



- Identifying opportunities
- Getting started

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Developing a CDM or JI project to reduce greenhouse gas emissions

- Identifying opportunities
- Getting started





MINISTRE D'ÉTAT
MINISTER FOR ECOLOGY, ENERGY,
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MINISTER FOR ECONOMY,
INDUSTRY AND EMPLOYMENT,
WITH RESPONSIBILITY FOR
FOREIGN TRADE

Paris, November 26th 2008

***F**ighting climate change is a worldwide challenge, which cuts across divisions between North and South and demands action from every country. It is also a factor of peace, as the Nobel Committee made clear with its award to the former US Vice President Al Gore and to the Intergovernmental Panel on Climate Change. Finally, climate change raises a major economic challenge: although very large investments will be needed to fight climate change, inaction would cost humanity far more than the preventive measures we must take to reduce greenhouse gas emissions.*

At the conference on climate change held in Bali in December 2007 under the aegis of the United Nations, an international consensus emerged, with, for the first time, support from the United States and China in particular to an ambitious target for the reduction of greenhouse gas emissions. This was a necessary first step, but it will not be sufficient to contain global warming to less than 2°C by 2100.

France, which has made action on climate change a priority during its European Union Presidency in the second half of 2008, will continue to work towards a binding, effective and equitable multilateral system to control greenhouse gas emissions across the world.

The Grenelle Environment Forum organised at the end of 2007 brought sustainable development to the core of French Government action. The success of the forum clearly shows the strength of potential mobilisation towards innovative and environmentally sound economic development.

This is the context which has prompted us to commission this publication.

The Kyoto Protocol (December 1997), which brought recognition of our climate as a global public good that we all need to protect, was a historic event. One of the Protocol's characteristics is the introduction of project mechanisms that promote emission reductions where they can be achieved at least cost: Joint Implementation (JI) and the Clean Development Mechanism (CDM).

More than 1 000 projects have now been registered with the United Nations. Ultimately, they could help to avoid emissions amounting to a total of several billion tonnes of CO₂ equivalent. The CDM and JI project mechanisms, which are based on an increasingly robust financial market, are making valuable contributions to efforts to reduce greenhouse gas emissions.

It is important that economic players, with French companies in the forefront, and non-governmental organisations alike, should have as much useful information as they need to understand and make use of these mechanisms. This is one of the objectives we set for this Guide, which we required to be as clear and easy to follow as possible.

Although there are still a great many questions that cannot be ignored as to post-Kyoto developments, we believe that these project mechanisms should find their rightful place within the multilateral system that will be needed as a framework for efforts to reduce greenhouse gas emissions as from 2013 – a multilateral system that could draw on the exemplary commitments made by the European Union for the period up to 2020.

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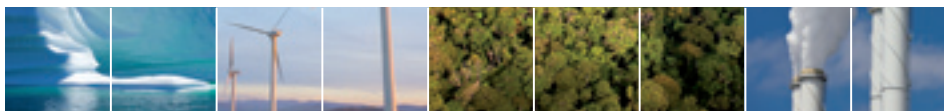
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The role of CDM and JI project mechanisms in international climate change strategy

1.1 The emergence of CDM and JI project mechanisms as operational instruments to support the delivery of Kyoto Protocol objectives

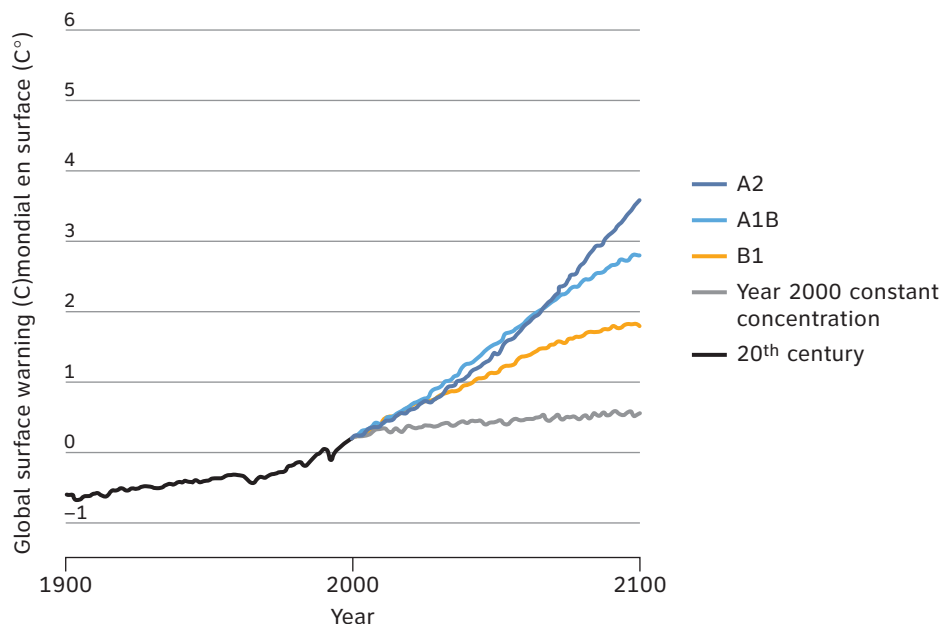
Climate change, which is mainly a result of increasing greenhouse gas emissions from human activities, is now widely recognised and confirmed by reports from the Intergovernmental Panel on Climate Change (IPCC).

Without drastic reductions in greenhouse gas (GHG) emissions, the climate will change rapidly with grave consequences for the world's populations and economies (droughts, floods, sea level rise and increasingly frequent extreme weather events).

Climate change projections – IPCC emission scenarios

If GHG emissions continue at current levels (scenarios A1B and A2) or higher, this will produce additional warming that will cause multiple changes in the global climate system throughout the 21st century, and most probably on a larger scale than the changes observed so far. For the moment, the negotiations leading up to the post-2012 period

(following the current Kyoto Protocol commitment period) are aiming to ensure that global surface temperatures do not rise by more than +2°C (scenario B1), which means that worldwide emissions must be cut by half by 2050, and by a factor 4 in industrialized countries over the same period.



Source: Climate Change Report 2007. Contribution from Working Groups I, II and III to the 4th Climate Change Assessment Report, Intergovernmental Panel on Climate Change, IPCC, 2007. The gray line shows GHG concentrations held at Year 2000 levels.

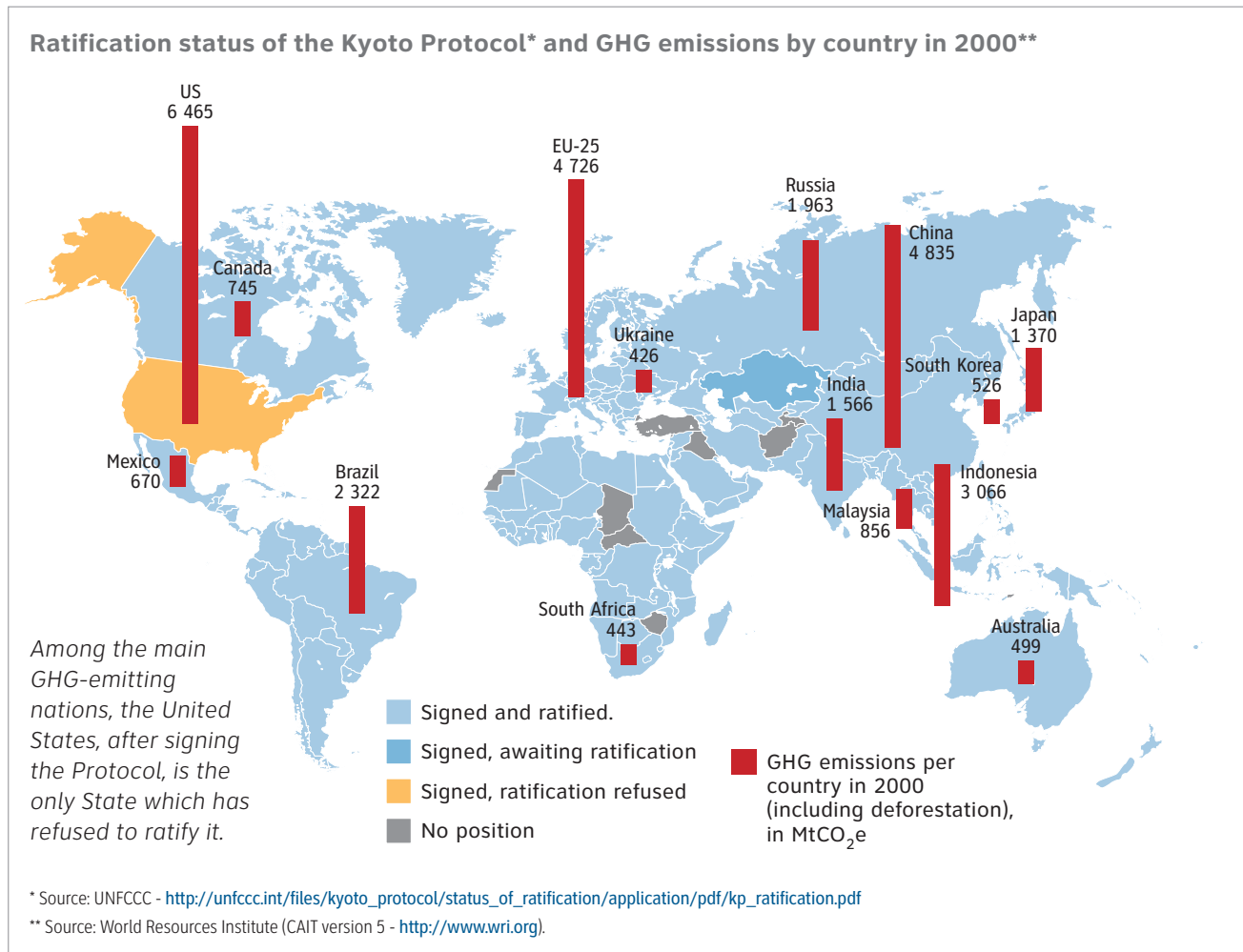
1 - For further details, see Annex 1, page 51 – **The international framework for climate change strategy.**

2 - UNFCCC, United Nations Framework Convention on Climate Change - <http://unfccc.int/>

In order to act against threat of such gravity, the international community has already adopted two agreements^[1]:

- **The United Nations Framework Convention on Climate Change (UNFCCC)**^[2], adopted in 1992 in Rio de Janeiro;

- **The Kyoto Protocol**, adopted in 1997, which sets out quantified and binding commitments to limit or reduce GHG emissions for 40 industrialised countries and countries undergoing transition to a market economy, during the period from 2008 to 2012.



In order to comply with their commitments, these countries are required to implement priority regional or national policies and measures to reduce GHG emissions. Three market mechanisms, known as the “Kyoto Protocol flexible mechanisms”, have been designed to support these efforts:

- **A mechanism for trade in national GHG emission quotas** between

countries which have ratified the Kyoto Protocol (emissions trading);

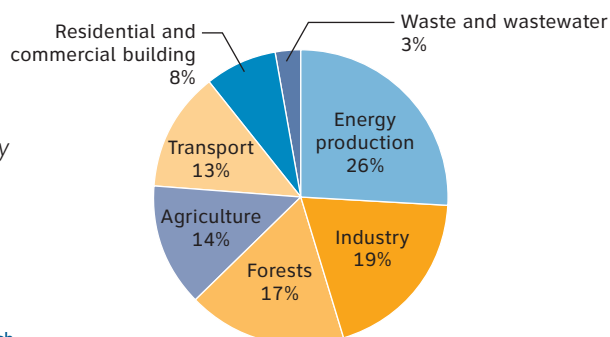
- **Two project mechanisms**, known as Joint Implementation (JI) and the Clean Development Mechanism (CDM).

Their purpose is to limit the cost of reducing GHG emissions by encouraging emission reductions where they are the least costly to achieve.

World greenhouse gas emissions by sector in 2004 (total: 50 GtCO₂e)

Among the different sectors of activity, energy production, industry and forestry (including deforestation) are the largest GHG emitters.

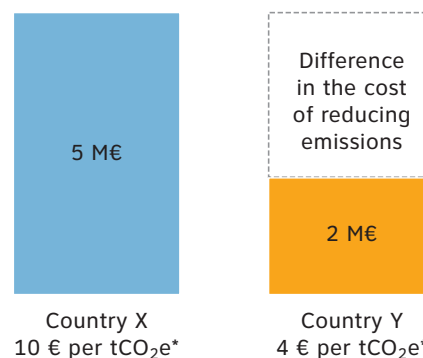
Source: IPCC, 2007. <http://www.ipcc.ch>



Economic justification for the flexible mechanisms

GHGs are pollutants which have a global impact. They become uniformly distributed in the Earth's atmosphere within about a week. The geographical location of the emission source is therefore immaterial. Likewise, any reduction in GHG emissions will also be spread across the globe, whether it occurs in China, France, or anywhere else, and regardless of the sectors or industrial facilities in which the reductions are achieved. On the other hand, the cost of reducing emissions varies from one country to another, across different sectors of activity and with each production unit concerned. The diagram illustrates the difference in cost between countries.

Example of cost difference of reducing emissions by 500 000 tCO₂e



* Average marginal reduction cost per tCO₂e.

3 - The terms "Annex I countries of the UNFCCC" and "Annex B countries of the Kyoto Protocol" are often used interchangeably. Strictly speaking, quantified emission reduction targets apply to the Annex I Parties to the UNFCCC which have ratified the Kyoto Protocol and which are then listed in Annex B to the Protocol. For the sake of simplicity, the term "Annex I" is used here to refer to both.

4 - For more details, see Annex 3 page 57 – **The EU Emissions Trading Scheme: a regulated market in search of efficiency.**

The developed countries (including economies in transition) which have ratified the Kyoto Protocol are generally referred to as **Annex I countries**³. These countries are committed to GHG emission cuts of 5.2% (on average) during the 2008-2012 period, compared to 1990 emission levels. These emission reduction targets are translated into emission quotas, called **Assigned Amount Units (AAU)**, which are allocated to each country. In the interests of reaching its reduction targets, the European Union (EU) has established the **EU Emissions Trading Scheme (EU-ETS)**, which is based on the same approach as the Kyoto Protocol and applies to the largest GHG emitters⁴.

The Kyoto Protocol is a first step towards global governance of a "global public good", our climate. However, the quantified emission reduction targets it has set are limited to the industrialised countries, and only during the first commitment period, which will expire at the end of 2012. Meanwhile, the 4th IPCC Assessment Report (April 2007) has made it clear that global greenhouse gas emissions must be reduced by at least 50% compared to their 1990 levels by 2050 if we are to contain the rise of global temperatures to no more than 2°C above preindustrial levels.

5 - For more details, see Annex 2 page 54 – **Negotiations on international climate change policy beyond 2012.**

Negotiations are now under way to reach an international agreement by the end of 2009, to ensure continuance of the global effort to combat climate change⁵. The European Commission, in anticipation of a new international agreement, presented a strategy on January 23rd, 2008 (the “Energy and Climate Change Package”) to tackle climate change and foster the use of renewable energy sources.

The policies, measures and flexible mechanisms established by the Kyoto Protocol will influence technological choices and lay the foundations for a low-carbon economy. All economic players will increasingly integrate climate change issues into their decision-making processes, as their investment choices become influenced by carbon constraints and by opportunities generated by new “clean technologies”.

The “Energy and Climate Change Package” is the core of Europe’s climate change strategy

The “Energy and Climate Change Package” presented by the European Commission contains proposals for:

- 1°) a revision of Directive 2003/87/EC establishing the EU-ETS;
- 2°) a decision on how efforts should be shared between Member States to enable the EU to achieve its objective of a 20% cut in its greenhouse gas emissions by 2020 compared to 1990 levels (excluding the EU-ETS);
- 3°) a framework directive on renewable energy aiming for a 20% increase in the share of renewables in EU energy consumption by 2020;
- 4°) a new directive on geological storage of CO₂ which would provide a common legal basis for a new and developing technology that could make a major contribution to emission reduction targets in Europe and across the world as from 2020.

The EU has unilaterally set a target of a 20% cut in greenhouse gas emissions by 2020 compared to 1990 levels, which may be increased to 30% if an international agreement is reached in Copenhagen (December 2009). To achieve the overall 20% emission reduction target, the proposed objective for sectors covered by the EU-ETS is a 21% cut in their GHG emissions from 2005 to 2020, and a 10% cut for non-EU-ETS sectors.

For more details, see the European Commission website <http://ec.europa.eu/energy>

1.2 Principles of the Clean Development Mechanism (CDM) and Joint Implementation (JI)

What is the purpose of these mechanisms?

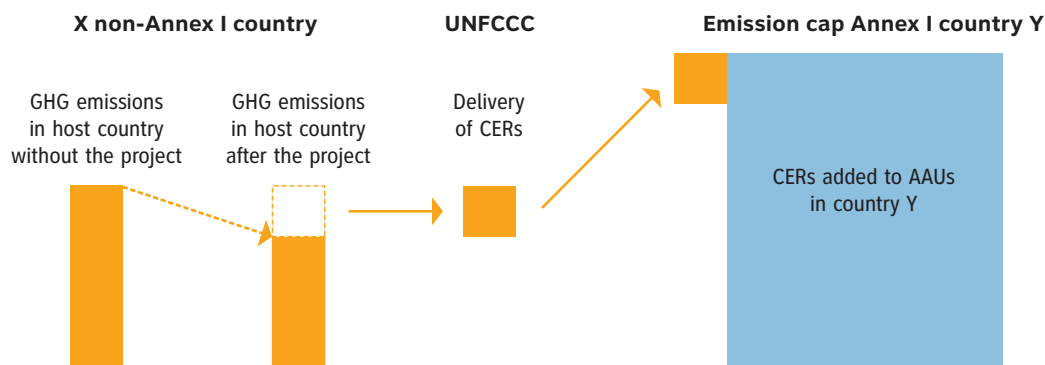
The project mechanisms are designed to help Annex I countries to achieve the emission reduction targets they have been assigned at the least cost, by supplementing their efforts on the domestic front.

These mechanisms enable investing countries (provided they have ratified the Kyoto Protocol) to obtain emission credits by investing in projects designed to reduce or avoid GHG emissions in another country⁶.

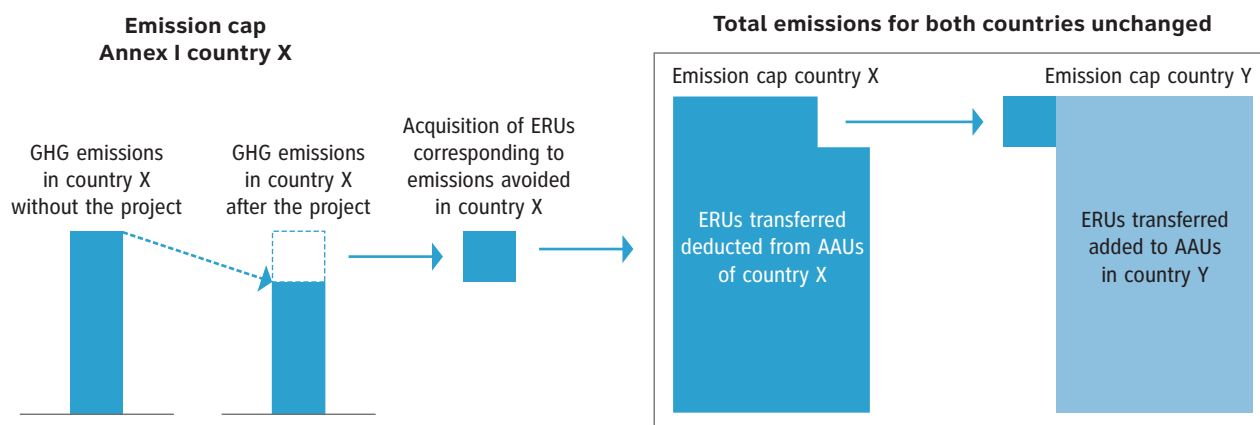
6 - A State may authorize corporate entities to take part in CDM and JI projects. However, the State alone is responsible for meeting its commitments under the Kyoto Protocol.

How the trade in emission quotas and credits works under the CDM and JI

1 - CDM (X is a non-Annex I country, Y is an Annex I country)



2 - JI (both X and Y are Annex I countries)



Source: IGES, Institute for Global Environment Strategies.

Note: AAUs are allocated only to those Annex I countries which have committed to emission cuts.

What is the difference between the CDM and JI?

The Clean Development Mechanism (CDM), established by Article 12 of the Kyoto Protocol⁷, allows Annex I countries (or private entities from those countries) to obtain carbon credits, called **Certified Emission Reduction Units or CERs**, by investing in projects that reduce emissions and are undertaken in emerging or developing countries which have signed the Kyoto Protocol ("Non-Annex I countries"). The CDM is supervised by the **CDM Executive Board (CDM EB)**.

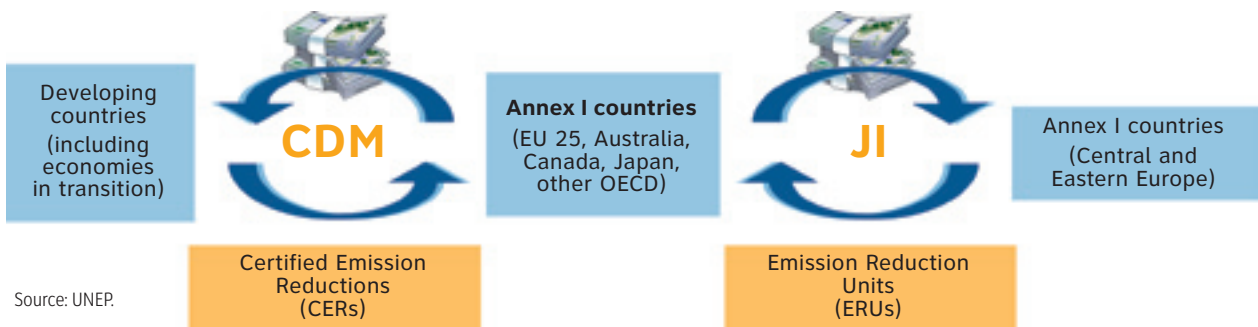
The Joint Implementation mechanism, established by Article 6 of the Kyoto

Protocol, allows emissions trading between Annex I countries. Investing in a project that leads to emission reductions will generate entitlements to **Emission Reduction Units (ERUs)**, which are added to the investing country's emission quotas or **Assigned Amount Units (AAUs)** but deducted from those of the project's host country. In some cases (JI Track 2) this mechanism is supervised by the **JI Supervisory Committee (JI SC)**. However, it may also be implemented purely on the basis of national regulations, as in the case of domestic offset projects in France⁸.

7 - Text of the Kyoto Protocol: <http://unfccc.int/resource/docs/convkp/kpfrench.pdf>

8 - For more details, see Annex 12, page 90 – **Domestic Offset Projects**.

The project mechanisms: the CDM and JI



Source: UNEP.

Although the two project mechanisms are similar, they differ in their geographical scope. The CDM concerns developing countries, including economies in transition, while JI concerns the industrialized (Annex I) countries.

What are the eligibility criteria?

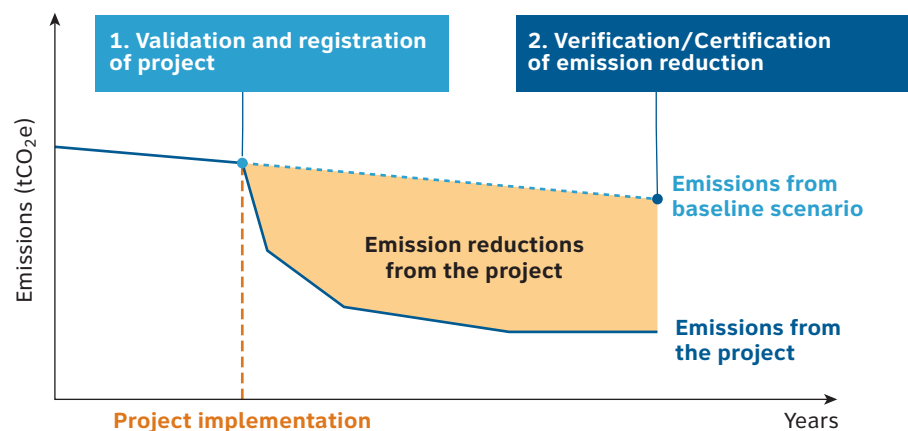
To be eligible for the CDM or JI, a project has to demonstrate that it is “additional”, which means that it must reduce GHG emissions in comparison with a baseline scenario⁹. The baseline scenario is defined as the most probable scenario had the project not existed. The difference between the project scenario and the baseline scenario is the basis for calculating carbon credits (CERs and ERUs).

Furthermore, the project in question must have no significant adverse impacts on the environment and must comply with local laws and regulations. It must contribute to the host country's sustainable development goals, particularly through transfers of clean technologies and know-how, and it must obtain formal approval from the host country.

9 - Six greenhouse gases are covered: CO₂, CH₄, N₂O, HFCs, PFCs and SF₆.

How emission reductions are assessed

Emission reductions achieved by the project are calculated as the difference between the emissions measured during the project's lifetime and the estimated emissions in the baseline scenario.



Source: UNEP.

What are the results to be expected from a CDM or JI approach?

CDM or JI mechanisms are fundamentally “project-based” approaches as they are primarily based on an industrial, energy or environmental project. A CDM or JI “project” is actually an additional activity that implies development costs for the investor but also revenues (“carbon returns”) from the use – through regional or national GHG emission reduction schemes – or sale to third parties of “carbon credits”. The term “CDM or JI component” is therefore more accurate than the term “CDM or JI project”. Although as a general rule these “carbon returns” are not the main objective of a project, they may improve the project’s Internal Rate of Return (IRR) and therefore influence investment priorities as well as technological choices.

CERs and ERUs (generally referred to as “carbon credits”) are used in particular by companies covered by the EU-ETS

for compliance purposes, in addition to their own emission reduction efforts. They may also be traded directly or through specialized intermediaries, in the same way as other company assets.

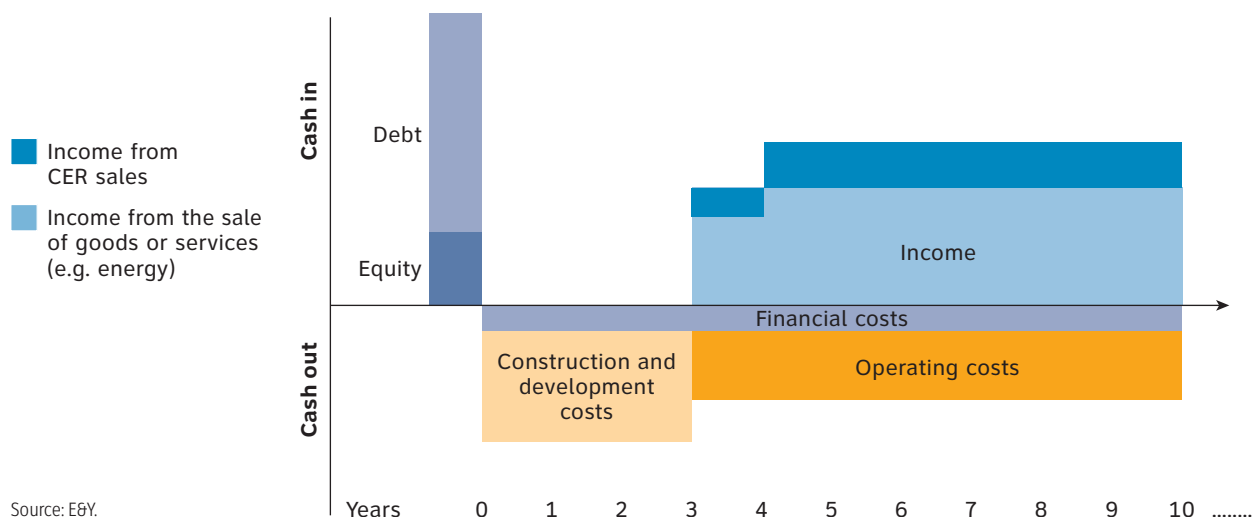
CERs and ERUs correspond to actual emission reductions which have been duly verified and registered in the **International Transaction Log (ITL)**^[10], managed by the UNFCCC Secretariat. This registry was established in order to record all operations required to check that the countries which are parties to the Kyoto Protocol are complying with their commitments and to ensure that transactions in this context which involve the various Kyoto units (AAU, CER, ERU, AU, tCERs, ICERs^[11]) are as secure as possible. Each State also manages a national registry in the form of an electronic database, in order to keep track of credit issuance, holders, transfers and cancellations of “Kyoto units”^[12].

10 - For more details, see http://unfccc.int/kyoto_protocol/registry_systems/itl/items/4065.php

11 - Absorption Units (AUs) are credits assigned to Annex I countries for carbon absorption by ecosystems (mainly forests) in these countries. Temporary Certified Emission Reduction units (tCERs) and Long-Term Certified Emission Reduction units (ICERs) are temporary credits for afforestation projects.

12 - For more details, see http://unfccc.int/kyoto_protocol/registry_systems/registry_websites/items/4067.php

Cash flows of a project with a CDM component



Source: E&Y.

A CDM component involves initial development costs but will generate additional income during the project's lifetime.

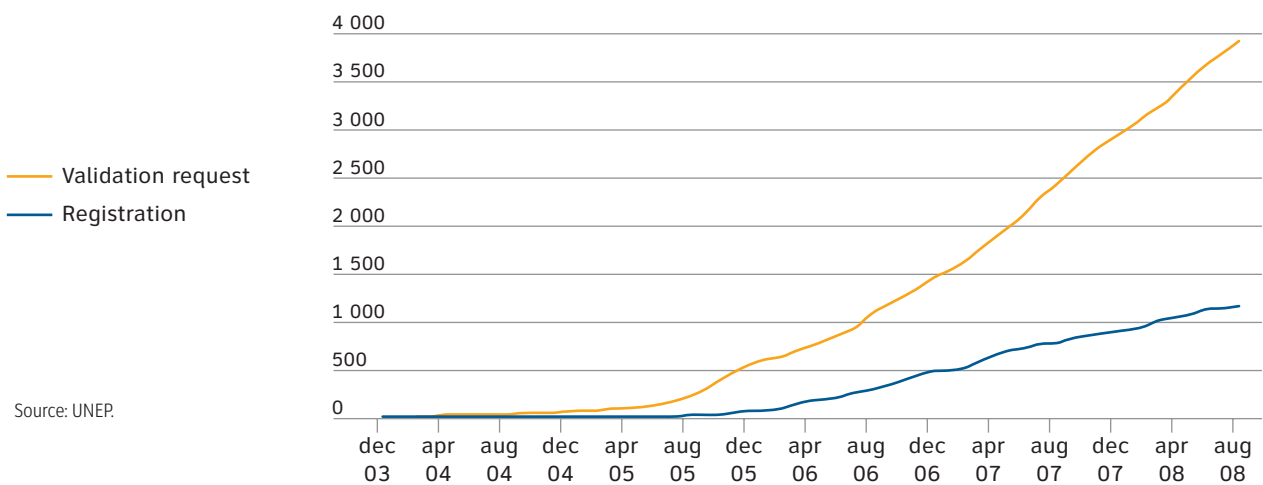
1.3 The growing strength of CDM and JI project mechanisms

13 - To keep abreast of trends in these data, check the UNEP/CDM pipeline database at: <http://www.cdmpipeline.org>

By mid-2008, 3 909 CDM projects were under development across the world with the potential to generate 2.7 billion CERs by 2012. Of these 3 909 projects, 1 152 (30%) have been validated and are now registered by the CDM EB, and are therefore capable of

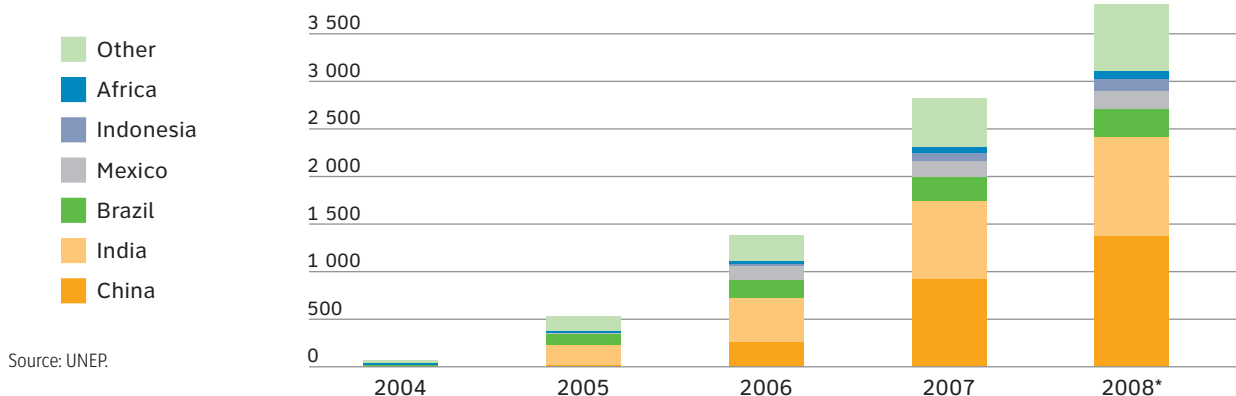
delivering CERs. By comparison, only 172 JI projects had been identified by mid-2008, of which 22 had been registered by the JI SC (13%)¹³. These 172 JI projects could generate 0.3 billion ERUs by 2012.

Trends in the number of CDM projects



2008 saw the number of CDM projects increase beyond the symbolic threshold of 1000 registered projects. With almost 4000 projects under development by mid-2008, the CDM has continued its rapid expansion since the Kyoto Protocol came into force in February 2005. Some projects had already been developed before 2005, in anticipation of the Protocol's entry into force.

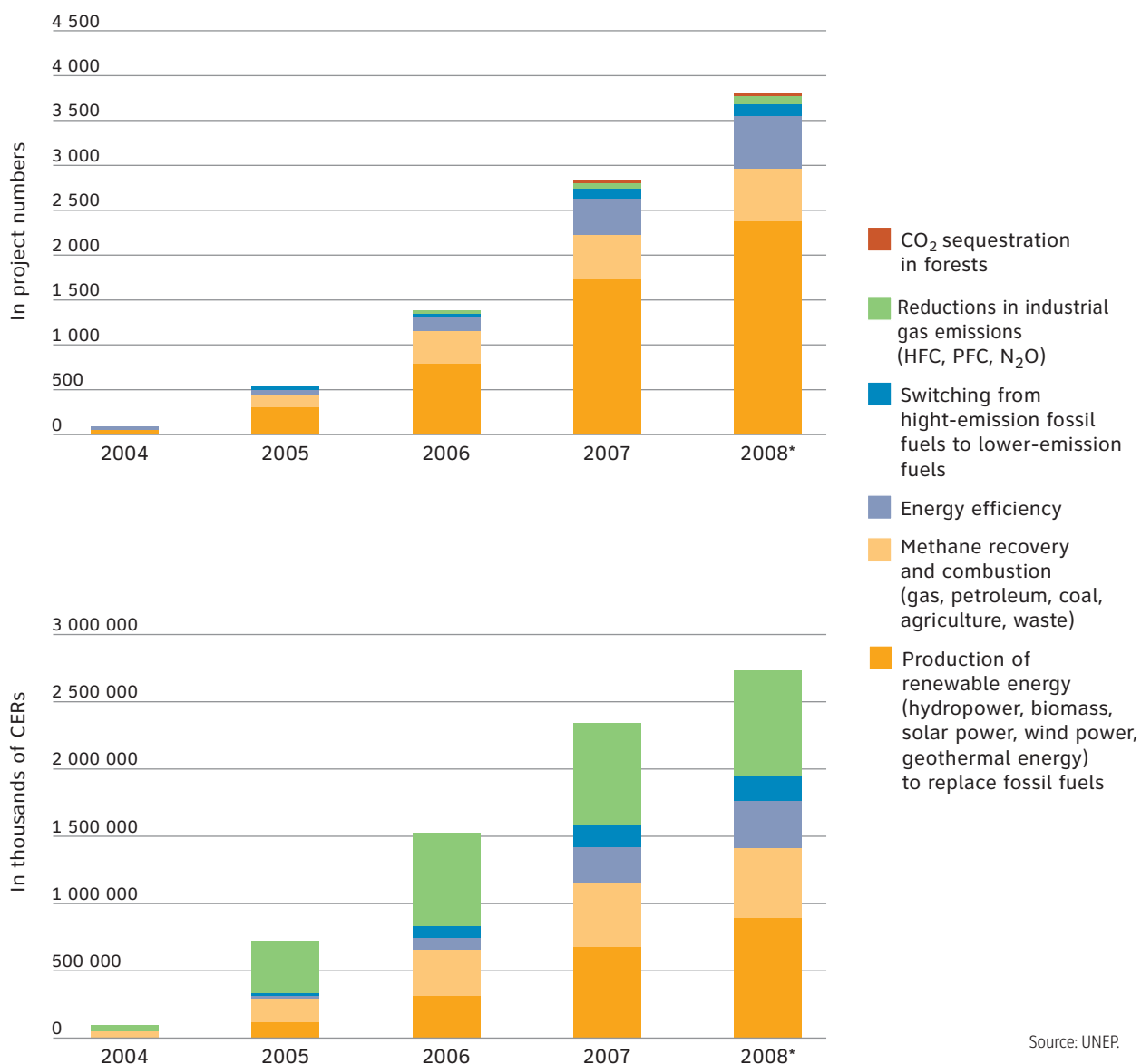
Number of CDM projects by country



CDM projects are increasingly diverse in geographic terms. However, 70% are concentrated in China, India and Brazil, while only 2% are based in Africa.

* 2008 data only cover up to the end of August 2008.

CDM trends by sector, in thousands of CERs generated and in number of projects since 2004



Trends in CERs generated by sector indicate that CDM projects are becoming more diverse after an initial phase when credits generated from the destruction of industrial gases (HFC, PFC, N₂O) were predominant. These projects generate very large emission reductions because of the very high global warming potential of industrial gases. The rapid rise in the number of renewable energy projects has now altered the balance in the portfolio of CERs issued by the CDM EB, but several sectors are still lagging behind due to methodological difficulties, particularly in transport and carbon absorption by forests.

* 2008 data only cover up to the end of August 2008.

2

CDM and JI project mechanisms: new opportunities on the horizon?

2.1 The expanding carbon market is creating new potential for CDM and JI projects

In order to encourage efforts to reduce emissions where this can be done at least cost, the Kyoto Protocol has introduced an international carbon market to allow trade in carbon credits between countries, financial intermediaries and project developers.

This international market has several components:

- **A market for trade in emission quotas** assigned under the Kyoto Protocol (AAUs), known as the “Kyoto market”, which States can use in order to comply with their emission reduction commitments.
- **The European Union Emissions Trading Scheme** (EU-ETS). The EU-ETS, by far the largest market in terms of trading volumes, assigns emission quotas to the main GHG-emitting facilities in the energy and industry

sectors (11 000 European sites currently covered). Operators of these facilities may trade their emission quotas (also known as European Union Allowances or EUAs) and purchase or produce CER and ERU credits generated through the project mechanisms.

- **Other markets** either established or under development in Australia, Canada, Japan, the US, New Zealand, etc.

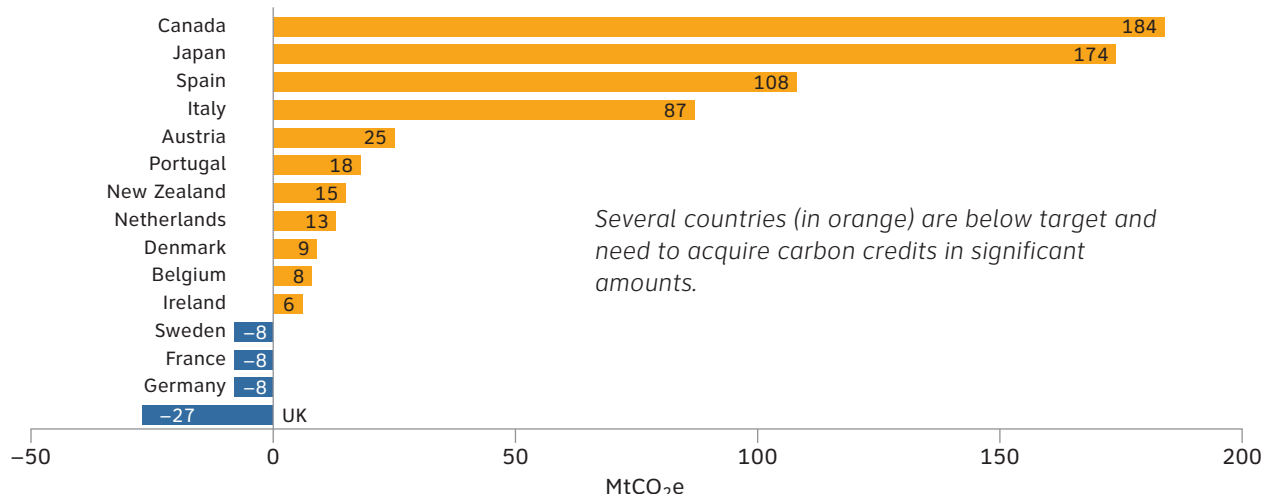
Many climate change initiatives introduced in the last few years are based on a “cap and trade” approach. This involves capping overall emissions at regional or national level (or sub-national level as in the USA and Japan), and allowing the organisations concerned to trade their emission quotas. As a result, various markets are being established for trade in “carbon credits” of different types, and with varying degrees of convertibility.

The “Kyoto market”

As the first Kyoto commitment period (2008-2012) begins, the data available suggests that a number of signatory countries will have difficulty meeting their emission reduction commitments. If countries do not close the gap between their observed emission levels in 2005 and their targets for the 2008-2012 period this is likely to create significant demand for carbon credits.

Countries like Canada, Japan, Spain and Italy will need to introduce costly measures to achieve drastic cuts in their national GHG emissions, or else turn to the market to secure a sufficient supply of carbon credits, especially in the form of CER and ERU credits generated by CDM and JI projects.

Distance between 2005 emissions and annual targets under the Kyoto Protocol for the 2008-2012 period



Source: Caisse des Dépôts et Consignations - "Mission Climat", UNFCCC.

The Kyoto Protocol also allows countries which will not be able to meet their emission reduction commitments to acquire AAUs¹⁴ from other Annex I countries which have surpluses (under the "international trade" mechanism provided for by Article 17 of the Protocol).

The countries of the former Soviet Union, whose GHG emissions dropped sharply after 1990 with the closure of their obsolescent industries, have large surplus amounts of AAUs. However, trade in these surpluses, often described as "hot air", has been criticized as it does not give rise to any further emission reductions.

There are four limitations on "hot air" transactions

Firstly, AAUs can only be used by States to secure their compliance with the Kyoto Protocol: industries covered by emission allowances therefore cannot use these credits for their own compliance needs except by converting them through JI projects;

Secondly, eligibility and monitoring conditions for the sale of AAUs are complex and there is some uncertainty as to when countries undergoing economic transition will be ready at institutional level to use the scheme;

Thirdly, countries that could potentially transfer AAUs are under obligation, under the Marrakech Accords (2001), to retain the equivalent of 5 times their emission levels of the reference year, although, depending on countries, this still leaves about 20 to 30% of AAUs available for sale;

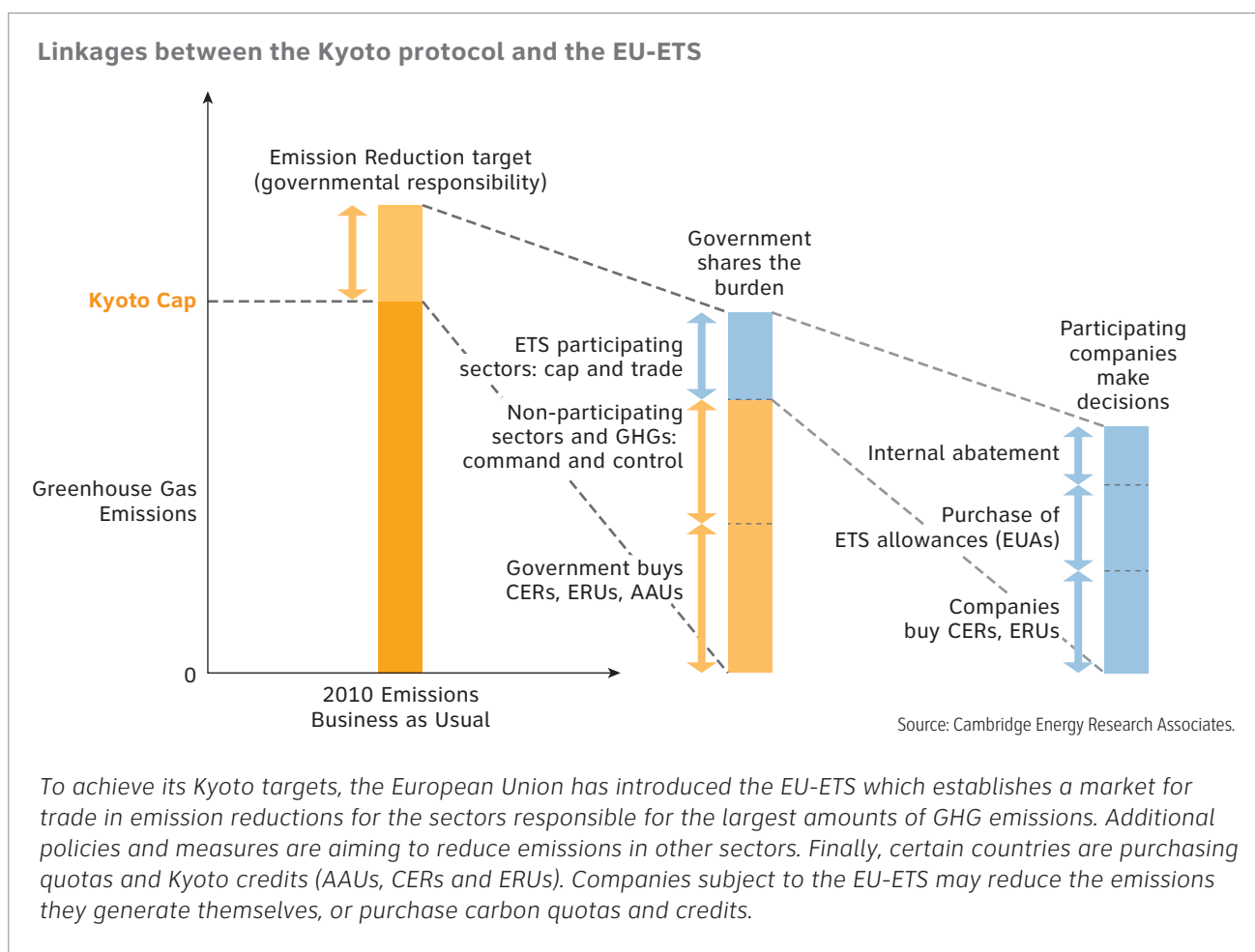
Finally, many countries and investment funds have deliberately chosen not to invest in "hot air", preferring Green Investment Schemes (GIS) where investments in clean technologies are traded for AAUs. No legal framework has been defined as yet for these GIS, but the World Bank and other major investors are beginning to propose possible approaches.

14 - AAUs are the emission quotas assigned to Annex I countries under the Kyoto Protocol.

The European market (EU-ETS) has the largest share of volumes traded on the carbon market

To help reach its targets under the Kyoto Protocol, the European Union has established a regional cap and trade system for CO₂ emission allowances, the EU-ETS¹⁹. This market covers approximately 50% of CO₂ emissions in Europe and 40% of all its greenhouse gas emissions. After an initial trial

period (2005-2007), the EU-ETS is now in its second trading period (2008-2012). As required by the system, each EU country has defined emission caps for the largest CO₂ emitters, in **National Allocation Plans (NAP)** that are duly approved by the European Commission.



15 -For more details, see Annex 3, page 57 – **The EU Emissions Trading Scheme: a regulated market in search of efficiency.**

16 - A system of financial penalties applies under the EU-ETS to companies that fail to meet their targets (100 € per tCO₂e not 'returned').

To reach their emission reduction targets,^[16] companies subject to emission quotas have three options:

1 - Reducing their CO₂ emissions, in particular through investments in cleaner technologies;

2 - Acquiring quotas on the European market;

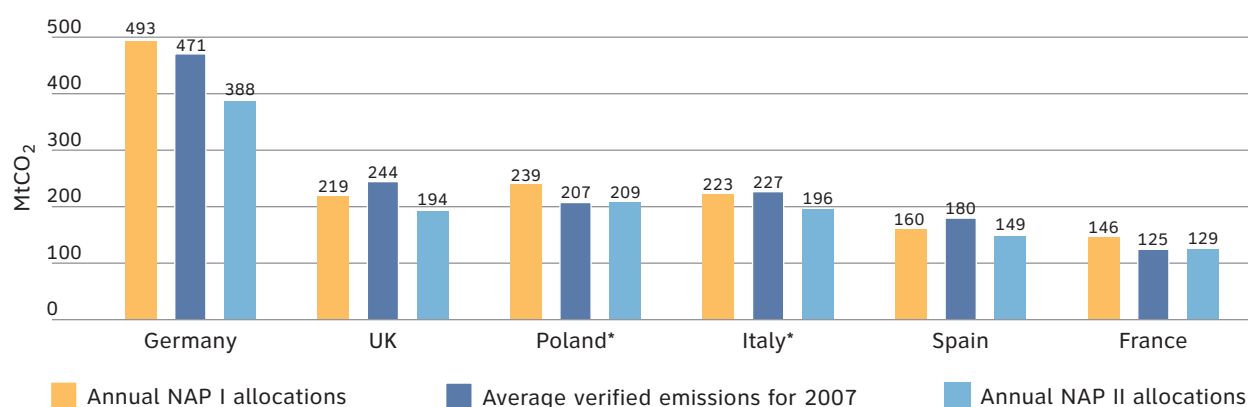
3 - Acquiring or producing credits generated by project mechanisms (CDM/JI), within the limits defined by the authorities in each country.

17 - tCER: temporary Certified Emission Reduction Unit – ICER: Long-Term Certified Emission Reduction Unit.

The amount of CERs/ERUs needed to enable companies covered by the EU-ETS to comply with their targets could be as high as 1.4 billion CERs/ERUs over the 2008-2012 period. At present, the EU is the source of the largest demand on the international carbon market, whether from industries subject to the EU-ETS or from countries seeking to comply with their Kyoto commitments.

It should be noted that certain types of credits, such as those generated by forestry projects (tCERs and ICERs)¹⁷, are not currently eligible under the EU-ETS, and that large hydropower projects (with a nominal capacity above 20 MW) have to satisfy very strict conditions to ensure that the credits they produce will secure unconditional acceptance by a Member State.

Allocations under NAP I (2005-2007) and NAP II (2008-2012) in 6 EU countries



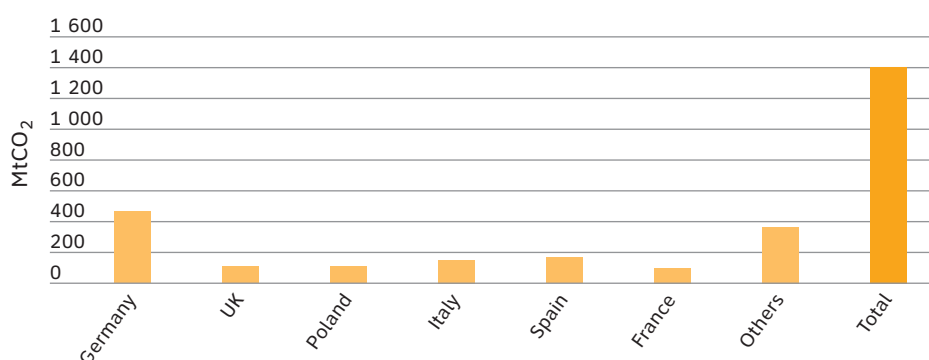
Source: Ernst & Young, based on the NAPs of the 6 countries and the CITL.

* At the time of publication, annual NAP allocations Poland and Italy had not been validated by the European Commission. The German, British, Spanish and French NAPs have been reprocessed to include boundary variations.

The second period will demand significant efforts towards emission reductions: NAPs approved for the 2008-2012 period require a 7% average cut compared to verified emissions for the year 2007.

Maximum Kyoto credits (CERs and ERUs) authorised in the EU-ETS in 2008-2012

Demand for carbon credits on the European market could reach 1 400 million CERs/ERUs during 2008-2012.



Source: European Commission.

The specific case of CERS and ERUs from large-scale hydropower projects (> 20 MW)

Hydropower is considered as a renewable source of energy which could replace fossil fuels. In this sense, it is eligible for the CDM and JI mechanisms. Projects currently under development could generate up to 270 million CER and ERU credits by 2012.

However, installing large-scale hydropower dams can have significant environmental and social impacts. Moreover, recent scientific results have cast doubts on the true potential of these projects for reducing GHG emissions, in that hydropower dams can generate methane emissions due to anaerobic decomposition of submerged organic material.

In order to limit EU-ETS access to projects that do not carry any environmental and social risks, the European Commission has introduced several restrictions on such projects. The “Linking Directive” specifies that before endorsing a hydropower project with a capacity of more than 20 MW, Member States must ensure that relevant international criteria and guidelines, including those contained in the final report for the year 2000 of the World Commission on Dams (WCD), are complied with during implementation. As the EU-ETS represents the majority of demand for CERs and ERUs, it is imperative for project developers to observe these criteria when considering hydropower projects with a capacity of more than 20 MW.

Details of the relevant criteria must be obtained from the DNA or DFP.

Other carbon trading schemes are emerging but still marginal

In parallel with the EU-ETS, similar initiatives are now in place or under development in Australia, Canada, Japan, the United States, New Zealand and some Canadian and US States¹⁸. The approaches are quite varied (ranging from mandatory allocations ruled by public authorities to voluntary commitments), as are their boundaries (national, regional or sectoral), allocation methods (by auction or without charge) and their access to credits generated by CDM/JI projects. These initiatives have introduced trading schemes that account for only 1% of the carbon market at present but which could grow in importance, especially if

a federal market is established in the United States. These initiatives could create new outlets for CER/ERU credits, particularly in the post-2012 period.

Besides the organised markets set up in the last few years, a growing number of companies, individuals and public agencies have been making voluntary commitments to offset their greenhouse gas emissions in order to demonstrate that their activities are “carbon neutral”. These proliferating initiatives are giving rise to a “retail” market for carbon credits, especially “Voluntary Emission Reduction” units (VERs). This system is referred to as the “voluntary market”¹⁹.

Demand for CDM and JI credits is essentially driven by the European market (EU-ETS)

Emission trading schemes allow players subject to emission caps to support their emission reduction efforts by acquiring “carbon credits”, such as those generated by CDM and JI projects. As the main marketplace for suppliers

and buyers of carbon credits, the carbon market, and the EU-ETS above all, has a determining influence on demand and therefore on prices for CERs and ERUs. The supply of CER and ERU credits is defined by the potential of current and

18 - For more details, see Annex 4, page 61 – **The international carbon market covers a variety of different schemes.**

19 - For more details, see Annex 5, page 62 – **The voluntary market.**

Supply and demand for CERs/ERUs up to 2012, according to World Bank figures

Demand for Kyoto credits 2008-2012 (MtCO ₂ e)		Supply of AAU Kyoto credits 2008-2012 (MtCO ₂ e)	
Europe:	1 940	Russia	3 330
Governments (EU-15)	540	Ukraine	2 170
Industries (EU-ETS)	1 400	Other	1 805
Japan:	450	Total	7 305
Government	100	Supply of CER/ERU Kyoto credits 2008-2012 (MtCO₂e)	
Industries	350	CDM	1 600
Rest of Europe and New Zealand:	45	JI	230
Governments	20	Total	1 830
Industries	25		
Total	2 435		

Source: State and Trends of the Carbon Market, 2008, World Bank.

20 - If no international "post-Kyoto" agreement is reached, the overall cap on CER/ERU imports determined by the European Commission for 2008-2012 (1.4 billion CERs/ERUs) may be extended into the 2008-2020 period. Furthermore, any CERs used will have to have been generated by projects which have begun to issue credits before the end of 2012.

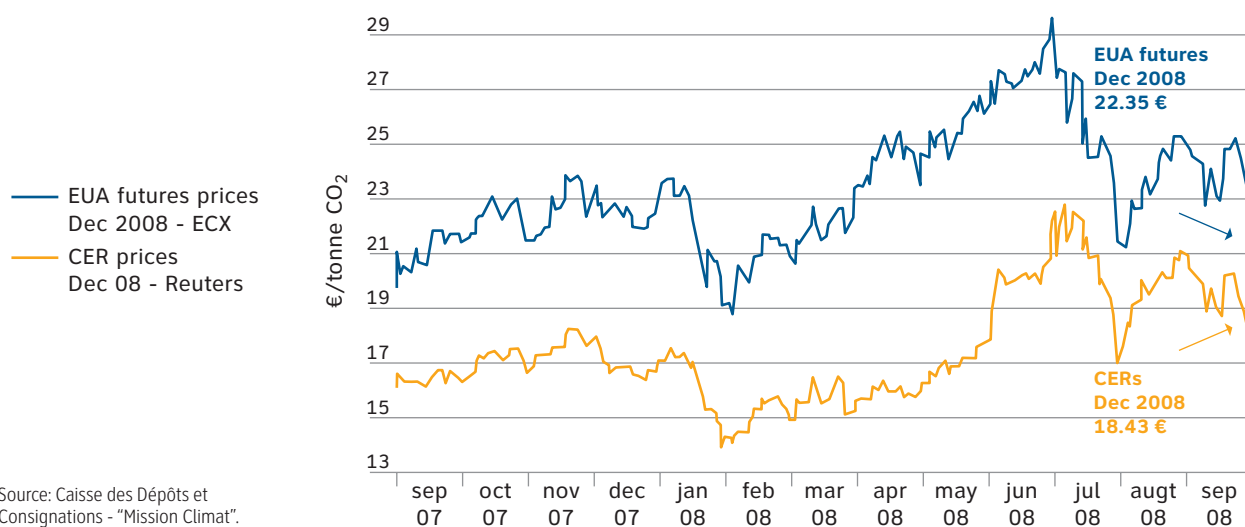
future CDM and JI projects. Although the combined potential of nearly 4 000 projects now under way amounts to some 3 billion CERs, the World Bank has estimated that they will only generate about 1.8 billion CERs/ERUs during the 2008-2012 period.

With potential maximum demand for 1.4 billion carbon credits by 2012 (cap amounting to 13.4% of the 2.1 billion annual quotas over 5 years), the European EU-ETS market is by far the largest buyer of CER/ERU credits. This is why a close correlation has been

observed up to now between prices for EUAs and prices for CERs/ERUs. Forthcoming decisions on EU-ETS architecture and binding emission constraints after 2012 will therefore have a major impact on demand for CERs/ERUs^[20] and on their value.

In addition, some countries (such as the Netherlands, which pioneered this area, but also Austria, Denmark, Spain, Ireland, Italy, Sweden and others) are also purchasing CER/ERU credits in order to comply with their Kyoto commitments.

Correlation between European allowance prices and CER prices



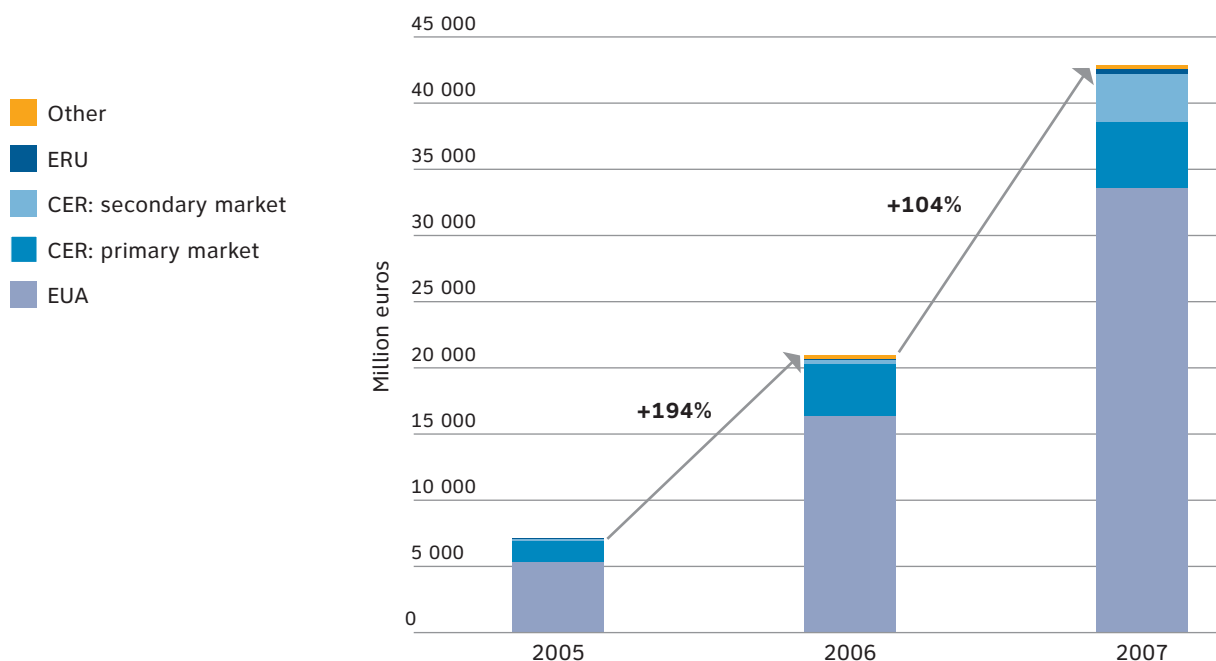
2.2 The volume of trade in carbon credits is rising fast

Almost 3 billion tonnes of CO₂ equivalent (tCO₂e) were traded on the international carbon market in 2007

These transactions, amounting to a total value 43.5 billion euros, fall into three categories:

- **78%** of total trade (in value) was in European Union Allowances (EUAs) on the European market;
- **21%** corresponds to trade in emission credits generated by the CDM or JI project mechanisms, of which 95% are CERs from CDM projects. CER transactions cover:
 - CERs not yet issued, through forward contracts. These are mainly futures transactions between project developers and carbon buyers. This so-called **“primary market”** accounts for 58% of all trade in CERs;
 - CERs already issued. This **“secondary market”** accounts for 42% of trade in CERs. Most of this trade is handled by financial intermediaries;
- Trade in other types of emission credits only accounts for about **1%** of traded value at present.

The carbon market from 2005 to 2007 (million euros)



Kyoto credits (CERs and ERUs) have been traded since 2005, the year when the Protocol came into force. The carbon market has expanded rapidly, with trade doubling in value from 2006 to 2007.

Source: State and Trends of the Carbon Market, 2007 and 2008, World Bank.

China is currently the main supplier of Kyoto credits

Accounting at present for almost 75% of the supply of CER-type Kyoto credit units (in volume), China continues to be a choice target for buyers of carbon credits. This situation is partly due to the size and buoyancy of China's economy, but also to the resulting economies of scale for CDM project identification and to the generally favourable climate for projects of this type.

Although Africa's contribution to the supply of CERs is small overall, transaction volumes or the number of projects under development are growing steadily in some countries (such as South Africa, Egypt, Kenya or Morocco). Elsewhere in Africa,

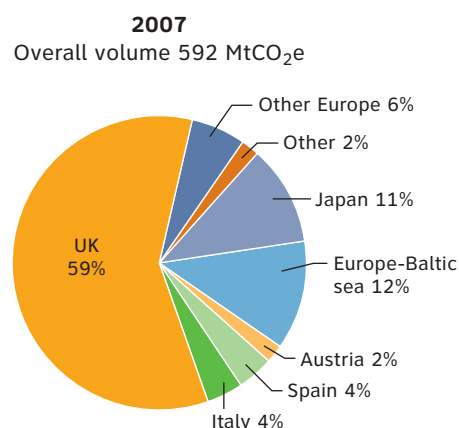
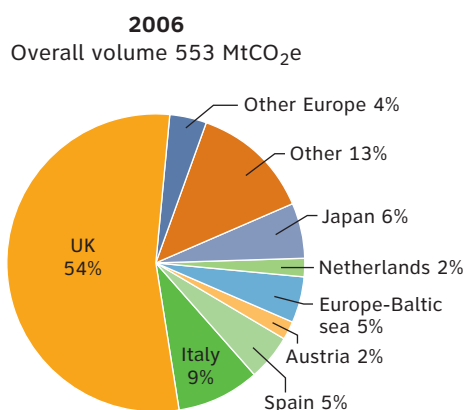
only few projects have emerged so far, despite considerable potential across the continent.

Russia and the Ukraine are the largest suppliers of ERUs under JI (with about one third of the market each).

With the development of a secondary market for CERs/ERUs, most transactions today are made through intermediaries (brokers, aggregators, carbon funds and financial institutions), a great many of which are currently based in London. This is why the UK regularly appears as the main purchaser of credits generated by the project mechanisms.

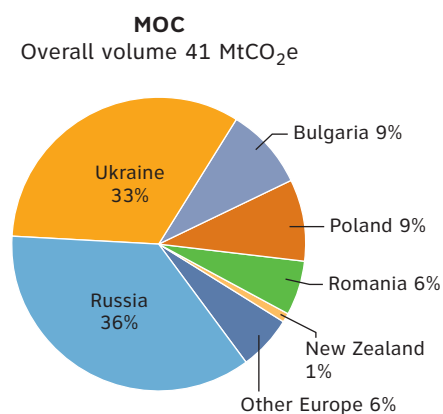
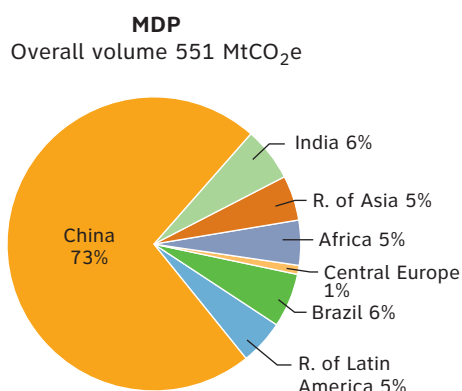
Countries purchasing Kyoto credits in 2006 and 2007 (in percentages of carbon credit volumes)

Demand is essentially fuelled by European buyers, whose market share is close to 90%.



Countries supplying Kyoto credits in 2007 (in percentages of carbon credit volumes)

The supply of carbon credits is dominated by China (CDM) and Russia and Ukraine (JI).



Source: State and Trends of the Carbon Market, 2007 and 2008, World Bank.

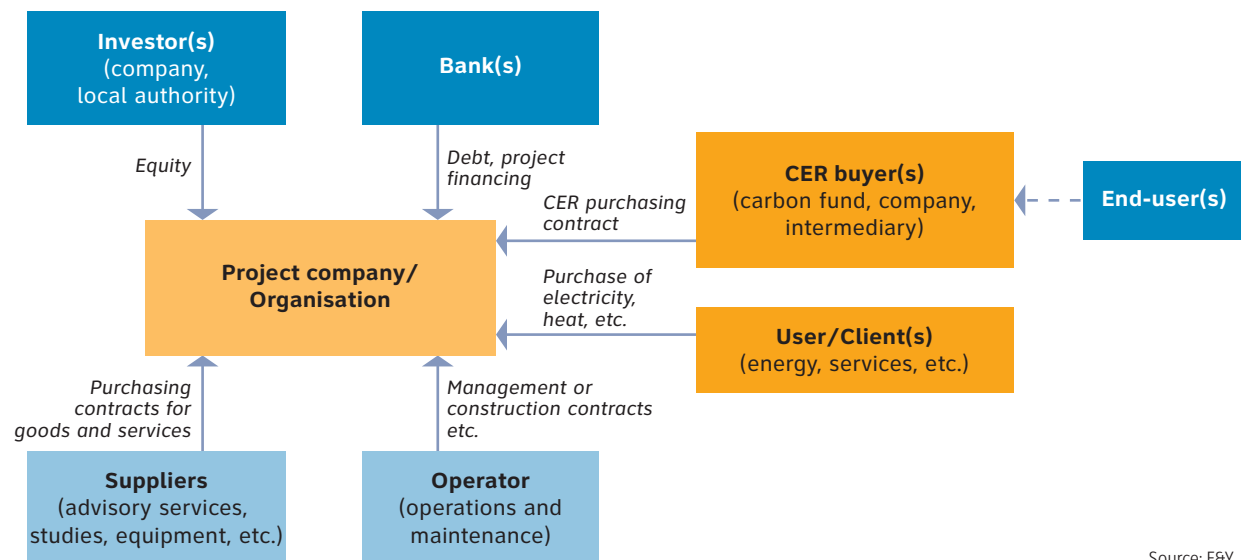
2.3 The rising number of stakeholders and sectors involved in CDM and JI project development

Many public and private players are already involved in developing CDM or JI projects or in transactions of credits generated by project mechanisms throughout the carbon credits “production chain”^[21]. Broadly speaking, the players involved in CDM or JI projects are:

- Project developers (also called project promoters) have operational responsibility for the project. Project developers generally fall into one of the following categories:
 - Renewable energy producers;
 - Local government authorities responsible for managing urban services and the operators who run the relevant facilities;
 - Farming or forestry enterprises;
 - Technology suppliers;
 - NGOs.
- Consultants, experts or engineering firms which assist project promoters in developing the CDM/JI component of a project and in the validation and registration processes;
- Project financing entities and/or purchasers of CERs/ERUs.

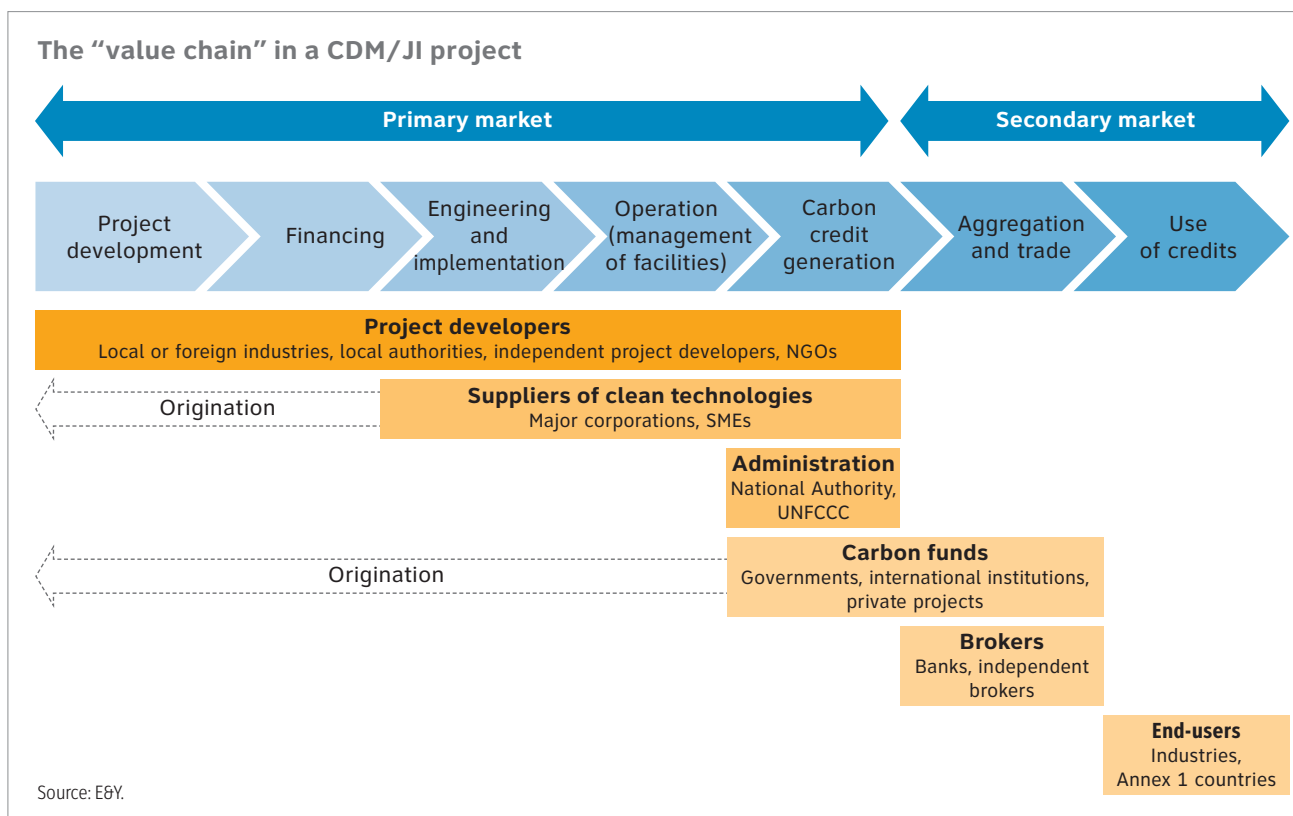
21 - For more details, see Annex 9, page 74 – **What organisations are involved in a CDM or JI approach?**

Stakeholders in CDM or JI projects



Source: EGY.

Setting up a project involves a variety of players to different degrees, some of whom may claim all or part of the carbon credits generated by the project.



The emergence of “carbon finance” players

The carbon market essentially operates through the following players:

- **The regulatory authorities** (UNFCCC, European Commission, etc.), which are responsible for defining market rules and for checking their enforcement;
- **Suppliers of carbon credits**, who either develop projects for GHG emission reductions or sell their own emission allowances;
- **End users of carbon credits**, who use them for “compliance” purposes.

The increase in investments has fostered the emergence of new players in carbon finance, especially intermediaries between project developers and end-users. These may be carbon funds,

brokers, marketplaces and so on, offering new products (hedging instruments, derivatives, delivery guarantees, etc.) and services (legal advice, market analysis, technical expertise, etc.).

Although the carbon market was essentially kick-started by the World Bank in the early 2000s (with the Prototype Carbon Fund) and by governments (the Netherlands especially), which sub-contracted carbon credit origination and purchasing, the last few years have seen merchant banks, insurance companies, hedge funds and other financial players arriving on the scene, all in search of new opportunities. Specialised marketplaces have also been established, such as the European Climate Exchange in London, Nordpool in Oslo and BlueNext in Paris.

Players on the carbon market

Regulation

Legal frameworks: UNFCCC, European Commission, etc.

Executive organisations: UNFCCC Secretariat, CDM EB, JI SC, DNA, DFP, etc.

Supply

Project developers
Industries subject to quotas
Financing entities
Consultants
Clean technology developers
Governments or government agencies

Primary credit

Intermediaries

Brokers
Traders
Marketplaces
Financial players (banking, insurance, arbitrage, etc.)
Carbon funds

Secondary credit (guaranteed)

Demand

Purchasers under quota (countries, industries, etc.)
Voluntary purchasers (private sector, NGOs, individuals)

Financial products

Risk management products

Other services

Quality control (DOE, AIE, NGOs, etc.), legal assistance, technical assistance, market information and analysis, capacity building.

Source: State and Trends of the Carbon Market, 2008, World Bank.

In less than five years, the dynamics of the carbon market have attracted players and service providers of all kinds.

The changing profile of carbon market players indicates that in just a few years, the system has moved on from the

experimental stage to become a booming market which is now attracting private investors.

The rapid development of carbon funds

Since the World Bank introduced the Prototype Carbon Fund (PCF) in 1999, funds for investing in carbon assets (known as “carbon funds”) have been set up in increasing numbers. In 2007, 58 of these carbon funds were listed, representing an estimated total capital of 7 billion euros. However, this figure covers a wide variety of schemes, including government funds, funds established to secure “compliance” for their participants and funds where profits are the sole aim. Carbon funds play an important role on the international market: they finance one quarter of all CERs and one third of ERUs and could contribute to emission reductions equivalent to 700 million tonnes of CO₂. Not all the capital raised has yet been invested to date, a sign that demand for projects could outstrip supply. This is one reason why some funds have begun to participate in project financing, in order to boost emerging opportunities and generate higher profits.

For more details, see “Fonds d’investissement CO₂: l’essor des capitaux privés”, Caisse des Dépôts et Consignations - “Mission Climat”, November 2007.

Increasing sectoral diversity

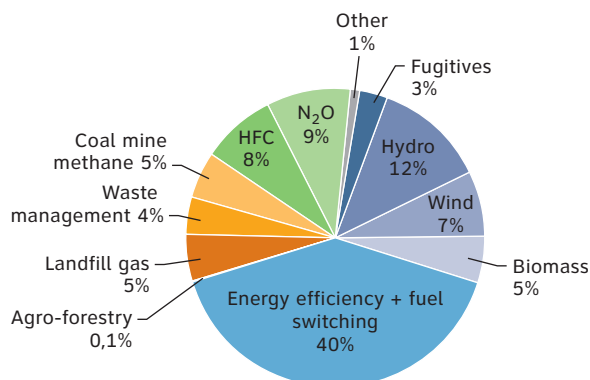
Initially dominated by projects for the destruction of gases from industrial and waste management activities, the market is becoming increasingly focused on projects for energy efficiency, renewable energy production (hydropower, wind power and biomass). Some sectors, such as forestry and agriculture (excluding waste and grouped together as AFOLU, for Agriculture, Forestry and Other Land Uses), transport, solar power and energy distribution, are still underrepresented despite their high potential.

Clean energy projects (renewables, fuel switching and energy efficiency)

accounted for 64% of total credits generated by CDM projects in 2007 (as against 33% in 2006 and 14% in 2005). This steep rate of growth is partly accounted for by very large-scale industrial energy efficiency projects. Potential in this sector remains high, both in renewable energy production and energy distribution. Conversely, the share of volumes supplied by projects for the destruction of HFC-23 and N₂O continued to drop in 2007, after dominating the market in 2005 and 2006. This trend illustrates the steady decline of potential in this sector, which was characterised up to now by low risks and large quantities of carbon credits generated.

Distribution by sectors of CER volumes generated per year (CDM)

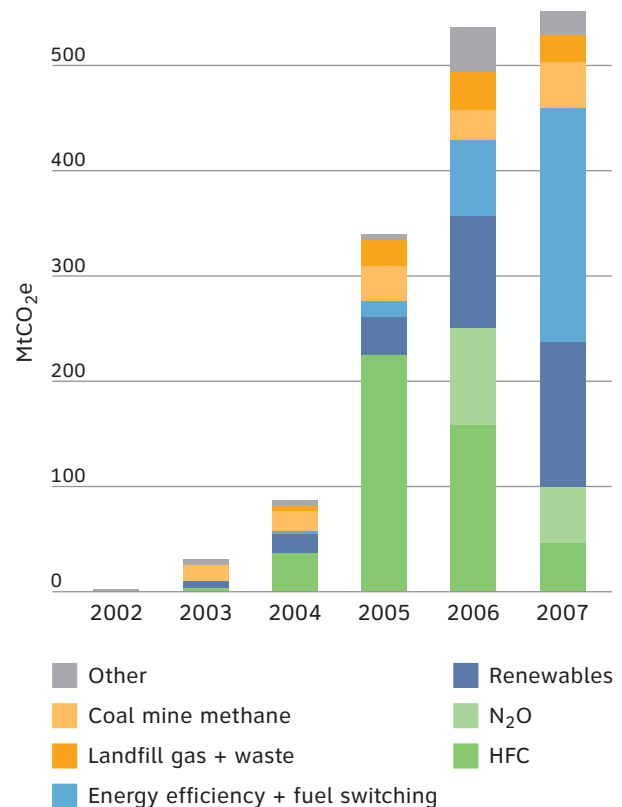
Situation in 2007



Energy efficiency and clean energy projects are now predominant.

Source: World Bank.

Primary CDM annual volumes transacted



Forests – a wealth of untapped opportunity for the project mechanisms

With just one project registered to date, in China, and 26 candidate projects (October 2008), the forest sector accounts for only 0.5% of current potential for CERs from CDM projects. This very low figure is due to the methodological complexities involved in projects of this type (field measurements, demonstration of land eligibility, definition of forest parcel boundaries, different definitions of forest lands in host countries, etc.). These difficulties are penalising forest projects in a market which is focused on purchasing credits for the first commitment period (up to 2012), and all the more so as forest projects actually have to wait for trees to grow before they can sell any significant amount of credits.

The second factor slowing the uptake of CDM forest projects is that forest credits are not eligible for trade on the European market (EU-ETS), mainly for technical reasons (fungibility of the system with temporary tCER and ICER credits). Yet forest projects can bring a great many socio-economic benefits to rural populations (employment in timber sectors, diversification of livelihoods, poverty reduction, etc.) as well as environmental benefits (controlling soil erosion, protection of water resources and biodiversity). Furthermore, although only afforestation and reforestation projects are considered under the current CDM framework, 17.4% of all GHG emissions across the world stem from land-use change, which essentially means deforestation and forest degradation.

Discussions on this subject during the COP in Bali in 2007 have led to an agreement on the need to implement pilot “REDD” activities (Reducing Emissions from Deforestation and Degradation in Developing Countries). Despite the many difficulties that will need to be resolved, it is essential that the international community agrees to introduce innovative financing mechanisms to halt tropical deforestation. Pilot activities are already in the process of implementation and should grow in number in the years to come.

For more details, see *Les marchés du carbone forestier*, Gardette & Locatelli, 2008.

2.4 Some good reasons for developing a CDM or JI project

Main motivations in the private sector

A number of French companies have become involved in setting up CDM or JI projects in the last few years, **mainly in the interests of managing their carbon constraint**. For companies subject to emission quotas under the EU-ETS, developing a CDM or JI project in their own facilities abroad enables them to generate

credits which they can use for “compliance” purposes. Some of these companies are also becoming involved in project development or carbon credit purchases in anticipation of future changes in the regulations, especially in sectors that could become covered by the EU-ETS in the medium term.

Other reasons for developing CDM or JI projects are:

- **To secure a position on the carbon market.**

Some companies which specialize in developing renewable energy production and/or generating carbon credits on emerging markets are building up a portfolio of carbon assets, in expectation of continued high demand for carbon credits in the future;

- **To contribute to project financing.**

In the case of investment projects abroad (new facilities, process extension or optimisation), developing a CDM or JI component can provide income from the sale of carbon credits which will contribute to project financing and improve its overall profitability. This additional income can help to reduce the risks involved in the project, such as customer creditworthiness in the case of contracts for the sale of equipment or services (e.g. delegation of public services);

- **To strengthen commercial relationships.**

Some players (technology suppliers, installers of energy facilities, operators of urban services) consider CDM or JI expertise as a way of gaining a competitive edge, by offering customers technical support to set up a project capable of generating carbon credits or to respond to the increasing number of calls for tenders that include a carbon component. Given the dynamic performance of European companies in the area, a number of French firms are looking to strengthen their expertise in the field in order to preserve or improve their competitive position;

- **Image value.** CDM and JI projects are seen by the local government authorities of host countries as potentially generating positive impacts on the environment but also on economic and social development. They can add value to the image of a country, city or company by associating it with the concepts of technology transfer, genuinely “sustainable” development and action on climate change. This is why various companies are highlighting their achievements in the area of CDM/JI projects, for example in their sustainable development reports.

Increasing involvement among French players

Since 2005, several French players have become involved in developing CDM and JI projects which are now registered and generating CERs and ERUs (see table on next page). At current average market prices for the reduction units they generate, estimated returns for project promoters range from 7 to 15 € per tCO₂e avoided. Other projects under way point to the involvement of a broader range of

countries and sectors (renewable energy, waste water treatment, reforestation, etc.).

Several French companies in the financial and energy sectors have also been moving into the carbon market (CER/URE purchases, portfolio management, credit sales, etc.). Some have now become leading players on the international carbon market.

CDM projects developed by French companies and registered by the CDM EB or JI SC

Company	Project name	Type of project	Country	Reduction in tCO ₂ e (annual average 2008-2012)	Duration (years)	Date of registration
Lafarge	Tétouan	Wind farm at the Lafarge cement works	Morocco	28 651	7	23/09/2005
Veolia Propreté	Trémembé	Methane capture from landfill	Brazil	88 275	10	24/11/2005
Rhodia	Onsan	N ₂ O emission reductions	South Korea	9 150 000	7	27/11/2005
Rhodia	Paulinia	N ₂ O emission reductions	Brazil	5 961 165	7	25/12/2005
Velcan Energy	Bagepalli	Biogas recovery	India	19 553	7	10/12/2005
Lafarge	Rawang and Kanthan	Energy production biomass	Malaysia	62 011	10	07/04/2006
Veolia Propreté	ONYX Alexandria	Methane capture from landfill	Egypt	355 812	10	15/12/2006
Rhodia	Paulinia (nitric acid)	N ₂ O emission reductions	Brazil	80 109	7	02/06/2007
Veolia Propreté	Tijuquinhos	Methane capture from landfill	Brazil	112 930	7	13/08/2008
Veolia Propreté	Mérida	Methane capture from landfill	Mexico	110 565	7	31/01/2008
Veolia Propreté	AESA Misiones	Methane capture from landfill	Argentina	30 529	7	22/03/2008
Dalkia	Pécs	CHP from biomass	Hungary	239 000	15	01/01/2008
Bionersis	Regional projects	Methane capture from landfill	Chile	76 734	10	04/07/2008
TOTAL				16 076 335		

Source: UNFCCC.

“Verbatim”

- “More and more customers are requesting a carbon component in their calls for tenders. We have developed know-how within the company that enables us to offer services to support the setup of CDM projects in addition to our activities as an urban services operator.”
- “The CDM is a source of financing for projects to optimize processes at our industrial sites abroad. The resulting credits we obtain help us to comply with our emission reduction targets under the NAP.”
- “Our CDM know-how gives us an edge over our competitors. Offering our services to customers to set up CDM projects based on the “clean” technologies we sell is above all a sales argument, rather than a matter of project profitability.”
- “Income from the sale of carbon credits helps us improve the quality of our services by contributing to investments in facilities that can reduce the project’s environmental impacts. We would not be able to consider such investments without the additional income from these project mechanisms.”

2.5 What are the prospects for the project mechanisms and the carbon market beyond 2012?

The rapid rise in the number of CDM/JI projects and in the volume of CERs/ERUs traded reflects the success of the project mechanisms in the carbon market's first few years of operation. Their success is due to the demand generated by commitments made under the Kyoto protocol and the EU-ETS at European level, and to the operational nature of the project mechanisms, which involve relatively low development costs compared to the profits anticipated. These first few years have helped market players to build up experience and expertise, to implement methodological tools and to clarify the procedures required by the project mechanisms.

Nevertheless, various adjustments are being considered to promote access to hitherto untapped potential for emission cuts in certain sectors (such as transport, forests or energy savings in the residential and tertiary sector) and through small-scale projects, in particular through "programmatic" approaches. Uptake of the CDM is high in some countries from which most of the supply of credits originates (China, India, Brazil) but still very low in Africa, for example. Furthermore, while the mechanisms have benefited large-scale projects, especially those concerned with the destruction of industrial gases (HFCs, PFCs and N₂O) and energy production, the emergence of smaller-scale projects is proving difficult because of the high transaction costs involved per project.

Changes in the way these project mechanisms operate are therefore to be expected after the meeting of the Conference of the Parties to the UNFCCC in Copenhagen in December 2009, where the broader aim is to succeed in defining a new framework for GHG emission reductions beyond 2012^[22].

As we await the results of the forthcoming negotiations in 2009 on the follow-up to the Kyoto Protocol, it is clear that the lack of visibility of the carbon market is hampering the development of new CDM or JI projects. This uncertainty particularly affects projects that are not able to generate carbon credits in the very short term.

Nevertheless, international policies on climate change will continue and the principle of using market mechanisms to promote them is agreed upon by most stakeholders, even though changes in the way they operate are likely. Despite current uncertainties, various signals are pointing to further development of the carbon market, such as the continuation of the EU-ETS market until 2020 or the emergence of new markets in the United States, Australia and New Zealand.

22 - For more details, see Annex 2, page 54 – **Negotiations on international climate change policy beyond 2012.**

3

CDM and JI components: making the right investment decision

3.1 What are the main phases in a CDM or JI project?

Developing the CDM or JI component of an industrial, energetic or environmental project is a process that will take several months. Resources will need to be allocated for a project manager, who will be playing a key role in identifying and anticipating factors with a potential impact on project implementation.

The three main phases involved in setting up a CDM or JI component usually take place in parallel to the investment project itself:



Coordinating the technical, carbon and financial components of the project

A successful CDM or JI set-up will generally depend on the developer's ability to manage three fundamental project components:

- 1** – the industrial or technical component;
- 2** – the CDM or JI component;
- 3** – the financial component.

These three components are closely interlinked and need to be well coordinated (for example, forward sales of “carbon credits” can help to finance the project).

- **Project identification.** This involves analyzing opportunities for reducing GHG emissions in comparison with the baseline scenario and for financing these reductions through carbon credits. The next step is to carry out a feasibility study, which includes quantifying potential emission cuts, analyzing the risks arising from the “carbon component” and securing the necessary funds.

- **Project setup and registration.** To register the project with the supervisory body for the mechanism (the CDM Executive Board, the JI Supervisory Committee, or the host country in the case of JI Track 1), a specific document will need to be produced, the PDD, usually before the operational launch of the project;

- **The operational project phase and periodic receipt of credits.** This is the phase in which emissions will be measured and monitored and emission reductions verified by an accredited external auditor, so that ERUs or CERs can be issued.

The different CDM and JI procedures are described in detail in the following sections of this document ^[23].

23 - The main stakeholders involved in CDM and JI procedures are described in Annex 9, page 74 – **What organisations are involved in a CDM or JI approach?**

3.2 How to identify a CDM or JI opportunity

A CDM or JI approach is a component in a broader industrial or environmental project (the “conventional” project), which should be robust from the technical and economic points of view. In order to identify an opportunity for developing a CDM or JI component in a conventional project, the following questions must be addressed:

- 1 - Is the project eligible for a CDM or JI mechanism?
- 2 - Is the CDM or JI opportunity worth pursuing? What are the associated costs and benefits?
- 3 - How should I finance the development of a CDM or JI approach?

Checking project eligibility

In order to include a CDM or JI component, the project has to satisfy the following criteria at least:

- **The sector and technology targeted by the project must be compatible with the CDM or JI mechanisms^[24].** The technology must be established and commercially exploitable, and it must be effectively transferred to the host country;
- **The project must be “additional”,** which means that it must generate an actual reduction in GHG emissions in comparison with the activities that would have been implemented had the project not existed;
- **The host country must have ratified the Kyoto Protocol and must give formal approval to the project.** In the case of a CDM component, this means that the host country must confirm that the project is consistent with its own sustainable development strategy.



Host country's approval procedures

In order to benefit from CDM and JI mechanisms, each country which has ratified the Kyoto protocol must establish a Designated National Authority (DNA) for the CDM or a Designated Focal Point (DFP) for JI, and define the necessary procedures for the issue of an official Letter of Agreement (LoA) for each project. In practice, DNA and DFP requirements vary widely, as does the time needed to obtain a LoA. Therefore, it is important to make sure, as soon as a project begins, that a DNA or DFP has been set up in the country where the project is located, and that appropriate procedures have been established. DNAs or DFPs will sometimes require a Project Idea Note (PIN) from the project developer^[25] Furthermore, some DNAs or DFPs will levy a tax on the credits generated by the project. This must also be included, should the case arise, in the project's financial analysis

24 - A list of eligible sectors and technologies is given in Annex 10, page 76 – **Which sectors and technologies qualify for the CDM and JI mechanisms?**

25 - For more details, see Annex 6, page 65 – **The Project Idea Note (PIN).**



Defining the project start date

To demonstrate project additionality, the developer will need to prove that the CDM or JI component was taken into account in the decision to invest before the project's start date. This date is defined as the earliest date at which the implementation or construction or real action (date of the formal decision to invest, for example) of the project activity begins. Consequently, the inclusion of a "carbon" component needs to be examined as early as possible, and all documents supporting this should be kept available for the registration process.

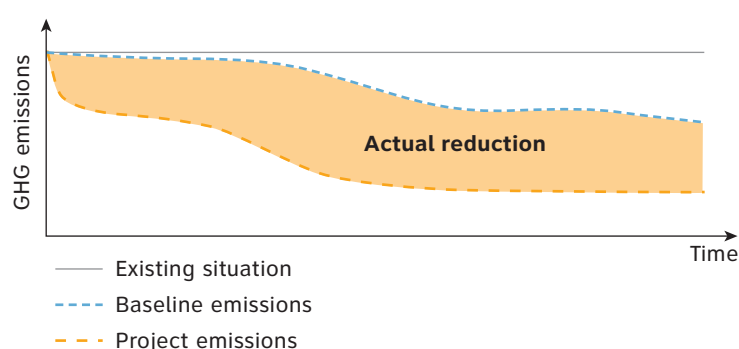
What makes a project "additional"?

The "additionality" of a project is assessed against a reference (or "baseline") scenario, which is the most likely scenario had a project with a CDM component not existed. If the project achieves more emission reductions than in the baseline scenario, then it is "additional".

Demonstrating additionality therefore relies on the principle that the project is distinct from the baseline scenario, provided it is proven that:

- The investments were not made purely for regulatory compliance;
- The project is technologically innovative in relation to common practice;
- Without the anticipated income from the sale of "carbon credits", the project under consideration would be less attractive, financially, than the baseline scenario.

Baseline scenarios and additionality



Making a cost-benefit analysis to determine whether the project is worth pursuing

The CDM or JI component of a project will generate specific costs and returns. The project developer or investor therefore needs to make a preliminary cost-benefit analysis to decide whether the project is worth pursuing.

- **The costs** are the specific expenses associated with setting up a CDM or JI component, referred to as "transaction costs"^[26], as well as the costs of internal resources dedicated to the development and implementation of the project and to the monitoring of emissions. Costs vary depending on the type of project, the country concerned and on whether or not an applicable methodology exists.

26 - For more details, see page 47
– **Transaction costs.**

- If the aim is to sell credits generated, **the income** to be expected from the project will depend on the volume and the market value of the estimated generation of carbon credits. This is calculated on the basis of the project's emission reduction potential, the crediting period chosen (10 years non-renewable or 7 years renewable no more than twice) and the price estimate for the credits obtained. This price estimate will mainly depend on:
 - the status of the project's implementation and registration;
 - the risks associated with the issuance of credits;
 - forecasts as to the balance of supply and demand on the international carbon market on the date when the credits become available.
- If the main objective is to generate credits for compliance purposes, **the income** generated by the project may be estimated as the avoided cost of reducing the same amount of GHG emissions on a site covered by a cap and trade scheme, or as the avoided cost of purchasing an equivalent amount of quotas on the market.

A preliminary estimation of the project's "carbon returns" will provide an initial indication as to whether or not development of the CDM/JI component should go ahead. The following guidelines may be useful:

- A project generating emission reductions of **more than 50 000 tCO₂e per year** will probably be an interesting opportunity to pursue, if other CDM/JI criteria are met;
- A project which generates emission reductions of **30 to 50 000 tCO₂e per year** may be of interest but will require an in-depth analysis before taking further steps.
- A project which generates emission reductions **below 30 000 tCO₂e per year** is likely to involve transaction costs that are too high in comparison with expected returns. However, such projects may qualify for simplified procedures applying to small-scale projects^[27].

Other benefits may be taken into consideration in deciding whether to develop a CDM or JI project, for example in terms of environmental and social impacts, image, competitive positioning, etc.^[28]



Checking the availability of an applicable methodology for the project

An accurate analysis of existing approved methodologies and their applicability should be carried out in the earliest stages of the project. If no approved methodology is applicable, developing a new methodology is a possibility, although this is a long and risky process that can have a considerable impact on the costs of developing the project's CDM or JI component.

A number of simplified methodologies are available for small-scale projects, which can lower the transaction costs. However, their application is subject to limitations in terms of emission reduction potential or project capacity.

27 - For more details, see Annex 8 page 72 – **Small-scale projects**.

28 - See pages 28-29 – **Some good reasons for developing a CDM or JI project**.



Estimating “carbon returns”

It is essential to use conservative estimates for both emission reductions and sale prices for carbon credits. Experience has shown that a great many projects have over-estimated the value of anticipated emission reductions and therefore the project’s overall profitability. Actual operating conditions in facilities often differ from the theoretical calculations used in applicable methodologies, and this is why an analysis of similar projects can offer points for comparison. Concerning price estimates, these can vary considerably over time. It is therefore important to define your approach for selling credits generated in the earliest stages of the process.



Defining the crediting period (duration of the CDM/JI project)

CDM procedures offer a choice between two alternatives: a fixed non-renewable crediting period of a maximum of 10 years or a crediting period of a maximum of seven years that may be renewed twice, i.e., up to a maximum period of 21 years. With the renewable option, the project validation process has to be repeated every seven years, with the risk that the project may no longer be considered additional after the first period depending on changes in the economic, energy or regulatory context. The decision should be made by the project developer on a case-by-case basis taking into account the project’s anticipated performance, its lifetime and possible changes in the baseline scenario.

With JI projects, emission reductions generated by projects before the first commitment period (2008-2012) cannot be formally taken into account. Emission reductions generated after 2012 may be taken into account if they are approved by the host country and if a follow-up to the Kyoto protocol is decided on in the forthcoming international negotiations.

Financing the development of a CDM or JI project

29 - See publication on Capacity Development for the CDM at: <http://cd4cdm.org/publications.htm>

30 - The content of a standard PIN is described in Annex 6, page 65 – **The Project Idea Note (PIN)**.

A guide on CDM or JI project financing was developed in 2007 by the United Nations Environment Programme (UNEP), entitled “Guide to CDM project financing”^[29]. Annex 13 also describes other potential sources of financing.

Some financing institutions require project developers to draw up a Project Idea Note (PIN)^[30].

3.3 Developing and registering a CDM or JI project

31 - For more details, see Annex 8 page 72 – **Small-scale projects**.

In order to benefit from project mechanisms, project developers must follow a specific approval and registration procedure. This involves demonstrating the project’s eligibility in a Project Design Document (PDD), which

must be validated by an independent auditor and approved by the national authorities. Simplified procedures are applicable to some “small-scale” projects, i.e., which generate only a small amount of emission reductions^[31].

Determining whether to apply for CDM, JI Track 1 or JI Track 2

CDM projects can be undertaken in any country which has ratified the Kyoto Protocol (except those listed in Annex I) and established a Designated National Authority (DNA). The list of eligible countries is available from the UNFCCC web site ^[32].

JI projects can only be undertaken in a country listed in Annex I of the Kyoto Protocol. The Marrakech Accords stipulate that an Annex I Party may transfer or acquire ERUs provided that ^[33]:

- 1 - It has ratified the Kyoto Protocol and is therefore a Party to it;
- 2 - It has calculated and registered its Assigned Amount Units (AAUs), i.e., it must have submitted an initial report;
- 3 - It has established a national system for estimating GHG emissions from human sources and GHG absorption into sinks;
- 4 - It has established a national registry;
- 5 - It has submitted its most recent GHG emissions inventory each year;
- 6 - It has provided additional information on its AAUs as required by Paragraph 1 of Article 7 of the Protocol.

The JI mechanism has two different procedures for projects involving trade in ERUs between Annex I Parties:

- **JI Track 1:** this option is only available if the host Party satisfies all 6 eligibility criteria listed above. If this is the case, JI track 1 can be a fairly simple procedure, in which only the host country needs to endorse the project and subsequently approves the issuance of ERUs. Verification of emission reductions is usually left to an independent organisation. In practice, the procedure varies with each country. France, which has satisfied all the criteria required for JI Track 1 since 21 April 2008 ^[34], has introduced an innovative system of “domestic offset projects” based on this mechanism ^[35].
- **JI Track 2:** Track 2 remains an option even if the host country does not meet all the eligibility criteria. In this case, project development is supervised by the JI Supervisory Committee, working through Accredited Independent Entities (AIE) for the validation and verification stages (verification is referred to as “determination” in JI). The procedure is similar to the procedure for the CDM. The host party may only deliver or transfer ERUs if it meets criteria 1, 2 and 4 at least.

32 - List of DNAs:
<http://cdm.unfccc.int/DNA>

33 - UNFCCC, Decision 9/CMP.1, Annex Article 21, COP/MOP 1, November 2005.

34 - The list of countries eligible for JI Track 1 is available under mechanisms eligibility at:
http://unfccc.int/kyoto_protocol/compliance/enforcement_branch/items/3785.php

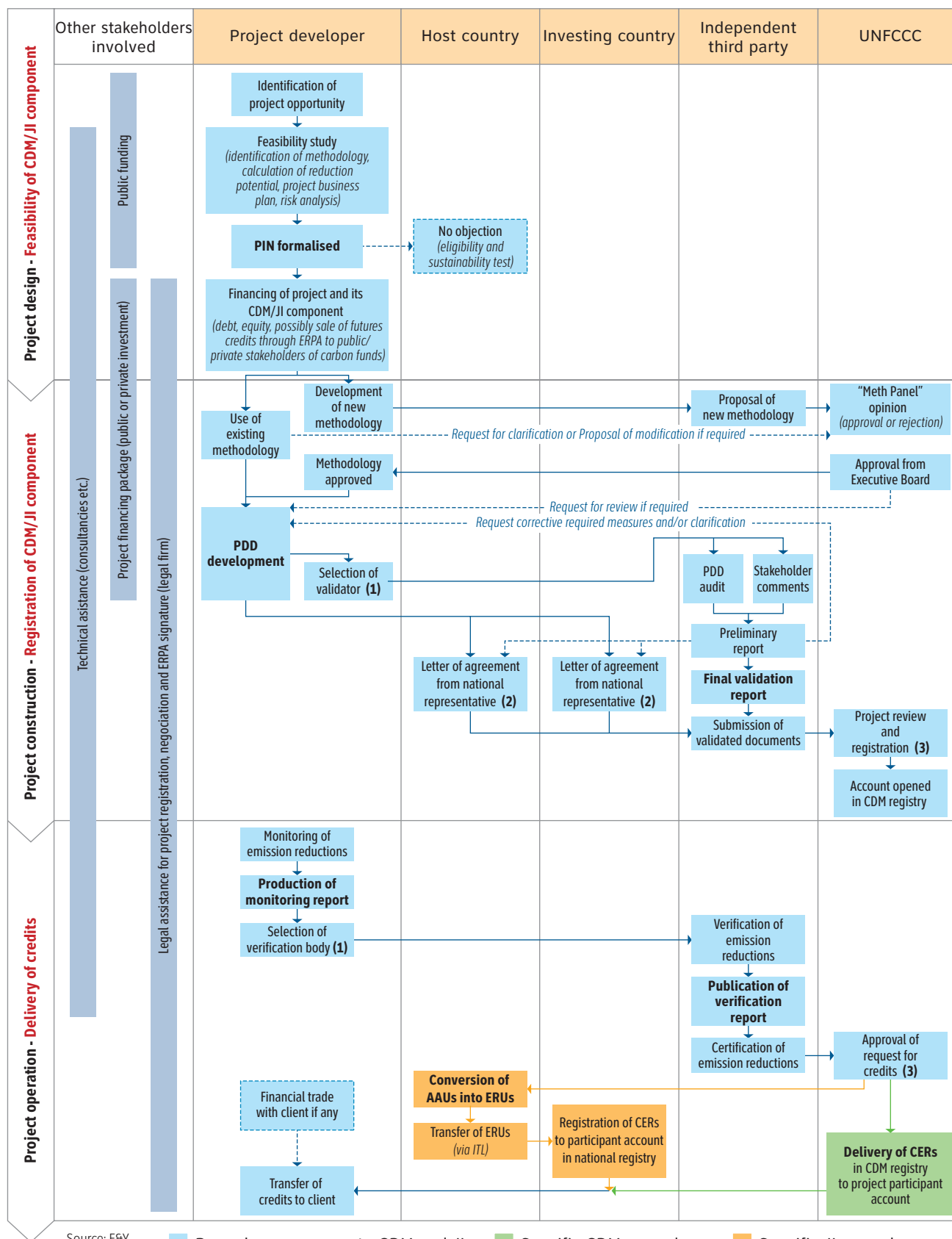
35 - For more details, see Annex 12 page 90 – **Domestic Offset Projects**.

What are the specific administrative procedures?

The procedures required to set up a CDM or a JI Track 2 project are similar in many ways, and described in the following sections of this document. In the case of JI Track 1, each country

has a specific procedure. It is therefore essential to contact the host country's Designated Focal Point (DFP) for information.

Main steps and players in a CDM or JI Track 2 approach

**CDM case**

- (1) Designated Operational Entity/DOE
 (2) Designated National Authority/DNA
 (3) CDM Executive Board/CDM EB

JI Track 2 case

- (1) Accredited Independent Entity/AIE
 (2) Designated Focal Point/DFP
 (3) JI Supervisory Committee/JI SC

The eight main steps in the process

- 1 - Formalisation of a Project Idea Note or PIN, if required
- 2 - Production of a Project Design Document or PDD
- 3 - Validation of the project by an independent third party
- 4 - Obtaining approval from the host country
- 5 - Project registration
- 6 - Monitoring and reporting on emissions
- 7 - Verification of emission reductions
- 8 - Issuance of CERs or ERUs

Step 1 - Formalising a Project Idea Note (PIN)

A Project Idea Note³⁶ is a 5 to 10 pages document presenting the technical and financial feasibility of your project. It covers four points:

- The project's financial structure;
- The project's social and environmental benefits;
- The context of the project;
- The methodology used and the emissions avoided by the project;

Production of a PIN is not mandatory. It may be requested by an investor, a potential purchaser of carbon credits, a DNA or a DFP.

Step 2 - Developing a Project Design Document (PDD)

Any request for registration of a CDM or JI project (Track 2, and Track 1 in many cases) must be based on a project description known as the Project Design Document (PDD). Besides a presentation of the context and objectives of the project, the PDD must include a demonstration of its additionality and an assessment of potential emission reductions, as well as a monitoring plan. It should be drawn up in accordance with the UNFCCC's standard format³⁷ and must include the following sections³⁸:

- **Section A** – A general description of the project activity
- **Section B** – A description of the methodology used to calculate the baseline scenario, to monitor emissions and to verify emissions arising from the project
- **Section C** – The duration of project activity and the crediting period for emission reductions arising from the project
- **Section D** – An analysis of the project's environmental impacts
- **Section E** – A description of the stakeholder consultation process and a summary of their comments

Particular attention should be given to the quality of the PDD: if the data are incomplete, the DOE (or AIE) will request clarification and this can significantly delay the process. As the PDD is a technical document addressing complex topics, project developers frequently rely on external experts to produce it. In this case, the expert's experience in the relevant activity sector and knowledge of applicable methodologies will be a determining factor.

36 - For more details, see Annex 6 page 65 – **The Project Idea Note (PIN)**.

37 - The standard PDD form is available from the UNFCCC web site at: http://cdm.unfccc.int/Reference/PDDs_Forms

38 - For more details, see Annex 7 page 67 – **Drawing up a Project Design Document (PDD)**.



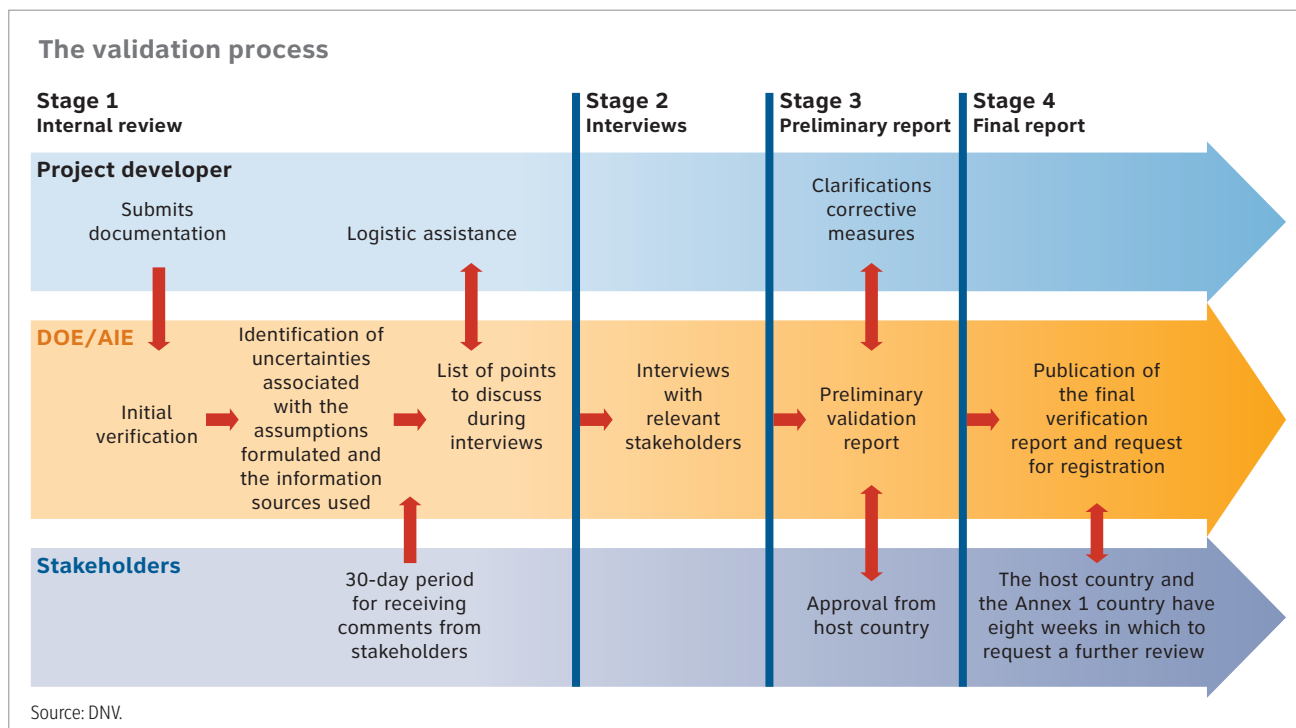
Keeping track of changes in CDM/JI procedures

The rules and methodological recommendations applying to CDM and JI projects are constantly evolving. Some changes are immediately applicable and may have a significant impact on the development of a CDM or JI component. To keep abreast of any changes, the best solution is to keep a watch on the minutes of CDM Executive Board ^[39] and JI Supervisory Committee ^[40] meetings. Other sources can provide summary information on these developments (such as the monthly publications from Point Carbon ^[41] or the monthly “CDM highlights” newsletter from GTZ ^[42]).

Step 3 - Validation of the project by an independent third party

The validation stage for a CDM project (or “determination” for a JI project) is conducted on the basis of the PDD by an independent third party. For CDM projects, this will be the **Designated Operational Entity (DOE)**,

and for JI projects the **Accredited Independent Entity (AIE)**. The project developer selects the validating body from a list of accredited organisations for each sector of activity, which is available from the UNFCCC ^[43] web site.



39 - <http://cdm.unfccc.int/EB>

40 - http://ji.unfccc.int/Sup_Committee/index.html

41 - CDM and JI monitor available at: <http://www.pointcarbon.com>

42 - GTZ newsletter available at: <http://www.gtz.de/en>

43 - List of DOEs per sector: <http://cdm.unfccc.int/DOE/list>
list of AIEs per sector: <http://ji.unfccc.int/AIEs>

The main steps towards validation are as follows:

- A review of supporting documentation (including, in particular, analyses of additionality, the methodology used to establish baseline emissions, monitoring plan, and an analysis of the project's environmental impacts).
- A public consultation for which the validating body publishes the PDD on the UNFCCC web site and invites comments from observers within 30 to 45 days, depending on the type of project.
- Interviews with project stakeholders and site visits.

- Delivery to the project developer of a preliminary report, which must include any requests for corrective action and clarification.
- Once all outstanding questions have been cleared, the validator issues an opinion and a validation report for a

CDM project (or a determination report for JI) which is submitted to the project developer for review.

Once all these analyses have been completed, the validator will be able to submit a request for registration to the CDM Executive Board (or the Supervisory Committee for JI).



Managing project timeframes during the validation stage

The time needed for validation has lengthened in recent years with the increase in the number of projects under development. Altogether, at present, 6 to 8 months may elapse between setting up the validation contract with the DOE or AIE and finalizing the validation report. This is why it is useful to begin the selection of a DOE or AIE during the initial CDM or JI project phases.

It is important to prepare the validation stage carefully: experience shows that questions raised by the validator can considerably lengthen the process.

Step 4 - Obtaining approval from the host country

A CDM or JI project can only be submitted for registration to the CDM Executive Board or the JI Supervisory Committee once it has received official approval from the host country, via the Designated National Authority (DNA) for the CDM or the Designated Focal Point (DFP) for JI. Approval from local authorities is required to ensure that:

- In the case of a CDM component, the project is consistent with the country's sustainable development priorities.
- In the case of a JI component, the host country undertakes to transfer the corresponding ERUs, provided that the project has effectively produced the equivalent emission reductions.



Relationships with the DNA (CDM) or DFP (JI)

In order to approve a project for registration, the host country must have established a specific institutional framework. Some governments draw up lists of projects they wish to encourage, and it is therefore useful to make contact with the host country's DNA or DFP from the outset. Their contact details are published on the UNFCCC web site⁴⁴. The economic missions in French embassies can help to arrange these contacts.

A Memorandum of Understanding (MoU) signed between an investing country and a host country can provide a facilitating framework. France has negotiated more than ten agreements, that essentially aim to promote the involvement of French operators in the development of CDM and JI projects in host countries. These are listed below with the dates on which the MoUs were signed:

Argentina (15/04/2004), Brazil (15/07/2005), Bulgaria (04/10/2007), Chile (11/02/2004), China (09/10/2004), Colombia (14/05/2003), Gabon (16/11/2006), Morocco (25/07/2003), Mexico (22/10/2004), Romania (28/09/2004, then 04/02/2008), Russia (20/09/2008), Senegal (16/01/2007), South Korea (16/11/2006), Tunisia (30/10/2006), Ukraine (15/03/2007), Uruguay (15/12/2005).

44 - The list of DNAs is available at: <http://cdm.unfccc.int/DNA>
For the list of DFPs, go to: http://ji.unfccc.int/JI_Parties/PartiesList.html

Step 5 - Project registration

The validator (DOE or AIE) is the only body entitled to submit a project for registration. The submission must be supported by the validation report (or determination report in the case of a JI component), which must include the PDD as well as the Letter of Agreement from the host country. All of these documents must be made available to the public through the UNFCCC web site.

Registration of a CDM project is considered to be accepted unless one of the countries concerned or at least three members of the CDM Executive Board request a review within 8 weeks (4 weeks in the case of small-scale projects). The procedure for JI projects is similar, with a 45-day deadline for the country concerned and JI SC members to request a review.

3.4 How to obtain carbon credits once the project has been registered

Step 6 - Monitoring emission reductions

Carbon credits, in the form of CERs or ERUs, can only be obtained after the project's operational phase has begun and once the emission reductions have been measured. The methods used to monitor emissions during the operational phases of the project are defined in the monitoring plan included in the PDD. This details the procedures which project participants must observe in order to make periodic calculations

of emission reductions that can be attributed to project activities. It also specifies the quality assurance and control procedures to follow for data collection and storage.

In order to periodically obtain CERs or ERUs, project participants must draw up monitoring reports on emission reductions (measured a posteriori), to be used as a basis for verification by an independent third party (DOE or AIE).



The importance of the monitoring phase

The monitoring of emission reduction is often under-estimated by project developers, even though it is an essential step in determining the amount of "carbon credits" that will actually be issued. Projects can lose the benefit of a great many credits if they do not monitor their emissions properly and fail to observe the procedures set out in the monitoring plan, for example in the event of a malfunction in their monitoring equipment.

Experience shows that risks of introducing material errors into the calculations arise mainly in the following circumstances, which must be covered by in-depth quality control procedures:

- Incorrect reporting of data recorded in the monitoring report;
- Problems with the calibration or operation of measurement equipment;
- Incorrect application of emission factors for different emission sources.

Furthermore, establishing a process for continuous measurements, which will involve processing many thousands of data items, can be highly problematical if the necessary technical expertise is not available locally.

Step 7 - Certifying emission reductions

Project developers seeking to obtain certification of emission reductions must have their calculations, as detailed in the monitoring report, audited by an independent third party. The auditor, the DOE for a CDM project or the AIE for a JI project, will then check that these calculations have been made in accordance with the monitoring plan and that they contain no material errors.

On the basis of its verification report, the DOE or AIE must certify in writing that the project activity has effectively reduced GHG emissions during the

crediting period and that the reduction would not have occurred without the project activity. The DOE or AIE informs the project participants stakeholders as well as the CDM EB or the JI SC of its decision to make the certification report available to the public. Unlike validation and verification, certification is the sole responsibility of the DOE or AIE.

With a CDM project component, the report produced must also include a request to the Executive Board to issue the amount of CERs that corresponds to the amount of verified emission reductions.

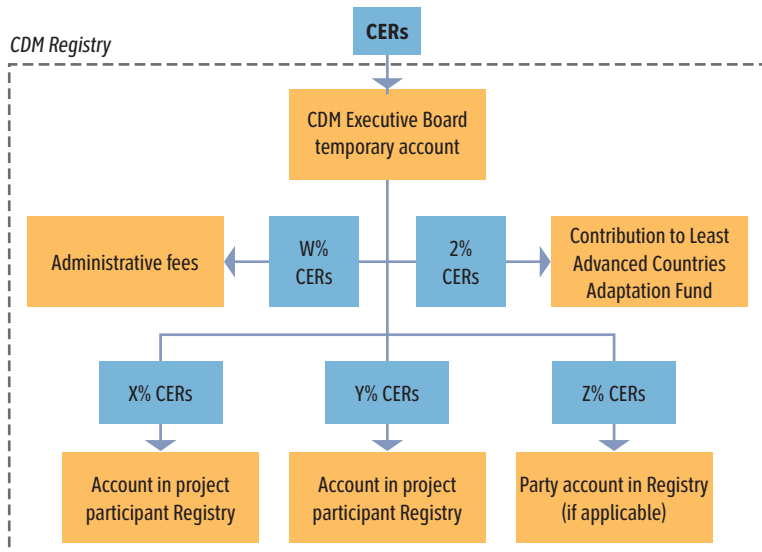
Step 8a - Delivery of CERs (for CDM projects)

Credits are calculated on the basis of the difference between baseline emissions presented in the PDD and actual emissions as measured and certified by an independent third party. Credits are issued within 15 days after the date on which the request for issuance was received, unless one Party (the DNA representative) or at least three members of the Executive

Board request a review. The scope of such reviews should be limited to issues of fraud, misconduct or incompetence on the part of the DOE.

Once the Executive Board has approved the issuance of CERs, the administrator responsible for the CDM registry credits the CERs to the accounts of the participants listed in PDD. A share of the credits issued (Share of Proceeds-SOP) will be deducted to cover the CDM Executive Board's administrative expenses and as a contribution to the adaptation fund (SOP-Adaptation) set up for the countries most vulnerable to climate change.

The CER issuance process



Source: UNFCCC.

Identifying the Focal Point

The focal point is a physical person who is associated with a project participant. The focal point should be selected with care, as all questions relating to the issuance of credits will be addressed to this person. Any change in the people responsible for the project must be notified in writing to the focal point.

Step 8b - Delivery of ERUs (for JI projects)

The AIE's assessment of emission reductions is considered final 15 days after it has been made public. The host country will then, in its national registry, convert some of its AAUs – equivalent to the emission reductions generated by the project – into ERUs. All or some of these ERUs, depending on the contractual provisions which you will

have defined with the host country, will then be transferred, via the International Transactions Log (ITL) from the host country's registry to the project developer's account in the investing country's registry, for distribution of the ERUs on the basis of each participant's contractual obligations.

3.5 How will I realise the value of my carbon credits?

Unless they are used directly for compliance purposes, the carbon

credits obtained will be traded on the market.

Using carbon credits for compliance purposes

The industrialized countries which have ratified the Kyoto Protocol may purchase carbon credits in order to supplement their domestic efforts to fulfill their GHG emission reduction targets for the 2008-2012 period. However, most of the demand for carbon credits is currently from the private sector (see Table on page 21).

Buyers, or project developers who obtain credits, are most often businesses seeking to use them in order to secure compliance with their national regulations. In Europe, Directive 2004/101/EC, known as the "Linking Directive", recognises that CERs and ERUs may be used by companies covered by the EU-ETS, thus creating a direct link between the Kyoto Protocol and the EU-ETS. The companies concerned are under obligation to surrender, each year on the 30th of April at the latest, an amount of emission allowances that corresponds to their actual verified emissions in the previous year.

The Linking Directive stipulates that carbon credits are to be used via the issuance and immediate restitution of one European allowance against one Kyoto credit. This "exchange" may be described as follows: an operator who has generated or purchased a Kyoto credit must apply to the State for the issuance of one emission unit in exchange. If the State agrees to do so, it will simultaneously return the quota, on behalf of the operator, in order to cover emissions from the operator's facilities. The request for this exchange is made directly by the operator to the entity in charge of the national registry^[45], which in France is the "Caisse des Dépôts et Consignations".

Most of the obstacles relating to the establishment and operation of the national registries have been removed now that the International Transactions Log (ITL) has become operational. The Community Independent Transactions Log (CITL) is linked with the ITL, so that records can be directly and materially reported to the accounts of contracting parties in their national registries.

45 - In accordance with Article 53 of Regulation 2216/2004/EC pursuant to article 19 of Directive 2003/87/EC as amended by Commission Regulation (EC) n° 916/2007 of 31 July 2007.

Negotiating an Emission Reduction Purchase Agreement (ERPA)

Carbon credit transactions usually take place “over the counter” on the primary market, well ahead of the project’s development and implementation and often before it is even registered by the CDM Executive Board (or the JI Supervisory Committee), thus providing project developers with an additional source of financing or a bank loan guarantee.

Any sale of carbon credits presupposes the existence of a legal relationship, which is effectively a contract for the purchase of certified emission reductions (Emission Reduction Purchase Agreement - ERPA). The purpose of ERPAs is to manage the relationship between the vendor and the buyer, and to set out the conditions governing this relationship, subject to the proper execution of the CDM or JI project itself.

Although standard contracts are now emerging (World Bank, national funds, International Emissions Trading Association, etc.), an ERPA is usually a long, complicated document written in a language that is not necessarily the vendor’s or the buyer’s (English is the language most commonly used). Their complexity also lies in the fact that negotiations concerning carbon credit sales require special expertise (on project mechanisms, on the carbon market and on legal developments on the international front), which neither the vendor nor the buyer may possess. This explains why intermediaries or legal advisers are frequently required. The CERSPA⁴⁶ initiative is most useful in this respect, since it offers free access to a standard contract form which is both simple and easily adapted to different situations.

46 - Web site for the CERSPA initiative:
<http://www.cerspa.org>

Who are the contracting Parties?

Since the object of the contract is to transfer or acquire carbon credits, the contracting Parties are those who express the wish to sell and to buy. It is therefore absolutely essential to clearly identify the contracting Parties in the contract itself, which must also stipulate guarantees as to their representation in order to ensure proper execution of their respective obligations, i.e., payment in the case of the buyer and delivery in the case of the vendor.

What is the legal nature of carbon credits?

The legal nature of carbon credits is defined by applicable national laws (law applicable to the contract or the laws of the host country). International law only governs legal relationships between States.

A carbon credit is very similar to an intangible asset insofar as it is transferable and the owner has a right of transfer; this right has a monetary value and can therefore be regarded as a commodity. Whatever the contracting options available (outright purchase, advance purchase or purchase option), carbon credits are therefore considered in most contracts as a commodity and sometimes as a financial instrument (especially in the case of purchase options).

A particular case are the “carbon sink” credits generated by forestry projects, where ownership of the sequestered carbon may depend on rights over land and over natural resources (which are customary rights in most cases). In this case, particular attention should be given to the conditions under which legal title to carbon credits can be effectively transferred from local communities or indigenous peoples to the buyer.

How to limit risks relating to the delivery of credits?

Contracts negotiated on the primary market usually concern credits to be issued at a later date. Clauses should therefore be included to guarantee any risks that are liable to prevent credits from being issued (risks associated with the stability of the host country, with improper contract execution, etc.). Some of these risks can be limited in clauses setting out conditions precedent, and concerning, for example:

- the obligation on project participants to obtain all authorisations and licences required under national laws to carry out the project;
- the need to secure the necessary financing for project development;
- validation of the project by a Designated Operational Entity (or Accredited Independent Entity);
- registration of the project.

How are the conditions for delivery negotiated?

Most contracts require credits to be delivered annually, but CDM and JI implementation rules allow the contracting parties to opt for shorter or longer periods. The purchase of credits in order to ensure compliance with the EU-ETS, which is assessed on 30th April each year, prompts most European buyers to demand delivery at the end of the year that precedes the year when they must surrender emission allowances.

To establish the place of delivery, the vendor and the buyer both have to hold a personal account in the national registry set up in accordance with Article 7.4 of the Kyoto Protocol or, as a temporary measure in the case of a CDM project, a provisional account (in the name of a project participant in the case of the vendor, and the buyer if applicable), in the registry managed by the CDM Executive Board.

What are the methods used to set prices?

The Parties may agree on the method to use to set prices, although the vendor is entitled to do so unilaterally in the case of calls for bids where the sale goes to the highest bidder. In “over the counter” sales, the most commonly used methods are as follows:

Method	Advantages	Disadvantages
Fixed price: the price per credit is fixed for the entire duration of the contract	Simple and low risk for both parties	Market variations are not taken into account
Indexed price: the unit price is calculated on the basis of a spot rate. A spot rate usually refers to other emission reduction units, such as the price for allowances under the EU ETS	Opportunities and risks for both buyer and vendor, depending on variations in the reference spot rate during the term of the contract	In contrast to the method described above, neither the vendors nor their banks will be able to calculate carbon returns, and therefore the value of the contract
A fixed price combined with an indexed price	Guaranteed minimum price and limited impact of spot rate fluctuations	
Indexed price with a floor price and ceiling price: a minimum (floor) price and a maximum (ceiling) price are included in the unit price	Protects both vendor and buyer from major market fluctuations, makes long-term planning easier	

3.6 What are the implications of a CDM or JI component in terms of costs, timeframes and risks?

Transaction costs

The different stages in setting up a CDM or JI project component will involve transaction costs, although these

are usually low in comparison with the expected returns from the sale of carbon credits.

Estimated transaction costs arising from a CDM or JI approach (excluding development of a new methodology)

Stage	Specific CDM or JI output	Indicative costs
Preparation phase		
Feasibility study	Production of a Project Idea Note (PIN) if required	5 000 to 20 000 €
Project development	Production of the PDD	20 000 to 70 000 €
Project approval	Validation by a DOE (for the CDM) or AIE (for JI)	15 000 to 60 000 €
Project registration	Cost of registering the project with the CDM EB or JI SC	Advance payment of Share of Proceeds Admin for the first year
Optional: negotiation of credit sales	Development of the sales contract	5 000 to 40 000 €
Operational phase		
Verification	External verification of emission reductions	5 000 to 50 000 € per verification
Administrative costs	Share of Proceeds Admin	0.1 US\$ per CER/ERU (for the first 15 000 tCO ₂ e) 0.2 US\$ per CER/ERU (above 15 000 tCO ₂ e)
Contribution to the Adaptation Fund for the Least Developed Countries	Share of Proceeds Adaptation	2% of CER/ERU value on each issuance

Over and above these expense items, the internal resources required to ensure that the project goes ahead will also need to be taken into account by the project promoter.

The following points must also be borne in mind:

- **The costs of developing** a new methodology can be considerable;
- **Transaction costs** are not really sensitive to the size of the project (in

terms of tCO₂e reductions achieved), and this penalises small-scale projects. However, there are several possibilities for reducing unit transaction costs for small-scale projects⁴⁷, (less than 60 000 tCO₂e/year for example), such as simplified methodologies and procedures or “bundling” of similar projects;

- **The costs of setting up** a first CDM project will be initially high but will drop as the learning curve rises and as the range of approved methodologies becomes broader.

What are the timeframes involved?

The stages that are specific to a CDM or JI project component can be conducted in parallel to the main investment project (“conventional” project).

With efficient management, the Kyoto component should be completed in 9 to 18 months and will not delay industrial and technical development for the project.

47 - For more details, see Annex 8 page 72 – **Small-scale projects**.

Timeframes in a CDM or JI approach

Stages		Time required	Remarks
Identification and feasibility study		1 month	
Production of the PDD		2 to 3 months	Obtaining key local figures, such as emission factors, may prolong this stage if they are not immediately available
If required: development and approval of a new methodology		12 to 24 months	
Project validation	Validation of the PDD by the DOE or AIE	3 to 8 months	The availability of the DOE (or AIE) is a key factor in this duration of this stage
	Obtaining the official Letter of Agreement (host country)	A few days to several months	The time needed here depends on the DNA for each country, on their procedures and their reactivity
	Obtaining the official Letter of Agreement (Annex I country)	A few days to several weeks	
Registration (from the time of submission)		At least two months	Two months is the minimum for this stage, which will be longer if a request for review is made to the CDM Executive Board
Total (excluding new methodology)		9 to 18 months	

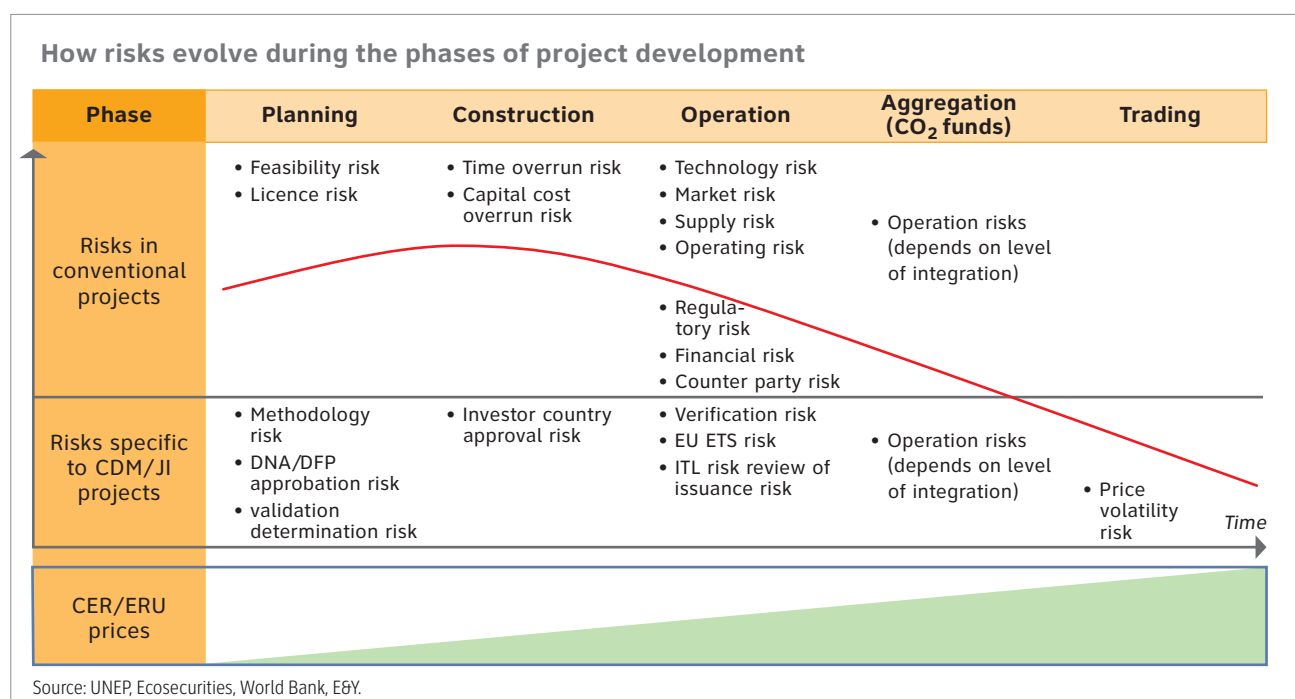
Source: E&Y.

What are the risks?

The CDM or JI component of a project carries specific risks that have to be considered in the overall risk analysis for the project before you make the decision on investment:

- Technological risks: projects involving certain sectors and technologies will be registered more quickly and easily than others^[48];
- Risks associated with the host country;
- Risks associated with the development of a new methodology;
- Risks associated with the validation, registration and credit delivery processes;
- Risks associated with the carbon market and its fluctuations.

48 - For more details, see Annex 10 page 76 – Which sectors and technologies qualify for the CDM and JI mechanisms?



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ANNEX 1

The international framework for climate change strategy

The United Nations Framework Convention on Climate Change (UNFCCC): a global approach to reduce greenhouse gas emissions

The United Nations Framework Convention on Climate Change^[1] (UNFCCC) was adopted at the Earth Summit in Rio de Janeiro in 1992. This Convention, which has now been signed by 192 countries, came into force on 21st March 1994. Its ultimate goal is to bring down greenhouse gas (GHG) emissions “to levels that will prevent dangerous human interference with the climate system”. All States share responsibility for achieving this objective, with different targets depending on the group they belong to:

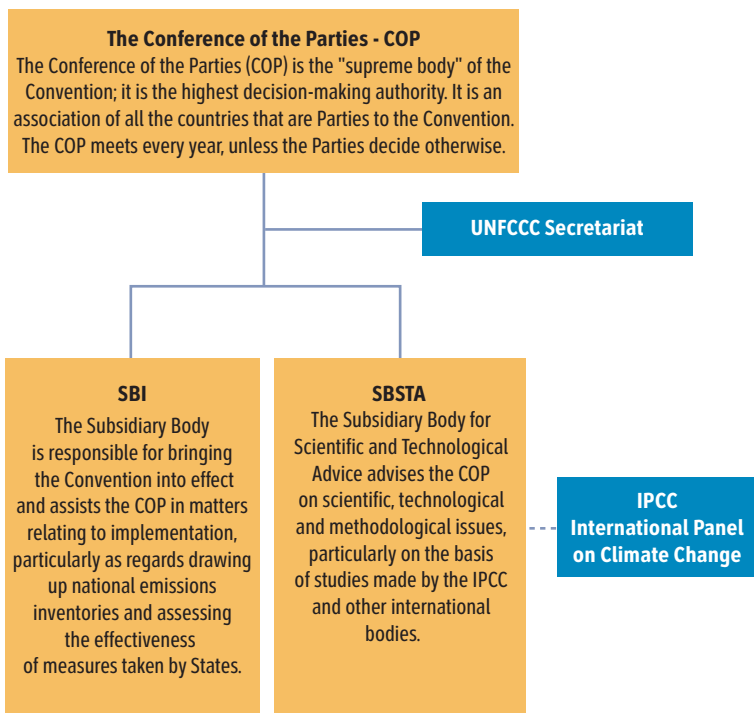
- **Annex I countries^[2]**: these are mainly the developed countries, including those which were OECD member countries in 1992 and those with a so-called “transitional” economy. Annex I covers 41 Parties, as follows:
Australia, Austria, Belgium, Bielorrussia, Bulgaria, Canada, Croatia, the Czech Republic, Denmark, Estonia, the European Community, Finland, France, Germany, Greece, Hungary, Ireland, Iceland, Italy, Japan, Latvia, Lithuania, Luxembourg, Monaco, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, the Russian Federation, Spain, Slovakia, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom and the United States. Amongst these, the 24 most highly developed countries (listed in a subdivision called Annex II), are also required to support the efforts of developing countries in addition to meeting their own targets.

1 - United Nations Framework Convention on Climate Change: <http://unfccc.int/resource/docs/convkp/convfr.pdf>

2 - List of Annex I countries: http://unfccc.int/parties_and_observers/parties/annex_i/items/2774.php

3 - List of countries not included in Annex I: http://unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php

Main bodies of the UNFCCC



Source: UNFCCC

- **Non-Annex I countries^[3]**: these are mainly the developing countries. They have no specific obligations in terms of emission reductions but they do take part in the global effort to act on climate change.

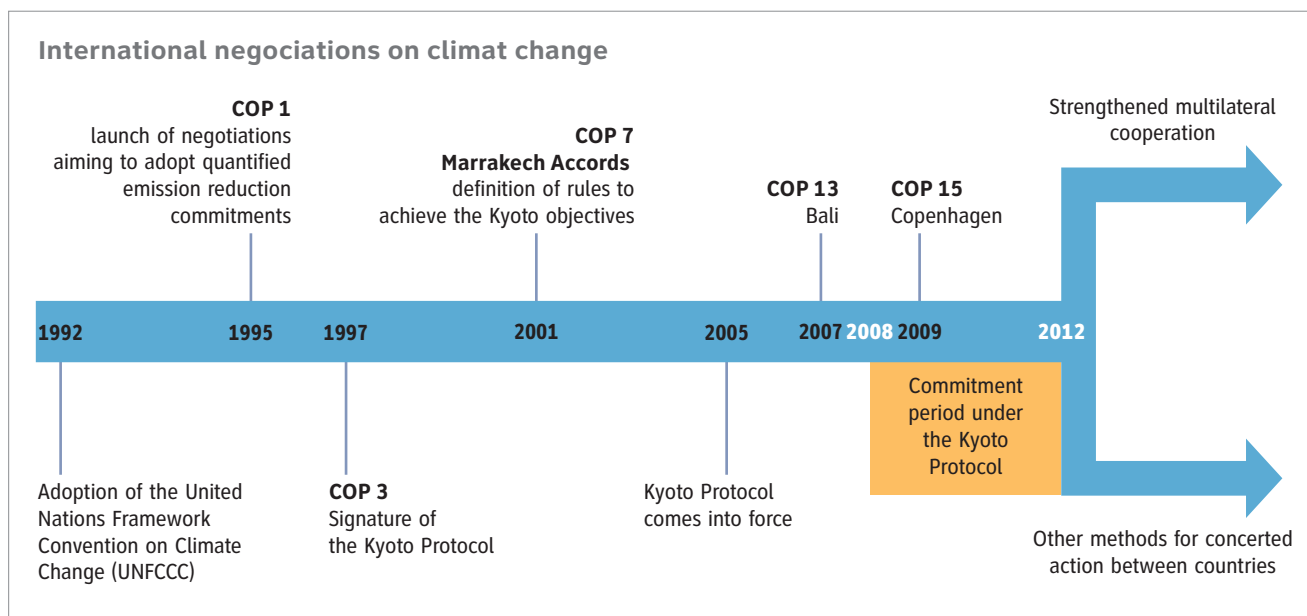
The signatory countries undertake to:

- **Share statistical and technical information** relevant to GHG emissions and their reduction;
- **Implement national strategies** designed to reduce emissions and to assist developing countries in acting to control GHG emissions;
- **Cooperate** on adaptation to climate change.

However, the convention does not set out any quantified targets or any obligations to act upon the causes of climate change. Countries may, if they so wish, make their own binding commitments.

The Kyoto Protocol: a legally binding commitment to quantified emission reduction targets from all Annex I countries having ratified the Protocol

The first COP (Conference of the Parties) held in Berlin in 1995 enacted the official launch of negotiations aiming to adopt quantified emission reduction commitments, in an approach similar to the Montreal Protocol for PFCs. This led to the signature of the Kyoto Protocol at the third COP in 1997. Conditions for implementing the Protocol were developed in the years that followed and adopted at the seventh COP in December 2001, under the Marrakech Accords.



Through the UNFCCC's institutions, the Kyoto Protocol sets out legally binding commitments whereby the Annex I countries undertake to reduce or limit their GHG emissions. Under the Marrakech Accords, penalties are imposed on non-complying countries during the next period, which require them to surrender, in the form of AAUs and, under certain conditions, of other Kyoto units, 1.3 times the amount by which they were below target at the end of the 2008-2012 period. However, these commitments could not effectively be made legally binding until:

- the Protocol itself could be brought into force, which meant that it had to be ratified by at least 55 of the countries party to the UNFCCC, and that at least 55% of CO₂ emissions from Annex I countries had to be covered;
- the country concerned had ratified the Convention and would also ratify the Protocol.

The Kyoto Protocol actually came into force on 16 February 2005 following its ratification by Russia, the United States having withdrawn in 2001. The first commitment period under the Protocol began in 2008 and will expire at the end of 2012. The overall target for the Annex I countries during this period is a 5.2% reduction in emissions compared to 1990 levels. Individual targets differ among the 40 committed countries, and are specified for each one in Annex B to the Protocol.

Examples of commitments from some Annex I countries

Country	1990* emissions (MtCO ₂ e)	Reduction commitment for 2008-2012 (compared to 1990 levels)	Target in emissions for 2012* (MtCO ₂ e)	2005* emissions (MtCO ₂ e)
EU-15	4 279	- 8%	3 937	4 187
EU-27	5 764	- 8%	5 312	5 164
Germany	1 232	- 21%	974	1 005
UK	780	- 12.5%	682	659
France	564	0%	564	555
Poland	563	- 6%	530	403
Italy	517	- 6.5%	483	578
Spain	290	+ 15%	333	441
USA	6 135			7 107
Russia	3 323	0%	3 323	2 133
Japan	1 261	- 6%	1 186	1 358
Ukraine	921	0%	921	419
Canada	594	- 6%	558	747
Australia	554	+ 8%	598	525

Source: UNFCCC, Institute for Global Environmental Strategies (IGES) and EPA. * LULUCF, Land Use, Land Use Change and Forestry excluded.

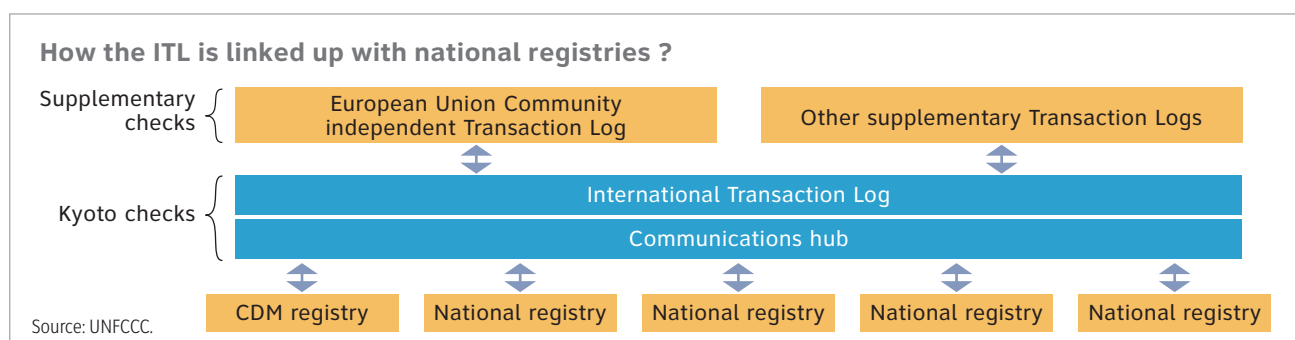
Besides the emission reduction measures to be implemented domestically by each country (improved energy efficiency, development of renewables, curbs on diffuse emissions, etc.), the Protocol defines **three flexible mechanisms** to help the Parties achieve their targets in an economically efficient manner:

- The worldwide system for emission trading, a mechanism for trade in AAUs between Annex I Parties;
- The Clean Development Mechanism (CDM);
- The Joint Implementation (JI) mechanism.

The Kyoto Protocol is organised around the following events and entities:

- The Conference of the Parties (COP), serving as the Meeting of the Parties to the Kyoto Protocol, is the supreme decision-making body under the Kyoto Protocol. All Parties having signed the Convention meet at the Conference of the Parties to review implementation of the Kyoto Protocol;
- The Executive Board of the CDM, with ten members, supervises CDM implementation and prepares COP decisions;
- The JI Supervisory Committee, which supervises JI implementation;
- The Compliance Committee verifies that States are on track towards their emission reduction targets. It supervises the upkeep of the national registries and the ITL^[4]. It has two branches: the “facilitating” branch, which provides support to States in their efforts towards compliance, and the “coercive” branch, which verifies and enforces compliance with State undertakings and imposes penalties if need be.

4 - The ITL system (International Transaction Log) was set up in order to monitor and record to all operations required by the project mechanisms and by State compliance.



ANNEX 2

Negotiations on international climate change policy beyond 2012

The 4th IPCC Assessment Report (November 2007) made it clear that worldwide greenhouse gas emissions must be reduced by at least 50% compared to their 1990 levels by 2050 if we are to attempt to contain global temperature rise to no more than 2°C above preindustrial levels.

However, at present, the Kyoto Protocol only sets out quantified emission reduction targets for the industrialized countries, and only for the first commitment period, which will expire at the end of 2012. Since 2006, the contracting parties to the Kyoto Protocol have been discussing ways of securing commitments from countries after 2012. It is now clear that an international agreement has to be concluded by the end of 2009, so that countries can ratify it before the first Kyoto Protocol commitment period comes to an end and thus avoid the risks of a legal vacuum and political disengagement with regard to climate change.

The 2007 Bali Action Plan and the definition of “building blocks”

Two years of discussions in numerous international forums (UNFCCC Dialogue, ad hoc working group for the Kyoto Protocol, initiative of the United Nations Secretariat General, G8+5, Gleneagles, etc.) on opportunity, levels of ambition and participation and on the negotiating process for a new global framework on climate culminated at the Bali Conference (1-15 December 2007, Indonesia, COP 13 and COP/MOP 3). After two weeks of intense negotiation, the Parties eventually adopted the Bali Action Plan, a roadmap for a negotiating process governed by the United Nations Framework Convention on Climate Change (UNFCCC) and aiming to reach an agreement at the 15th Conference of the Parties to be held in Copenhagen, Denmark, in December 2009.

The Bali Action Plan has organised the coming negotiations around five “building blocks”. These are:

- 1 – A “shared vision” to be established** that includes a “global long-term objective for emission reductions”. The EU is arguing in favour of an emission reduction target that will at least halve worldwide emissions by 2050 compared to 2000 levels, on the basis of findings in the IPCC report¹.
- 2 – Climate change mitigation.** One of the hurdles to be overcome in the negotiations is how to find a balance between future action on the part of the developed countries (including the United States) and the developing countries. Forthcoming discussions will focus primarily on:

- Implementation by all the developed countries of measurable, reportable and verifiable undertakings or actions that are comparable between countries;
- Actions on the part of the developing countries, to be supported and made possible by transfers of technology and specific financing, which must also be measurable, reportable and verifiable;
- Open discussions on Land Use, Land Use Change and Forestry (LULUCF);
- Openings for cooperative sectoral approaches and sector-specific actions.

1 - The IPCC was established in 1988, on request from the G7 (now G8). Its mandate is to assess, in an unbiased, methodical, clear and objective manner, all available scientific, technical and socio-economic information relevant to the question of climate change. The IPCC reports on the points of view and uncertainties, clearly bringing out all questions on which there is a consensus among the scientific community.

3 – Adaptation to the adverse effects of climate change. The scope of discussions covers both international cooperation to support implementation of adaptation measures in the short term, and of strategies for managing risks and natural disasters in the longer term.

4 – Technology development and transfer. On this point, the negotiations are expected to focus in particular on mechanisms for transferring technologies to the developing countries and on cooperation for research and development.

5 – Finance and investments required to support mitigation and adaptation activities. Discussions are expected to focus on improving access to financial resources, on incentives for developing countries to implement new mitigation activities, on assistance to adaptation and on mobilising public and private finance.

These five building blocks emphasize that the Parties must agree to a shared vision on long-term cooperation and to an overall long-term target for emission reductions in order to reach the UNFCCC's ultimate goal. This shared vision must be in accordance with the principles of the UNFCCC and in particular with the principle of common but differentiated responsibilities and capabilities, which allows commitments from developing countries, and especially emerging countries, to be specifically catered for, since different social and economic conditions as well as other factors have to be taken into account in developing this shared vision.

The Bali Action Plan is a step forward for the developing countries, because for the first time, their own efforts towards climate change mitigation can be taken into account. These are efforts towards mitigation which they undertake in the interests of making progress towards sustainable development, and which are supported and enabled by the deployment of technologies, finance and capacity building. All of these are addressed in the last two "building blocks" in the Bali Action Plan and have to be supplied by the developed countries.

The role of the carbon market

The Bali Action Plan emphasizes the role of the carbon market in promoting activities that can mitigate climate change. This aspect is addressed in very broad terms, since it covers all possible approaches to the issue, including a stronger focus on sectoral projects for the CDM (as partly outlined already in the "programmatic" CDM approach²), or national policies and measures in developing countries (for example through the approaches referred to as "No-Lose Targets" or "Sustainable Development Policies and Measures"). Furthermore, sectoral approaches are under consideration to enable industrialized and developing countries to cooperate in deploying and transferring technologies and technical practices and processes that will help to manage, reduce or prevent greenhouse gas emissions in all relevant sectors, including energy, transport, industry, agriculture, forests and forest management. These sectoral instruments would be based on transnational agreements that would, ultimately, put a cap on sectoral emissions across borders and over and above emission trading rights between economic operators in the industrialised and developing countries where the relevant capacities and political will exist.

2 - This refers to a programme of activities that bring about emission reductions through project activities conducted in several sites following a government measure or private-sector initiative.

Financing climate change mitigation and adaptation

Directing worldwide investments towards a low-carbon economy capable of withstanding the impacts of climate change will require very important financial resources. Existing studies suggest that to respond to the challenge, investments of tens, even hundreds, of billions of US dollars per year will be needed up to 2030. The private sector will be playing a pre-eminent role, supplying an estimated 80% of the additional finance required. The post-2012 regime will need to create a favourable environment for this private-sector investment, in particular with the integration of carbon prices in investment decisions. The carbon market – broadened out to encompass other countries besides the developed nations – and the development of new instruments additional to the CDM, will be crucial to secure the necessary resources. Public funds will also need to be mobilised to build up an environment that offers sufficient incentive to the private sector, without acting in its place.

For more information

Useful contacts

MEEDDAT

Ministry for Ecology, Energy, Sustainable Development
and Town and Country Planning

Paul Watkinson/Daniel Delalande

<http://www.developpement-durable.gouv.fr>

IDDRI

Institute for Sustainable Development and International
Relations

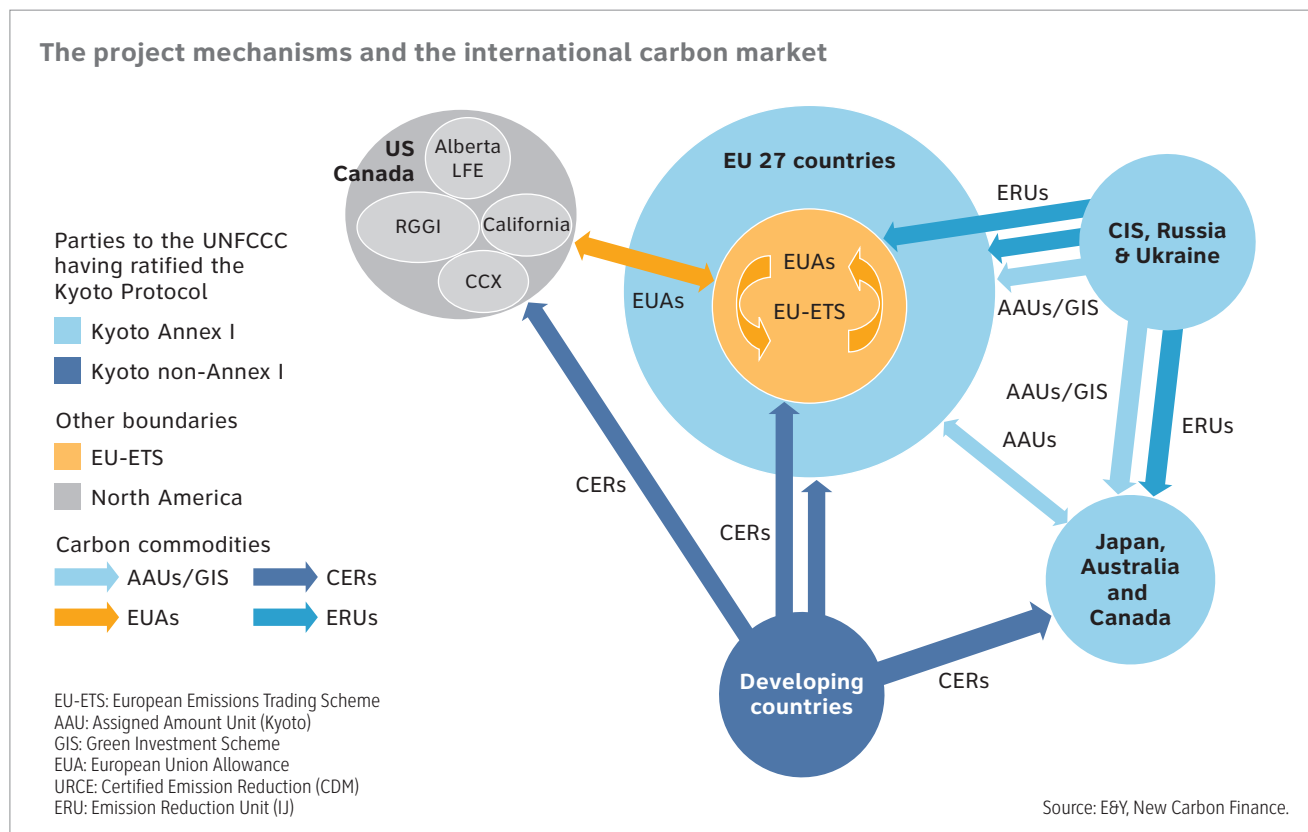
<http://www.iddri.org>

ANNEX 3

The EU Emissions Trading Scheme: a regulated market in search of efficiency

What is the European Union Emissions Trading Scheme (EU-ETS)?

The European Union Emissions Trading Scheme (EU-ETS) is **the leading market for trade in greenhouse gases**. It is the European Union's main instrument for reducing its own GHG emissions in accordance with its Kyoto Protocol commitments (8% reduction in 2008-2012 compared to 1990, for the EU-15). The EU-ETS is supervised by the European Commission and defined by two Directives, 2003/87/CE on "quotas"^[1] and 2004/101/CE on "projects"^[2].



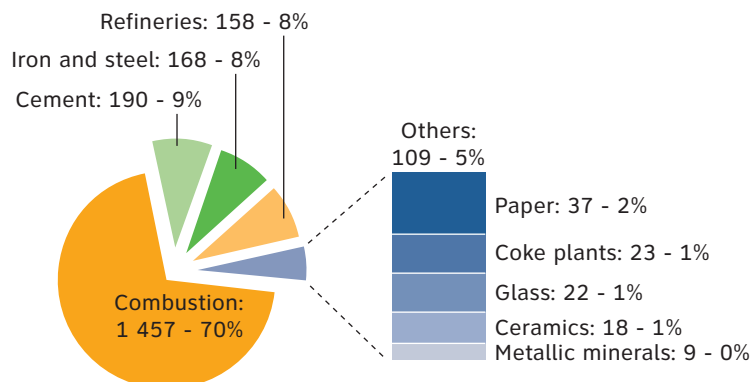
The system sets a cap on CO₂ emissions (and N₂O in few countries) from the largest industrial facilities. Four main sectors are concerned at present: energy production, production and processing of ferrous metals, mineral industries (cement, ceramics and glass) and paper and cellulose production. With over 11 000 installations and 2.3 billion tCO₂e subject to quotas, **the EU-ETS covers about 50% of Europe's CO₂ emissions**, or about 40% of its emissions of all greenhouse gases.

The rules of the system are established for each commitment period. The first period was a trial phase that lasted from 2005 to 2007. The second, now under way, covers 2008-2012. The third is now being negotiated and will cover 2013 to 2020. The main evolutions from one period to the next concern the boundaries and objectives of emission reductions.

1 - Directive 2003/87/EC:
<http://europa.eu/scadplus/leg/fr/lvb/l28012.htm>

2 - Directive 2004/101/EC:
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004L0101:FR:NOT>

Quotas per sector in the EU-25 out of a total of 2 300 MtCO₂/year in the first commitment period – 2006 allocation (in MtCO₂)



The combustion sector is predominant.

Source: Caisse des Dépôts et Consignations - "Mission Climat".

Characteristics of the three commitment periods

	Countries	GHGs	Sectors	Emission caps
2005-2007	EU 25 + Bulgaria and Romania in 2007	CO ₂ only	Energy production, production and processing of ferrous metals, mineral industry (cement, ceramics and glass), paper and cellulose production	2 300 million units per year
2008-2012	EU 27 + Iceland, Norway and Liechtenstein	CO ₂ N ₂ O in certain countries	Ditto + aviation as from 2012	2 100 million units per year
2013-2020	EU 27 + Iceland, Norway and Liechtenstein	CO ₂ + N ₂ O + PFC	Ditto + aluminium and ammonia production (discussion on inclusion of shipping)	1 974 million units per year in 2013, dropping to 1 720 million per year in 2020

Source: Caisse des Dépôts et Consignations - "Mission Climat".

How does the EU-ETS market operate?

Since 2005, at the beginning of each year, governments assign an initial amount of emission allowances or quotas (European Union Allowances or EUAs) for a given commitment period, as listed in the National Allocation Plans (NAP)³, to facilities with high GHG emission levels. Actual emissions during year N are checked by an approved auditor and reported at the beginning of the following year (N + 1). The companies concerned have to return to the government an amount of EUAs that corresponds to these verified emissions. Under Directive 2004/101/EC, restitution of these EUAs may, within limits set by each Member State, be in the form of reduction units generated by CDM or JI projects (CERs or ERUs).

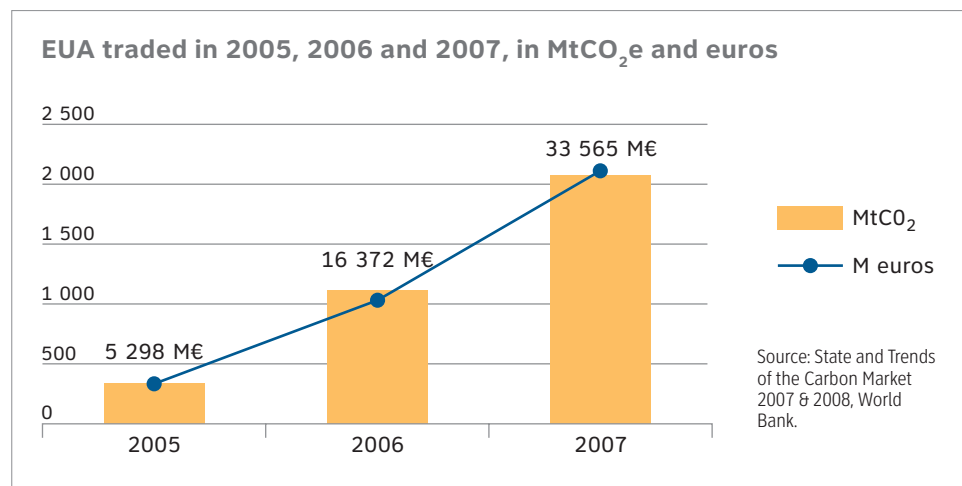
As with the Kyoto Protocol, and to avoid penalties (which in any case will not release the operator from the obligation to surrender an amount of allowances equal to excess emissions), **industrial operators have three levers to secure compliance** with their emission caps:

- 1** - reducing their own emissions;
- 2** - purchasing allowances from other operators or intermediaries;

3 - For more details on NAPs in European countries, see: http://ec.europa.eu/environment/climat/emission/2nd_phase_ep.htm

- 3** - purchasing or generating CERs or ERUs. However, the EU-ETS limits the use of credits of this type to 13.4% of allowances overall (although the percentage varies from 0 to 20% depending on countries, as specified in their NAP).

The second lever has created a market for trade in quotas between industries covered by the EU-ETS, as well as numerous intermediaries, such as traders and investors. With an annual trading volume of over 2 billion tCO₂e (more than 30 billion euros) and 86% growth from 2006 to 2007, the EU-ETS is by far the world's largest market in carbon credits.



Market organisation through registries and marketplaces

The EU-ETS market is organised through:

- national registries that keep track of emission allowances, trade and restitution;
- specific marketplaces for carbon credits which foster market fluidity and transparency.

Quotas are traded either “over the counter” (OTC, about one third of the total) or through dedicated marketplaces (about two thirds).

EUA marketplaces

Marketplace	Location	Types of contracts	Market share of EUA trade in 2007 (in number of transactions)
ECX/ICE	London (UK)	Futures ⁴ and Options	87%
Nord Pool	Oslo (Norway)	Forward and Spot ⁵	8%
Bluenext	Paris (France)	Spot and Futures	2%
EEX	Leipzig (Germany)	Spot and Futures	3%
Green Exchange	New York (USA)	Futures and Options	0%

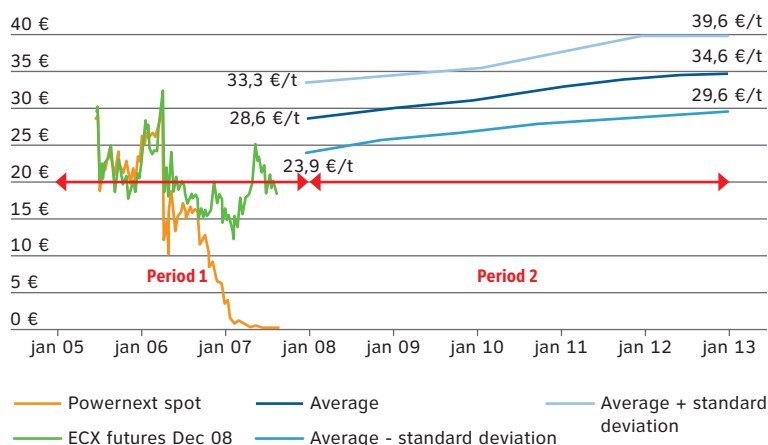
Source: E&Y, based on information from Thomson Reuters - <http://communities.thomsonreuters.com/Carbon>

4 - Futures and Forward contracts: with these two contract types, a given volume of quotas is delivered at a future date. Futures contracts are standard, anonymous contracts with fixed maturity dates, while Forward contracts are bilateral (not anonymous), negotiated (not standard) with specific maturity dates. With Forward contracts, final delivery of the instruments traded is usually effective, while Futures contracts most often do not produce a delivery.

5 - Spot contracts: contracts in which the two parties agree to an immediate delivery of a given quota amount at a fixed price.

Lessons from the first commitment period and prospects for the future

EUA prices during the two commitment periods



Source: Caisse des Dépôts et Consignations - "Mission Climat".

The EU-ETS has established a market that sets an economic value on GHG emissions in Europe. Its success depends on its capacity to induce actual emission cuts at an economically acceptable cost. The EUA "price signal" reflects performance in this respect.

These trends may be summarised as follows:

- First period (2005-2007).** After coming close to 30 € in early April 2006, quota prices crashed to just a few Euro-cents after the first CO₂ emission verifications at industrial sites. The market proved to be "long", and the collapse was therefore caused by an over-allocation of quotas. This period was a test phase for the market.
- Second period (2008-2012).** Following this initial experience, the European Commission considerably reduced the quotas allocated under each country's NAP. At the start of the period, prices oscillated around 25 €/quota. Models have estimated that carbon prices will range from 25 € to 40 € over the period as a whole.
- Third period (2013-2020).** The rules to be applied during this period are currently under negotiation. However, the "Energy and Climate Change Package" is pointing to even stricter market rules. The European Commission's impact assessment provides for a carbon price during the third period ranging from 30 € to 47 € per quota^[6].

6 - For more details, see *Impact Assessment, Document accompanying the Package of Implementation measures for the EU's objectives on climate change and renewable energy for 2020*, EC, January 2008.

How does the EU-ETS interact with the CDM and JI?

With potential market outlets for 1.4 billion credits in the 2008-2012 period (13.4% of the 2.1 billion annual quotas assigned over 5 years), companies subject to the EU-ETS

make up by far the largest group of buyers of CERs and ERUs. Up to now, a close correlation has been observed between prices for EUAs and CERs/ERUs. Market behaviour and the rules defined by the European Commission are therefore likely to have a considerable influence on returns from CERs/ERUs that project developers can anticipate, and therefore on the ultimate future of these mechanisms.

For more information

Useful contacts

European Commission

http://ec.europa.eu/environment/climat/emission/index_en.htm

Information on the "Energy and Climate Change Package"

http://ec.europa.eu/environment/climat/emission/ets_post2012_en.htm

Caisse des Dépôts et Consignations ("Mission Climat" and Carbon Finance department) <http://www.caissedesdepots.fr/spip.php?article38>

Société Générale (Commodities Research)

<http://www.sgresearch.socgen.com>

Market data

Thomson Reuters <http://communities.thomsonreuters.com/Carbon>

Point Carbon <http://www.pointcarbon.com>

SG Carbon Drivers <http://www.commodities.sgcib.com>

ANNEX 4

The international carbon market covers a variety of different schemes

Existing carbon markets

Country	Type of market	Regulator	Players/sectors subject to binding targets	Reduction targets	Credits	Date established	CDM/JI eligibility
Countries which have ratified the Kyoto Protocol	Kyoto ¹ Voluntary market	UNFCCC	Annex I countries	– 5.2% reduction compared to 1990 in 2008-2012	Quotas: AAU, AU Credits: CER, ERU, tCERs tERUs	2008	Yes
EU-27 + Norway, Iceland, Lichtenstein	UE-ETS ² Mandatory	European Commission	Industrial and energy facilities	– 20% reduction compared to 1990 by 2020	Quotas: EUA Credits: CER, ERU	2005	Yes
Australia	New South Wales Greenhouse Gas Abatement Scheme ³ Mandatory	Government of New South Wales	Electricity production and consumption in NSW and ACT	Variable annual targets (according to benchmark)	Quotas/ Credits: NGAC	2003	No
Japan	Tokyo's Cap and Trade ⁴	Tokyo Metropolitan Area Authority	Largest emitters: industry and tertiary sector	Target for Tokyo Metropolitan Area: – 25% by 2020 compared to year 2000		2010	
New Zealand	New Zealand Emissions Trading Scheme ⁵ Mandatory	Government of New Zealand	Forests, Energy, Industry, Transport, Agriculture, Waste	Targets vary according to sectors covered	Quotas: NZU, AAU (some types) Credits: CER, ERU	2008 to 2013 (phasing-in by sector)	Yes
USA	CCX ⁶ (Chicago Climate Exchange) Voluntary market	CCX	Voluntary public and private member organisations of the CCX	– 6% compared to 1990 by 2010	CFI (quotas and credits)	2003	Yes
USA	RGGI ⁷ (Regional Greenhouse Gas Initiative) Mandatory	States involved	Electrical facilities with more than 25 MW output in 10 States: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont	– 10% compared to 2009 by 2018	Quotas: RGGI allowances Credits: RGGI offset	2009	No

1 - <http://unfccc.int>

2 - http://ec.europa.eu/environment/climat/emission/index_en.htm

3 - <http://www.greenhousegas.nsw.gov.au>

4 - <http://www.kankyo.metro.tokyo.jp>

5 - <http://www.climatechange.govt.nz/emissions-trading-scheme/index.html>

6 - <http://www.chicagoclimatex.com>

7 - <http://www.rggi.org>

Emerging carbon markets

Country	Type of market	Regulator
Australia	Australian Carbon Pollution Reduction Scheme	Government
USA	USA – Emissions Trading Scheme	Government
USA / Canada	WCI (Western Climate Initiative)	WCI
Canada	Large Final Emitters System	Government
Japon	Large Final Emitters System	Government

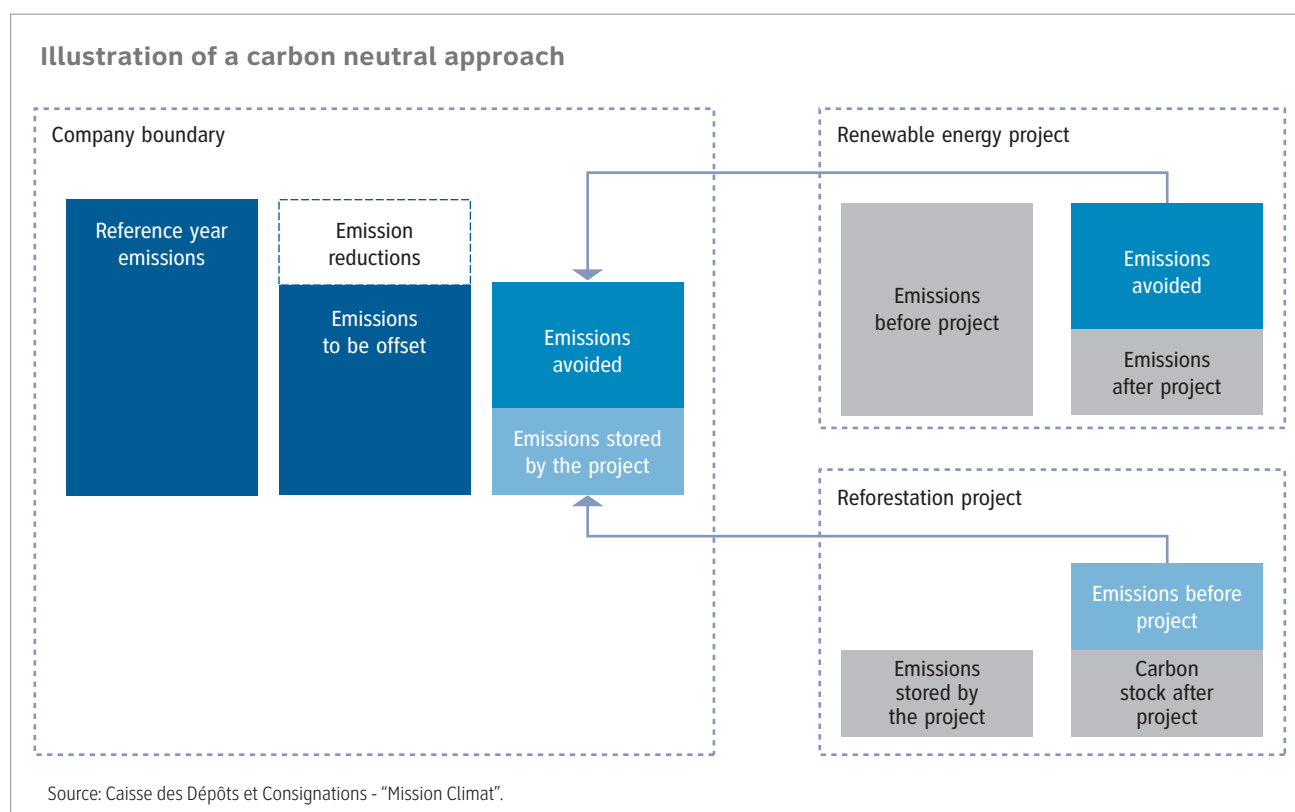
ANNEX 5

The voluntary market

What is the voluntary market?

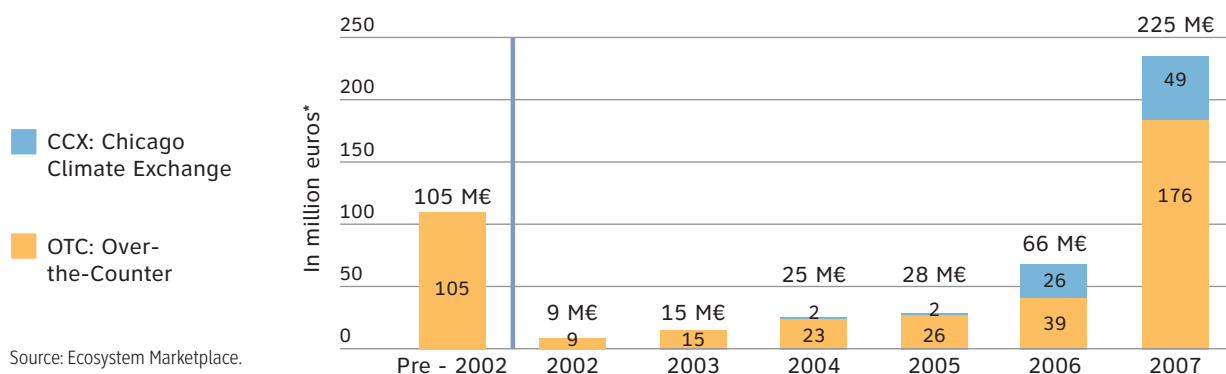
In parallel with the implementation of the Kyoto Protocol and legally binding GHG emission reduction targets, increasing numbers of companies, individuals and public agencies are making voluntary commitments to offset their greenhouse gas emissions. Operators in all sectors are seeking to demonstrate that their activities are “carbon neutral”, both for media coverage reasons and as proof of their genuine commitment to sustainable development.

The principle is as follows: operators assess their own “carbon footprint”, using tools such as the GHG Protocol, the ISO 14064 standard or the “Bilan Carbone” method developed by the French Environment and Energy Management Agency. They will then reduce their emissions and offset any residual (or “incompressible”) emissions by financing emission reduction projects or by buying carbon credits on the market.



These proliferating initiatives have created a “retail” market for purchases of carbon credits of all types. Specialised service providers have emerged to serve a market which is buoyant and fast developing, although incomparably smaller in scale than those based on binding commitments (Kyoto Protocol, EU-ETS), and mainly operates with small or very small-scale projects (a few hundred or thousand tCO₂e per year).

The exponential growth of the voluntary market



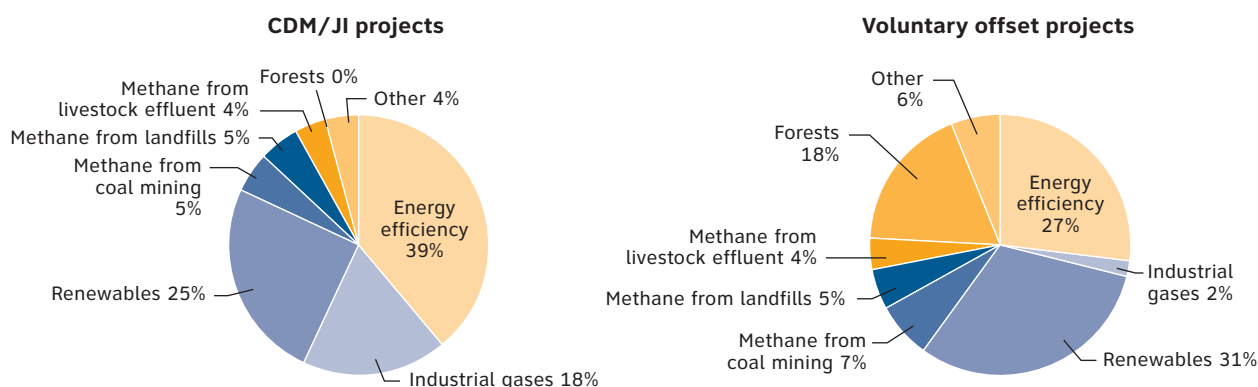
How does the voluntary market differ from other carbon markets?

Although it is based on projects and credits generated by the CDM and JI, The voluntary market has mainly developed in areas not covered by markets based on binding targets (CDM, JI and others).

There is little overlap between the two: the assets traded are not the same (VERs, or Voluntary or Verified Emission Reductions), small-scale and forestry projects are more numerous and many of the projects are run in the industrialized countries, whether or not they have ratified the Kyoto Protocol. A voluntary offset project will generate around 5 000 tCO₂e per year, whereas a counterpart CDM project will reduce emissions by at least 50 000 tCO₂e per year. The reason for this lies in the high transaction costs associated with the project mechanisms, whose complexity can be far beyond the means of small-scale projects. In some cases, projects that would be unprofitable on the “binding target” markets can become profitable on voluntary markets.¹

1 - For more details, see the publication entitled “Compenser pour mieux réduire, le marché de la compensation volontaire”, 2007, Caisse des Dépôts et Consignations - “Mission Climat”.

Comparison between voluntary market projects and CDM projects



Source: World Bank, Ecosystem Marketplace.

The majority of voluntary offset projects concern the forestry and renewable energy sectors. Those concerning industrial gases (N₂O and fluorinated gases) are much less common than under the Kyoto protocol.

However, the market still lacks fluidity: despite some marketplace trading, most transactions are “over the counter”. Prices range from 1 to 200 €/tCO₂.

Towards higher professional standards in voluntary markets?

The voluntary market is therefore capable of securing finance for projects that are not covered by the CDM or JI methodological framework and which are often smaller, more varied and innovative. On the other hand, due to the lack of methodological clarity and low product traceability, they are liable to include poor quality projects that do not offer secure information to buyers.

To counter this problem, while also limiting the transaction costs arising from the required procedures, standards are gradually being introduced which may help to achieve better product standardisation and foster the emergence of a market in the true sense.

Main standards on voluntary markets

Standard	Founders	Launch date	Market share in 2007
VCS	Various carbon market players (IETA, WBCSD, etc.)	November 2007 (VCS 2007)	29%
Gold Standard	51 NGOs (including WWF)	September 2008 (version 2.0)	9%
VER+	Tüv Süd	May 2008 (version 2.0)	9%
CCX	350 CCX members	2003	7%
CCBs	NGOs and companies (BP, Intel, SC Johnson)	October 2008 (version 2.0)	2%

Source: E&Y.

The voluntary market also offers considerable potential for projects that do not qualify at present for the CDM/JI mechanisms, whether for political reasons (projects in Turkey, which has not ratified the Kyoto Protocol), technical reasons (some technologies, for example for avoiding deforestation, are not eligible) or financial reasons (CDM/JI transaction costs can be too high for small-scale projects).

For more information

Useful contacts

ADEME (French Environment and Energy Management Agency)
<http://www.compensationco2.fr>

Caisse des Dépôts et Consignations - Carbon Finance department
<http://www.caissedesdepots.fr/spip.php?article38>

Market data

Ecosystem marketplace <http://www.ecosystemmarketplace.com>

New Carbon Finance <http://www.newcarbonfinance.com>

ANNEX 6

The Project Idea Note (PIN)

What Is a Project Idea Note?

A Project Idea Note is a 5 to 10 pages document that provides a brief description of a CDM or JI project. It should cover at least the following information:

- The type, location and size of the project;
- Its emission reduction potential;
- The crediting period;
- The anticipated sale price of credits;
- The project's financial structure;
- Benefits associated with the project.

The PIN is intended for investors, potential buyers of CERs/ERUs and also for DNAs and DFPs, who may request the document in order to deliver a Letter of Agreement. Potential buyers will examine the information submitted against current CDM rules and against their own investment criteria.

What are the main contents of a PIN?

A PIN is usually drawn up in four parts:

- **Part 1 gives an overall description of the project**, including: the project's objective, the project activity and how it can reduce emissions, the technology used, the location of the project, the list of project participants and the role of each one (developer, investor, owner of the credits, consultants, etc.), project timeframes (start of operations, start of emission reductions, crediting period), and the position of the DNA or DFP if applicable;
- **Part 2 describes the methodology used and the emissions avoided by the project.** This initial estimate may be made using average emission factors or specialized tools and data such as the GhG Protocol^[1] or International Energy Agency (IEA) data^[2]. If an existing methodology is used in the project, a simplified version may also be applied. Preliminary material used to demonstrate additionality should also be supplied here, such as the baseline scenario, the legal context of the project, financial additionality and the barrier analysis;
- **Part 3 describes the project's financial structure:** feasibility, construction and operation costs, and anticipated returns from the sale of CERs/ERUs. This part should, if possible, be presented together with a business plan.
- **Part 4 should describe the project's social and environmental benefits**, with particular reference to the sustainable development priorities of the host country.

What are the forms to use?

There is no standard PIN model. The World Bank's Carbon Finance department has developed forms that can be used for projects of different types. Business plan models are also available at:

<http://carbonfinance.org/Router.cfm?Page=SubmitProj&ItemID=24683>

1 - "Project Protocol" module in the Greenhouse Gas Protocol Initiative:
<http://www.ghgprotocol.org/standards/project-protocol>

2 - IEA statistics:
<http://www.iea.org/Textbase/stats/index.asp>

Conversion key and baseline data for calculating emission cuts from the project

GHG	GWP (Global Warming Potential)
CO ₂	1
CH ₄	21
N ₂ O	310
SF ₆	23 900
PFC	6 500 to 9 200
HFC	140 to 11 700

Multiples			
Kilo	k	10 ³	1 000
Mega	M	10 ⁶	1 000 000
Giga	G	10 ⁹	1 000 000 000
Tera	T	10 ¹²	1 000 000 000 000

Volume	L
1 cubic metre (m ³)	1 000
1 cubic foot (ft ³)	28.32
1 US gallon (gal)	3.79
1 US barrel (bbl)	159

Mass	Kilo
1 tonne (t)	1 000
1 pound (lb)	0.454

Energy	kWh	J	cal
1 watt hour (Wh)	0.001	3 600	860
1 megawatt hour (MWh)	1 000	3 600 000 000	860 000 000
1 gigajoule (GJ)	278	1 000 000 000	329 000 000
1 000 000 BTU (British Thermal Unit)	293	1 055 000 000	252 000 000
1 tonne oil equivalent (toe)	11 630	41 868 000 000	10 000 000 000

Fuel	PCI (GJ/tonne)	PCI (GJ/m ³)	kgCO ₂ /GJ (PCI)	tCO ₂ /tonne	tCO ₂ /m ³
Natural gas		0.04	55		
LPG		24	65		0.002
Petrol	45	34	69	3.150	1.550
Diesel	42	36	74	3.100	2.350
Heating oil	41	37	75	3.100	2.700
Coal	23		95	2.200	2.600
Lignite	14		100	1.400	
Wood and wood waste	19		100	1.900	

Examples of emission reduction calculations for projects described in the Case Studies (see Annex 11)

Case study	Technology	Waste tonnage in kt/year		Emissions avoided in tCO ₂ e/ t waste	CERs generated ktCO ₂ /year
Bionersis (pg 78)	Methane recovery and destruction	120 (approx)		0.2	27
		Installed power (MW)	Annual production (GWh)	Emissions avoided tCO ₂ /tMWh	CERs generated ktCO ₂ /year
Dalkia (pg 80)	CHP (biomass, gas)	120 Mwe/290 MWth	535	0.4	240
Hydelec (pg 82)	Hydropower	15	80	0.6	45
Lafarge (pg 84)	Wind power	10	36	0.8	29
		Planted area/ha		Emissions avoided tCO ₂ /t ha/year	CERs generated ktCO ₂ /year
ONFI (pg 86)	Forest plantation	4 000		31.3	125
		Annual biomass consumption/kt		Emissions avoided tCO ₂ /t biomass	CERs generated ktCO ₂ /year
Vicat (pg 88)	Fuel switch coal-Jatropha	97		0.9	89

ANNEX 7

Drawing up a Project Design Document (PDD)

Any developer intending to submit a project for registration for the CDM or JI (Track 2 or 1, depending on the host country procedure) should first draw up a Project Design Document (PDD). The document's structure has to follow a specific format developed by the UNFCCC Secretariat.

This annex describes the main points to watch when drawing up a PDD. The topics are dealt with in the order of the standard content¹ of the five sections of the document (version 3.2 in effect since 28 July 2006), with reference to the UNFCCC Secretariat's guidelines² (EB 41 - Annex 12). For information, the PDD format for JI Track 2 projects³ is very similar to the format for the CDM described below.

Official PDD plan for a CDM project (version 3.2)

Sections

- A.** General description of project activity
- B.** Application of a baseline and monitoring methodology
- C.** Duration of the project activity/crediting period
- D.** Environmental impacts
- E.** Stakeholders' comments

Annexes

- Annex 1:** Contact information on participants in the project activity
- Annex 2:** Information on public funding
- Annex 3:** Baseline information
- Annex 4:** Monitoring plan



Points to watch

The PDD and all attached documents sent to the UNFCCC Secretariat must be completed and submitted in English. The most recent version of the form is available from the UNFCCC Secretariat's web site <http://unfccc.int>

The form must not be altered or modified in any way (do not add or remove any chapters, or columns in the tables). If any section is not relevant, this should be indicated as "not applicable". Similarly, if a table is inappropriate, it should be left empty.

PDD SECTION A. Overall description of the project activity

This section provides a summary of the project activity, its participants and its contribution to sustainable development in the host country. It describes the identifying features of the project and gives a technical description of the activities concerned: project category, technology used, estimated annual emission cuts and crediting period.

A clear description of the project's context and location and of the schedule for the different development phases should be provided. Most of the information to be included in this section can be drawn directly from a business plan. This section must also describe all building permits and licenses required to conduct the activity, as well as the conclusions of the project's environmental impact analysis (which will depend on host country requirements, see Section D of this annex).

1 - PDD forms for CDM projects:
http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs

2 - Instructions on completing the PDD for CDM projects:
<http://cdm.unfccc.int/Reference/Guidclarif>

3 - PDD forms for JI projects:
<http://ji.unfccc.int/Ref/Docs.html>



Identifying project participants

Project participants must be identified with great care. Each one will need to obtain permission from the Party (country) concerned. Only identified project participants may subsequently claim credits from the CDM Executive Board or the JI Supervisory Board at the time when credits are delivered.

If any public funding from Annex I countries is called on for the project, the financing country will not be entitled to receive CERs or ERUs in return.

PDD SECTION B. Methodology used to calculate emissions in the baseline scenario and for emissions monitoring

Selecting the appropriate methodology [PDD Section B.1, B.2]

To ensure that a project is eligible, the project developer must be able to demonstrate that it is additional in comparison to the baseline scenario in the host country. This is the purpose of the methodology. The project developer may choose either to use a methodology which has already been approved by the CDM Executive Board or to submit a new methodology. In either case, the developer will need to justify the choice of methodology and explain why it is applicable to the project.

The use of a methodology is mandatory for CDM projects, but not for JI.



Choosing a methodology

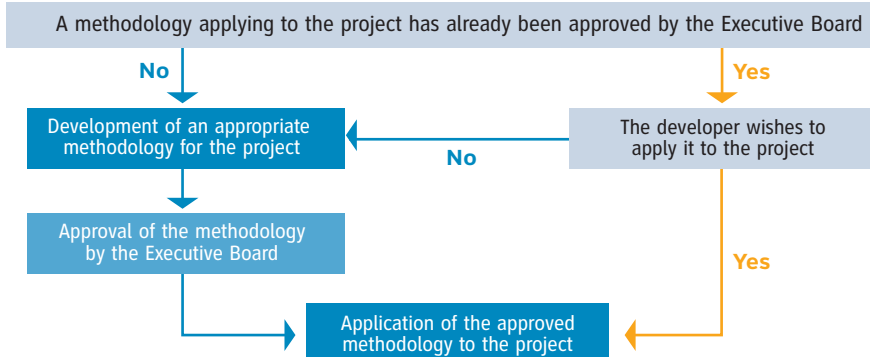
The list of approved methodologies is available from the UNFCCC web site⁴. This is continuously evolving as and when new methodologies are developed or revised. Project developers should take particular care to avoid drawing up a PDD with a methodology that is no longer valid.

In the interest of greater simplicity, the CDM Executive Board is currently adopting consolidated methodologies by introducing generic directives that apply to groups of similar projects or sectors. This means that project developers can use either the consolidated methodology or one of the approved methodologies, as they prefer.

If there is no applicable methodology for the (CDM) project, the developer may submit a new methodology to the CDM EB's "Meth Panel". The members of this panel, who are experts selected for their specific knowledge and according to UN rules of geographical distribution, will then supply the CDM EB with a recommendation to endorse or reject the new methodology submitted. The process is lengthy (12 to 24 months) and the outcome uncertain. The project developer may also apply for a review or "deviation" from an existing methodology (using the procedures known as a "Request for deviation" or a "Revision to an approved methodology").

4 - List of approved methodologies:
<http://cdm.unfccc.int/methodologies/index.html>

The submission process for a new methodology (PDD sect. B.3)



Defining the project boundary and identifying emission sources and leakage [PDD section B.3]

The project developer must identify all sources of GHGs in the project, and must specify, for each source and each type of GHG, whether it is included or not within the project boundary.

The Marrakech Accords stipulate that for the CDM, a project boundary must include all anthropogenic emissions from sources and/or removals by sinks of greenhouse gases which are under the control of project participants and which are significant and can reasonably be attributed to the project”.

Leakage is described as “the net change in anthropogenic emissions by sources of greenhouse gases which occur outside the project boundary, and which is measurable and attributable to the CDM project activity”.

These definitions may also apply to JI projects.

Defining the baseline scenario [PDD section B.4]

The baseline scenario is defined by means of the chosen methodology, and will be decisive in assessing the emission cuts generated by the project. It is defined as the level of emissions in the “no project” scenario during the project’s crediting period. The method for calculating the baseline scenario is described in the methodology (see Section C).



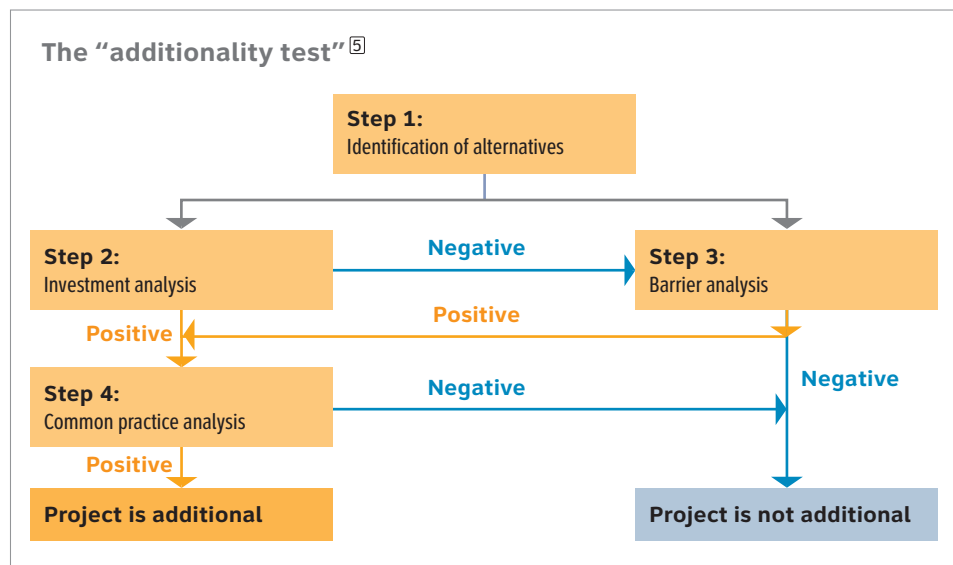
Defining the baseline scenario

The choice of the baseline scenario will be essential to demonstrate the project’s additionality, and it is therefore crucial to project approval from the CDM EB, the JI SC and the host country.

Demonstrating project additionality [PDD section B.5]

Additionality is a key criterion in CDM project validation. The Marrakech Accords state that “a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity”. The additionality of a project can be demonstrated as follows:

5 - Additionality tool available from the UNFCCC web site at: <http://cdm.unfccc.int/Reference/tools>



Assessing emission reductions [PDD Section B.6]

The number of credits generated by a project is calculated by comparing the project scenario with the baseline scenario. The calculation is shown in a summary table giving:

- GHG emissions, expressed in tonnes CO₂ equivalent, resulting from activities within the project boundary;
- GHG emissions, expressed in tonnes CO₂ equivalent, generated in the baseline scenario;
- The difference between emission values in the baseline scenario and in the CDM or JI project scenario, which represents the emission reductions resulting from the project activity.

Main outlines of the monitoring plan

The description of the monitoring process must explain in detail how participants will ensure that the data collected are comprehensive, consistent and reliable.

The plan must state which of the emission sources identified are to be monitored, and why these have been chosen.

The plan must specify the measurement methodologies used, which must be based on established techniques for each type and source of GHGs. If project developers wish to use a different measurement protocol to the one presented in the approved methodology, they must provide an assessment of its advantages and disadvantages and specify whether it has been applied successfully in other cases.

Data collection methods must be designed to produce data with the required level of accuracy.

The data must be stored in a secure manner and be readily accessible for verification purposes. Data storage procedures must be defined, specifying the period during which the data must be kept.

Data quality control and consolidation procedures must be defined. Written reports on the results of internal audits must be produced.

Establishing an emissions monitoring plan [PDD Section B.7]

The monitoring plan sets out procedures for the collection and storage, throughout the crediting period, of all data required to measure or calculate GHG emissions within the project boundary and to identify increases in emissions that are directly attributable to the project outside its boundary. The project developer is responsible for the design and execution of the monitoring plan. Once the project becomes operational, the data collected must be periodically checked by an independent third party (DOE or AIE).

PDD Section C. Duration of the project activity and crediting period

Concerning the crediting period, the developer has a choice between two alternatives: a fixed non-renewable crediting period of a maximum of 10 years or a crediting period of a maximum of 7 years that may be renewed twice, i.e., up to a maximum period of 21 years. The decision is made on a case-by-case basis and will depend in particular on anticipated project performance, on its lifetime, on the supporting financial package and on how the baseline scenario evolves. For each CER or ERU crediting period, the starting date and duration of the crediting period decided on must be specified.

PDD Section D. The environmental impact assessment

This is an assessment of the project's impact on the environment, which must be drawn up according to host country procedures. The impact assessment must be attached to the PDD.

PDD Section E. Stakeholder comments

Final validation of the Project Design Document will depend on the comments made by the various stakeholders as regards its contribution to sustainable development and the methodology chosen for the baseline scenario. This final section must describe the procedures and the approach used to invite comments from the stakeholders.

PDD Annexes

Annex 1: contact details for participants in the project activity.

Annex 2: information on public financing.

Annex 3: the methodology used to establish the baseline level.

Annex 4: the methodology used for the monitoring plan.

For more information

Useful informations

PDD forms for CDM projects (large or small-scale)

http://cdm.unfccc.int/Reference/PDDs_Forms/index.html

Guidelines for completing the project design document (CDM-PDD)

<http://cdm.unfccc.int/Reference/Guidclarif/index.html>

List of approved methodologies

<http://cdm.unfccc.int/methodologies/index.html>

CDM PDD Guidebook: Navigating the Pitfalls (second edition), UNEP RISOE

<http://cd4cdm.org/publications.htm>

PDD forms for JI projects (Track 2) <http://ji.unfccc.int/Ref/Docs.html>

ANNEX 8

Small-scale projects

Why are simplified procedures defined for small-scale projects?

The validation stages for a CDM or JI project include a number of demanding procedures in terms of time, technical expertise and cost, which can handicap the implementation of projects where emission reductions are small but can have a major impact if the project is replicated. To facilitate the set-up of small-scale CDM or JI projects, which are of interest to many developing countries, especially in Africa, fast-track procedures and simplified methodologies were specially defined in the Marrakech accords. In particular, they reduce the transaction costs (for preparation, monitoring and registration) involved in setting up a project.

The ceilings set for small-scale projects are high enough for a wide variety of projects to be submitted through simplified procedures. Almost half of all CDM and JI projects submitted for registration are in the small-scale projects category.

What kinds of projects are classified as small-scale?

Small-scale projects are of three distinct types covering 38 activity categories (in October 2008).

In order to qualify for these simplified procedures and arrangements, the project in question must:

- **Fall into one of the predefined activity categories.** However, if the project includes an activity which does not fall into any of the predefined categories, the project developer may submit that activity to the CDM EB for approval;
- **Satisfy the eligibility criteria.** Nominal capacities or emission reduction potential must not exceed 15 MW, 60 GWh per year or 60 000 tCO₂e per year for emission reductions and 16 000 tCO₂e per year for sequestration projects;
- Not be part of a broader project activity from which it was “unbundled”.

What are the specific procedures that apply?

The phases involved in the implementation of small-scale projects are the same as in ordinary CDM or JI projects. However, the procedures are simpler:

- **“Bundling”.** A series of small-scale projects can be “bundled” into a single portfolio throughout all the project stages (PDD, validation, registration, monitoring, verification and certification) in order to reduce this transaction costs per project. However, the total capacity of “bundled” projects must not exceed the eligibility ceiling (15 MW or equivalent);
- **Single DOE.** A single Designated Operational Entity may validate, verify and certify one small-scale project or several small-scale CDM projects bundled together;
- **Registration procedure.** Registration costs and time frames are lower for small-scale projects;
- **Simplified methodologies.** A set of simplified methodologies is available for the production of the PDD.

1 - List of methodologies for small-scale projects:
<http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html>

The following areas have been simplified:

- The project boundary, which is limited to the project's physical activity;
- Leakage calculations, which are simpler and specified for each project category;
- Baseline levels, with a standard baseline level set out in the methodologies for each project category;
- Development of the monitoring plan, with simplified monitoring procedures to reduce costs and possibilities for using a sample-based approach for bundled projects.

Examples of eligible projects

Type of project	Definition and applicable ceilings	Activity category examples	Project examples
Type 1 Renewable energy	Projects designed to produce power from renewable energy sources and not exceeding a capacity of 15 MW	Production of electricity by the user	Programmes for photovoltaic power, pico or mini hydropower stations, internal electricity production from biomass for plant supply
		Production of mechanical energy by the user	Solar or wind pumps, water mills
		Production of thermal energy by the user	Individual or district solar-powered water heaters, heating with biomass fuel
		Production of electrical power for the grid	Photovoltaic power, wind farms, mini hydropower plants, biomass-fired power stations, geothermal energy
Type 2 Improved energy efficiency	Projects designed to improve energy efficiency and resulting in energy consumption savings of up to the equivalent of 60 GWh per year	Improved energy efficiency for the producer (energy transmission and distribution)	Reduced electricity losses in transformers, improved distribution networks
		Improved energy efficiency for the producer (energy production)	Modifications to thermal or hydraulic power plants to improve yields or annual production potential
		Improved energy efficiency for the user (specific technologies)	Programmes to replace incandescent light bulbs with fluorescent light bulbs, heat insulation in buildings
		Energy efficiency and fuel switching measures in industry	Fuel switching and energy efficiency in industry
		Energy efficiency and fuel switching measures in the construction sector	Improved energy efficiency in boilers electrical motors or pumps, switching from diesel or coal to gas or biomass fuel
Type 3 Other activities	Projects designed to reduce GHG emissions of human origin and which produce less than 60 ktCO ₂ e in direct emissions per year	Agriculture	New low-energy or low-emission cultivation techniques (rice crops, fertiliser use, etc.)
		Replacement of fossil fuels	Use of natural gas to replace more polluting fuels
		Emission reductions in the transport sector	Promotion of low-consumption or gas-fuelled vehicles
		Avoidance of methane emissions	Capture and use of biogas from municipal landfills, from a wastewater treatment or from agricultural waste

For more information

Useful informations

Guide to small-scale projects

http://cdm.unfccc.int/Projects/pac/pac_ssc.html

Simplified PDD form for small-scale projects

http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs

Guidelines and advice for drawing up a PDD

http://cdm.unfccc.int/Reference/Guidclarif/ssc/index_guid.html

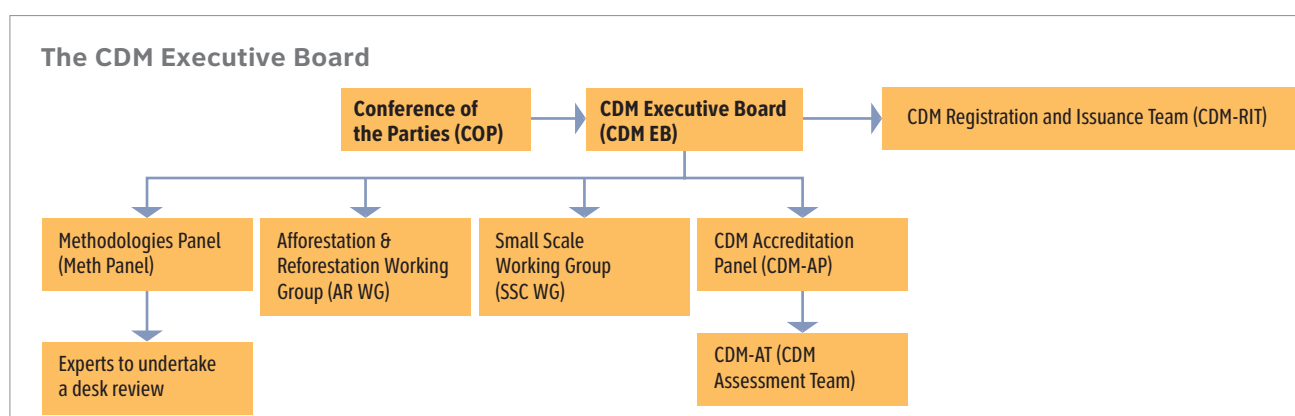
What organisations are involved in a CDM or JI approach?

The main entities usually involved in the process of setting up a CDM or JI project are:

- **The project developer** is responsible for setting up the project. The developer may be a private or public company, a financial institution, a local authority, or an institution such as a ministry, a foundation or an NGO. Organisations acting as intermediaries for a project developer may also, on behalf of the developer, submit projects to the CDM Executive Board. The project developer may also be called the project “promoter”;
- **The host country** plays a key role in several respects: it must satisfy the eligibility criteria that entitle a country which is a Party to the Kyoto Protocol to use the project mechanisms, and it must have established a Designated National Authority (DNA) for the CDM or a Designated Focal Point (DFP) for JI. One of these two authorities, whose designation must have been notified to the UNFCCC Secretariat, will be responsible for issuing official Letters of Agreement (LoA) to project developers, which signify that their project has been approved and, in the case of a CDM project, that it is consistent with the host country’s sustainable development objectives;
- **The investing country** must also satisfy the eligibility criteria for using the Kyoto Protocol project mechanisms and delivers to project participants either an LoA (in the case of requests formulated before registration of the project by the CDM Executive Board or the JI Supervisory Committee), or a letter authorizing them to participate (in the case of applications concerning projects already registered). To do so, the country in question will also need to have designated its DNA or DFP. In France, the Ministry for Ecology, Energy, Sustainable Development and Town and Country Planning (MEEDDAT)’s Directorate-General for Energy and Climate (DGEC) is responsible for both functions;
- **The Designated Operational Entities (DOE) and Accredited Independent Entities (AIE).** These are national or international organisations which have been accredited by the CDM Executive Board or the JI Supervisory Committee. They are responsible for some of the essential stages in the preparation cycle of CDM projects. Their responsibilities include validation of project activities under the CDM, making the documents relating to the design and development of the project available to the public, collecting comments from the public on the project documents and taking these into account, and verifying and certifying emission reductions;
- **The CDM Executive Board (CDM EB),** which supervises the CDM mechanism and endorses projects. It is also responsible for several cross-cutting missions, including approval of new methodologies for baseline scenarios, monitoring plans and project boundaries, accreditation and suspension of DOEs, public information on the activities proposed under the CDM and on all the procedures involved in developing a CDM project or determining project activities under JI Track 2, development and upkeep of the CDM registry, examination of project validation and verification reports, and creating and reporting CERs in the CDM registry;
- **The JI Supervisory Committee (JISC)** organizes and monitors the JI mechanism. It is responsible for accrediting the independent entities in charge of determining projects as JI projects, and also for several cross-cutting tasks, including the examination and review of criteria for determining baseline levels and monitoring, taking into account the studies conducted by the CDM EB, informing the public on activities proposed under JI and on all the procedures involved in developing a JI project and examining project determination and verification reports;

- **The investor(s)** who finance, through debt or equity capital, all or part of the project. Their participation may be limited to the carbon component of each project. Investors in carbon credits may be public or government organisations, private companies or NGOs;
- Although some project developers decide to use their internal know-how on the set-up of CDM or JI projects, most call on external advisors to assist them with technical, legal and financial aspects (drawing up administrative documents, following up validation and registration, sales of credits, contracts, etc.). This has resulted in the development of a specialized field of knowledge within **many consultancies and legal firms**.

The project stakeholders are those who will be affected by the project. They must be consulted and their comments collected for the project validation or determination report.



Apart from a few details, the agencies involved in JI Track 2 and in the CDM are more or less identical, as shown in the table below.

Comparative structure of the JI Track 2 and CDM mechanisms

JI Track 2	CDM
JI Supervisory Committee	CDM Executive Board
Accredited Independent Entity - AIE	Designated Operational Entity - DOE
Designated Focal Point - DFP	Designated National Authority – DNA
Determination report from an AIE	Validation report from a DOE
Review by the Supervisory Committee if required	Registration by the CDM Executive Board
ERU conversion and transfer by host country	CER issuance by the CDM Executive Board

For more information

Useful informations

List of DNAs <http://cdm.unfccc.int/DNA/index.html>

List of DFPs http://ji.unfccc.int/JI_Parties/PartiesList.html

List of DOEs <http://cdm.unfccc.int/DOE/index.html>

List of AIEs <http://ji.unfccc.int/AIEs/index.html>

Government web site on foreign trade <http://www.exporter.gouv.fr>

ANNEX 10

Which sectors and technologies qualify for the CDM and JI mechanisms?

Technologies used in CDM and JI projects

Type	Sub-type	Technology implemented	GHG	Number of candidate CDM projects	% officially registered CDM projects
Solid and liquid wastes	Agricultural waste	Capture and flaring of biogas from agricultural waste (animal excrement, etc.).	CH ₄	176	63%
		Aerobic digestion of agricultural waste (animal excrement, etc.).			
	Solid waste (landfill)	Capture and flaring of biogas from managed landfills	CH ₄	90	58%
		Capture and energy production (heat and/or electricity) biogas from managed landfills		97	37%
		Combustion or gasification of solid municipal waste (incineration)		13	8%
		Aerobic digestion and composting of solid waste		89	12%
	Wastewater	Capture and flaring of methane from wastewater treatment (industrial and domestic effluent, etc.)	CH ₄	46	7%
		Anaerobic digestion of sewage sludge			
Renewable energy to replace GHG-emitting fuels	Biogas: methane capture for energy production	Capture and energy production (heat and/ or electricity) from methane produced by solid and liquid agricultural waste treatment centres	CH ₄	217	30%
	Renewable biofuels	Biomass energy (heat, electricity) from agricultural waste	CO ₂	486	41%
		Biomass energy (heat, electricity) from forestry waste		81	28%
		Biomass energy (heat, electricity) from industrial waste		3	33%
		Biomass energy (heat, electricity) from gasification of biomass		8	13%
		Biodiesel fuel from biomass		7	0%
		Ethanol fuel from biomass		0	NA
	Hydropower	Improvements to existing hydropower dams	CO ₂	63	46%
		Hydropower plants on a storage dams		272	13%
		Damless hydropower		671	26%
	Wind power		CO ₂	511	30%
	Solar power	Solar photovoltaic	CO ₂	13	15%
		Other (thermal, etc.)		10	20%
	GSM and energy		CO ₂	13	46%
	Tidal power		CO ₂	1	100%
Fossil fuel substitution		Fossil fuel switching to release fewer GHGs (natural gas instead of coal for example)	CO ₂	133	23%
Energy efficiency	Energy efficiency improvements in individual processes	Energy efficiency measures in private houses	CO ₂	10	30%
		Energy efficiency measures in residential and tertiary buildings	CO ₂	16	13%
	Improved energy efficiency in industrial processes	Chemical industry: e.g., efficiency in exchangers and steam circuits, CHP, etc.	CO ₂	42	26%
		Petrochemicals: e.g., reduced heat loss, CHP, reduction in flaring		34	29%

Type	Sub-type	Technology implemented	GHG	Number of candidate CDM projects	% officially registered CDM projects
Energy efficiency	Improved energy efficiency in industrial processes	Paper: e.g., optimisation of steam circuits, waste recovery for heat production, high efficiency motors	CO ₂	14	43%
		Cement: e.g., additional exchangers upstream and downstream from kilns, on-site power production from flue gases		13	38%
		Iron and steel: e.g., improved furnace efficiency, recovery of hot gases improved energy efficiency in ovens, recovery of hot gases		12	17%
		Electromechanics: e.g., reduced losses from ovens and electrical motors		8	13%
		Textiles: e.g., energy-saving in lighting and air-conditioning, introduction of CHP, management of steam circuits		10	10%
		Electronics: e.g., management of air-conditioning, lighting and kilns		6	33%
		Agri-foods: e.g., CHP, recovery and uses of effluent, management of steam circuits		7	14%
		Construction (materials): e.g., recycling of hot gases in kilns, use of new firing technologies,		12	25%
		Glass: e.g., use of high energy efficiency kilns, process improvements		4	25%
		Non-ferrous metals: e.g., improved electrical kilns, recovery of hot gases, preheating, lower energy consumption in processing (moulding, cold drawing, rolling)		3	33%
		Recovery of heat or gases to produce electricity: e.g., electrical ovens, steel mills, cement plants, refineries		367	18%
		Energy efficiency measures in electrical and/or thermal power plants: e.g., automated management of combustion parameters, reduction in cooling losses, reduced auxiliary power consumption, optimized generator management		37	38%
Energy distribution		Grid connections in isolated areas (instead of GHG-emitting generators)	CO ₂	4	25%
Coal mining	Methane capture, flaring or recovery for power production	Methane capture in coal mines for flaring or recovery for power production (heat, electricity)	CH ₄	55	15%
Fugitive emissions	Reduction of methane leakage in the petroleum and gas sectors	Reduction of methane leakage in pipelines	CH ₄	29	28%
		Reduced flaring and recovery of associated gases in oilfields			
Industrial gases	HFC	Destruction of HFC-23	HFC	22	77%
	PFC	Destruction of PFC	PFC	8	13%
	N ₂ O	Reduction of N ₂ O (nitric acid, adipic acid and caprolactam production)	N ₂ O	65	54%
Transport		Uses of low-emission fuels	CO ₂	7	29%
		Improved energy efficiency in vehicles	CO ₂		
Forests		Afforestation	CO ₂	5	0%
		Reforestation	CO ₂	21	5%
Agriculture		Improved energy efficiency or use of low-emission fuels to power irrigation pumps	CH ₄	1	0%
Cement		Substitution of carbonated materials with replacement materials	CO ₂	46	30%
CO ₂ capture		Recycling CO ₂ via recovery at the end of the production line	CO ₂	1	0%

Source: E&Y, based on the the UNEP CDM pipeline, 1 September 2008 (JI projects not included in the figures).

ANNEX 11

Case study n°1:

Capture and combustion of methane emissions from landfill in the Valparaíso region (Chile)



Key project data

Sector	Waste
Type	Methane recovery and destruction
Country	Chile (Valparaíso)
CERs generated	27 119 CERs/year
Registration date	Project validated, registration in progress
Promoter	Bionersis
Financed by	Bionersis

This project concerns the construction and operation of a system for collecting biogas emissions (CH_4) from anaerobic decomposition of organic waste in two landfills in Chile. The methane collected is burned off by flaring. The project therefore replaces methane emissions with emissions of CO_2 , which have a lower Global Warming Potential (GWP) (GWP = 1 for CO_2 as against 21 for methane).

“Five questions to Stéphane Vidaillet Carbon Finance Director with Bionersis

Why did you decide to undertake this CDM project?

Developing and producing CERs through projects for the recovery and destruction of methane emissions from domestic waste landfills is central to the Bionersis economic model, along with the sale of electricity from biogas.

How was the project identified?

This project was identified by our local teams. Technically, there is no problem with additionality in projects of this type, as the methodologies are available and

income from the project will be exclusively from the sale of CERs.

What were the main obstacles?

One of the main difficulties was the length of time – several months – needed to obtain the Letter of Agreement (LoA) from the Chilean DNA. Each DNA has its own procedures for issuing this document, and the time required can therefore vary considerably from one country to another. Mobilising the DOE also took up time, and furthermore, the methodology

used was changed by the CDM Executive Board during the setup of the project. For this reason, we had a maximum of eight months to submit the project for registration, which was an additional time constraint for project management.

What were the key factors ensuring a successful outcome?

Timeframes have to be planned for. Sound project management helped to avoid the main pitfalls (like the change in methodology). Being present on the spot is very important, especially for contacts with the host country's DNA. To handle all these aspects, we internalized the necessary carbon expertise. As the site construction and commissioning were completed before registration, our company used the market and the voluntary credit scheme (VER+ credits certified by Tüv Süd).

Do you expect to continue your CDM/JI activities in the future?

Bionersis is banking on the continuation of the Kyoto Protocol project mechanisms after 2012. We will therefore continue to develop CDM project activities, especially in Latin America and Asia. We have 40 projects in the pipeline over the next two years.

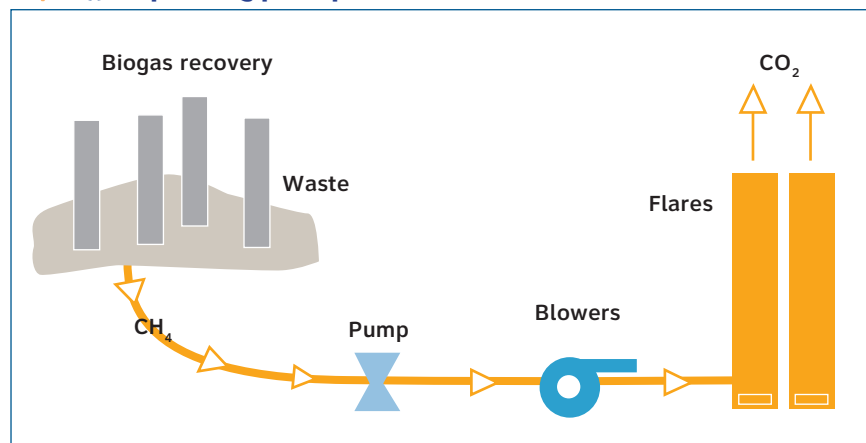


Key technical data

Methodology	ACM0001 v7: "Consolidated baseline DNA monitoring methodology for IDNAfill gas project activities"
Crediting period	10 years
Investment	1 M€ (excluding CDM component)
Total CERs generated	271 189 CERs
Type of ERPA	Bionersis produces credits for sale on the secondary market



Operating principle



Key Project Stages

CDM component

Project

Stage 1

An existing methodology (ACM0001) is applicable to the project: **PDD development begins**.

Stage 2

PDD finalised and **validation phase begins** with the DOE.

Stage 3

New version of the methodology used (ACM 0001 v7 replaced by v8). However a deadline of 8 months was set for submission of the project for registration with no change in methodology.

Stage 4

First DOE report .

Stage 5

Second DOE report.

Stage 6

Project not yet registered but reducing GHG emissions. To obtain **voluntary offset credits**, Bionersis launches verification and validation by Tüv Süd according to VER+ standard.
DOE supplies **draft validation report**.

Stage 7

LoA (Letter of Agreement) **obtained** from the French and Chilean authorities.
DOE supplies **final validation** report.

Stage 8

Request for registration by CDM EB.

After submission of the documents to the CDM EB, they undergo a completeness check lasting 6 to 8 weeks, followed by an examination phase lasting 8 weeks. On the final day of this period, the project is automatically registered, unless the CDM EB requests a further review, which lengthens the process by about two months. The CDM EB must then notify its decision (registration or request for modification) within 8 weeks.

FEASIBILITY

07/2007

11/2007

12/2007

CONSTRUCTION

02/2008

04/2008

OPERATION

06/2008

08/2008

Stage 1

Signature of biogas purchasing contract with the municipality (owner of the landfill).

Construction work launched on the biogas recovery and destruction system (orders for equipments, earthworks, etc.).

Stage 2

Commissioning: construction phase ends, operational phase begins.

Stage 3

Launch of site operations.



Benefits arising from the project

- Reduction of methane emissions into the atmosphere;
- Launch of an initial approach to environmental site management;
- Creation of local employment.

Contacts for the project

Bionersis

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Carbon Finance Director
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Anne-Sophie Zirah

Desk Officer for Carbon Finance
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For more information

<http://cdm.unfccc.int/Projects/Validation/DB/DYRTK2ZPQODX1YOAYWEFO0DNAOKKY5/view.html>

ANNEX 11

Case study n°2:

JI project (Track 1) for combined heat and power (CHP) generation in the city of Pécs (Hungary)



Key project data

Sector	Energy
Type	Fuel switching (coal to biomass)
Country	Hungary (Pécs)
CERs generated	239 000 CERs/year
Registration date	01/1/2008
Promoter	Pannonpower (Dalkia)
Financed by	World Bank Prototype Carbon Fund

The coal-fired power plant at Pécs has supplied the city with heat and electricity since 1959. With a nominal capacity of 190 MWe, it supplies 514.3 GWh of electricity and 2 315 TJ of heat each year. The project's objective is to switch from coal to forest biomass and natural gas. The biomass component is eligible for JI track 1, while the natural gas component became subject to the EU-ETS when Hungary joined the European Union.

“ Four questions to Véronique Cikala Head of Sales and Development - Environmental Products

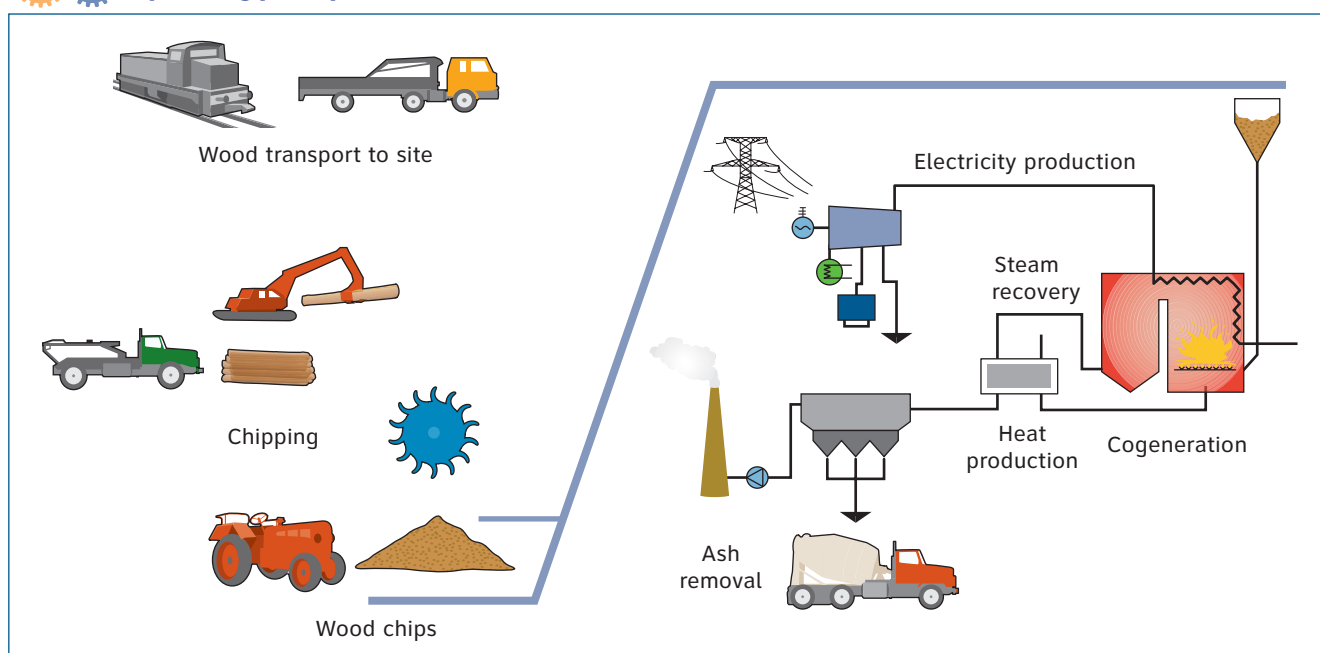
Why did you decide to undertake this CDM project?

There are four power production units on the site. Coal has been replaced by

natural gas in three of these. The carbon credits have contributed to the financial attractiveness of switching from coal to biomass in the fourth unit.



Operating principle



© Dalkia

What were the main obstacles?

Although the project started in 2004, CERs can only be generated under JI during the first Kyoto protocol commitment period, in other words as from 1st January 2008. The voluntary market enabled us to realise the value of our emission reductions in 2004-2008.

What were the key factors ensuring a successful outcome?

We were able to undertake the project thanks to financing from the World Bank (via the Prototype Carbon Fund). Subsequently, a favorable institutional context in the host country facilitated implementation of the JI component (credit issue for a JI track 1 project).

Do you expect to continue your CDM/JI activities in the future?

Dalkia's activities on CDM/JI projects will be strengthened and diversified in the future. The aim is to increase the number of internal but also external Kyoto projects (project development and origination). Veolia has now also set up its VEETRA subsidiary (Veolia Environment Emissions Trading), which specializes in carbon credit trading.



Key technical data

Methodology	Jl track 1: specific project methodology
Crediting period	15 years (2005-2019)
Investment (excluding JI component)	25 M€
Total ERUs	1.2 million during 2008-2012
ERPA Type	Buyback of credits by World Bank during 2008-2012 (Prototype Carbon Fund)

Key Project Stages

CDM component

Stage 1

Project setup and contract signed with the World Bank Prototype Carbon Fund.
PDD developed.
Validation by KPMG.
Project approved by Hungarian DNA.

Stage 2

Validation and verification of the project and voluntary credits in accordance with standards for the VCS voluntary market.

Stage 3

First Kyoto Protocol period, project registration by the JI Supervisory Committee (JI SC).
Verified ERU credits to be bought back by the World Bank Prototype Carbon Fund.

Project

2002

Stage 1

Feasibility studies.

FEASIBILITY

2003

Stage 2

Investment decision and contracts.

sept. 2003

Stage 3

Construction of power units begins

CONSTRUCTION

aug. 2004

Stage 4

New units brought into commission.

31 dec.
2007

OPERATION

Since
1st january
2008



Benefits arising from the project

- Improved air quality in the Pécs region;
- Value added to forest resources;
- Use of a local source of energy and diversification of fuel supplies.

Contact for the project

Dalkia

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For more information

<http://ji.unfccc.int/JIITLProject/DB/TWQ5WHA/DFLGILD173LDFZEVURZTXJ0/details>

ANNEX 11

Case study n°3: Sahavinotry Hydropower Plant (Madagascar)



Key project data

Sector	Energy
Type	Renewable energy production (hydropower)
Country	Madagascar (Sahavinotry)
CERs generated	45 473 CERs/year
Registration date	Validation in progress
Promoter	Hydelec Madagascar
Financed by	African Development Bank (ADB), local banks and equity capital, MIGA guarantee from International Finance Corporation (IFC)



© Hydelec

The Sahavinotry power plant is a small damless 15 MW hydropower plant generating 80 GWh/year. It is connected to the Jirama grid which supplies the Antananarivo region. Hydelec Madagascar is a subsidiary of a French company which is investing in hydro and diesel power in France, Europe and developing countries.

“ Four questions to Jean-Pierre Sanchis Managing Director, Hydelec Madagascar

How was the project identified?

This CDM project component was initiated in 2007 as part of a World Bank CDM support mission, with French co-financing and production of a PIN (Project Idea Note) highlighting the value of the project. The PDD was developed by a foreign consultant under an Emission Reduction Purchase Agreement (ERPA) on behalf of the Austrian government.

What were the main obstacles?

This CDM project is the first undertaken by the Hydelec group, which had no

internal experience with Kyoto projects because of the small size of the company, especially its Madagascar branch, and the low level of CDM development in Madagascar.

What were the key factors ensuring a successful outcome?

The determining factor was the initial support received from the World Bank (through CF Assist) for awareness raising and preparation of the PIN. With preparation of the PDD taken in charge through an ERPA with the Austrian

government, we were able to make rapid progress without too many demands on the local management team. The positive attitude of the Malagasy authorities and the African Development Bank was also a key of success factor.

Do you expect to continue your CDM/ JI activities in the future?

Hydelec Madagascar is developing other small-scale hydro and wind power projects in Madagascar and is planning to use the CDM or JI to facilitate the financial set-up of these projects, given that financial aspects are often problematical due to country risks.

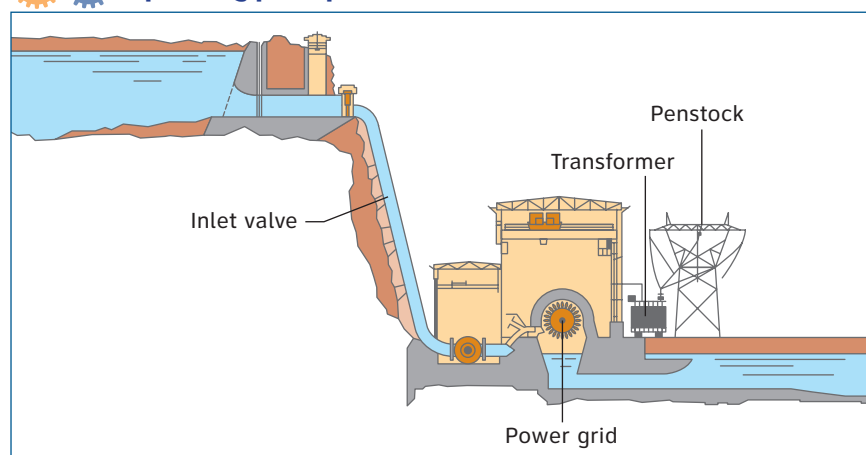


Key technical data

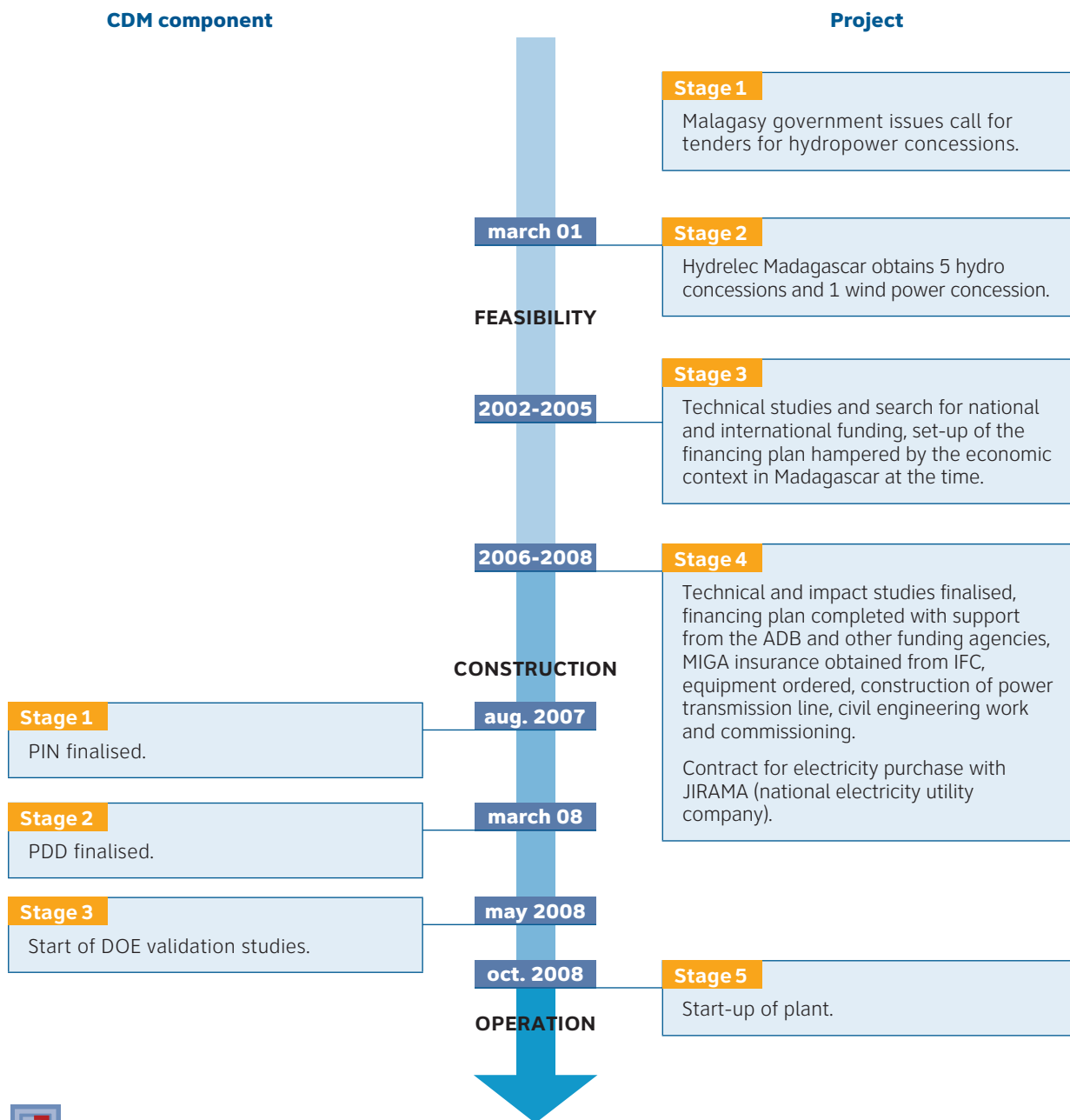
Methodology	Small-Scale I.D Grid Connected Generation from Renewable Resources
Crediting period	10 years (2008-2018)
Investment (excluding CDM component)	13 M€
% Equity	30%
% Debt	70%
Total CERs	454 730 CERs
ERPA Type	Buyback of credits by an Austrian government fund



Operating principle



Key Project Stages



Benefits arising from the project

- Significant help with completing the financial package in a difficult economic context.
- Creation of 14 long-term jobs in operations and maintenance.
- Support to economic activity by reducing "brown-outs" of the Antananarivo power grid.
- Reduction in foreign currency hydrocarbon imports for diesel-fired power plants.
- Reduction in cost of electricity for domestic or industrial use.
- Value added to a local source of renewable energy.
- Demonstration for the set-up of similar projects likely to qualify for the CDM.

Contact for the project

Hydelec

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For more information

<http://cdm.unfccc.int/Projects/Validation/DB/B1ARWHSJY4TIR9UUC5248SEIEM5X08/view.html>

ANNEX 11

Case study n°4: Wind farm for the Tétouan cement plant (Morocco)



Key project data

Sector	Cement
Type	Renewable energy production (windpower)
Country	28 651 CERs/year
CERs generated	23/09/2005
Registration date	Lafarge Maroc
Promoter	Lafarge Maroc
Financed by	Lafarge Maroc with FGEF support

The Tétouan wind farm project is designed to produce renewable power from 12 wind turbines with a combined capacity of 10 MW. This wind farm should cover 40% of the electrical requirements of the Lafarge Maroc cement plant. Power from the wind farm will be used to substitute electricity from the Moroccan grid, which is mainly powered by fossil fuel resources (coal and gas). This is the first Moroccan and French CDM project.

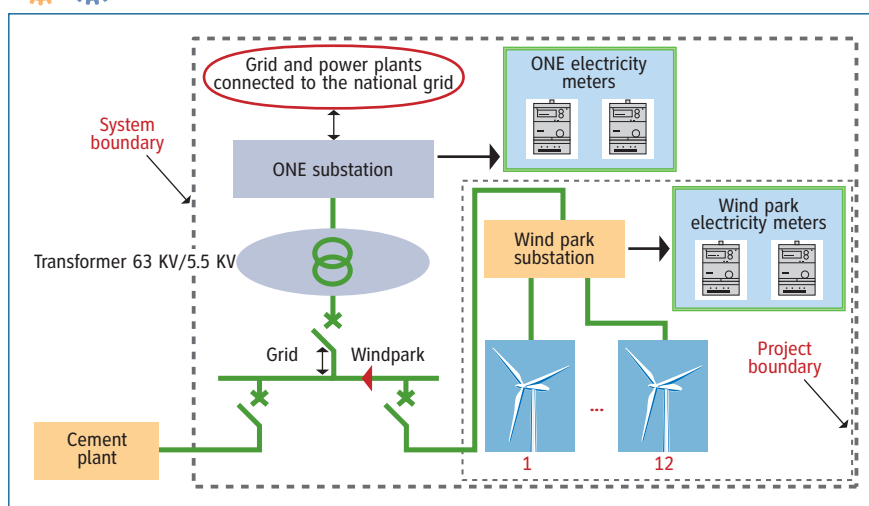


Key technical data

Methodology	AMS-I.D. v5 - Renewable electricity generation for a grid
Crediting period	7 years, renewable twice
Investment (excluding CDM component)	10 M€
Emission reductions generated by the project	201 257 CERs during the first period
Total cost of CDM component	About 80 000€
Gross income from credit sales over 7 years (price estimate 10 €/CER)	About 2 M€
ERPA type	Buy-back of credits from the unit by Lafarge Group for NAP compliance for its European facilities



Operating principle



Five questions to Gaëtan Cadero

Climate Change
Initiatives Manager

Why did you decide to undertake this CDM project?

Developing a CDM component with this wind farm project enabled us to improve the overall rate of return, which was too low in comparison to the IRR generally required by the Lafarge Maroc group, and to raise investment finance. A further aim was to set up a pilot to encourage other sites in the group to use the flexible mechanisms to reduce greenhouse gas emissions.

How was the project identified?

The Lafarge Group is an industrial pioneer in the environmental field. The site's wind power potential was assessed as far back as 1996, and its CDM potential was already being considered in 2001, three years before the Kyoto Protocol came into force.

What were the main obstacles?

The project's carbon component was planned from a very early stage. There were few major obstacles to its development. The decision to go ahead with this project, despite initially low returns and relatively complex implementation (management of an uncertain source of energy) was the subject of intense internal debate.

What were the key factors ensuring a successful outcome?

Sound project management with a robust local team within Lafarge Maroc and support from the Lafarge Group's head office were two key factors of success. The project also received substantial technical support both locally (MATEE – ADS Maroc) and at international level (French GEF).

Do you expect to continue your CDM/JI activities in the future?

The CDM option is systematically examined for all international projects in non-Annex I countries, and several further CDM projects from the Lafarge Group have now been registered. Studies are also being conducted for JI projects.

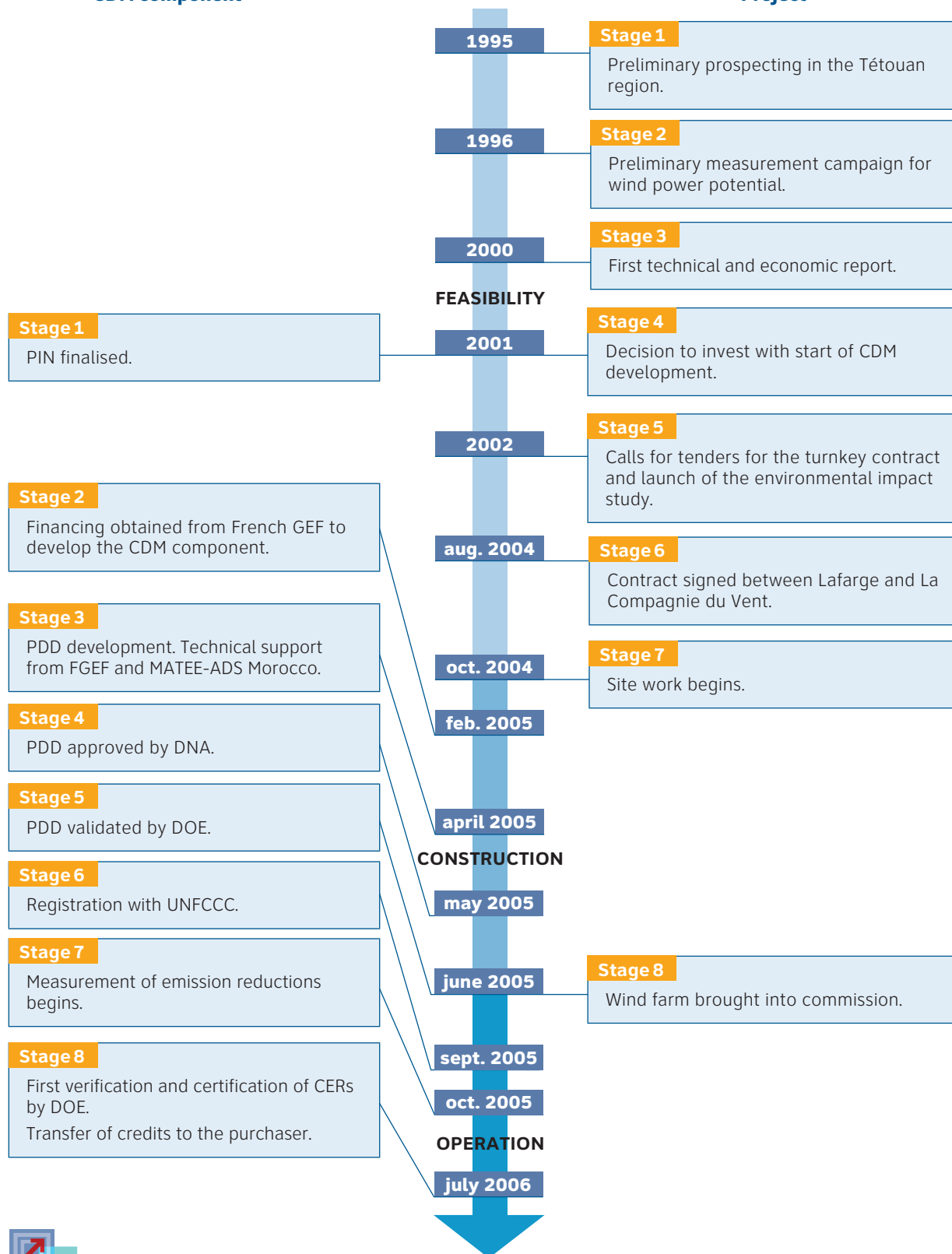


© Lafarge

CDM component

Key Project Stages

Project



Benefits arising from the project

- Internal encouragement to replicate CDM lever;
- External communication for Lafarge and the FGEF: first French, Moroccan and African CDM project;
- Issue of self-generated CER credits towards NAP compliance of Lafarge cement plants in Europe;
- Partial energy independence of the site in a context of high prices for conventional fuels and strong international competition.

Contact for the project

Lafarge

Gaëtan Cadero

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For more information

<http://cdm.unfccc.int/Projects/DB/DNV-CUK1123244454.33>

ANNEX 11

Case study n°5: Gmelina timber plantation in Zapayan municipality (Colombia)



Key project data

Sector	Forestry
Type	Reforestation
Country	Colombia, Atlantic Coast, Lower Magdalena region
Reforested area	4 000 hectares
Species	Teack (<i>Tectona grandis</i>), Gmelina (<i>Gmelina arborea</i>), Ceiba (<i>Bombacopsis quinata</i>)
tCERs generated	80 000 tCERs/year
Registration date	Validation in progress
Promoter	Cordmagdalena with support from ONFI
Financed by	Cordmagdalena, Finagro, owners of Magdalena Bajo

The Magdalena Bajo commercial reforestation project is an initiative from the Colombian company Cormagdalena, which is in charge of navigation on Colombia's main river, the Rio Magdalena. This reforestation programme, which began in 2000, covers 4 000 hectares, mainly using teak, gmelina and ceiba. It is being developed in lands belonging to livestock farmers on the Atlantic Coast, including small landowners, and financed through private participation contracts between the owners, Cormagdalena and the Bank of Colombia Finagro, with technical support from the international branch of the French National Forests Office (ONF International).

“ Four questions to Martin Perrier Director, ONF International

How was this CDM project identified?

ONF International has been supporting Cormagdalena since 2000 in the implementation of its planning programme for the Magdalena river basin. As part of the planning activities for the catchment basin, ONF International made a proposal to

Cormagdalena for a CDM reforestation project which would benefit livestock farmers on the Atlantic coast by helping to control erosion and siltation risks along the river, and support local development by generating alternative sources of income (timber and carbon) to extensive livestock farming.

What were the main obstacles?

The main obstacles were methodological, as rules and procedures for CDM forest projects were only defined in 2003. There was no approved methodology at the time when the project began. The first methodology for afforestation and reforestation projects was approved in 2005 (AR AM 0001) and is highly restrictive. A specific methodology had to be developed for this project, which considerably lengthened the process. After lengthy exchanges with this CDM Executive Board, the first version of the methodology proposed by the ONFI was finally accepted in June 2008. The second complication arose from the decision to involve small and medium landowners in the area, which would produce a tenfold impact in social terms as well as coherently planned reforestation nodes. ONFI therefore implemented an additional programme to support traditional livestock farming with intensified production, in order to help the project gain acceptance among small and medium landowners.

What were the key factors ensuring a successful outcome?

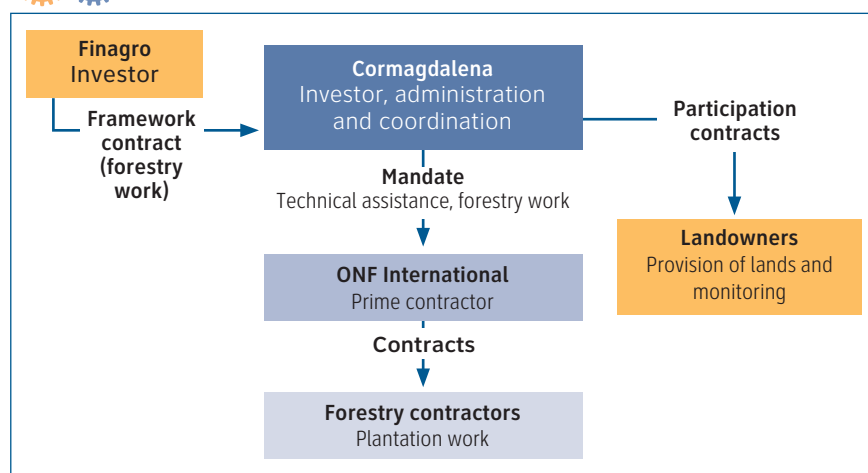
Key factors of success were the involvement of Colombian partners, both institutional (Cormagdalena) and financial (Finagro) in the project, while the technical success of the plantations helped to convince both landowners and partners of the project's value. Support from the Colombian authorities and the French government also allowed the project to continue despite the difficulties encountered with the CDM.

Do you expect to continue your CDM/JI activities in the future?

The ONF International intends to pursue and diversify its CDM/JI activities as the carbon market evolves. In order to diversify its activities, ONF International is looking in particular into the new labels emerging on the voluntary carbon



Stakeholders involved



Key technical data

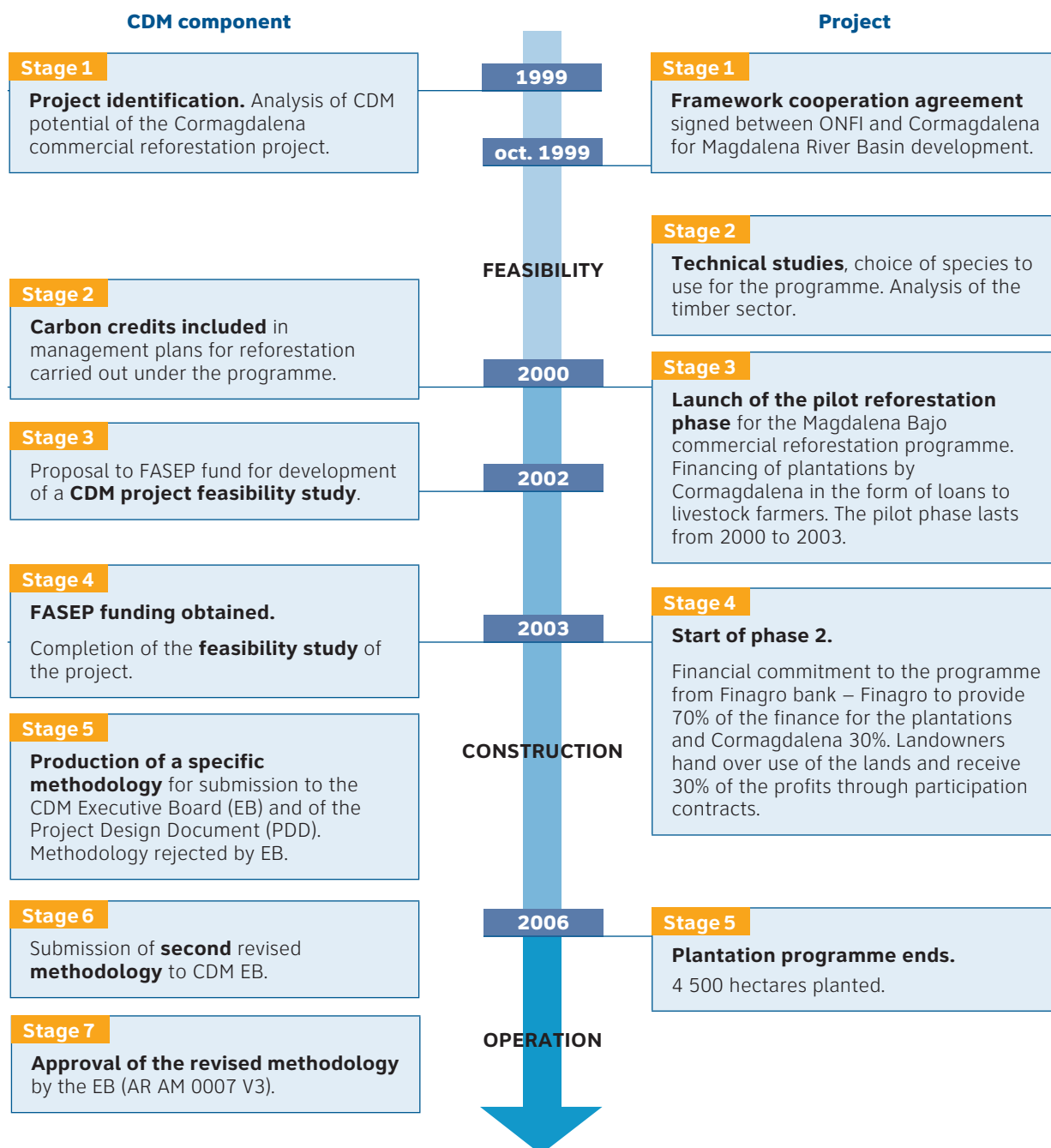
Methodology	AR AM 0007 v3 "afforestation and reforestation of Land Currently under Agricultural and Pastoral Use"
Crediting period	30 years
Investment (excluding CDM component)	8 M€
% equity	100%
% debt	0%
Total CERs	2 500 000 tCERs
Carbon income	4 M€
IRR delta	12.5%

market and into the energy sector (CHP and heat production) and energy efficiency. Similarly, ONF International

has an important role to play in the area of national inventories in both Annex I and non-Annex I countries, in anticipation

of emerging REDD projects (Reducing Emissions from Deforestation and Degradation).

Key Project Stages



Benefits arising from the project

- Environmental benefits: hydrosystem regulation (with consequences for navigability along the river Magdalena), biodiversity conservation and erosion control;
- Socio-economic benefits: creation of the local employment; diversification of economic livestock farming activities; prevention and control of insecurity through reorganisation of the social fabric and improvement in the living conditions of rural populations.
- Others: image value for the project developer, Cormagdalena.

Contact for the projet

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For more information
<http://www.onf.fr>

ANNEX 11

Case study n°6: Fuel switching from coal to jatropha fruit for cement production in Rufisque (Senegal)



Key project data

Sector	Cement
Type	Renewable energy production: fuel switch from coal to biomass
Country	Senegal (Rufisque)
CERs generated	89 000 CERs/year
Registration date	Validation in progress
Promoter	Sococim Industries, Vicat Group
Financed by	Vicat, banks

This project aims to substitute about 40% of the imported coal used in the Sococim cement plant (Vicat Group) with the jatropha fruit from plantations managed by community groups and private-sector producers. The jatropha plantations will cover about 11 000 ha of marginal lands which are unfit for food crops. The fruit of the jatropha are harvested, dried and transported for burning in the cement kilns, thus generating substantial reductions in CO₂ emissions from coal burning. This project, the first of its kind in the world, should significantly improve rural livelihoods in the region concerned.

“ Five questions to Moctar Diaw Environment Director for Sococim Industries

Why did you decide to undertake this CDM project?

The Vicat Group has been committed to a sustainable development policy for many years. The group is subject to NAP quotas and is seeking to reduce emissions in all its facilities. It has investigated all potential openings for CDM projects in its facilities abroad. The Sococim jatropha project emerged as one of the most promising and the most innovative. Annual emission reductions, estimated at 89 000 tCO₂e under routine

operating conditions and converted into CERs will be used by the Vicat Group to comply with its quota obligations. The project reduces energy dependency in Senegal and in the cement plant in a difficult worldwide energy context. This CDM takes an essential part in launching a project which is subject to major risks.

How was the project identified?

The project was identified by the group's head office and Sococim directors with



Key technical data

Methodology	ACM 0003 v072 – “Emissions reduction through partial substitution of fossil fuels with alternative fuels or less carbon intensive fuels in cement manufacture”
Crediting period	7 years, renewable twice
Investment (excluding CDM component)	28 M€
Total CERs for emission reductions generated by the project	620 000 CERs in the first period (7 years)
Gross income from credit sales over 7 years (price estimate: 10€/CER)	Approximately 6.2 M€
ERPA type	Sococim to transfer CERs produced to Vicat Group to fulfil its NAP obligations. In return, Vicat Group will finance part of the investments for the jatropha project



© Sococim

the support of two specialized consultants.

What were the main obstacles?

Determining technical feasibility required the creation of pilot plantations and a great deal of research. The setup of the project was particularly complex at the organisational level, as regards defining the responsibilities and obligations of the various stakeholders, and demanded a great deal of dialogue with the government, elected officials, rural groups and research institutes. It received significant political support at the highest levels. The setup of this CDM application itself was complicated by the introduction of a new applicable CDM methodology (ACM0003 Version 7.2). On the administrative side, the Senegalese DNA commissioned an expert evaluation and approved the project without reservations within a short time. This CDM project was the first for the Vicat Group and demanded considerable involvement from its executive staff in Senegal and at its head office. Technically speaking, the additionality of this type of project is not difficult to demonstrate, given the scale of existing areas and the project's modest returns. The setup of the CDM project should not delay the physical implementation of the project.

What were the key factors ensuring a successful outcome?

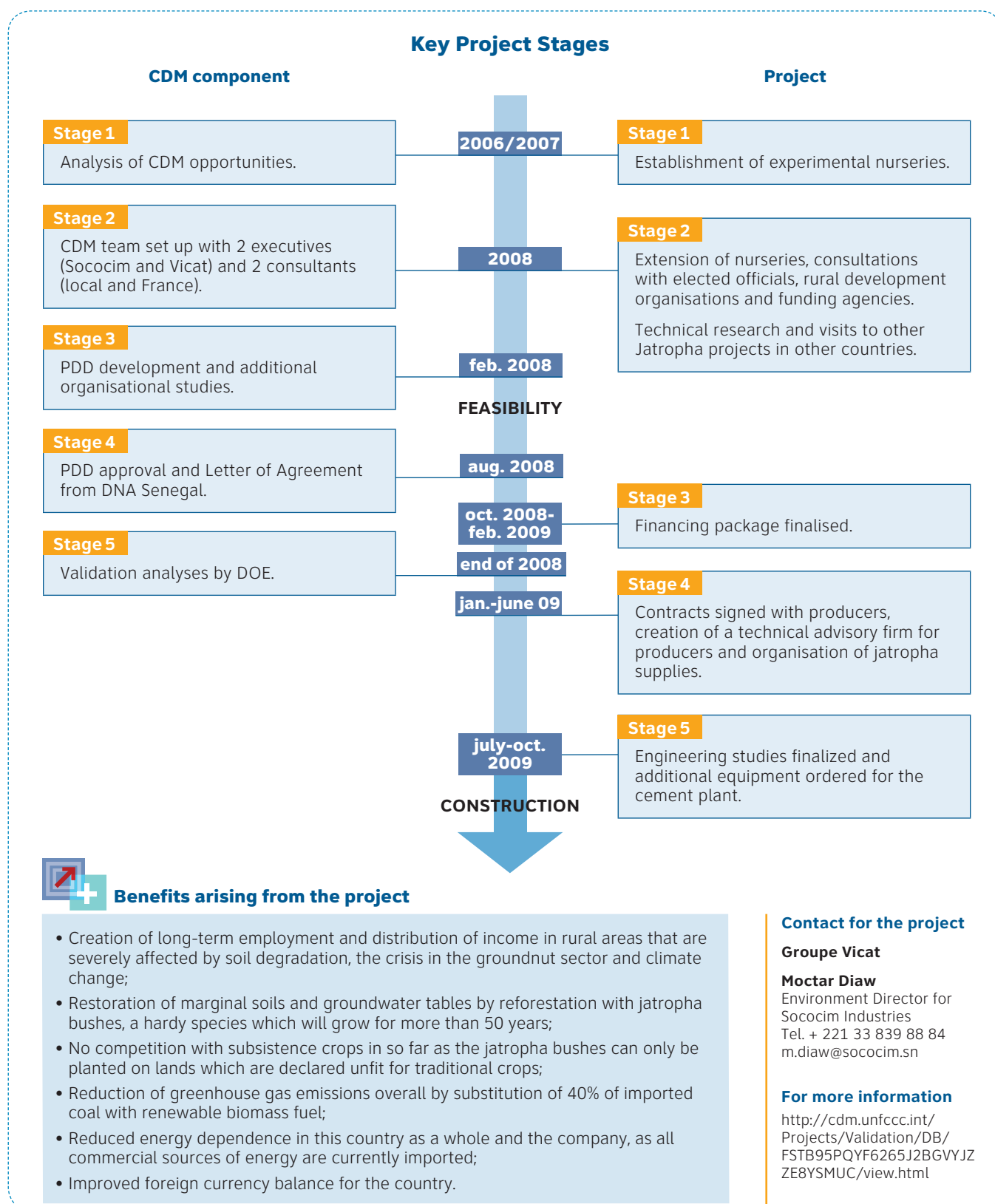
The key factors of success were the Vicat Group's determination to innovate in the area of sustainable development and accept the associated risks, and the excellent level of collaboration with the Senegalese government, which is strongly committed to biofuel development. The second key factor was the creation from

the outset, during the preliminary study phase, of a robust team of executive staff from the head office and the Sococim subsidiary, working together with one French and one Senegalese expert, both very experienced and working in synergy.

The objective being to develop a working knowledge of the CDM approach within the Vicat Group.

Do you expect to continue your CDM/ JI activities in the future?

The Vicat Group is investigating other CDM or JI projects that may be considered for its subsidiaries. Sococim is considering commitments to further CDM projects in future.



ANNEX 12

Domestic offset projects

What is a domestic offset project?

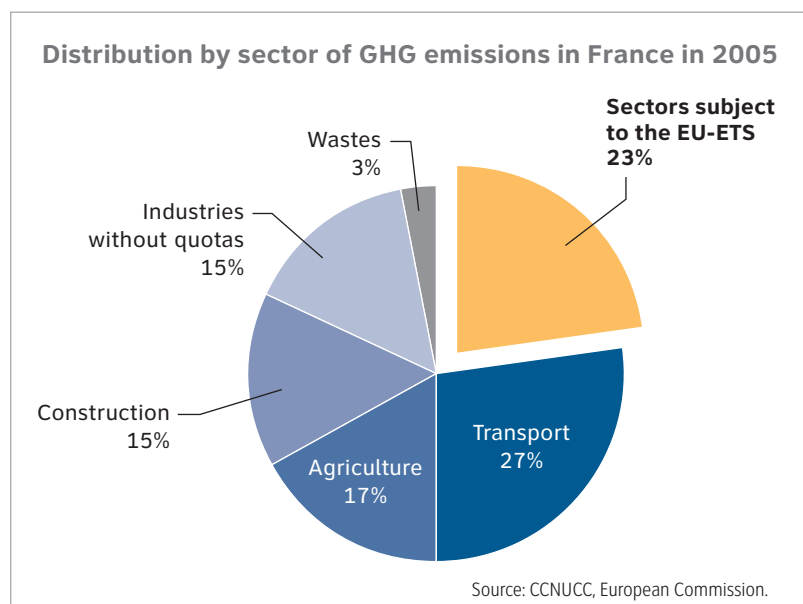
Domestic offset projects are conducted under schemes that attract financial rewards for emission reductions. In France (mainland and overseas departments or DOM), the scheme was launched by a Government Order issued on 2 March 2007 and signed by the minister for the environment and the minister for the economy.

Domestic offset projects use the Joint Implementation Track 1 mechanism provided for in Article 6 of the Kyoto Protocol, whereby the State hands over Assigned Amount Units (AAUs) so that developers of projects which reduce GHG emissions can be rewarded in Emission Reduction Units (ERU). The French Government Order specifies the conditions under which projects and emission cuts are eligible for the scheme: in particular, emission cuts have to be measurable, additional and reportable to the national GHG emissions inventory which is drawn up each year in accordance with the Kyoto Protocol.

The JI mechanism provides for trade in ERUs between two Annex I countries. In order to receive credits generated by domestic offset projects, the project developer in the country concerned must be partnered by an associate from another country that also has to satisfy the eligibility criteria allowing it to use the flexible mechanisms provided for in the Protocol.

What is the purpose of the mechanism? For whom is it intended?

The EU Emissions Trading Scheme (EU-ETS) is already encouraging companies in some industrial sectors to reduce their CO₂ emissions. Companies subject to quotas that decide to reduce their emissions may receive income generated by the quotas released. However, this system only covers about 50% of Europe's total GHG emissions and less than 25% of those in France.



The purpose of the French domestic offset projects scheme is to offer financial incentives to players not covered by the EU-ETS to take measures to reduce their emissions.

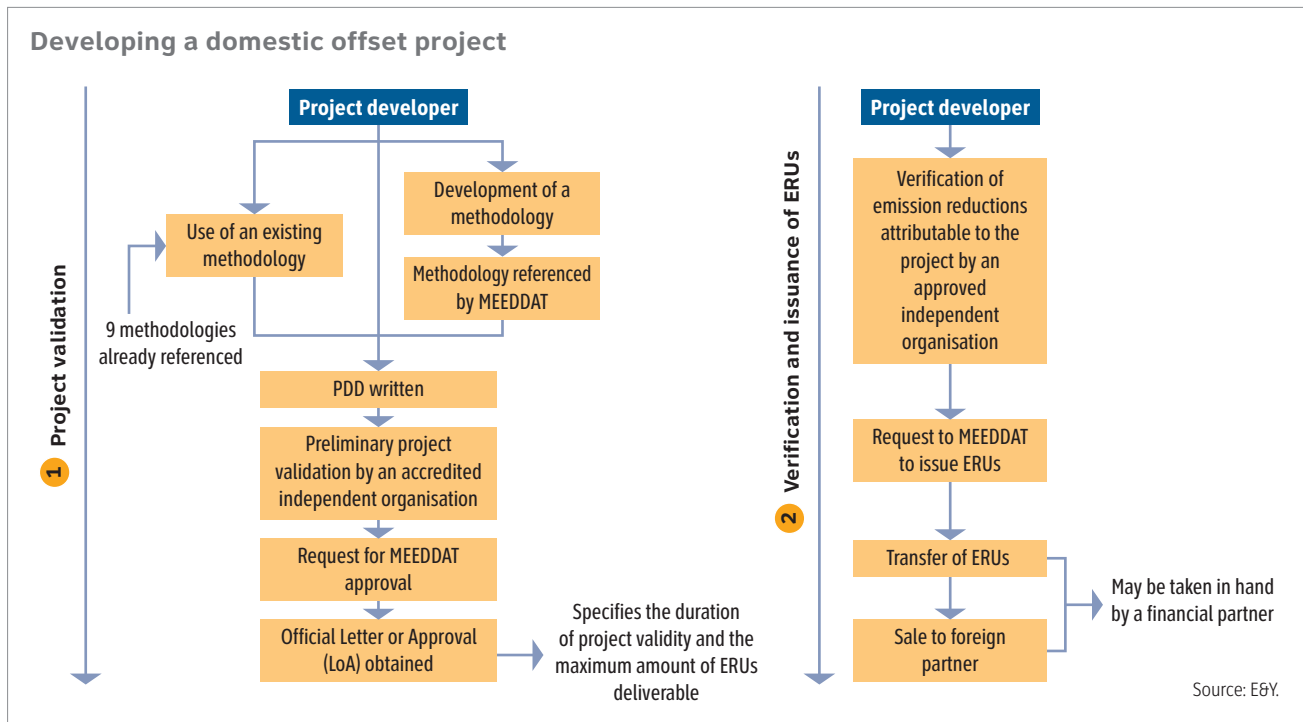
The scheme is designed for stakeholders such as local authorities, SMEs, large corporations and associations presenting projects that aim to reduce GHG emissions in France and which satisfy the eligibility criteria defined by the government for the following main sectors: transport, agriculture, construction, waste treatment and facilities not covered by the quota system.

In order to use the scheme, project developers must either submit a methodology for referencing or use

a methodology which has been referenced by the Ministry for Ecology, Energy, Sustainable Development and Town and Country Planning (MEEDDAT). They must draw up a Project Design Document (PDD) and obtain a PDD validation report from

an approved third party (certifying that the methodology is correctly applied and that the additionality demonstration complies with requirements). Subsequently, to support each application for a credit issuance (ERUs), they must obtain verification of the emission cuts achieved during the crediting period (in the previous year, for example). ERU credits may be issued for no more than 90% of the verified emission cuts.

The diagram below shows the steps required to draw up these documents:



At the time of publication (October 2008), 9 methodologies were already referenced by the MEEDDAT and 2 were being processed:

Referenced methodologies
Methane capture from livestock effluent in farms (trial method for an initial 10 projects)
Reducing HFC emissions from commercial refrigerating equipment, agri-foods and skating rinks
Recovery of biowaste for biomethane fuel production to replace biomethane fuel with natural gas as vehicle fuel
Production of thermal energy to reduce fossil fuel consumption in new or existing facilities
Reduction of fuel consumption in the professional marine fisheries sector
Thermo-oxidation of gaseous effluent emissions from industrial production facilities
Thermal breakdown of N ₂ O in gaseous effluent from existing industrial production facilities
Destruction of N ₂ O emissions from adipic acid production
Cutting fuel consumption by dynamic car-pooling

Referencing in progress
Transport mode switching: from freight haulage by road to river transport
Methanisation of livestock effluent in small-scale units

Financial operators (consultancies, banks and lending institutions or certification organisations) are offering intermediation services such as:

- Project identification and aggregation (for small-scale projects, aggregation by one operator is particularly important in order to keep down transaction costs);
- Technical assistance upstream from project set-up and handling of the administrative approval procedure;
- Assistance with emissions monitoring;
- Identification of foreign partners.

A particular example is the Caisse des Dépôts et Consignations, which initiated the scheme and launched a call for projects in October 2007, offering some of its services to kick-start the mechanism.

What is the situation today in practice?

At the time of production of this document (October 2008), about twenty domestic offset projects are currently under development in France. Most are “aggregated projects”. Fourteen are being developed in response to the Caisse des Dépôts et Consignations call for projects, and represent total potential emission reductions of more than 2.1 MtCO₂ for the 2008-2012 period; 3 others (1.3 MtCO₂), for which the method has not been referenced by the government, are being processed. The last three projects (1.5 MtCO₂) are being conducted outside the scope of the Caisse des Dépôts et Consignations call for projects. The majority of these projects concern heat from biomass, followed by energy efficiency. Taken together, the domestic offset projects currently under development in France could help to reduce GHG emissions by almost 5 MtCO₂ from 2008 to 2012.

What are the prospects beyond 2012?

Domestic offset projects are based on the JI mechanism, which is currently to remain in force until 2012. However, the European Commission put forward a new directive on 23 January 2008, aiming to reform and continue the EU-ETS over the 2013-2020 period. The proposed directive explicitly includes the possibility of developing a European scheme for domestic offset projects, or of harmonising the various national “domestic offset project” schemes that currently exist in Europe to date, in most of the new Member States as well as in France, Germany, Spain and Denmark.

For more information

Useful contacts

MEEDDAT

**Ministry for Ecology, Energy, Sustainable Development
and Town and Country Planning**

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http://www.effet-de-serre.gouv.fr/les_projets_domestiques

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<http://www.caissedesdepots.fr/projetsdomestiquesCO2>

ANNEX 13

Institutional support and sources of finance

Supporting institutions in France and and bilateral sources of finance

Advice, information, technical support
French DNA - Directorate-General for Energy and Climate of MEEDDAT http://www.developpement-durable.gouv.fr
Economic missions of French embassies - Contacts and information on host countries http://www.missioneco.org/me/
Ubifrance - PEXE: Export Plan for Eco-Businesses http://www.ubifrance.fr/
ADEME (French Environment and Energy Management Agency) http://www.ademe.fr
Club ADEME International http://www.clubinternational.ademe.fr
Caisse des dépôts et Consignations "Mission Climat" - Information on the carbon market http://www.caissedesdepots.fr/missionclimat/fr
CDM/JI Guides http://www.exporter.gouv.fr/exporter/pages.aspx?iddoc=506&pex=1-2-40-132-133-134-506
Regional Councils/Competitiveness Clusters (Tennerdis, DERBI, etc.) Tennerdis - http://www.tenerrdis.fr DERBI - http://www.pole-derbi.com
Financing
FFEM - French Global Environment Facility (FGEF) - Subsidies for innovative projects http://www.ffem.fr - contact: +33 1 53 44 42 42
DGTPE/MEIE - FASEP: Financing for upstream project feasibility studies http://www.exporter.gouv.fr - contact: +33 1 44 87 19 44 (Project Support Office)
DGTPE/MEIE - Emerging Countries Reserve Fund (RPE): Financing for infrastructure projects http://www.exporter.gouv.fr - contact: +33 1 44 87 19 44 (Project Support Office)
AFD French Development Agency - Project financing http://www.afd.fr - contact: +33 1 53 44 31 31
Ubifrance - French agency for international business development http://www.ubifrance.fr/ - contact: +33 8 10 81 78 17

Other sources of funding

Three other sources of funding may be called on for CDM and JI projects: multilateral and bilateral donor agencies, carbon funds and private capital investment companies or developers.

Multilateral and bilateral agencies

The table below gives a non-exhaustive list of relevant multilateral funding agencies. The most recent and most detailed data are available from the web sites of these funding agencies.

Private and multilateral funding agencies

Name of Funding Agency	Web site
African Development Bank	http://www.afdb.org
Asian Development Bank	http://www.adb.org
European Bank for Reconstruction and Development	http://www.ebrd.org
European Investment Bank	http://www.eib.org
Export-Import Bank of Japan	http://www.jbic.go.jp
Export-Import Bank of the United States	http://www.exim.gov
French Global Environment Facility	http://www.ffem.fr
Global Environment Facility	http://www.gefweb.org
Inter-American Development Bank	http://www.iadb.org
International Fund for Agricultural Development	http://www.ifad.org
Japan Bank for International Cooperation	http://www.jbic.go.jp
Kreditanstalt für Wiederaufbau (German Bank for Reconstruction and development)	http://www.kfw.de
North American Development Bank	http://www.nadb.org
Swedish International Development Agency	http://www.sida.se
United Nations Environment Programme (UNEP)	http://www.unep.org
United States Agency for International Development	http://www.usaid.gov
World Bank Group (including IBRD, IDA, IFC and MIGA)	http://www.worldbank.org

Multilateral, governmental and private-sector carbon funds

Multilateral, governmental and private-sector carbon funds prefer to negotiate over projects that have already reached an advanced stage of preparation and where the necessary financing has been identified. These funds generally demand proof of the project's economic (and technological) viability. Preference is also given to projects whose eligibility has already been assessed against the CDM regulatory framework. This can require a pre-existing approved methodology and a preliminary assessment of the emission reductions resulting from the project. Finally, most of the carbon funds established by national or international development banks require projects to meet their own very demanding social and environmental eligibility criteria. The table below gives a non-exhaustive list of multilateral, governmental and private carbon funds.

A more exhaustive list of carbon funds is provided in the Caisse des Dépôts et Consignations study¹.

1 - Note on the study by the Caisse des Dépôts et Consignations - "Mission Climat", November 2007.

Examples of multilateral, governmental and private carbon funds

Carbon funds	Web site
World Bank carbon funds (BioCarbon Fund, Community Development Carbon Fund, Prototype Carbon Fund, etc.)	http://www.carbonfinance.org
CAF-Spain Carbon Initiative	http://www.caf.com
Danish Carbon Public Procurement Program	http://www.danishcarbon.dk
Multilateral Carbon Credit Fund (MCCF)	http://www.ebrd.com
Swedish International Climate Investment Program SICLIP 2002-2012	http://www.stem.se
ICECAP	http://www.icecapltd.com
KfW Carbon Fund	http://www.kfw.de/carbonfund
Austrian CDM/JI programme	

Private capital investment companies and developers

More and more investors seeking to invest capital in CDM or JI projects are showing an interest in the increasingly mature carbon market. Project developers seeking to identify capital investment companies or to associate private developers in their projects need to analyze the sector in question and try to contact potential developers individually. Given the increasing importance of the carbon market on the international scene, seminars, fairs and other events attended by the main players on the market are regularly organised across the world. Attendance at events such as the World Bank/IETA Carbon Expo (<http://www.carbonexpo.com>) or Carbon Expo Asia (<http://www.carbonexpoasia.com>) is highly recommended as a way of meeting CDM or JI players, including private capital investment companies and developers. The CDM Bazaar web site provides a great deal of relevant information on these players (<http://www.cdmbazaar.net>).

These organisations include:

- AgCert,
- CAMCO International Limited,
- Climate Change Capital,
- Econergy,
- EcoSecurities Group plc,
- EDF Trading,
- ENDESA, S.A.,
- Enel Trade SpA,
- European Carbon Fund,
- First Climate,
- MGM Carbon Portfolio, SARL,
- Mitsubishi UFJ Securities,
- ORBEO,
- RWE Power AG,
- South Pole Carbon Asset Management Ltd.,
- SouthSouthNorth,
- Tricorona,
- Vattenfall Europe Generation AG & Co. KG.

Useful informations

Guide to CDM project financing, UNEP 2007

<http://www.cd4cdm.org/publications.htm>

Note on the study by the Caisse des Dépôts et Consignations - "Mission Climat", November 2007. "Fonds d'investissement CO₂: l'essor des capitaux privés"

<http://www.caissedesdepots.fr/spip.php?article650>

CDM forum: the CDM Bazaar

<http://www.cdmbazaar.net>

Useful contacts

Institutional focal points

International

- **UNFCCC**, <http://unfccc.int>
- **List of DNAs**, <http://cdm.unfccc.int/DNA/index.html>
- **List of DFPs**, http://ji.unfccc.int/JI_Parties/PartiesList.html

European

- **European Commission, EU-ETS**,
http://ec.europa.eu/environment/climat/emission/index_en.htm

National

- **French DNA: MEEDDAT Directorate-General for Energy and Climate**,
<http://www.developpement-durable.gouv.fr>
- **French Global Environnement Facility**,
<http://www.ffem.fr>
- **French economic missions**, <http://www.missioneco.org/me>
- **List of French consultancies**, <http://www.exporter.gouv.fr>

Information on CDM and JI projects

Procedures and updates on the mechanisms (including minutes of JI Supervisory Committee and CDM Executive Board meetings), documents and information on registered projects:

- **UNFCCC**, <http://unfccc.int>
- **List of DOEs**, <http://cdm.unfccc.int/DOE/index.html>
- **List of AIEs**, <http://ji.unfccc.int/AIEs/index.html>
- **Statistics on CDM/JI projects: the UNEP CDM and JI pipeline -**
United Nations Environment Programme (UNEP),
<http://www.cdmpipeline.org/>
- **Statistics and Guides on CDM and JI projects: IGES** (Institute for Global Environment Strategies), <http://www.iges.or.jp/en/index.html>
- **List of players** (credit purchasers and vendors, service providers) and
CDM forum: the CDM Bazaar, <http://www.cdmbazaar.net/>
- **GTZ Newsletter: "CDM Highlights"**,
<http://www.gtz.de/en/themen/umwelt-infrastruktur/umweltpolitik/14317.htm>
- **CDM Initiative - Mailing list sent out by the Francophone CDM Partnership Initiative**, <http://www.mediaterre.org/mailman/listinfo/initiative-MDP>

Information on the carbon market

- **The World Bank Carbon Finance Department** (especially the annual report on *State and Trends of the Carbon Market*), <http://carbonfinance.org/>
- **Caisse des Dépôts et Consignations "Mission Climat"**,
<http://www.caissedesdepots.fr/missionclimat/fr>
- **Société Générale (Commodities Research)**,
<http://www.sgresearch.socgen.com>

- **Point Carbon**, particularly **the CDM/JI Newsletter** (CDM & JI Monitor), <http://www.pointcarbon.com/news/cdmjien/cdmjifr/>
- **Thomson Reuters**, <http://communities.thomsonreuters.com/carbon>
- **New Carbon Finance**, <http://www.newcarbonfinance.com/>
- **Carbon Finance**, <http://www.carbon-financeonline.com/>
- **Ecosystem Marketplace**, <http://www.ecosystemmarketplace.com/>
- **International Emissions Trading Association (IETA)**, <http://www.ieta.org>

Information on international Climate negotiations

- **French Ministry for Ecology, Energy, Sustainable Development and Town and Country Planning (MEEDDAT)**, <http://www.developpement-durable.gouv.fr>
- **French Institute for Sustainable Development and International Relations (IDDRI)**, <http://www.iddri.org>

Guides to CDM/JI project development

- **CDM/JI Guides, 2nd edition** (in English and French), <http://www.exporter.gouv.fr/exporter/pages.aspx?iddoc=506&pex=1-2-40-132-133-134-506>
- **The “CDM Toolkit” from South South North**, <http://www.cdmtoolkit.org>
- **The “CDM/JI Guide” from the Japanese Ministry for the Environment**, <http://gec.jp>
- **UNEP Guides**
<http://www.cd4cdm.org/Publications/PDDguidebook2ndEdition.pdf>
<http://www.cd4cdm.org/Publications/FinanceCDMprojectsGuidebook.pdf>

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- **Documentation from the World Bank Carbon Finance Department**, <http://carbonfinance.org>
- **OECD Documentation**, <http://www.oecd.org>
- **UNEP CD4CDM Documentation** (Capacity Development For the Clean Development Mechanism), <http://www.cd4cdm.org>

Networks

- **List of IISD Climate**, <http://www.iisd.ca/email/climate-L.htm>

Events

- **Carbon Expo**, <http://www.carbonexpo.com>
- **Carbon Market Insights**, <http://www.pointcarbon.com/>

Acronyms and abbreviations

Acronym	English	Acronym	French
AAU	Assigned Amount Unit	UQA	Unité de Quantité Attribuée
AFOLU	Agriculture, Forestry and Other Land Uses (previously LULUCF, Land Use, Land Use Change and Forestry)	UTCF	Utilisation des Terres, Changement d'usage des sols et Foresterie
AIE	Accredited Independent Entity	EIA	Entité Indépendante Accréditée
CDC	A French public financial institution under parliamentary oversight	CDC	Caisse des Dépôts et Consignations
CDM	Clean Development Mechanism	MDP	Mécanisme pour un Développement Propre
CDM EB	Executive Board of the Clean Development Mechanism	CE MDP	Conseil Exécutif du Mécanisme pour un Développement Propre
CER	Certified Emission Reduction	URCE	Unité de Réduction Certifiée des Emissions
CITL	Community Independent Transaction Log		Journal Communautaire Indépendant des Transactions
COP	Conference of the Parties	CP	Conférence des Parties
DFP	Designated Focal Point	PFD	Point Focal Désigné
DNA	Designated National Authority	AND	Autorité Nationale Désignée
DOE	Designated Operational Entity	EOD	Entité Opérationnelle Désignée
ER	Emission Reduction	RE	Réduction d'Emissions
ERPA	Emission Reduction Purchase Agreement	CAREV	Contrat d'Achat de Réductions d'Emissions Vérifiées
ERU	Emission Reduction Unit	URE	Unité de Réduction des Emissions
EUA	European Union Allowance	EUA	Quota européen dans le cadre du SCEQE
EU-ETS	European Emissions Trading Scheme	SCEQE	Système Communautaire d'Echange de Quotas d'Emissions
FGEF	French Global Environment Facility	FFEM	Fonds Français pour l'Environnement Mondial
GHG	GreenHouse Gas	GES	Gaz à Effet de Serre
GIS	Green Investment Scheme	SIE	Schéma d'Investissement Environnemental
HFC	HydroFluoroCarbon	HFC	HydroFluoroCarbures
IEA	International Energy Agency	AIE	Agence Internationale de l'Energie
IPCC	Intergovernmental Panel on Climate Change	GIEC	Groupe Intergouvernemental d'Experts sur l'Evolution du Climat
ITL	International Transaction Log		Journal International des Transactions
JI	Joint Implementation	MOC	Mise en Œuvre Conjointe
JI SC	Joint Implementation Supervisory Committee	CS MOC	Comité de supervision de la MOC
ICER	Long-Term Certified Emission Reduction	IURCE	Unité de Réduction Certifiée des Emissions Durables
LoA	Letter of Agreement	LoA	Lettre Officielle d'Agrément
MEEDDAT	Ministry for Ecology, Energy, Sustainable Development and Town and Country Planning	MEEDDAT	Ministère de l'Ecologie, de l'Energie, du Développement Durable et de l'Aménagement du Territoire
MEIE	Ministry for Economy, Industry and Employment	MEIE	Ministère de l'Economie, de l'Industrie et de l'Emploi
	Monitoring		Suivi des réductions d'émissions
NAP	National Allocation Plan	PNAQ	Plan National d'Allocation des Quotas
ODA	Official Development Assistance	APD	Aide Publique au Développement
PDD	Project Design Document	DDP	Document Descriptif de Projet
PFC	Perfluorocarbon	PFC	Perfluorocarbures
PIN	Project Idea Note	NIP	Note d'Identification du Projet
RMU	Removal Unit	UA	Unité d'Absorption
SSP	Small-Scale Project		Projet à petite échelle
tCER	Temporary Certified Emission Reduction	tURCE	Unité de Réduction Certifiée des Emissions Temporaires
tCO ₂ e	Metric tonne of CO ₂ equivalent	teq CO ₂	Tonne équivalent CO ₂
UNEP	United Nations Environment Program	PNUE	Programme des Nations Unies pour l'Environnement
UNFCCC	United Nations Framework Convention on Climate Change	CCNUCC	Convention-Cadre des Nations Unies sur les Changements Climatiques
VER	Voluntary/Verified Emission Reduction		Unité de Réduction des Emissions Volontaire/Vérifiée

Notes

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