**VIETNAM COUNTRY REPORT**
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# Solid Waste Management in Vietnam

In Vietnam, environmental pollution has posed specific and complicated problems. Urban solid waste management is becoming more and more urgent now because of rapid population growth and urbanization, industrialization process and rural to urban migration, which leads to an increasing number of patients and the need to improve disease diagnostic and treatment quality.

Table 1

| Area (sq km) | Population (million) | Estimates of Solid Waste Produced (thousand tons/day) | | | |
|---|---|---|---|---|---|
| | | Total of Waste | Health Care Waste | Industrial Waste | Domestic Waste |
| 330,000 | 80 | 49,134 | 428,75 | 26,877 | 21,828 |

According to the ADB-funded Estimation of Hazardous Waste Management Project, the volume of Vietnam's hazardous waste is about 280,000 – 640,000 tons/year.

## 1. Solid Waste Management Issues

### *a. Key Waste Management Issues*

a.1 Current and Emerging Issues

a.1.1 Planning and Construction of Sanitary Landfills. At present, some cities and provinces have a lot of difficulties for land fund. The planning and construction of sanitary landfills should be given more consideration.

a.1.2 Waste Collection: The percentage of waste collection in Vietnam is currently at 60 - 70%.

- Household and street waste is collected by Urban Environment Companies (URENCOs) who are capable to collect about 60 - 85% of this type of waste. The rest is collected by recyclers or discharged into lakes, canals and ponds.

- Industrial waste is mostly collected and treated by the industrial establishments themselves before being transported to the municipal landfills.
- Health care waste in big cities and provinces like HaNoi, Ho Chi Minh City, DaNang is contractually collected and treated by URENCOs. The remaining waste is collected, transported and treated by the health care establishments themselves
- Sludge/nightsoil is collected by URENCOs at the rate of 60 - 70%. The rest is collected by suburban people or by companies with the necessary equipment.

a.1.3 Waste Treatment

Almost all municipal waste is treated in the landfill now. Because segregation at source is not done, health care and hazardous wastes are not treated but dumped with domestic waste in crude open dumpsites/landfills. A small volume of waste is recycled and the volume of compost production is insignificant.

Some of the waste generated by health care facilities is incinerated. Industrial waste in big cities like Hanoi and Ho Chi Minh is treated. Industrial companies store their hazardous waste at their respective sites while waiting to be treated.

a.1.4 Applied Technology for Collection and Treatment

At present, Vietnam has 826 hospitals of which 29 are central hospitals, 198 are city and provincial hospitals, 551 are districts hospitals and 48 are branch hospitals with 104,065 beds. Of the total waste volume of these various hospitals, 12 – 15% is hazardous waste that needs specific treatment. However, we lack appropriate treatment facilities. Only a few health care establishments have incinerators assessed by Ministry of Science, Technology and Environment in terms of technical standards and gas emissions. Vietnam lacks the facilities to be able to analyze dioxin concentration from incinerator emissions.

***b. Status of Waste Incineration***

b.1 Type of Incinerators

Incinerators in operation or being constructed or proposed in Vietnam are mainly for health care waste (see table 1).

**Table 1**

| Type of Incinerator | Capacity | Manufacturer's Country | Selling Company |
|---|---|---|---|
| CAMAT- GX | 45 kg/h | Viet Nam | |
| RET - 1 | | Viet Nam | |
| RET - 2 | | Viet Nam | |
| L§ 45 - (No - 001) | 45 - 90 kg/h | Viet Nam | |
| L§ 45 - (No - 002) | 45 - 90 kg/h | Viet Nam | |
| TBD - 45 | | Viet Nam | |
| RET 50 | 50 kg/h | Viet Nam | |
| RET 20 | 20kg/h | Viet Nam | |
| HOVAL - MZ 2 | 200 - 300 kg/d | Switzerland | Theyssen & Trapp |
| 200 - CA | 45 - 90 kg/h | USA | |
| 400 - CA | | USA | |
| DELMONEGO | 120 - 200 kg/d | Switzerland | Andre |

| | | | |
|---|---|---|---|
| MACROBURN | 150 kg/h | | |
| VHI - 18 | | Viet Nam | |
| VHI - 18 B | | | |
| INCINCO | | | |
| §RC - 300 | 200 kg/h | | |
| HOVAL GG 42 | | Switzerland | |
| COMA - dtbv 50 | 40 - 50 kg/h | | |
| HOVAL MZ 4 | | Switzerland | |
| L§ 45 - K | 45 kg/h | Viet Nam | |
| HOVAL WERKAG | 200 - 300 kg/d | Switzerland | |
| IR - 30 - IH | 30 kg/h | Viet Nam | |

b.2 Information on Waste Management Companies and their Technologies

In the face of urgent demand for solid waste treatment, especially of medical waste, some domestic manufacturers have urged the Vietnamese government to provide them with production license. At present, 15 local manufacturers have been granted the necessary licenses. The government has just published temporary stipulations on incinerators, including technical standards, assessment methods and waste gas examination.

b.3 Funding of Waste Incinerator Projects

Vietnamese manufacturers construct domestic incinerators like CAMAT-GX, RET 1, RET 20 and L§ 45. Imported incinerators like Hoval are operating in some hospitals. The Ministry of Health intends to import another 25 incinerators for local hospitals.

***c. Initiatives to Stop Waste Incinerators and Promote Non-Burn Alternatives***

c.1 Firm commitment of the relevant authorities for better solid waste management. The credibility of implementing authorities is vital for its success.

c.2 Strategic planning, which is an essential for a more cost-effective use of the limited government resources.

c.3 Waste minimization first. Source reduction is the most important rule for solid waste management in the 21st century.

c.4 Improved collection service and cost saving. Waste collection is the most expensive process of solid waste management. The improvement in the collection service and cost saving will generate financial resources that can be used to maintain a sanitary landfill.

c.5 Use of saved cost for final disposal improvement [careful siting and management are the key to a successful landfill project].