

Assessment of Costs for Waste Management in the South-East Region

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Abstract: Expenditure on investment associated services to waste management are important. Establishment costs are high about the experience of projects implemented in Romania as well as experience gained in the estimation of the costs of equipment and waste management. Currently, the Regional Plan of Waste Management, at the time of analysis, there is precise information on the site in November capabilities (storage, transfer stations, sorting, composting, etc.). It is possible to make estimates of the costs depending on site operating costs are also influenced by the fixed locations for storage and waste processing areas.

Keywords: waste management, regional plan, operating costs.

1. Introduction

An increased level of safety on the estimate of costs can be achieved in later stage of planning, related to feasibility studies and in conjunction with conceptual and detailed outline of the site of various capacities, and the particular characteristics of the present equipment stage. In the process of planning, investment costs are based on the average total cost of various facilities and the different types of equipment to be purchased. To estimate the costs have been several reports and studies that provide information on recent waste management sector in Romania, of which we mention the following.

- The ISPA EU and Romania, for the waste management program of Arges, Bacau, Galati, Dambovita, Piatra Neamt, Ramnicu Valcea and Teleorman;

Master-plans for waste management developed for 2006-2008 Bistrita Nasaud, Giurgiu, Harghita-Covasna, Vrancea¹; and Maramureş. In addition, on standard unit costs, have been a number of other data sources identified in the other programs of investment in waste management, including:

- "The costs of managing municipal waste in the EU, being Eunomia Consulting firm, representing ECOTEC. This report provides information on the price of waste management in the EU for 2007 for all phases of the cycle of waste management;

Cost-estimates stations for recycling / sorting and transfer contained in the Framework of the Legislative promoting recycling and D. Hogg J HUMMEL (2002);

¹ These plans have been completed under the Technical Assistance for project preparation of waste, Romania Europeaid/119085/D/SV/ROMANIA by Royal Haskoning / ERM I and Group consortium.

- Estimate of cost-stations for bio-mechanical treatment (BMT) found Vito (2007) Vergelijking van Voor Verwerkingsscenario Rest van HHA en Nietspecifiek Category II Bedrijfsafval, Eindrapport.

2. About Master Plans and Costs Analysis

Master plans for waste management developed for Bistrita Nasaud, Giurgiu, Harghita-Covasna, Maramures and Vrancea is a useful source for estimating costs for investment. This source offers the advantage of offering numerous recent information, as applicable local, on unit cost for investment and operating costs. Master plans were recently approved in the summer of 2006, and the cost estimates appear to be sufficiently clear for regional planning. Master plans provide estimate cost categories based on unit costs for a series of waste management - cost per person served and costs per tone.

Taking as a starting point for the proposed funding for the region and said unit costs were estimated the following costs for investment. Result analysis is a calculation of the overall VPN (net present value) associated costs of new services for waste management (taking into account both investment costs on period planned). Also, the calculated values are updated per tone of waste, during the planning and per person per month. VPN-investment per person per month is average total cost per person per month of investment over the period planned. If we assume that a program of investment is financed entirely by user fees, the impact of the average monthly investment would be 0.48 Euro per person. It is likely that investment is borne by the EU. Assuming that 70% of the EU financial support is directed towards investment (cost of O & Q is funded entirely by user fees), the impact of the average monthly investment would be 0.36 euros per person. The total amount of investment 79.7 million euro between 2007 and 2013. This amount does not include projects that have already ISPA funding and which are discussed separately. You will also need to be 0.4 million € / year for replacement containers of waste after 2013.

In the south-east region there is a project already approved ISPA. It is 2003/RO/16/P/PE/027 project in Galati, with a total of 23.75 million €. Structure of the project cost is set Galati below.

Table 1: The cost of ISPA project in Galati

TYPE OF WORKING	TOTAL COST	INELIGIBLE COST	TOTAL ELIGIBLE COST
	- € -		
Planning / Design	624.260	0	624.260
Land acquisition	375.000	375.000	0
Preparing land	1.074.954	0	1.074.954
Construction works	7.457.142	0	7.457.142
Plant and machinery	8.713.218	0	8.713.218
Technical Assistance	1.687.870	0	1.687.870
Supervisory and implementation	1.687.870	0	1.687.870
Unforeseen. 10%	1.754.686	0	1.754.686
Fees / taxes	374.000	374.000	0
TOTAL	23.749.000	749.000	23.000.000

Data source: ISPA Measure No.2003/RO/16/P/PE/027., MEMORANDUM OF FUNDING

The revenues recorded in Region south-east are presented in the following table.

Table 2: Income level in Region 2 (2008)

Area Development	Total households	Households of:			
		<i>Employees</i>	<i>Farmers</i>	<i>Unemployed</i>	<i>Pensioners</i>
	<i>ROL, monthly per person</i>				
Total income	3293985	3997144	2506825	2112122	3171159
Percentage of cash income	75,3	85,4	48,7	73,6	70,0
Gross Wages and other rights wage	41,3	73,9	6,3	27,6	16,9
Income from agriculture	4,7	0,7	25,9	4,6	4,0
Income from non-independent activities	3,6	1,1	1,7	3,3	1,3
Income from social benefits	20,2	5,8	11,2	21,0	43,0
Income from property	0,4	0,2	0,3	0,7	0,4
The equivalent income in kind received by employees and beneficiaries Social benefits	2,8	3,7	1,1	2,4	2,5
The equivalent consumption of agricultural products from own resources	21,9	10,9	50,2	24,0	27,5

Source: Statistical Yearbook of Romania, 2008

For the purposes of this analysis assumes that the future income will increase by the rate of GDP growth in each region. Forecast growth rates of GDP for the period 2006-2009 were developed by the National Commission for Prognosis and are presented in the table below. In the table below shows that the annual rate of GDP growth after 2009, will fall to 5%, and will remain constant in 2011 and beyond each year to all regions.

Data source: National Commission for Prognosis (www.cnp.ro) and consultant estimates Taking as a reference level of income in 2007, and adjusting them with the forecasted values of regional GDP can be calculated acceptable level of monthly costs for waste management, for each region separately.

For Region south-East, monthly average availability of supporting growth rates for waste management is 1.32 euros to 2.08 euros between 2004 and 2013.

For example, the ability to pay monthly in Region 8 (Bucharest) are where the highest maximum monthly payments accepted beyond the national average by 30%. It would have been ideal to distinguish between income level and ability to support urban and countryside.

Unfortunately no data are available on the regional income level, to make a distinction between urban and rural households.

Table 3: Sources of income in Romania (2008)

Income	Urban	Rural
Salary income and personal income (Euro / month)	143	122
salary income and personal	61%	28%
consumption of food private sale of agricultural products of meat and	11%	45%
social assistance	19%	20%
Other revenue	9%	7%
TOTAL	100%	100%

Source: Rural Development in Romania - 2008

The most important source of income for urban households is mean salary and welfare. Impact of food produced in the private and the agricultural products have an impact on total income of urban households (11% of total revenue).

In rural areas the most important source of income is farming activities undertaken in the household (in both directions at monetary and in kind), these activities amount to 45% of total revenue. Other sources of income are wages and self-financing (28%) and welfare (20%).

Rural Development Study results can be used for a very general approximation of the ability levels of support to rural households. In Region 2, the rural population represents 44.5% of the total households.

It can be very general estimate that the ability of the monthly support charges of waste management - the person in rural areas - is around the value of 1.2 in 2004 and will increase to 1.9 euros in 2013.

Table 4: Rural and Urban Population Region of South East

	In percent over the total		Inhabitants / km ²
	Urban	Rural	
	55,5	44,5	79,9
<i>Brăila</i>	65,3	34,7	77,8
<i>Buzău</i>	41,4	58,6	81,2
<i>Constanța</i>	71,1	28,9	101,1
<i>Galați</i>	56,9	43,1	139,1
<i>Tulcea</i>	49,0	51,0	29,8
<i>Vrancea</i>	37,8	62,2	81,2

Source: Statistical Yearbook of Romania, 2008.

The level of tariff is included likes objectives of this plan. The establish amount is not systematic inventory like level for all tariff providers in the region. Anyway below listed some examples of rates for households to service waste management, applied for several service providers in the south-east region the tariffs applied to households in 2008 were between 1.98 to 5.4 USD per person / month (~ 0.6 - 1.6 euros).

Weighted average tariff for the management of waste at the region was estimated at 3.42 USD / person / month.

The impact of proposed tariffs on primary predictions of the financial flows of investment in waste management service in the region have been developed, taking into account increased costs for the proposed investments and their impact on operating costs .

Have indicated that they were considered only incremental costs (additional) of the proposed investment for a planning period of 2006-2025, i.e. impact of additional investment and operating cost (increase / decrease) in regional infrastructure to manage waste.

Current costs for waste management in the region not included in this analysis is assumed to be constant. These costs cover both the needs of current operations and the need of replacing existing equipment.

3. Conclusions

Were calculated the additional costs of new capacity. The pricing of the proposed investment falls within acceptable limits possible in the region.

It should be stressed that these calculations, the above is only proposed investment costs per capita and not take into account the actual costs allocated to the population or cross-subsidies between groups of generators of waste.

In region area a quantity of 70% waste were collected from households. The costs would be distributed proportionally between the generators of waste (population, business administration), when households should pay less towards the above.

As can be seen, the proposed charges to investment remain below the supportabilities 1.5% of income.

On average, rates needed to cover investment costs and the proposed A & Q represents 63% of limit supportabilities in the absence of EU funding.

If the grant support proposed investments, then the tariff is required 58% of limit supportabilities.

It should be noted that the calculated values represent average per capita who have not taken account of what share of investment should be allocated to families or businesses that generate waste household type.

Also calculated were the cross-subsidization between different types of generators.

The price of real consumer is a function of several factors such as local conditions, financing schemes investment performance for the payment of the users (the collection of bills).

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