

**“INTEGRATED MUNICIPAL SOLID WASTE MANAGEMENT IN ROMANIA.
CASE STUDY – REGION 8 – BUCHAREST – ILFOV”**

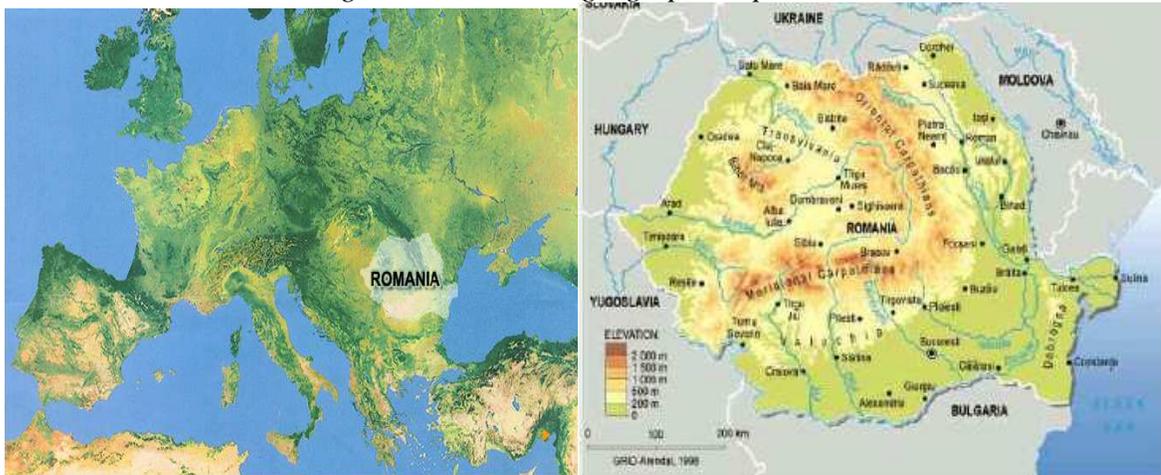
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1. General information

Romania is situated in the south-eastern part of Europe in the crossing point of the main European communication axes: west-south east and north-south east. Her neighbours are the following: Ukraine in the North, Republic of Moldavia in the East, Bulgaria in the South and Hungary in the West.

Figure 1 - Romanian geographical position



The Romanian geographical position and border lengths are presented in Tables 1 and 2.

Table 1 - Geographical position of Romania

	Extreme point	County	Eastern longitude¹⁾	Northern latitude
North	The Horodiștea village	Botosani	26 ⁰ 42'05"	48 ⁰ 15'06"
South	The Zimnicea town	Teleorman	25 ⁰ 23'32"	43 ⁰ 37'07"
East	The Sulina town	Tulcea	29 ⁰ 41'24"	45 ⁰ 09'36"
West	The Beba Veche village	Timis	20 ⁰ 15'44"	46 ⁰ 07'27"

¹⁾according to Greenwich

Table 2 - Length of Romanian borders

Borders	Border lengths (km)			
	Total	Land	River	Sea
Total borders	3149.9	1085.6	1816.9	247.4
Bulgaria	631.3	139.1	470.0	22.2
Yugoslavia	546.4	256.8	289.6	-
Republic of Moldova	681.3	-	681.3	-
Ukraine	649.4	273.8	343.9	31.7
Hungary	448.0	415.9	32.1	-
Black Sea	193.5	-	-	193.5

Comparing with other European States, Romania is a mean dimension country having a surface of 238,391 Km² (13th European country) and a population of 21,584,365 inhabitants.

Romania's climate is a temperate-continental of transition, with oceanic influences from West, Mediterranean from South-West and continental excessive from the North-East.

annual precipitations decrease in intensity from West to East, amounting from 600 mm to 500 mm in the Romanian Plains to below 400 mm in Dobrogea, while in the mountain areas they reach 1,000 to 1,400 mm.

From the administration point of view Romania is divided in 41 counties, including 266 cities and towns and 2,689 villages. In order to reach the basic objectives of the regional development policy, the Law No. 151/1998 set up to create 8 development regions, gathering together voluntarily the counties. The development regions are not administrative-territorial units or legal entities (Figure 2).

Figure 2 - Administrative map of Romania

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The main cities are the following Bucharest (București), Iași, Constanța, Cluj-Napoca, Timișoara, Galați, Craiova, Brașov, Ploiești, Brăila.

Bucharest is the most populated and the most important city of Romania, the main political, administrative, economical, financial, bank, and educational, cultural and scientific centre.

Population

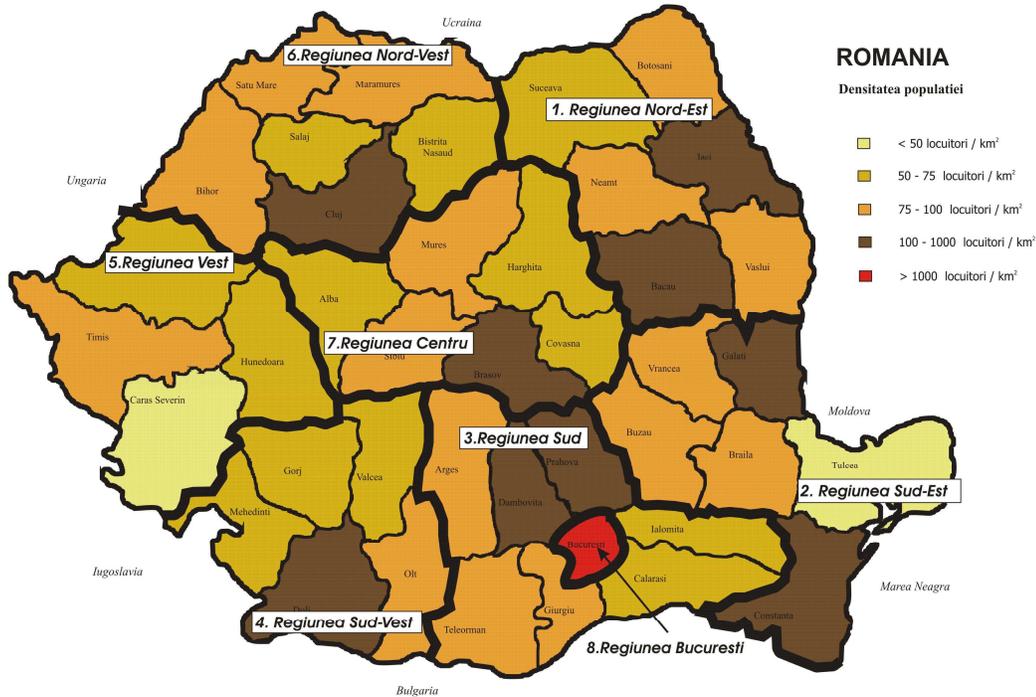
- July 1990 – 23,206,720 inhabitants;
- July 2006 – 21,584,365 inhabitants.

Classification of counties and localities by inhabitants number, on July 1, 2006

- municipalities and town – 319 from which 25 with a population of 100,000 to 1,000,000 and 294 with a population under 99,999 inhabitants;
- communes – 2,854 from which 2,765 with a population between 2,000 and 4,999 inhabitants (60%).

Population density on July, 1, 2006 is presented in the Figure I.3. At the national level the population density is 90.5 inhabitants/km². (95.7 inhabitants in 1994).

Figure 3 - Population density in Romania- 2006



2. Economic Conditions

Romania's entire development in the last decade is characterized and influenced by the process that started after 1989 of transition from the old economic and social system to a new one, from the administrative, command economy to the market economy, from a mostly self-centered economy to an economy integrating in the EU and world structures. This process of structural and qualitative changes is unprecedented in the history – not only in Romania but in the entire world history – through its deepness and complexity, through the novelty of the problems, the social costs it implies and the changes in the people's life and their social status.

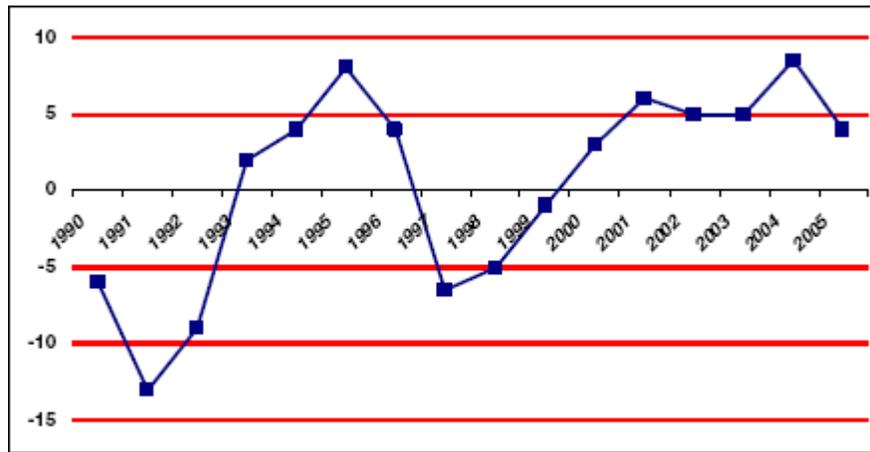
The main economic indicator is the Gross Domestic Product (GDP), which is the value of the goods and services resulted from the production processes within the national economy in order to be consumed, invested, stored or exported.

The evolution of the Gross Domestic Product was estimated in comparable conditions from the methodological point of view and in Table 3 and Figure 4.

Table 3 - Gross Domestic Product Evolution (million lei)

Categories of Resources	2001	2006
Gross added value	104,283.7	304,154.7
Gross domestic product – Total	116,768.7	344,535.5
Gross domestic product per inhabitant (x1,000 lei)	5,210.9	15,962.3
Private sector share of GDP (%)	68	71.8
Gross national income	115,953.5	333,097

Figure 4 – Gross Domestic Product Evolution



Compared to 1990, the services – for both the population and the units – directly conditioned by the income increases and functional character improvement of the market economy recorded a significant progress in 2004.

3. Legislation

EU legislation on the Waste Management was transposed in Romania at the level of 100%.

The waste management is based on Romanian National Strategy for Waste Management (RNSWM) and National Plan for Waste Management – approved in 2004 – by Government Decision No. 1470/2004.

Ministry of Environment and Sustainable Development is preparing a new RNSWM for the period 2008 – 2015, which will take into consideration all the requirements of the Thematic Strategy on Waste Prevention and Recycling – COM(2005)666, Thematic Strategy on Sustainable Use of Natural Resources – COM(2005)670, Thematic Strategy on Urban Environment – COM(2005)718, New Framework Directive on Waste, European Strategy for Sustainable Development, Sustainable Consumption and Production (SCP), Environmental Technology Action Plan (ETAP), Thematic Strategy on Soil Protection, aso.

The general objective of RNSWM 2008 is: *Environmental protection and health population protection through generation of low quantities of waste that will be sustainable managed with the reduction of impact on the environment.*

EU legislation on public services continues to be implemented in Romania and revisited periodically. With respect at EU legislation on public services should be mentioned that in the present legislation there are not provisions on Public-Private-Partnership.

The activity of waste management in Romania is controlled through the regulations of:

- Ministry of Environment and Water Management – environmental permit, directly or through National Environmental Agency, Regional Environmental Protection Agencies (control the permits for the investments and activities there are under the IPPC Directive) and County Environmental Agencies;
- Ministry of Economy and Trade – revaluation permit.
- National Authority for Public Services – licensing;
- National Environmental Guard – enforcement;
- Local authorities – work permit for operation;

4. Local conditions of Waste Management in Romania

One of the most serious problems of the environmental protection field is the waste generation in large quantities and their inadequate management.

With respect at the municipal waste, the collection and disposal of municipal waste is the municipality responsibility, directly, through the specialised departments within the Local Boards, or indirectly – by granting this duty to special sanitation services, on a contract basis. The sanitation services exist and operate mainly in the urban areas. It is estimated that only 10% from the rural population did not benefit from these services (mainly the rural localities which are in the proximity of cities).

At present, in Romania the situation is characterised by the following:

- a low level of cleanness and modest actions of sanitation in most of the towns;
- the lack of sanitation actions in communes and villages excepting several communes located near the great towns;
- the lack of civic sense of the majority of population as regards cleanness as result of some major deficiencies related to education, information and the lack of sustained actions on the part of the competent institutions, especially schools and town halls;
- taking into consideration the above mentioned, the European objectives, which are being overtaken in Romanian legislation and contain extremely severe provisions create a significant discrepancy and major difficulties in their application and observance;
- budgets of austerity which do not provide funds for important sectors of environmental protection, in general, and sanitation, in particular;
- insufficient support rendered by competent state bodies to private sector;
- Insufficient actions of ecological parties and non- governmental organisations to promote solutions and measures of cleaning, namely sanitation.

In order to improve the existing situation and to respect the EU legislation, Romania asked for a period of transition for the Chapter 22 – Environment.

The main important aspects are presented above.

Landfill

- 2013 – closure of 238 existing municipal landfills which are not in compliance with EU regulations;
- Construction of 65 municipal landfills which are in compliance with EU regulations (min. capacity of 100,000 t/year – regional) – transfer stations;
- 2016 – reduction of the quantity of solid waste disposed in 101 municipal non-hazardous waste which are not in compliance with EU regulations;
- 2013 – reduction of the quantity of liquid waste disposed in 23 plants which are not in compliance with EU regulations;
- 2006 – 2011 – reduction of the quantity of liquid waste disposed in five sedimentation ponds which are not in compliance with EU regulations.

Biodegradable waste management

The Strategy provides to reduce the removal by landfills of biodegradable waste:

- by 25% up to 2011;
- by 50% up to 2015;
- by 65% up to 2016,

compared with the quantities generated in 1995.

Selective collecting of packaging waste – M.O. No. 1281/2005

Containers – inscriptions and colours

- Non - recyclable waste – black/grey;
- Biodegradable waste – brown;
- Paper/cardboard – blue;
- Glass white/coloured – white/green;
- Ferrous and plastic – yellow;
- Hazardous waste – red.

Packaging and packaging waste (directive 94/62/ce)

- 2013 – recycling target level - 55%
- 2013 – revaluation target level – 62%

WEEE (Directive 2002/96/CE)

Targets:

31.12.2008 – 4 kg WEEE/inhabitant/year

31.12.2008 – recovery and recycling ...

Incineration of waste

Transition period until 2009 for the close-up of 335 crematoria located in the hospital and construction of 8 regional incineration plants for medical hazardous waste and one national incineration plant for industrial hazardous waste.

Different programs, absolutely necessary to fulfil the legislation requirements, will be implemented in Romania in the period 2008 - 2016:

- construction of 65 new landfills in compliance with UE and Romanian legislation; except the existing 20 should be constructed other 45 new landfills;
- transfer station at the level of each county for small localities;
- regional sorting plants;
- recycling plants;
- composting plants;

- construction of 8 incinerators for medical waste (one for each region);
- construction of an industrial hazardous waste incinerator, estimated capacity 62,000 tons/year;
- co incineration of some municipal waste categories in the cement kilns;
- construction of municipal incineration plants with minimum capacity of 150,000 tons/year (each); locations in Region 1, Region 6 and Region 8.

The tendency is to build, as much as possible under technical and economical point of view, regional waste treatment platforms for treatment- recycling and final disposal of municipal waste.

For the moment the existing projects are connected with the construction of new landfills with the obligation the close-up the existing landfill, but the Romanian investors analyse the extension of the existing projects with sorting and recycling stations for municipal waste, WEEE, used oils, aso.

In order to be economically feasible, the locations of the regional waste treatment platforms will be located near the big cities.

5. National Statistic Data (2006)

In 2006 the total quantity of waste generated has been 320,609 thousand tons, from which 99.7% represented non hazardous waste.

Table 4 – Waste generated in 2006 in Romania

Type	Hazardous Waste		Non Hazardous Waste		Total	
	Tons	%	Tons	%	Tons	%
Mining industry	497,588	0.25	198,751,713	99.75	199,249,301	100
Industry (minus mining)	555,227	0.49	111,938,335	99.51	112,493,562	100
Municipal waste	x	x	8,866,424	100	8,866,424	100
Total	1,052,815	0.33	319,556,472	99.67	320,609,287	100

Recovery of industrial waste

Quantities of industrial waste (hazardous and non hazardous) recovered in 2006 was 12,511 thousand tons (4% of the total generated quantities) and the most important sector were in metallurgic industry (18.78), wood industry (8.99%) and waste recycling (34.30%)

Waste Disposal

Disposal system is land filling - 98%.

Municipal Waste

Collection

In 2006, the total quantities of municipal waste collected, directly, through the specialised departments within the Local Boards, or indirectly by granting this duty to special sanitation services on a contract basis, was 6,809,000 tons.

Selective collection represented only 2% from the total generated quantity.

Urban population percentage which benefits from sanitation was 79.53% and the percentage in the rural area was 11.44%. Table 5 presents the percentages for each development regions and at national level.

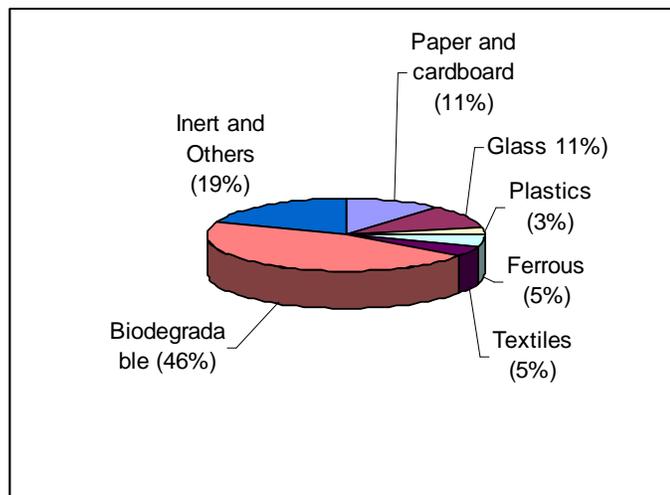
Table 5 – Percentage of urban and rural population which benefits from sanitation

Region	Total (%)	Urban (%)	Rural (%)
Region 1 – North - East	35.82	76.88	4.40
Region 2 – South - East	46.99	84.30	0.52
Region 3 – South Muntenia	40.91	82.19	11.39
Region 4 – South – West Oltenia	32.18	64.82	2.53
Region 5 - West	57.40	84.92	9.44
Region 6 – North - West	52.76	77.23	25.21
Region 7 - Center	63.22	84.80	30.99
Region 8 – Bucharest - Ilfov	73.66	78.47	27.93
Total	48.84	79.53	11.44

From the collected quantity of 6.808,837 thousand tons, 78.76 represented household and assimilative waste, 14.28% municipal services waste (streets cleaning, litter, green waste, markets) and 6.96% construction and demolition waste.

Figure 5 presents the composition of household and assimilative waste from municipal waste at the national level.

Figure 5 - Composition of household and assimilative waste – Romania - 2006



At the national level, is considered that the household waste production is at the level of 0.9 kg per inhabitant and day in urban areas and 0.4 kg per inhabitant and day in rural areas (those figures are presented in all the Regional Waste Management Plans and some of the operators prefer to keep those figures and not the real figures that in some cases are lower, mainly in the cities located in “disadvantageous areas”).

The present information on household characteristics should be considered as a start for feasibility studies and should be establish for each area during a characterization campaign of one year.

In Table 6 are presented the results for 2003 and 2006 for all the regions.

Table 6 – Composition of municipal waste in 2003 and 2006 in Romania

Region Compozition	R1		R2		R3		R4		R5		R6		R7		R8	
	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006
Paper and cardboard (%)	11	10.4	9	8	6	12	11	10.6	10	14.6	16	12.5	11	11.7	15	10.6
Glass (%)	5	8	4	7.9	3	10.6	5	10.2	4	14	4	10.6	6	15.2	7	10.2
Plastics (%)	10	1.8	3	3	3	3.8	8	2.6	4	3.3	14	3.4	8	2.6	12	3.2
Ferrous (%)	5	4.2	3	2.3	8	6	5	4.2	6	7.8	5	6.5	3	4.4	4	5.6
Textiles (%)	4	4.1	3	4.3	3	6	3	3.8	3	3.2	4	4.6	3	5.2	3	4.3
Biodegradable (%)	51	53.4	59	53.7	66	43.2	54	50	58	38.3	42	40.1	53	47.8	50	45.3
Inert and Others (%)	14	18.1	19	20.7	11	18.4	14	18.6	15	18.8	15	22.3	16	13.1	9	20.8

Comments:

- biodegradable waste – the values decrease in 2006 comparing with 2003 in seven regions and increase only in Region 1; it is feasible, because Region 1 is considered to be one of the poorest region in UE;
- the figures cover both the urban and rural areas; for rural areas there is only one information from 2004 – rural area near Braila (see Table 7);
- plastics – the figures decrease, except Region 3, and that due to the private companies that started after 2004 to collect the plastic packaging and plastic packaging waste; as result the quantities of the plastic waste collected by public and private operators (collection, transport, landfill) decreased;

Table 7 – Composition of household in one rural area in Romania

Compozition	%
Paper and cardboard (%)	8
Glass (%)	13
Plastics (%)	15
Ferrous (%)	1
Textiles (%)	1
Biodegradable (%)	54
Inert and Others (%)	8

With respect at other characteristics of municipal waste, based on the existing information, the estimated values are:

- *Humidity*
 - urban areas – 45 – 50%;
 - rural areas – 50 – 60%
- *Calorific value*
 - urban areas – 900 – 1,800 Kcal/kg;
 - rural areas – 300 – 650 Kcal/kg
- *Density*
 - in container – average - 0.25 t/m³
 - in truck – average 0.4 t/m³
 - landfill – average 0.7 t/m³

- *Maximum level of compactness*

- the trucks manufacturers maximum value is consider to be 1:6, but the existing trucks in Romania operate with a maximum value of 1:4..5.

Transfer stations

Two in operation and five in construction (capacities of 9,000 – 12,000 equivalent inhabitants).

Sorting

Five sorting plants are in operation in Romania (two in Buchatrest, one in Constanta, one in Arad and one in Piatra Neamt).

Composting

The existing processing capacity is 14,350 tons/year. In 2006 the quantity of waste processed was 905 tons and obtained compost quantity was 650 tons.

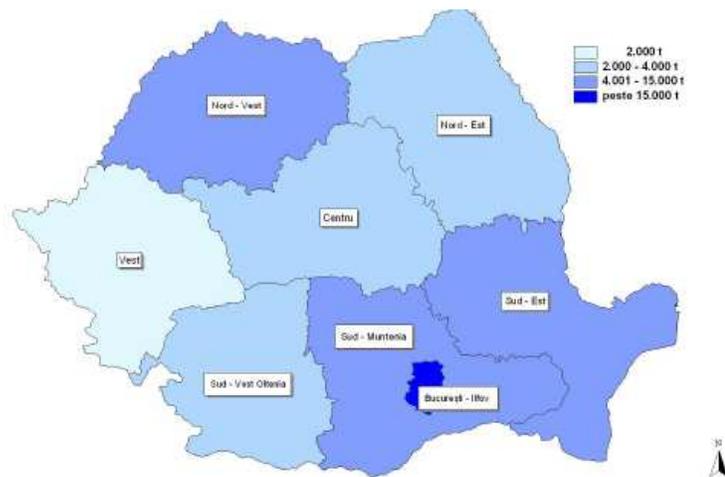
Recovery

In 2006 only 1% of the collected municipal waste were recovered, mainly the paper and cardboard packaging waste. The highest rate of recovery has been registered in the Region 8 – Bucharest – Ilfov. The quantities recovered by materials were:

- plastic – 32,000 tons;
- paper and cardboard – 95,000 tons;
- glass – 530 tons;
- ferrous – 670,000 tons;
- wood – 1,100 tons.

Figure 6 presents the quantities of municipal waste recovered for each Region (tons).

Figure 6 - Quantities of municipal waste recovered for each Region (tons in 2006)



Municipal Waste Disposal

Disposal system is land filling - 99%.

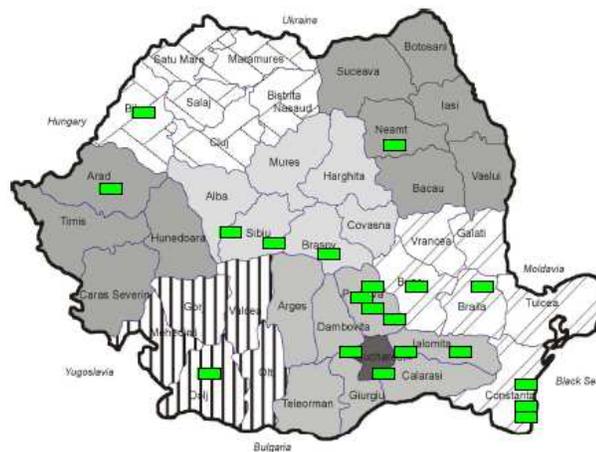
Total number of landfills in Romania is presented in Table 6.

Table 6 – Total number of landfills in Romania (2006)

Region	Number of Municipal Landfills	Surface (ha)	Waste disposed in 2006 (tons)
Region 1 – North - East	29	93.76	804,288
Region 2 – South - East	31	122.14	1,069,892
Region 3 – South Muntenia	31	116.91	798,248
Region 4 – South – West Oltenia	31	64.44	394,503
Region 5 - West	31	132.75	662,985
Region 6 – North - West	33	102.31	1,167,054
Region 7 - Center	50	139.16	932,902
Region 8 – Bucharest - Ilfov	3	27.2	938,020
Total	239	798.67	6,767,892

From the 239 landfills, only 20 are in compliance with the existing legislation requirements (16 on PPP and 2 of municipality).

Figure 7 – Locations of the complying landfills



A prognosis of the future quantities of waste generated in Romania has been performed in 2005 with the assistance of German experts during the draw up of the Strategy and National Plan on Waste Management in Romania. The results are presented above and have been accepted by EC in 2005.

- *Industrial Waste*

The estimation is based on a 10% increase per inhabitant till 2013 comparing with the quantity generated in 2002, which is due to the future development of industrial activities.

Estimated value – 1.225 tons/inhabitant

- *Medical Waste (total) – (estimated reduction of 30%)*

Estimated value – 0.021 tons/inhabitant.

- *Hazardous Medical Waste – (estimated reduction of 60%)*

Estimated value – 0.00348 tons/inhabitant.

- *Municipal Waste*

A value of 0.9 kg/inhabitant and day in urban areas and 0.4 kg/inhabitant and day in rural area in 2006 and a continue increase of 0.8% per year.

The investment costs for the 2008 – 2015 in Romania for the implementation of integrated waste management are estimated at 762,629,000 Euro and detailed in Table 7.

Table 7 – Costs for 2008 – 2015 for municipal waste management in Romania

	Collection/ Transportation	Treatment and Recovery Plants	New Landfills	Closure of existing landfills	Total
Region 1 – North - East	41,257,000	23,400,000	43,524,000	11,910,000	120,091,000
Region 2 – South - East	30,075,000	4,843,000	40,395,000	4,410,000	79,723,000
Region 3 – South Muntenia	30,464,000	9,980,000	4,557,000	6,488,000	51,498,000
Region 4 – South – West Oltenia	29,965,000	49,433,000	39,969,000	8,775,000	129,142,000
Region 5 – West	24,796,000	45,436,000	38,169,000	21,333,000	130,534,000
Region 6 – North - West	7,221,000	23,200,000	44,640,000	21,750,000	96,811,000
Region 7 – Center	10,798,000	18,999,000	51,150,000	20,400,000	101,347,000
Region 8 – Bucharest – Ilfov	10,422,000	29,615,000	7,500,000	5,955,000	53,492,000
Total	184,998,000	204,906,000	264,904,000	102,821,000	762,629,000

6. Statistic Data – Bucharest 2007

- Total Area – 237.5 sq km
- Population – 1,931,236 inhabitants
- Activity Rate – 66% (Unemployment Rate – 4.7%)
- Average Net Nominal Monthly Earnings – 690 Euro/inhabitant
- Dwellings Stock – 785,696 units (30,432,532 sq m)
- Gross Domestic Product – 37,500 million Euro (22,792.5 Euro per inhabitant)
- Turnover – 127,064.4 million Euro (33.9% of the National Turnover)
- Investments – 20,610 million Euro (38.3 of the National Investments)

Quantities and composition of municipal waste generated in 2007 in Bucharest are presented in Table 8 and Table 9

Table 8– Types of Municipal Waste generated in Bucharest in 2007

	Type of waste	Code of waste	Year
			u.m.= tons
			2007
1	Municipal waste, from which	20./15.01	906,450.78
1.1	Mixed household	20.03.01	173,812.92
1.2	Mixed assimilative waste	20.03.01	1,057.05
1.3	Household and assimilative waste collected in separative system (selective collection)	20.01./15.01	634,615.64
1.5	Green Waste	20.02	4,566.6
1.6	Market Waste	20.03.02	9,621.19
1.7	Street Cleaning and Pitter	20.03.03	82,777.384
2	Construction and Demolition Waste	17.	23,577.57
TOTAL			930,028.35

Table 9– Composition of municipal waste in Bucharest in 2007

Compozition	2007
Paper and cardboard (%)	17.22
Glass (%)	7.45
Plastics (%)	14.62
Ferrous (%)	3.24
Textiles (%)	6.50
Biodegradable (%)	40.15
Inert and Others (%)	10.82

Taken into consideration the national and regional plans for waste management in 2007, has been realised the Bucharest Municipal Waste Management Plan for the period 2007 – 2013.

The plan analyse the existing situation and based on prognosis of future generated quantities and evaluation of potential techniques established the necessary capacities, implementation measures, cost implementation and monitoring program for 2010 and 2013.

In the Figure 8 are presented photos of the selective collection pilot-projects and one of the sorting plants of Bucharest.

Figure 8 – Photos of photos of the selective collection pilot-projects, one of the sorting plants of Bucharest and the medical hazardous waste incinerator plant (10,000 tons/year)



The existing management system will be improved until 2013 by:

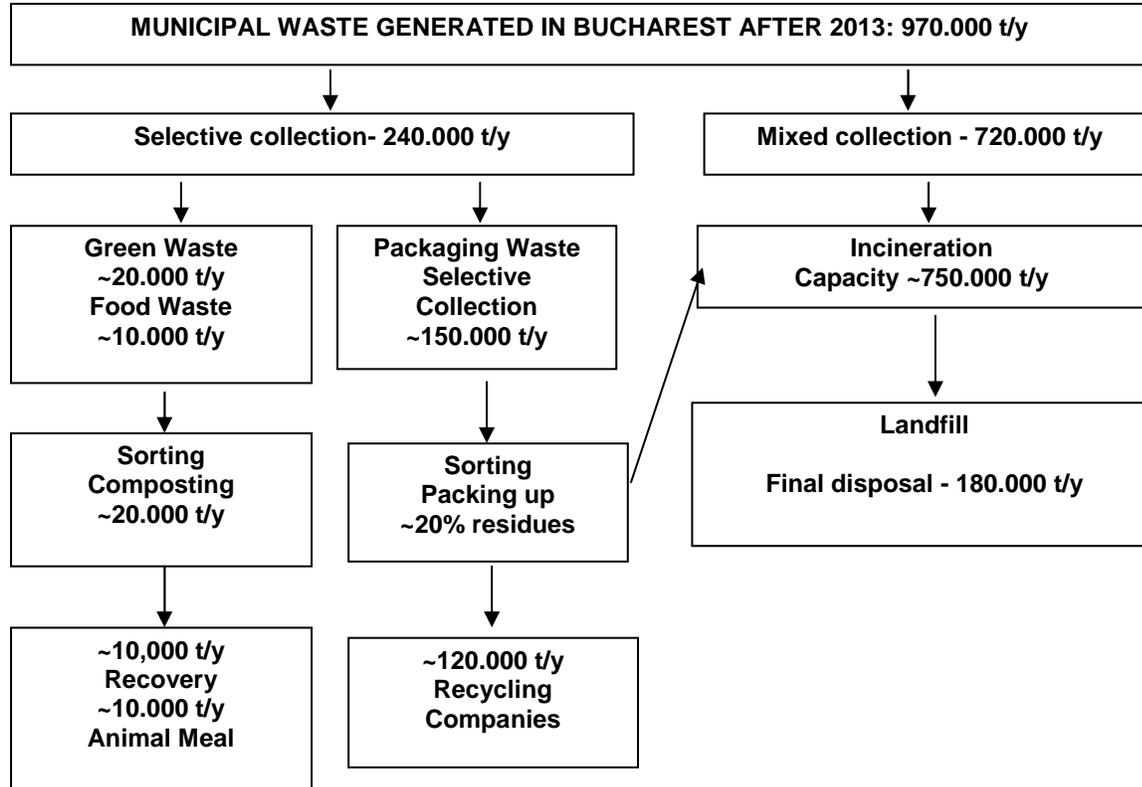
- implementation of selective collection of household and assimilative waste;
- construction of two sorting plants;
- construction of one mechanical biological plant;
- construction of two composting plants;
- modernization of the existing landfills (landfill gas collection and recovery);
- construction of new cells at the existing landfills (estimated surface 1 ha/year);

- construction of a treatment plant for construction and demolition waste recycle (capacity – 80,000 tons/year).

After 2013 is considered that the thermal treatment could be implemented due to the characteristics and the composition of municipal waste in Bucharest combined with the residues resulted from the all ready implemented treatment plants in the period 2008 – 2013.

In the Figure 9 are presented the necessary capacities for waste management after 2013.

Figure 9 – Necessary capacities for municipal waste management after 2013



Results of the evaluation of the implementation costs are presented in Table 10.

Table 10 – Implementation costs – Bucharest – 2008 - 2013

	Comments	Units	Cost per unit (Euro)	TOTAL COSTS (x1000 €)
Collection/Transport				
Containers		39544		1838
Containers - types				
➤ 120 dm ³		12648	35	442,68
➤ 240 dm ³		25896	45	1165,32
➤ 110 dm ³ - for extension		1000	230	230

Collection trucks		27		4490
Compacting Trucks	14 m ³	26	165000	4.290
Special collection Truck		1	200000	200
Infrastructura				
Transfer Stations				
Others Plants		8		30757
Sorting Plants	580.000 t/y - total Existing – 155.000 t/y Difference – 425,000 t/y	3	20.48 E/t	8704
MBT Plant	200,000 t/y	2	80 E/t	16000
Composting Plants	2 plants of 85,000 and 95,000 t/y	2	33.63 E/t	6053
Landfills		6	1500000	7500
Modernization of existing landfills	Landfill gas collection and recovery	3	1000000	3000
New cells at the existing landfills	1 ha/y	3	500000	4500
Closure of the existing uncontrolled discharge areas	28, 39 ha	28	150000	5955
Construction and Demolition Treatment Plant		1	1200	1200
Investment Costs - TOTAL				51736

Maintenance and Operation Costs

For maintenance and operation the costs are estimated as:

- collection/transportation – 22 Euro/ton;
 - sorting – 30.72 Euro/ton;
 - composting – 33.36 Euro/ton ;
 - MBT – 32.02 Euro/ton;
 - disposal at landfill – 3 Euro/ton;
- and in 2013 will represent 45,438,600 Euro.

7. Conclusions

National

To apply the strategy, in general, and the projects in the operational sector, in particular, the following elements should be taken into consideration:

- there is a need of studies to establish the efficiency of the proposed system of collection-treatment-disposal; starting with the characterization of waste using the Romanian Standard - SR 13493/2004 – Methodology for Municipal Waste Characterization - REMECOM
- population, economic agents and institutions should be motivated in order to assume the responsibilities in selective collecting;

- the checking technology requires sorting in ever more sub-products;
- the destination of the waste becomes ever more varied due to the methods of recycling and to the fact that these methods are permanently developed;
- legislation should be harmonised continuously to the technological progress;
- activities of selective collecting, recovery and recycling are not profitable by themselves now and they should be supported by other funds (ex. Romanian Administration of Environmental Fund);
- costs should be reasonable and accepted by the citizens.

Bucharest

Over the mentioned conclusions in case of Bucharest is estimated that starting with 2013 the calorific value of municipal waste (combustible) will be 2,000 kcal/kg and the thermal treatment will represent a feasible option.

The conclusions of the studies performed in the period 2000 – 2007 are that in Romania a first incineration plant (1 unit of 150,000 t/y) could be build near Bucharest due to the following reasons:

- Location is in compliance with the Romanian Waste Strategy and National Plan requirements;
- Interest of the local administration and operators;
- Existing companies specialised in studies, design and construction for a part of the constructions and installations;
- Available data on household waste and municipal composition and characteristics (RDNIIEP Bucharest – characterization campaign – 2002 – 2004)
- Preliminary evaluation (MSDEP, RDNIIEP Bucharest, Polytechnic University of Bucharest, Romanian – German Twinning Project, ADEME – France – 2000-2006);
- EU legislation implemented;
- available quantity of municipal waste – minimum 150,000 tons/year;
- existing consumers for the energy (heat and electricity) produced by the plant.

The plant must respect all the EU and Romanian legislation (Waste-to-Energy concept and Energy Efficiency – 0.65) and the investor have to take into consideration a period of minimum 2 years to obtain the permit.