Waste Management in Turkey: Sustainable Resource Management

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Undersecretary

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Brief Information of Turkey

Population
75,627,384

Area
783,562 km²

Region
7 regions, 81 provinces

World economy 18th
The rapid developments in the field of industry and technology, on one hand, improve the living standards of people by increasing the man’s sovereignty over nature, on the other hand, together with the increasing population and rapid urbanization causes the degradation of natural balances.
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.
Law on Environment

Article 8;

“it is prohibited to introduce into store in, transport to or remove from the receptor area any discharge or waste in such a way directly or indirectly in contradiction with the standards and methods specified in the pertinent regulations or to engage in similar activities.

Article 11;

Metropolitan municipalities and municipalities are responsible for construction and operation of separation, disposal and composting facilities.
National Legislation on Waste Management

Management in Pursuant to Type of Waste

- Regulation on Control of Solid Waste
- Regulation on Control of Hazardous Wastes
- Regulation on Control of Medical Waste
- Regulation on Control of Packaging Waste
- Regulation on Control of Waste Oils
- Regulation on Control of Used Batteries and Accumulators
- Regulation on Control of Waste Vegetable Oils
- Regulation on Control of Excavation and Construction Waste
- Regulation on Control of PCB and PCT's
- Regulation on Control of End of Life Tyres
- Regulation on Control of End of Life Vehicles
- Regulation on Control of Waste Electrical and Electronic Equipment

Management and Disposal

- Regulation on Landfill
- Regulation on Waste Incineration
- Comminuque on Recycling of Nonhazardous Waste
- Comminuque on Refused Derived Fuel, Additional Fuel and Alternative Raw Material

Transportation

Regulation on Waste Transport

National Legislation on Waste Management
Solid Waste Management

In Turkey, studies in the field of waste management have shown a very significant development in the last 12 years, with increasing social and political sensitivity.

The planning is performed based on the achievement of 2023 vision to create long-term strategies.
Types of Waste Economy Cycle in Planning

Linear Economy

Source → Production → Consumption → Waste

Economy Chain

Source → Downcycling → Production → Upcycling → Sustainable production

Cycle Economy

Sustainable consumption

Classical Economy
Waste economy is related to Europe, the neighbouring countries and world over the long term.
UCES is to establish a healthy and viable environment by taking into consideration the economic and social conditions of our country and to provide the implementation of our national environmental legislation by harmonizing it with EU Environmental Acquis and monitoring and controlling of this implementation.

It is updated for 2014-2023 in order to revise realization.
The steps are being taken to implement the economic size of the waste with

National Recycling Strategy Action Plan

that is considered as an important point to reach our vision of 2023
"National Recycling Strategy and Action Plan"

is prepared in order to find solutions to recycling problems and reach sustainable recycling system and effective structure.
Waste management hierarchy and the principle of producer responsibility take part on the basis of the waste management policy.
Integrated Waste Management

It must be a total system
(include all components of a solid waste)

It should be able to form an economic value
(Recovery of Energy and Materials)

It should be flexible
(sufficient flexibility to accommodate with the possible changes)

A regional planning should be made
(regional planning should have adopted in order to use sources effectively)
World-wide (Disposed Amount of Waste and Used Technologies)

Europe (EU27) (Disposed Amount of Waste and Used Technologies)

Source: Eurostat, 2012 (European Commission)
Turkey
(Disposed Amount of Waste and Used Technologies)

Collected municipal waste amount: **25,845,000** tones/year

Municipal Waste Disposal Technologies

- Landfill, Compost: 71%
- Dumpsite: 29%

Source: TURKSTAT, 2012
Population Growth in Ten Years (2004-2013)

Source: REC Turkey, Data source: UNSD
Household Population (2005-2010)

Source: TURKSTAT, Data Source: UNSD
The Purchasing Power Parity (10 Years Growth) (2004-2013)

Source: TURKSTAT, Data Source: World Bank
Gross Domestic Product (GDP) - Municipal Waste Amount (kg/person.year) (2011)

Source: ÇŞB, EUROSTAT (Waste), World Bank (GDP)
Waste Management in EU - Municipal Waste - (2011)

Source: TURKSTAT, Data Source: EUROSTAT

[Bar chart showing waste management percentages for different countries in the EU.]

- Deposit onto or into land
- Incineration / disposal (D10)
- Incineration / energy recovery (R1)
- Material recycling
- Composting and digestion
- Other

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Landfill Sites in Turkey

The Number of Landfill Facilities

- 1247 Municipalities: 1396 Municipalities

The Rate of Served Population

- 2002: 33%
- 2014: 69%
- 2017: 77%
- 2023: 100%
Renewable Energy

The installed power capacity of licensed facilities that producing energy from the landfill gas ~ 95 MWe

The electric energy production from the renewable energy in the part of all energy production is planned to increase 30% at 2023
The new investments that is made to recycling sector and biogas energy facilities, especially will meet the particular needs of the majority of the local energy, be useful for the domestic heating and greenhouse area and increase the employment opportunities.
There are 3 biomethanization facilities (Ankara, Adana, Pamukova/Sakarya) in Turkey.

<table>
<thead>
<tr>
<th>The installed power capacity of licensed facilities that produced energy from biomass</th>
<th>~ 147 MWe</th>
</tr>
</thead>
<tbody>
<tr>
<td>The rate of in all licensed facilities</td>
<td>~ %8,17</td>
</tr>
<tr>
<td>The income obtained from production of electrical energy</td>
<td>100 million$/year</td>
</tr>
</tbody>
</table>
Hazardous Waste Incineration Facilities

The number of hazardous waste recycling and disposal facilities
Hazardous Waste Disposal Facilities

- Landfill for Hazardous Waste:
  - 17,500 ton/yr
  - 41,000 ton/yr
  - 6,084 ton/yr
  - 11,000 ton/yr
  - 240,000 ton/yr
  - 105,000 ton/yr
  - 160,000 ton/yr
  - 200,000 ton/yr

- Incineration:
  - 41,000 ton/yr
  - 105,000 ton/yr
  - 6,084 ton/yr
  - 240,000 ton/yr
  - 200,000 ton/yr

Note: The map shows the distribution of hazardous waste disposal facilities across Turkey.
Producer Responsibility System

Packaging waste

Waste batteries

Waste electrical and electronic equipment

End of life vehicles

End of life tyres

Waste oil
In Turkey, the entry price of 2.5-3 million tons/year consumed packaging waste into recycling facilities is approximately 1.8 to 2.4 billion TL.
The Income can be Obtained From Packaging Waste

<table>
<thead>
<tr>
<th>Recycling Type</th>
<th>The income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste paper recycling</td>
<td>3,735 billion TL</td>
</tr>
<tr>
<td>Waste plastic recycling</td>
<td>2,77 billion TL</td>
</tr>
<tr>
<td>Waste glass recycling</td>
<td>30–35 million TL</td>
</tr>
<tr>
<td>Waste metal recycling</td>
<td>128 million TL</td>
</tr>
</tbody>
</table>

The total economic value that can be gained to Turkey's economy from packaging waste is nearly about

7-9 billion TL / year
## Special Wastes

<table>
<thead>
<tr>
<th></th>
<th>Amount of waste (ton)</th>
<th>The income (million TL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>End of life tyres</td>
<td>117.000</td>
<td>37.5</td>
</tr>
<tr>
<td>Waste accumulators</td>
<td>64.000</td>
<td>87.5</td>
</tr>
<tr>
<td>End of life vehicles</td>
<td>10.648</td>
<td>59</td>
</tr>
<tr>
<td>Waste oil</td>
<td>18.750</td>
<td>23</td>
</tr>
</tbody>
</table>
According to our National Legislation, It is aimed that %60 of marketed products packaging waste are obliged to collect and recover to 2020.

According to EU directives, harmonization studies on collection and recycling targets will continue.
### Results & Targets

**Recovery of waste electrical and electronic equipment;**

<table>
<thead>
<tr>
<th>Waste electrical and electronic equipment</th>
<th>Recovery targets (weight %)-2018</th>
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</thead>
<tbody>
<tr>
<td>Large household appliances</td>
<td>80</td>
</tr>
<tr>
<td>Small household appliances</td>
<td>70</td>
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**Recycling of waste electrical and electronic equipment;**

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<td>Large household appliances</td>
<td>75</td>
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<td>50</td>
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</table>
It is aimed that waste accumulators that deposited is collected recycling and disposed less than its 90%.

The amount of the biodegradable waste to be stored shall be reduced to

2015 → % 25

2018 → % 50

2025 → % 65

by weight of the total amount of the biodegradable waste produced in 2005.
Results & Targets

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.
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.
THANK YOU