FEATURE ARTICLE

CARBON CREDITS AND CLEAN DEVELOPMENT MECHANISM

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SYNOPSIS

Of late, there has been much interest and enthusiasm among the scientists and professionals alike in Malaysia and abroad on the newly-coined jargon called *carbon credits*. Some people including millers appear to be confused about the whole thing and for good reasons. The following information, so far the best I have read, is extracted from a research publication funded by the UK Department for International Development (DFID) for the benefit of developing countries. Research papers tend to confuse ordinary people due to the complex terminology they often use to explain simple things. So, before reading the following, let us discuss what exactly is meant by carbon credits using an example. Let us say, a person intends to set up a factory in a developing country like Malaysia and this particular factory during operation will generate 100 000 t of CO_2 per year based on data collected from existing factories in developed countries. Using renewable energy or energy efficiency techniques if the emission from this factory can be brought down to 50 000 t of CO_2, it can earn 50 000 certified emission reductions (CERs) under an international agreement. Every country is entitled to emit greenhouse gases but varying in quantities with more allowance being allocated for developing countries. If Malaysia's greenhouse emission is below the maximum set limit, this 50 000 CERs earned by the factory can be sold to a country needing it. Likewise, there are other contributors of CERs like grid-connected electricity that results in reduction in the combustion of fossil fuels in power station boilers. Other examples are planting trees as they will use up some of the CO_2 emitted by factories. Even improving energy efficiency in industries can earn CERs. If a plant currently uses 100 000 kWhr electrical energy a day and by adopting a more energy efficient technology, the electricity consumption is reduced to half, the CERs earned by the plant can be calculated based on the reduction in the consumption of fossil fuel and the corresponding reduction in CO_2 emission. Palm oil mills can also earn CERs, in a similar manner. Under this context, it is worthwhile to mention that the newly created Energy Efficiency Unit under Pusat Tenaga Malaysia (PTM), the only energy efficiency unit in the world with a revolving fund, has done a magnificent job of spearheading the new technology by implementing energy efficiency in a number of industries. PTM has agreed to help us set up energy efficiency technology in MPOB's Experimental Mill at Labu. The recently formed Renewable Energy Unit is also moving along the same direction to develop renewable energy in palm oil mills so that apart from earning carbon credits, the mills can also earn the extra revenue from the sale of electricity - a golden opportunity for the oil palm industry!

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THE CLEAN DEVELOPMENT MECHANISM

The rising levels of carbon in the atmosphere are a major cause for global climate change and this is brought about by de-forestation, decomposition, soil erosion, *etc*. For developing countries, there is now a great opportunity to pursue carbon mitigation projects that can attract foreign investments. The Kyoto Protocol (1997), the international agreement on climate change in which Malaysia is a signatory, offers all the opportunity under the clean development mechanism (CDM) to accumulate carbon credit points, which can be sold to developed nations as a commodity.

The highlight of the Kyoto Protocol is its legally binding commitments for 39 developed countries to reduce their greenhouse gas (GHG) emissions by an average of 5.2% based on 1990 levels and the target date set is between 2008-2012, the first commitment period. As it is difficult for developed countries to achieve their targets within this period, they are allowed to reach the targets through flexibility mechanisms. These include emissions trading (between developed nations), joint implementation (transferring emission allowances between developed nations, linked to specific emission-reduction projects), and the CDM. The CDM is the only flexibility mechanism that involves developing countries like Malaysia. It allows developed countries to achieve part of their reduction obligations through projects in developing countries that reduce emissions. Yes, they do the investment in return for the carbon credits and we develop the nation. It is a win-win situation.

The CDM has two goals:

- to assist developing countries who host CDM projects to achieve sustainable development; and
- to provide developed countries with flexibility for achieving their emission-reduction targets, by allowing them to take credits from emission-reducing projects undertaken in developing nations.

The GHG benefits of each CDM project will be measured according to internationally agreed methods and will be quantified in standard units, to be known as certified emission reductions (CERs) expressed in tonnes of CO_2 emission avoided. When the Kyoto Protocol becomes fully operational, it is anticipated that these carbon credits will be bought and sold in a new environmental market as a new commodity.

The largest carbon flows between oceans, forests and the atmosphere occur naturally. But emissions from burning fossil fuels upset the natural balance and increase CO_2 in the atmosphere - leading to climate instability. Forest clearance causes 25% of the annual emissions of CO_2 but fortunately tree planting or regeneration of forest ecosystems removes part of the CO_2 - a process known as carbon sequestration. Soil management plays a vital role, as soils contain substantially more carbon than is contained in the atmosphere. Afforestation and reforestation are considered the only eligible land-use activities recognized in the CDM according to a decision made in Bonn, in July 2001. Some examples of these are:

- establishment of woodlots on communal lands;
- reforestation of marginal areas with native species, *e.g.* riverine areas, steep slopes, around and between forest fragments (through planting and natural vegetation);
- new large-scale, industrial plantations;
- establishment of biomass plantations for energy production and substitution of fossil fuels;
- small-scale plantations by land owners;
- introduction of trees into existing agricultural systems (agroforestry); and
- rehabilitation of degraded areas through tree planting or assisted natural regeneration.

These methods offer Malaysia excellent opportunities for accumulating carbon credits for which there is a great demand in the developed countries. Some studies indicate that the trade in carbon credit could run into billions of US dollars. As a comparison, the total foreign aid for forestry activities in developing countries amounts to about US$1.5 billion a year. CDM can offer developing countries the opportunity to promote and attract investment in sustainable forestry, land restoration, energy efficiency and renewable energy projects.

CLEAN DEVELOPMENT MECHANISM(CDM) RULES AND CONDITIONS

It should be clearly understood that the existing renewable energy generated by the mills for operating their plants are not eligible for CREs; only future additions like grid connected co-generation using the surplus fuels or biogas can earn the carbon credits. Biogas power generation also can attract funding from UNDP-GEF. Millers are encouraged to think carefully and venture into this lucrative business and be the leader in this newly emerging field. The agreed conditions are:

- only areas that were not forest on 31 December 1989 are likely to meet the CDM definitions of afforestation or reforestation.

- projects must result in real, measurable and long-term emission reductions, as certified by a third party (operational entities as defined by the convention). The carbon stocks generated by the project need to be secure over the long-term (called permanence), and any future emissions that might arise from these stocks need to be accounted for.

- emission reductions or sequestration must be additional to any that would occur without the project. They must result in net storage of carbon and therefore a net removal of carbon dioxide from the atmosphere. This is called additionality and is assessed by comparing the carbon stocks and flows of the project activities with those that would have occurred without the project (its baseline). For example, the project may be proposing to afforest farm land with native tree species, increasing its stocks of carbon. By comparing the carbon stored in the project plantations (high carbon) with that would have been in the *baseline* abandoned farmland (low carbon), it is possible to calculate the net carbon benefit.

- projects must be in line with sustainable development objectives, as defined by government that is hosting them.

- projects must contribute to biodiversity conservation and sustainable use of natural resources.

- only projects starting from the year 2000 onwards will be eligible.

- two percent of the carbon credits awarded to a CDM project will be allocated to a fund to help cover the costs of adaptation in countries severely affected by climate change (the adaptation levy). This adaptation fund may provide support for land use activities that are not presently eligible under the CDM, for example conservation of existing forest resources.

- some of the proceeds from carbon credit sales from all CDM projects will be used to cover administrative expenses of the CDM (a proportion still to be decided).

- projects need to select a crediting period for activities, either a maximum of seven years that can be renewed at most two times, or a maximum of 10 years with no renewal option.

- the funding of CDM projects must not come from a diversion of official development assistance (ODA) funds.

- each CDM project's management plan must address and account for potential leakage. Leakage is unplanned, indirect emissions of CO_2, resulting from the project activities. For example, if the project involves the establishment of plantations on agricultural land, then leakage could occur if people who are farming on this land migrated to clear forest elsewhere.

Definitions (articles 3.3 and 3.4 of the protocol)

- Afforestation is the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources.

- Reforestation is the direct human-induced conversion of non-forested land through planning, seeding or human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. For the first commitment period (2008-2012), reforestation activities will be limited to reforestation occurring on those lands that did not contain forest on 31 December 1989.

- Forest is a minimum area of land of 0.05 to 1.0 ha with tree crown cover of more than 10%-30% with trees, with the potential to reach a minimum height of 2-5 m at maturity *in situ*. A forest may consist either of closed forest formations, where trees of various storeys and undergrowth cover a high proportion of ground or open forest. Young natural stands and all plantations which have yet to reach a crown density of 10%-30% or tree height of 2-3 m are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest.

The Following Clean Development Mechanism (CDM) Rules are Yet to be Decided

- calculating the net carbon benefit of CDM projects.
- dealing with flexible and non-permanent land-use systems.
- addressing the social; and environmental impacts of projects.

REHABILITATING DEGRADED FOREST AREAS IN MALAYSIA

It is interesting to note that the first large-scale forestry-based carbon offset project in the world was undertaken in Sabah by a co-operative venture between the Sabah Foundation and a semi-government organization, and the FACE Foundation of the Netherlands with a total commitment of US$15 million by FACE. The planting phase is expected to last 25 years and the forests will be maintained for 99 years. At the end of the first 60 years growth cycle, the forests may be exploited for timber in a careful way to ensure that the residual stand can again regenerate a well stocked forest in order to maintain a carbon pool for the FACE Foundation, which has the exclusive rights to the carbon sequestered through the 99 years of the project. The project will produce over 4 million m^3 of sawn hardwood timber over the project lifetime.