissions can be offset by directly funding a project or by buying credits on the secondary market. This voluntary demand is negligible compared with demand resulting from compulsory regulations.

Total demand for carbon credits

Demand for carbon credits over the period 2008-2012 comes mainly from the European Emissions Trading Scheme in CO_2 quotas and some Annex B countries whose Kyoto targets will be difficult to attain by national measures alone (Japan, Spain, Italy, etc.). Total demand for carbon credits between now and 2012 is estimated at between 1,900 Mt and 3,000 $MtCO_2$.

Estimated demand for credits after 2012 is more uncertain, in the absence of an international climate agreement to take over from the Kyoto Protocol. Only the European Union is maintaining demand through its emissions trading scheme and national reduction targets established as part of the energy-climate package adopted in April 2009. Obtaining an international climate agreement for the post-2012 period would allow this European demand to be revised upwards, in addition to the demand from signatory countries to the agreement. The anticipated emissions trading schemes in Japan, Australia and the United States in 2013 (?) may become new sources of demand for credits.

Supply of carbon credits from Kyoto mechanisms

The supply of carbon credits mainly comes from Kyoto credits generated by Clean Development Mechanism (CDM) projects, CERs, and Joint Implementations (JI) projects, ERUs. Other types of carbon credits have been created to respond to the emergence of demand for voluntary offsetting.

Joint Implementation

Joint Implementation (JI), defined in article 6 of the Kyoto Protocol, allows Annex B countries, or any purchaser from an Annex B country, to obtain emissions credits by investing in emissions reductions projects in another Annex B country. Emission reduction units (ERUs) are obtained in return for the investment.

Clean Development Mechanism

The Clean Development Mechanism (CDM), defined in article 12 of the Kyoto Protocol, is the mechanism involving developing countries, which, according to the principle of "common but differentiated responsibilities", do not have targets for controlling or reducing their greenhouse gas emissions. Using this project mechanism, an industrialized country in Annex B of the Kyoto Protocol or a private operator from an industrialized country can obtain certified emission reduction units (CERs) in return for funding emissions reduction projects in a non-Annex B country. They can use these themselves or sell them on a “secondary" carbon market.

Voluntary emissions reduction

A number of types of voluntary emissions reduction credits exist, such as Verified Emissions Reductions (VERs), Emission Reductions (ER), Carbon Financial Instruments (CFIs – a unit of account on the Chicago Climate Exchange, Chicago’s voluntary market) and Renewable Energy Certificates (RECs). Since these credits cannot be used for compliance purposes or traded as part of Kyoto commitments, the level of investment by investment funds in this type of asset is currently minimal.

Table 2 – Estimation of total supply and demand for carbon credits (CER/ERU)

	Estimate 2008-2012 (Mt)		Estimate 2008-2020 (Mt)	
	Bottom estimate	Top estimate	Bottom estimate	Top estimate
Demand for credits				
International Kyoto market				
EU 27	500	1,000	*unknown*	
Japan	200	400		
Canada	0	0		
New Zealand	0	10		
Australia	0	200		
Other carbon markets				
EU 27 – EU ETS	1,100	1,400	1,510	2,710
Japan's voluntary market	0	5	20	950
*United States**	0	0	5,250	7,000
*New Zealand**	0	0	35	105
*Australia**	0	0	280	560
Voluntary offsetting	0	10	0	10
Total	**1,900**	**3,025**	**7,095**	**11,335**
Supply of credits				
CER	**750**	**1,500**	**2,000**	**12,000**
ERU	**5**	**360**	**5**	**360**
Domestic offset proejcts	**0**	**200**	**0**	**200**
Total	**755**	**3,060**	**2,005**	**12,560**

Note: the figures shown in the table are estimates, except for those indicated for the EU 27- EU ETS which are taken from the energy-climate package. The difference between the top and bottom estimates for the EU ETS essentially depends on whether a post-2012 international climate agreement is signed.

** For the United States, New Zealand and Australia, estimates of demand have been based on bills to implement emissions trading and capping systems.*

Source: CDC Climat Research.

II. DYNAMIC DEVELOPMENT OF CARBON FUNDS

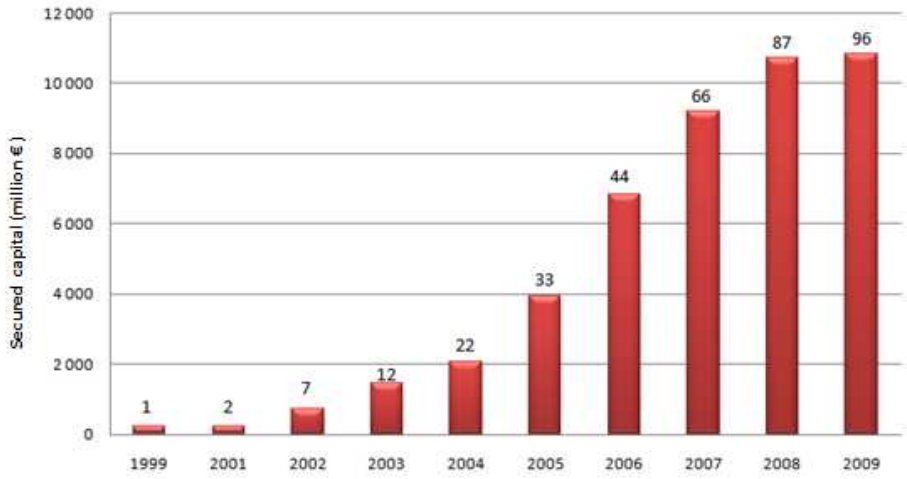
Carbon funds are among the main financers of CDM/JI project mechanisms. Since the emergence of the sector in 1999, the number of carbon funds has increased and they have diversified their activities and their investment strategies.

A. 10 years of development: the first stage of investment complete

In 1999, the World Bank pioneered investment in carbon credits by setting up the Prototype Carbon Fund (PCF), a 180 million dollar fund combining governmental and private investors. This initiative was followed a few months later by the Netherlands' launch of their ERUPT purchasing programme. Both programmes were innovative, aiming to cultivate the emerging possibilities of purchasing carbon credits in an uncertain context. The number of carbon investment funds has since increased significantly.

At the end of 2002, there were seven carbon funds, accounting for less than 750 million euros. By autumn 2005, there were 33, representing an investment potential of more than four billion euros. The total capitalisation of carbon funds in 2007 was 9.2 billion euros for 66 funds, reaching at least 10.8 billion euros in 2009, spread between 96 funds. We should note that a third of these 96 carbon funds identified do not disclose the amount of capital they have raised to invest in emissions reductions projects.

Figure 3 – Carbon fund evolution by secured capital and number of funds



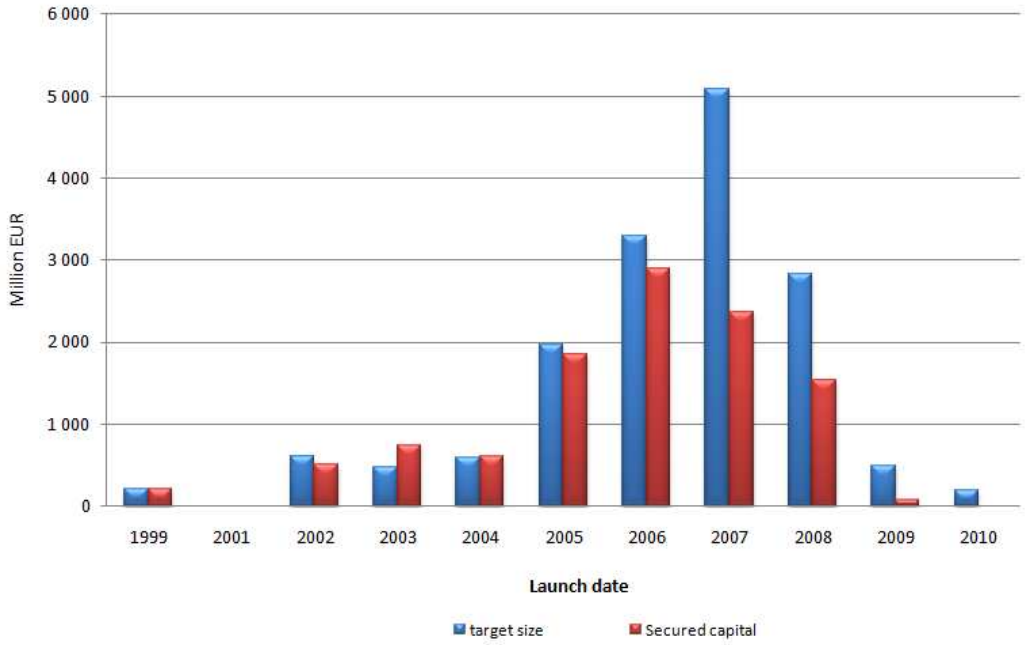
Source: CDC Climat Research, based on data from Environmental Finance 2010, Point Carbon and funds' websites

Since 2007, 30 new carbon investment funds have been launched. Table 3 lists those carbon funds set up in the last three years. As an example, in 2008, Swiss Re/Arreon Carbon Facility (300 million euros) was created with the objective of purchasing carbon credits in China, along with CE2 Carbon Capital and Energy Capital Partners (125 million euros) whose strategy is to target investment opportunities in emission reduction projects in North America. Among public players, the Irish government committed to buying 290 million euros in carbon assets through the Irish Carbon Fund.

Despite this strong development dynamic, since 2007 carbon investment funds have been impacted by the financial crisis in two ways:

- from 2007 carbon investment funds experienced difficulties reaching their fund-raising target. Between 2007 and 2008, the difference between funds' carbon investment targets and capital actually raised continued to grow, as shown in Figure 4. Fund managers were forced to revise their investment targets downwards.

Figure 4 – Investment capacity: target size vs secured capital



Source: CDC Climat Research, based on data from Environmental Finance 2010, Point Carbon and funds' websites

- some carbon investment funds were closed due to a lack of investors or poor profitability of investments. Table 3 lists the carbon funds which have closed in the last two years.

Table 3 – Carbon investment funds closed between 2007 and 2009

Name of the carbon fund	Reason for closure
ArcelorMittal Carbon Fund	Set up in 2008 with capitalisation of 100 million euros for compliance on the EU ETS. Suspended due to the economic recession which led to a reduction in steel production.
Care Brasil Social Carbon Fund	Created in 2006 by NGO Care Brasil, with the target of raising 50 million USD to fund small CDM emissions reduction projects in Brazil in order to support local communities through sustainable development projects. Did not raise sufficient funds to begin operation.
Cheyne Carbon Fund	Suspended following departure in January 2009 of the fund manager, who set up the Glacier Environmental Fund.
China Methane Recovery Fund	No credit transactions had been made in China since its launch in 2007. Man Group attributes this failure to conditions surrounding foreign direct investments in China.
DWS CO_2 Opportunities Fund	Set up in 2008 by Deutsche Bank, with 3.14 million euros to invest in derivative and structured products of carbon assets, it did not succeed in attracting other investors.
Gold Carbon Capital Fund & CS Carbon Infrastructure Fund	The Gold Carbon Capital Fund aimed to generate carbon credits while the CS Carbon Infrastructure Fund aimed to generate liquidities. The unit managing the funds within Crédit Suisse left the bank to found a new management company EBG capital (European Business Group).

Source: CDC Climat Research, based on data from Environmental Finance 2010, Point Carbon and funds' websites.

Investment company Istithmar World Ventures also pulled out of its partnership with developer Sindicatum Carbon Capital (SCC). The Istithmar & Sindicatum Climate Change Partnership fund, launched in December 2007 and which had already raised 280 million USD, had difficulty finding new investors. The fund is now called Sindicatum Climate Change Partnership.

B. Types of carbon funds: a range of profiles

Carbon investment funds can be divided according to whether their investments are public, private or mixed, their investment objective, their investment approach and, lastly, their strategy for purchasing carbon credits.

Capitalisation divided equally between public and private investors in 2009

Capital raised by carbon investment funds comes from a range of public, private or mixed funding sources:

- Public funds come from public funds mainly from industrialized countries anticipating difficulties meeting their emissions targets set by the Kyoto Protocol for 2008 to 2012 and therefore aiming to offset their excess emissions with carbon credits or non-Annex B countries to promote the development of project mechanisms for projects. Some funds may have a purpose of financial gain.
- Private funds come from private investors which may be energy providers or industrial companies subject to emissions reduction restrictions due to the establishment of the emissions trading schemes, or financial investors.
- Public-private (or mixed) funds bring public and private players together within a single legal structure to raise funds.

Table 4- Examples of carbon funds by type of investor

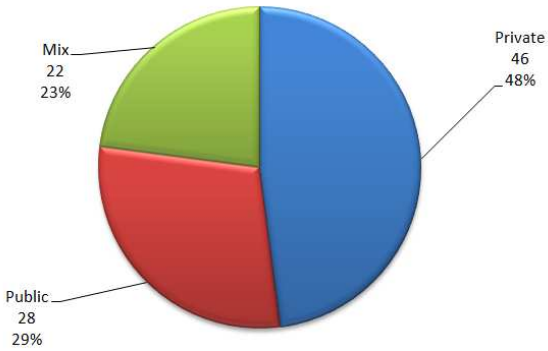
Public carbon funds	Mixed carbon funds	Private carbon funds
Asia-Pacific Carbon Fund	Baltic Sea Region Testing Ground Facility	CE2 Carbon Capital
Austrian CDM Project Procurement and CER Sale Facility	BioCarbon Fund (BioCF)	CF Carbon Fund II
Austrian JI / CDM programme	Brazil Sustainability Fund	Climate Change Capital Carbon Fund
Belgian JI/CDM Tender	Carbon Assets Fund II	Climate Change Investment I
Carbon Capital Fund Morocco	Carbon Fund for Europe (CFE)	Climate Change Investment II
CAF-Netherlands CDM Facility (CNCF)	Community Development Carbon Fund	Da Vinci Green Falcon Fund
CAF-Spain Carbon Initiative	Danish Carbon Fund (DCF)	Dexia Carbon Fund
CERPT	GreenStream Nordic Carbon Pool	European Clean Energy Fund
ERUPT New Style	Prototype Carbon Fund (PCF)	European Kyoto Fund (EKF)
Carbon Fund Post 2012	European Carbon Fund	FE Global Clean Energy Services Fund IV
Flemish Government JI/CDM Tender	KfW Carbon Fund	FE Global-Asia Clean Energy Services Fund
Forest Carbon Partnership Facility (FCPF)	KlimaInvest	Financial Emissions Fund
IFC-Netherlands Carbon Facility (INCaF)	Korea Eximbank Carbon Fund	Fine Carbon Fund
Irish carbon Fund	Luso Carbon Fund	Glacier Environmental Fund
Korea Carbon fund	Multilateral Carbon Credit Fund (MCCF)	

Source: CDC Climat Research based on data from Environmental Finance 2010.

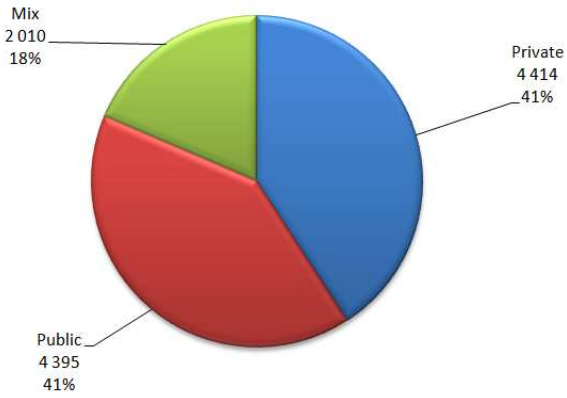
The acceleration in the development of carbon investment funds was sparked by the arrival of public investors in 2002, then private investors in 2004 following ratification of the Kyoto Protocol. The proportion of public and mixed investors in the financing of carbon funds has consistently decreased since in favour of private investors. The establishment of the European Emissions Trading Scheme (EU ETS) in 2005 contributed to this by attracting a massive influx of private capital. In 2009, 41% of investment in carbon funds came from public capital, 41% private capital and 18% mixed capital.

Figure 5 – Investors in carbon funds in 2009

By number of funds: 96



By secured capital: 10.8 billion euros



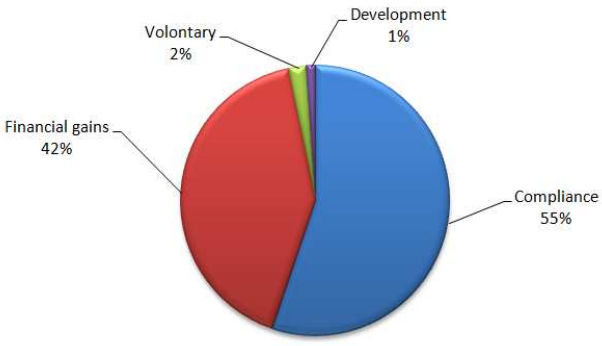
Source: CDC Climat Research based on data from Environmental Finance 2010.

Investments with a regulatory compliance objective

In 2010, 55% of funds had a compliance objective compared with 42% with the objective of financial gains. Only 3% of carbon funds declared that their activity would be based on human development or voluntary offsetting objectives.

Figure 6 – Breakdown of funds by investment purpose

By number of funds: 96



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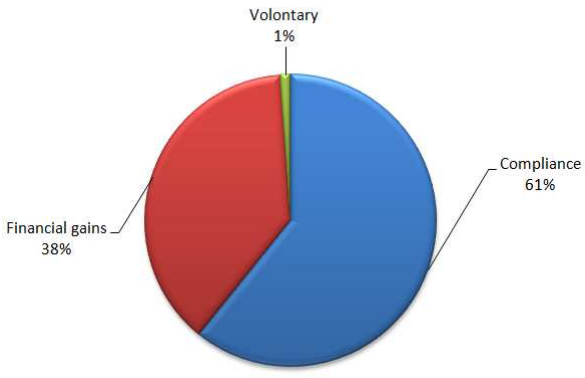


NB: since some funds do not release their financial data, those with a development or voluntary offsetting dimension do not appear in the chart in terms of capital.

Source: CDC Climat Research based on data from Environmental Finance 2010.

The objective of regulatory compliance carbon funds is to acquire credits in order to sell them on to their industrial investors, subject to cap-and-atrde schemes such as the European Emissions Trading Scheme. The unusual feature of compliance funds is that they offer returns on investment in the form of credits.

Financial profit carbon funds invest in carbon assets with the aim of subsequently reselling them on the secondary market at a higher price than was paid for them.

Voluntary compliance carbon funds respond to demand from the voluntary offset market, made up of private individuals, public entities and companies that have decided to voluntarily offset their emissions. The carbon credits used may be Kyoto credits, explaining the emergence of many service providers offering guaranties that projects are carried out and their compliance with the additionality principle. Growing demand on the voluntary offset market explains the decision in 2009 by the Glacier Environmental Fund to buy verified emissions credits (VER). In 2009, the first Canadian voluntary fund, Green Power Action's Green Canada Fund, was set up by BMO Financial Group and TD Bank with an investment capitalisation of 12.3 million US dollars. The fund will buy credits on behalf of Canadian companies wanting to offset their carbon footprint.

Finally, the objective of development carbon funds is to contribute to the growth of developing countries via through the funding of CDM/JI projects. These funds operate by selling CERs generated by projects in order to fund sustainable development projects in developing countries. These particularly include the World Bank's Community Development Carbon Fund, and the Millennium Goals Carbon Facility, managed jointly by the United Nations Development Programme (UNDP) and the Fortis bank. The objective of the Millennium Goals Carbon Facility is to use CDM/JI project mechanisms in under-represented countries. It relies on a system of guaranteed fixed prices for CERs generated by emissions reductions. Fortis finances itself by selling on carbon assets on the secondary market.

Some funds emphasize projects' sustainable focus. For example, the Swedish government's CDM/JI programme, launched in 2002, was not originally designed to promote development objectives but, since 2007, has concentrated on setting up CDM projects in countries which are the most under-developed and under-represented in relation to foreign direct investment (FDI).

Wide-ranging financial policies: from purchasing credits to venture capital

Investment funds present varying levels of financial commitment in CDM/JI projects. Some investment funds focus on purchasing credits from project owners when they are generated, others before they are even generated, and others from the development stage of the emissions reduction project. The degree of integration of carbon credits into the primary market makes it possible to distinguish two types of carbon fund:

- "Credit" carbon funds. These are investment vehicles specialising in the purchase of carbon credits generated by emissions reduction projects through an ERPA-style purchase agreement. Carbon credits then act as dividends for investors and are used for compliance purposes or resold on the secondary market with the expectation of a financial profit. Historically, these were the first funds to have been set up.
- "Project" carbon funds. These provide direct funding and expertise to actively develop and manage emissions reduction projects. These funds therefore play a key role in development of the project. These funds are often managed by management companies which have acquired experience as project developers such as Ecosecurities.

Some carbon funds may invest in both types of project. Other funds take a range of investment approaches in carbon assets and companies whose activities contribute to the fight against climate change (green energies, renewables, etc.).

In 2009, 52% of purchases of carbon credits by carbon funds were made via purchasing agreements (ERPA), 13% of carbon funds' investments were made via direct funding of CDM/JI emissions reduction projects.

Although "credit" carbon funds dominate the sector, the trend over the last two years has been towards a concentration of players on the credit market and the growing financial involvement of carbon funds in projects' development.

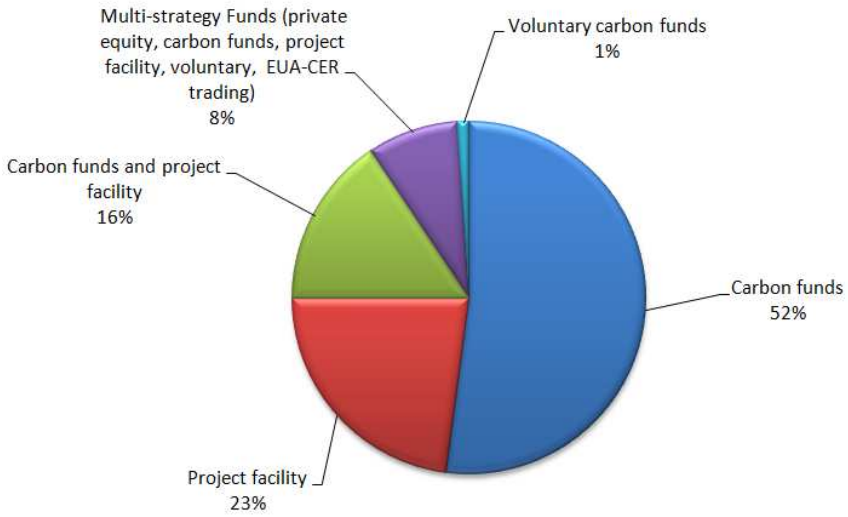
This can be explained by a number of interdependent factors:

- increasing competition to purchase credits created by solid projects generating large amounts of credits for a low price;
- an increase in prices of primary credits. This leads carbon funds to seek more profitable, though more risky, investment alternatives;
- more difficult access to project funding for new and small project owners.

In order to become involved in the funding of CDM/JI projects, managers of carbon funds have developed internal funding capacity, using shares or loans, and project management skills. A fund which provides equity capital with other investors will be entitled to only part of the carbon credits and can acquire additional carbon credits for a reduced price. Another example is the granting of a loan based on future revenue from the sale of CER/ERU credits. This means they are able to take part in projects' development and assess their risks. As a result, carbon funds have begun to invest in higher risk projects which require more capital such as projects in the renewable energies sector.

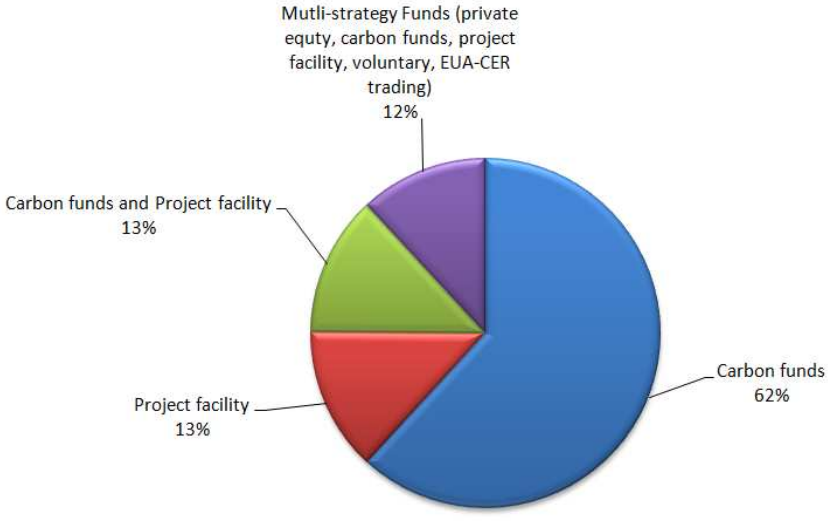
Figure 7 – Breakdown of investment funds by financial policies

By number of funds: 96



Source: CDC Climat Research based on data from Environmental Finance 2010.

By secured capital: 10.8 billion euros



Source: CDC Climat Research based on data from Environmental Finance 2010.

Box 1 - Examples of investment funds

Examples of "credit" investment funds

The Carbon Capital Fund Morocco

The Carbon Capital Fund Morocco was set up in 2008 by the Caisse des Dépôts et de Gestion du Maroc (CDG) and is managed by CDG Capital Private Equity (a fully-owned subsidiary of the CDG group specializing in management of investment funds). The fund's investment target is 26.5 million euros. The CDG has a 50% stake in the fund, the European Investment Bank 25% and CDC Climat, a subsidiary of Caisse des Dépôts et Consignations 25%. The Carbon Capital Fund Morocco helps Moroccan developers carry out their CDM projects by acquiring credits for the period 2008-2017. It operates in the renewable energies, energy efficiency, waste management, forestation and reforestation sector. The Carbon Capital Fund Morocco is the largest fund in French-speaking Africa specially dedicated to carbon funding.

Examples of "project" investment funds

Dexia Carbon Fund

The objective of this fund, launched in July 2008 and managed by Dexia, is to raise 150 million euros. Of this, 50 million has been secured and 10 million is already invested. The fund invests directly in CDM, JI and voluntary projects by concentrating on emerging carbon markets such as Australia and New Zealand. The fund will be liquidated on 30th June, 2013.

Climate Change Investment 1 and 2

These two funds are managed by First Climate Asset Management SA and their objective is to invest in equity capital and debt in traditional and programmatic CDM projects and JI projects to then benefit from the carbon credits generated. The capitals committed are 70 million euros (CCI 1) and 39 million euros (CCI 2). Investments are mainly made in Latin America, India, China and South-East Asia.

Example of a mixed "projects and credit" investment fund:

Carbon Assets Fund II

Managed by Plane Tree Capital, an investment company specialising in private equity, the objective of the Carbon Assets Fund II is to invest in stakes of project companies and buy CDM credits from renewable energy projects in Latin America. The fund-raising target is between 50 and 70 million euros.

Example of a "carbon multi-strategy" investment fund:

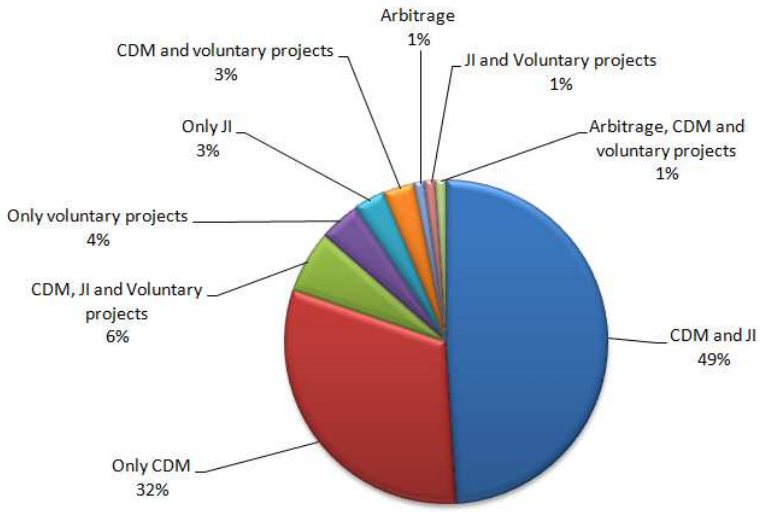
Arkx Carbon Fund

This fund, launched in December 2007 and with a fund-raising target of 2 billion Australian dollars, adopts a wide-ranging investment strategy across several markets: 50% in public companies specializing in renewable energies, 25% invested directly in CDM projects, 20% in trading of European emissions quotas and CERs, and 5% in various opportunities in Australia.

Types of credits purchased by carbon funds

Investments by carbon funds mainly involve CDM and JI projects resulting from the Kyoto Protocol. In 2010, 55% of carbon funds announced they would invest in both CDM and JI projects, 32% of funds declared an investment strategy focusing solely on CDMs, and 2% only JIs. Other strategies also exist. Some funds express a desire to invest solely in JI and voluntary projects; others choose to invest in CDM and voluntary, and others only voluntary.

Figure 8 – Breakdown of carbon credit investment portfolios: by number of funds: 96



Source: CDC Climat Research based on data from Environmental Finance 2010.

C. Some unusual carbon funds

Some carbon funds have an unusual structure or investment strategy. Other carbon funds specialise in purchasing carbon credits from projects developed in a specific geographical area or business sector.

Funds of funds

Several innovative approaches have been initiated by the World Bank, including the Umbrella Carbon Fund Facility, a fund of funds containing capital from the carbon funds of the International Bank for Reconstruction and Development (IBRD) and other players. Having raised 776 million euros, this structure pools the risk by diversifying the funds' investment portfolio, making it possible to fund large-scale projects.

Other carbon funds also accept capital from other funds, including the Prototype Carbon Fund, the Baltic Sea Region Testing Ground Facility, the Multilateral Carbon Credit Fund, and the Asia Pacific Carbon Fund.

Hedge Carbon Funds

Since 2008, fund managers are increasingly developing activities to complement the purchase of carbon credits. For instance, the British fund Climate Change Capital, which manages nearly a billion dollars of investments in carbon credits, has developed a carbon credits portfolio management business, whose strategy is positioned between investment capital and more speculative hedge funds. We could also mention Man Investments, which sees increasing opportunities in trading futures contracts, and CF Partners, which has launched a 50 million dollar carbon arbitrage fund, whose strategies rely on the changing prices of CO_2 quotas, carbon credits and commodities (coal, oil and gas).

Carbon funds specialising in a geographical area or business sector

From the 96 carbon funds identified as active in 2010, 10 funds declared that they were investing in and purchasing carbon credits from projects organized in a specific region. In 2008, the Sri Lankan government launched a carbon fund, the Sri Lanka Carbon Fund, in partnership with private players, aiming to acquire carbon credits by investing in CDM emissions reduction projects developed exclusively in Sri Lanka. These credits are resold to international buyers. The Carbon Capital Fund Morocco, set up in

2008, helps Moroccan developers carry out their CDM projects by acquiring their credits for the period 2008-2017.

Green Venture, a management company based in New York, also launched the carbon fund Green India Carbon Venture Fund in 2008, with capitalisation of 300 million dollars, to acquire CERs generated by CDM projects developed in India. In January 2010, the 18 million dollar Korean fund, Korea Eximbank Carbon Fund, managed by Korea Investment Trust Management Corporation in partnership with Orbeo, an international carbon credit broker based in France, announced it would fund CDM projects developed in South Korea.

While some funds focus on geographical areas, other carbon funds specialise in investment in specific sectors. Out of 96 carbon funds identified, four say that they specialise in a specific sector. The Terra Bella Carbon Fund, launched in 2009, is dedicated to funding emissions reduction projects in the agricultural and forestry sectors. The voluntary UK Government Carbon Offsetting Fund, launched in 2007, invests solely in emissions reduction projects in the energy efficiency sector. The BioCarbon Fund, created by the World Bank in 2003, focuses only on emissions reduction projects in the agro-forestry sector.

III. INVESTMENTS OF CARBON FUNDS: EMISSIONS REDUCTIONS STRATEGY AND POTENTIAL

CDM and JI projects whose credits are purchased by at least one carbon fund can be examined by analyzing two databases, the CDM Pipeline and the JI Pipeline.

Out of the 4,734 CDM projects studied in November 2009, the credits of 790 projects were purchased by at least one carbon fund. In total, 46 carbon funds are listed as having CDM projects that have issued or will issue CER credits between now and 2012.

Out of 243 CDM projects studied in January 2010, the credits of 60 were purchased by at least one carbon fund. Fifteen carbon funds are listed as having JI projects that have issued or will issue ERU credits between now and 2012.

This second part of the study looks at the carbon funds' portfolios of investment in traditional and programmatic CDMs, as well as JI projects, by examining the strategies of carbon funds compared with other categories of carbon credits buyers. The study's results show the volume of credits issued and expected by 2012 by type of credit purchaser. These credit volumes are estimates based on analysis of the data included by project owners in the project design document (PDD) and do not take account of delivery times and risks.

Box 2 – Estimate of the supply of CER credits between now and 2012

At the end of the CDM/JI project registration process, the number of carbon credits delivered to purchasers of credits may differ from the amount expected when the CDM/JI project was developed. This is because the number of credits actually issued relies on three factors: completion of the project registration procedure with the UNFCCC; the results of verification of actual emissions reductions after implementation of the project, which may prove to be higher or lower than initially expected; and the arrival of new projects between now and 2012.

Each month CDC Climat Research analyzes data from CDM Pipeline and estimates the volume of certified emission reduction units (CERs) which will be issued by 2013, i.e. before the end of the European trading scheme's second compliance period. This estimate is based on the past development of CDM projects, including risks and delays during the registration process.

Credits will be issued late as a result of these delays, although the total expected quantity of CERs will not change. The model incorporates two risk factors: a success factor at the validation stage as well as a project performance factor. These delays and risks are calculated based on each project's past data and separated according to host country and technology.

In March 2010, the supply of credits in the period leading up to 2012, corrected to allow for the above-mentioned risk factors, was estimated at 1,225 Mt.

Source: CDC Climat Research, Trotignon & Leguet (2009).

A. Carbon funds, the largest credits buyers from CDM projects

The CDM-project investment portfolios of 46 funds that purchase CDM project credits were assessed. These feature 35% private funds, 35% public funds and 30% mixed funds. Thirty funds invest only in CDMs. Finally, 45% of the 790 projects funded by these carbon funds are already registered with the UNFCCC; 40% are going through the process of validation by an appointed operational body. This breakdown is practically the same as that of projects funded by other types of credit buyers.

According to data from the CDM Pipeline in November 2009, carbon funds account for 112 million CERs issued, corresponding to projects whose potential to reduce residual emissions by 2012 is theoretically

around 645 Mt CO_2eq, if we assume that projects will continue to reduce emissions following the carbon funds' disinvestment period.

Table 5 – CER credits issued and expected by 2012 and 2020 by type of credit purchaser

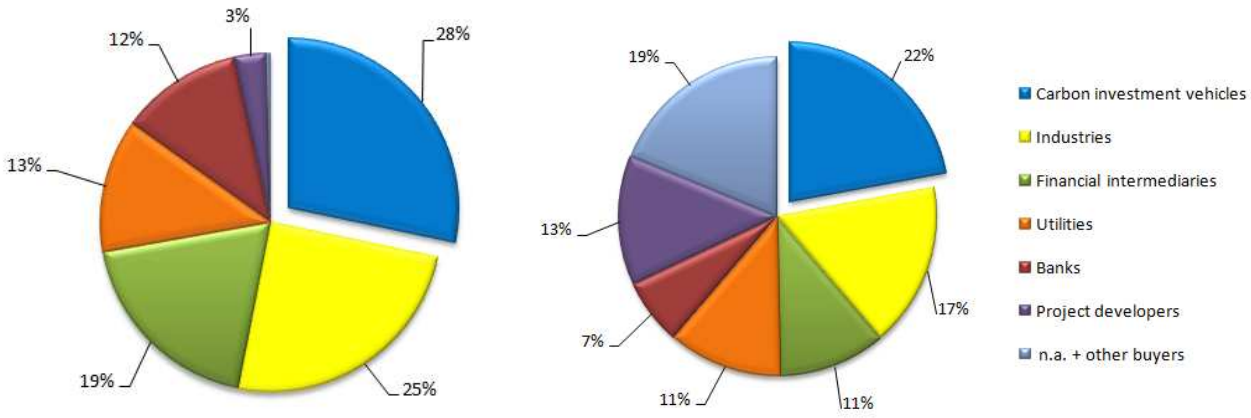
Credit buyers	Million CERs issued	Emissions reductions expected by 2012 ($MtCO_2eq$)
Carbon funds	112.7	645
Industrial companies	98.6	486
Financial intermediaries	76.2	320
Electricity providers	50.8	340
Banks	46.2	198
Project owners	12.3	340
n.a.	1.4	484
Other buyers	0.53	3
Total	**398.0**	**2,819**

Source: authors' calculations based on CDM Pipeline, November 2009.

Carbon investment funds are the main buyers of CER credits, whatever the delivery period for credits. They represent 28% of buyers of CER credits already delivered; 22% of buyers of CERs to be delivered in 2012.

Figure 9 – Estimate of CERs delivered and expected by 2012 by category of credit buyers

CERs delivered (Total: 398 Mt CO_2eq.) **CERs in 2012 (Total: 2.8 Gt CO_2eq.)**



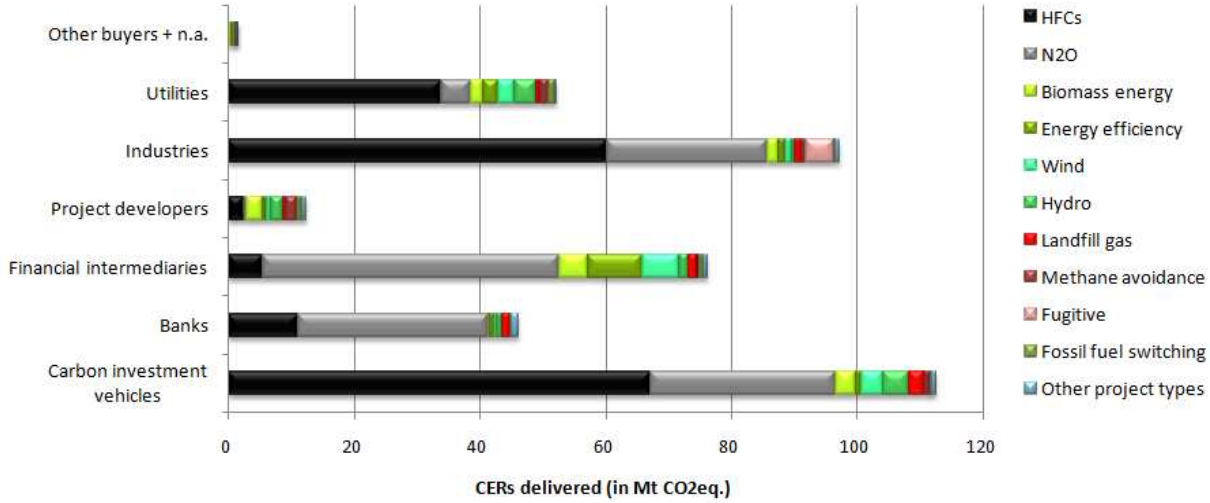
Source: CDC Climat Research based on data from UNEP Risoe, November 2009.

Carbon Fund: a majority of credits from HFCs, N2O and hydraulic CDM projects

The sectoral breakdown of credits issued reveals that projects to reduce industrial emissions, such as HFC23 and N_2O, have been the most successful projects, especially among carbon funds and industrial companies. In fact, 60% of CER credits delivered to carbon funds come from HFC-related CDM projects and 26% from N_2O projects.

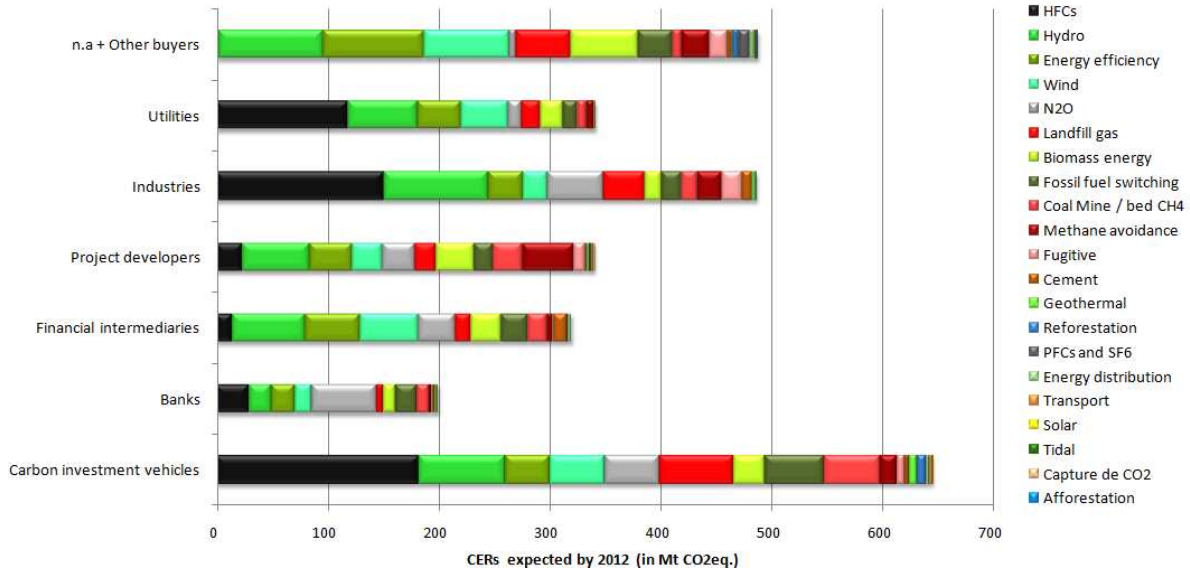
This makes carbon funds the main CER credits buyers generated by HFC projects (68 Mt), followed in second place by industrial companies (60 Mt). Financial intermediaries, on the other hand, are the main buyers of credits delivered by N_2O projects (48 Mt). They are also the main buyers of credits generated by CDM projects developed in the sectors of energy efficiency (6 Mt), biomass (4 Mt) and wind power (5 Mt).

Figure 10 – CERs delivered by project type and category of credit buyers (Total : 585 projects, 398 $MtCO_2eq.$)



Source: CDC Climat Research based on data from UNEP Risoe, November 2009.

Figure 11 – Estimate of CERs expected by 2012 by project type and by category of credit buyers (Total: 4,734 projects, 2.8 $GtCO_2eq$)



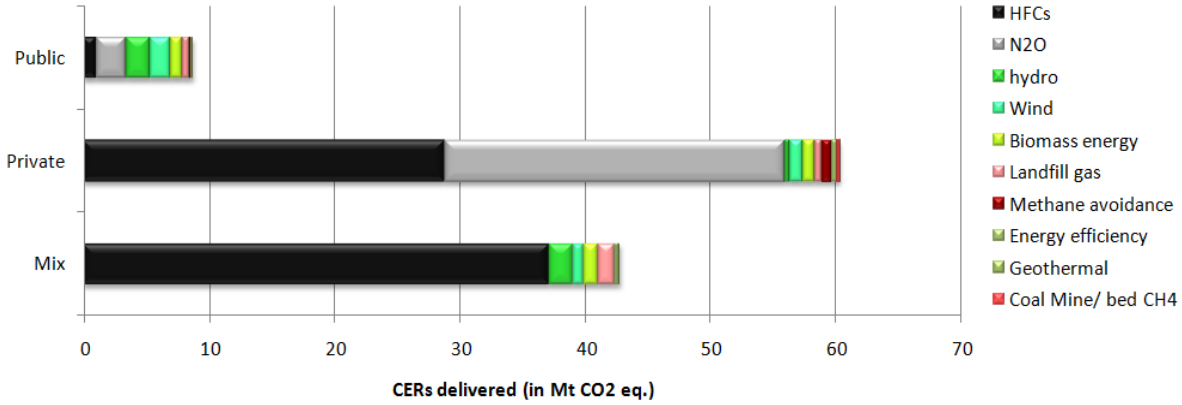
Source: CDC Climat Research based on data from UNEP Risoe, November 2009.

Carbon funds are expecting delivery of 645 Mt of credits generated by CDM projects by 2012, including 180 Mt from HFC projects and 85 Mt from hydroelectric projects.

A more in-depth analysis of investment by carbon funds, according to whether investors are public, private or mixed, reveals distinct characteristics. In terms of volume of credits delivered and expected by 2012, a significant distinction can be seen between public, private and mixed carbon funds. In November 2009, private carbon funds received 60 million CDM credits compared with 45 million and 8 million for mixed and

public carbon funds respectively. In terms of a sectoral breakdown of projects, mixed carbon funds received 38 million credits from HFC projects while private funds received just 26 million CER credits.

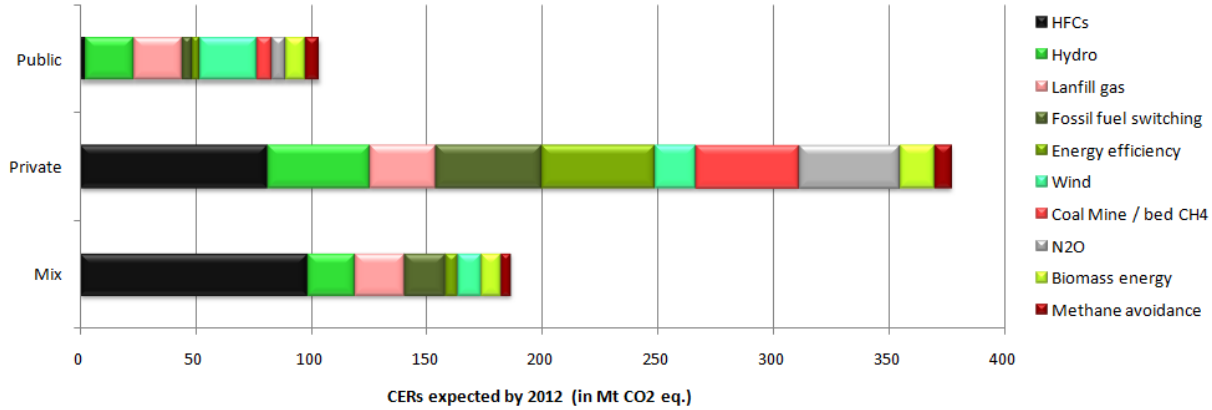
Figure 12 – Estimate of CERs delivered by type of carbon funds and type of project (Total: 112 $MtCO_2eq.$)



Source: CDC Climat Research based on data from UNEP Risoe, November 2009.

According to the CDM Pipeline, in November 2009 private carbon funds were expecting to take delivery of the most carbon credits by 2012, estimated at 380 Mt. Mixed funds were due to receive 180 Mt of CDM credits compared with 105 Mt for public funds. The sectoral profile of the projects delivering the credits is moving towards projects involving energy efficiency, methane reduction, landfill gas, etc.

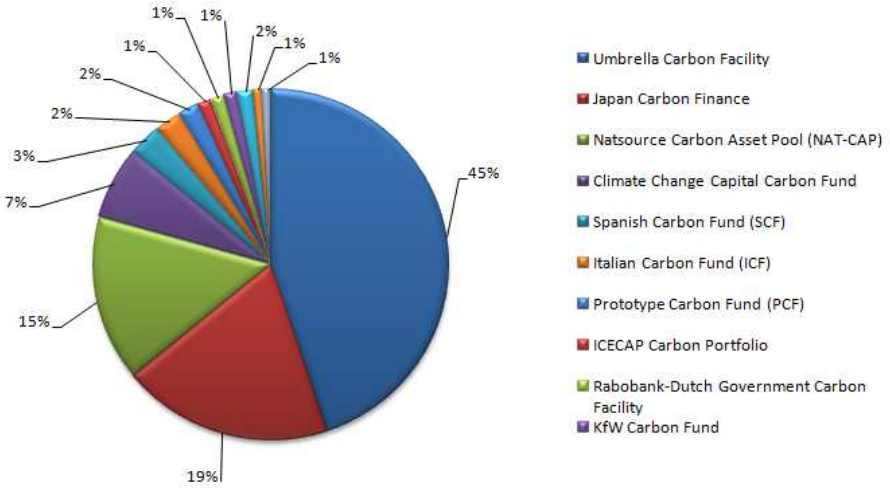
Figure 13 – Estimate of CERs expected by 2012 by type of carbon funds and type of projects (Total: 645 Mt $CO_2eq.$)



Source: CDC Climat Research based on data from UNEP Risoe, November 2009.

Although most of the credits obtained by carbon funds between now and 2012 will apparently come from HFC23 or N_2O projects, funds are moving their investments into projects concerning hydroelectric, wind power, flaring and energy recovery from landfill gas, as well as reductions in methane from coal mines. In 2009, the carbon investment funds sector completed the first stage in its development: the "first generation" of investments in the most profitable emissions reduction projects relating to HFC and N_2O gases, is now over.

Box 3– Estimate of CERs expected by 2012 as a result of HFC projects (Total: 181 Mt CO2eq.)



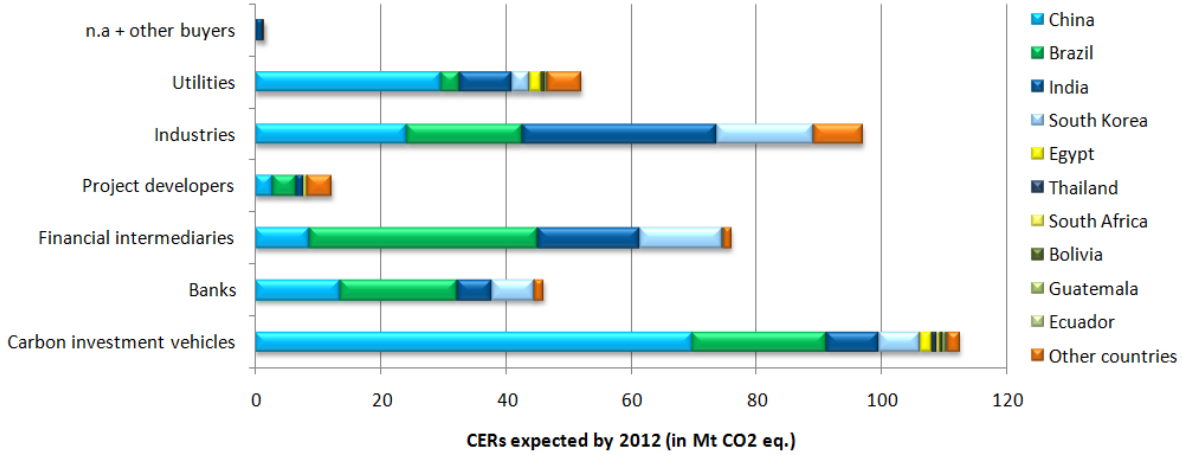
Source: CDC Climat Research based on data from UNEP Risoe, November 2009.

Most credits expected by 2012 from HFC projects will be acquired by: the fund of funds Umbrella Carbon Facility managed by the World Bank (45%), followed by the Japan Carbon Finance fund (19%), Natsource Carbon Asset Pool (15%), Climate Change Capital Carbon Fund (7%), the Spanish Carbon Fund (3%), the Italian Carbon Fund (2%), the Prototype Carbon Fund (2%), ICECAP Carbon Portfolio (1%) etc.

Carbon funds: a majority of credits from CDM developed in China, Brasil and India

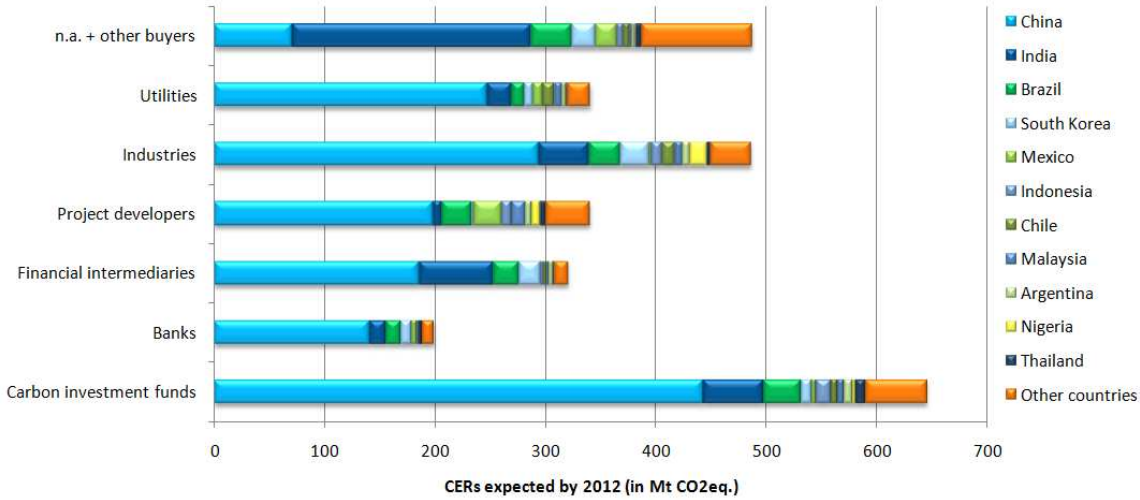
China is still the leading host country for CDM projects between now and 2012, across all categories of credit buyers. In fact, credits delivered to carbon funds in November 2009 mainly came from projects in China (62%), Brazil (19%), India (7%), and Korea (6%). Carbon funds have invested to a lesser extent in around 20 other countries, including Egypt, Thailand, South Africa, Bolivia and Ecuador.

Figure 14 – Estimate of CERs credits delivered by host country and by type of credit buyers (Total: 585 projects, 398 $MtCO_2eq$)



Source: CDC Climat Research based on data from UNEP Risoe, November 2009.

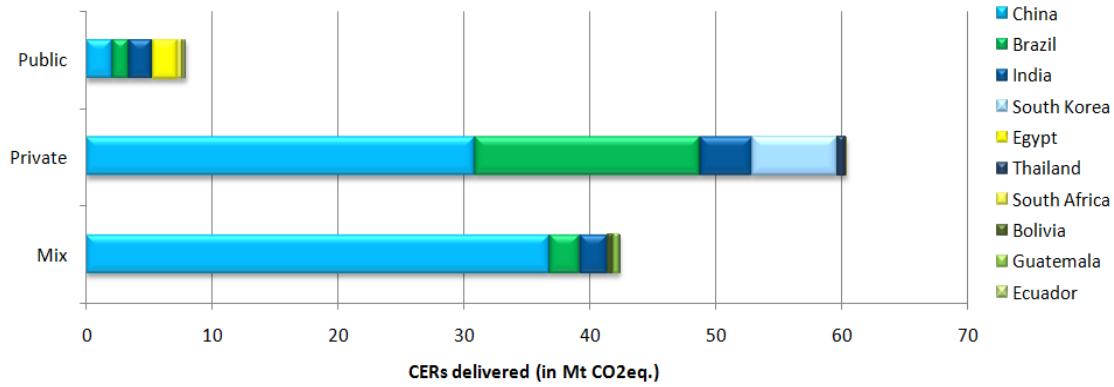
Figure 15 – Estimate of CERs credits expected by 2012, by host country and by type of credit buyers (Total: 4,734 projects, 2.8 $GtCO_2eq$)



Source: CDC Climat Research based on data from UNEP Risoe, November 2009.

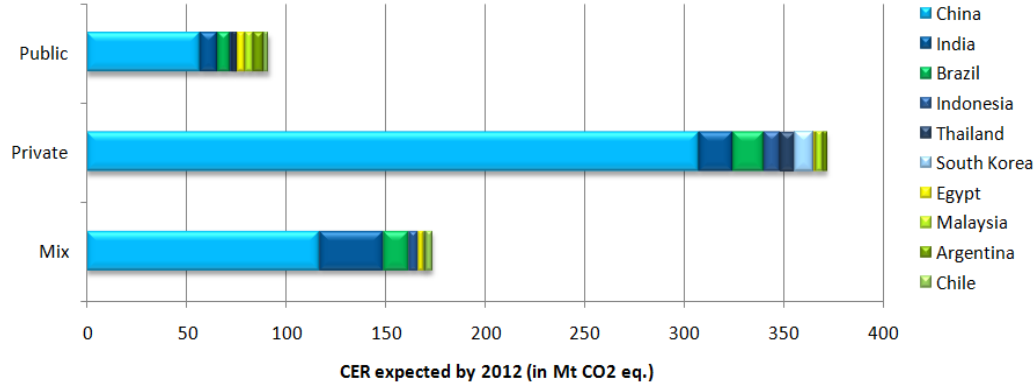
The geographical breakdown of public, private and mixed carbon funds' credit portfolios is not significantly divergent. In November 2009, a significant majority of credits delivered to public, private and mixed carbon funds came from CDM projects developed in China.

Figure 16 – Estimate of CERs credits delivered by host country and by type of carbon funds (Total: 112 Mt CO_2eq.)



Source: CDC Climat Research based on data from UNEP Risoe, November 2009.

Figure 17 – Estimate of the number of CER credits expected by 2012 by host country and by type of carbon funds (Ranking: 10 countries; 637 MtCO_2eq)



Source: CDC Climat Research based on data from UNEP Risoe, November 2009.

Africa accounts for at least 2% of CDM projects recorded and does not benefit from project mechanisms which generate investment flows. The United Nations Environment Programme (UNEP) and Standard Bank announced the launch of a system called the African Carbon Asset Development Facility (ACAD), which aims to provide aid to cover transaction, technical assistance and training costs. By each putting in 1.5 million dollars, this scheme should make it possible to carry out around 10 energy efficiency and renewable energy projects.

B. Carbon funds, the third biggest credits buyers from JI projects

The 15 carbon funds whose portfolio of investments in JI projects will be examined can be characterized as follows:

- 60% are public funds, 20% private funds and 20% mixed funds.
- 12 also buy credits from CDM projects.
- 3 funds invest solely in JI projects: the Baltic Sea Region Testing Ground Facility (TGF), ERUPT New Style and the Netherlands European Carbon Facility (NECF).
- 43% of the 60 JI projects funded by at least one carbon fund are already registered with the UNFCCC or their host country and 55% are going through the process of validation by an appointed operational body.

The *JI Pipeline* indicates that 358 Mt ERUs will be bought by 2012. In January 2010, just 3.8 million – or 1% – had been delivered to their buyers, investors in JI projects.

Table 6 – ERUs already delivered and expected by 2012, by type of credit buyers

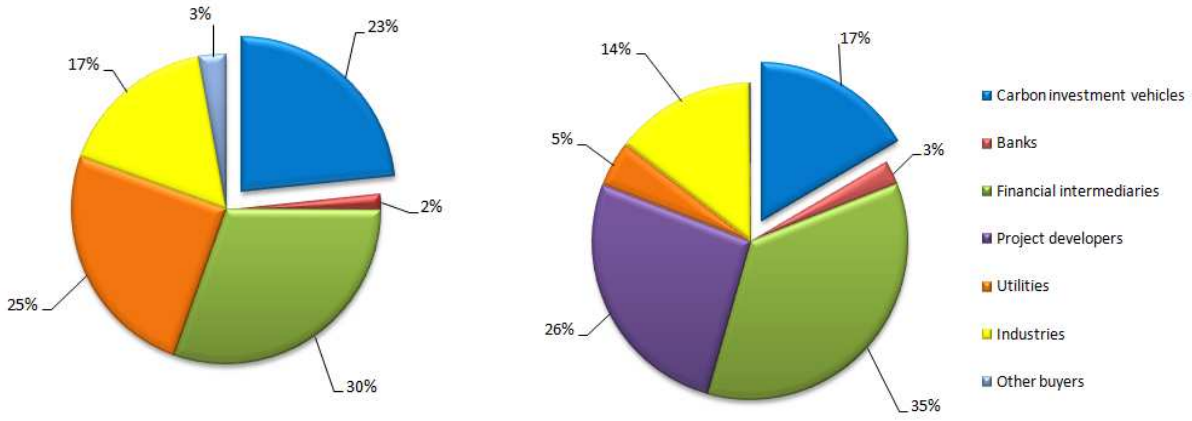
Credit buyers	Number of ERUs delivered	Number of ERUs expected by 2012
n.a. (no information about buyers)	0.107	110
Financial intermediaries	1.151	87
Project owners	-	65
Carbon funds	0.885	40
Industrial companies	0.631	35
Energy providers	0.946	11
Banks	0.065	6
Other buyers	-	0.3
Total	**3.785**	**358**

Source: CDC Climat Research based on data from UNEP Risoe, January 2010.

Carbon funds are the third largest category of ERUs buyers after financial intermediaries and energy companies, whatever the deadline for delivery of credits. Carbon funds represent 23% of buyers of ERUs already delivered and 12% of ERUs buyers for delivery by 2012.

Figure 18 – Estimate of ERU credits delivered and expected by 2012 by type of credit buyers

ERUs delivered (Total: 3.7 $MtCO_2eq$) **ERUs expected by 2012 (Total: 358 $MtCO_2eq$)**

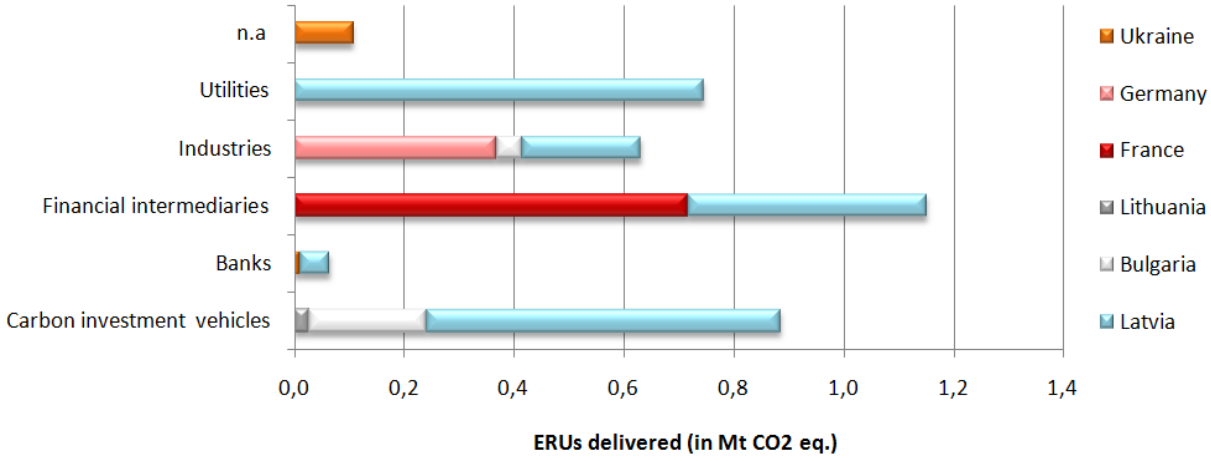


Source: CDC Climat Research based on data from UNEP Risoe, January 2010.

Carbon funds: a majority of credits from JI developed in Russia and Ukraine

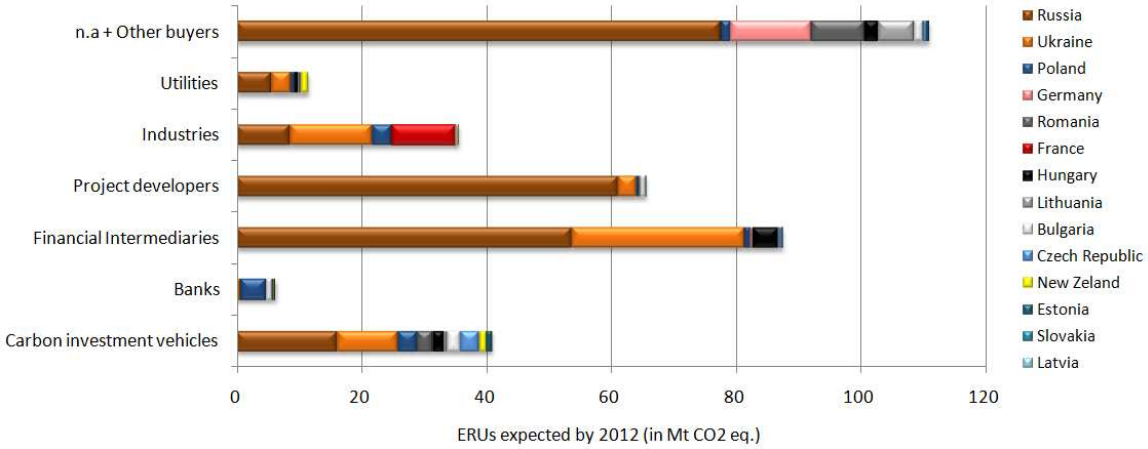
The geographical breakdown of JI credits purchased diverges significantly depending on the delivery period for the credits, whatever the category of purchaser. Analysis of the geographical origin of credits already delivered reveals that at the end of 2009, Latvia, France, Germany and Ukraine were the main host countries for the JI projects which had already delivered credits.

Figure 19–Estimate of ERU credits delivered by host country and type of credit buyers (Total: 24 projects, 3.7 $MtCO_2eq$)



Source: CDC Climat Research based on data from UNEP Risoe, January 2010.

Figure 20 – Estimate of ERU credits expected by 2012 by host country and by type of credit buyers (Total: 243 projects, 358 $MtCO_2eq$)



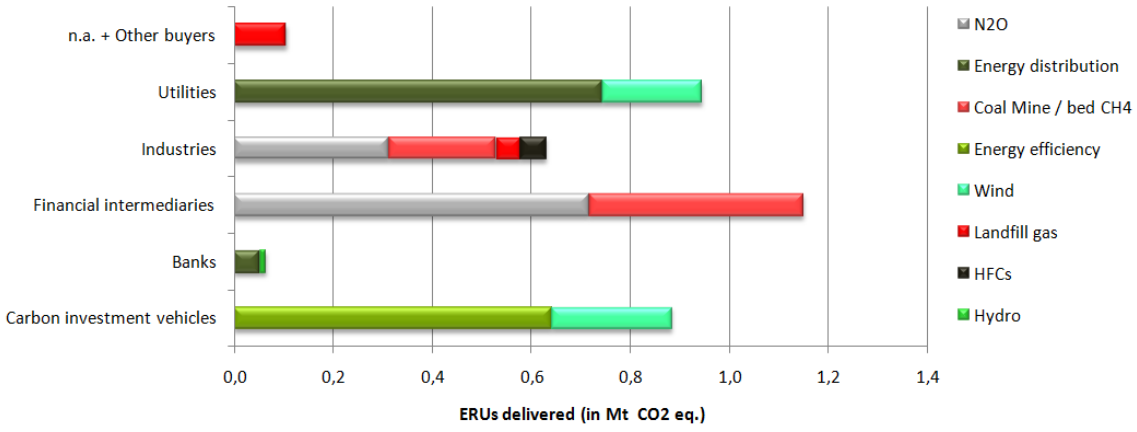
Source: CDC Climat Research based on data from UNEP Risoe, January 2010.

However, analysis of the geographical origin of JI credits expected by 2012 reveals that Russia is considered to be the leading potential source of ERU credits, mainly due to the size of its industrial sector and the sharp decline in its industrial activity since 1990. After several years' hesitation, the Russian government might approve JI projects in the federation: 30 million ERUs have been put to one side for a call for tenders, and the first credits may be delivered by October 2010.

Carbon funds: a majority of credits from JI developed on the energy efficiency

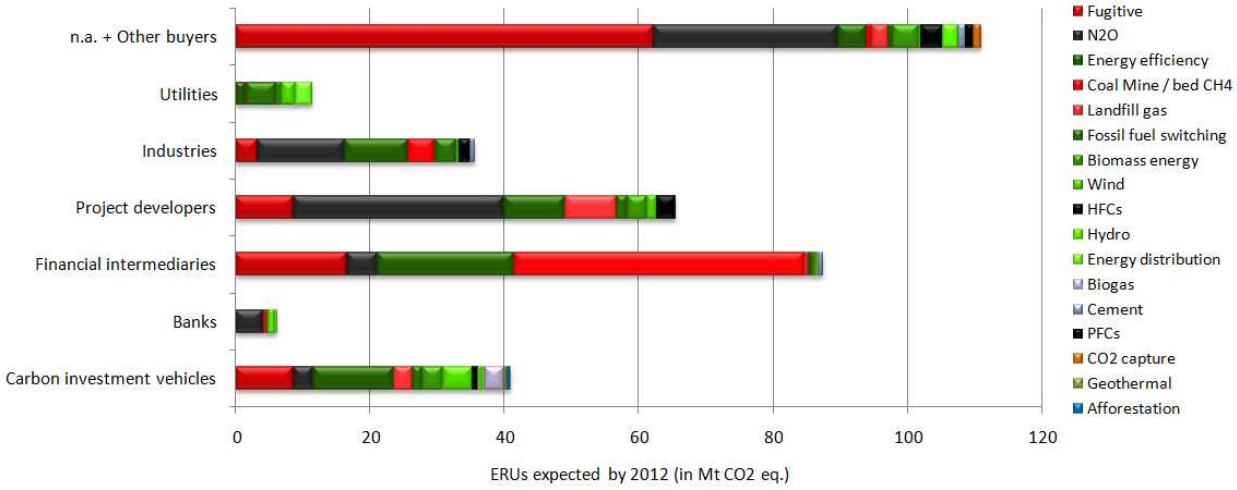
In terms of sectoral breakdown, an analysis of 243 JI projects reveals that, counting all buyers together, investments are moving towards projects involving industrial N_2O emissions reductions, energy distribution, methane reduction, energy efficiency improvements, wind power, flaring and energy recovery from landfill gas, followed by HFC and hydroelectric projects. Similarly to CDM projects, the second wave of credit deliveries are mainly concentrated on projects relating to gas emissions reductions, N_2O, energy efficiency improvements, and methane reduction.

Figure 21 – Estimate of ERU credits delivered by type of project and type of credit buyers (Total: 24 projects, 3.7 $MtCO_2eq$)



Source: CDC Climat Research based on data from UNEP Risoe, January 2010.

Figure 22 – Estimate of ERU credits expected by 2012 by type of project and type of credit buyers (Total: 243 projects, 358 $MtCO_2eq$)

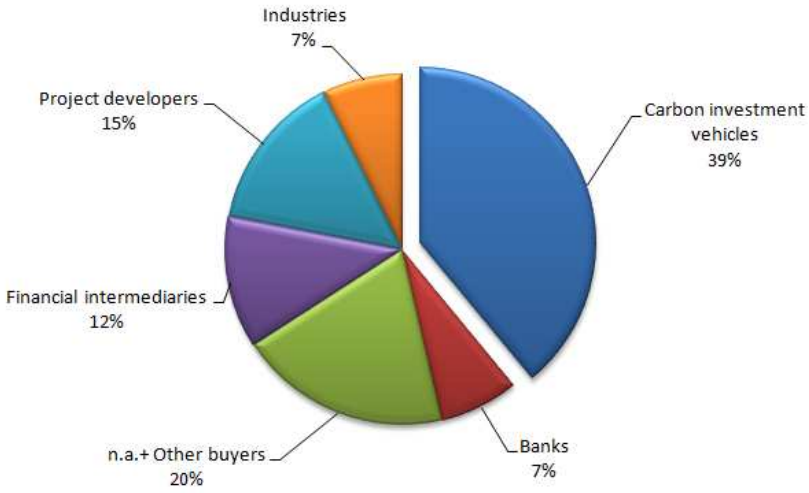


Source: CDC Climat Research based on data from UNEP Risoe, January 2010.

C. Carbon funds, the largest credits buyers from programmatic CDM projects

Forty programmatic CDMs are included in the CDM Pipeline database. The leading investors in programmatic CDM projects are carbon funds: 39% of programmatic CDM projects are funded by at least one carbon fund. Industrial companies or energy providers which purchase credits are still not very involved in programmatic CDM projects.

Figure 23 – Players in programmatic CDMs (Total: 40 programmes)



Source: CDC Climat Research based on data from UNEP Risoe, November 2009.

In terms of geographical distribution, carbon funds mainly finance programmatic CDM projects in China, Bangladesh, Thailand and Vietnam. The geographical breakdown of programmatic CDMs financed by carbon funds includes countries in which traditional CDMs are not developed.

In total, Asian countries (Bangladesh, India, China, Vietnam, etc.) host more than 51% of programmatic CDM projects. In India, Mexico and South Africa, banks and financial intermediaries fund programmatic CDM projects.

Very broadly, programmatic projects are: methane reduction, energy efficiency improvements and solar projects. Carbon funds are currently the biggest players in them and are involved mainly in projects relating to methane reduction, hydroelectric, landfill gas and energy distribution.

Box 4 – Characteristics of programmatic projects

A Programme of Activities (PoA) is a project mechanism developed to extend the reach of CDM/JI projects into sectors in which there was little investment from traditional CDM/JI projects. The programmatic CDM's objective is to reduce transaction costs by aggregating numerous small projects and establishing a flexible structure to extend use of the mechanism to sectors under-represented by CDM.

The programmatic CDM process is similar to that of a traditional CDM in terms of registering the project. The main difference is the appointment of a coordinating body, which must be a stakeholder in the project. Its role is to coordinate the project's implementation and communicate with the CDM management committee. It is also responsible for the Programme of Activities Design Document, the PoA-DD, which sets out the eligibility criteria for projects which want to be included in the programme, particularly determination of the additionality and the procedures to avoid double counting.

In a Programme of Activities, an unlimited number of projects can be introduced at any time in the programme's lifecycle, which must not be longer than 28 years. These projects are called CDM Programme Activities (CPA). Every activity must comply with inclusion and eligibility criteria as defined in the registered Programme of Activities. The term of CPAs may be either 10 years non-renewable or 7 years renewable at most twice.

D. Assessment of the work of carbon funds in CDM/JI emissions reduction projects

As at January 2010, carbon funds had already funded a total of more than 112 million tonnes of emissions reductions as a result of CDM and JI projects, and expect up to 685 million tonnes of emissions reductions by 2012 from the CDM and JI projects they have bought carbon credits from. Integrating delivery risk factors, expected emissions reductions would most likely be around 300 million tonnes.

In terms of CDM projects, carbon funds have already financed more than 112 million tonnes of emissions reductions, mainly as a result of HFC projects (70 million tonnes) and N_2O projects (30 million tonnes), developed in the following countries: 70 million tonnes in China, 20 million tonnes in Brazil, 8 million tonnes in India and 7 million tonnes in South Korea. Between now and 2012, carbon funds are expecting until 685 million tonnes of emissions reductions, mainly as a result of CDM projects developed in the following sectors: 180 million tonnes in HFC gases, 85 million tonnes in hydroelectric projects, 75 million tonnes in landfill gases; and in the following countries: 440 million tonnes in China, 50 million tonnes in India and 30 million tonnes in Brazil.

In terms of JI projects, carbon funds have already financed a little less than 1 million tonnes of emissions reductions, mainly as a result of energy efficiency projects (60%) and wind power projects (22%), in Latvia (70% of credits) and Bulgaria (20%). Between now and 2012, carbon funds are due to finance a maximum of 41 million tonnes of emissions reductions, through CDM projects developed in the following sectors: energy efficiency (35%), gas emissions (20%) and wind power (10 %); and mostly in the following countries: Russia (40%), Ukraine (20%) and Poland (7%).

Carbon funds are distinctive from other carbon credits buyers in several ways:

- In terms of quantities of credits delivered and expected between now and 2012, carbon funds are the leading investors in CDM and programmatic CDM projects. Private funds dominate the sector – they are likely to account for 56% of credits delivered to carbon funds between now and 2012.
- The sectoral breakdown of carbon funds' portfolios of investment in CDM projects does not differ significantly from other investors' (industrial companies, energy providers, project owners, etc.).

Among the various types of carbon funds, private funds' CDM projects have a broader sectoral breakdown than that seen for public or mixed funds. However, the sectoral breakdown of carbon funds' portfolios of investment in JI projects does not differ from other investors' (industrial companies, energy providers, project owners, etc.), since carbon funds have shown a strong preference for JI energy efficiency projects.

- The geographical breakdown of carbon funds' portfolios of investment in CDM and JI projects does not differ significantly from other investors' (industrial companies, energy providers, project owners, etc.). The geographical breakdown of CDM projects is identical for private, public and mixed funds.

IV. THE OUTLOOK FOR INVESTMENT IN EMISSIONS REDUCTIONS PROJECTS

Once the initial stage of development for CDM/JI projects for the period 2008 to 2012 is over, carbon funds, like other types of carbon credits buyers, will look for new investment opportunities in emissions reduction projects.

By 2012, most carbon credits will come from CDM and JI project mechanisms. After 2012, the range of reduction projects will change in three ways:

- some "first generation" HFC and N_2O-type reduction projects will disappear to be replaced by regulatory standards;
- the number of project mechanisms in sectors which are difficult to regulate using cap-and-trade schemes will increase, especially the forestry sector and methane emissions;
- the framework for emissions reduction project mechanisms will change in favour of reformed CDMs and programmatic, sectoral CDMs and domestic offset projects. The architecture of project mechanisms will change, firstly in relation to the international institutional framework established by the Kyoto Protocol and international climate negotiations carried out as part of the UNFCCC for a new post-2012 international climate agreement, and secondly in relation to national and regional regulations establishing cap-and-trade scheme.

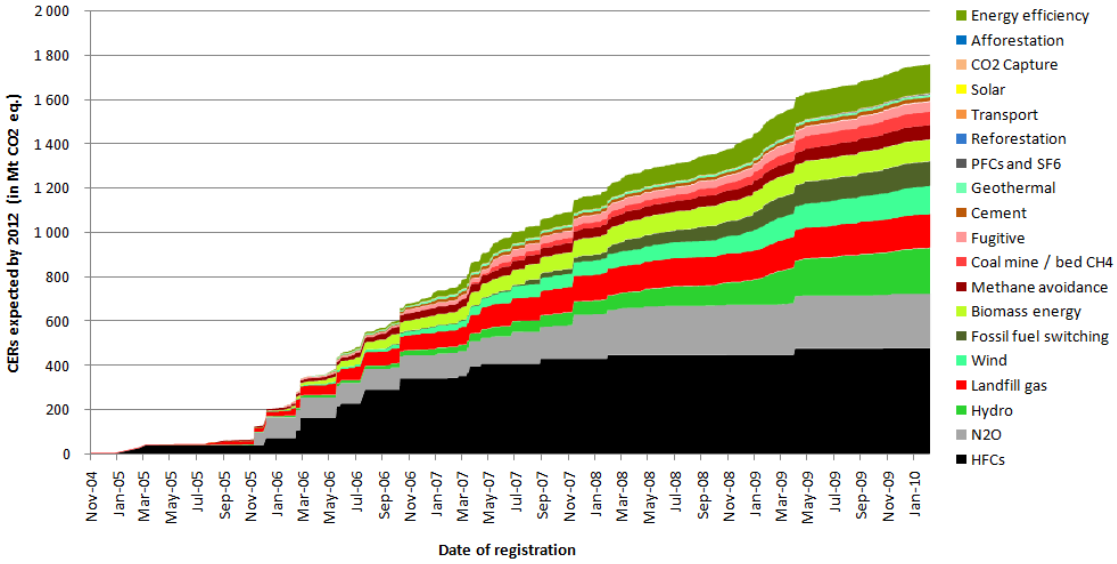
A. Increasing scarcity of reduction projects in the most profitable industrial sectors

In 2010, the "first generation" of investments in the most profitable emissions reduction projects – relating to elimination of HFC and N_2O industrial gases – is now over. While most of the credits obtained by carbon funds between now and 2012 will come from these types of projects, funds are moving their investments into projects tackling hydroelectric, wind power, flaring and energy recovery from landfill gas, as well as reductions in methane from coal mines.

By 2012, nearly 30% of emissions reductions generated by CDM projects will come from large industrial projects to eliminate HFC and N_2O gases. Those HFC and N_2O projects have an emissions reduction potential of 477 $MtCO_2$ and 257 $MtCO_2$ respectively between now and 2012. The popularity of both these types of projects increased rapidly between 2005 and 2008. In November 2007, HFC projects had already reached a reduction level of 400 $MtCO_2$ and N_2O projects stood at more than 200 $MtCO_2$ in May 2008. Figure 24 shows changing trends in emissions reductions from CDM projects according to project types by sector. The graph's line shows the declining potential for emissions reductions from HFC and N_2O reduction projects.

These HFC and N_2O reduction projects therefore have limited development potential beyond 2010. The supply of credits for reducing HFC and N_2O emissions from project mechanisms such as CDMs and JIs will apparently decrease after 2012, when these types of greenhouse gas emissions may be regulated by other economic instruments. Standards regulating fluoride gases, such as the Montréal Protocol (1987) which prohibits the use of CFCs and HCFCs, could in fact replace project mechanisms in reducing emissions of these gases. In response to the decline in supply, demand for carbon credits from HFC and N_2O emissions reduction projects is also likely to decrease in favour of "high quality" environmental projects. After 2013, once an international agreement on climate change has been signed, the European Union is planning to only accept high-quality CDM credits from third-party countries that have ratified the agreement.

Figure 24 – CDM registred projects trends by type of projects



Source: CDC Climat Research based on data from UNEP Risoe, March 2010.

B. Changes to reduction project mechanisms' architecture after 2012

The current architecture of project mechanisms is likely to change after 2013: CDM and JI mechanisms established by the Kyoto Protocol will be improved or transformed, while other emissions reduction project mechanisms, such as sectoral or domestic mechanisms, may be developed at an international or regional level.

Kyoto project mechanisms: CDM and JI

The future of CDM and JI projects depends on two factors: current reform of these project mechanisms undertaken as part of the Conference of the Parties (COP) and the international climate negotiations which will bring to an end or continue the Kyoto Protocol, depending on whether an international climate agreement is signed for the period after 2012.

Reform of CDM and JI project mechanisms

In the framework of the Kyoto Protocol, the current reform of CDM and JI project mechanisms aims to improve their implementation. At the Conference of the Parties (COP) in Copenhagen in December 2009, a dozen decisions were agreed under the UNFCCC, including decision 2[3] and its 60 recommendations relating specifically to project mechanisms.

In respect of CDM projects, the Conference of the Parties calls on the Executive Board of the CDM to simplify the additionality principle, using simplified criteria and standardized methods. It also asks it to establish a procedure, available to project owners, for appealing against its decisions. Finally, it asks the Executive Board to develop appropriate methodologies for countries with less than 10 registered projects, mainly located in Africa, in order to encourage a better geographical distribution of projects. No decision was made on the inclusion of carbon capture and sequestration.

In respect of JI projects, the Conference of the Parties to the Kyoto Protocol called on the Join Implementation Supervisory Committee (JISC) to introduce the concept of "materiality" into the assessment of auditors' work, which should help project validation and verification to run more smoothly.

[3] Decisions adopted by the Conference of the Parties during the meeting of the Parties to the Kyoto Protocol: http://unfccc.int/resource/docs/2009/cmp5/eng/21a01.pdf#page=4

The committee is also invited to offer feedback at the next COP in order to improve the mechanism in the future.

The Copenhagen Accord and the future of the CDM and JI

In December 2009, international climate negotiations reached a key stage in implementing a global climate change policy. The Copenhagen Conference was the culmination of a negotiation process which had begun at the Bali conference in 2007, aiming to reach a post-2012 international climate agreement. A sub-group of 28 heads of state negotiated a text called the "Copenhagen Accord", separate from the Framework Convention (UNFCCC) which "took note" of it. Nevertheless, in February 2010, 55 countries out of the 192 signatories to the UNFCCC signed it. Although they were among the 28 countries which drafted it, China and India have still not signed it as yet.

Between now and the end of the Kyoto Protocol's first commitment period in 2012, the Accord will only have a minor effect on implementation of project mechanisms. However, it may have a significant impact on the development of project mechanisms after 2012. In the absence of an international climate agreement to take over from the Kyoto Protocol, the CDM will remain in place after 2012 until a further decision brings it to an end. There is uncertainty over the demand for credits, firstly from European industrial companies subject to the European Emissions Trading Scheme and, secondly, from players in other regional markets in which draft legislation has been approved or is awaiting approval (New Zealand, United States, etc.).

Without a post-Kyoto agreement, the future of the JI mechanism is more uncertain. However, other mechanisms, implemented in an identical way to reductions projects developed in industrialized countries such as JI, may emerge, particularly in Europe in the context of domestic offset projects established by article 24a of directive 2009/29/EC and other regional projects such as domestic carbon credits created for federal emissions trading schemes in the United States.

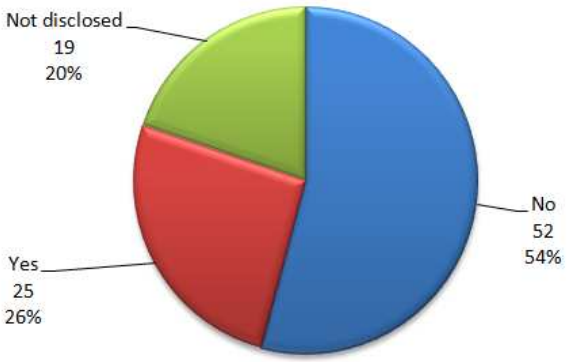
An uncertain investment context post-2012: the sovereign investors return

In early 2010, just after the Copenhagen Conference, the institutional risk in relation to post-2012 investment remains very high for private investors looking for financial gains. That is why many development banks, in their role as pioneers, have already launched products investing in carbon assets post-2012: the Future Carbon Fund from the Asian Development Bank (ADB); the Forest Carbon Partnership Facility from the World Bank; the Post-2012 Carbon Fund, managed by a consortium formed by the European Investment Bank, Caisse des Dépôts, KfW Bankengruppe and Nordic Investment Bank; and the European Kyoto Fund (EKF) managed by Natixis.

Our last report on carbon funds in 2007 indicated that nearly a third of funds wanted to invest in credits generated after the 2008-2012 commitment period. Figure 24 shows that out of the 96 funds identified in 2009, just 25% want to invest in projects post-2012.

In 2010, project owners and other credit buyers face many questions regarding future international climate policy post-2012 and the future level of carbon credit prices, as well as the openness and commitment of buyers to Emissions Reductions Purchase Agreements (ERPAs) signed previously. Investors committing to post-2012 projects are all AAA-rated public financial institutions, preventing any counterparty risk which project owners may face.

Figure 25 – Number of carbon funds wishing to invest in post-2012 emissions reductions projects



Source: CDC Climat Research based on data from Environmental Finance 2010.

China recently confirmed its desire to support post-2012 CDM projects, but only if the prices are "acceptable", in other words similar to those for pre-2012 projects, i.e. more than 8 euros. Previously, China only approved projects if they were based on contracts expiring at the end of 2012. Funds investing in carbon assets will have to adapt to these new institutional changes in any case.

Programmatic CDM/JI project mechanisms: hesitant first steps

The concept of a Programme of Activities (PoA) is set out in Box 4 of this report. This type of project is a project mechanism developed to extend the reach of CDM/JI projects into sectors in which there was little investment from traditional CDM/JI projects. The objective of the programmatic CDM is to reduce transaction costs by aggregating numerous small projects and establishing a flexible structure to extend use of the mechanism to sectors under-represented by CDM. Despite growing interest in this type of project, obstacles to programmatic CDMs persist. This is because the range of methodologies needing to be checked by several entities generates additional workload and significant delays.

Since December 2009, programmatic JI have provided a means of grouping JI projects whose location and start date are still unknown at the time of the registration request and may vary during the fulfilment period. ERUs may be issued during a crediting period beginning on 1st January 2008. However, JI projects implemented since 2006 are also eligible. The crediting period may occur after 2012, but its conditions will be subject to the project mechanisms regime in place post-2012. As of May 2010, 7 PoA are registred in the JI Pipeline, hosted by Germany mainly developped in the energy efficiency of households, of heating boilers, and in biomass.

Towards sectoral project mechanisms

Apart from international CDM and JI credits, new standards for carbon credits issued by project mechanisms may be developed as part of a sectoral approach. The principle of a sectoral approach is to focus a greenhouse gas emissions reduction target on a given sector rather than focussing it on the whole economy. The difficulty in implementing these sectoral mechanisms lies in defining the reference scenario, in particular estimating countries' forecast emissions in these sectors. Despite this limitation, international sectoral agreements offer several potential advantages, particularly in terms of increasing participation. Furthermore, negotiations will be easier to undertake, since there is a small number of actors in these sectors (aluminium, cement, etc.),

At the international level, the Copenhagen Accord does not mention sectoral approaches nor particular sectors outside REDD+. At a regional level, only the European Union has taken a position on the subject, with its proposal to set up "sectoral crediting" systems for industrial sectors with high levels of emissions and which are significantly exposed to international competition. A sectoral agreement could therefore be

reached at an international level for sectors such as cement, aluminium, etc. This proposal by the European Union during the international climate negotiations has so far met a lukewarm response from industrialized and developing countries.

Towards domestic project mechanisms to complement JI

Development of project mechanisms at a national level may become popular after 2012. In Europe, the European Commission has stated that other types of credits may also be used by installations covered by the EU ETS. National credits generated by "domestic" projects could be recognized and managed according to common European rules.

The European Union indicates that if no international agreement is reached, it will be possible to establish bilateral or multilateral agreements between the European Union and other countries in order to obtain carbon credits generated by high-quality projects which can then be traded on the EU ETS. These agreements will therefore enable projects which have produced ERUs up until 2012, but cannot continue to do so under the Kyoto Protocol, to carry on being recognized in the EU ETS. With international climate negotiations continuing in preparation for the Cancun conference in December 2010, it remains unlikely that the European Union will invoke this clause before every possibility of reaching an international agreement is definitely exhausted.

A domestic carbon credits market may also develop in the United States. The Waxman-Markey Bill, which proposed setting up a federal market for trading quotas and which was abandoned in April 2010, planned to accept 1,000 million national carbon credits and up to 1,000 million international carbon credits for the compliance of regulated facilities (with the amount raised to 1,500 million international credits if there are not enough national credits).

C. *Strong development potential for reduction projects in the forestry sector*

Slow growth of CDM projects in the forestry sector

According to estimates by the World Bank, CDM emissions reductions projects in the forestry sector represented just 5.3 $MtCO_2$ in 2008, i.e. 1% of the volume of carbon credits generated by CDM projects, despite the sector's strong potential – changes in use of lands and, above all, deforestation account for 20% of global greenhouse gas emissions.

This slow growth can be explained by the high level of complexity in terms of methodology, accounting, economics, politics, etc. Development of forestry projects in the context of the JI mechanism has proved to be very complicated. Firstly, the appeal of investing via this project mechanism is very low due to the calculation of absorption quotas for Annex I countries[4], and secondly the ability of forestry projects to generate ERU credits is still uncertain. For CDMs, the number of emissions reduction projects set up in the forestry sector has been limited up until now due to the narrow scope of forestation and reforestation projects. Forestation and reforestation projects are likely to generate 0.015 million credits – 0.5% of the total expected number of credits generated by CDMs – between now and 2012.

A favourable international regulatory framework for post-2012: REDD+

Development of reduction projects in the forestry sector should increase after 2012. International climate negotiations under the UNFCCC and, at a regional level, emissions trading schemes authorizing the use of carbon offsetting credits generated by forestry projects, provide a favourable environment for them to grow.

[4] See "*Bringing forest carbon projects to the market*", UNEP, ONFI, AFD, World Bank, (2010).

The Copenhagen Accord recognizes the crucial role of Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) in the fight against climate change, while the Kyoto Protocol deliberately excluded this topic from the debate. It sets out the procedure for establishing a programme, called REDD+, to channel funding from developed to developing countries. These must identify the determining factors in deforestation, actions to reduce it and establish a system for monitoring, inspecting and reporting on forests, in order to produce a reliable estimate of associated emissions. The REDD+ programme should clear the way for funding of emissions reductions projects in this sector supported by public and private investors, such as carbon funds. Several questions concerning the environmental integrity of emissions reductions generated by REDD programmes are being debated, such as the scale and scope of the programme, the reference scenario based on historic or estimated emissions, additionnality and the breakdown of the carbon "rent" (between project owners, investors and the host country).

In 2009, Indonesia was the first country to set up a regulatory framework for REDD projects, establishing rules for the management and distribution of the large revenues resulting from the carbon credits between the various participants: the government, the indigenous people and the project's investors. Indonesia aims to create a national agency to supervise its REDD projects and programmes by the end of 2010.

At a regional level, climate policies are also sending out a number of signals promoting the development of forestry credits, by proposing emissions trading schemes authorizing the use of credits generated by REDD+ projects. This is particularly true of the United States, for instance, where the Waxman-Markey and Kerry Boxer Bills proposed the implementation of a federal emissions trading scheme, including the possible inclusion of forestry carbon credits among the two billion credits from projects which would be able to be used each year by industrial facilities covered by the system. Several other regional cap-and-trade systems, such as New Zealand's and those due to be set up in Australia and Japan, expect to be open to forestry carbon credits.

Conversely, the European Union remains hesitant in recognizing forestry carbon credits. The Energy-Climate Package's Directive 2009/29/EC[5], which defines the rules for the third period of the EU ETS (2013-2020), leaves the door open to this type of credit, although this position remains dependent on a "satisfactory" international agreement for post-2012. The European Union expects that some of the revenue from auctioning the allocation of allowances during phase III could also be used to fund REDD+ projects.

First initiatives by carbon funds in the forestry sector

The situation for forestry projects in the post-2012 period remains very uncertain. Nevertheless, the first investment initiatives in forestry projects have emerged. The World Bank was a pioneer in 2008, with the development of the Forest Carbon Partnership Facility (FCPF). The FCPF was launched to prepare tropical and sub-tropical countries for a future REDD programme to encourage emissions reductions. The fund will coordinate transactions generated by these countries in order to test and demonstrate the reliability of the future system.

In 2009, 37 countries in Africa, Asia-Pacific and Latin America took part in the FCPF and 13 investors and contributors from the public and private sector provided finance for the fund. Eleven countries, including Australia, Finland, Norway, Spain, Japan, Switzerland, the UK, the United States and France, committed to funding of 107 million dollars. The investment target is 385 million dollars, 180 million of which will be spent on preparation and development of the system in the 37 selected countries in Asia, Central and Latin America and Africa, and 200 million on creating a carbon fund.

Other initiatives by carbon funds dedicated to funding emissions reduction projects in the forestry sector may emerge between now and 2012.

[5] Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0063:0087:FR:PDF

CONCLUSION

Since the emergence of the first fund investing in projects to reduce greenhouse gas emissions, between 1999 and 2009 carbon funds have contributed significantly to reducing emissions by financing CDM and JI projects. This report sets out all the characteristics of carbon funds active in 2009.

The development of carbon funds has accelerated since 2005. Launched in 1999 with the creation of the World Bank's Prototype Carbon Fund, the carbon funds industry numbered 96 funds investing in emissions reduction projects in 2009, compared with 66 in 2007. These 96 carbon funds declared a total capitalization of 10.8 billion euros in 2009, representing a 54% increase in capital since 2007. The majority of carbon funds are private (48% compared with 29% public funds), buy credits directly (52% compared with 23% of funds investing in CDM/JI projects), and invest according to a regulatory compliance objective (55% compared with 42% of funds which only declare a financial profitability objective). In the end, this study shows the wide range of investment strategies, objectives and approaches taken by the 96 carbon funds in relation to CDM and JI projects.

The study reveals that, as at January 2010, carbon funds had funded a total of 113 million tonnes of emissions reductions as a result of CDM and JI projects, and expect up to 685 million tonnes of emissions reductions by 2012 from the CDM and JI projects they have bought carbon credits from. Integrating delivery risk factors, expected emissions reductions would most likely be around 300 million tonnes. Carbon investment funds are the leading purchasers of credits generated by CDM projects (28% of credits delivered), followed by industrial investors (25%), financial intermediaries (19%) and energy providers (13%), and the third largest purchasers of credits generated by JI projects.

In 2009, the carbon funds sector completed the first stage in its development: the "first generation" of investments in the most profitable emissions reduction projects – relating to HFC and N_2O gases – is now over. Although most of the credits obtained by carbon funds between now and 2012 will come from this type of project, funds are moving their investments into projects tackling hydroelectric, wind power, flaring and energy recovery from landfill gas, as well as reductions in methane from coal mines. The challenge is to find new investment opportunities in emissions reduction projects. These reduction project mechanisms are likely to develop in three ways in the future: "first generation" projects will be replaced by regulatory standards; project mechanisms in the agro-forestry sector, which cannot be regulated using quota systems, will increase; and new programmatic and sectoral project mechanisms will develop.

In conclusion, 2010 seems to have been a pivotal year for the carbon funds industry, with a record number of funds and capital committed, the completion of the "first generation" of investments in the most profitable emissions reduction projects relating to HFC and N_2O gases, combined with a lack of clarity over the future frameworks of international climate policy post-2012 and CDM and JI project mechanisms. It is therefore imperative we have clarification on the future institutional regime governing the carbon credits market after 2012, in order to create a new dynamic for a second generation of investments in emissions reduction projects by carbon funds over the coming years.

ANNEX I: METHODOLOGY

A. Method used to collect data on active carbon funds

The study identifies 96 carbon investment funds active in 2009 and assesses the investments of 46 carbon funds which financed CDM/JI projects that had delivered credits at the end of 2009 or are expected to deliver credits by 2012. The carbon funds were identified and their investment activity assessed according to the selection criteria and databases presented below.

Identification of carbon investment funds

Data on carbon investment funds was collected using three databases:

- The Environmental Finance database, constructed using the CD-Rom "Le guide des fonds carbone de 2008 à 2010" (Guide to carbon funds from 2008 to 2010). This database lists most existing carbon funds, giving their creation date, investment start and end dates, amounts raised and sometimes invested, as well as a non-exhaustive list of the funds' investors.
- The UNEP-Risoe CDM Pipeline database (data as at November 2009) listing the 4734 clean development mechanism (CDM) projects. This database sets out all the projects' characteristics, including credits buyers.
- The UNEP-Risoe JI Pipeline database (data as at January 2010) listing the 243 Joint Implementation (JI) projects. This database sets out all the projects' characteristics, including credits buyers.

Selection of carbon investment funds

The carbon funds were selected according to the following three criteria:

Activity: a carbon fund raises capital from private or public investors who help fund Kyoto projects. CDM/JI projects deliver carbon credits to the carbon fund, which it then passes on to the investors up to the amount of their investment. We have excluded the EDF Carbon Fund since this fund only raises capital from EDF and its subsidiaries and is not open to other investors. This fund has been listed in the "energy providers" category of buyers.

Governance: a carbon fund may be managed:

- by a management company, whose legal structure is independent of investors, and which manages the financing of carbon assets and/or projects on behalf of these same investors,
- by one of the carbon fund's investors that has the internal asset management skills.

Most carbon funds analyzed in the study have chosen to be managed by an independent management company reporting to the investors. Only management of the KfW Carbon Fund is carried out internally by the KfW group. The bank invests jointly with the German government and industrial companies subject to the European CO_2 Emissions Trading Scheme and also manages the fund's investments.

Investment time horizon: carbon funds have a limited lifecycle containing three stages:

- one (or more) subscription stages (fund-raising period),
- an investment stage,
- and a disinvestment stage.

Treatment of double counting for investments

Double counting of amounts invested in carbon funds has been negated. Capitals raised by the funds of funds have been subtracted from the capitals of the carbon funds in which they have invested. For example, the World Bank's Umbrella Carbon Facility, whose capitalisation is calculated at 776 million euros, has not been included in the analysis of capital, because the fund includes other carbon investment funds. It has therefore been excluded from the financial calculations to avoid existing funds in which it has invested being counted twice.

B. Analysis of carbon funds' investments in CDM/JI projects

The second half of the study provides an analysis of investments by the 49 funds in CDM/JI projects, compared with those of other carbon credits buyers (e.g. industrial companies, project owners and financial intermediaries), taking into account estimates of credits delivered and expected between now and 2012 and 2020, as supplied by UNEP-Risoe.

Identification of carbon funds as credits buyers

The analysis of credit buyers was carried out using the UNEP-Risoe CDM Pipeline and JI Pipeline databases. Credits buyers have been ranked by "category" according to the following segmentation:

- Carbon funds
- Industrial companies
- Energy providers
- Financial intermediaries
- Banks
- Project owners
- Other buyers

Public funds, governmental credit purchasing schemes and mixed funds were easily identifiable in UNEP-Risoe's CDM Pipeline and JI Pipeline databases. Identifying private carbon funds was much more difficult, however, mainly due to the intermediation of management companies in their investment in the primary carbon credits market. Using the Environmental Finance database, most management companies associated with carbon funds, operating directly on the primary market to purchase credits generated by CDM/JI projects, were identified. Where management companies manage several funds and we did not have sufficient public information, we associated them with a particular fund, or governmental credit purchasing scheme in the case of government agencies.

For example, we associated the following companies with the stated carbon fund.

Table 7 – Management companies associated with carbon funds

Asset management company or government agency	Carbon investment fund
Natixis	European Carbon Fund (ECF)
Rabobank	Rabobank Dutch Government Carbon Facility
Asian Development Bank	Asia Pacific Carbon Fund
Danish Energy Agency (DEA)	Denmark JI/CDM Programme
Sindicatum	Austrian JI / CDM programme
KfW	KfW Carbon Fund
NEDO	Kyoto Mechanisms Credit Acquisition Program
Natsource	Natsource Carbon Asset Pool (NAT CAP)

Perimeter of CDM/JI projects invested in by carbon funds

Using the UNEP-Risoe databases, each CDM/JI project was associated with a category of purchaser. If the purchaser of a project's credits could not be identified, the project was listed in the "unidentified" category of purchaser.

- the CDM Pipeline database lists 5513 CDM projects. Among CDM projects which delivered credits, 97% of projects were associated with a purchaser. For projects whose delivery of credits is expected by 2012, 70% were associated with a purchaser.
- the JI Pipeline database lists 272 JI projects. Among JI projects whose delivery is expected by 2012, 75% were associated with a purchaser.

Both UNEP-Risoe databases provide the current state of progress of each CDM/JI project in registering with the United Nations Framework Convention on Climate Change (UNFCCC). UNEP-Risoe defines 10 registration progress statuses, of which only the following six have been included in the study: "validation in progress", "registered", "correction request", "registration request", "review request" and "review in progress". Projects with greyed-out statuses in the table below have been excluded from the study. In all, this has meant that 13% of CDM projects and 7% of JI projects have been excluded from the analysis.

Table 8 – Status statistics for CDM/JI projects

Status	CDM		JI		Programmatic CDM		Programmatic JI		Total
At validation	2,581	46.8%	169	62.1%	38	95.0%			**2,789**
Registered	1,873	33.9%	85	31.2%	2	4.8%	6	100%	**1,966**
Validation terminated	470	8.5%							**470**
Validation negative	143	2.5%							**143**
Rejected	126	2.2%	1	0.3%					**126**
Correction request	114	2.0%							**114**
Registration request	109	1.9%							**109**
Review request	40	0.7%							**40**
Withdrawn	40	0.7%	17	6.2%					**57**
Under review	17	0.3%							**17**
Total	5,513	100.0%	272	100%	40	100	6	100%	5,831
Total projects of the study	**4,734**		**243**		**40**		**6**		**5,023**

Source: CDC Climat Research based on data from UNEP Risoe, November 2009 and January 2010.

Projects which have not been associated with credits buyers are mainly undergoing "validation". The purchaser's identity is generally filled in during the phase following the registration process.

Calculation assumptions for the breakdown of credits between buyers

Between different products in a single credit purchasing programme

A single management company may manage several carbon funds or investment programmes. When we did not have sufficient information to allocate the CDM/JI projects between the different funds, the credits were assigned to the oldest fund managed by the management company.

Between investors in a single carbon fund

1. When no data was available in the CDM Pipeline and JI Pipeline databases or the Project Design Document (PDD)[6] on the breakdown of investment amounts between investors, we used the calculation assumption of an equal distribution of credits between investors in a single carbon fund.

The assumption of equal distribution of credits does not significantly change the data since in most cases, the carbon fund is the sole purchaser of credits from a project. In fact, out of the 787 projects involving at least one fund, 646 projects involve only one fund. Conversely, some projects are jointly financed by a fund and other players (financial intermediaries and/or industrial companies). For example, Project 0115 "GHG emission reduction by thermal oxidation of HFC 23 at refrigerant (HCFC-22) manufacturing facility of SRF Ltd" which involves several funds, including: ICECAP, Climate Change Capital Carbon Fund, EDF trading and around 10 other financial institutions. When sufficient public information was available, the breakdown of credits between the different investors was estimated for each project based on recorded transactions.

2. When several subsidiaries of a single industrial group covered by the European Union Emissions Trading Scheme (EU ETS) feature in the PDD document, we have aggregated credits delivered and expected by 2012 to the parent company, on the assumption that the parent company centralizes the allocation of credits to all its subsidiaries.

Correcting effects of errors

The "Swiss hub" effect prior to connecting the ITL-CITL databases. Connecting the two international (ITL) and European (CITL) databases was a prerequisite for ensuring delivery of the Kyoto credits to the national accounts of European investors. Originally credit transactions came via the Swiss national register, which was connected to the ITL before the national registers of European Union member states began to be in October 2008. In order to tackle this technical problem limiting delivery of credits, a temporary solution used by many carbon funds involving European investors was to associate Switzerland as an investor, in order to have the credits generated by the projects delivered to the Swiss register. We have therefore removed Switzerland as an investor from projects registered before October 2008 and involving the subsidiary of an already-identified investor that is present in Switzerland. However we have included the involvement of Swiss investors for projects registered after October 2008.

C. *Limitations of the study*

The results presented in this study have limitations as a result of the access to and validity of information and data collected. The second part of the study lists 96 carbon funds and presents their different characteristics. All the results and statistics presented have come partly from analysis of declarations of information collected by Environnemental Finance. The third part of the study examines CDM and JI projects generating credits bought by at least one carbon fund. Analysis of the UNEP-Risoe databases identifies 46 carbon funds directly involved in projects.

There are three reasons for the difference between the 96 carbon funds identified and the 46 carbon funds whose CDM/JI projects' characteristics were examined:

- Some carbon funds are still in their fund-raising period and have not yet begun buying carbon credits.
- Some carbon funds do not have a CDM/JI project at the validation and registration stage in the UNFCCC procedure.
- Some carbon funds have not been included due to non-identification of the financial intermediaries or management companies which will manage them.

[6] Various project PDDs are available on the UNFCCC website. www.unfccc.int

The number of emissions reduction credits from CDM/JI project mechanisms expected between now and 2012 remain estimates based on analysis of the data included by project owners in their PDD. These credit amounts expected by 2012 do not take account of delays and delivery risks.

ANNEX 2: TABLE OF CARBON FUNDS

Table 9 – The 96 carbon funds actives in 2010 by date of launch *

Date of launch	Name of carbon fund
1999	Prototype Carbon Fund (PCF)
2001	CERUPT
2002	Swedish JI/CDM Programme (SICLIP - Swedish International Climate Investment Programme)
	Netherlands Clean Development Mechanism Facility (NCDMF)
	IFC-Netherlands Carbon Facility (INCaF)
	Community Development Carbon Fund (CDCF)
	CAF-Netherlands CDM Facility (CNCF)
2003	Rabobank-Dutch Government Carbon Facility
	Netherlands Emissions Reduction Cooperation Fund (NERCOF)
	Italian Carbon Fund (ICF)
	BioCarbon Fund (BioCF)
	Austrian JI / CDM programme
2004	Spanish Carbon Fund (SCF)
	Netherlands European Carbon Facility (NECF)
	KfW Carbon Fund
	Japan Greenhouse Gas reduction Fund (JGRF)
	ICECAP Carbon Portfolio (ICP)
	Flemish Government JI/CDM Tender
	FE Global-Asia Clean Energy Services Fund
	Denmark JI/CDM Programme
	Baltic Sea Region Testiong Ground Facility (TGF)
	Austrian CDM Project Procurement and CER Sale Facility
2005	Trading Emissions Plc (TEP)
	Merzbach Carbon Finance (MCF)
	Japan Carbon Facility
	Greenhouse Gas-Credit Aggregation Pool
	European Carbon Fund (ECF)
	ERUPT New Style
	Danish Carbon Fund (DCF)
	Climate Cent Foundation
	CAF-Spain Carbon Initiative (Iniciativa Iberoamericana del Carbono)
	Belgian JI/CDM Tender
	Argentine Carbon fund
2006	RNK Capital LLC
	Portuguese Carbon Fund (FPC)
	Multilateral Carbon Credit Fund (MCCF)
	Luso Carbon Fund
	Kyoto Mechanisms Credit Acquiqition Program
	Japan Carbon Finance (2nd and 3rd facilities)
	Fondo de Carbono para la Empresa (FC2E)
	Finnish Carbon Procurement Programme (Finnder)
	European Clean Energy Fund
	Climate Change Capital Carbon Fund
	Carbon Assets Fund

Date of launch	Name of carbon fund
2007	UK Government Carbon Offsetting Fund
	Peony Carbon Fund
	Norwegian Carbon Purchase - Carbon Neutral Norway
	Natsource Asset Management Private Funds & Separate Accounts
	Merzbach Carbon Finance Fund (MCFF)
	MDG Carbon Facility
	Leaf Clean Energy Company
	Korea Carbon fund
	KlimaInvest
	Istithmar & Sindicatum Climate Change Partnership
	Irish carbon Fund
	Green Initiative Carbon Assets (GICA)
	Fine Carbon Fund
	FE Global Clean Energy Services Fund IV
	European Kyoto Fund (EKF)
	Energy Austria CDM Portfolio
	EIB-KfW Carbon Programme
	Climate Change Investment I
	Carbon Fund for Europe (CFE)
	Asia-Pacific Carbon Fund
	Arkx Carbon Fund
	Akeida environmental Fund
2008	Swiss Re/Arreon Carbon Facility
	Sri Lanka Carbon Fund
	Small-Scale Austria/ Germany CDM Portfolio
	Post-2012 Carbon Credit Fund
	Nordic Carbon Fund (NCF)
	NEFCO Carbon Fund (NeCF)
	Natsource Carbon Asset Pool (NAT-CAP)
	India Carbon fund
	GVI Global Carbon Trading
	GreenStream Nordic Carbon Pool
	Green India Venture fund
	Forest Carbon Partnership Facility (FCPF)
	Fonds carbone Post 2012
	Carbon Capital Fund Morocco
	Financial Emissions Fund
	Dexia Carbon Fund
	Climate Change Investment II
	CE2 Carbon Capital
	Carbon Assets Fund II
	Brazil Sustainability Fund
	ADB Climate change Fund

Date of launch	Name of carbon fund
2009	Terra Bella Carbon Fund
	Korea Eximbank Carbon Fund
	GTS Global Climate Fund
	GreenStream Post-2012 Climate Opportunity
	Glacier Environmental Fund
	Future Carbon Fund
	Da Vinci Green Falcon Fund
	CF Carbon Fund II
2010	Africa Carbon Fund

** The list of 96 funds does not include funds that were closed before the end of their term investment and those that were closed at the end of investment period.*

Source : CDC Climat Recherche, based on data from Environmental Finance, Point Carbon, funds'websites.

Table 10 –The 15 carbon funds identified in the database UNEP Risoe-JI Pipeline

Name of carbon funds
Austrian JI/CDM Programme
Baltic Sea Region Testing Ground Facility (TGF)
Belgian JI/CDM Tender
Climate Cent Foundation
Climate Change Capital
Danish Carbon Fund (DCF)
Denmark JI/CDM Programme
Dutch JI/CDM Programme
ERUPT
Finnish Carbon Procurement Programme
Japan Carbon Finance
Netherlands Emissions Reduction Cooperation Fund (NERCOF)
Netherlands European Carbon Facility (NECF)
Prototype Carbon Fund (PCF)
Swedish JI/CDM Programme

Table 11 –The 46 carbon funds identified in the database UNEP Risoe-CDM pipeline

Name of carbon funds
Asia-Pacific Carbon Fund
Austrian JI/CDM programme
Belgian JI/CDM Tender
BioCarbon Fund
Bunge Emissions Fund *
CAF
Carbon Assets Fund
Carbon Fund for Europe (CFE)
CERUPT
Climate Cent Foundation
Climate Change Capital Carbon Fund
Climate Change Investment
Community Development Carbon Fund (CDCF)
Danish Carbon Fund (DCF)
Denmark JI/CDM Programme
Dutch JI/CDM programme
EcoSecurities - Standard Bank Carbon Facility
Energy Austria CDM Portfolio
European Carbon Fund (ECF)
Fine Carbon Fund
Finnish Carbon Procurement Programme
Fondo de Carbono para la Empresa
Fonds de financement des mécanismes de Kyoto
Grey K Environmental Fund*
ICECAP Carbon Portfolio
IFC-Netherlands Carbon Facility (INCaF)
Istimar & Sindicatum Climate Change Partnership
Italian Carbon Fund (ICF)
Japan Carbon Finance
KfW Carbon Fund
Kyoto Mechanisms Credit Acquisition Program
Luso Carbon Fund
Natsource Carbon Asset Pool (NAT-CAP)
NEFCO carbon fund
Netherlands Clean Development Mechanism Facility (NCDMF)
Netherlands Emissions Reduction Cooperation Fund (NERCOF)
Nordic Carbon Fund
Norwegian Carbon Purchase
Peony Carbon Fund
Prototype Carbon Fund (PCF)
Rabobank-Dutch Government Carbon Facility
Spanish Carbon Fund (SCF)
Swedish JI/CDM Programme
Swiss Re/Arreon Carbon Facility
Trading Emissions
Umbrella Carbon Facility

These funds have been closed at the end of investment period.

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