

SOLID WASTE MANAGEMENT IN TURKEY

Current Status and Developments

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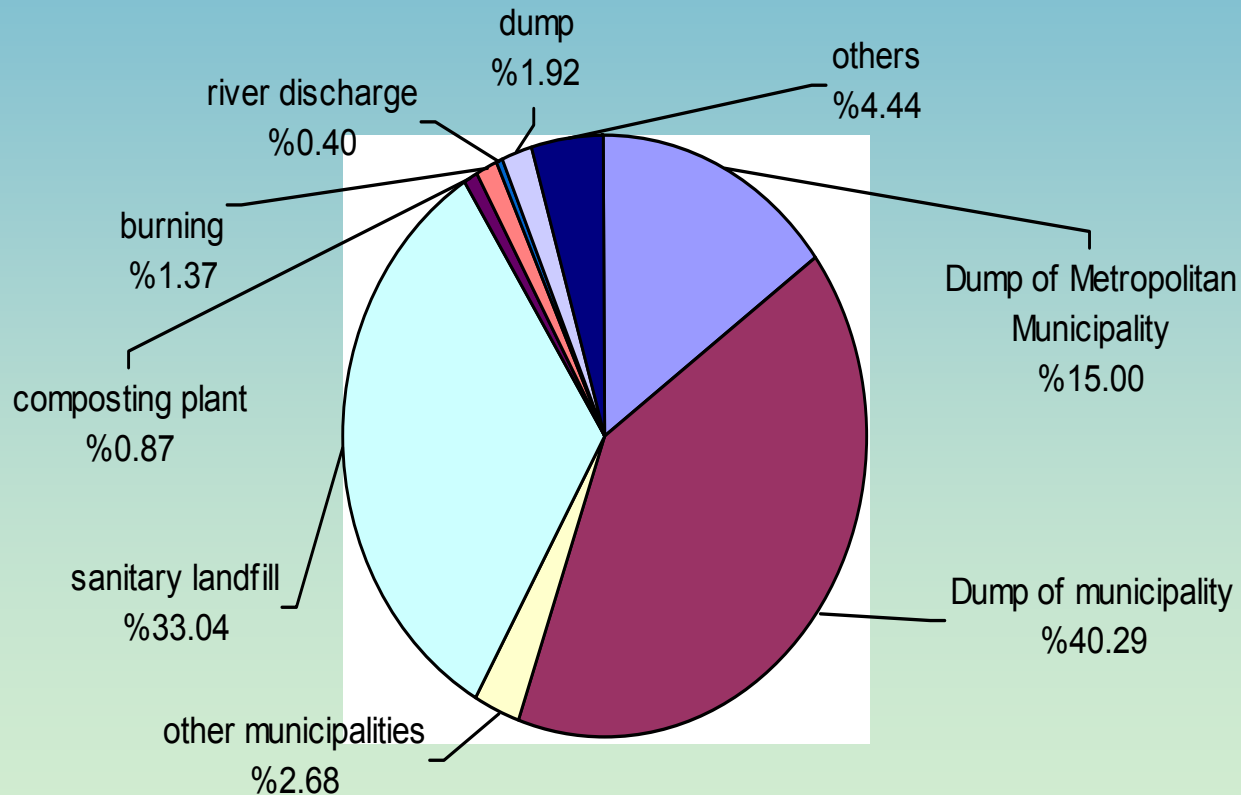
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INTRODUCTION

- 81 provinces in Turkey
- 3215 municipalities (16 of them are metropolitan municipalities)
 - A total of 13 sanitary landfills
 - 3 composting plants
 - 3 incineration plants
- 33% of wastes are disposed in sanitary landfills
- 1% of wastes are being composted
- 66% of wastes are being disposed of using non-conventional methods...

Solid Waste Management Strategies

Distribution of Solid Waste Management Applications



(State Statistics Institute, 2001. *Solid Waste Statistics of Municipalities*. Ankara, Turkey)

Situation of Landfilling among Municipalities

- **Sanitary Landfills (13):**
 - İstanbul, Bursa, Gaziantep, İzmir, Mersin, Kocaeli, Balıkesir, Antalya-Patara, Muğla-Marmaris, İzmir-Foça, Muğla-Göcek, Antalya, Denizli
- **Sanitary Landfills under Construction (4):**
 - Ankara, Aydın-Didim, İzmir-Foça, Muğla-Göcek
- **Municipalities with EIA Approval (9):**
 - Adapazarı, Antalya, Muğla-Fethiye, Isparta, İzmir-Çeşme, Konya, Nevşehir, Rize, Trabzon
- **Municipalities preparing EIA&Pre-EIA Reports for LF Sites (18):**
 - Adıyaman, Afyon, Antalya-Belek, Muğla-Fethiye, Antalya-Kekova, Aydın-Datça, Batman, Diyarbakır-Bismil, Diyarbakır-Silvan, Gaziantep-Nizip, Kilis, Mardin-Kızıltepe, Mersin-Göksu, Muğla-Göcek, Nevşehir-Ihlara, Siirt, Şırnak, Şanlıurfa-Viranşehir
- **Rehabilitated Old Landfill Sites (6):**
 - Adana, Bursa, İstanbul (4)

Current Issues in Solid Waste Management in Turkey

- Waste management refers to collection of the wastes and cleanness of the city in most municipalities
- Reuse or recycling, and sanitary disposal of wastes are usually ignored
- Inappropriate site selection & operation of landfills combined with the above concerns lead to:
 - Open waste dumps causing environmental pollution,
 - Risks of fires and explosions due to stored gases
 - Aesthetic concerns

Problems of Solid Waste Management in Turkey

- Financial problems;
 - Insufficient financial resources of municipalities
 - Lack of encouragement for self-sufficiency in financial subjects
 - Lack of regular accounting systems
- Lack of a superior legal institution responsible for supervising waste management services, having a budget and an investment program
- Lack of technical capabilities
- Lack of sufficient trained personnel
- Lack of information about the Solid Waste Control Regulation
- Uncontrolled growth rate and urbanization

STATISTICS

(State Statistics Institute, 2001. *Solid Waste Statistics of Municipalities*. Ankara, Turkey)

(State Statistics Institute, 1996. *Environmental Inventory for Municipalities*. Ankara, Turkey)

	1996	2001
No. of Municipalities	2322	3215
No. of Municipalities with SW Management Services	2157	2915
Amount of SW Collected (million tons/year)	22.8	25.1
SW per capita (kg/ cap/ day)	1.31	1.31
No. of Sanitary Landfills	6	13
Capacity of Sanitary Landfills (million tons)	127	261
Number Of Municipalities Incompliance with the Regulation		
Lack of information about the regulation	521	974
Financial restrictions	942	1768

EXAMPLE CASES

■ **CASES FOR GOOD MANAGEMENT:**

- Bursa Sanitary Landfill
- Kocaeli İZAYDAŞ Municipal and Industrial Solid Waste Landfill

■ **CASES FOR REHABILITATION OF OLD WASTE DUMP SITES:**

- Rehabilitation of Four Dumps in İstanbul
- Rehabilitation of Demirtaş Waste Dump in Bursa

Example Case for Good Management: Bursa Sanitary Landfill

- The landfill is composed of a main and two sub-valleys (X and T)
- Total Area.....: 175 ha
- Total Landfill Area: 77 ha
- Storage Capacity: 20,000,000 m³
- Operational Lifetime: 30 years
- Amount of SW Stored:
 - X-Valley.....: 210,000 tons
 - T-Valley.....: 1,493,726 tons
 - Main Valley: 871,195 tons



Example Case for Good Management: Bursa Sanitary Landfill

■ Gas Recovery from Landfill:

Total cost: 1,500,000 USD

Production capacity: 1.4 MW

Gas suction capacity: 900 m³/hr

Time to produce electricity: November 1998

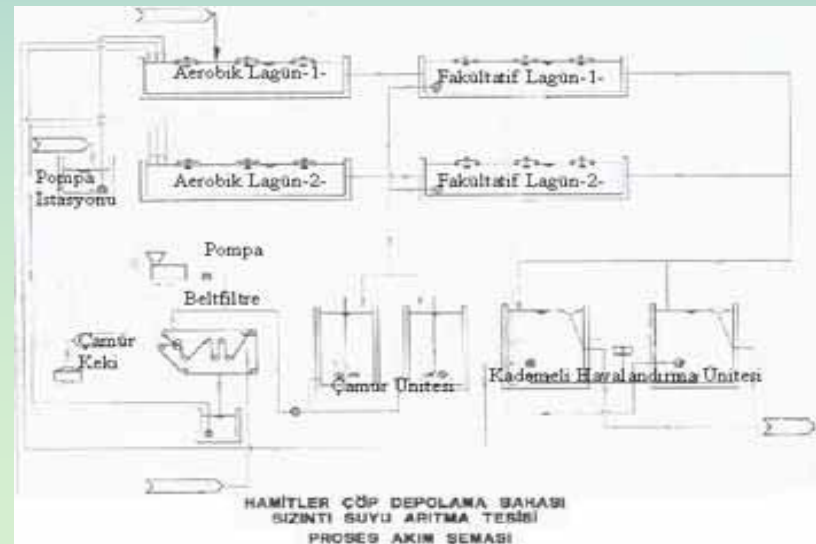
Electricity produced (Nov., 02):
5,500,000 kW/hr

■ Leachate Treatment:

Flow rate (initial).....: 403 m³/day

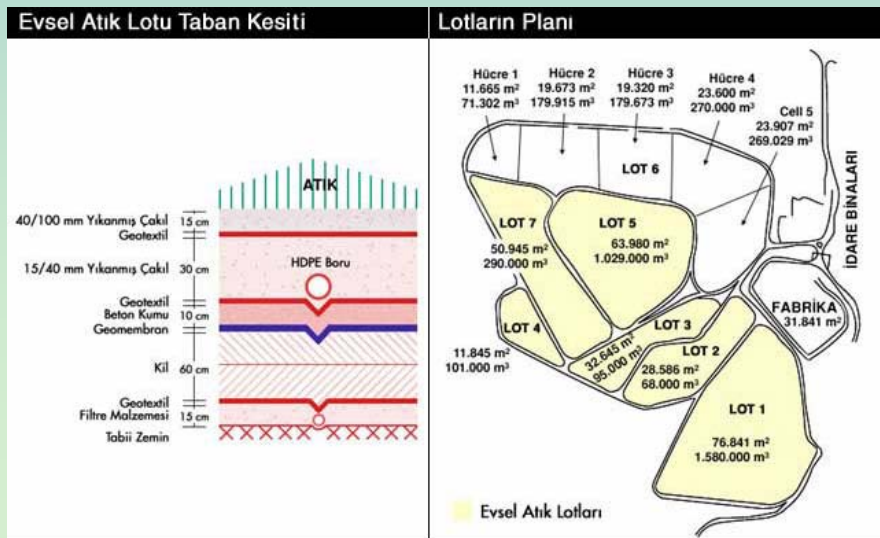
Flow rate (intermediate): 737 m³/day

Flow rate (current).....: 1029 m³/day



Example Case for Good Management: İZAYDAŞ I&MSWLF

- Total LF area: 363,007 m²
- 6 lots for municipal wastes
- 1 lot for industrial wastes
- Total Capacity: 3,163,000 m³
- Operational Lifetime: 25-30 yr
- Rehabilitation after closure
- **Leachate treatment:**
 - Pre-treatment in chemical treatment plant
 - Industrial & Municipal Wastewater Treatment Plant
- **Gas collection:**
 - Collected for recovery



Rehabilitation of Old Waste Dump Sites

■ Bursa-Demirtaş:

Total area: 160,000 m²

Capacity: 2,000,000 m³

Rehabilitation cost: 1,880,000 USD

- ✓ 1.6 ha of land is rehabilitated and being used as parks, etc.



**Bursa-Demirtaş
Rehabilitated
Waste Site**

■ İstanbul-Yakacık:

Construction and sports facilities.

■ İstanbul-Ümraniye:

3 football fields, 1 volleyball field, 1 basketball field, social facilities, jogging tracks, parks

■ İstanbul-Halkalı:

Total area: 15 ha

Gas collection via gas pipes, prevention of leachate formation, vegetation

■ İstanbul-Kemerburgaz:

Total area: 5.77 ha

Gas recovery and energy production studies:
electricity produced: 1006 kW
emissions (NO_x) <500 mg/Nm³



İstanbul-Halkalı



**İstanbul-
Kemerburgaz
Landfill Gas
Facility**

CONCLUSION

- The current strategy of solid waste management in Turkey needs significant improvements.
- Concrete steps will have been taken with the initiation of the project *Capacity Building for Solid Waste Management in Turkey (LIFE00TCY/TR/011)* the Mof E
- The targets are:
 - Determining the institutional and regulatory obstacles in solid waste management and suggesting solutions,
 - Providing the information flow among ministry staff on solid waste policies, techniques, and technologies via *trainer training* method.
 - Demonstrating the developments, information and experiences in solid waste management on local and regional level via workshops and seminars.

CONCLUSION

- The following issues have been raised during the discussions:
 - Improvement of solid waste management planning: *re-planning & construction of sanitary landfills, rehabilitation of old sites, reuse-recovery-recycling, composting concerns, etc...*
 - Legal reforms: *compliance to EU Directives, polluter pays, publishing guidelines with case studies, private-sector participation, etc...*
 - Institutional reforms: *supporting municipalities, establishment of an independent environmental agency, etc...*
 - Training and communication: *raising public awareness, training staff, etc...*
 - Monitoring the application of the action plan: *determining indicators for success and needs, systematic data collection, developing a system for information sharing and reporting*
- An action plan including the issues and cost-benefit analysis has been prepared recently and the project was completed in April, 2004.