



PAYMENTS FOR CARBON SEQUESTRATION SERVICES

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Introduction

Carbon sequestration – the process of removing excess carbon dioxide (CO₂) from the atmosphere and storing it on land – helps mitigate global warming. Various land-use changes (no-till agriculture, grasslands) can absorb or sequester carbon. For instance, when barren lands are converted to forest, growing trees sequester CO₂ from the atmosphere and store it as woody biomass and soil organic matter. Conversely, when mature forests are replaced by croplands, a large amount of CO₂ is released into the atmosphere. While afforestation always sequesters carbon, one of the first large-scale projects established specifically to provide carbon sequestration services was set up in Malaysia in 1992. Supported by the FACE Foundation, the project aims to sequester 15.6 million tons of CO₂ over the next 100 years by regenerating 25,000 hectares of rain forest.

Recent technical innovations allow for accurate measurement of the amount of CO₂ sequestered by a given stand of trees or unit of land. This facilitates an arrangement whereby, instead of directly reducing their own carbon emissions, a corporation, a government, or even an individual can invest in projects that sequester carbon on their behalf. They usually buy what are called carbon offsets or carbon credits, each offset being equal to a ton of CO₂ (tCO₂) removed from the atmosphere. Farmers and landowners (producers) can thus receive payments for land-use practices that generate carbon offsets for these international investors (buyers). Because the effect on the atmosphere is the same regardless of where carbon sequestration takes place, buyers can purchase carbon offsets from anywhere in the world. Demand for carbon sequestration services has rapidly evolved into a global market consisting of two broad segments: legislated and voluntary. Each of these segments can involve either trading in carbon sequestration offsets or a project-based transaction between the end buyer and the producer (Bayon *et al.*, 2007).

The table on the next page shows the four resulting market segments, which are then discussed in more detail.

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Table 2: Four kinds of transactions for carbon sequestration services		
	Trading in carbon sequestration offsets	Project-based transactions
Legislated	New South Wales GHG Abatement Scheme ²	Clean Development Mechanism
Voluntary	Chicago Climate Exchange	Voluntary sequestration projects

Trading in carbon sequestration services operates under cap-and-trade regimes that require participants to reduce their carbon emissions by a certain percentage. Agencies can either directly reduce their own emissions or purchase offsets from others, including carbon sequestration offsets. These regimes operate like equity markets in which carbon sequestration offsets are equated with other kinds of offsets, e.g., from reduced use of fossil fuel, capture of methane from landfills, and shift to renewable energy. Thus buyers do not invest in any specific project, they simply purchase carbon offsets from sellers who either generated these sequestration offsets or bought them from someone else. However, not all carbon markets allow for trade in sequestration credits.

Project-based transactions occur when buyers directly invest in emissions reduction or sequestration projects and get carbon offsets in return, e.g., a company pays a local community to grow forests and claims the carbon offsets.

Legislated transactions pertain to laws that require participating entities to reduce their carbon emissions within a stipulated period. Such laws have been formulated at the local, national, and international levels. For instance, the New South Wales Greenhouse Gas (GHG) Abatement Scheme operates under local legislation mandating all local power plants to reduce their carbon emissions by 5% between 2003 and 2012. Similarly, at the international level, the Kyoto Protocol requires participating industrialized countries³ to reduce their carbon emissions to 5.2% below 1990 levels by 2012. Under the Kyoto Protocol's Clean Development Mechanism (CDM), these countries can achieve their targets by investing in carbon emissions reduction or sequestration projects in developing countries. These projects earn carbon sequestration offsets (called Certified Emission Reductions or CERs) for the investor. However, carbon sequestration under the CDM has been limited by slow approval and stiff eligibility rules that only allow *afforestation* (growing forest on land without forest cover for at least 50 years preceding 1990) and *reforestation* (regrowing forest on degraded forest land). Further, each project has to prove *additionality* (carbon sequestration under the project being additional to what would have happened without the project), *permanence* (once planted, trees will not be cut for a certain duration), and absence of *leakage* (project participants will not cut any trees even outside the project boundary), apart from contributing to local sustainable development. The CDM Executive Board has approved only one project⁴ to date with a few others in the pipeline⁵.

² The European Union Emission Trading Scheme, which is the major market under the Kyoto Protocol, is not cited as an example here because it allows trading in carbon emissions reductions credits, not trading in carbon sequestration credits.

³ The United States and Australia are two important non-signatories to the Kyoto Protocol.

⁴ It is based in Gaoligongshan Nature Reserve in China, where 1,200 acres of degraded land will be reforested with native trees to sequester about 160,000 tCO₂.

⁵ To accelerate the approval process, the CDM Executive Board has now issued simplified guidelines for small-scale carbon sequestration projects that benefit local communities. It is also exploring the possibility of including avoided deforestation in the post-2012 phase under negotiation.

It is useful to note that one aspect of permanence is unique to carbon sequestration; once a tree is cut, it may lose all the carbon it has sequestered over the years, thus overturning all the previous environmental benefits. Therefore, CDM projects are now categorized as *temporary* (providing short-term sequestration) and *long-term* (more than 20 years).

Voluntary transactions involve corporations, governments, and individuals purchasing carbon sequestration offsets voluntarily, either for philanthropic reasons or to experiment with new carbon markets before entering the more formal ones that operate under legislated regimes. The U.S.-based Chicago Climate Exchange (CCX) is the world's biggest voluntary market, requiring its members to reduce their carbon emissions by 1% every year. In 2006 alone, CCX traded 10 million CO₂ credits worth more than \$30 million, including carbon sequestration offsets from farmers in several states who practice no-till agriculture (www.chicagoclimatex.com). Similarly, companies also invest directly in voluntary carbon sequestration projects. For example, the Scolel Te Project in Mexico generates carbon offsets from forestry and agroforestry activities with farmers and has sold these offsets to the World Economic Forum, the rock group Pink Floyd, and a carbon trading company called Future Forests. Ecosystem Marketplace estimates that about \$84 million worth of voluntary carbon offsets have been traded to date (www.ecosystemmarketplace.com).

Developing standards to raise the credibility of carbon credits

A major problem with the voluntary market is the poor credibility of carbon offsets due to absence of a central verification system or a registration body. Some organizations have tried to address this problem by formulating a uniform set of standards for carbon sequestration projects. Prominent among these are the Climate, Community and Biodiversity Standards (CCBS), developed by an international alliance consisting of BP, Conservation International, the Hamburg Institute of International Economics, Intel, The Nature Conservancy, the Centre for International Forestry Research (CIFOR), and the World Agroforestry Centre (ICRAF) (www.climatestandards.org). CCBS requires sequestration projects to achieve climate benefits, biodiversity conservation, and socioeconomic development. Projects that meet these standards can usually charge a price premium because they are perceived to provide higher-quality offsets.

References

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Further reading

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