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Waste Management Perspectives in Developing Countries

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EXECUTIVE SUMMARY

In developing countries, it is common for municipalities to spend 20-50 % of their available operations budget on solid waste management services. Yet, it is also common that 30-60 % of all the urban solid waste in developing countries is uncollected and less than 50 % of the population is served. In some cases, as much as 80 % of the collection and transport equipment is out of service, in need of repair or maintenance. Recycling is typically done informally by wastepickers both at collection points and at disposal sites. Open dumping with open burning is the norm in most developing countries.

The World Bank (www.worldbank.org), which works to alleviate poverty in developing countries, seeks to improve waste management conditions through loans and grants and more recently with its carbon finance program.

The Bank is involved with more than 100 projects (active or under development) with municipal solid waste management components in developing countries. Loan and grant commitments have been made for capital investments in a broad scope of waste management functions including recycling, collection, transfer stations, and landfill design/construction.

The Bank's carbon finance program (www.carbonfinance.org), which was initiated in 2000, purchases greenhouse gas emission reductions from approved Clean Development Mechanism (CDM, <http://cdm.unfccc.int/index.html>) projects in developing countries. CDM, a provision of the Kyoto Protocol, enables eligible projects to sell their emission reduction credits to buyers in developed countries that have ratified the Protocol as a means to meet their Kyoto targets. The Bank purchases CDM emission reductions for a group of 11 carbon funds or facilities for various European countries and Japan, utilities, and manufacturing companies.

Summaries of representative loans and carbon finance projects that demonstrate the scope of the Bank's activities in developing countries are provided below.

Bank Loans

Jordan, Amman. Addition of two new transfer stations and capacity expansion at the city's landfill are two important parts of this loan. Capacity building and institutional improvements are

objectives of the loan to Amman (population: 2.5 million). A landfill gas capture project through the CDM is another important piece of the program for the Greater Amman Municipality.

Morocco. The Government of Morocco (population: 30 million with 18 million in urban areas) will use this loan for improved performance of the waste management services. These improvements will include the closure of open dumps and the development of engineered landfills, improved collection services, especially for the urban poor, and increased recycling through integration with the informal sector (wastepickers). The program will also have a CDM component for landfill gas capture – 11 potential landfill sites have been identified at this stage.

Uzbekistan, Tashkent. Tashkent, the capital of Uzbekistan (population: 2.6 million) received a loan from the Bank and a parallel loan from the European Bank for Reconstruction and Development. Returning the waste management service to an acceptable level and capacity building were the primary objectives of the loans. The loan was used for collection equipment, three transfer stations, dump closure and development of a modern landfill.

Carbon Finance

In the carbon finance area, the Bank has 25 landfill gas capture (including 13 registered with CDM) and seven composting (including one registered and three projects pending registration) projects in various stages of development, as of mid-July 2009. At the same time, there are 102 landfill gas capture and six composting projects registered with CDM. Landfill gas projects capture the methane generated in a landfill and flare or use it for energy. Methane is a greenhouse gas. Aerobic composting avoids methane generation.

Recycling is a waste management activity that can reduce greenhouse gas emissions, but at present there is not a CDM approved methodology. The Bank is developing a recycling methodology, see conference paper by Peterson, C. and Godin, J. Clean Development Mechanism (CDM) and Development of a Methodology for the Recycling of Municipal Solid Waste.

Since payment for emission reductions is tied to verified performance, operators have a financial incentive to operate facilities in an environmental sound manner. This approach will provide an operator with the maximum level of greenhouse gas emission reductions and the highest revenue from the sale of these emission reductions.

China, Tianjin - Landfill Gas. The Shuangkou Landfill in Tianjin, financed as part of a World Bank loan for urban environmental projects, began operations in 2001 and receives about 1,300 tons per day of municipal waste. The World Bank is the buyer of the emission reductions generated from the project. The captured methane is used to generate electricity for sale to the power grid. Both methane treatment and power generation are covered by approved CDM methodologies. This CDM registered project is forecast to generate 913,108 tons of carbon dioxide equivalent (tCO₂e) emission reductions during the first 7-year crediting period.

Egypt, Cairo - Composting. The Egyptian for Solid Waste Recycling (ECARU) provides treatment and landfill service for the municipal waste collected in the southern zone of the city. ECARU plans to treat waste beyond its contract requirements through sorting incoming waste for recyclables, composting of organic biomass (food, non-recyclable paper, wood), and landfill of the residue. The additional waste to be treated amounts to more than 1,100 tons per day. The World Bank will purchase the emission reductions from methane avoidance achieved with aerobic composting. The project is expected to be registered with the CDM in late 2009 and generate 504,965 tCO₂e during the initial 7-year crediting period.