The Carbon Economy and Carbon Trading in South Africa

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The predicted widespread and potentially severe impact of climate change (colloquially referred to as "global warming") has led to a range of international initiatives to promote Greenhouse Gas (GHG) emission mitigation by developing a so called "carbon economy". [1]

In the carbon economy, so-called "carbon-income" is basically derived from the trade in Certified Emission Reduction credits, more generally referred to as "carbon credits", which are yielded or produced by qualifying GHG mitigation projects.

The carbon economy derives its basis from the Kyoto Protocol. The Clean Development Mechanism (CDM), one of the Kyoto Protocol's three market-based mechanisms, was conceived as:

> "a way to allow industrial countries greater flexibility in meeting their emissions targets, while at the same time transferring cleaner technologies to developing countries so they can build cleaner technologies into their own economic development programs". [2]

The CDM presents developing countries with both significant opportunities as well as considerable challenges. This article provides a basic overview of carbon trading in the South African context.

The Kyoto protocol

The CDM was established under the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC was produced at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro (also known as the Earth Summit). The Earth Summit sought to address the issue of climate change and pursue the possibility of limiting worldwide GHG emissions.

The UNFCCC was opened for signature on 9 May 1992 and entered into force on 21 March 1994. The parties to the UNFCCC meet annually at the Conferences of the Parties (COP) in order to discuss progress and negotiate further action.

The Kyoto Protocol was adopted by COP 3 – held in December 1997 in Kyoto, Japan – and came into force on 16 February 2005 when the requisite number of countries acceded to it. South Africa ratified the UNFCCC in August 1997 and acceded to the Kyoto Protocol in March 2002.

The Kyoto Protocol is only binding on "industrialised" or "developed" states. These are states listed in Annex 1 to the Protocol and those deemed to have been the main contributors of GHG emissions during the industrialisation period. Notably, none of the so-called "BRICS" countries – Brazil, Russia, India, China and South Africa – are listed in Annex 1.

While countries are expected to employ mitigation activities, the Kyoto Protocol allows for flexibility in how countries meet their targets.

The Kyoto Protocol sets mandatory limits on the emissions of six GHGs by industrialised countries. While the targets vary from nation to nation, the aim is to reduce the combined emissions by 5% of the 1990 levels over the first commitment period, namely 2008 to 2012. The first commitment period will expire in 2012 and, as will be discussed below, it is hoped that COP 17 (which will take place in Durban, South Africa towards the end of 2011) will result in the parties signing up for a second commitment period to cut emissions beyond 2012.

The Enforcement Branch of the Kyoto protocol monitors countries' compliance with the reduction targets. Should an Annex 1 country fail to meet its obligations the Enforcement Branch will declare that that country is in non-compliance, and require it to make up the difference between its emissions and its assigned amount during the second commitment period, plus an additional deduction of 30%. In addition, it will require the country to submit a compliance action plan and, importantly, suspend the eligibility of the country to make transfers under emissions trading until it is reinstated.

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Each country has a prescribed number of "emission units" which make up the target emission. The Kyoto Protocol provides mechanisms for countries to acquire "carbon credits" through involvement in GHG reduction activities throughout the world. The credits go towards reducing their overall emissions.

Market mechanisms designed to achieve emission reduction

There are three mechanisms that assist states in meeting their emission reduction targets:

- International Emissions Trading;
- Joint Implementation;
- CDM.

These systems are regarded as effective because, as has been observed in a UNFCCC publication, the *"atmosphere is equally damaged by GHG emissions wherever they occur*

and equally helped by emission cuts wherever they are made".[3] The mechanisms also create an economically viable way for countries to reduce their GHG emissions.

The carbon market is regulated by the Marrakesh Accords, developed at COP 7 in 2001.

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The Marrakesh Accords provide that the emissions of countries must be monitored and precise records have to be kept of the trades. Registries are currently being formed and will act like banks, keeping a record of the country's emission units. In addition, an international transaction log will be created.[4] The Marrakesh Accords also established "operating procedures, eligibility criteria, roles and responsibilities of parties and role-players and definitions."[5]

CDM

The CDM is particularly relevant for a developing country such as South Africa. It is a voluntary, project-based mechanism that was developed under Article 12 of the Kyoto Protocol with the dual purpose of reducing emissions and contributing to sustainable development in developing countries. CDM projects provide the opportunity for developed countries to implement project activities that reduce emissions in non-developed countries, in return for carbon credits.

The CDM is administered by the CDM Executive Board, which reports and is accountable to COP. The CDM Board appoints Designated Operational Entities (DOEs) to monitor and assess the key stages of the CDM project cycle.

The cost of creating GHG reduction projects is usually much lower in a developing country. For this reason, the CDM allows developed countries to fund GHG reduction projects in developing countries. The developed country will receive carbon credits for the reductions that result from the project. These credits can then be used by the developed country to meet its emission reduction targets. The developing country benefits through the capital as well as the environmentally friendly technology that allows their factories or electrical generating plants to operate more efficiently in the long term.

For a host country to be eligible for participation in the CDM it must have ratified the Kyoto Protocol and have designated a national authority to provide official host country approval of a project.

The designated national authority in South Africa is the Department of Minerals and Energy (DME).[6] In practice, however, the Department of Environmental Affairs and Tourism is the lead department for implementing UNFCCC and dealing with climate change.

CDM Project Steps

The steps to a successful CDM Project involve a complex and highly regulated procedural process which is referred to as the Carbon Asset Management Cycle. The steps consist of a series of milestone requirements which have to be met to receive approval from the CDM Board. This approval is essential as only CDM Board

accredited carbon credits can be traded. The services of a DOE have to be secured in order to register and validate each step. The strict requirement from the UNFCCC is that any project must have a measurable and long-term ability to reduce emissions, and must promise reductions in addition to any that would otherwise occur.[7]

The Carbon Market and Emissions Trading

The carbon credit trading system is a market-driven system which offers a cost-efficient incentive for those in industry to initiate GHG emission reductions.

Generally, trading systems entail the issuing of carbon credits, usually by a government agency, to entities which emit pollutants. The credits or allowances which are issued are an indication of the levels of pollution which an entity is allowed to emit. In the case of carbon credits, these may then be sold to an excessive carbon or other pollution emitter – most likely a company in the developed world involved in heavy industry. In principle, where there is the need to buy the credits, due to excessive emissions, the price will escalate. In theory this sort of initiative should make it more cost effective for heavy emitters to engage in emissions reductions programs. As the aim of the trading system is to reduce emissions and pollution over time, the allowances may be lowered or the portion of the credits available in the market may be reduced, thus resulting in a net reduction in emissions each time a trade occurs.

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Transfers and acquisitions of carbon credits are tracked and recorded through the registry systems under the Protocol, as well as by a national registry established by each Annex 1 Party.

Carbon Transactions

Carbon transactions are recorded in Emission Reductions Purchase Agreements. These transactions consist of one party paying another party in return for GHG emission reductions, which the buyer can use to meet its compliance objectives. Payment is made using cash, equity, debt or in-kind contributions.

There are two types of carbon transactions:

- allowance-based transactions, which involve the purchase of emission allowances created and allocated to a party by regulators under a cap-and-trade regime such as the Assigned Amount Units under the Kyoto Protocol;
- project-based transactions, which involve the purchase of emission credits from a project that reduces GHG emissions. These projects are usually under the CDM or Joint Implementation mechanisms.

Carbon transactions may be either *fixed forward* or *indexed forward* contracts. In many cases, there is a fixed price for part of the volumes delivered and thereafter an indexed price for the remainder. Indexed prices are most often linked to a European Union Allowances (EUA) price index or a market spot price.[8]

This allows both the buyer and seller to hedge their risk that EUA or carbon credit prices may move against them by pegging the price of credits to the price of allowances.

In typical indexed transactions, the price of a portion of carbon credits can be determined by taking a percentage of the price of EUAs at the time of transfer. The price of EUAs will be set by a daily EUA price index.

CDMs and carbon trading in South Africa

In South Africa, the first carbon credits were issued in June 2008.

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To date, there are 228 CDM projects that have been submitted to the Department of Minerals and Energy – 189 Project Idea Notes and 39 Project Design Documents (PDDs). Out of these 39 PDDs, 20 have been registered by the CDM Board as CDM projects (7 issued with carbon credits), and 19 are at different stages of the project cycle – DME approval, validation stage and/or request for review. The projects submitted to the DME for initial review and approval cover the following types: bio-fuels, energy efficiency, waste management, cogeneration, fuel switching and hydro-power. They include sectors such as manufacturing, mining, agriculture, energy, waste management, housing, transport and residential. [9]

Whilst CDMs are still considered a useful mechanism to help finance clean development projects that are typically costly, South African companies have been slow to take advantage of CDMs and, to date, very few companies have been awarded carbon credits.

Two notable CDM projects in South Africa are the Kuyasa Housing Project and the eThekwini Municipality Landfill.

- The Kuyasa project is based in the Khayelitsha settlement in Cape Town. The project is a collaborative partnership between the City of Cape Town and SouthSouthNorth, an international CDM NGO. In August 2004 the project was awarded gold standard recognition by the UNFCCC which allows it to earn carbon credits. The project was also awarded joint third place at the global Point Carbon's Best CDM Project 2004 Competition in Amsterdam. The project involved retrofitting eight low-cost houses and two crèches with simple energy-saving devices such as insulated ceilings, low-watt bulbs and solar water heaters. This has saved almost 2.85 tons of carbon dioxide each year. The retrofitted buildings are 5% warmer in winter and 5% cooler in summer allowing a saving of up to 40% on electricity bills. The project seeks to include more than 2000 dwellings in the Kuyasa settlement over the next 21 years.

- The eThekwini Municipality Landfill project is funded by the French Development Agency and aims to generate electricity through the fermentation of household waste. The methane released by the waste will be converted into electric power by generators. The project is expected to generate up to 10 Megawatts of electricity (enough to illuminate about 9000 homes). This will reduce the volume of coal burnt at city power stations, thereby reducing GHG emissions. The landfill sites used in the project are Bisasar Road, Marianhill and La Mercy.

More recently, Gold Fields' Beatrix Mine in Welkom has been accorded CDM status. The project captures methane gas, which is considered to be a more destructive gas than carbon dioxide, at source in the mine.[10] The gas is then conveyed to the

surface and then flared or, alternatively, used to generate electricity. It is expected that Gold Fields' carbon emissions will be reduced by 1.7 million tons of carbon dioxide equivalent between 2011 and 2018. It is expected that Gold Fields could earn up to R200 million from the sale of carbon credits that will be yielded from the Beatrix Mine project.[11]

There have also been developments in the carbon credit market outside of CDM projects and the trade in carbon credits. Pioneers within the carbon credit market, Sterling Waterford, created the first investment derivative (Carbon Credit Note) and also publicly listed the first carbon credit derivative on the JSE. The company subsequently released their first fixed-interest carbon credit linked instrument – The Collateralised Enhanced Yield Certificate - another first in this market. In 2008 Sterling Waterford Holdings issued and listed a second retail investment note (Carbon Credit Note 2) on the JSE Securities Exchange. It matures in December 2012 and is listed under the short code CBN013 on the JSE.

Future developments: COP 17

As noted above, the first commitment period of the Kyoto Protocol will end post 2012.

COP 15, which was held in Copenhagen, Denmark in 2009 fell short of reaching a post-2012 multilateral agreement on climate change and is widely believed to have been a failure. Some progress was made during COP 16, which was held in Cancun, Mexico, with the establishment of important structural elements relating to technological and financial aspects of carbon trading.

The seventeenth annual Conference of the Parties (COP 17) to assess progress in dealing with climate change and negotiations for an instrument for the reduction of greenhouse gas emissions will take place in November and December 2011 in Durban. The primary focus of the conference will be to secure a global climate agreement as the Kyoto Protocol's first commitment period (2008–2012) is about to end.

There is, accordingly, a great deal of uncertainty (and risk) in the carbon market, given the unresolved future of the Kyoto Protocol. As the only compulsory cap on emissions globally is driven by the Kyoto Protocol, there is a chance that all post 2012 trading schemes will essentially be voluntary. Many analysts, however, believe that the carbon market is mature enough to survive even if the parties to COP 17 are unable to agree to an extension of the current commitment period or a new commitment period.

NOTES

1. See "The Clean Development Mechanism: a guide for potential participants in South Africa" (available at http://www.erc.uct.ac.za/Research/publications-pre2004/02CDMGuideforParticipants.pdf) published by Future Energy Solutions from AEA Technology plc and the Energy Research Institute of the University of Cape Town.
2. http://www.saiia.org.za/archive-eafrica/what-is-carbon-trading.html
3. A Summary of the Kyoto Protocol available at http://unfccc.int/kyoto_protocol/background/items/2879.php
4. The Clean Development Mechanism http://unfccc.int/kyoto_protocol/background/items/2881.php
5. Department of Minerals and Energy: Designated National Authority What is the Clean Development Mechanism http://www.dme.gov.za/dna/dna_what.stm
6. This is by way of a regulation under Section 25 of the National Environmental Management Act, gazetted on 24 December 2004.
7. "The Clean Development Mechanism: a guide for potential participants in South Africa" referred to in note 1 above contains a detailed overview of the Carbon Asset Management Cycle.
8. An EUA Price Index linked price is a price determined as a percentage of the cost of EUAs at the time of the transfer of credits. The trade is priced as an index to the EU ETS to manage price risk in both the European allowance and Kyoto credit markets.
9. http://www.energy.gov.za/files/esources/kyoto/kyoto_frame.html
10. See Business Day, 15 September 2011.
11. See Beeld, 15 September 2011.