



WASTE MANAGEMENT

Waste treatment



TYPES OF WASTE

- Hazardous waste (at least one of hazardous properties- toxicity, flammable, oxidative..)
 - Industrial waste from the production
 - Waste from laboratories, hospitals,
 - Secondary waste from waste treatment
- Non-hazardous waste
 - Municipal solid waste – end-of-life waste
 - Secondary waste from waste treatment



TYPES OF WASTE

- We can find hazardous waste in MSW
 - Batteries
 - Pesticides
 - Drugs
 - Fluorescent lamps



TYPES OF WASTE

- MSW contains
 - Biodegradable waste
 - Plastics
 - Glass
 - Metals
 - Paper
 - Hazardous waste
 - Residues



MSW TREATMENT

- We can separate about 30 – 60 % of materials able to recycle. The rest is a wet mixture of kitchen waste and residues.
- Mechanical – biological waste treatment:
 - SORTING bulky waste, hazardous components of the waste
 - Crushing of waste and moving by conveyors
 - Separation with magnetic and air, gravity separators
 - Aerobic composting and fermentation



MSW TREATMENT

- PRODUCTS:
 - metals, light fraction, heavy fraction, and compost light fraction – used as SAF solid alternative fuel



MSW TREATMENT

- WASTE TO ENERGY –
 - SORTING with magnetic separators, optical sensors
 - oxidation
 - PRODUCTS
 - ash – Hazardous waste containing metals (can be recycled)
 - slag – non hazardous waste (can be used for road construction)
 - energy



MSW TREATMENT

- LANDFILLING
 - Dumping of waste into specially modified reinforced place with the drainage system of water and gas drainage.
 - PRODUCTS
 - biogas
- But, it is still wasting with the waste potencial!



INDUSTRIAL WASTE

- Solids - sludge
- Liquids - wastewater
- Gaseous – waste gases



INDUSTRIAL WASTE COMPOSITION

- These are substances that, due to their chemical composition, are harmful to the environment, contain, for example, heavy metals, do not have a neutral pH, are flammable, explosive, or corrosive.



INDUSTRIAL WASTE COMPOSITION

- Combustion – Waste to energy
- Pyrolysis
- Melting
- Thermal decomposition
- PRODUCTS
 - secondary waste, energy, materials
- It is a controlled process of oxidation of waste at elevated temperature, which results in thermal and oxidative destruction of combustible components, mainly of organic nature.



SECONDARY WASTE FROM WASTE TREATMENT

- It is ash, filter ash, slag.
- Ash contains concentrated heavy metals and is, therefore, a waste that is recycled to a greater extent.
- Ash also contains heavy metals and we can obtain metals from, for example, Zinc.
- Slag, on the other hand, is an inert - insoluble material suitable for construction work.



BIOLOGICAL WASTE TREATMENT

- Biological waste treatment processes are based on biosynthesis and biodegradation using microorganisms, the sorption capacity of biomass.
- They are based on natural processes.
- Biological waste treatment is suitable for waste water treatment.