LANDFILL GAS RECOVERY: THE LOW HANGING FRUIT FOR CARBON CREDITS TRADING IN DEVELOPING COUNTRIES

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In 1982, over 180 countries adopted the United Nations Framework Convention on Climate Change (UNFCC), which was established as the legal structure to begin stabilizing greenhouse gases (GHGs) in the atmosphere. The three major GHGs are carbon dioxide, methane, and nitrous oxide. All parties to the Climate Change Convention agreed to compile inventories of their greenhouse gas emissions and submit reports indicating the steps they are taking to implement the Convention. The parties to the Climate Change Convention adopted the Protocol in 1996.

Under the Kyoto Protocol, industrialized countries, also known as Annex I countries, are legally bound to meet quantitative targets for reducing their greenhouse gas emissions. The entry into force of the Kyoto Protocol on 16 February 2005 means the international carbon trading market is now a legal and practical reality. As of 19 February 2005, 154 countries had signed the Protocol representing 61.6% of the world's greenhouse gas emissions. The issue of emissions targets for developing countries has generated a great deal of debate. While developing countries are not currently subject to timetables and targets to reduce their GHG emissions like the Annex I countries, they are expected to limit the growth rate of their GHG emissions and to report on their actions to address climate change. The Protocol lays the groundwork for the world's first market-based trading systems for greenhouse gas emissions that are fair, open, efficient, accountable and consistent across national boundaries.

The Protocol specifically allows businesses in Annex I countries to meet their emission reduction targets by utilizing carbon credits purchased from projects in the developing world through the Clean Development Mechanism (CDM). The Kyoto Protocol allows Annex I countries to meet their emission reduction targets through mechanisms referred to in the Protocol as "flexibility mechanisms". One of the mechanisms, the Clean Development Mechanism (CDM), is the only mechanism under the Protocol that involves developing or Non-Annex I countries and is the subject of this paper. The CDM concept was first proposed in Brazil and provides a means for developing countries to receive foreign investment, have access to resources and technology to assist in development of their economies, and achieve their development goals while reducing greenhouse gas emissions. The CDM has two key goals:

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

Landfill methane recovery projects have proved to be particularly attractive to buyers. They also benefit sellers in the developing world as the sale of carbon credits can significantly increase the financial viability of such projects. These projects can generate revenue, contribute to sustainable development, and be a cost-effective global climate change mitigation mechanism.

There are a number of reasons landfill gas recovery should be considered the low hanging fruit for CDM projects in developing countries. First, a significant component of CDM project eligibility is the requirement of "additionality". Article 12.5 of the Protocol states that it supports only ". . . reductions in emissions that are real, measurable and additional to any that would occur in the absence of the certified project activity".

Environmental laws and regulations in many developing countries do not require that landfill gas be recovered, flared, or utilized. They allow for landfill methane to be vented to the atmosphere, unless health and safety considerations dictate, on a case-by-case basis, that other measures be taken. Passive venting of gas is the status quo in many developing countries and therefore is considered to be the baseline scenario. As long as a country's environmental regulations require venting only, any landfill gas that is captured and flared or used for an energy project will constitute a reduction in the baseline emissions scenario and will meet the test for *"additionality"*. It is no coincidence that as of May 2004, landfill gas recovery projects were the second largest suppliers of emission reductions worldwide.

Second, investors and buyers of carbon credits are discovering that landfill gas recovery projects can meet the additionality test, and so there has been a steady escalation of interest in these projects. This explains why a significant percentage of all carbon credits committed in 2004 came from landfill gas recovery projects.

Third, the technologies required for landfill gas recovery and utilization are proven and reliable. As noted earlier, over 1100 projects exist worldwide as this technology has been fully commercial since 1975.

The carbon credit market continues to evolve and mature. Prices are rising and the number of trades/month is increasing with 2.5 million tons of carbon/month traded in the last quarter of 2004, 6 million tons in January 2005, and 8 million tons in February 2005. The potential funders, investors and/or buyers of carbon credits in a CDM project may be governments through government agencies, corporations and other private companies, foundations, multilateral agencies like the World Bank, investment funds and other financial entities or institutions buying either for compliance or for investment and resale. Carbon credit buyers can make financial contributions, take full or partial equity, provide loans or lease financing, pre-pay CERs which pre-payment can be used to fund capital expenditures, simply enter into carbon credit purchase agreements, or utilize other new, creative structures that are emerging to respond to market factors.

Structured properly, landfill gas recovery projects may be viewed as low hanging fruit for the creation and sale of carbon credits while providing environmental and energy benefits to local project owners and surrounding communities. The success of landfill gas projects in the emerging global carbon credits markets will depend on the development of projects that are attractive to both investors and potential buyers of carbon credits. In addition to Kyoto regulatory requirements, there are also site-specific technical and non-technical issues that must be considered by any landfill gas project in the developing world; these include realistic projections of gas quantity and quality; suitability of the site for vertical or horizontal gas collection systems; definition of gas ownership rights and liabilities; credit enhancement possibilities for the seller of carbon credits; and the development of multi-party contractual arrangements among landfill owners, operators, gas recovery contractors, gas users, and financiers and buyers of emission reductions.

In this paper, we will describe the Clean Development Mechanism of the Kyoto Protocol and its requirements, discuss the opportunities and challenges for landfill gas recovery projects in the developing world, and suggest ways in which landfill gas projects in developing countries can minimize the perceived risks and enhance chances for investment through the sale of carbon credits.