

The Roadmap of Turkey on Waste Management

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Industrial and technological developments have increased rapidly throughout the world including Turkey. Furthermore, the population of Turkey is also increasing and the ever-increasing consumption creates larger amounts of waste and adversely affects the environment and human health. The development of a waste management and disposal system has become necessary in all countries of the world. As part of the process of seeking entry to the European Union, Turkey continues to harmonize the necessary legislation to satisfy European Union regulations for the disposal of all types of waste within the framework of the strategy. An integrated waste management system is applied for each town in Turkey that is suitable for the different contents and increasing amounts of waste produced.

Environmental infrastructure investments will thus be targeted towards remediation. Regarding synergies with other sectors it should be underlined that it is foreseen that construction and operation of regional landfill sites including gas recovery units, gas collection systems and pre -treatment facilities for leachates. Furthermore agricultural activities will be supported by composting. Investments in the solid waste sector will thus lead to an efficient nationwide solid waste management system, protection of the soil, surface and groundwater and to a better quality of life for the population.

1. Introduction

Turkey is the biggest of the candidate countries for EU accession, with a population of some 75 million on a territory of 783,562 square kilometres. Half of Turkey’s population is younger than 30 years old and 77.3 percent of the total population live in urban areas. It plays an important regional role, as a result of its strategic location between Europe and Asia. It has borders with eight other countries, including EU Member States, and borders the Black Sea, the Mediterranean and the Aegean Sea.

Economic growth has been highly dependent on (mainly imported) energy and the consumption of natural resources, leading to growing greenhouse gas emissions and environmental degradation. Greenhouse gas emissions almost doubled between 1990

and 2009 (from 3.39 tonnes CO₂ equivalent in 1990, to 5.13 tonnes in 2009), and increased in all sectors except agriculture. The energy sector is the largest contributor to total national greenhouse gas emissions. The economy's energy intensity in 2010 was 0.25 tonnes of oil equivalent per thousand euros of GDP.

Environmental policy represents one of the most complex and costly challenges for the EU accession process, with over 300 different pieces of legislation, and rapidly changing requirements. It will require around EUR 60 billion to fully implement this.

The 2006 Turkish National Environmental Approximation Strategy sets out the work plan and costs related to transposing and implementing the relevant EU directives, and includes a financing plan for meeting requirements for significant investment. The same priorities are covered by the 10th National Development Plan. Turkey's other main environment strategies are: the Strategic Plan (2013-17) for the Strategic Environmental Assessment study and implementation in all sectors.

The waste sector's general objective is to improve environmental protection, improve citizens' quality of life by making progress on aligning Turkey's legislation with the EU's environment.

In the field of waste, activities to comply with the Waste Framework Directive are foreseen, including infrastructure investments, to increase the quantity of recycled waste, reduce biodegradable waste going into landfills and improving final disposal. In principle, landfill investments will be agreed where there is a waste management plan and the landfill is planned in accordance with it.

2. Waste management studies

Integrated Solid Waste Management (ISM) covers providing some issues which are anticipated in the relevant legislation. Today, essentially 4 strategies are anticipated to be applied for the integrated solid waste management [1], [2]:

- Waste minimization,
- Recycling and composting,
- Recovery, thermal conversion (combustion),
- Landfill.

Our strategy is not independent from these strategies and there are mutual relations among them. And the waste management options is applied according to a logical order of precedence, too. For example, the recycling process is intended after every applicable method regarding waste minimization at source is made. Similarly, thermal or biological treatment methods is not intended unless the highest recycling has been fulfilled. Technological options to be applied in scope of ISM framework are also affected by the international trends and decisions.

Our integrated solid waste management system is total and flexible, also, it has an economic value and depends on regional planning.

In recent years, there has been growing support for the Notion of integrated waste management and strategies to reduce waste. Waste materials are first considered for reuse and recycling, and the rest are disposed at landfill sites [2]. Municipal and industrial solid waste disposal sites have been the focus of special attention because they are a significant source of soil, water and air contamination. But, in Turkey, many sites of waste disposal are controlled; the restrictions imposed by environmental agencies are regarded, and the rules and techniques for proper landfill management are not ignored. The management of municipal solid waste (MSW) is going through a important phase due to the availability of suitable facilities to treat and dispose of the increasing amount of MSW generated in metropolitan municipalities.

Waste generation and collection: The total amount of municipal waste generated is 25,8 million and nearly 409 kg per capita which is below the EU-27 average (502 kg) [EUROSTAT 2012]. Approximately 98 percent of the population had access to municipal waste collection service in 2012 [4]. Most rural areas are lacking collection services. The separate collection for packaging waste, the *dual* system has been adopted, namely a dry and a wet bin. The system will be enhanced with additional bins for other fractions (for example, paper/cardboard, metal/ plastic and glass).

According to the results of Municipality Solid Waste Statistics Questionnaire of the year 2012 which was administered by Turkish Statistical Institute, TURKSTAT, the amount of solid waste collected was 14,6 million tons in the summer of 2012 and 11,2 million tons in the winter of 2012, with an annual amount of 25,8 million tons [4]. According to these results, the average daily solid waste quantity per capita was 1,12 kg in average. Among the total amount of solid waste collected in nowadays from the municipalities which give solid service, 70 percent of the disposal is to the municipal landfill sites. There are 80 landfill facilities, 3 biomethanization units and 21 landfill gas recovery facilities for municipal solid waste management in Turkey.

According to the medical waste management results of our the Ministry of Environment and Urbanization there are 50 sterilization facilities and 2 incineration facilities, nowadays.

By 2015, the economy has provided an annual added value in excess of 2.5 billion with increasing the number of recycling facilities to 2110 in Turkey.

The number of packaging waste recycling plant is increased to 642, the number of sorting plant is increased to 497 thus, the recovery of packaging waste is provided. The total economic value that can be gained to Turkey's economy from packaging waste is nearly about 7 to 9 billion TL/year.

The hazardous waste that results from industrial facilities is recycled. The number of these facilities (recycling, intermediate storage, including removal of PCB and RDF) in the year of 2003 was 18, but nowadays the number of facilities is increased to 362. There are 41 waste incineration and co-incineration plants and 3 of them are waste incineration facilities. And also, there are 7 hazardous waste landfills (class 1).

The current progress of industrial waste management can be seen on Figure 1, special waste streams can be seen on Figure 2 and 3 and municipal waste management can be seen on Figure 4, respectively.

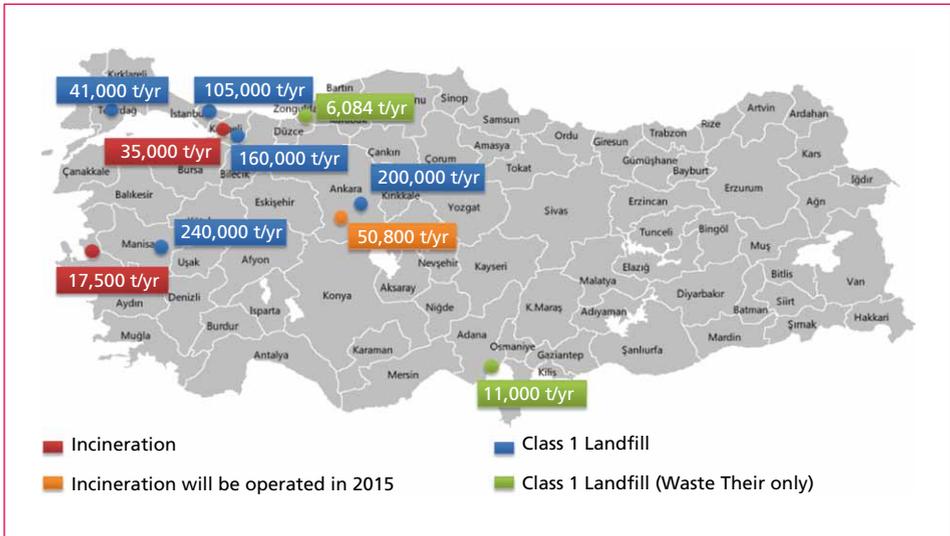


Figure 1: Industrial waste management in Turkey



Figure 2: Current progress of special waste – end of life tyres – in Turkey

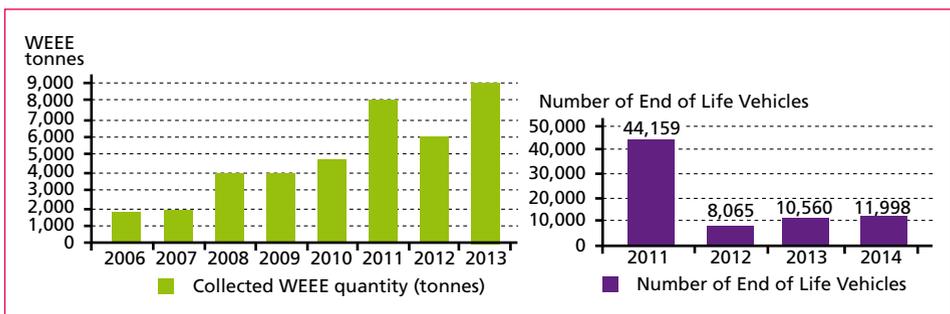


Figure 3: Current progress of special waste – end of life vehicles an WEEE – in Turkey

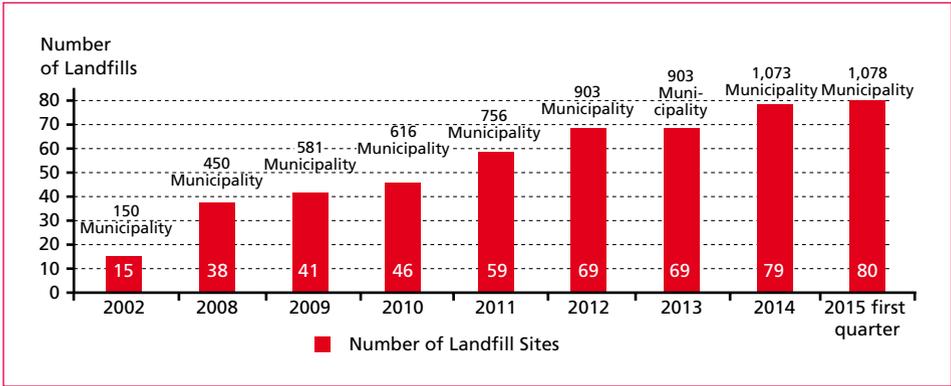


Figure 4: Municipal solid waste management in Turkey – Number of landfills

3. Green growth and Turkey

The most important factor that determines the development is the rapid and irreversible destruction of the resources used for social and economic development. Understanding of this fact brought the abandonment of traditional development models along with the seeking of new models in order. Hence, the traditional unlimited growth and unlimited consumption patterns gave way to sustainable and balanced development models of the green economy and the policies.

Economic and technological problems are the constraints on green economy politics. It is needed to maximize the economic and employment opportunities for all countries in expanding renewable sources of energy and clean technology.

Economic and technological problems are the constraints on green economy politics. It is needed to maximize the economic and employment opportunities for all countries in expanding renewable sources of energy and clean technology. Consumption tax and value added taxes should be encouraging for entrepreneurs.

In conclusion, Turkey is a rapidly developing country with high aspirations to pursue its economic and social development in a sustainable development manner. Moreover, expanding the renewable sources of energy and also clean technology, in our country it is aimed to maximize the opportunities for economic development and employment.

4. Conclusion

Turkey believes that the waste sector will provide a significant contribution to generate new job opportunities and rise human welfare with sustainable production, consumption, energy efficiency and renewable energy usage areas.

Therefore, in the World’s new development model that puts forward to bilateral and regional cooperation, Turkey pays attention to make cooperation with the whole world in know-how, research and development activities, innovation, environmental technologies and finance issues.

The goals and actions on waste are [3]:

- Reducing the quantity of biodegradable wastes admitted to landfill sites, taking year 2005 as a basis, by 75 percent in weight till 2015, by 50 percent till 2018 and by 35 percent till 2025.
- Preparation and implementation of Integrated Waste Management Plans (IWMP) by Municipalities/Municipality Unions.
- In our country, 6.87 billion TL economic income is obtained by the use of recyclable waste. 15 to 18.6 billion TL economic income can be obtained by evaluation of recycling all recyclable waste in 2023.
- Establishing integrated solid waste disposal facilities across the country, and dispose 100 percent of municipal waste in these facilities, until the end of 2023.
- Collecting the landfill gas (biogas) created in the suitable sections of the covered areas of landfill sites and ensuring their use in energy generation.
- Finalizing Packaging Waste Management Plans and ensuring effective implementation of source-separated collection of wastes.
- Establishing the recycling facilities foreseen within the scope of the Solid Waste Master Plan with the EU-aligned Integrated Waste Management approach.
- Increasing the number of compost and biomethanisation plants.
- Conducting studies to generate renewable energy from all waste sources (i.e. domestic wastes and other municipal wastes) that have an energy value.
- Ensuring that local governments benefit from incentives for implementation of waste management systems.
- Termination of uncontrolled disposal of wastes 100 percent by 2023.

The economic development of Turkey within the framework of the principles of sustainable development, is continued with confident steps road to 2023, tending to the clean production technology and consuming less energy.

5. References

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Bibliografische Information der Deutschen Nationalbibliothek

Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über <http://dnb.dnb.de> abrufbar

Thomé-Kozmiensky, K. J.; Thiel, S. (Eds.): **Waste Management, Volume 5**
– Waste-to-Energy –

ISBN 978-3-944310-22-0 TK Verlag Karl Thomé-Kozmiensky

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Publisher: TK Verlag Karl Thomé-Kozmiensky • Neuruppin 2015
Editorial office: Professor Dr.-Ing. habil. Dr. h. c. Karl J. Thomé-Kozmiensky,
Dr.-Ing. Stephanie Thiel, M. Sc. Elisabeth Thomé-Kozmiensky.
Layout: Sandra Peters, Ginette Teske, Janin Burbott-Seidel, Claudia Naumann-Deppe
Printing: Universal Medien GmbH, Munich

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