

Costing-Pricing Methodology of Solid Waste Management Services from Regional Solid Waste Management Bodies in Greece

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Description of the Regional Solid Waste Management Bodies (FODSA) in Greece

The **Regional Solid Waste Management Bodies (FODSA)** in Greece are the competent agencies which are in charge of temporary storage, transshipment, elaboration and disposal of solid waste

Goals

- The optimal use of the environmental policy, as it is determined by the legislative framework
- The minimization of the environmental impacts
- The maximization of the thriftiness of the system operation
- The optimal application of the current technology, as well as the continuous monitoring of the technological advances

Stages of the Pilot Project

Pilot Project: the development of a costing-pricing methodology of waste management services for the Regional Solid Waste Management Body of Central Macedonia

Three distinct Stages of the Project:

- **Stage A** concerns the description of the current situation of FODSA of Central Macedonia (information concerning workforce, existing operational procedures , legal framework , income-expenditure ,clients , tariff structure , quantities and categories of waste , existing infrastructure , investment programs)
- **Stage B** concerns the evaluation of the collected data and the development of a cost model regarding the supplied services using a specific algorithm
- **Stage C** concerns the development of a tariff structure regarding the supplied services of the Body.

Materials and Methods used

- Visits of the project team work to the installations of the Regional Solid Waste Management Body of Central Macedonia.
- Face to face interviews with the responsible bodies.
- Quantitative and Qualitative Analysis of the elements gathered through visits and interviews.
- Development of the costing model

Infrastructure

The **Region of Central Macedonia** is divided in **seven regional units** which are the following: 1) Regional Unit of Thessaloniki, 2) Regional Unit of Kilkis, 3) Regional Unit of Imathia, 4) Regional Unit of Pella, 5) Regional Unit of Pieria, 6) Regional Unit of Serres, 7) Regional Unit of Halkidiki

- **11 landfills:** one in Thessaloniki, one Kilkis, three in Pella, two in Pieria, one in Serres, and three in Chalkidiki

two of them have recently stopped working (one in Pella and one in Chalkidiki).

in two of them, at the Regional Unit of Pieria the Body is not in charge of the Operation of the Landfills yet.

The rest of them are working directly under the supervision of the Regional Solid Waste Management Body of Central Macedonia or through contracts with Municipalities or contractors

- **three active transfer stations** (two in Serres and one in Chalkidiki)
- **One recycling sorting center** (has recently stopped working)
- **Two Environmental Parks**

Total Weight (tons) of solid waste in Central Macedonia

Total Weight (tons) of solid waste in Central Macedonia	
Landfill	tons 2014
Kassandra	5.150
Anthemounta (Triglia)	39.571
Poluguros	23.781
Kilkis	30.752
Serres	55.739
Mavroraxi	422.917
Giannitsa	34.753
Edessa (Almopia, Naousa, Skydra)	33.202
Katerini*	37.246
Litohoro	No data is available
Total	683.111

Current Pricing Policy for Municipalities

County	Price/ton
Thessaloniki	22 €
Imathia	20-25 €
Kilkis	23-25 €
Pella	20-25 €
Pieria	-
Serres	20 €
Chalikidiki	33 €

Revenues of the Body

REGIONAL UNIT	RETRIBUTIVE REVENUES	PRIVATE REVENUES	REVENUES FROM BIOGAS	RECYCLING REVENUES	INTEREST REVENUES	OTHER REVENUES	TOTAL REVENUES
THESSALONIKI	6.018.945	401.098	232.632	12.222	163.808	2.491.792	9.320.497
PELLA	1.010.000	7.013	0	0	1.195	0	1.018.208
KILKIS	667.000	288.205	0	0	565	0	955.770
SERRES	1.115.961	0	0	0	956	0	1.116.917
CHALKIDIKI	2.148.300	0	0	0	1.231	0	2.149.531
PIERIA	0	0	0	0	0	0	0
IMATHIA	630.000	0	0	0	0	0	630.000
TOTAL	11.590.206	696.316	232.632	12.222	167.755	2.491.792	15.190.923

Overheads

ADMINISTRATIVE-FINANCIAL COST (OVERHEADS)		SUM OF TONS	COST (€)
		FODSA /PER YEAR	PER Ton
PAYROLL AND STAFF COSTS	895.356,00	683.325	2,75
THIRD PARTY EXPENSES	236.117		
UTILITIES	127.354		
CONSUMABLES	61.852,00		
OTHER EXPENSES	232.398,00		
INVESTMENTS	234.464,00		
DEPRECIATION	0,00		
VAT	90.584,00		
TOTAL	1.878.125,00		

Key Performance Indicators (KPIs)

REGIONAL UNIT	THESSALONIKI	SERRES	CHALKIDIKI	KILKIS	PELLA	PIERIA*	IMATHIA*
SUM OF TONS/YEAR	422.917	55.818	68.502	30.752	68.157		
PAYROLL AND STAFF COSTS	1.511.094,00	118.762	127.816	10.117	12.143		
PERSONNEL INDICATOR /Ton	3,573027332	2,127664911	1,865872529	0,32898673	0,1781622		
THIRD PARTY EXPENSES	14.500,00	179.398,00	1.004.810,00	123.127,00	607.011,00		
THIRD PARTY INDICATOR /Ton	0,034285687	3,213981153	14,66833085	4,00386967	8,9060698		
INDICATOR (Personel&Third party)/Ton	3,607313019	5,341646064	16,53420338	4,3328564	9,084232		
FUELS OF VEHICLES	446.248,56	52.676,21	19.826,49	82.675,76	0,00		
INDICATOR OF FUEL /Ton	1,055168177	0,943713677	0,28942936	2,68846774	0		
CHEMICAL MATERIAL	39.039,30						
INDICATOR OF CHEMICAL MATERIAL /Ton	0,092309602						
ELECTRICITY	197.525,87	81.689	34.003		47.061		
INDICATOR OF ELECTRICITY /Ton	0,467055876	1,46348848	0,496379668	0	0,6904793		
COATING MATERIAL		8.267,42					
INDICATOR OF COATING MATERIAL /Ton	0	0,14811387	0	0	0		
VEHICLES' MAINTENANCE	244.563,63	12.311,12	1.270	11.851,70			
INDICATOR OF VEHICLES' MAINTENANCE /Ton	0,578278078	0,220558243	0,018539605	0,38539607			
INSTALLATIONS' MAINTENANCE	35.630	9.170,79	6.288	5.800			
INDICATOR OF INSTALLATION'S MAINTENANCE /Ton	0,084248209	0,164298076	0,09179294	0,18860562			
INVESTMENTS (OWN- RESOURCES)	1.580.000	0	0	0	0		
INDICATOR OF INVESTMENTS/Ton	3,735957647						
DEPRECIATION	2.721.663	1.915	11.354	3.996	10.180		
INDICATOR OF DEPRECIATION/Ton	6,435454238	0,034307929	0,165746985	0,12994277	0,149361		

REGIONAL UNIT	LANDFILL	WASTE tn/year	POPULATION (NUMBER OF RESIDENTS	PRODUCTION OF WASTE PER PERSON
THESSALONIKI	MAVRORAHI	422.917	1.104.460	0,382917444
PELLA	GIANNITSA	34.753	111.002	0,313084449
PELLA	EDESSA	33.202	83.330	0,398439938
KILKIS	KILKIS	30.752	78.975	0,389389047
SERRES	SERRES	55.739	176.050	0,316608918
HALKIDIKI	POLIGIROS	23.781	43.605	0,545373237
HALIKIDIKI	TRIGLIA	39.571	62.297	0,635199127
PIERIA	KATERINI	37.246	101.530	0,366847237

Costing Model – Cost Modules

Selection of Key Parameters for the development of the costing model

- Selection of spatial scale (Regional unit)
- Selection of cost modules

Cost Modules :

1) Operating Management Cost

2) Administrative-Financial Cost

3) Environmental Management Cost :

a) Closure cost

b) Cost of the new landfills (cells)

c) Post-closure cost

d) Depreciation Cost

e) Special burial fee

4) Investment Cost

5) Non-relevant Expenses

Presentation of the Costing Model: Special calculation tabs

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COSTING MODEL:
Solid Waste Management Services from Regional Solid Waste Management Body of Central Macedonia

Version1.2

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	1.1 MODEL INFORMATION								
	REGIONAL UNIT	RU Thessaloniki	RU Serres	RU Kilkis	RU Chalikidiki	RU Pella	RU Pieria	RU Imathia	
	ANALYSIS YEAR	2014							
	CURRENT YEAR	2015							
	1.2 TOTAL COST								
	Total amount of waste of FODSA	683.324 tons							
		RU Thessaloniki	RU Serres	RU Kilkis	RU Chalikidiki	RU Pella	RU Pieria	RU Imathia	
	Total amount of waste of RU	422.917	55.739	30.752	68.502	68.500			tons
	Total Cost	12.179.549	1.593.201	1.065.845	2.882.651	2.317.563	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	€
Cost per ton of waste	28,80	28,58	34,66	42,08	33,83	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	€/ton	
Percentage RU / FODSA	61,89%	8,16%	4,50%	10,02%	10,02%	0,00%	0,00%	%	
1.3 KEY DEMOGRAPHICS									
	RU Thessaloniki	RU Serres	RU Kilkis	RU Chalikidiki	RU Pella	RU Pieria	RU Imathia		
Population of RU	1.104.460	176.050	78.975	105.902	194.332				
Average tons treated/inhabitant	0,383	0,317	0,389	0,647	0,352	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!		
Average cost of ton treated/inhabitant	11,03 €	9,05 €	13,50 €	27,22 €	11,93 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!		
GUIDE TO MODEL FORMATTING									
		Base Data - cells must be filled in by the user							
		Drop -down list user must select appropriate option							
		Calculated cells							
		model data							
		Default values							

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2. INFRASTRUCTURE OF FODSA

2.1 LANDFILLS

Number of Active Landfills	<input type="text" value="5"/>							
LANDFILL	MAVRORAHI	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA	TOTAL
Total Capacity	8.500.000	1.150.315	535.100	625.817	1.269.520	0		9.650.315 m ³
Surface of Land Managed	450.000	54.335	151.290	71.900	89.191	0		504.335 m ²
Annual Capacity	420.000	101.404	25.000	70.570	72.442	0		521.404 m ³
Volume of waste in the basins	61.856	61.856	155.000	529.429	244.678	0		123.712 m ³
Total predicted quantity of waste managed	8.438.144	1.088.459	380.100	96.388	1.024.842	0		9.526.603 m ³
Expected Lifetime	16,00	16,13	15,60	16,80	17,50	0		14 years (average)
Residual Lifetime	14,71	14,71	10,60	9,90	12,00	0		10 years (average)
Total employees		16	12	36	21	0		16 persons
Number of Vehicles		3	6	6	6	0		3 vehicles
Daily Consumption of Vehicles	0	0	0	0	0	0		0 lt
Value of Vehicles	0	0	0	0	0	0		0 €
Average useful life of all existing vehicles	0	0	0	0	0	0		0 years(average)
Average age of existing vehicles	0	0	0	0	0	0		0 years (average)
Consumption	0	0	0	0	0	0		0 lt/hr
Hours of operation /day	0	0	0	0	0	0		0 hr/day(average)

2.2 WASTE TRANSFER STATIONS

Number of WTS	<input type="text" value="2"/>							
WTS	SERRES 1	SERRES 2	C	D	E	F	H	TOTAL
Station Capacity	0	0						0 tons/day
Number of Vehicles	0	0						0 vehicles
Value of Vehicles	0	0						0 €
Average useful life of all existing vehicles	0	0						0 years (average)
Average age of existing vehicles	0	0						0 years (average)
Consumption	0	0						0 lt/km (average)
Employees	4	4						8 persons
km	0	0						0 km (average)

2.3 OTHER INFRASTRUCTURE

2.3.1 RECYCLING SORTING CENTER (R.S.C.)

Number of R.S.C.	<input type="text" value="0"/>							
R.S.C.	A	B	C	D	E	F	H	TOTAL
Capacity								m ³
Useful lifetime								years
Employees								
Value of Equipment								€

2.3.2 PARKS

Number of PARKS	<input type="text" value="0"/>							
PARKS	A	B	C	D	E	F	H	TOTAL
Employees								
Environmental Monitoring								

Tab: Operating Expenditure of Landfill/Year (1/2)

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	3.1 PAYROLL AND EXPENSES											
BASIC INFORMATION		MAVRORAHİ	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA		Indicator: Annual Actual Cost /Ton treated (€/ton)	Benchmarking Indicator	
	Payroll and Staff Costs (60.01 to 60.05)	1.511.094,00 €	118.762,00 €	10.117,00 €	127.816,00 €	12.143,00 €				28% of operating account cost	2,60	10%
INFRASTRUCTURE	Third Party Expenses	14.500,00 €	179.398,00 €	123.127,00 €	1.004.810,00 €	607.011,00 €				2,82	XX	
	TOTAL	1.525.594,00 €	298.160,00 €	133.244,00 €	1.132.626,00 €	619.154,00 €	- €	- €		3,61		
OPERATING ACCOUNT OF	Personnel - Indicator: Annual Actual Cost /Ton treated (€/ton)	3,57	2,13	0,33	1,87	0,18	#ΔIAIP,/0!	#ΔIAIP,/0!				
	Third Party Expenses - Indicator: Annual Actual Cost /Ton treated (€/ton)	0,03	3,22	4,00	14,67	8,86	#ΔIAIP,/0!	#ΔIAIP,/0!				
OPERATING ACCOUNT OF WTS	3.2 UTILITIES											
		MAVRORAHİ	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA	price/kwh	kwh	Indicator: Annual Actual Cost /Ton treated (€/ton)	Benchmarking Indicator
OVERHEADS	ENERGY (Electricity)											
	Buildings-General	1.921,23 €	1.689,00 €		1.000,00 €	2.061,00 €			0,12 €	55.134,13		
ENVIRONMENTAL COST	Leachates Treatment Unit	197.526,00 €	80.000,00 €		33.000,00 €	45.000,00 €			0,12 €	2.938.231,40	0,52	XX
	TOTAL	199.447,23 €	81.689,00 €	- €	34.000,00 €	47.061,00 €	- €	- €		2.993.365,54	0,53	XX
INVESTMENTS	Electricity - Leachates Treatment Unit - Indicator: Annual Actual Cost /Ton treated (€/ton)	0,47 €	1,44 €	0	0,48 €	0,66 €	#ΔIAIP,/0!	#ΔIAIP,/0!				
	OTHER UTILITIES											
OUTLAYS FROM OTHER SERVICES	TANKER LEASING	90.000,00 €	- €								0,13	
	INSTALLATIONS	24.747,41 €	- €								0,04	
	MEANS OF TRANSPORT INSURANCE	38.755,43 €	- €								0,06	
	Other Outlays	4.942,67 €	- €	154.898,00 €								
	TOTAL	158.445,51 €	- €	154.898,00 €	- €	- €	- €	- €	- €	- €	- €	
	Tanker Leasing - Indicator: Annual Actual Cost /Ton treated (€/ton)	0,21 €	- €	- €	- €	- €	#ΔIAIP,/0!	#ΔIAIP,/0!				
	Machinery Insurance - Indicator: Annual Actual Cost /Ton treated (€/ton)	0,06 €	- €	- €	- €	- €	#ΔIAIP,/0!	#ΔIAIP,/0!				
	Means of Transport Insurance - Indicator: Annual Actual Cost /Ton treated (€/ton)	0,09 €	- €	- €	- €	- €	#ΔIAIP,/0!	#ΔIAIP,/0!				

Tab: Operating Expenditure of Landfill/Year (2/2)

3.3 CONSUMABLES										
	MAVRORAH	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA	price/lt	Indicator: Annual Actual Cost /Ton treated (€/ton)	Benchmarking Indicator
Chemical Material	39.039,00 €							- €	0,06	XX
Coating Material	- €	8.267,42 €	- €					#ΔΙΑΙΡ./0!		
Maintenance Materials	41.232,00 €							price/m ³	0,06	
TYRES -AIR CHAMBERS -RETREADING	58.659,48 €							5.167,14	0,09	
Other Consumables	11.505,60 €									
TOTAL	150.436,08 €	8.267,42 €	- €	- €	- €	- €	- €			
Chemical Material - Indicator: Annual Actual Cost /Ton treated (€/ton)	0,09 €	- €	- €	- €	- €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!			
Υλικά Συντήρησης - Indicator: Annual Actual Cost /Ton treated (€/ton)	0,10 €	- €	- €	- €	- €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!			
Tyres - Indicator: Annual Actual Cost /Ton treated (€/ton)	0,14 €	- €	- €	- €	- €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!			
3.4 FUELS										
	MAVRORAH	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA	price/lt	Indicator: Annual Actual Cost /Ton treated (€/ton)	Benchmarking Indicator
Fuels used for heating	3.549,43 €									
Fuels used as propellants	446.248,56 €	52.676,21 €	82.675,76 €	19.826,00 €				1,20 €	0,88	XX
Lubricant oil	18.364,92 €									
TOTAL	468.162,91 €	52.676,21 €	82.675,76 €	19.826,00 €	- €	- €	- €			
lt (propellants)	371.873,80	43.896,84	68.896,47	16.521,67	0,00	0,00	0,00	lt/vehicle/hour		
Indicator: Annual Actual Cost /Ton treated (€/ton)	1,06	0,95	2,69	0,29	0,00	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!			
3.5 MAINTENANCE										
	MAVRORAH	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA	Indicator: Annual Actual Cost /Ton treated (€/ton)	Benchmarking Indicator	
Maintenance and Repair of Vehicles	244.563,63 €	12.311,12 €	11.851,70 €	1.270,00 €				0,40	XX	
Maintenance of Installations	14.845,28 €	9.170,79 €	5.800,00 €	6.288,00 €				0,05	XX	
Other Forms of Maintenance	20.798,78 €	- €						0,03	XX	
TOTAL	280.207,69 €	21.481,91 €	17.651,70 €	7.558,00 €	- €	- €	- €			
Maintenance and Repair of Vehicles - Indicator: Annual Actual Cost /Ton treated	0,58	0,22	0,39	0,02	0,00	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!			
Maintenance of Installations - Indicator: Annual Actual Cost /Ton treated (€/ton)	0,04	0,16	0,19	0,09	0,00	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!			
Other Forms of Maintenance - Indicator: Annual Actual Cost /Ton treated (€/ton)	0,05	0,00	0,00	0,00	0,00	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!			
FOR VEHICLES)										
	MAVRORAH	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA			
Fees- Vehicles' Expenditure	16.059,00 €	2.640,00 €		5.941,00 €	186,00 €					
TOTAL	16.059,00 €	2.640,00 €	- €	5.941,00 €	186,00 €	- €	- €			
3.7 OTHER EXPENDITURE										
	MAVRORAH	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA			
Other Expenditure	13.190,00 €	6.214,45 €	10.393,00 €	12.135,00 €	6.704,00 €					
VAT	235.139	52.911	46.976	166.700	80.765					
TOTAL	248.329,00 €	59.125,45 €	57.369,00 €	178.835,00 €	87.469,00 €	- €	- €			
3.8 MACHINERY DEPRECIATION										
	MAVRORAH	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA			
Depreciation	200.000,00	1.915,00	3.996,00	11.354,00	10.180,00					
Total Operating Expenditure of Landfill of RU										
	3.246.681,42 €	525.954,99 €	449.834,46 €	1.390.140,00 €	764.050,00 €	- €	- €	TOTAL	Indicator: Annual Actual Cost /Ton treated (€/ton)	Benchmarking Indicator
Indicator: Annual Actual Cost /Ton treated (€/ton)	7,68	9,44	14,63	20,29	11,15	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!		9,33	XX
Total Operating Expenditure of Landfill of RU										
6.376.660,87 €										

Tab: Overheads

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BASIC INFORMATION	ADMINISTRATIVE-FINANCIAL COST		
INFRASTRUCTURE	PAYROLL AND STAFF COSTS	895.356,00 €	
OPERATING ACCOUNT OF	THIRD PARTY EXPENSES	236.117,00 €	
OPERATING ACCOUNT OF WTS	UTILITIES	127.354,00 €	
OVERHEADS	CONSUMABLES	61.852,00 €	
ENVIRONMENTAL COST	OTHER EXPENSES	232.398,00 €	
INVESTMENTS	INVESTMENTS	239.464,00 €	
OUTLAYS FROM OTHER SERVICES	DEPRECIATION	- €	Indicator: Annual Actual Cost /Ton treated (€/ton) Benchmarking Indicator
INDICES	VAT	90.584,00 €	
	TOTAL	1.883.125,00 €	2,76 20%
			18%
	TOTAL SUM OF TONS OF FODSA (tons)	683.324 tons	
	Total Administrative-Financial Cost (Overheads) <small>(ποσό που επιβαρύνει την ΠΕ)</small>		
		RU OF THESSALONIKI	1.165.487,49 €
		RU OF SERRES	153.607,23 €
		RU OF KILKIS	84.747,29 €
		RU OF CHALKIDIKI	188.779,89 €
		RU OF PELLA	188.774,38 €
		RU OF PIERIA	- €
		RU OF IMATHIA	- €
		TOTAL	1.781.396,28 €

Tab: Environmental Cost

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6. ENVIRONMENTAL COST								
6.1 CLOSURE COST								
	MAVRORAHİ	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA	
Rehabilitation Surface	450,00	54,34	151,29	71,90	89,19			(ha) x (expected lifetime)
Rehabilitation/Closure Cost / ha	10.000,00 €	10.000,00 €	10.000,00 €	10.000,00 €	10.000,00 €			€/atp
Residual lifetime	14,71	14,71	10,60	9,90	12,00	0,00	0,00	
Total Closure Cost	4.500.000,00 €	543.350,00 €	1.512.900,00 €	719.000,00 €	891.910,00 €	- €	- €	Indicator: Annual Actual Cost /Ton treated (€/ton)
Total Closure Cost /year	305.914,34 €	36.937,46 €	142.726,42 €	72.626,26 €	74.325,83 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	Benchmarking Indicator
Total Closure Cost at Closure time	5.467.864,34 €	660.214,24 €	1.815.993,82 €	862.807,26 €	1.073.265,03 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!
Total Closure Cost at Closure time/year	371.710,70 €	44.882,00 €	171.320,17 €	87.152,25 €	89.438,75 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	XX
VAT	- €							
TOTAL	5.467.864,34 €	660.214,24 €	1.815.993,82 €	862.807,26 €	1.073.265,03 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	
Indicator: Annual Actual Cost /Ton treated (€/ton)	0,88 €	0,81 €	5,57 €	1,27 €	1,31 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	
6.2 COST OF NEW LANDFILLS								
	MAVRORAHİ	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA	
Total Tonnage of a new Landfill	4.500.000	600.000	300.000	750.000	720.000			tons
Construction Cost / ton	4,00 €	4,00 €	4,00 €	4,00 €	4,00 €			
Total Construction Cost	18.000.000,00 €	2.400.000,00 €	1.200.000,00 €	3.000.000,00 €	2.880.000,00 €	- €	- €	Indicator: Annual Actual Cost /Ton treated (€/ton)
Total Construction Cost /year	1.223.657,38 €	163.154,32 €	113.207,55 €	303.030,30 €	240.000,00 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	Benchmarking Indicator
Total Construction Cost at Closure time	21.871.457,38 €	2.916.194,32 €	1.440.407,55 €	3.600.030,30 €	3.465.600,00 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!
Total Construction Cost at Closure time/year	1.223.657,38 €	163.154,32 €	113.207,55 €	363.639,42 €	288.800,00 €	#ΔΙΑΙΡ./0!	#ΑΝΑΦ!	XX
VAT	- €	- €	- €	- €	- €	- €	- €	
TOTAL	21.871.457,38 €	2.916.194,32 €	1.440.407,55 €	3.600.030,30 €	3.465.600,00 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	
Indicator: Annual Actual Cost /Ton treated (€/ton)	2,89 €	2,93 €	3,68 €	5,31 €	4,22 €	#ΔΙΑΙΡ./0!	#ΑΝΑΦ!	
6.3 POST-CLOSURE COST								
	MAVRORAHİ	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA	
Post-closure years	30,00	30,00	30,00	30,00	30,00			
Insurance cost /year	- €	- €	- €	- €	- €			
Monitoring cost /year	50.000,00 €	15.000,00 €	15.000,00 €	15.000,00 €	15.000,00 €			
Maintenance cost /year	50.000,00 €	15.000,00 €	15.000,00 €	15.000,00 €	15.000,00 €			
Post-closure cost /year	100.000,00 €	30.000,00 €	30.000,00 €	30.000,00 €	30.000,00 €	- €	- €	Indicator: Annual Actual Cost /Ton treated (€/ton)
Total Post-closure cost	3.000.000,00 €	900.000,00 €	900.000,00 €	900.000,00 €	900.000,00 €	- €	- €	Benchmarking Indicator
Total Post-closure cost at closure time	3.541.300,00 €	1.062.390,00 €	1.025.400,00 €	1.019.100,00 €	1.038.000,00 €	- €	- €	#ΔΙΑΙΡ./0!
Total Post-closure cost at closure time/year	240.740,99 €	72.222,30 €	96.735,85 €	102.939,39 €	86.500,00 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	2%
VAT	- €	- €	- €	- €	- €	- €	- €	4%
TOTAL	3.541.300,00 €	1.062.390,00 €	1.025.400,00 €	1.019.100,00 €	1.038.000,00 €	- €	- €	
Indicator: Annual Actual Cost /Ton treated (€/ton)	0,57 €	1,30 €	3,15 €	1,50 €	1,26 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	
6.4 DEPRECIATION COST								
	MAVRORAHİ	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA	
Residual value	- €							
Annual depreciation	- €							Indicator: Annual Actual Cost /Ton treated (€/ton)
Total depreciation	- €							0,00
								XX
6.5 SPECIAL BURIAL FEE								
	MAVRORAHİ	SERRES	KILKIS	CHALKIDIKI (2)	PELLA (2)	PIERIA	IMATHIA	
Special Burial Fee /ton								€/ton
Total Amount of Waste without Process								tons
Total Burial Fee	- €	- €	- €	- €	- €	- €	- €	
	4,34	5,03	12,40	8,08	6,78	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	Indicator: Annual Actual Cost /Ton treated (€/ton)
								Benchmarking Indicator
Total Environmental Cost	1.836.109,06 €	280.258,62 €	381.263,57 €	553.731,07 €	464.738,75 €	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	2,69
								XX
								1.836.109,06 €

Tab: Investments

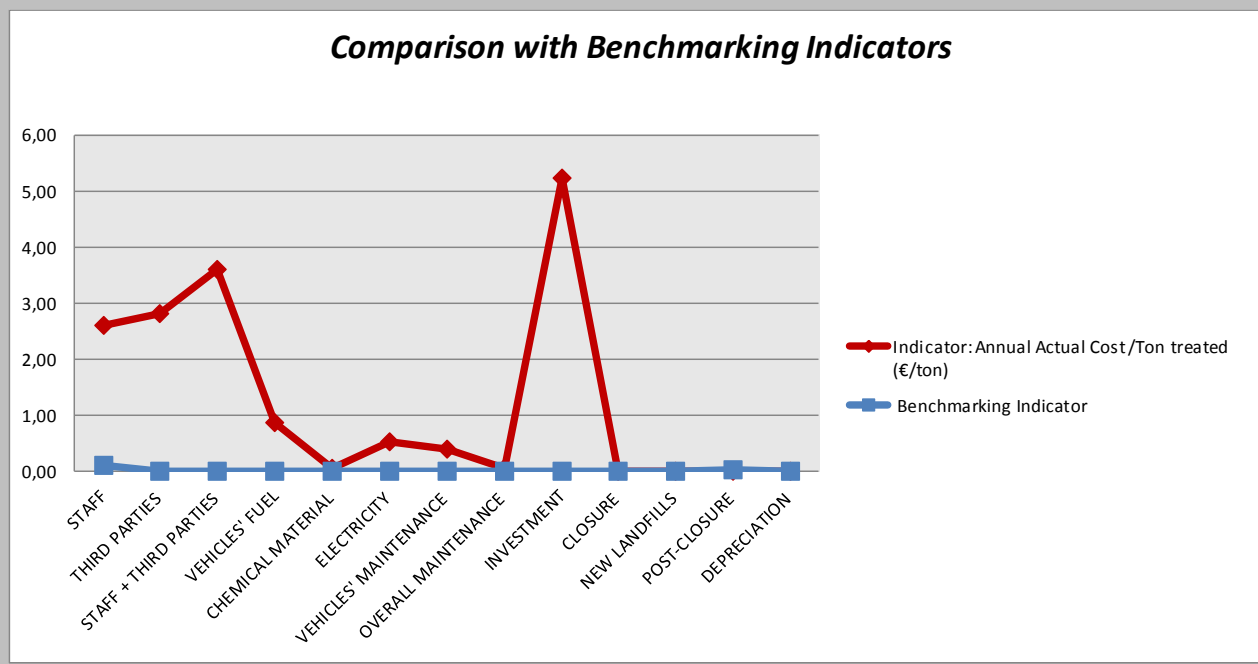
<p>HOME PAGE</p> <p>BASIC INFORMATION</p> <p>INFRASTRUCTURE</p> <p>OPERATING ACCOUNT OF</p> <p>OPERATING ACCOUNT OF WTS</p> <p>OVERHEADS</p> <p>ENVIRONMENTAL COST</p> <p>INVESTMENTS</p> <p>OUTLAYS FROM OTHER SERVICES</p> <p>INDICES</p>	7.INVESTMENTS (YEAR 2015)									
	7.1 RECYCLING									
		RU Thessaloniki	RU Serres	RU Kilkis	RU Chalikidiki	RU Pella	RU Pieria	RU Imathia	Indicator: Annual Actual Cost /Ton treated (€/ton)	Benchmarking Indicator
	Construction of a new R.S.C.	80.000,00 €								
	Construction of a Recycling Park	50.000,00 €								
	TOTAL	130.000,00 €	- €	- €	- €	- €	- €	- €	0,19	XX
	7.2 COMPOSTING									
	Composting Facilities	- €							Indicator: Annual Actual Cost /Ton treated (€/ton)	Benchmarking Indicator
	TOTAL	- €							0,00	XX
	7.3 UPDATE PROJECTS OF LANDFILLS-WTS									
Leachates Management	1.000.000,00 €	450.000,00 €	150.000,00 €	750.000,00 €	900.000,00 €			Indicator: Annual Actual Cost /Ton treated (€/ton)	Benchmarking Indicator	
	- €									
Construction of Parking Space (WTS of Eukarpia)	100.000,00 €									
WTS	100.000,00 €									
TOTAL	1.200.000,00 €	450.000,00 €	150.000,00 €	750.000,00 €	900.000,00 €	- €	- €	5,05	XX	
Indicator: Annual Actual Cost /Ton treated (€/ton)	3,14	8,07	4,88	10,95	13,14	#ΔΙΑΙΡ./0!	#ΔΙΑΙΡ./0!	TOTAL	Indicator: Annual Actual Cost /Ton treated (€/ton)	Benchmarking Indicator
	1.330.000,00 €	450.000,00 €	150.000,00 €	750.000,00 €	900.000,00 €	- €	- €	3,14	XX	
Total Investment Cost								1.330.000,00 €		

Tab:Indices

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9. PROPOSED INDICATORS OF OPERATION FOR MONITORING

Basic Indicators						
	Indicator: Annual Actual Cost /Ton treated (€/ton)	Percentage over the total cost/Ton treated	Benchmarking Indicator	Percentage over the total cost /ton treated	Divergence	
STAFF	2,60	9,04%	10%	0,35%	2505%	
THIRD PARTIES	2,82	9,80%	XX	#TIMH!	#TIMH!	
STAFF + THIRD PARTIES	3,61	12,53%	0%	0,00%	#ΔIAIP./0!	
VEHICLES' FUEL	0,88	3,06%	XX	#TIMH!	#TIMH!	
CHEMICAL MATERIAL	0,06	0,20%	XX	#TIMH!	#TIMH!	
ELECTRICITY	0,52	1,81%	XX	#TIMH!	#TIMH!	
VEHICLES' MAINTENANCE	0,40	1,37%	XX	#TIMH!	#TIMH!	
OVERALL MAINTENANCE	0,05	0,18%	XX	#TIMH!	#TIMH!	
INVESTMENT	5,24	18,19%	#TIMH!	#TIMH!	#TIMH!	
CLOSURE	#ΔIAIP./0!	#ΔIAIP./0!	XX	#TIMH!	#ΔIAIP./0!	
NEW LANDFILLS	#ΔIAIP./0!	#ΔIAIP./0!	XX	#TIMH!	#ΔIAIP./0!	
POST-CLOSURE	#ΔIAIP./0!	#ΔIAIP./0!	2%	0,07%	#ΔIAIP./0!	
DEPRECIATION	0,00	0,00%	XX	#TIMH!	#TIMH!	



Conclusions-Recommendations

- **Necessity** for the creation of a costing model which meets the current operational requirements of the Body as well as the comprehensive and proper operation of all the various stages concerning the solid waste management process. This model should be applicable under the existing conditions and infrastructure. Such a costing model was presented in detail above, as a result of research and theoretical and statistical analysis of the data collected to develop this report.
- **Necessity** for the creation of a monitoring plan of this model so that the model will be improved, evolved and adapted to the respective existing conditions and needs. Furthermore, consulting services for both the pricing policy and the solid waste management policies should be provided.

Recommendations for further research

- Conducting a more comprehensive research and analysis of environmental policies. More specifically, the integration, in the overall policy of solid waste management, of stages such as the separation of materials, recycling, reuse, anaerobic digestion (organic waste) and other methods aimed at minimizing environmental pollution – as well as the solid waste management cost.
- Awareness of citizens concerning the necessity of reducing the amount of (solid) waste, and their active participation in recycling practices
- Further investigation, in the next stage of this study in order to build a tariff policy for the Body for the services provided in the next five years through the introduction of the related costing material in the costing model. During this period the Body will reorganize the mixture of its provided services (such as recycling, composting) on which a new pricing policy will be built.