

Initiate Demo Projects to Promote Widespread Methane Recovery and Utilization from Mixed Municipal Refuse Landfill Site in China

-- An Introduction to GEF Project

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Abstract

This essay gives a brief introduction to GEF Promoting Methane Recovery and Utilization from Mixed Municipal Refuse Landfill Site in China, including project background, design, implementation, achievements and experiences learnt.

1. Project Background

With the rapid development of economy, urbanization and people's life in China, the municipal disposed refuse is also steadily increasing, and it has become a key problem in endangering environmental protection, urban construction, people's life and sustainable development. Currently, the annual disposed waste in China is nearly 164 million tons, and increases by 8% per year. To date, the total amount of disposed waste in China has reached 6,000 million tons, occupying a total of 750,000 Mu. 200 of 668 Chinese municipalities are now surrounded by landfill sites. 90% of 1,000 in-use landfill sites use simple disposal method, and the rate of comprehensive waste process and utilization is just about 58.2%. Conventional waste disposal method not only causes pollution, but also generates a large amount of CH₄, which is a major GHG that has a GHE equivalent 21 times as much as CO₂.

2. Project Design and Implementation

After four-year unremitting efforts, the Promoting Methane Recovery and Utilization from Mixed Municipal Refuse Landfill Site in China proposed by the State Environmental Protection Administration was finally approved by GEF in 1996. The total investment of this project is 14.28 million USD, among which 5.285 USD comes from the donation of GEF. The project was officially launched in 1997. UNDP is the project sponsor on behalf of GEF, and UNDESA is the international executing agency. The project is composed of five parts, including three project demo cities (Nanjing, Anshan and Maanshan), a LFG Technology Development and Training Center and a National Action Plan.

The goal of this project is to promote the widespread adoption of LFG recovery and utilization technology in China.

Based on the experience of developed countries and the three demo cities, the main barriers of

China in terms of LFG recovery and utilization are in the areas of technology, mechanism, policy, institutional structure and implementation. The project tries to remove these barriers through the following activities:(a) build and operate three demo projects in Nanjing, Anshan and Maanshan, to acquire experience on design, construction and operation of LFG collection and utilization project; (b) undertake training courses for Chinese technicians to gradually play a role in the LFG recovery and utilization activities in China; (c) undertake capacity building based on experiences learnt, to promote local enterprises to build, operate landfill sites and recover LFG as a source of energy, thus lowering the cost of domestically-built equipments; (d) demonstrate the feasibility of LFG as a source of energy, and urge local decision-makers to accept and use it as a way of energy generation and a feasible method of pollution reduction in air, water and soil, thus encouraging the development of related institutional structure and laws; (e) formulate a national action plan based on the experience learnt to promote LFG recovery and widespread adoption in China; (f) strengthen current institutional structure to make it capable of publicizing experiences and technologies acquired through project implementation.

3. Project Achievements

(1) Three demo projects in Nanjing, Anshan and Maanshan;

The three demo cities use different LFG recovery and utilization technologies. Nanjing collects LFG to generate electricity and put it onto the grid (please see the appendix for more details), Anshan collects, cleans the LFG and compressed it to generate alternative fuels for vehicle, while Maanshan collects LFG to burn hazardous hospital waste of the city.

To date, Nanjing Shuige Landfill Site has started to generate electricity and connect to the grid. The installed capacity is 1,250 kw, which generates 25,000 kw~28000 kw per day. The construction and installment of Anshan Yangeryu Landfill Site is basically completed. It is expected that 5-10 waste transport vehicles will be remodeled to use LFG as an alternative fuel during the testing period. The construction, installment and testing of Maanshan Xiangshan Landfill Site will be completed by the end of 2003. 1.5 tons of hospital waste is expected to be incinerated per day at that time.

(2) In order to publicize and promote LFG-related technology information, a training center in Anshan has been established and developed in terms of education, research, and information sharing, etc..

(3) Institutional and capability building to promote the enterprise-involved, market-oriented and business-driven LFG recovery and utilization in china.

(4) Formulation of a National Action Plan to promote the widespread adoption of LFG recovery and utilization technologies in China.

The National Action Plan proposes an in-depth and specific insight of municipal waste management system and policy, and provides guidance on future waste management activities and projects in China.

4. Experience

Experience is gained during the implementation of the project, especially during the construction and operation of three demo cities, they are:

- The grid connection and tariff of LFG generated electricity;
- Market environment and investment policy;
- Selection of installed capacity and arrangement of operation;
- The pre-cleaning of LFG as an alternative fuel for civil utilization and vehicles.

Appendix

Nanjing Case

Nanjing has a population of 2.47 million people, which produces 2,000 tons of waste per day. Nanjing Shuige Landfill site is 20 km to the southern part of the city, and covers an area of 540 mu (88.8 acre). Nearly 1,000 tons of waste is disposed in Shuigei each day. This project invested 3.4 million RMB to build a small demo power plant in the landfill site and Nanjing Municipal Environmental Sanitation Administration Bureau is the implementing agency of the project.

In 1997, the power generation project in Nanjing Shuige Landfill Site was officially launched. The construction and installment were completed in May 2002 and the operation started in July 2003. Currently, the total installed capacity is 1250 kw, 400 m³ CH₄ were processed per hour, and the utilization rate of CH₄ is 0.37 kg/kwh. With the development of power plant, in the future, the installed capacity will reach 5,000 kw/h.

Nanjing is the 1st demo city that uses GEF fund to generate electricity by utilizing LFG in China.

For more information, please contact:

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