

# About an Integrate System for Waste Management

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**Abstract:** An important issue with regarding the environment protection in Romania is represented by waste management with reference to the activities of collection, transport, treatment, processing, recovery and disposal of waste categories. According to European Union requirements, the waste national strategic management is oriented on two main directions, which covers all types of waste defined by OUG (Emergency Gouvernmental Ordinance) no. 78/2000 with subsequent amendments and additions:

**Keywords:** waste management, integrate system, environment protection.

## 1. Introduction

General objectives of national and European waste management requires the involvement of the entire society, represented by central authorities and local generators of waste, professional associations and research institutes, civil society .

The strategy for waste management is necessary for the development of a system integrated for waste management, efficiently as economic and environmental reason for setting the objectives of Romania in the field - applies to all types of waste, as defined by the GEO 78/2000 on Waste - as amended by Emergency Ordinance no. 61/2006.

The national plan for waste management, identify actions to be taken to implement the strategy and conduct of their responsibilities on time.

The main commitments assumed by Romania in the context of accession to the European Union are defined by a series of European Directive which states the objectives of each part, as follows: 1. Until 31.12.2008 for the achievement of recycling targets - 60% by weight for paper and cardboard - 50% by weight for metal 2. Until 31.12.2011 to achieve the objectives - the overall recovery of 50% - individual recycling of 15% plastic, 15% by weight for wood 3. Up to 31.12.2013 to reach the objective - overall: 55% recycling, recovery of 60% - individual Recycle: 22.5% by weight for plastics, 60% by weight for glass.

## 2. Waste collection

Waste collection requires a rigorous set of actions set, whose uniform implementation at national level was contoured from the conduct of pilot projects, examples in this regard: 2004-2006: pilot projects and awareness of population 2007-2017: Expanding collection Selective nationwide 2017-2022: Implementation of the most difficult areas (rural, mountain areas, etc.). Municipal waste management during the year 2006 have generated over 97 million tons of solid waste, including:

- urban waste - 10.7 million tons
- industrial waste - 84.9 million tons (including sterile mining)
- Agricultural wastes - 0 , 9 million tons
- Other types of waste - 0.4 million tonnes. (hospital waste)

Average percentage composition of household waste in 2006 is presented synthetically in Table 1

Table 1

<b>Materials</b>	<b>%</b>
Paper, cardboard	13,8
Glass	5,5
Metals	2,5
Plastics	11,0
Textiles	3,2
Other materials	64,0
<b>Overall</b>	<b>100,0</b>

In urban areas, municipal waste management is done in organized manner through its own services of specialized firms or city halls health. The proportion of urban population served by health services increased from 73% in 2004 to approx. 90% in 2008.

In rural areas, there is no organized services, for waste management, transportation to places of storage is being made by individual generators. Are served by organized services for waste management only a small part of rural areas and in particular only those rural villages located near urban centers. In 2006, approx. 5% of rural population was served by health services.

The amount of municipal waste generated varies from year to year, are recorded in the last 6 years a general trend of growth, determined as of population growth and increasing proportion of the population served by household services comunala11. Data on the generation and management of municipal waste in 2004-2008 are presented in the following graphic:

Quantity[ thousand tons]

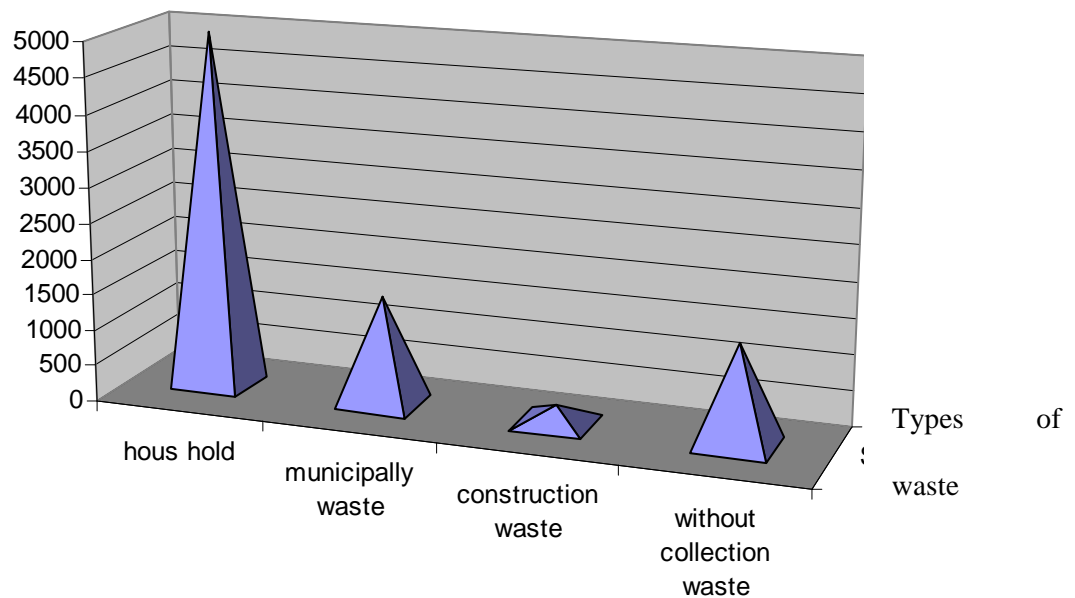


Fig.1. Evolution of waste quantity on types on 2008 year

Of the total amount of municipal waste, most is waste and household equivalent, generated from households, from economic, commercial, offices, institutions, medical units. Composition has varied in recent years, the largest share with a biodegradable waste (excluding paper and cardboard) were approx. 51% of the total waste collected. Prognosis generation of municipal waste was based on population growth prognosis type of living environment, taking into account the increasing consumption of goods to the population, so national plan for waste management estimates an increase average of 0.8% per annum of the amount of municipal waste generated.

### 3. Managing household

Waste from municipal waste total, approximately 40% of the municipal waste is recyclable materials, of which approx. 20% can be recovered, not contaminated. Following selective collection pilot projects, only 2% of the total recyclable materials generated are capitalized. The rest is removed by storage pierzându is so large quantities of secondary raw materials and energy resources.

In recent years, private agencies began sustained action to collect the cardboard and PET sites. In some localities is going from the location of "points of the submission / collection" in which people can lodge (with or without pay) waste, cardboard, bottles, plastic. In Romania, the institutions of the glass industry, paper and cardboard and plastics are authorized and began to take the waste collection points for recycling and / or recovery.

In some cities have stations set up pilot composting of biodegradable waste.

Storage is the main form of municipal waste disposal and is according with Directive 1999/31/EC on waste disposal were analysed in early 2004.

In Romania there are 267 landfills for municipal urban area (receiving waste collected by waste companies in urban areas), of which: - 16 stores are complying or have become in accordance with European norms to 31.12.2006 - 238 landfills do not comply with European requirements, which will stop the storage step-by-step until the year 2017;

From 16 landfills, 11 were built before the introduction of national legislation with European rules on landfills, but is in accordance of the constructively with them (Constanta, Chiajna Braila, Piatra Neamt, Sighisoara, Sibiu - Cristian , Ploiesti-Boldesti, Vidra, Glina, Baicoi and Campina-money), they do not require major investments for compliance, but only to enhance operating activities and monitoring and 3.55 million Euros. 5 other stores were built in accordance with the European data and service in 2003-2004 (Brasov, Buzau-Galbinasi, Arad, Slobozia, Costinesti). The cost of investment, necessary to ensure if the municipal landfills existed, was estimated at 1775 million Euros.

Following the accession negotiations for the chapter Environment, Romania has undertaken to cease storage 137 stores in the urban area representing approx. 427 ha to 16 July 2009 and the 101 municipal landfills remaining representing approx. 301 ha, between 16 July 2009 and 16 July 2017.

In addition to municipal landfills in the urban area, in Romania there are 2686 spaces in the storage area with a rural area less than 1 ha. Closing rural deposits and greening will be up to 16.07.2009, with the expansion of waste collection and rural level, the transport system, transfer of deposits and opening area.

Based on prognozei generation and management of hazardous waste specified in the National Waste Management, it was agreed that it is necessary to provide additional capacity for storage of hazardous waste, both municipal waste and hazardous waste production can be stored together with waste municipal level.

It is estimated that over 16 stores in Romania is also required construction of 49 storage spaces for non-hazardous waste, with capacities 50.000-100.000 t / year. Currently, in Romania there are installations in operation for a thermal treatment municipal solid waste. The composition and characteristics of domestic waste in Romania (eg moisture content of approx. 50% biodegradable substances contained in the approx. 50% and calorific value of less than 8400 kJ / kg) and higher costs of this method of waste disposal not permit the incineration of waste at this time and can be considered as feasible, economically and socially, as Romania will be able to build installations for the incineration of municipal waste only after the year 2016.

#### **4. Managing mud from municipal waste water treatment**

Currently, most of the mud generated from municipal wastewater treatment is treated by different methods and stored on land belonging to the cleaning stations; only a small part of the quantity produced annually is used in agriculture.

The legal framework for agricultural recovery of mud was created by the transposition of Directive 86/278 on environmental protection and in particular of soil, mud when cleaning is used in agriculture, through order MEWM 49 / 2004 for approval of technical norms and environmental protection in particular soil, when sewage sludge is used in agriculture.

It intends to encourage agricultural recovery of this type of mud, and create the conditions necessary to ensure the elimination of the best methods, both in terms of cost and environmental protection.

#### **5. Waste management in construction and demolition**

Waste quantity of construction and demolition generated in Romania is relatively low, but it forecast an increase, determined by the economic development of the country. As regards the recovery of waste from construction and demolition there is a well established, just a re-use in international household own or on a trading market undeclared.

## 6. Waste from industrial production

These types of waste are represented by industrial and agricultural waste, including those resulting from energy production. Organization of the management of production waste generator is required, by its own means or by contracting the services of specialized companies.

Currently, there are very few companies that have the field of waste production and the services they provide are limited both in terms of types of waste, and capacity for work.

During 2008, the amount of waste generated by mining and industry, was 386 million tons, of which most (90%) are wastes resulting from mining activities (mining) - 341 million tonnes and 40.5 million tonnes are waste production industry and agriculture.

Economic activities in which were the largest quantities of waste in 2006, with the exception of extractive industry, the petrochemical industry have been, chemical, rubber and plastics (27%), metallurgy and metal construction (17%) energy (13%), food, beverages, tobacco (10%), other economic activities (33%).

Major industries generating waste is the energy industry, chemical and petrochemical, metallurgy, food industry. Quantity of waste generated by production, approx. 30% recovered, the rest being disposed of by incineration or storage. In the year 2006 were disposed of by incineration / co-incineration plants about 2 million tons of waste (primarily waste fuel).

In 2008, operating 6 for hazardous waste incinerators, belonging to private agents; incinerators 8, owned by 4 private operators.

Waste quantity [x 10 thousand tons]

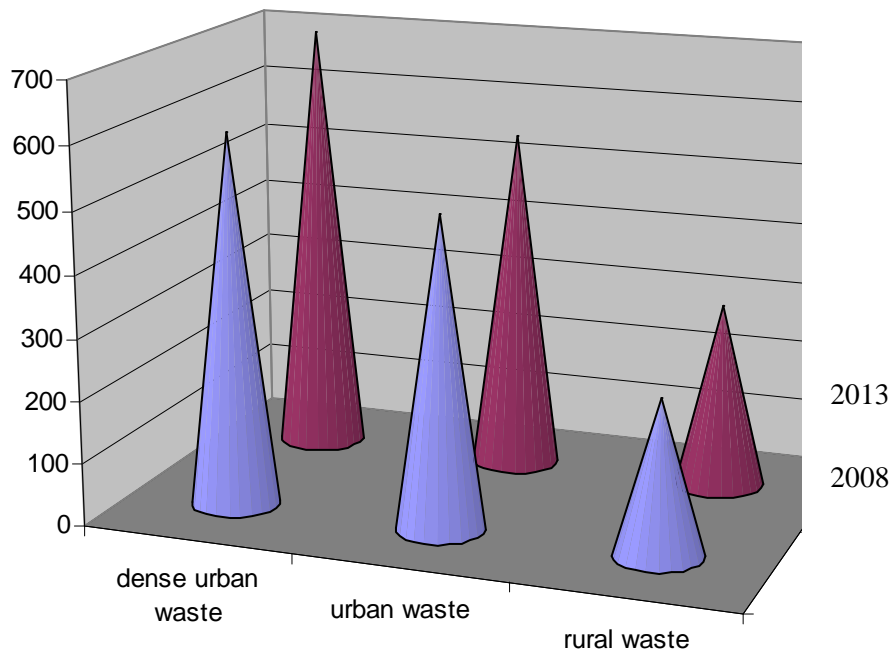


Fig.2. Waste quantity evolution on 2008 year and prevision on 2013 year

- dense urban environment (dense urban) = 50 cities with over 1000 inhabitants (cities with over 50,000 inhabitants).

- urban environment (urban) = cities with less than 50 000 inhabitants (cities with less than 5• 0,000 inhabitants)
- rural environment (rural) - kg / inhab / year (kg / capita / year)

## **7. Management of medical waste**

Waste from medical activities is currently regulated by the Minister of Health and Family no. 219/2002 which approves the rules on technical management of waste from medical activities and methodology of data collection for the national data. Of the total amount of waste produced in health units, 75-90% are non-hazardous waste, equivalent to the household and only 10-25% are hazardous waste.

Hazardous medical waste is destroyed in incinerators, direct incineration plant for heat treatment. Final disposal of hazardous waste resulting from medical activities in 2006 was as follows: 76% of health units were used for final disposal crematoriul own 13% used another crematoriul units, 7.5% were burned in hazardous waste facilities or improvised outdoors, 6% were removed in the final waste incinerators.

Hazardous wastes that result from medical activities represent approximately 30% of the total 19,000 tons / year.

## **8. Conclusion**

The environmental European policies must be accorded with the national environmental policies. For that is created SOP Environment (Sectorial Operational Program for environmental infrastructure) that has been prepared in accordance with EU regulations on the Structural Funds, establishing the general provisions on the European Regional Development Fund, European Social Fund and Cohesion Fund .

It contributes substantially to the overall objectives of Romania has decided the new policy for EU cohesion, reducing the gap between Member States and the less developed EU by improving conditions for economic growth and employment of labor, improving the quality of investments physical and human capital, innovation and development of knowledge based society, adaptability to changing social and economic improvement and environmental protection and administrative capacity.

Thus, SOP environmental priorities with predilection providing investment for the expansion and improvement of infrastructure for water and sewage, waste, improve air quality and developing appropriate management systems for nature protection and flood prevention. POS Environment is also in close correlation with the European Strategy for Sustainable Development (Goteborg 2001) and the 6 th Environmental Action Program (2001 to 2010).

Defining priority areas of action for environmental policy at European level in the - 6th Environmental Action Program: nature protection and biodiversity, health in relation to the environment, conserve natural resources and waste management - can be found in the three priorities of SOP Environment to develop regional management systems for utilities and waste water, the investment in sustainable development and environmental management systems for nature protection and flood prevention.

In SOP Environment priorities are reflected in the European Strategy for Sustainable Development about responsible management of natural resources and human health, priority will be realized by achieving adequate standards of water and increasing population access to water and sanitation, and use of management systems integrated waste.

All projects funded environmental SOP Environment will contribute to the protection and improvement of the environment, respecting the polluter pays principle, the principle of prevention and the precautionary

principle. These will be subject to national, harmonized with the community on environmental impact assessment.

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