

COST - BENEFIT ANALYSIS

SPLIT-DALMATIA COUNTY

This model has been developed based on the 'Guide to Cost-benefit Analysis of Investment Projects, Economic appraisal tool for Cohesion Policy 2014-2020' published by the European Commission in December 2014.

All assumptions for this Cost Benefit Analysis are detailed in the 'FLOWS ' worksheet. All the necessary inputs for the calculations are entered in 'INPUT' worksheet. The financial analysis (see worksheet 'FG') details the investment costs, operating costs, revenues and sources of financing to estimate the financial return on investment and the financial return on capital. The financial sustainability of the project is assessed in the 'OUTPUT' sheet, this worksheet is divided into five modules: revenues, income statement, cash flow statement, balance sheet and ratios. The worksheet 'EcoBEN presents the incremental economic benefits. The worksheet 'Output-H' and 'Output-E' illustrates output tables, as they appear in the accompanying CBA report.

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all values in constant EUR
Table with 28 columns for years (2010-2040) and multiple rows for categories like Calculation of DPC (base), Total net purchase, Total net construction, etc.

Operating costs
Table with 28 columns for years (2010-2040) and rows for various cost categories such as Operating costs - Collection Cost (Residual, recyclables, bio-waste), Operating costs - Transfer Station G1, etc.

Waste collected / delivered from regions, in tone
Table with 28 columns for years (2010-2040) and rows for DPC (base) investment, DPC (base) operating, and DPC (base) total. Includes sub-rows for Dynamic Prime Cost Investment, Dynamic Prime Cost Operating, and Dynamic Prime Cost Total.

all values in constant EUR
Table with 28 columns for years (2010-2040) and rows for Calculation of DPC (Collection & Transportation), Total net purchase, Total net construction, etc.

Operating costs
Table with 28 columns for years (2010-2040) and rows for various cost categories similar to the first table.

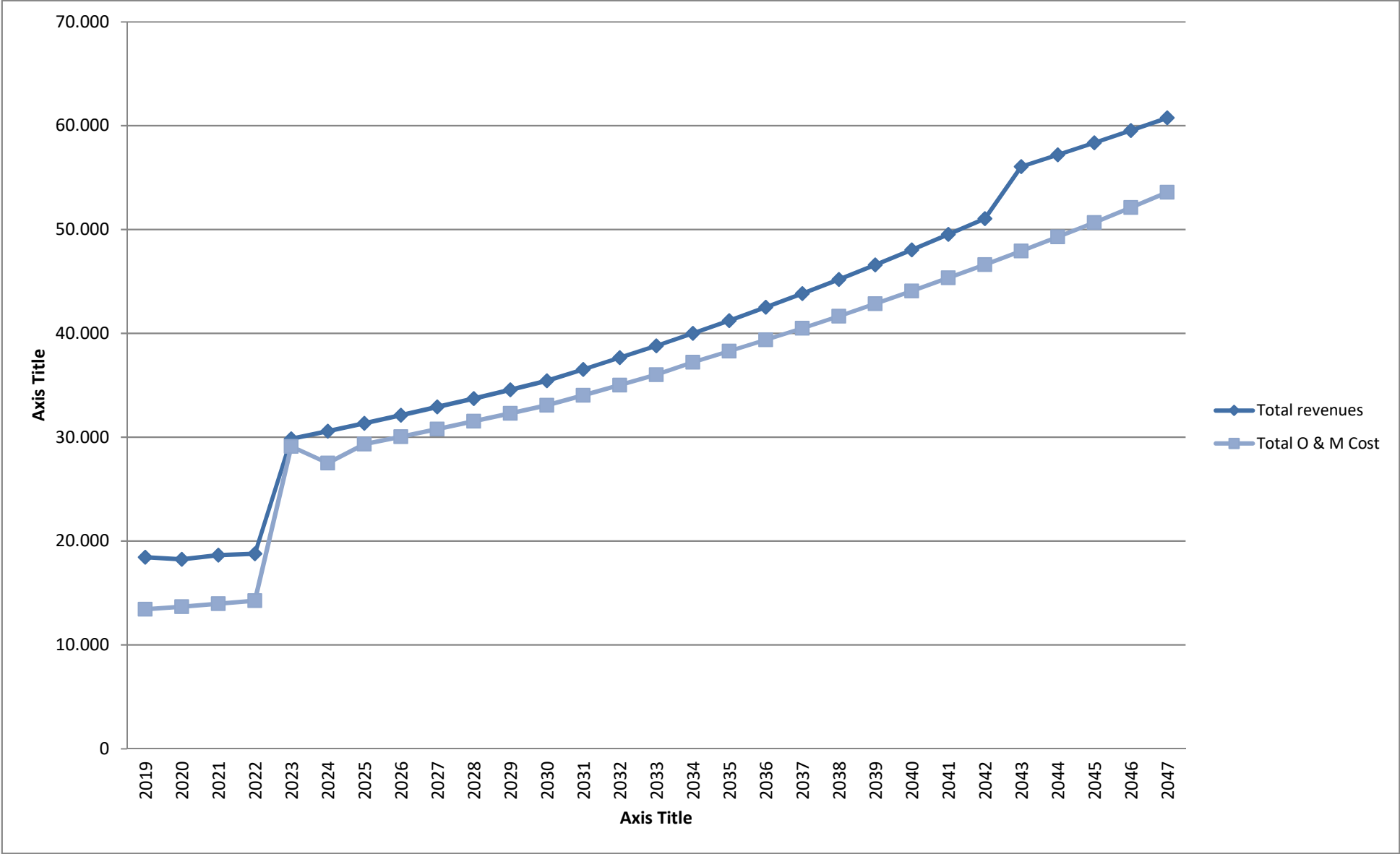
Waste collected / delivered from regions, in tone
Table with 28 columns for years (2010-2040) and rows for DPC (base) investment, DPC (base) operating, and DPC (base) total.

all values in constant EUR
Table with 28 columns for years (2010-2040) and rows for Calculation of DPC (base), Total net purchase, Total net construction, etc.

AFFORTABILITY

User fees		2018	2023	2030	2035	2040	2045	2047
Residential User fees	EUR/t	56,7	92,0	102,7	111,2	120,3	139,0	139,0
Residential User fees for collection& transportation	EUR/t	29,5	47,8	53,4	57,8	62,6	72,3	72,3
Residential User fees for treatment & disposal	EUR/t	27,2	44,2	49,3	53,4	57,7	66,7	66,7
Commercial User fees	EUR/t	178,0	139,0	139,0	139,0	139,0	139,0	139,0
Lower three deciles regional household income	EUR/HH/Year	3.985,7	4.086,4	4.231,6	4.338,4	4.448,0	4.560,3	4.606,0
Average HH income	EUR/HH/Year	8.623,7	9.093,0	10.091,9	10.871,8	11.712,0	12.617,2	12.998,5

Collection, transportation, treatment & disposal		2018	2023	2030	2035	2040	2045	2047
Waste per person	tonnes	0,25	0,37	0,37	0,37	0,38	0,39	0,39
Waste per HH	tonnes	0,74	1,09	1,07	1,09	1,11	1,13	1,14
Tarrifs per person	EUR/cap	14,30	34,33	37,65	41,45	45,66	53,71	54,11
Tarrifs per HH	EUR/HH	41,77	100,26	109,93	121,05	133,31	156,84	158,01
waste tarrif as a % of average HH income	%	0,48%	1,10%	1,09%	1,11%	1,14%	1,24%	1,22%
waste tarrif as a % of the lower three decile HH income	%	1,05%	2,45%	2,60%	2,79%	3,00%	3,44%	3,43%



Split Dalmatia Solid Waste Project

Blue cells contain NON-MONETARY input data
Green cells contain MONETARY input data in current terms
Yellow cells contain MONETARY input data in real terms of base year
White cells contain calculated data

General parameters

Table with 2 columns: Parameter, Value. Includes: First year of allocation (Year: 2018), Implementation period (Year: 2018), Reference period (i.e. economic life of project) (Year: 25).

Changes in waste flow

Large data table showing waste generation and management from 2018 to 2047. Includes categories like Waste generated in project area, Situation with respect to, and Resource cost savings.

Resource cost savings

Table showing resource cost savings from 2018 to 2047, including categories like Sale of materials and energy, Economic value of other materials and energy, and Extension of economic life of landfills.

Reduction of disamenities and health risks

Table showing reduction of disamenities and health risks from 2018 to 2047, including categories like Closure of uncontrolled dumpsites, Avoidance of uncontrolled waste leachate, and Total reduction of disamenities and health risks.

Reduction of greenhouse gas emissions

Table showing reduction of greenhouse gas emissions from 2018 to 2047, including categories like Total CO2 emissions without project, Displaced emissions through generation from clean sources, and Total reduction of greenhouse gas emissions.

TOTAL ECONOMIC BENEFITS

Summary table of total economic benefits from 2018 to 2047, including resource cost savings, reduction of disamenities and health risks, and reduction of greenhouse gas emissions.

MODEL VERSION July 2018

Project
Split Dalmatian Solid Waste Project

Blue cells contain NON-MONETARY input data
Green cells contain MONETARY input data in current terms
Yellow cells contain MONETARY input data in real terms of base year
White cells contain calculated data

Model inputs

General parameters

1	First year of projection	Year	2018
2	Implementation period	Years	30
3	Reference period i.e., economic life of project	Years	26
4	Annual inflation rate of EURO during implementation	%	1.8%
5	Financial discount rate (real)	%	4.0%
6	Social discount rate (real)	%	6.0%
7	TAR rate	%	0.0%
8	Maximum co-funding rate for the priority axis	%	85.0%

Investment cost

Project cost during implementation (2018-2022) (*)	TOTAL	E l i g i b l e						N o n - e l i g i b l e						
		2018	2019	2020	2021	2022	2023	2024	2018	2019	2020	2021	2022	2023
9	Eligible	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Land purchase	EUR 2 772 371	0	0	0	0	0	0	2 772 371	1 082 362	1 690 013	0	0	0
11	Building and construction	EUR 708 927	653 333	0	653 333	0	0	0	51 590	0	51 590	0	0	0
12	Plant and machinery & mobile equipment	EUR 24 816 614	27 719 729	0	12 473 591	11 087 504	4 157 594	0	1 756 855	0	836 826	650 000	250 000	0
13	Contingencies	EUR 8 282 640	8 282 640	0	0	0	0	0	13 708 860	0	8 929 860	291 500	190 000	8 288 000
14	Price adjustment	EUR 4 903 481	4 375 995	0	0	0	0	0	348 484	0	224 487	193 307	25 000	95 540
15	T&E suspension during implementation & Beneficiary Support	EUR 0	0	0	0	0	0	0	0	0	0	0	0	0
16	Public Works	EUR 3 000 000	2 700 000	0	0	0	0	0	360 000	0	0	120 000	120 000	120 000
17	Public Works	EUR 200 000	200 000	0	0	0	0	0	0	0	0	0	0	0
18	Sub-TOTAL	EUR 1 520 000	0	0	0	0	0	0	1 520 000	0	0	0	0	1 520 000
19	Sub-TOTAL	EUR 80 449 959	89 763 844	0	653 333	21 237 892	23 412 840	14 449 789	20 696 115	1 082 362	8 965 950	1 371 162	1 635 600	8 251 040
20	TOTAL	EUR 80 449 959	89 763 844	0	653 333	21 237 892	23 412 840	14 449 789	20 696 115	1 082 362	8 965 950	1 371 162	1 635 600	8 251 040

(*) Values after implementation period will be ignored

Economic life of project assets

1	Building and construction	Years	30
2	Plant and machinery	Years	15
3	Intangible assets	Years	5
4	Mobile equipment	Years	5

Project revenues and costs (*)

(*) Cash basis, not accrual basis

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047		
1	Incremental revenues	EUR	0	0	0	0	0	8 629 788	9 636 164	9 093 361	9 162 546	9 212 748	9 273 951	9 336 215	9 399 506	9 520 597	9 637 998	9 806 074	9 928 160	10 052 136	10 178 277	10 306 909	10 437 776	10 620 116	10 756 827	10 894 004	11 027 332	11 206 160	11 334 488	12 039 889	12 791 674	12 836 924
11	Incremental O&M costs due to project	EUR	0	0	0	0	0	-7 629 888	-7 656 730	-7 683 640	-7 690 867	-8 108 120	-7 794 793	-7 791 956	-20 653 858	-8 337 650	-8 505 566	-14 184 648	-8 093 997	-8 129 384	-8 346 071	-11 026 896	-23 911 405	-8 313 813	-8 351 010	-8 591 897	-8 701 154	-8 461 617	-8 498 460	-8 535 483	-8 572 251	-8 609 303
12	Deployment Project cost (included in line 72)	EUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Loans																																					
Loan #1 (Automatic calculation)																																					
13	Loan amount	EUR																																			
14	Interest (%)	%																																			
15	Credit fee (at signature)	%																																			
16	Commission fee (at undisbursed amount)	%																																			
17	Principal grace period	years																																			
18	Amortisation period (including grace period)	years																																			
19	Amortisation type (*)																																				
*) Real, not nominal																																					
**) Input "Y" for Equal instalments of Principal or "I" for Equal Instalments of Principal and Interest																																					

Economic benefits																																					
Resource savings and externalities																																					
26	Production cost savings	EUR																																			
27	Reduction of visual disamenities, odours and health risk	EUR																																			
28	Reduction of greenhouse gas emissions	EUR																																			
29	...	EUR																																			
30	...	EUR																																			
31	...	EUR																																			

Economic costs																																				
Break-down of costs (excluding land acquisition)																																				
34	Travel goods	%	95%	95%	1.00	1.00																														
35	Production goods	%	5%	5%	0.36	0.36																														
36	Skilled Labour	%	10%	10%	1.00	1.00																														
37	Unskilled Labour	%	20%	4%	1.00	0.47																														
38	Transfer payments	%	0%	3%	0.00	0.00																														
39	Total (%)		100%	100%																																

Risk analysis																																				
Range of variation of variables as % of the base case																																				
40	Project investment cost	%	-30.0%	-30.0%																																
41	Operatives	%	-30.0%	-30.0%																																
42	OCM costs	%	-5.0%	-5.0%																																
43	Economic benefits	%	-30.0%	-30.0%																																
44	Economic cost investment	%	-5.0%	-5.0%																																
45	Economic costs (OCM)	%	-5.0%	-5.0%																																

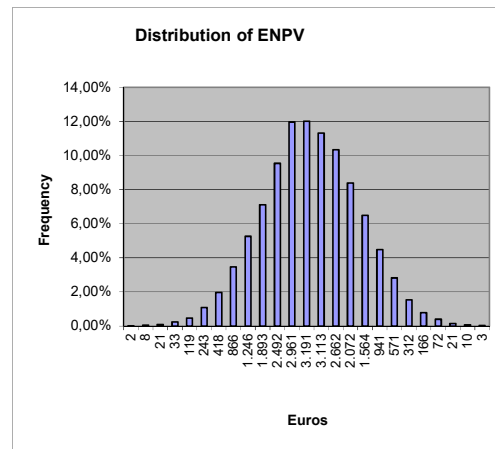
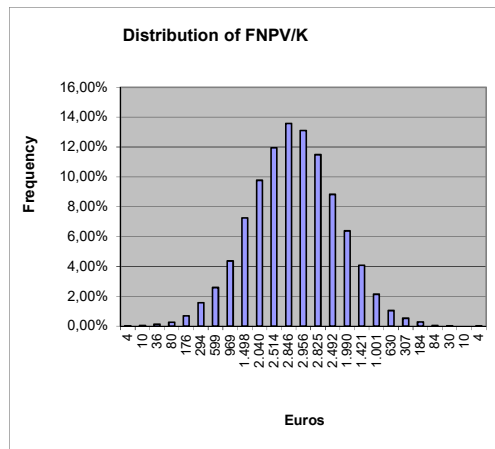
RISK ANALYSIS

E.3.3 Risk analysis - parameters considered in the analysis

	Variable	Range of variation from base case	
		Lower	Upper
1	Project investment cost	-5,00%	30,00%
2	Revenues	-30,00%	5,00%
3	O&M costs	-5,00%	30,00%
4	Economic benefits	-30,00%	5,00%
5	Economic costs (Investment)	-5,00%	30,00%
6	Economic costs (O&M)	-5,00%	30,00%

E.3.3 Risk analysis - results of the Monte Carlo analysis

	Variable	FNPV/K	ENPV
1	Expected value	-61.687.110	79.232.970
2	Standard deviation	11.544.014	16.498.398



Based on the distributions above:

- There is a 95% probability that FNPV/K is between -84313376,2 and -39060842,9, with a 00% probability of FNPV/K >0.
- There is a 95% probability that ENPV is between 46896110,6 and 111569829,3, with a 100% probability of ENPV >0.

FINANCING PLAN

H.1 Cost breakdown

Euro	Total project costs (A)	Ineligible costs (B)	Eligible costs (C)=(A)-(B)
10. Sub-TOTAL	80.449.959	20.696.115	59.753.844
11. VAT	0	0	0
12. TOTAL	80.449.959	20.696.115	59.753.844

Note: All cost estimates are shown in current prices

H.2.1 Community contribution calculation (Euro)

	Value
1. Eligible costs (in Euro, not discounted) (Section H.1.12 (C))	59.753.844
2. Funding gap rate (%) = (E.1.2.11)	83,55%
3. Decision amount, i.e. the "amount to which the co-financing rate for the priority axis applies" (Article 41(2)) = (1)*(2) (respecting the maximum public contribution according to state aid rules)	49.922.312
4. Co-financing rate of the priority axis (%)	85,0%
5. Community contribution (in euro) = (3)*(4)	42.433.965

H.2.2 Sources of co-financing

Source of total investment costs (Euro)								
	Eligible cost				Ineligible cost			
	59.753.844				20.696.115			
Total investment cost [H.1.12.(A)]	Community assistance [85% of H.2.1-3]	Contribution of Environmental Protection & Energy Efficiency Fund (EPEEF)	County / city contribution (H2.1.1 - H.2.1.3)		Ineligible other: EPEEF contribution	Ineligible other: County / city contribution	VAT reclaimed	VAT non reclaimed: own financing
a) = b) through i)	b)	c)	d)		f)	g)	h)	i)
80.449.959	42.433.965	11.344.495	5.975.384		2.885.739	17.810.376	0	0

H.3 Annual financing plan of Community contribution

(in Euro)	2018	2017	2018	2019	2020	2021
ERDF	0	0	463.962	15.082.008	16.626.539	10.261.456

RINTING

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
-17.404.481	-16.811.688	1.199.900	1.378.419	1.409.702	1.161.678	1.104.641	1.509.182	1.544.259	-14.054.352	1.182.907	1.132.419	-4.378.275	1.834.553	1.922.754	1.832.306	-751.987	-13.473.629	2.306.304	2.404.817	2.302.177	2.326.178	4.864.543	4.636.084	4.404.606	4.219.322	29.366.371	0	0	0	0	0	0
-8.392.943	-8.107.081	1.139.905	1.309.498	1.339.217	1.103.594	1.049.409	1.433.723	1.467.046	-13.351.634	1.123.761	1.075.798	-4.159.361	1.742.825	1.826.616	1.740.691	-714.388	-12.799.948	2.190.989	2.284.576	2.187.068	2.209.869	4.621.316	4.404.280	4.184.376	4.008.356	21.445.501	0	0	0	0	0	0
-10.645.828	-10.283.233	1.641.389	1.830.176	1.864.370	1.619.305	1.565.278	1.972.881	2.011.070	-13.584.377	1.658.935	1.614.319	-3.887.956	2.330.961	2.425.361	2.341.225	-236.642	-12.951.740	2.837.310	2.942.609	2.846.877	2.877.544	5.530.851	5.292.809	5.051.600	4.858.901	24.234.763	0	0	0	0	0	0
-10.645.828	-10.283.233	-1.449.037	-1.332.128	-1.318.303	-1.584.086	-1.659.183	-1.273.007	-1.256.605	-16.874.204	-1.673.260	-1.758.976	-7.320.187	-1.143.892	-1.092.887	-1.221.207	-3.844.060	-16.604.962	-879.731	-821.931	-966.024	-982.022	866.695	695.738	522.639	381.850	19.707.190	0	0	0	0	0	0
-10.645.828	-10.283.233	-1.089.067	-918.602	-895.392	-1.235.583	-1.327.791	-820.253	-793.327	-21.090.510	-1.318.388	-1.419.250	-8.633.669	-593.526	-516.061	-671.515	-4.069.656	-20.647.051	-187.840	-100.486	-275.371	-284.169	2.326.058	2.086.563	1.844.021	1.647.647	21.005.176	0	0	0	0	0	0
-10.645.828	-10.283.233	1.581.394	1.761.255	1.793.885	1.561.221	1.510.046	1.897.422	1.933.857	-12.881.659	1.599.789	1.557.698	-3.669.042	2.239.233	2.329.223	2.249.610	-199.042	-12.278.059	2.721.994	2.822.368	2.731.768	2.761.235	5.287.624	5.061.004	4.831.370	4.647.935	24.018.432	0	0	0	0	0	0

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
-19.791.409	-19.117.319	17.535.975	17.562.671	17.592.278	17.421.120	17.391.143	17.699.107	17.740.903	6.419.740	17.576.726	17.611.032	13.641.823	18.232.386	18.371.973	18.383.248	16.583.132	7.414.962	18.932.953	19.088.167	19.098.889	19.191.730	19.373.110	19.353.861	19.334.789	19.315.889	36.218.117	0	0	0	0	0	0
-19.791.409	-19.117.319	9.841.715	9.853.006	9.866.222	9.677.669	9.629.275	9.917.781	9.939.060	-1.403.700	9.697.371	9.679.551	5.657.211	10.193.619	10.278.005	10.233.012	8.375.541	-851.095	10.607.300	10.701.761	10.650.552	10.685.953	10.864.920	10.843.173	10.821.522	10.799.963	27.699.450	0	0	0	0	0	0
-25.728.832	-24.852.515	16.436.795	16.461.290	16.488.556	16.314.913	16.282.305	16.587.489	16.626.354	5.302.105	16.451.104	16.477.963	12.501.164	17.083.990	17.215.692	17.218.928	15.410.619	6.234.096	17.743.574	17.890.109	17.891.984	17.976.619	18.157.655	18.138.048	18.118.608	18.099.329	40.077.447	0	0	0	0	0	0
-18.801.839	-18.161.453	16.436.795	16.461.290	16.488.556	16.314.913	16.282.305	16.587.489	16.626.354	5.302.105	16.451.104	16.477.963	12.501.164	17.083.990	17.215.692	17.218.928	15.410.619	6.234.096	17.743.574	17.890.109	17.891.984	17.976.619	18.157.655	18.138.048	18.118.608	18.099.329	34.155.118	0	0	0	0	0	0
-19.791.409	-19.117.319	14.772.753	14.791.393	14.812.789	14.572.143	14.513.966	14.894.028	14.926.966	186.932	14.632.702	14.622.940	9.407.560	15.318.816	15.442.712	15.398.690	12.998.726	1.019.134	15.930.372	16.068.793	16.018.148	16.078.939	16.312.216	16.284.588	16.257.105	16.229.762	33.123.517	0	0	0	0	0	0
-19.791.409	-19.117.319	16.714.136	16.739.606	16.767.850	16.605.374	16.577.028	16.869.733	16.909.586	6.154.634	16.754.170	16.787.133	13.016.765	17.378.186	17.511.189	17.522.301	15.812.601	7.103.257	18.045.775	18.193.661	18.204.290	18.292.899	18.465.228	18.446.958	18.428.859	18.410.923	35.314.106	0	0	0	0	0	0

11.544.014

Obs	Frequency
5	0,02%
8	0,03%
32	0,13%
61	0,24%
171	0,68%
389	1,56%
644	2,58%
1090	4,36%
1811	7,24%
2443	9,77%
2987	11,95%
3396	13,58%
3276	13,10%
2871	11,48%
2206	8,82%
1593	6,37%
1015	4,06%
532	2,13%
258	1,03%
131	0,52%
67	0,27%
8	0,03%
5	0,02%
0	0,00%
1	0,00%

16.498.398

Obs	Frequency
6	0,02%
9	0,04%
23	0,09%
58	0,23%
117	0,47%
270	1,08%
491	1,96%
864	3,46%
1314	5,26%
1779	7,12%
2386	9,54%
2992	11,97%
3003	12,01%
2828	11,31%
2583	10,33%
2098	8,39%
1623	6,49%
1119	4,48%
705	2,82%
382	1,53%
193	0,77%
98	0,39%
36	0,14%
16	0,06%
7	0,03%

THIS SHEET CONTAINS AUXILIARY CALCULATIONS AND IS NOT INTENDED FOR PRINTING

SENSITIVITY OF FRR/K and FNPV/K		-0.01%	-0.024 969																																			
Scenario	FRR/K	FNPV/K	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
1% with project investment cost +1%	-0.07%	-21,542,571	-522,285	-4,504,432	-10,046,064	-10,871,116	-10,500,848	1,199,900	1,378,419	1,409,702	1,161,678	1,104,641	1,509,182	1,544,259	-14,054,352	1,182,907	1,132,419	-4,378,275	1,834,553	1,922,754	1,832,306	-751,987	-13,473,629	2,306,304	2,404,817	2,302,177	2,326,178	4,864,543	4,636,084	4,404,606	4,219,322	23,780,580	0	0	0	0	0	0
-1% with project investment cost -1%	0.09%	-19,739,781	-489,815	-4,224,388	-9,421,493	-10,195,251	-9,848,002	1,187,901	1,364,634	1,395,605	1,150,061	1,093,594	1,494,091	1,528,817	-13,913,809	1,171,078	1,121,095	-4,334,492	1,816,208	1,903,527	1,813,983	-744,467	-13,338,893	2,283,241	2,380,769	2,279,155	2,302,916	4,815,897	4,589,723	4,360,560	4,177,129	23,159,474	0	0	0	0	0	0
1% with revenues +1%	0.38%	-19,573,989	-511,462	-4,411,084	-9,837,873	-10,645,828	-10,283,233	1,288,198	1,468,770	1,500,636	1,253,203	1,196,768	1,601,922	1,637,621	-13,960,357	1,278,112	1,228,799	-4,280,211	1,933,335	2,023,276	1,934,090	-448,918	-13,360,251	2,412,505	2,512,375	2,411,117	2,436,451	4,997,804	4,767,429	4,534,005	4,347,238	23,717,326	0	0	0	0	0	0
-1% with revenues -1%	-0.28%	-22,275,949	-511,462	-4,411,084	-9,837,873	-10,645,828	-10,283,233	1,111,602	1,288,067	1,318,769	1,070,152	1,012,513	1,416,443	1,450,897	-14,148,347	1,087,701	1,036,040	-4,476,338	1,735,272	1,822,233	1,730,523	-855,056	-13,578,007	2,200,103	2,297,259	2,193,237	2,215,904	4,731,281	4,504,739	4,275,207	4,091,407	23,458,608	0	0	0	0	0	0
1% with O&M +1%	-0.26%	-22,225,932	-511,462	-4,411,084	-9,837,873	-10,645,828	-10,283,233	1,123,601	1,301,851	1,332,866	1,081,769	1,023,560	1,431,535	1,466,340	-14,288,891	1,099,530	1,047,364	-4,520,121	1,753,617	1,841,460	1,748,846	-862,576	-13,712,743	2,223,166	2,321,307	2,216,259	2,239,166	4,779,927	4,551,100	4,319,253	4,133,600	23,501,874	0	0	0	0	0	0
-1% with O&M -1%	0.25%	-19,624,008	-511,462	-4,411,084	-9,837,873	-10,645,828	-10,283,233	1,276,199	1,454,986	1,486,539	1,241,586	1,185,722	1,586,830	1,622,179	-13,819,813	1,266,283	1,217,475	-4,236,428	1,915,489	2,004,048	1,915,767	-641,398	-13,234,515	2,389,442	2,488,327	2,388,095	2,413,189	4,949,159	4,721,068	4,489,959	4,305,045	23,674,060	0	0	0	0	0	0

SENSITIVITY OF ERR and ENPV		18.60%	129,422,120																																			
Scenario	ERR	ENPV	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
1% with economic benefits +1%	18.32%	132,075,626	-950,846	-8,200,544	-18,289,360	-19,791,409	-19,117,319	16,656,631	16,681,566	16,709,300	16,536,154	16,504,073	16,909,813	16,949,284	5,525,632	16,676,228	16,704,577	12,729,206	17,313,670	17,448,948	17,451,792	15,645,122	6,470,269	17,981,450	18,129,720	18,133,365	18,219,841	18,400,746	18,381,211	18,361,845	18,342,641	35,244,555	0	0	0	0	0	0
-1% with economic benefits -1%	18.37%	126,768,614	-950,846	-8,200,544	-18,289,360	-19,791,409	-19,117,319	16,216,959	16,241,014	16,267,812	16,093,671	16,060,537	16,385,166	16,403,444	5,078,579	16,225,979	16,251,340	12,573,032	16,854,311	16,984,436	16,986,064	15,176,116	5,997,023	17,505,698	17,650,497	17,650,603	17,733,597	17,914,564	17,894,886	17,875,372	17,856,016	34,757,774	0	0	0	0	0	0
1% with economic costs (inv) +1%	18.44%	128,881,486	-960,354	-8,282,549	-18,472,254	-19,989,323	-19,308,492	16,436,795	16,461,290	16,488,556	16,314,913	16,282,305	16,587,489	16,626,354	5,302,105	16,451,104	16,477,963	12,501,164	17,083,990	17,215,692	17,218,928	15,410,619	6,234,096	17,743,574	17,890,109	17,891,984	17,976,619	18,157,655	18,138,048	18,118,608	18,099,329	35,170,374	0	0	0	0	0	0
-1% with economic costs (inv) -1%	18.76%	129,962,755	-941,338	-8,118,539	-18,106,466	-19,593,495	-18,926,146	16,436,795	16,461,290	16,488,556	16,314,913	16,282,305	16,587,489	16,626,354	5,302,105	16,451,104	16,477,963	12,501,164	17,083,990	17,215,692	17,218,928	15,410,619	6,234,096	17,743,574	17,890,109	17,891,984	17,976,619	18,157,655	18,138,048	18,118,608	18,099,329	34,831,955	0	0	0	0	0	0
1% with economic costs (o&m) +1%	18.53%	128,603,470	-950,846	-8,200,544	-18,289,360	-19,791,409	-19,117,319	16,381,327	16,405,627	16,432,897	16,258,620	16,223,360	16,531,041	16,569,708	6,131,600	16,396,490	16,416,129	12,398,044	17,025,151	17,156,593	17,158,264	15,330,223	6,060,264	17,683,134	17,829,398	17,829,522	17,913,363	18,096,140	18,076,266	18,056,568	18,037,010	34,938,577	0	0	0	0	0	0
-1% with economic costs (o&m) -1%	18.67%	130,240,771	-950,846	-8,200,544	-18,289,360	-19,791,409	-19,117,319	16,492,263	16,516,953	16,544,415	16,373,005	16,341,250	16,643,938	16,683,001	5,472,611	16,511,717	16,539,797	12,604,284	17,142,830	17,274,791	17,276,603	15,491,015	6,407,928	17,804,014	17,950,819	17,954,445	18,039,875	18,219,169	18,199,830	18,180,659	18,161,647	35,063,753	0	0	0	0	0	0

Variable tested	Financial rate of return (FRR/K)(base case: 00%)	Financial net present value (FNPV/K) variation	Economic rate of return (ERR)(base case: 00%)	Economic net present value (ENPV) variation	CRITICAL VARIABLE
1 Project investment cost - increase of 1%	-0.07%	2.95%			YES
2 Project investment cost - decrease of 1%	0.09%	-5.66%			YES
3 Revenues - increase of 1%	0.26%	-6.46%			YES
4 Revenues - decrease of 1%	-0.28%	6.46%			YES
5 O&M costs - increase of 1%	-0.26%	6.22%			YES
6 O&M costs - decrease of 1%	0.25%	-6.22%			YES
7 Economic benefits - increase of 1%			0.22%	2.05%	YES
8 Economic benefits - decrease of 1%			-0.23%	-2.05%	YES
9 Economic costs (investment) - increase of 1%			-0.16%	-0.42%	NO
10 Economic costs (investment) - decrease of 1%			0.16%	0.42%	NO
11 Economic costs (O&M) - increase of 1%			-0.07%	-0.63%	NO
12 Economic costs (O&M) - decrease of 1%			0.07%	0.63%	NO

CATEGORIES OF VARIABLES	CHANGE	FNPV/K	ERR	ENPV	DIFFERENCE ON FNPV/K	DIFFERENCE ON ENPV	DIFFERENCE ON ERR	CRITICAL VARIABLE
BASE	0,0%	-20.924.969	18,60%	129.422.120				
Quantity of waste delivered to the plant								
Quantity of waste delivered to the plant	0,0%	-20.924.969	18,60%	129.422.120				NO
	1,0%	-20.921.814	18,71%	130.625.901	-0,02%	0,93%	0,11%	
	-1,0%	-20.928.124	18,49%	128.218.336	0,02%	-0,93%	-0,11%	
Price of Recyclables								
Price of Recyclables	0,0%	-20.924.969	18,60%	129.422.120				NO
	1,0%	-20.820.480	18,65%	129.950.170	-0,5%	0,41%	0,05%	
	-1,0%	-21.029.457	18,55%	128.894.070	0,5%	-0,41%	-0,05%	
Reduction of EU funds								
Reduction of EU funds	0,0%	-20.924.969	18,60%	129.422.120				YES
	-1,0%	-21.283.304	18,60%	129.422.120	1,7%	0,00%	0,00%	
Shadow price of CO2								
Shadow price of CO2	0,0%	-20.924.969	18,60%	129.422.120				NO
	1,0%	-20.924.969	18,7%	130.213.722	0,0%	0,61%	0,06%	
	-1,0%	-20.924.969	18,5%	128.630.519	0,0%	-0,61%	-0,06%	
Shadow price of landfill space								
Shadow price of landfill space	0,0%	-20.924.969	18,60%	129.422.120				NO
	1,0%	-20.924.969	18,62%	129.650.065	0,0%	0,18%	0,02%	
	-1,0%	-20.924.969	18,58%	129.194.176	0,0%	-0,18%	-0,02%	
Price of RDF								
Price of RDF	0,0%	-20.924.969	18,60%	129.422.120				NO
	1,0%	-20.956.526	18,59%	129.341.515	0,2%	-0,06%	-0,01%	
	-1,0%	-20.893.410	18,61%	129.502.724	-0,2%	0,06%	0,01%	
Quantity of source separated recyclables								
Quantity of source separated recyclables	0,0%	-20.924.969	18,60%	129.422.120				NO
	1,0%	-20.962.919	18,59%	129.331.678	0,2%	-0,07%	-0,01%	
	-1,0%	-20.886.727	18,61%	129.513.075	-0,2%	0,07%	0,01%	
Quantity of source separated recyclables								
Quantity of source separated recyclables	0,0%	-20.924.969	18,60%	129.422.120				
	-50,0%	-18.291.307	19,18%	135.244.295	-12,6%	4,50%	0,58%	

1000,0%

Quantities (t)			
Total (HH& COMMERCIAL)	HH (78,3%)	Commercial (21,7%)	Other Waste
1.408,82	1.103,11	305,71	
5.320,00	4.165,56	1.154,44	
9.312,29	7.291,52	2.020,77	
2.285,28	1.789,37	495,91	
8.322,24	6.516,31	1.805,93	82,42
7.404,51	5.797,73	1.606,78	
2.963,00	2.320,03	642,97	
2.119,00	1.659,18	459,82	
1.888,14	1.478,41	409,73	
83.549,03	65.418,89	18.130,14	1002,44
12.065,28	9.447,11	2.618,17	11,86
4829,57	3.781,55	1.048,02	
141.467,16	110.768,79	30.698,37	1.096,72

Revenues 2013								
HH			Commercial		other users	fees	Total	
HRK/Y	HRK/ton	HRK/cap	HRK/Y	HRK/ton	HRK/Y	HRK/Y	HRK/Y	HRK/ton
774.880	702	455	1.184.850	3.876	343.848		2.303.578	1.635
2.268.731	545	120	927.000	803	16.302		3.212.033	604
4.858.446	666	200	3.566.178	1.765	478.955		8.903.579	956
1.771.422	990	639	3.303.460	6.661	412.435	7.832	5.495.149	2.405
1.824.008	280	138	1.846.750	1.023	116.052		3.786.810	451
5.061.661	873	366	4.232.739	2.634	945.000		10.239.400	1.383
	0	0		0			2.467.314	833
495.000	298	178	724.000	1.575	299.000	14.000	1.532.000	723
1.459.774	987	580	1.900.658	4.639	767.350	727.131	4.854.913	2.571
24.117.803	369	93	23.538.088	1.298	10.774.148	64.157	58.494.196	692
	0	0		0			0	0
1.643.686	435	387	3.377.547	3.223	429.479		5.450.712	1.129
44.275.410,51	408	128	44.601.270,16	1.484	14.582.569,77	813.120,16	106.739.684,60	749

Operating Cost						
Collection		Disposal		Other	Total	
HRK/Y	HRK/ton	HRK/Y	HRK/ton	HRK/Y	HRK/Y	HRK/ton
1.510.612	1.072	333.562	237	142.905	1.987.079	1.410
2.599.108	489	593.000	111		3.192.108	600
3.467.501	372	1.357.429	146		4.824.930	518
3.697.490	1.618		0	233.614	3.931.104	1.720
2.272.937	270	821.952	98		3.094.890	368
3.615.222	488	1.186.364	160		4.801.586	648
	0		0		0	0
	0		0		1.774.174	837
2.730.071	1.446	384.529	204		3.114.600	1.650
22.609.655	267	22.609.655	267		45.219.310	535
	0		0		0	0
4.987.378	1.033	148.156	31	197.471	5.333.005	1.104
47.489.974,55	351	27.434.647,47	203	573.990,00	77.272.786,02	572

Quantities (t)			
Total (HH& COMMERCIAL)	HH (78,3%)	Commercial (21,7%)	Other Waste
1.408,82	1.103,11	305,71	
5.320,00	4.165,56	1.154,44	
9.312,29	7.291,52	2.020,77	
2.285,28	1.789,37	495,91	
8.322,24	6.516,31	1.805,93	82,42
7.404,51	5.797,73	1.606,78	
2.963,00	2.320,03	642,97	
2.119,00	1.659,18	459,82	
1.888,14	1.478,41	409,73	
83.549,03	65.418,89	18.130,14	1002,44
12.065,28	9.447,11	2.618,17	11,86
4829,57	3.781,55	1.048,02	
141.467,16	110.768,79	30.698,37	1.096,72

Revenues 2013								
HH			Commercial		other user	fees	Total	
EUR/Y	EUR/ton	EUR/cap	EUR/Y	EUR/ton	EUR/Y	EUR/Y	EUR/Y	EUR/ton
101.607	92	60	155.365	508	45.088	0	302.060	214
297.491	71	16	121.554	105	2.138	0	421.182	79
637.070	87	26	467.620	231	62.804	0	1.167.494	125
232.280	130	84	433.171	873	54.081	1.027	720.559	315
239.176	37	18	242.158	134	15.218	0	496.551	59
663.717	114	48	555.024	345	123.914	0	1.342.656	181
0	0	0	0	0	0	0	323.530	109
64.908	39	23	94.936	206	39.207	1.836	200.886	95
191.415	129	76	249.226	608	100.620	95.346	636.607	337
3.162.480	48	12	3.086.464	170	1.412.775	8.413	7.670.133	91
0	0	0	0	0	0	0	0	0
215.531	57	51	442.886	423	56.316	0	714.732	148
5.805.674,69	52	17	5.848.403,49	191	1.912.159,71	106.621,51	13.996.389,38	98

Operating Cost						
Collection		Disposal		Other	Total	
EUR/Y	EUR/ton	EUR/Y	EUR/ton	EUR/Y	EUR/Y	EUR/tons
198.081	141	43.739	31	18.739	260.558	185
340.812	64	77.758	15	0	418.570	79
454.681	49	177.995	19	0	632.676	68
484.839	212	0	0	30.633	515.471	226
298.042	35	107.780	13	0	405.822	48
474.051	64	155.564	21	0	629.615	85
0	0	0	0	0	0	0
0	0	0	0	0	232.641	110
357.984	190	50.422	27	0	408.406	216
2.964.722	35	2.964.722	35	0	5.929.445	70
0	0	0	0	0	0	0
653.977	135	19.427		25.894	699.298	145
6.227.188,87	46	3.597.406,25	27	75.265,24	10.132.501,38	75

225.735 173.816 51.919

5.805.674,69 33,401261 5.848.403,49 112,6446014

6.227.188,87 27,58626657

MIN	37	12		105				0		35		13		68
MAX	130	84		873				337		212		35		226

