This project is co-funded by the European Union and the Republic of Türkiye

Technical Assistance for Assessment of Türkiye's Potential on Transition to Circular Economy

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Biowaste Management in Türkiye

Münüre Türkmen
Environment and Urbanization Expert
Republic of Türkiye Ministry of Environment, Urbanization and Climate Change

Activity 3.2.4. Training on Integrated Waste Management in Circular Economy
October 10-11, 2024 Ankara

TÜRKİYE CUMHURİYETİ
ÇEVRE, ŞEHİRCİLİK VE
İKLİM DEĞİŞİKLİĞİ BAKANLIĞI

Biowaste Management in Türkiye

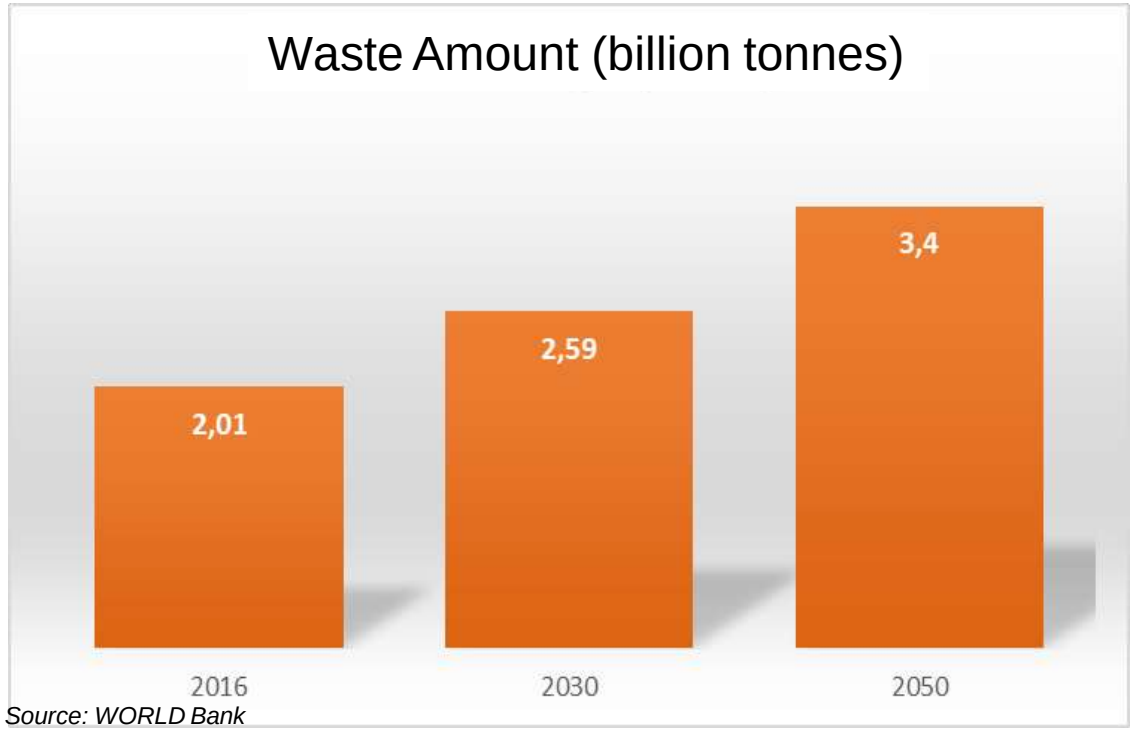
Münüre Türkmen
Environment and Urbanization Expert

General Directorate of Environmental Management
Department of Circular Economy and Waste Management
Municipal and Biodegradable Waste Management Branch Directorate

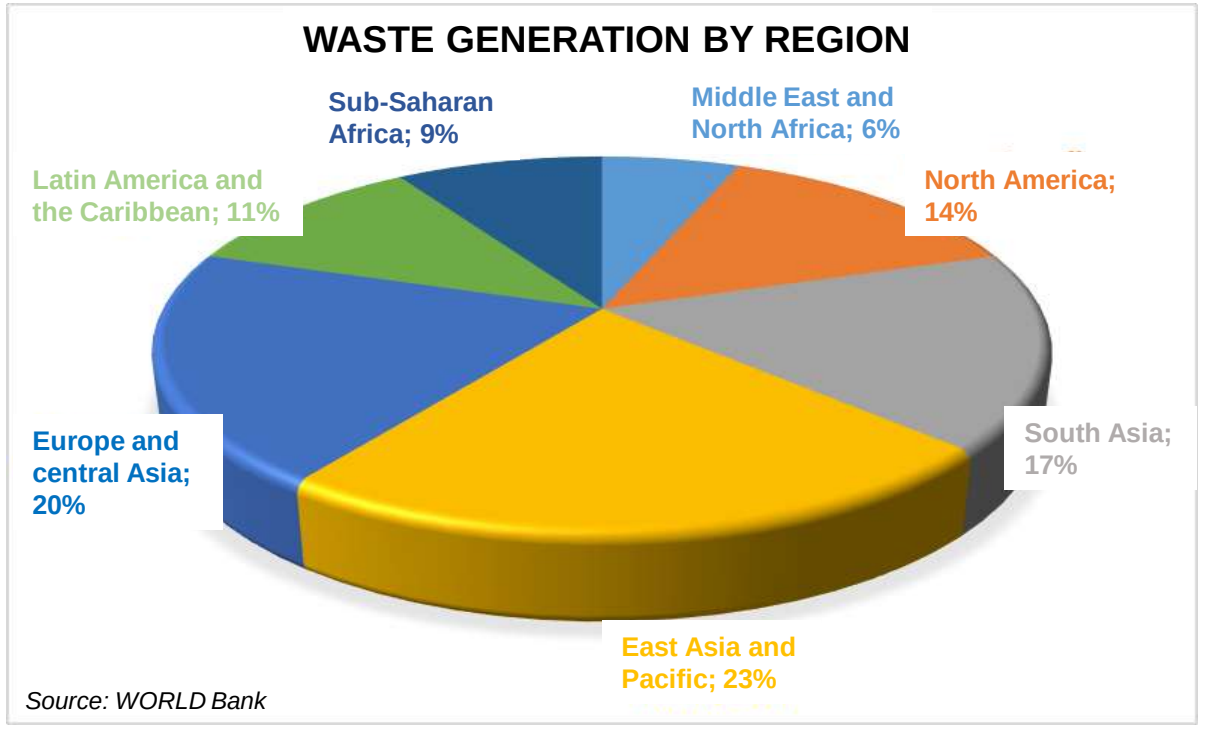
Content

- Current Situation and Strategy in Waste Management in the World and in Türkiye
- Biodegradable Waste Management Technologies
- Relevant Legislation and Practices

Waste Management in the World-"Amount of Waste"



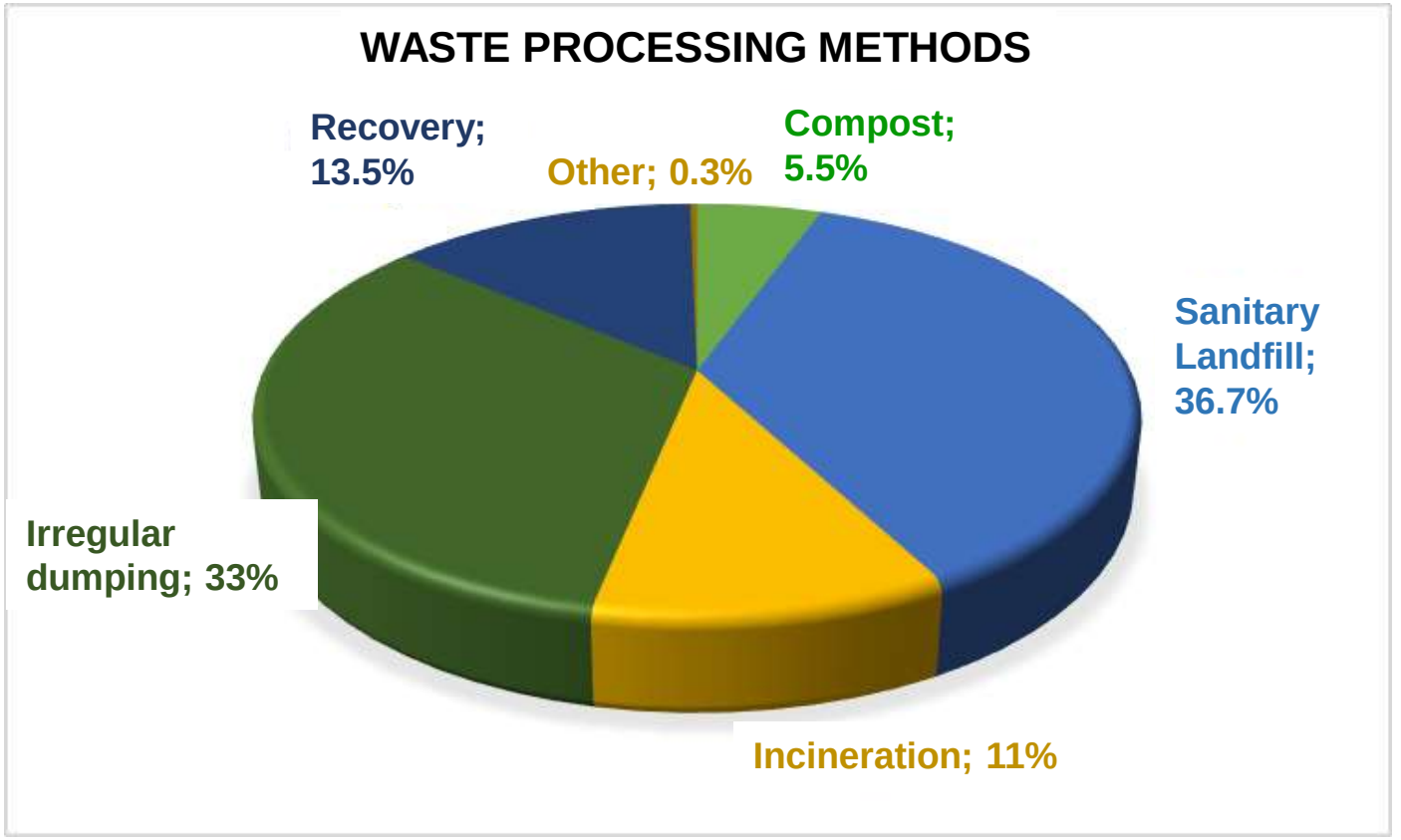
Source: WORLD Bank



Source: WORLD Bank

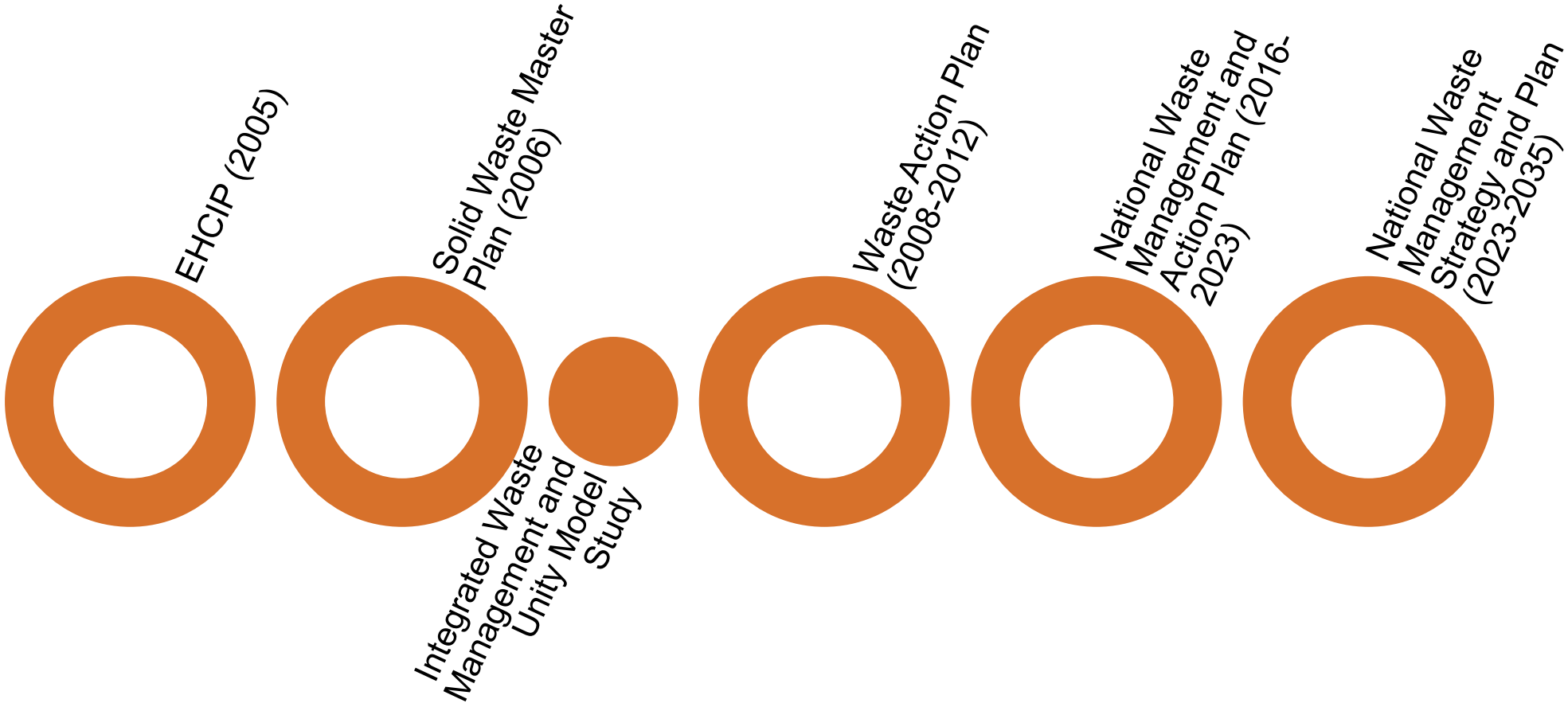
Waste Processing Methods in the World

Waste production per capita: **0,74 kg/person.day** (0.11-4.54 kg)



Source: WORLD Bank

The Waste Management Strategy of Our Country

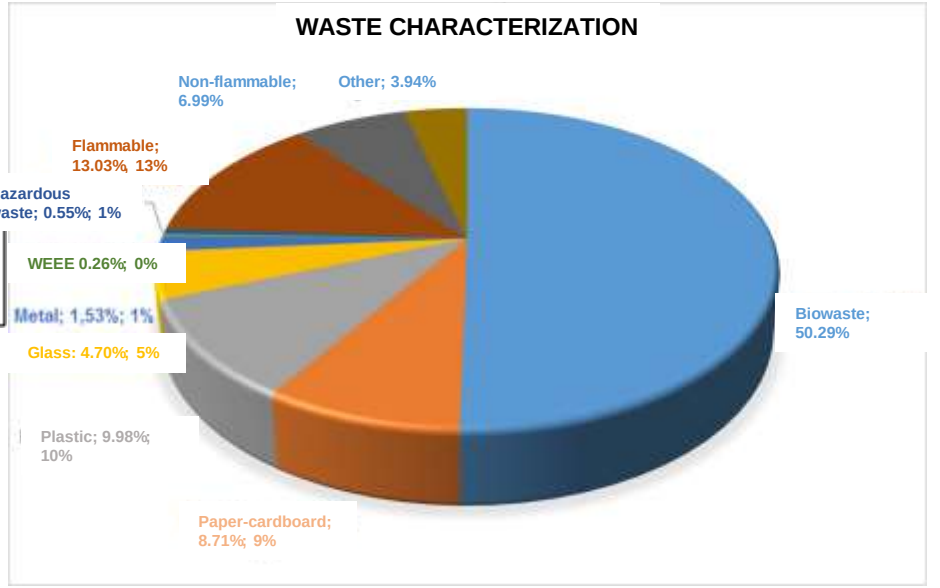


National Waste Management Strategy and Plan (2023-2035) Waste Amount and Characterization

National Waste Management Strategy and Plan (NWMP) (2023-2035) content;

- NWMP Survey Study
- Waste Amount and Characterization,
- Waste Processing Methods and Ratios
- 2023-2035 Planning
- Cost Analysis

Waste production per capita:
1.13kg/person-day (TÜİK 2020)



Amount of Municipal Waste Collected:
32.3 million tons/year (TÜİK-2020)
38.9 million tonnes (MoEUCC - 2022)

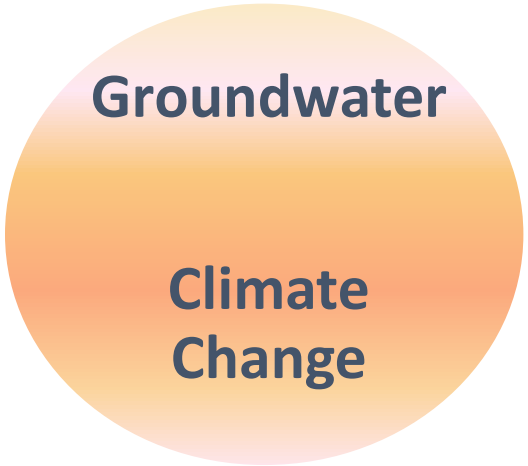
Regulation on Landfilling of Wastes

Biodegradable Waste Minimisation and Pretreatment - Provisional Article 1

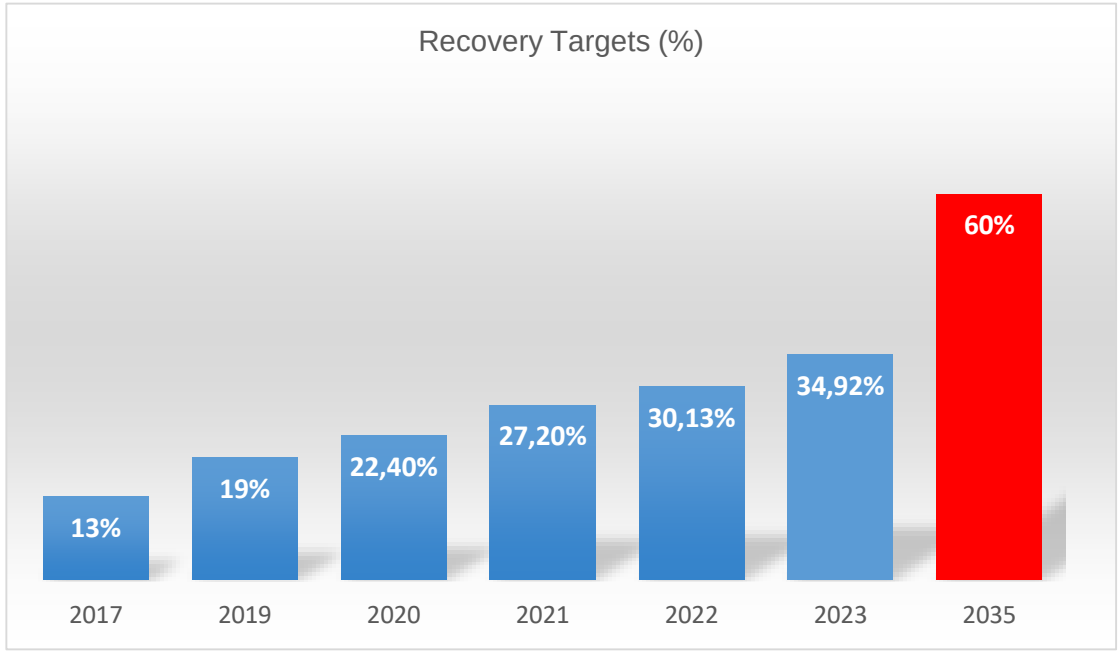
One or more of the biological processes applied to waste to reduce physical, thermal, chemical or biological processes applied to waste to reduce its volume or hazardous properties, facilitate its management or increase its recovery, including separation

- In order to ensure the recovery of municipal waste in accordance with the zero waste management system, it is essential to use physical, chemical, biological or thermal technologies compatible with the environment. Pre-treatment facilities and capacities using these technologies shall be established so that at least 60% by weight of the amount of municipal waste collected in 2035 can be recovered.
- Wastes cannot be admitted to landfill facilities without pre-treatment.

Why Pre-Treatment?



Municipal Waste Processing Plants in our country



*__Our Country's Climate Neutral Target 2053:__ *Pre-treatment of all municipal waste*

- The capacity of municipalities for pre-treatment facilities is determined within this framework.
- Efforts are being made to establish financial mechanisms for separate collection of wastes at source and increasing recovery efficiency.

The Current Situation in the Management of Municipa

- While the number of sanitary landfill facilities was 15 in 2002, this number has reached 94 today. These facilities serve 75.9 million people, i.e. 94.5 % of the population, in 1248 municipalities.

- In our country, energy is obtained from biogas and landfill gas in 99 energy production facilities in 60 provinces.

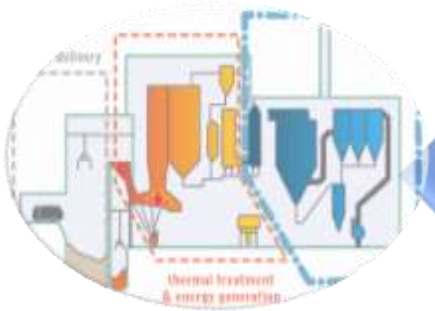
- As of the first half of 2024, there are 33 mechanical separation plants, 2 biodrying plants, 14 composting plants and 18 biomethanisation plants with environmental licences where municipal waste is processed.

- As of 2053, wastes that are not pre-treated will not be accepted for landfilling.

Common Technologies Used in Biodegradable Waste Management

Compost

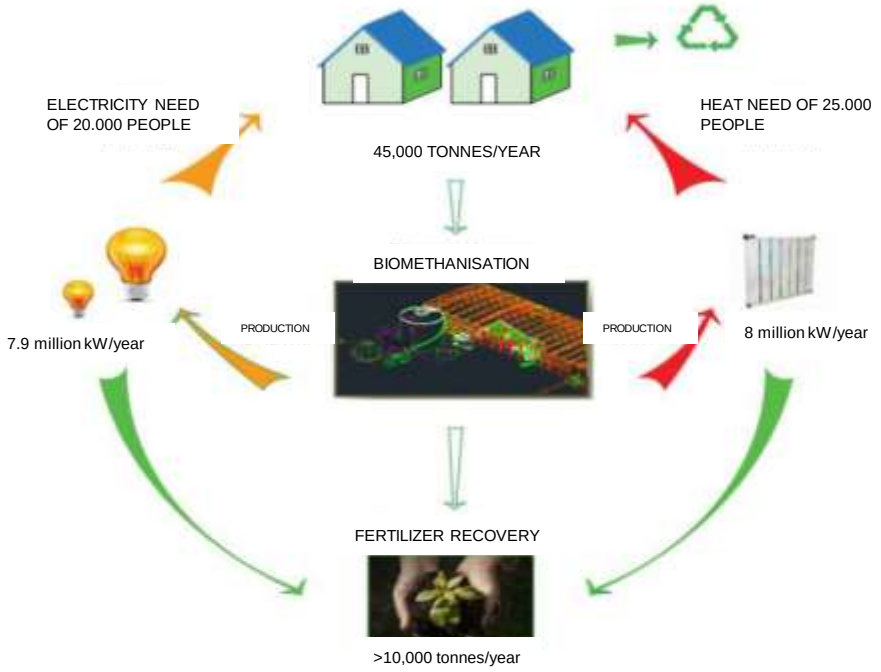
Biomethanization

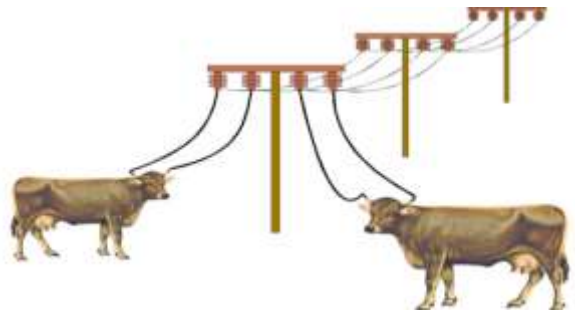


Thermal Technologies

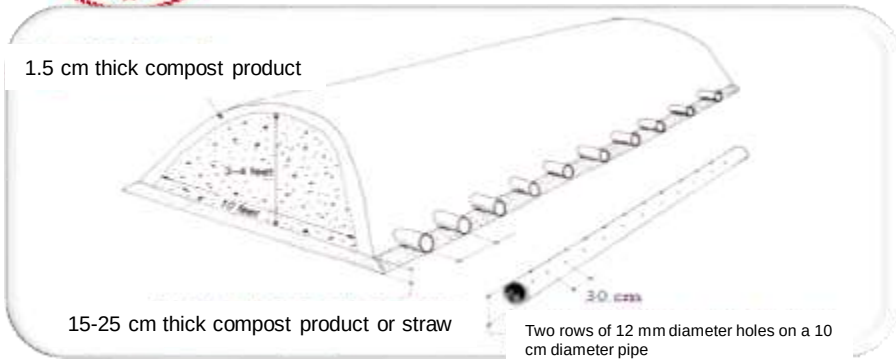
Biomethanization

Decomposition of organic wastes in the absence of oxygen (anaerobic fermentation)



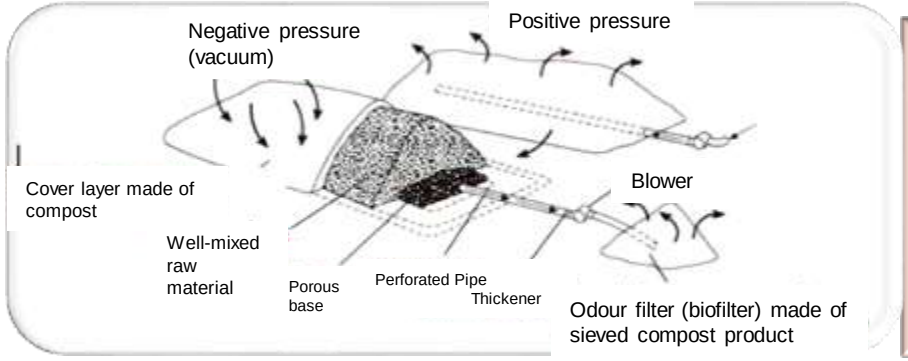


Composting Technologies



•**Compost in passive heap:** **They are simple systems. No mixing is performed. Natural air movement is utilised. The heap height does not exceed 1-1.2m.**

•**Composting in the transfer heap:** **The most widely used system worldwide. Special machine equipment is used for mixing. Space requirements are high.**

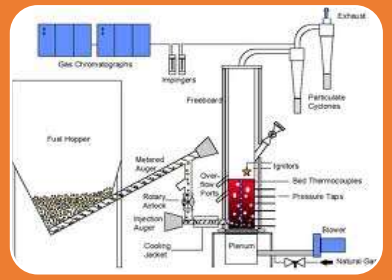


- **Compost in aerated static heap:** **Negative or positive pressure is created in the aeration. In negative ventilation, the air drawn in can be purified in the biofilter, so there are fewer odour problems. The height of the heap is between 1.5-2.5 m.**

Thermal Systems

Incineration
It is the process of converting combustible waste into an inert residue (ash, slag) and energy recovery is achieved. The waste can be incinerated directly or it can be pre-treated in order to increase its calorific value and to provide more effective process control in the incineration plant.

Pyrolysis
Pyrolysis is incineration in the absence of oxygen. Pyrolysis process products can be solid, liquid and gas. In practice, heat energy is transferred to an organic waste from outside.



Gasification
In gasification, a limited amount of oxygen is supplied to the system and the resulting oxidation generates enough heat to make the system self-sustaining.

WASTE MANAGEMENT REGULATİON

(O.G. numbered 02/04/2015-29314)

Objective of the Regulation:

To determine the general procedures and principles for;

- Ensuring the management of wastes from generation to disposal without harming the environment and human health,

- Reducing waste generation, reducing the use of natural resources through reuse, recycling and recovery of wastes and ensuring waste management,

- The production and market surveillance and inspection of products within the scope of this Regulation, which have certain criteria, basic conditions and characteristics in terms of environmental and human health.

- Wastes given in Annex-4 waste list,

- Waste processing methods,

- Responsibilities of waste generators

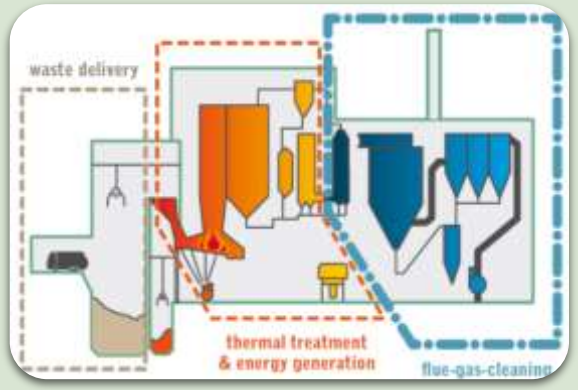
are included.

Complies with the EU Waste Framework Directive (2008/98/EC).

Legislation

Compost Communiqué

Communiqué on Mechanical Separation, Biodrying and Biomethanisation Facilities and Fermented Product Management



Regulation on Incineration of Wastes

Communiqué on Mechanical Separation, Biodrying a Biomethanisation Facilities and Fermented Product Management

Published in the Official Gazette dated 10/10/2015 and numbered 29498.

(Amended: O.G. dated 28/07/2017 and numbered 30137)

(Amended: OG-23/9/2020 dated and 31253 numbered R.G.)

Objective

Determines the following procedures and principles regarding the biodegradable wastes;

*To reduce the amount to be disposed of in sanitary landfill facilities,

* Technical criteria for mechanical separation, biodrying and biomethanisation plants,

* Management of the fermented product obtained in biomethanisation plants.

Out Of Scope

Animal cadavers,
Animal feces used for agricultural purposes,

Animal by-products managed under the provisions of the Regulation on Animal By-Products Not Used for Human Consumption published in the Official Gazette dated 24/12/2011 and numbered 28152, except for animal wastes sent to biodrying and/or biomethanisation facilities for processing,

Radioactive wastes and wastewater,

Agricultural and forestry products with biomass that can be used as fuel,

Units such as anaerobic digestion, thickening, dewatering and stabilisation units established for the treatment of sludge from wastewater treatment plants (WWTP), which are evaluated as a whole within the WWTP design during the project approval process,

Liquid and Solid Fermented Product Quality and Utilis

*The fermented product can be used as a liquid or solid by dewatering.

Products with dry matter ratios up to 15 % are considered liquid fermented products.

*In case the fermented product is dewatered, necessary procedures are applied to ensure that the solid and liquid fermented product obtained meets the values specified in the Regulation on Organic, Mineral and Microbial Source Fertilisers Used in Agriculture published in the Official Gazette dated 23/2/2018 and numbered 30341.

Compost Communiqué

O.G. dated 05/03/2015 and numbered 29286.
(Amended:OG-28/7/2017- 30137
OG-30/9/2020-31260
OG-15/9/2022-31954)

Product produced by decomposing organic based wastes in oxygenated or anaerobic environment

Objective

Determine the procedures and principles regarding the following;

To ensure separate collection at source and management,

To reduce the amount to be disposed of in sanitary landfill facilities,

To determine the technical criteria of composting facilities,

Management of products obtained from composting facilities.

Utilisation of Compost

In the use of the product obtained as a result of the processes carried out in the compost facility;

The criteria in the Regulation on Organic, Mineral and Microbial Source Fertilisers Used in Agriculture published in the Official Gazette dated 23/2/2018 and numbered 30341 are provided.

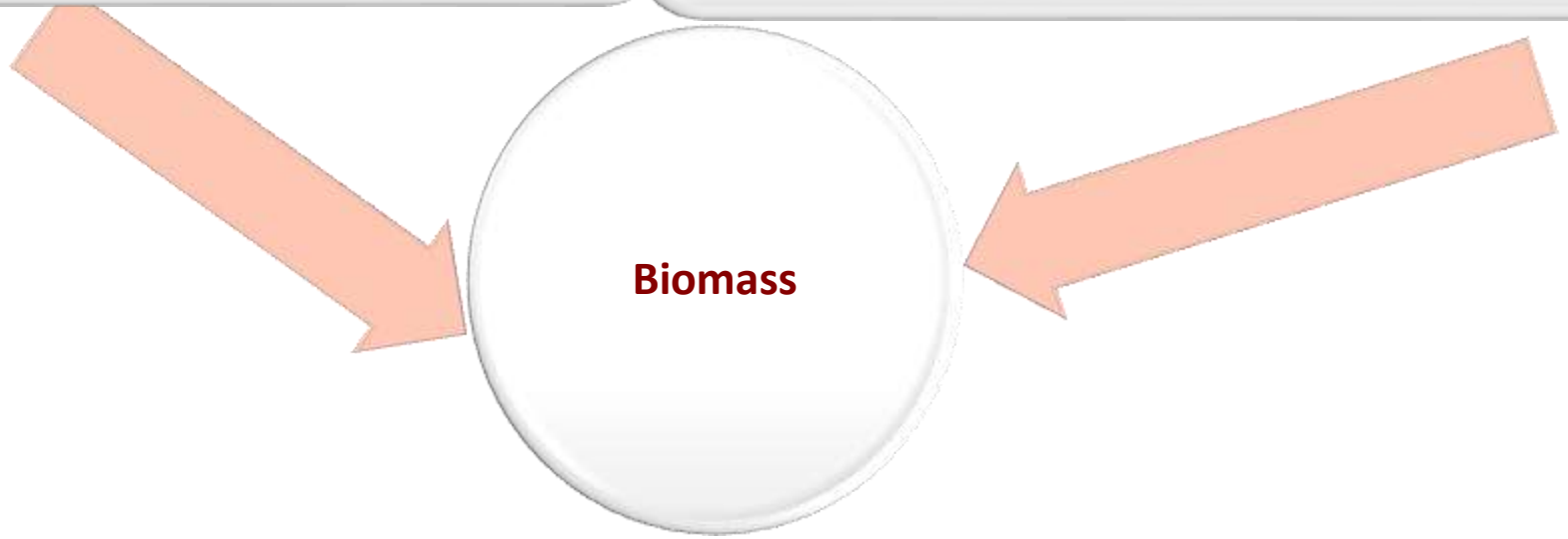
Definition of Biomass

Law No. 5346 on the Utilisation of Renewable Energy Resources for Electricity Generation

«Provided that they are not imported; municipal wastes (including landfill gas) as well as vegetable oil wastes, agricultural wastes without food and feed value, forest products other than industrial wood and resources obtained from by-products of the processing of waste tyres, industrial waste sludge and sewage sludge»

Regulation on Control of Industrial Air Pollution

«Products consisting of all or part of plant materials that are agricultural or forestry products and can be used as fuel in order to recover all or part of the energy in them, plant waste from agriculture and forestry, plant waste from the food processing industry if the resulting heat can be recovered, wood wastes, except fibrous vegetable wastes generated during pulp production and paper production from pulp, cork waste, wood wastes containing halogenated organic compounds or heavy metals as a result of treatment with wood preservatives and coatings, in particular those resulting from construction or demolition wastes, if they are co-incinerated at the production site and the resulting energy is recovered»

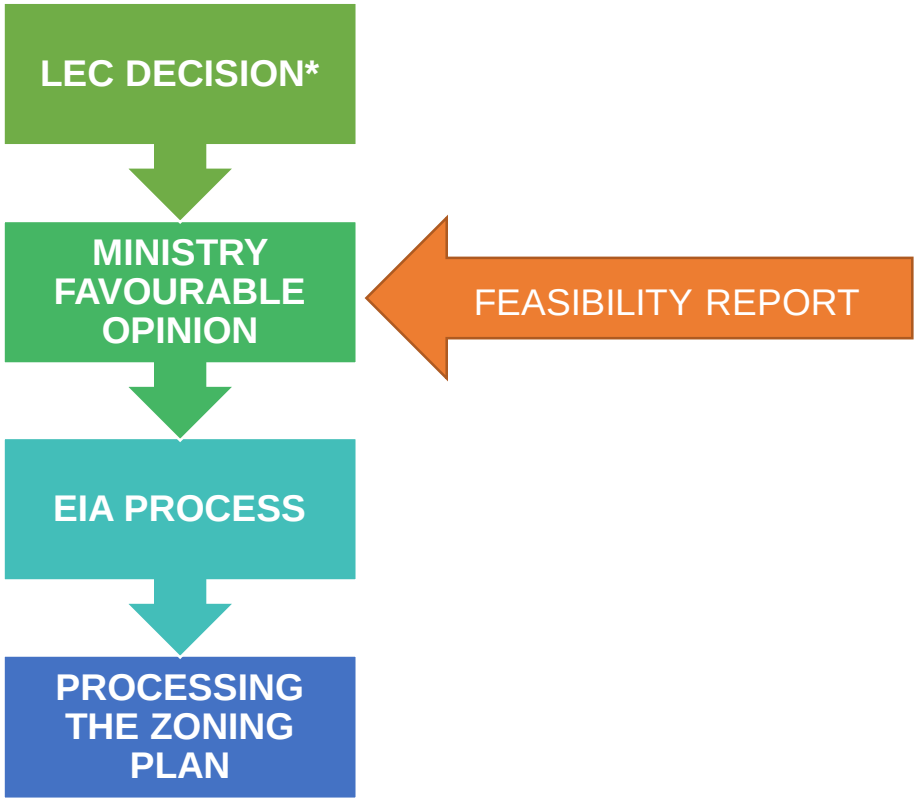


Regulation on Incineration of Wastes

(O.G. dated 06/10/2010 and numbered 27710)

Objective: Preventing and limiting the negative effects on the environment and the risks that may arise from the incineration of wastes with applicable methods

Waste Incineration Directive 2000-76-EC



- Article 6
- Private and legal persons wishing to establish an incineration plant;
- Apply to the Local Environmental Council for the place they have chosen to establish an incineration plant
- Obtaining the appropriate opinion of the Ministry
- Inclusion of the location of the facility in the zoning plan

*It should state that the name of the facility is Waste Incineration Plant. The name of the facility and its capacity must be specified in the LEC Decision and Article 6 of the Regulation on

Thermal Methods in Waste Management Strategies

Yöntemler	Stratejiler
Termal*	Belediye atığı
	1. Öncelikli İller: İstanbul, Ankara, İzmir, Kocaeli
	2. Öncelikli İller: Doğu Karadeniz Bölgesi(İstisna Bölge)
	3. Öncelikli İller: Tesis kapasitenin 500.000 ton/yıl ve üzerinde olması koşuluyla Adana, Aydın, Balıkesir, Bursa, Gaziantep, Hatay, Kayseri, Konya, Manisa, Mersin, Muğla İlleri.
Mekanik Biyolojik Arıtım	Belediye atığı
Biyometanizasyon	Kaynağında ayrı toplanmış biyobozunur atıklar
	365.000 ton/yıl ve üzerinde atık üreten iller (kaynağında ayrı toplanmış en az 100 ton/gün biyobozunur atık)
	Turistik alanlar ve otel bölgeleri
	Hayvansal ve tarımsal atık potansiyeli bulunan iller
Kompost	Kaynağında ayrı toplanan belediye atıklarına ilave olarak tarım atığı, hayvansal gübre ve orman atıkları da dikkate alınabilir.
	İl merkezlerinde kaynağında ayrı toplanmış en az 50 ton/gün biyobozunur atık
	Tarım ve orman alanlarının yoğunluğu
	Tarım, orman ve hayvansal atık miktarları
Düzenli Depolama	Düzenli depolama tesisi olmayan iller

Regulation on General Principles of Waste Pretreatment and Recovery Facilities

Fertiliser production facilities that produce fertiliser from animal wastes that are not covered by the Regulation on Animal By-Products Not Intended for Human Consumption are considered as non-hazardous waste recovery facilities under the 'Regulation on General Principles of Waste Pretreatment and Recovery Facilities'.

Evaluation

- Producing solutions to environmental problems by processing wastes,
- Feasibility study in the planning of facilities,
- Optimisation of waste collection and transport,
- Evaluating the facilities as waste processing facilities rather than energy production facilities and ensuring material recovery,
- Obtaining a product as a result of waste processing and prioritising the use of this product,
- Producing regional and holistic solutions with an integrated facility approach.

THANK YOU.

This project is co-funded by the European Union and the Republic of Türkiye

Thanks for your attention.

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