

CARBON MARKETS – WHICH TYPES EXIST AND HOW THEY WORK

Two types of **carbon market** exist; the **regulatory compliance** and the **voluntary** markets. The compliance market is used by companies and governments that by law have to account for their GHG emissions. It is regulated by mandatory national, regional or international carbon reduction regimes. On the voluntary market the trade of carbon credits is on a voluntarily basis. The size of the two markets differs considerably. In 2008, on the regulated market US\$119 billion were traded, and on the voluntary market US\$704 million (Hamilton *et al.*, 2009).

The three **Kyoto Protocol** mechanisms are very important for the **regulatory market**: Clean Development Mechanism (CDM), Joint Implementation (JI) and the EU Trading System (ETS). Some countries have not legally accepted the Kyoto Protocol, but have other legally binding state and regional GHG reductions schemes.² Developing countries can only participate in the CDM.

In general for small-scale AFOLU projects in developing countries, the voluntary market is more interesting than the regulatory market because the CDM market has quite complex procedures and methodologies for project registration and the majority of agriculture and forestry and “Reducing Emissions from Deforestation and Degradation” (REDD) projects are excluded. However, a brief introduction is given to the CDM, because some possibilities for small-scale projects (e.g. renewable energy) exist. Additionally, many of the established rules (see Box 3) also apply to the voluntary market.

BOX 3

SOME CDM RULES:

- **Additionality:** Emission reductions or sequestration must be additional to any that would occur without the project. GHG emissions after the implementation of the project have to be lower than in the business-as-usual case.
- **Permanence:** When accounting for credits, the length of the carbon storage and the risk of loss (natural or human disturbances, such as fire, flood or pest outbreak) are an important issue. Carbon is not stored indefinitely in forest biomass and soils, therefore, a separate temporary crediting system was developed for afforestation/ reforestation (A/R) projects in which credits expire roughly between five and thirty years and can be renewed and resold.
- **Leakage:** The unplanned, indirect emissions of GHGs, resulting from project activities. For example, if the afforestation of agricultural land leads to the migration of people who used to farm this land; and who then clear forest somewhere else.

² E.g. the Australian New South Wales Greenhouse Gas Abatement Scheme (NSW GGAS) and the US Regional Greenhouse Gas Initiative (RGGI) involving ten states from the East coast.





Production of biofuel from cow manure in Bangladesh, Photo by ©FAO/Giulio Napolitano.

CLEAN DEVELOPMENT MECHANISM (CDM)

Under the Kyoto Protocol developing countries (Non Annex I countries) are not obliged to reduce their GHG emissions, whereas industrialised countries (Annex I countries) have to fulfil specified targets. They can achieve these by reducing GHG emissions in their own country; implementing projects to reduce emissions in other countries; or trading. This

The carbon credits from CDM projects are called **Certified Emission Reductions (CER)**.

means that countries that have satisfied their Kyoto obligations can sell their excess carbon credits to countries which find it more expensive to meet their targets.

For developing countries the CDM is of most interest among the regulatory market mechanisms. An industrialised country implements an emission reduction project in a developing country. This can be an afforestation, an energy

efficiency or a renewable energy project. Because of the uptake or savings of GHGs, carbon credits (CER) are generated. These belong to the industrialised country and will be used to compensate some of its domestic GHG emissions and reach their emission targets. The projects support sustainable development within the host country, as a new – additional – project is created which helps to slow down global warming. Through the project new technology is transferred to the host country, investments are made, additional jobs are created and the project reduces environmental impacts.

All projects must utilize rigorous baseline and monitoring methodologies that have been approved by the CDM Executive Board. Any project can submit a methodology for consideration or rely on methodologies that have already been approved. So far five methodologies have been approved for agriculture, 11 for afforestation/reforestation (A/R) and six for agricultural residues/biogas³. At the moment the rules for AFOLU projects in CDM only allow for specific types of projects in developing countries (some examples of projects are given in Box 4):

Agriculture:

- Methane avoidance (manure management)
- Biogas projects
- Agricultural residues for biomass energy

Forestry:

- Reforestation
- Afforestation

BOX 4

EXAMPLES OF CDM PROJECTS:

- **Methane Avoidance:** Energy and fertiliser enterprise from dumped cattle waste in Pakistan
- **Biogas:** Methane capture & combustion from poultry manure treatment at Lusakert Plant, Armenia
- **Biomass Production:** Electricity generation from mustard crop residues in India
- **Reforestation Programme:** Planting trees for timber, firewood and fodder production on degraded land in Bagepalli, India
- **Afforestation of Grassland:** Establishment and management of forest plantations in Tanzania

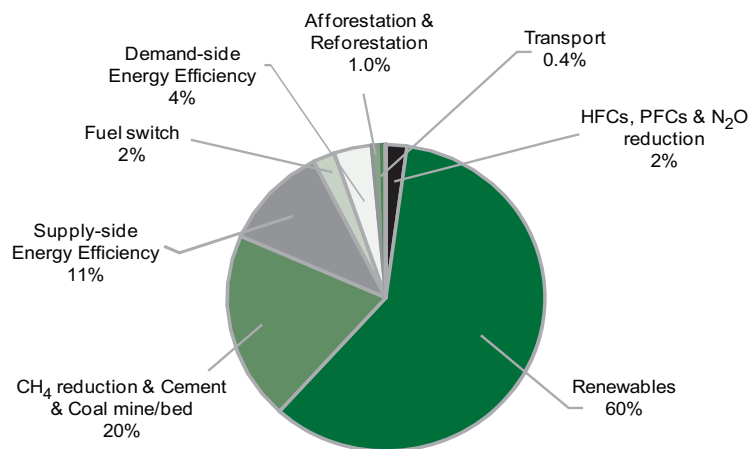
=> for information on individual projects see <http://cdm.unfccc.int/Projects/projsearch.html>

The AFOLU sector has been very restricted and among all CDM projects only 1.1 percent are A/R projects. By July 2009 only six A/R projects have been registered under the CDM and 43 projects submitted for validation. For renewable energy projects the CDM looks better and around 120 projects deal with agricultural residues and 120 biogas projects (UNEP Risoe, July 2009)⁴.

³ <http://cdm.unfccc.int/DOE/scopes.html> (Methodologies linked to sectoral scopes).

⁴ www.cdmpipeline.org/cdm-projects-type.htm.

FIGURE 3

Percentage of CDM projects in each category

(UNEP Risoe, 2010).

In the current political discussions various countries support the inclusion of REDD, agriculture and wetlands in the Kyoto Protocol. This means that in future different types of AFOLU projects could be registered under CDM. However, as the Copenhagen meeting in December 2009 has not led to a legally binding agreement, no decisions can be taken on the proposed changes.

Under the CDM so-called small scale project activities can be developed. These benefit from simplified modalities and procedures, no adaptation tax has to be paid, and reduced registration and administration fees apply. Agricultural projects are only allowed to provide an annual emission reduction of 60 kt CO₂ and A/R projects of 16 kt CO₂ (represents about 400 to 800 hectares for a typical forest project planting fast-growing species). Less project types are available than within the ordinary CDM projects, but most of the above mentioned ones are included.



Recycling of organic residues from coffee production in Colombia, Photo by ©FAO/Jeanette Van Acker.

More information on *small-scale projects* can be found in the CDM Rulebook: <http://cdmrulebook.org/558>.

A guidebook for the *formulation of A/R projects* under the CDM can be found under www.itto.int/en/technical_report.

Different *CDM guidebooks* (Legal Issues, CDM Information and Guidebook, Wind Power and CDM, PDD Guidebook, Baseline Methodologies for CDM projects, Guidebook to Financing CDM projects) can be found at: www.cd4cdm.org/Guidebooks.htm

Information for *forestry and land use projects development under CDM*: www.cdmcapacity.org/index.htm.

VOLUNTARY MARKET

The voluntary market has become very important for agriculture and forestry projects. Voluntary carbon credits (VER) are mainly purchased by the **private sector**. Corporate social responsibility (CSR) and public relations are the most common motivations for buying carbon credits. Other reasons are considerations

Carbon credits on the voluntary markets are called **Verified Emission Reductions (VER)**.

such as certification, reputation and environmental and social benefits. Some companies offer clients to neutralise their carbon emissions (e.g. British Airways offers carbon neutral flights and Morgan Stanley provides the equivalent amount of carbon credits). The private sector can either purchase carbon credits directly from projects, companies (e.g. Ecorescurities) or from carbon funds (e.g. The World Bank BioCarbon Fund).

The story behind the credits plays a crucial role in these markets. AFOLU projects are usually valued highly for their social and environmental benefits, as they deal with people's livelihoods and the protection of important ecosystems.



Control of soil erosion through crop cultivation, Photo by ©FAO/Giuseppe Bizzarri.

TABLE 1

Land-based carbon sequestration projects

	EXAMPLE	WHO?	HOW?
Afforestation/ restoration projects (42%)	Uchindile and Mapanda Forest Projects in Tanzania: 10,814 hectares of degraded land will be reforested and 7,565 hectares put into conservation to protect local biodiversity.	Green Resources (www.greenresources.no) is the project developer. Community tree planting is promoted by giving away seedlings and providing necessary training in silviculture.	Generation of VERs over 99-years. Carbon revenues are locally reinvested and 10% is spend on community projects.
	Acacia Senegal Plantation Project , Mali. It will reforest over 17,700 hectares of Acacia Senegal over a five-year period.	Deguessi Group, a private producer of agricultural products, is the project developer and works in partnership with local communities. The WB BioCarbon Fund buys the credits.	Intercropping is promoted. 10,000 families receive social benefits: additional revenues generated by Arabic gum, grains and forage and CER.
REDD (28%)	REDD project in Sumatra/ Indonesia, to protect the 750,000 hectares Ulu Masen forest.	US investment bank Merrill Lynch , Aceh government, the British NGO Flora and Fauna International and Carbon Conservation. Funding comes from WB Multi-Donor Fund's Aceh Env't & Forest project.	The project is expected to generate 100 million tonnes of VERs over 30 years.
	Noel Kempf Mercado Climate Action Project , Bolivia for 30 years to protect 1.5 mill ha of forest www.noelkempff.com .	Government of Bolivia, the Friends of Nature Foundation (FAN), The Nature Conservancy (TNC) and three energy companies implement the US \$11 million project.	The aim is to stop logging activities and initiate alternative income programs for communities. It has been verified in 2005 as the first forest emission reduction project.
Agricultural soil projects (16%)	Agricultural Carbon Project on 60,000 ha in Nyanza and Western Provinces, Kenya.	The project developer (Swedish Cooperative Center-Vi Agroforestry - SCC-ViA) promotes adoption of sustainable agricultural land management (cropland management & rehabilitation of degraded land). The WB BioCarbon Fund will purchase the credits.	Smallholder farmers and small-scale business entrepreneurs organized in common interest groups, primary level cooperatives, farmer groups and informal organizations. Funds will flow back to communities and farmers involved.
Plantations/ monoculture (13%)	Afforestation in the states of Orissa and Andhra Pradesh in India of 3,500 ha with tree plantations.	Promotion of plantations and agroforestry. Implementation is through a joint partnership between a cooperative society, a paper industry company and another company. The WB BioCarbon Fund will purchase the credits.	The plantations are established on bare and highly degraded land of small and marginal farmers on their private lands. Farmer cooperatives are supported to increase representation and negotiation power.

Table 1 provides examples of agriculture and forestry carbon sequestration projects from the voluntary market. The percentage of projects by category (in 2007) is indicated in brackets for each project type (Hamilton *et al.*, 2008).

Credits from land-based carbon sequestration projects counted for 11 percent of the voluntary market transactions in 2008, declining from 16 percent in 2007 and 36 percent in 2006 (Hamilton *et al.*, 2009). The decrease in these types of projects can be attributed to the same difficulties A/R projects face in the regulatory markets – issues such as permanence, accounting uncertainty, and leakage (see Box 3).

In the USA the Chicago Climate Exchange (CCX) is an important trading system for GHGs. It accepts projects which generate emissions reductions from agricultural methane, agricultural soil, forestry and rangeland activities, but the activities need to take place in the USA and non Annex 1 countries www.chicagoclimatex.com/content.jsf?id=781.

Some other examples of land-based carbon projects can be found in the Inventory of the Forest Carbon Portal: www.forestcarbonportal.com.