SUMMARIZED VIEW ON LANDFILLS AND LEACHATE MANAGEMENT IN TURKEY

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ABSTRACT

There are increasing efforts for improving municipal solid waste management practices in Turkey. Waste generation and management have been recognized as a priority and policies are being developed. According to the Turkish Statistical Institute (TÜİK, 2010) reports, 54 % of household waste is disposed in sanitary landfill sites, while the remaining 44 % is dumped into dumpsites. The preparation of a strategy to decrease the amount of biodegradable waste is on-going according to the Turkish Ministry of Environment and Urbanisation. There are 69 sanitary landfills on operation, 29 in the construction and bidding phase and 41 of another group in the design phase (excluding site selection) 12 of the sanitary landfill are producing electrical energy from landfill gases. There are 15 Leachate Treatment plants and three new plants in construction stage in Turkey. In terms of leachate water treatment, several methods are being used. Results are displaying that many investment is required for existing and future municipal waste related needs and additional developments, extensions needed for the current plants, landfills especially for leachate treatment and biogas utilisation. In addition accurate technical consultancy and site control is required by many municipalities for especially leachate treatment plants. This study summarized the general data on municipal solid waste management sector and technical preferences in landfills, leachate treatment plants, energy production for the Turkey.

Key words: Leachate, Landfill, Turkey, Treatment, Biogas, Municipality

INTRODUCTION

Nowadays there are increasing efforts for improving municipal solid waste management practices in Turkey. Waste generation and management have been recognized as a priority and policies are being developed to overcome existing obstacles.

Impetus for this research is limited existence of the general information regarding the landfills and leachate management in Turkey. Based on this reason, different sources (annual reports, performance programs, bid advertisements, national and local newcasts on this issue are searched and single data accumulated on total numbers of landfills, leachate treatment plants and design & construction steps of new plants. Specific objective of this study is to summarize the case of landfills and treatment plants for leachate water and to look for required plants, investments, technical knowledge in Turkey.

MATERIALS AND METHODS

Regarding the subject in this study; there are very limited publicly open information and reference data in this literature review is collected from many different type of sources such as activity reports, performance programs of single public organisations, bid advertisements for construction projects, several study reports from ministries and universities.

RESULTS AND DISCUSSION

There are 81 provinces in Turkey. Total number of municipalities around 3.300 and 30 of them are metropolitan municipalities. According to the Turkish Statistical Institute (TÜİK, 2010) reports, 54 % of household waste is disposed in sanitary landfill sites, while the remaining 44 % is dumped into dumpsites and municipal solid waste is around 1.21kg per person.

The By-law on Landfill of waste (No: 27533 2012/03) aimed to decrease the amount of land filled biodegradable municipal waste in a scheduled period. The preparation of a strategy to decrease the amount of biodegradable waste is on-going according to the Turkish Ministry of Environment and Urbanisation. Municipal waste management is improving in recent years. The number of licensed recycling and recovery facilities has sky rocketed in the last decade. In 2003, there were 46 recycling and recovery facilities for different recyclable waste types, whereas by 2012 the number of licensed facilities increased to 956. In order to decrease the amount of biodegradable waste sent to landfill sites, new plants for biodegradable wastes (composting plants etc) are under construction. 8 composting facilities and 6 facilities for electricity production from methane gas are operating (MoEU 2012). However, these improvements in the waste management capacity have not yet been reflected in the reported data. (EEA Report: Municipal Waste Management in Turkey, 2013)

In the current situation there are 69 sanitary landfills on operation these plants are serving 44,5 million population within 903 municipalities in the end of 2012, desired number of total landfills for 2013 is 80, 130 for 2017 which will serve for 77% of the population (Ministry of Environment and Urbanisation), 29 in the construction and bidding phase and 41 of another group in the design phase (excluding site selection) 12 of the sanitary landfill are producing electrical energy from landfill gases. There are 15 Leachate Treatment plants and three new plants in construction stage (EKAP) in Turkey. Some of the leachate treatment plants are being constructed such as Denizli Metropolitan Municipality.

In terms of leachate water treatment, there several methods are being used such as reverse osmosis treatment (24%), Membrane bio reactor and nano-filtration (23%), anaerobic and aerobic systems (15%), combined (aerobic-facultative lagoon-sequential batch reactor) (%15) chemical treatment (23%) Regarding leachate disposal utilization of re-circulation (31%), discharge to central wastewater treatment plants (%27), discharge to sewage network (21%), discharge to surface waters (12%), others (9%) (Öztürk, İ., 2010)

Some of the old plants which use filtration systems may face with several technical problems. Also regarding the design phase of the some landfills waste characterization could not be inspected properly such as water–solid ratios.

In refer to findings; technical support for municipal landfill and leachate water treatment managers is required for initial steps to the commissioning. Such as preparation of bidding tenders, specifications, defining technical requirements, construction site control, commissioning and operation especially for leachate water treatment plants.

CONCLUSION

Nowadays there are increasing efforts for improving municipal solid waste management practices in Turkey. Waste generation and management have been recognized as a priority and policies are being developed to overcome existing obstacles.

Results are displaying that many investment is required for existing and future municipal waste related needs and additional developments and extensions needed for the current plants, landfills especially for leachate treatment and biogas utilisation. Additionally, accurate technical consultancy and professional design works are highly required by many municipalities especially for leachate treatment plants. Assuming landfills and regular waste water treatment plants there are many professional contractors and design firms are being active in Turkey.

This study summarized the general data on municipal solid waste management sector and has proportional data related with technical preferences on landfills, leachate treatment plants, energy production for the Turkey.

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REFERENCES

- Atıkların Düzenli Depolanmasına İlişkin Yönetmelik (By-law on Landfill of waste (No: 27533 2012/03)), Ministry of Environment and Forestry, *www.atikyonetimi.cevreorman.gov.tr/belge/ddy.doc*
- Bakas I, Milios L., Municipal Waste Management in Turkey, 2013, European Environment Agency *www.eea.europa.eu/.../turkey-municipal-waste-...*
- Elektronik Kamu Alımları Platformu (EKAP) 2012,2013, Public Procurement Authority, Bid Advertisements for Design, Build, Operation of Leachate Water Treatment and Landfill Projects, https://ekap.kik.gov.tr/EKAP/Ortak/IhaleArama2.aspx#RESULTS
- Environmental Situation Report (cities) for 2012, General Directorate of Environmental Impact Assessment, Permissions and Auditing, Ministry of Environment and Urban Planning http://www.csb.gov.tr/db/ced/editordosya/CDR_OZET_2012.pdf
- Ministry of Environment and Urban Planning, Statement of the Minister, (2013) Anadolu Agency, http://www.aa.com.tr/tr/s/171651--turkiyenin-kati-atik-sorunu-cozuluyor
- Öztürk, İ. (2010) Waste Sector, Assessment Report for Prepared by Prof. Dr. İzzet Öztürk and Ministry of Environment and Forestry, (Second Draft) : http://iklim.cob.gov.tr/iklim/Files/Atik_Sektoru_Mevcut_Durum_Degerlendirmesi_Raporu.pdf
- Turkish Statistical Institute (TÜİK, 2010) Environmental Reports, Municipal Waste
- Waste Management Action Plan for the Years 2008-2012, General Directorate of Environmental Management, Ministry of Environment and Forestry, (2008), www.cygm.gov.tr/CYGM/Files/EylemPlan/atikeylemplani.pdf