What are carbon markets?

Key points:

- Most carbon offset projects have been developed in middle income countries (China, India, Brazil) and less than 1% of projects are in the least developed countries (LDCs).
- Corporate Social Responsibility (CSR) motivations drive demand for voluntary projects rather than legally regulated emissions targets.
- The lack of an international regulatory structure in the voluntary market provides flexibility for project development due to lower transaction costs and a simplified project cycle.

What are the carbon markets?

Carbon markets have developed in order to facilitate the trade in carbon credits and help to mitigate climate change in a cost effective way. There are many types of carbon markets, but there are currently two main markets for trading carbon from offset projects in developing countries. They include:

- The **regulated carbon markets**, which are regulated by international rules defined in the Kyoto Protocol and includes Clean Development Mechanism (CDM) carbon projects.
- The **voluntary carbon markets**, which are unregulated and includes a range of different trading relationships and voluntary project standards.

The commodity which is traded in carbon markets is 'tonnes of carbon dioxide equivalent' (tCO2e). Each tonne of carbon dioxide emitted (or another GHG) has an incremental impact on atmospheric GHG concentrations and therefore climate change. One tCO2e is often called a carbon 'credit' and carbon credits are bought and sold in carbon markets in a similar way to other commodities.

Carbon credits can only be traded if they meet certain criteria which help to ensure that the emissions reductions or removals have, or will, actually occur and that they have only occurred because of the carbon offset project.

What are the common features of the regulated and voluntary carbon markets?

The CDM and voluntary carbon markets have a number of common features:

- Types of actors in markets and projects include:
  1. End users/buyers: those that need credits to offset emissions for regulatory or voluntary purposes
  2. Suppliers/originators: those that generate and sell credits
  3. Intermediaries: those that intervene between originators and end users providing specialist technical skills and familiarity with country contexts (including carbon funds and facilities, traders, brokers, aggregators, and exchanges).
- Types of *transactions* occurring. For example, transactions can happen directly between suppliers and end

This information sheet is part of a larger resource pack, Understanding the social opportunities and risks in forestry and bioenergy carbon offset projects. The resource pack has been developed by the Overseas Development Institute (ODI) on behalf of the Ford Foundation. For more information, please e-mail CCEF@odi.org.uk.

users or through intermediaries. Transactions may also differ depending on whether emissions reductions have already occurred, or will occur in the future.

- Similar project *risks* and *financing* issues (see info sheet 7 on project financing).

The regulated market: CDM projects

The CDM is one of the flexible market mechanisms regulated under the Kyoto Protocol, which allows Annex 1 (developed) countries to meet their emissions targets by implementing reduction projects in non-Annex 1 (developing) countries. Credits which are generated from CDM projects are referred to as Certified Emission Reductions (CERs).

The Kyoto Protocol states that the purpose of the CDM is not only to assist the Annex I countries to achieve their compliance targets, but also to help achieve sustainable development goals in non-Annex 1 countries. However, the achievement of this objective is in question, because:

- The overwhelming majority of projects have been developed in middle income countries (China, India, Brazil) and less than 1% of projects are in least developed countries (LDCs).
- The project types with low risks and higher profitability are preferred, and sustainable development benefits are usually not a main criterion for buyers and investors.

CDM project cycle

The CDM has a standard seven-stage project cycle for all projects in order to ensure high standards and reduce investment risks:

1. Identifying a promising project activity according to an approved methodology
2. Obtaining host country approval from a Designated National Authority (DNA)
3. Validation by a third party Designated Operational Entity (DOE)
4. Registration by the CDM Executive Board under the UNFCCC
5. Implementation and beginning the operational phase with periodic monitoring
6. Monitoring results are verified by an independent third party
7. Carbon credits issued by the United Nations

CDM projects by location

Many of the CDM projects are located in the more advanced developing countries rather than in the least developed countries (LDCs). For example, China, India and Brazil host 71% of CDM projects.

Despite efforts for the development of CDM projects in Africa, only 2% (27 projects, as of September 2009) are located in the region. The reasons for this include:

- Complex technical requirements for establishing projects, with limited expertise in countries.
- Investors being risk averse in relation to investing in the LDCs .
- A lack of existing emissions in these countries which can be offset.
- The restrictions placed on forestry offset projects under the CDM and in emissions trading schemes such as the EU Emissions Trading Scheme (ETS).

Figure 1: Types of actors and transactions in the carbon markets

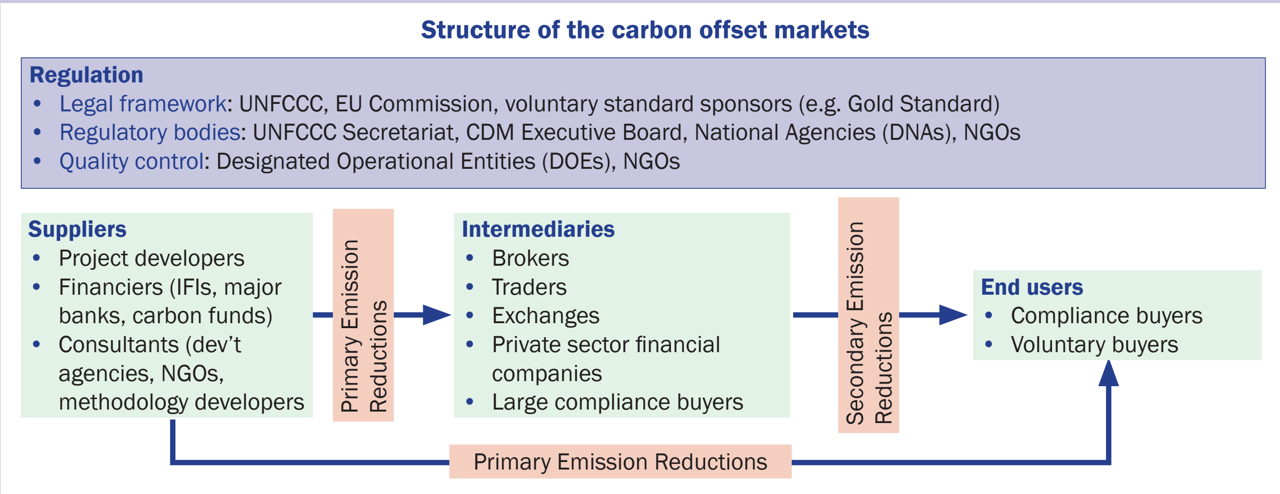


Figure 2: The CDM project cycle

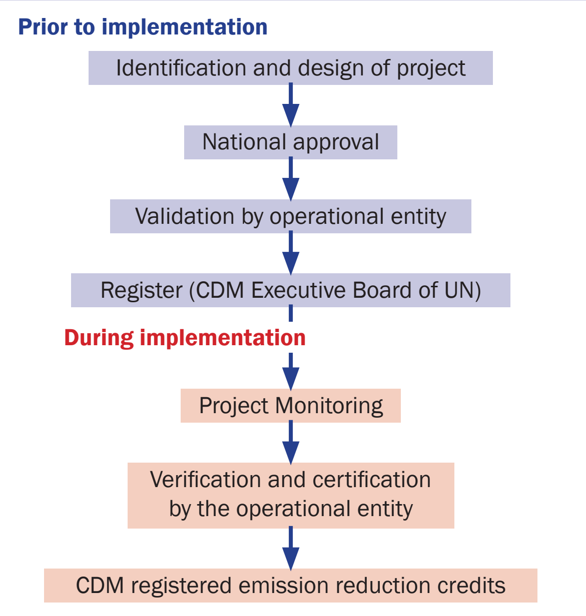
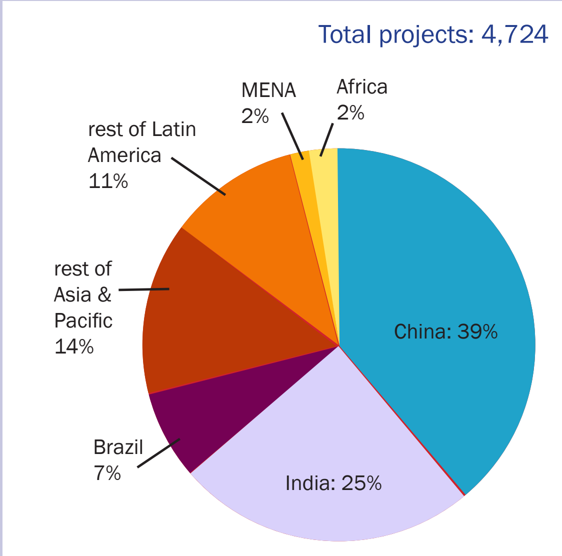
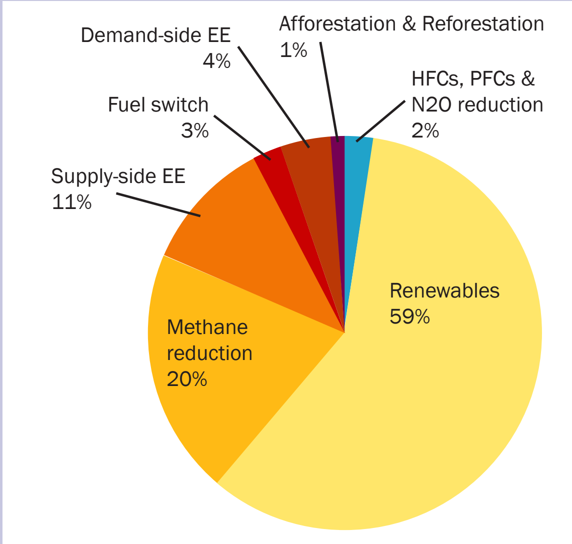


Figure 3: CDM projects by location (at validation stage and/or registered)



Source: UNEP Risoe CDM/JI Pipeline Analysis and Database, September 1st 2009

Figure 4: CDM projects by type (as of Sept 09)



Source: UNEP Risoe CDM/JI Pipeline Analysis and Database, September 1st 2009

CDM projects by type

Several types of CDM project have been developed. Renewable energy projects account for more than 50% of the total registered projects and energy efficiency projects constitute 11%. By November 2009, there were only six registered forestry projects (1 afforestation, 5 reforestation).

The voluntary carbon markets

Voluntary carbon markets include all carbon offset trades that are not required by regulation. One primary motivating factor for purchases of voluntary credits is corporate social responsibility (CSR) for companies looking to market themselves as 'green' or environmentally conscious. The voluntary carbon markets have two separate components:

1. **Chicago Climate Exchange (CCX)**, a voluntary but legally binding cap-and-trade system, operating as a formal rules-based market. Just like the regulated market under the Kyoto Protocol, the CCX trades units denominated in tonnes of carbon dioxide equivalent (tCO2e).
2. The non-binding **'Over-the Counter' (OTC)** offset market. In the 'OTC' market, there is a wide range of voluntary transactions that is not driven by any emissions cap, and does not occur under any formal exchange. OTC carbon offsets are referred to as Voluntary Emission Reductions (VERs). Voluntary buyers buy credits to offset their own emissions.

While there is no single source of information on the number of OTC voluntary projects either by type or by location, information does exist on the voluntary carbon market transactions both by type and location (for both CCX and OTC markets), and is included in the section below.

Differences between CDM and voluntary markets

There are some key differences between CDM and voluntary markets, summarized in the table overleaf.

Table 1: Comparison between CDM and voluntary carbon markets

	CDM market	Voluntary market
Volume transacted in 2008 (tCO_2e)	389 million in total (primary CERs*)	54 million
Total financial value of transactions in 2007 (US$)	6,519 million	397 million
Project size in 2008 (tCO_2e/ yr)	Approx. 138,000 (average size of projects in pipeline). 86% of projects in pipelines are in the range of 10,000 – 500,000	46% of transaction volume in 2008 was generated by very large projects, 500,000 tCO_2e/year or above
Project locations	Asia (81%) Latin America (13.5%) Africa (3.2%) Europe and Central Asia (1.2%) Middle East (1.1%) (Figures based on expected CERs by 2012)	Asia (45%) North America (29%) Latin America (4%) Australia and New Zealand (4%) Africa (1.2%) (Figures based on volumes transacted in 2008)
Project types (top four)	Hydro (27%); Wind (17%); Biomass energy (14%); Methane Avoidance (11%) (by number of projects)	Hydro power (32%), landfill (16%), wind power (15%), afforestation/reforestation conservation projects (7%) (by transaction volume)
Main drivers of demand	Compliance with internationally agreed targets for developed countries' governments and with targets imposed by the governments for companies	Corporate Social Responsibility and Public Relations/ branding
Standards & procedures	CDM project cycle including 3rd party verification by Designated Operational Entities, regulated under the decision made by the Parties of Kyoto Protocol	No mandatory and universal standards, although many projects use 3rd party verification and some independent standards

* A primary transaction is a transaction between the original owner of credits and buyers and a secondary transaction is a transaction between a seller, who is not the original owner, and buyers.

Source: Capoor and Ambrosi, 2009; Hamilton et al., 2009; UNEP Risoe Centre, 2010.

Further Resources

CDM: Up-to-date information on the CDM regulatory market. http://cdm.unfccc.int

Ecosystem Market Place: For up-to-date information on the status of carbon markets. The Ecosystem Market Place has also recently established a Forest Carbon Portal (http://www.forestcarbonportal.com) that provides up-to-date information on the forest carbon market. http://www.ecosystemmarketplace.com/

State of the Voluntary Carbon Market: The Voluntary Carbon Markets: Current State of Affairs (webinar). http://ecosystemmarketplace.com/pages/article.library.presentations.php?component_id=6062&component_version_id=9088&language_id=12

Forests: Taking Root in the Voluntary Carbon Markets: An introduction to carbon markets for practitioners and current information on reforestation, afforestation and REDD projects generating carbon credits. http://ecosystemmarketplace.com/documents/cms_documents/ForestCarbonBooklet%2008-0908%203[1].pdf

Carbon Catalog: Independent directory of carbon offset projects and providers. Offers detailed unbiased information for the carbon offset purchaser. www.carboncatalog.org/

CD4CDM: A project by UNEP to help clarify some of the complex legal, financial and technical issues associated with the CDM. The website also contains detailed and up to date data on the CDM project pipeline. www.cd4cdm.org/