

Comparison Scenario Report -
Waste to Energy
Country:
Town:
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SAMPLE OF A COMPARISON SCENARIO REPORT WASTE

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Part 1: Recycling, Composting, Digestion

Dry materials

% of material	Status quo	Scenario 1	Scenario 2	Scenario 3
Paper, Cardboard	30%	50%	50%	70%
Plastics	30%	50%	50%	70%
Glass	10%	30%	30%	50%
Metals	40%	60%	60%	70%
Textiles	10%	20%	20%	40%

Organic waste composting and/or digestion

% of material	Status quo	Scenario 1	Scenario 2	Scenario 3
Food waste	40%	40%	40%	40%
Garden and Park waste	0%	20%	20%	40%

% of organic waste to recycling is

% of material	Status quo	Scenario 1	Scenario 2	Scenario 3
Composted	0%	100%	100%	100%
Digested	0%	0%	0%	0%

Intermediate result/information. Separate collection change the original waste composition, the recycling rates lead to the following physical properties for the remaining residual waste.

Result - carbon content of total waste	Status quo	Scenario 1	Scenario 2	Scenario 3
Calorific value (MJ/kg)	7.3	6.3	6.3	5.1
Total carbon content (% wet waste)	22,2%	19.8%	19.8%	16.7%
Fossil carbon content (% wet waste)	8.9%	7.2%	7.2%	5.0%
Regenerative carbon content (% wet waste)	13.3%	12.6%	12.6%	11.7%

Part 2: Waste Treatment and disposal

Shall be avoided:

Type of Waste treatment and disposal	Status quo	Scenario 1	Scenario 2	Scenario 3
Scattered waste not burned	10.0%	10.0%	10.0%	0.0%
Open burning of scattered waste	10.0%	0.0%	0.0%	0.0%
Wild dumps/unmanaged disposal site	80.0%	0.0%	0.0%	0.0%

Simple Treatment technologies

Type of Waste treatment and disposal	Status quo	Scenario 1	Scenario 2	Scenario 3
Controlled dump/landfill without gas collection	0.0%	0.0%	0.0%	0.0%
Sanitary landfill with gas collection	0.0%	90.0%	0.0%	0.0%
BS ¹ + landfill	0.0%	0.0%	90.0%	0.0%

Advanced technologies

Type of Waste treatment and disposal	Status quo	Scenario 1	Scenario 2	Scenario 3
MB ² T + further treatment + landfill	0.0%	0.0%	0.0%	0.0%
MBS/MPS ³ + co-processing cement kiln	0.0%	0.0%	0.0%	0.0%
Gasification	0.0%	0.0%	0.0%	100.0%

¹ BS – Biological stabilization

² MBT – Mechanical biological treatment

³ MBS/MPS – Mechanical-biological stabilization/mechanical-physical stabilization

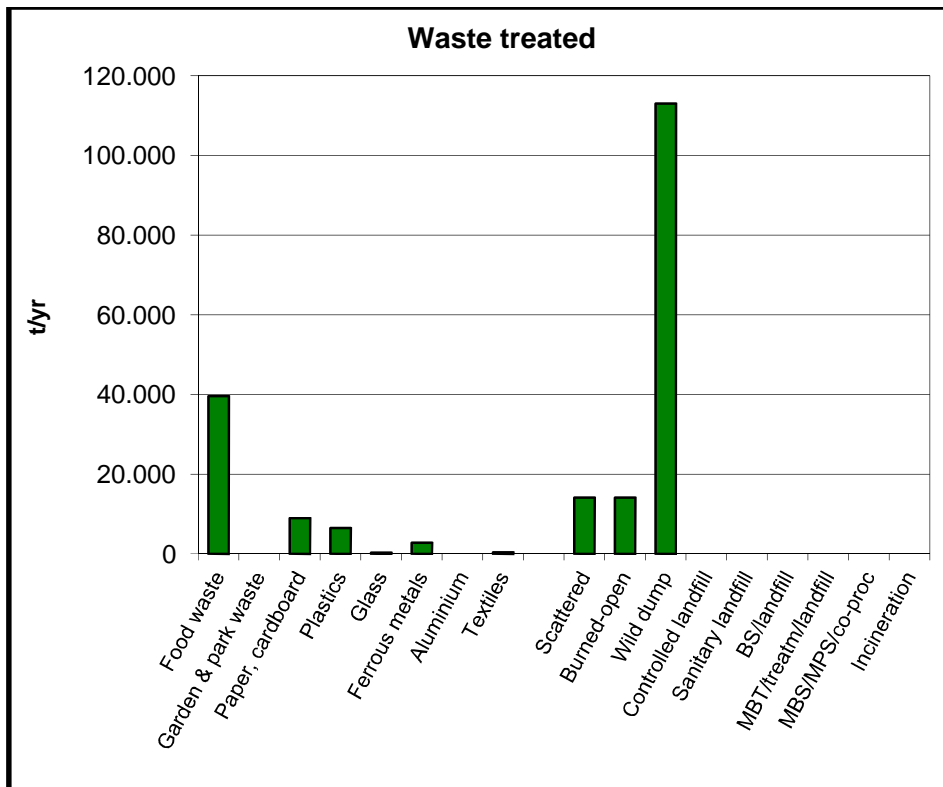


Part 3: RESULTS

Part 3.1 - RESULTS - STATUS QUO

WASTE TREATED in t/yr

TOTAL WASTE IN T/YR 200.000					
There of recycled	58.680	29%	71%	141.320	There of disposed of
Food waste	39.600	67%	10%	14.132	Scattered
Garden & Park Waste	0	0%	10%	14.132	Burned open
Paper, Cardboard	9.000	15%	80%	113.056	Wild dump
Plastics	6.540	11%	0%	0	Controlled landfill
Glass	320	1%	0%	0	Sanitary Landfill
Ferrous metals	2.800	5%	0%	0	BS/landfill
Aluminium	0	0%	0%	0	MBT/treatment/landfill
Textiles	420	1%	0%	0	Gasification

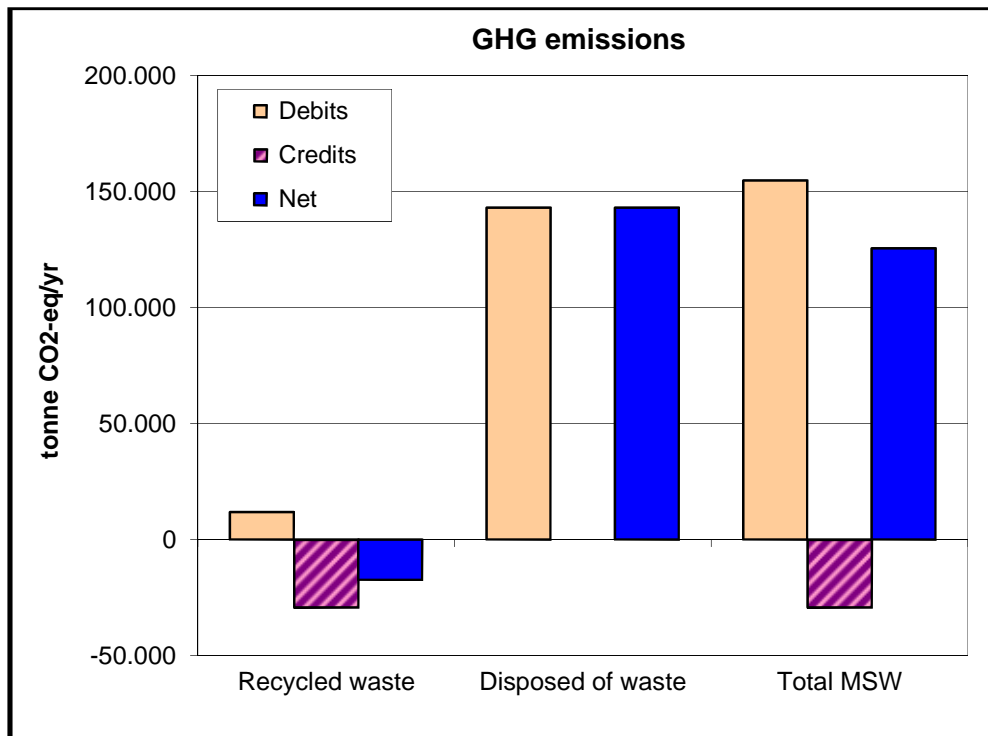


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Results GHG emissions recycling and disposal in t CO2-eq/yr

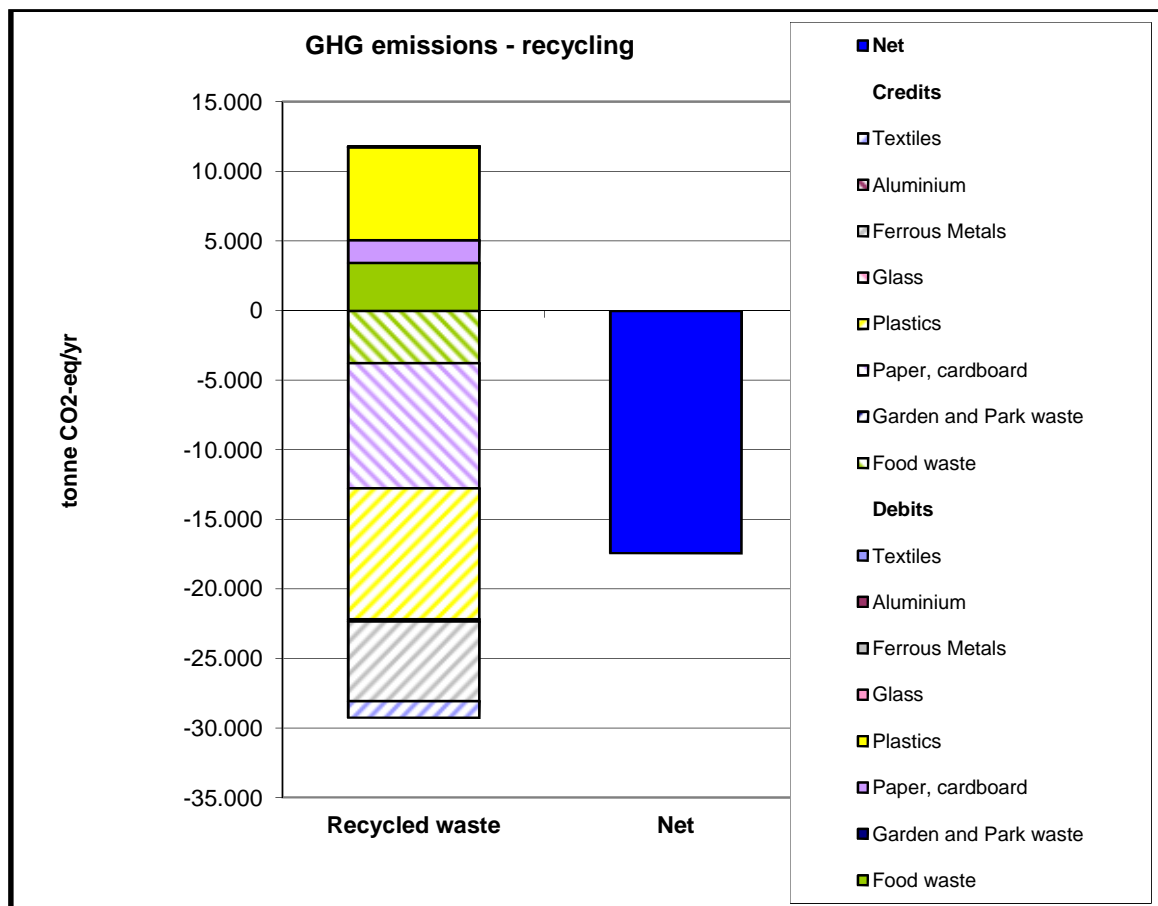
	Emissions	Avoided emissions	Net results
Recycled Waste			
Food Waste	3.445	-3.762	-317
Garden and Park Waste	0	0	0
Paper, Cardboard	1.620	-9.000	-7.300
Plastics	6.687	-9.395	-2.700
Glass	6	-160	-154
Ferrous Metals	61	-5.731	-5.670
Aluminium	0	0	0
Textiles	13	-1.197	-1.184
Disposal of Waste			
Scattered waste not burned	0	0	0
Open burning of scattered waste	4.599	0	4.599
Wild dump	138.299	0	138.299
Controlled dump/landfill without gas collection	0	0	0
Sanitary landfill with gas collection	0	0	0
BS + landfill	0	0	0
MBT + further treatment + landfill	0	0	0
MBS/MPS + co-processing cement kiln	0	0	0
Gasification	0	0	0
TOTAL	154.731	-29.245	125.486



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	Recycled waste	Net
DEBITS		
Food waste	3.445	
Garden and Park waste	0	
Paper, Cardboard	1.620	
Plastics	6.687	
Glass	6	
Ferrous Metals	61	
Aluminium	0	
Textiles	13	
CREDITS		
Food waste	-3.762	
Garden and Park waste	0	
Plastics	-9.395	
Glass	-160	
Ferrous Metals	-5.731	
Aluminium	0	
Textiles	-1.197	
NET		-17.412

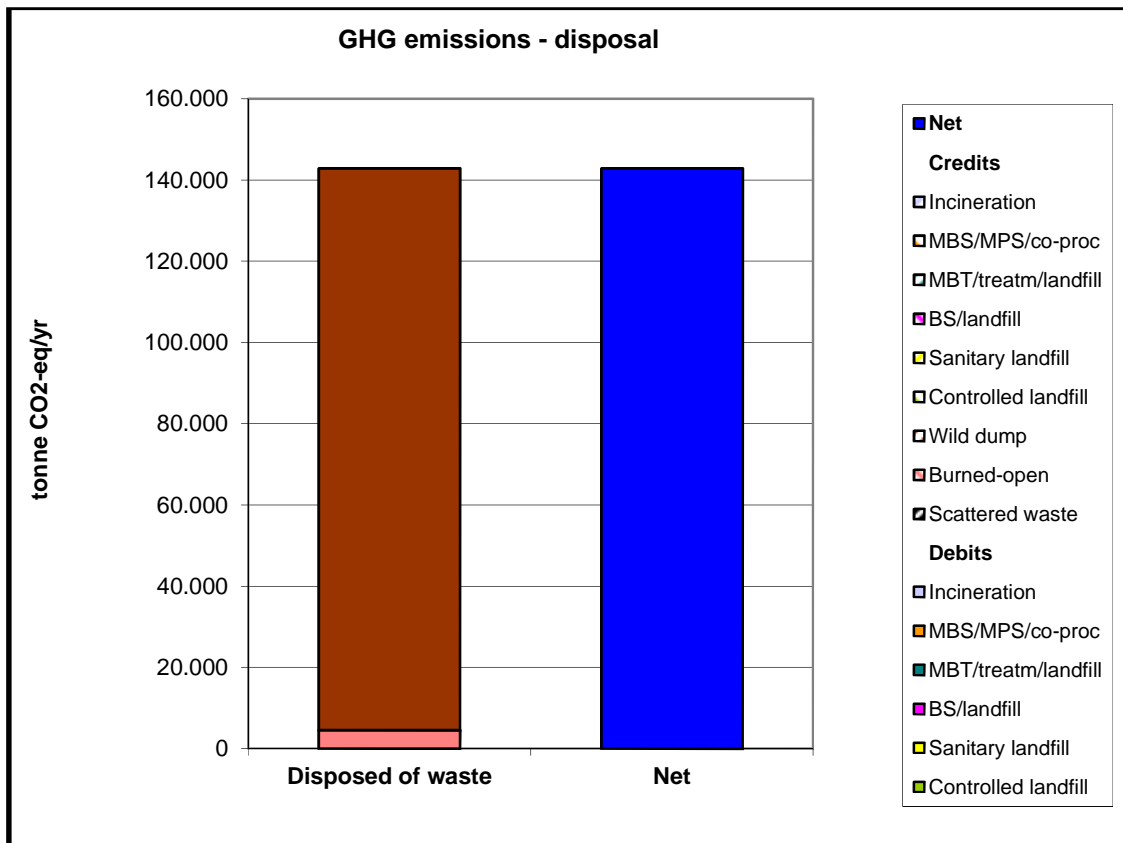


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Results GHG emissions disposal in t CO2-eq/yr

	Disposed of waste	Net
DEBITS		
Scattered waste	0	
Burned-open	4,599	
Wild dump	138,299	
Controlled landfill	0	
Sanitary landfill	0	
BS/landfill	0	
MBT/treatment/landfill	0	
MBS/MPS/co-processing	0	
Gasification	0	
CREDITS		
Scattered waste	0	
Burned-open	0	
Wild dump	0	
Controlled landfill	0	
Sanitary landfill	0	
BS/landfill	0	
MBT/treatment/landfill	0	
MBS/MPS/co-processing	0	
Gasification	0	
NET		142,897

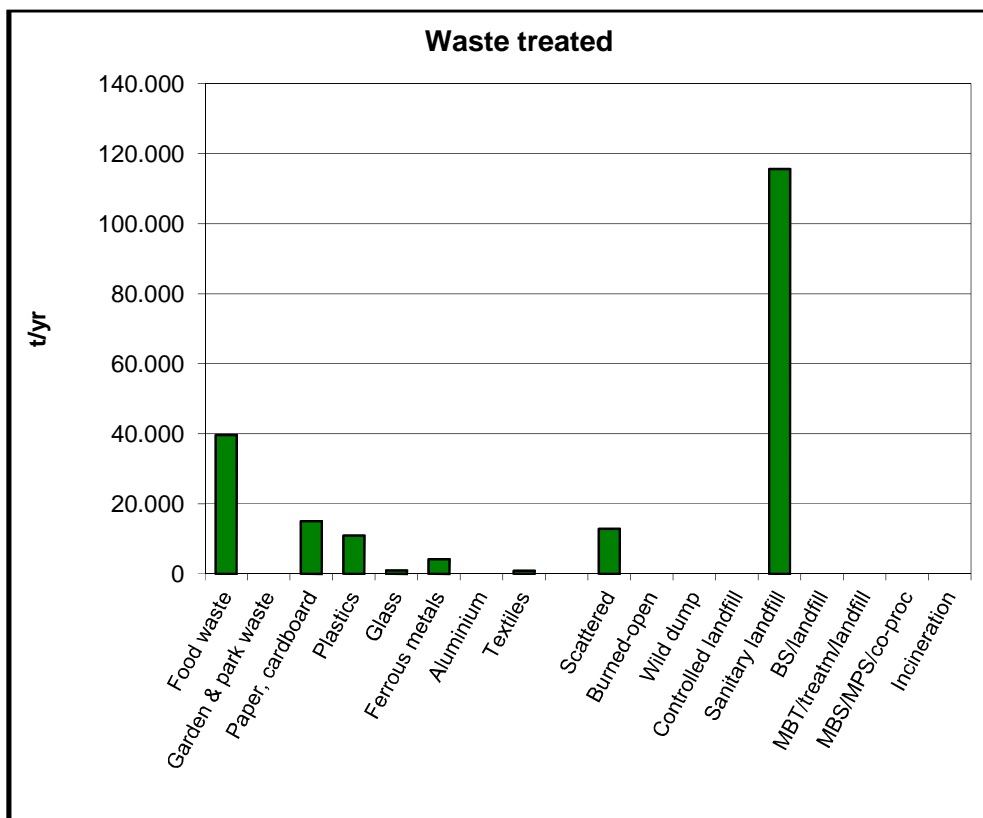




Part 3.2 - RESULTS - SCENARIO 1

WASTE TREATED in t/yr

		TOTAL WASTE IN T/YR 200.000					
There of recycled		71.500	36%	64%	128.500	There of disposed of	
Food waste	39.600	55%		10%	12.850	Scattered	
Garden & Park Waste	0	0%		0%	0	Burned open	
Paper, Cardboard	15.000	21%		0%	0	Wild dump	
Plastics	10.900	15%		0%	0	Controlled landfill	
Glass	960	1%		90%	115.650	Sanitary Landfill	
Ferrous metals	4.200	6%		0%	0	BS/landfill	
Aluminium	0	0%		0%	0	MBT/treatment/landfill	
Textiles	840	1%		0%	0	MBS/MPS/co-processing	
				0%	0	Gasification	

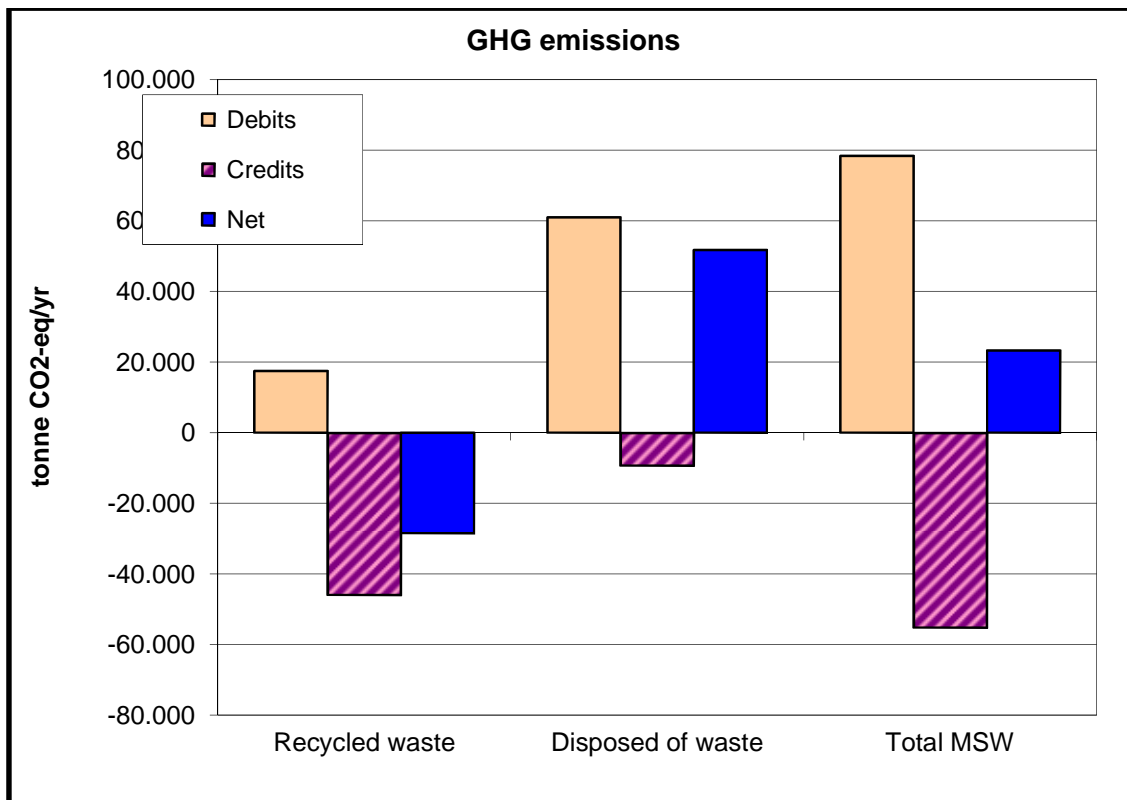


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Results GHG emissions recycling and disposal in t CO2-eq/yr

	Emissions	Avoided emissions	Net results
Recycled Waste			
Food Waste	3.445	-3.762	-317
Garden and Park Waste	0	0	0
Paper, Cardboard	2.700	-15.000	-12.300
Plastics	11.145	-15.658	-4.513
Glass	19	-480	-461
Ferrous Metals	91	-8.597	-8.505
Aluminium	0	0	0
Textiles	27	-2.394	-2394
Disposal of Waste			
Scattered waste not burned	0	0	0
Open burning of scattered waste	0	0	0
Wild dump	0	0	0
Controlled dump/landfill without gas collection	0	0	0
Sanitary landfill with gas collection	60.940	-9.231	51.710
BS + landfill	0	0	0
MBT + further treatment + landfill	0	0	0
MBS/MPS + co-processing cement kiln	0	0	0
Gasification	0	0	0
TOTAL	70.368	-55.121	23.247

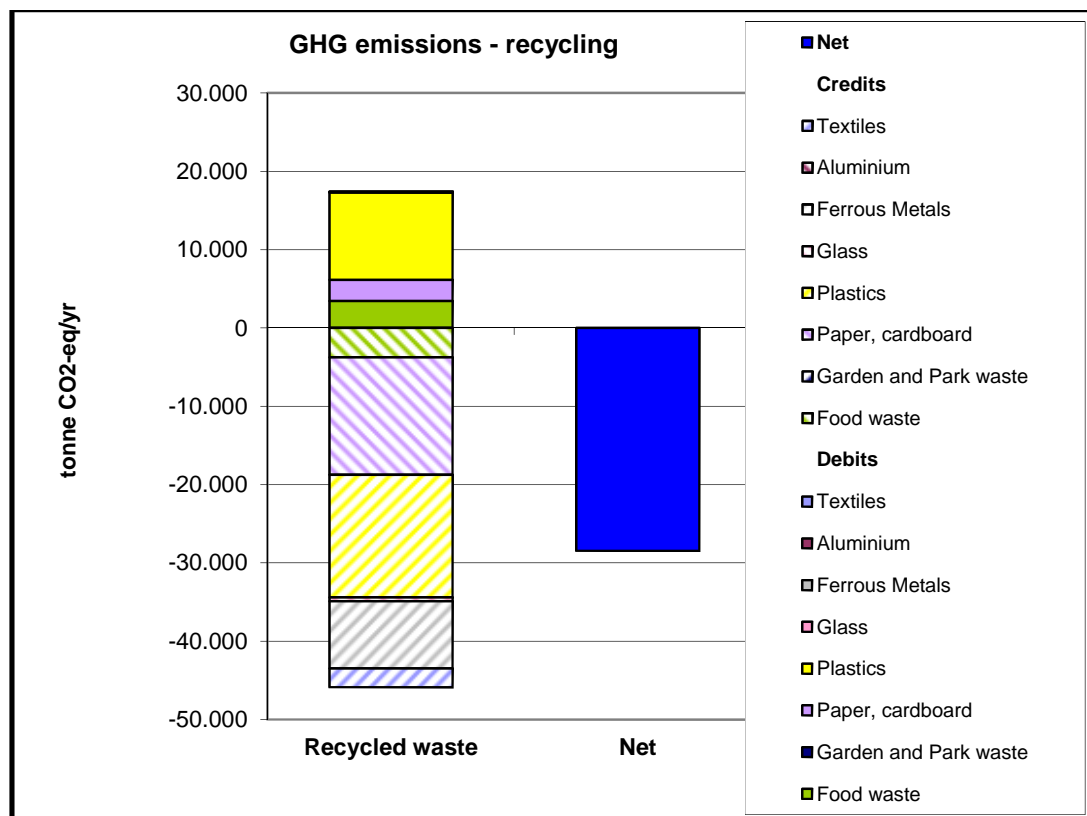


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Results GHG emissions recycling in tCO2e/yr

		Recycled waste	Net
DEBITS			
	Food waste	3.445	
	Garden and Park waste	0	
	Paper, Cardboard	2.700	
	Plastics	11.145	
	Glass	19	
	Ferrous Metals	91	
	Aluminium	0	
	Textiles	27	
CREDITS			
	Food waste	-3.762	
	Garden and Park waste	0	
	Paper, Cardboards	-15.000	
	Plastics	-15.658	
	Glass	-480	
	Ferrous Metals	-8.597	
	Aluminium	0	
	Textiles	-2.394	
NET			-28.462

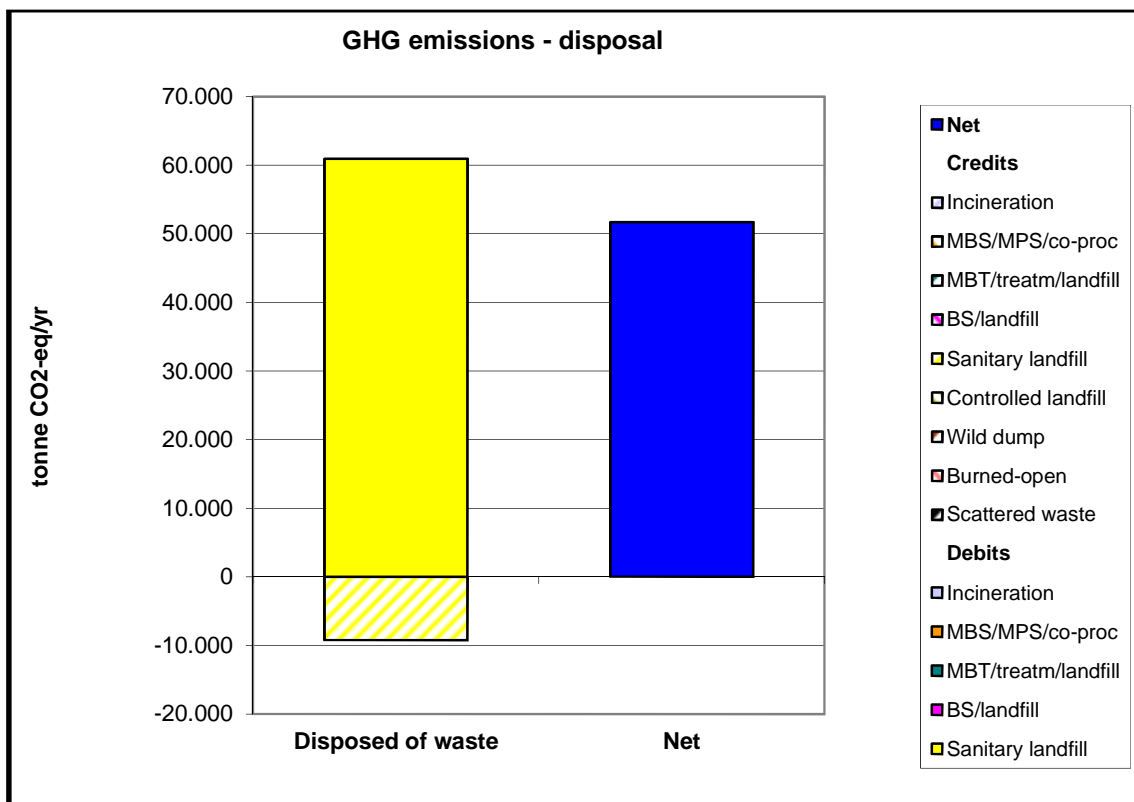


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Results GHG emissions disposal in t CO2-eq/yr

	Disposed of waste	Net
DEBITS		
Scattered waste	0	
Burned-open	0	
Wild dump	0	
Controlled landfill	0	
Sanitary landfill	60.940	
BS/landfill	0	
MBT/treatment/landfill	0	
MBS/MPS/co-processing	0	
Gasification	0	
CREDITS		
Scattered waste	0	
Burned-open	0	
Wild dump	0	
Controlled landfill	0	
Sanitary landfill	-9.231	
BS/landfill	0	
MBT/treatment/landfill	0	
MBS/MPS/co-processing	0	
Gasification	0	
NET		51.710

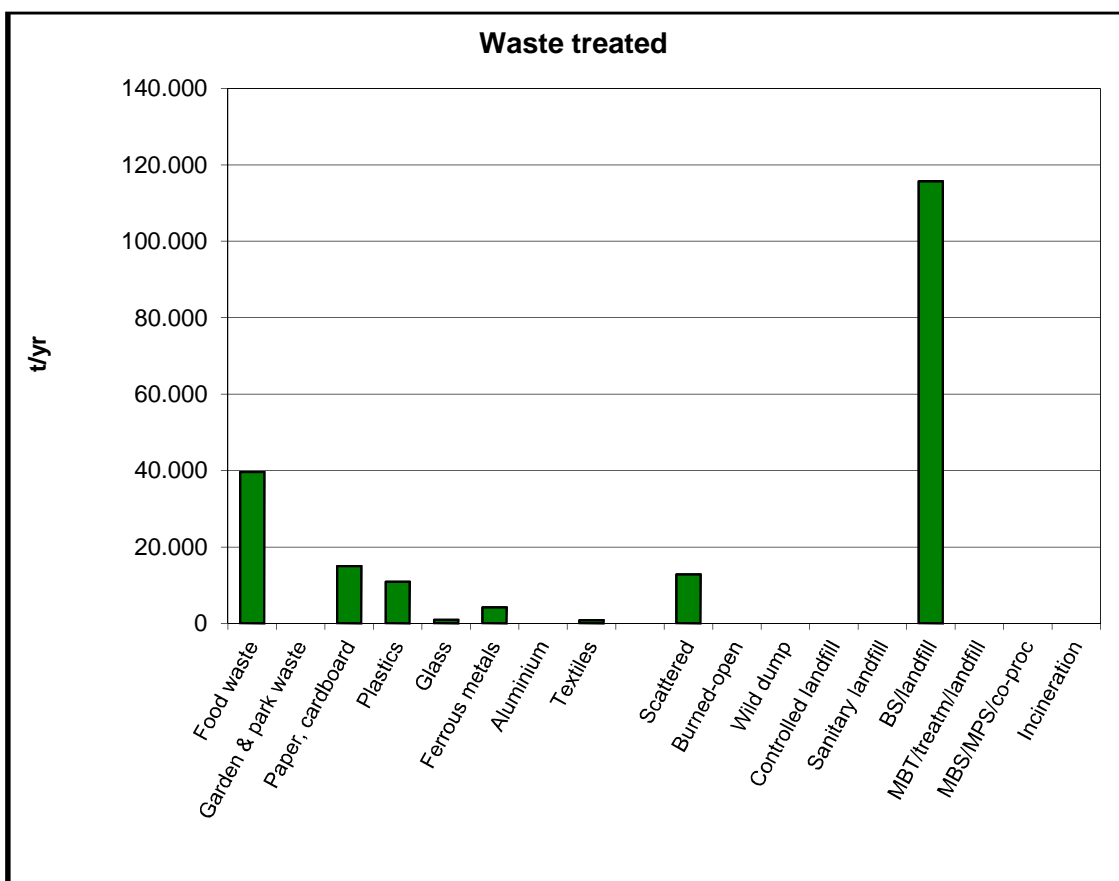




Part 3.3 - RESULTS - SCENARIO 2

WASTE TREATED in t/yr

		TOTAL WASTE IN T/YR 200.000			
There of recycled	71.500	36%	64%	128.500	There of disposed of
Food waste	39.600	55%	10%	12.850	Scattered
Garden & Park Waste	0	0%	0%	0	Burned open
Paper, Cardboard	15.000	21%	0%	0	Wild dump
Plastics	10.900	15%	0%	0	Controlled landfill
Glass	960	1%	0%	0	Sanitary Landfill
Ferrous metals	4.200	6%	90%	115.650	BS/landfill
Aluminium	0	0%	0%	0	MBT/treatment/landfill
Textiles	840	1%	0%	0	MBS/MPS/co-processing
			0%	0	Gasification

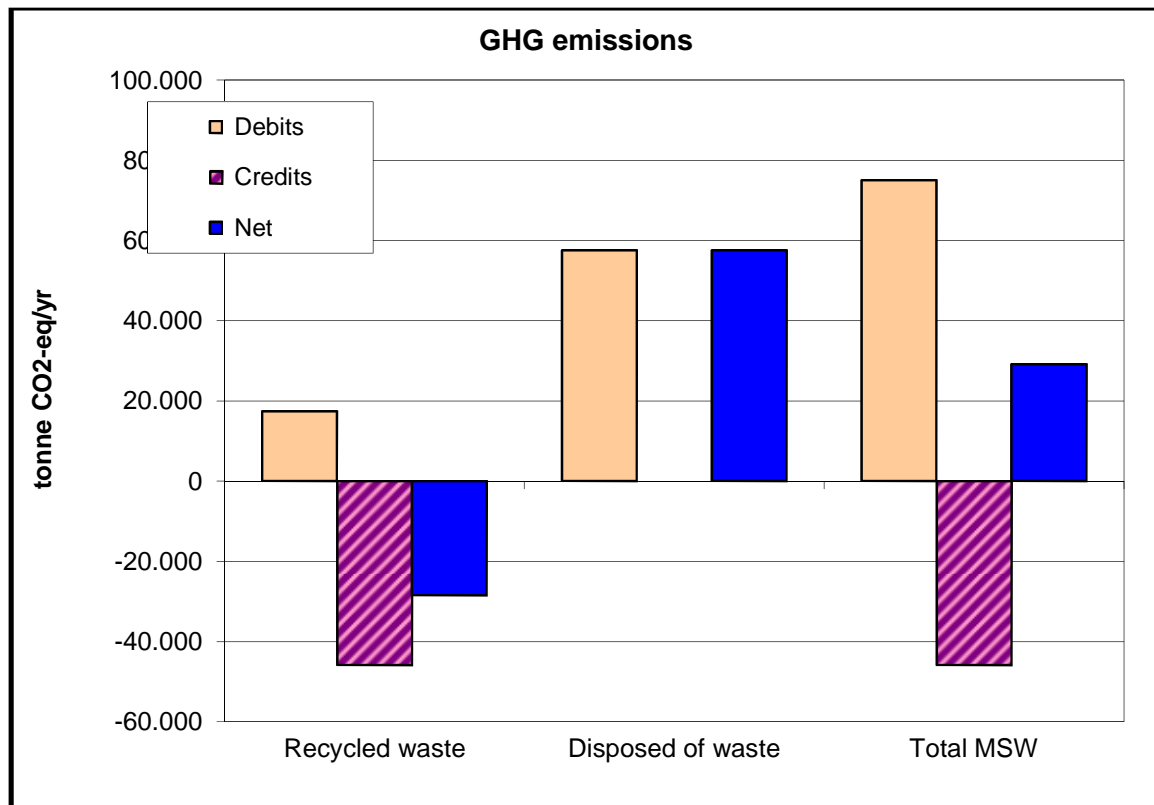


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Results GHG emissions recycling and disposal in t CO2-eq/yr

	Emissions	Avoided emissions	Net results
Recycled Waste			
Food Waste	3.445	-3.762	-317
Garden and Park Waste	0	0	0
Paper, Cardboard	2.700	-15.000	-12.300
Plastics	11.145	-15.658	-4.513
Glass	19	-480	-461
Ferrous Metals	91	-8.597	-8.505
Aluminium	0	0	0
Textiles	27	-2.394	-2394
Disposal of Waste			
Scattered waste not burned	0	0	0
Open burning of scattered waste	0	0	0
Wild dump	0	0	0
Controlled dump/landfill without gas collection	0	0	0
Sanitary landfill with gas collection	0	0	0
BS + landfill	57.582	0	57.582
MBT + further treatment + landfill	0	0	0
MBS/MPS + co-processing cement kiln	0	0	0
Gasification	0	0	0
TOTAL	75.010	-45.890	29.120

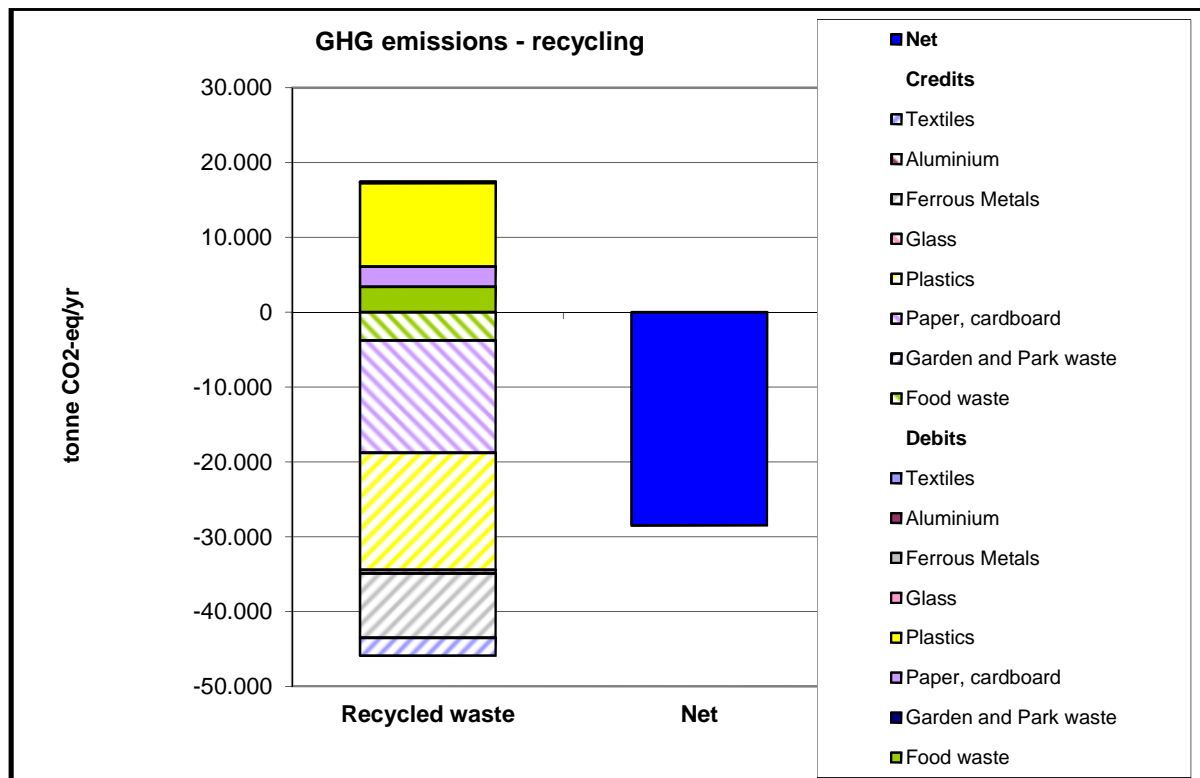


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Results GHG emissions recycling in tCO2e/yr

		Recycled waste	Net
DEBITS			
	Food waste	3.445	
	Garden and Park waste	0	
	Paper, Cardboard	2.700	
	Plastics	11.145	
	Glass	19	
	Ferrous Metals	91	
	Aluminium	0	
	Textiles	27	
CREDITS			
	Food waste	-3.762	
	Garden and Park waste	0	
	Paper, Cardboards	-15.000	
	Plastics	-15.658	
	Glass	-480	
	Ferrous Metals	-8.597	
	Aluminium	0	
	Textiles	-2.394	
NET			-28.462

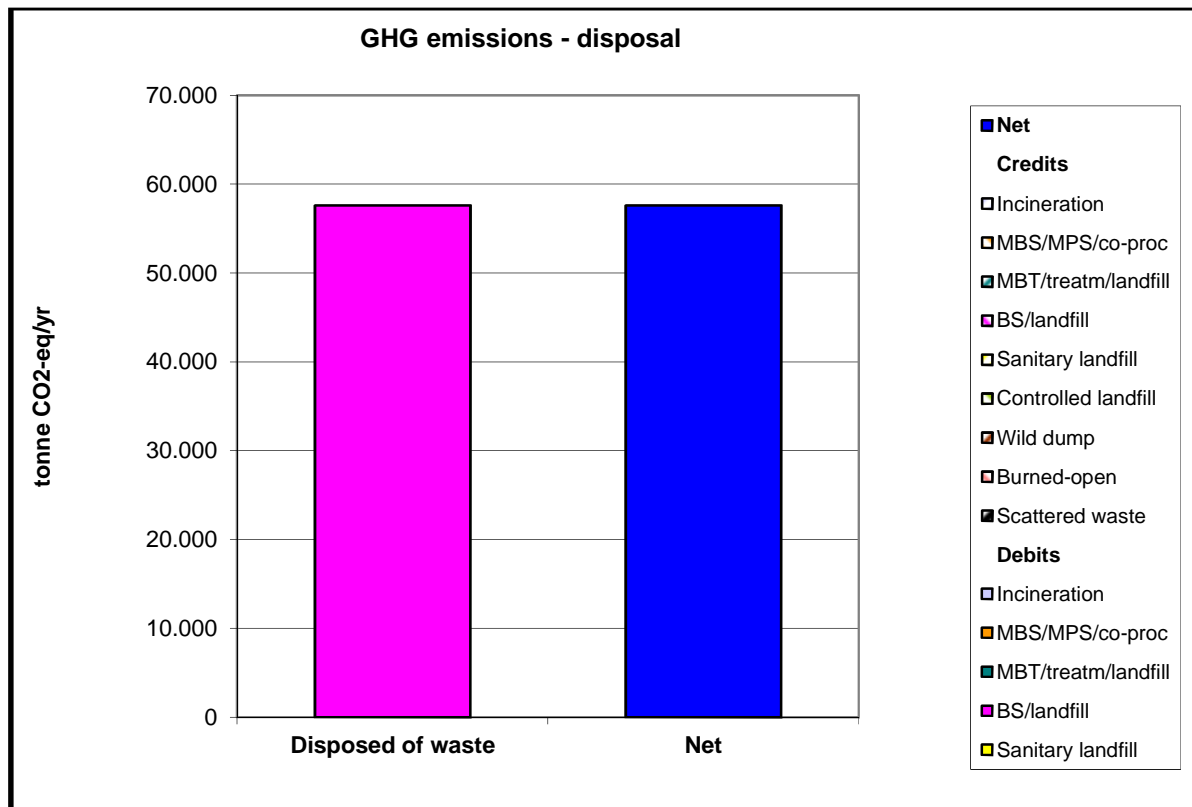


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Results GHG emissions disposal in t CO2-eq/yr

		Disposed of waste	Net
DEBITS			
	Scattered waste	0	
	Burned-open	0	
	Wild dump	0	
	Controlled landfill	0	
	Sanitary landfill	57.582	
	BS/landfill	0	
	MBT/treatment/landfill	0	
	MBS/MPS/co-processing	0	
	Gasification	0	
CREDITS			
	Scattered waste	0	
	Burned-open	0	
	Wild dump	0	
	Controlled landfill	0	
	Sanitary landfill	0	
	BS/landfill	0	
	MBT/treatment/landfill	0	
	MBS/MPS/co-processing	0	
	Gasification	0	
NET			57.582

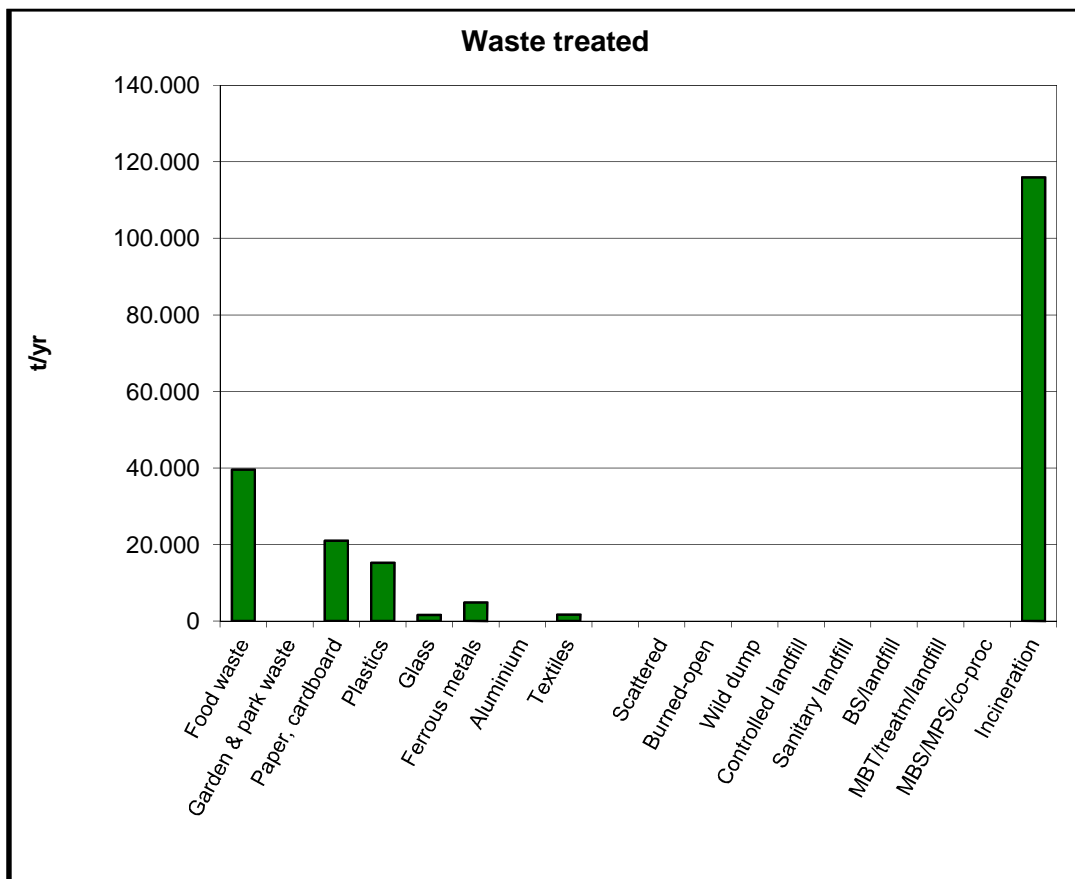




Part 3.4 - RESULTS - SCENARIO 3

WASTE TREATED in t/yr

		TOTAL WASTE IN T/YR 200.000			
There of recycled	84.040	42%	58%	115.960	There of disposed of
Food waste	39.600	47%	0%	0	Scattered
Garden & Park Waste	0	0%	0%	0	Burned open
Paper, Cardboard	21.000	25%	0%	0	Wild dump
Plastics	15.260	18%	0%	0	Controlled landfill
Glass	1.600	2%	0%	0	Sanitary Landfill
Ferrous metals	4.900	6%	0%	0	BS/landfill
Aluminium	0	0%	0%	0	MBT/treatment/landfill
Textiles	1.680	2%	0%	0	MBS/MPS/co-processing
			100%	115.960	Gasification

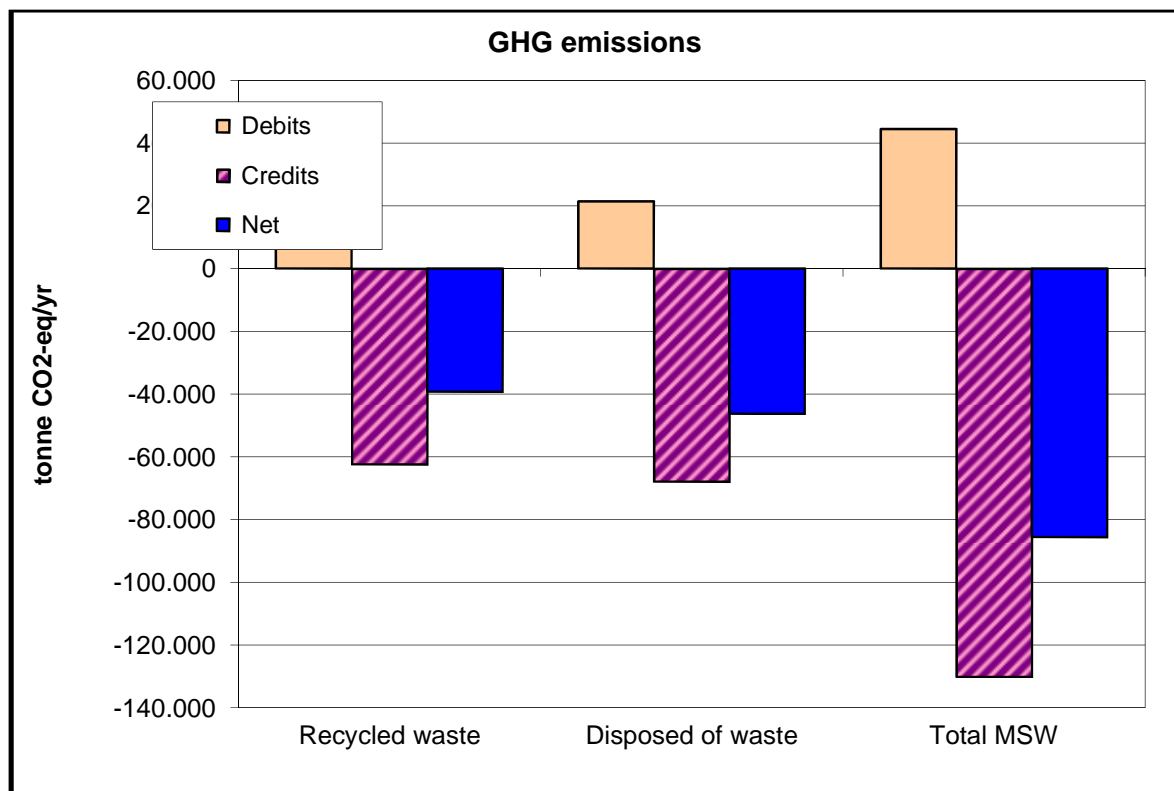


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Results GHG emissions recycling and disposal in t CO₂-eq/yr

	Emissions	Avoided emissions	Net results
Recycled Waste			
Food Waste	3.445	-3.762	-317
Garden and Park Waste	0	0	0
Paper, Cardboard	3.780	-21.000	-17.200
Plastics	15.603	-21.921	-6.318
Glass	32	-800	-768
Ferrous Metals	107	-10.029	-9.923
Aluminium	0	0	0
Textiles	54	-4.788	-4.734
Disposal of Waste			
Scattered waste not burned	0	0	0
Open burning of scattered waste	0	0	0
Wild dump	0	0	0
Controlled dump/landfill without gas collection	0	0	0
Sanitary landfill with gas collection	0	0	0
BS + landfill	0	0	0
MBT + further treatment + landfill	0	0	0
MBS/MPS + co-processing cement kiln	0	0	0
Gasification	21.455	-67.807	-46.352
TOTAL	44.476	-130.107	-85.631

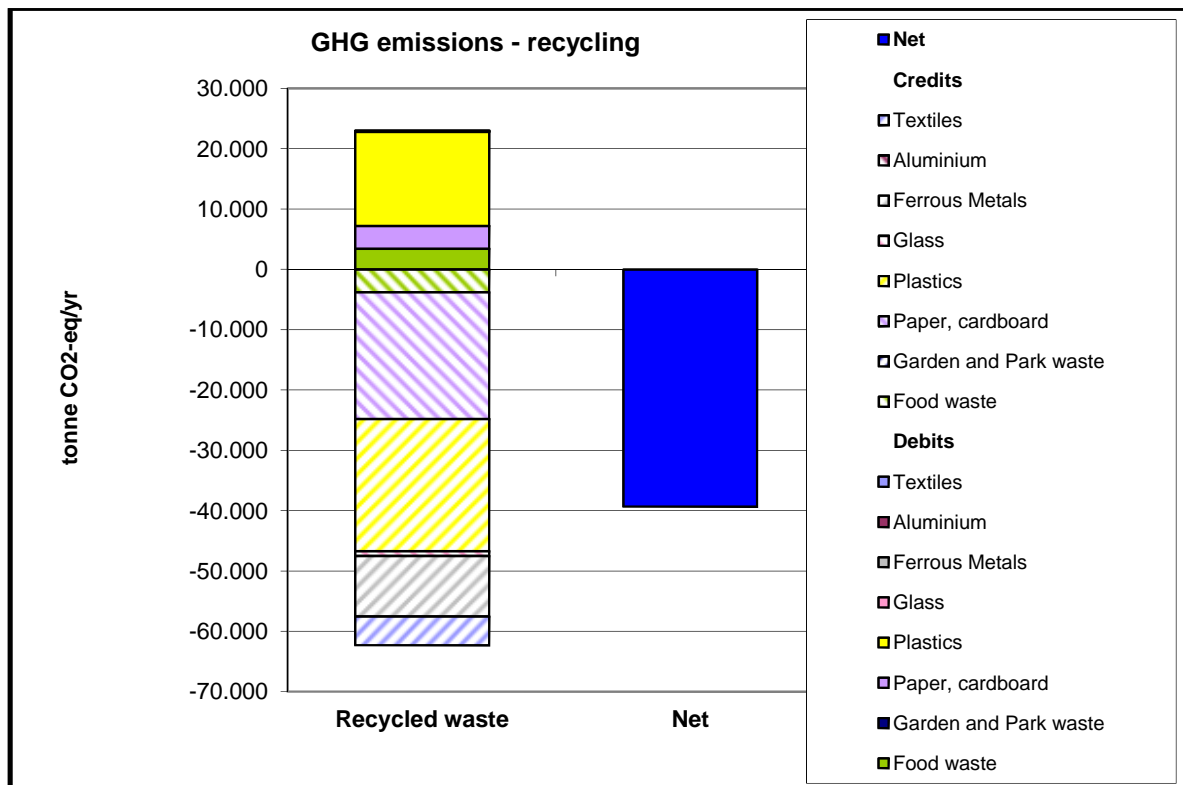


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Results GHG emissions recycling in tCO2e/yr

		Recycled waste	Net
DEBITS			
	Food waste	3.445	
	Garden and Park waste	0	
	Paper, Cardboard	3.780	
	Plastics	15.603	
	Glass	32	
	Ferrous Metals	107	
	Aluminium	0	
	Textiles	54	
CREDITS			
	Food waste	-3.762	
	Garden and Park waste	0	
	Paper, Cardboards	-21.000	
	Plastics	-21.921	
	Glass	-800	
	Ferrous Metals	-10.029	
	Aluminium	0	
	Textiles	-4.788	
NET			-39.279

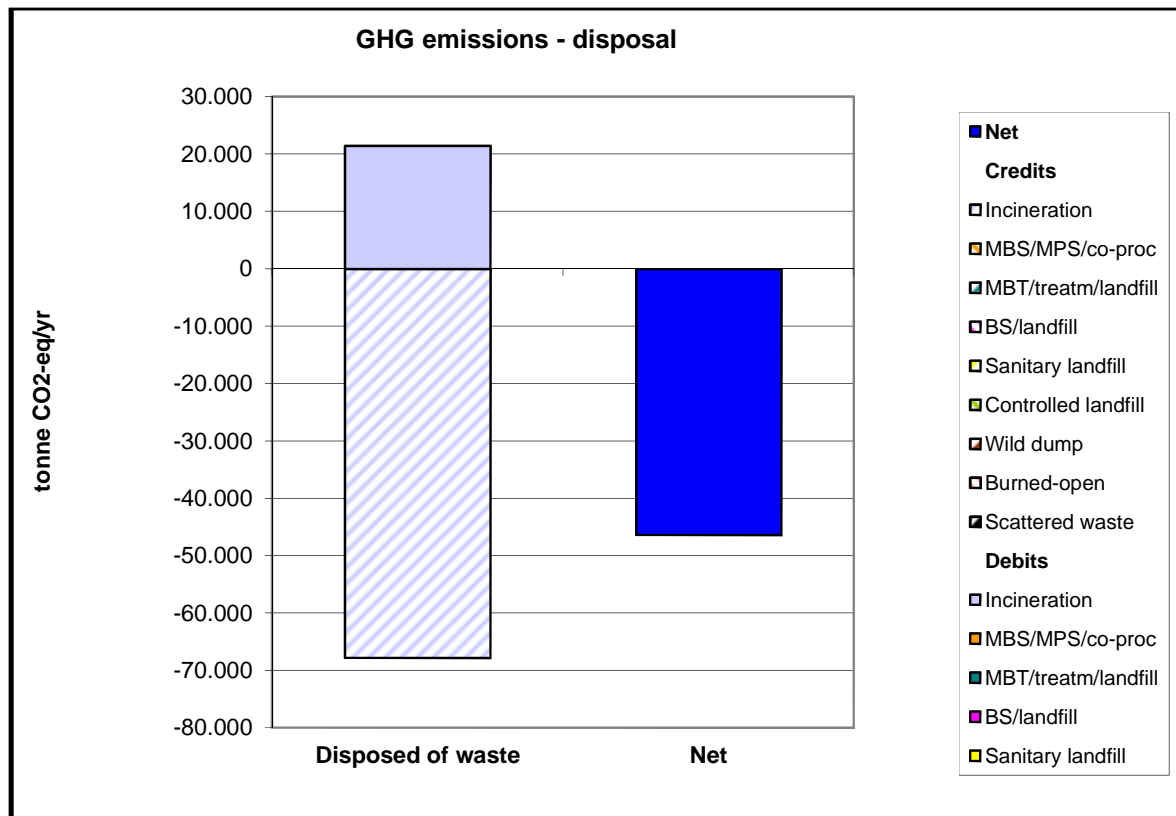


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Results GHG emissions disposal in t CO2-eq/yr

	Disposed of waste	Net
DEBITS		
Scattered waste	0	
Burned-open	0	
Wild dump	0	
Controlled landfill	0	
Sanitary landfill	0	
BS/landfill	0	
MBT/treatment/landfill	0	
MBS/MPS/co-processing	0	
Gasification	21.455	
CREDITS		
Scattered waste	0	
Burned-open	0	
Wild dump	0	
Controlled landfill	0	
Sanitary landfill	0	
BS/landfill	0	
MBT/treatment/landfill	0	
MBS/MPS/co-processing	0	
Gasification	-67.807	
NET		-46.352

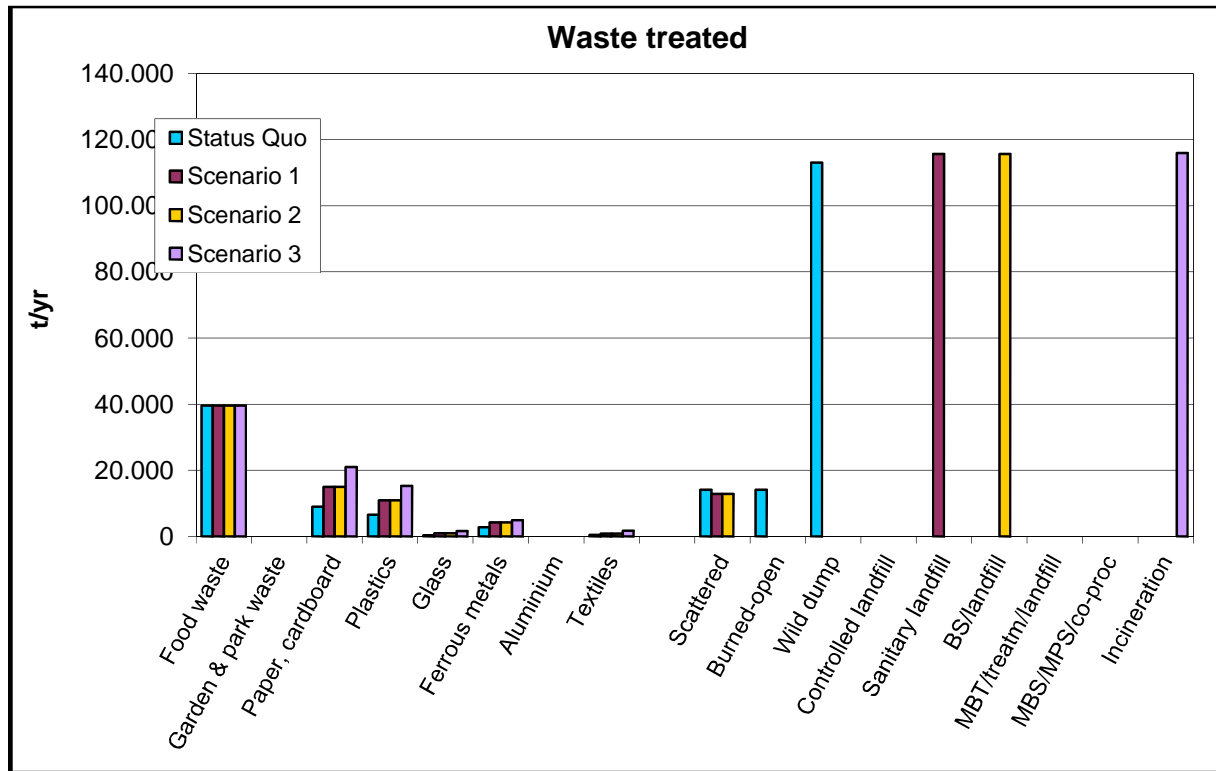




Part 3.5 - RESULTS - ALL SCENARIOS

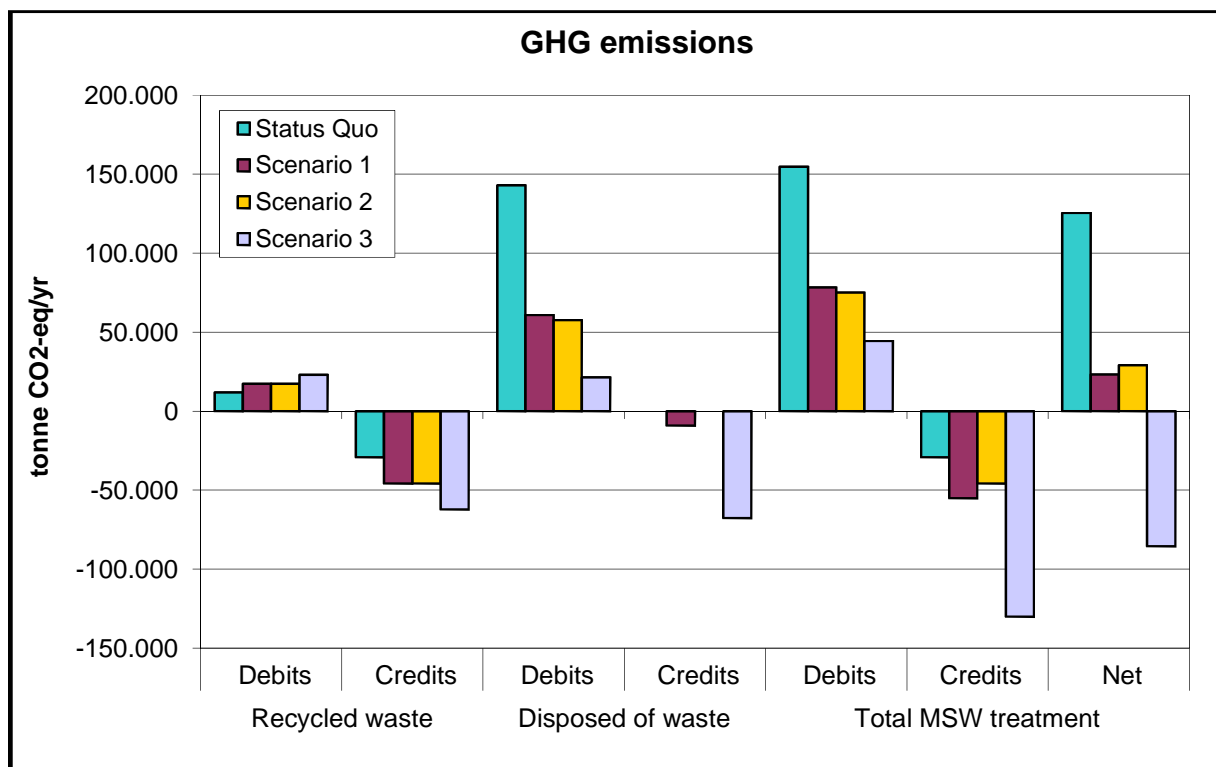
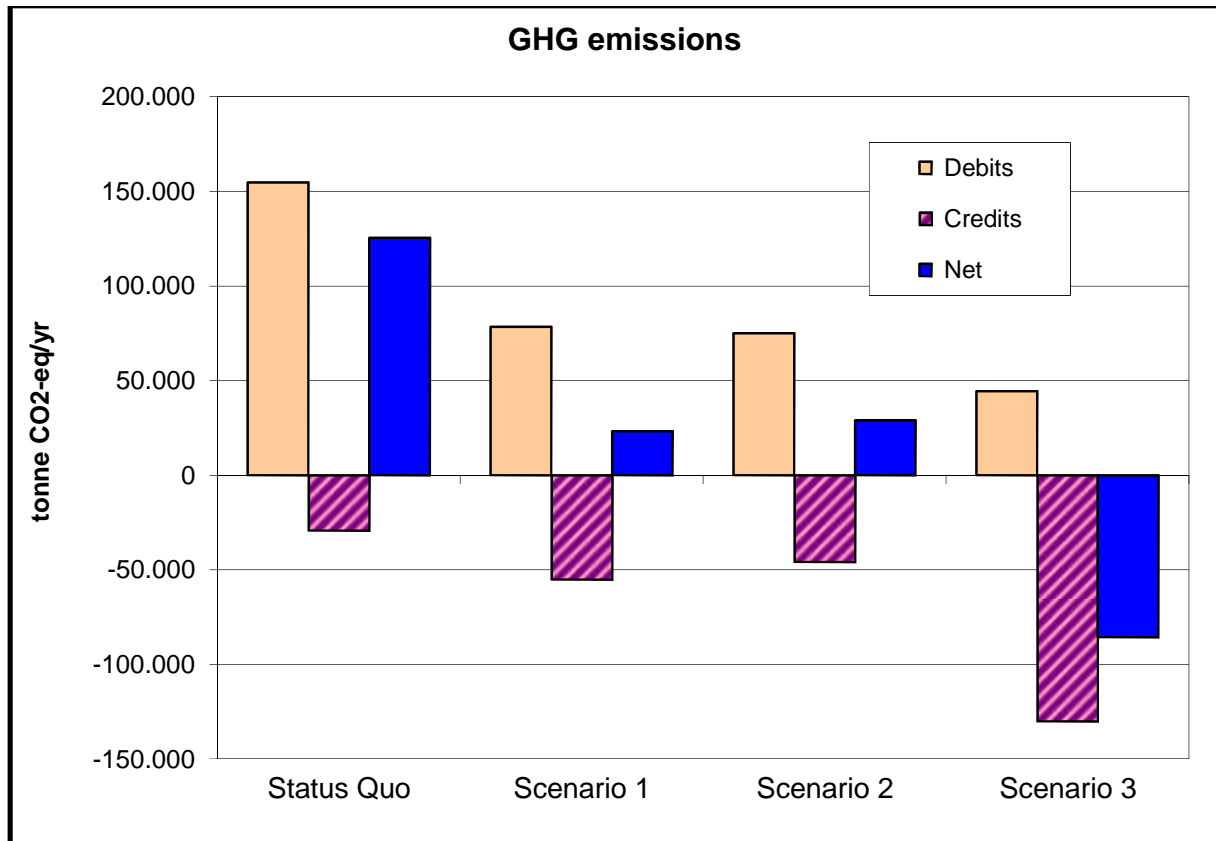
Waste treated in t/yr

	Status Quo	Scenario 1	Scenario 2	Scenario 3
Total waste	200.000	200.000	200.000	200.000
Recycled Waste	58.680	71.500	71.500	84.040
thereof				
Food waste	39.600	39.600	39.600	39.600
Garden & park waste	0	0	0	0
Paper, cardboard	9.000	15.000	15.000	21.000
Plastics	6.540	10.900	10.900	15.260
Glass	320	960	960	1.600
Ferrous metals	2.800	4.200	4.200	4.900
Aluminium	0	0	0	0
Textiles	420	840	840	1.680
Disposed of waste	141.320	128.500	128.500	115.960
thereof				
Scattered	14.132	12.850	12.850	0
Burned-open	14.132	0	0	0
Wild dump	113.056	0	0	0
Controlled landfill	0	0	0	0
Sanitary landfill	0	115.650	0	0
BS/landfill	0	0	115.650	0
MBT/treatm/landfill	0	0	0	0
MBS/MPS/co-proc	0	0	0	0
Incineration	0	0	0	115.960



Results GHG emissions recycling and disposal in t CO₂-eq/yr

		Status Quo	Scenario 1	Scenario 2	Scenario 3
Recycled waste	Debits	11.833	17.428	17.428	23.021
	Credits	-29.245	-45.890	-45.890	-62.300
Disposed of waste	Debits	142.897	60.940	57.582	21.455
	Credits	0	-9.231	0	-67.807
Total MSW treatment	Debits	154.731	78.368	75.010	44.476
	Credits	-29.245	-55.121	-45.890	-130.107
	Net	125.486	23.247	29.120	-85.631



Results absolute costs for the calculated scenario

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	Status Quo	Scenario 1	Scenario 2	Scenario 3
	Euro/yr	Euro/yr	Euro/yr	Euro/yr
Recycled dry waste	95.400	159.500	159.500	222.200
Composted organic waste	0	1.584.000	1.584.000	1.584.000
Digested organic waste	0	0	0	0
Residual waste to controlled dump/landfill without gas collection	0	0	0	0
Residual waste to sanitary landfill with gas collection	0	2.313.000	0	0
Residual waste to BS/landfill	0	0	2.891.250	0
Residual waste to MBT/treatm/landfill	0	0	0	0
Residual waste MBS/MPS/co-proc	0	0	0	0
Residual waste to MSWI	0	0	0	17.394.000
Total	95.400	4.056.500	4.634.750	19.200.200

Mitigation costs per tonne of GHG emissions for the calculated scenario compared to Status Quo (SQ)

	Status Quo	Scenario 1	Scenario 2	Scenario 3
Total GHG emissions in t CO2e/yr.	125.486	23.247	2.120	-85.631
Total costs in €/y	95.400	4,056.500	4,634.750	19,200.000
Difference GHG compared to SQ in t CO2e/yr	0	-102.239	-96.366	-211.117
Difference costs compared to SQ in €/yr.	0	3,961.100	4,539.350	19,104.800
Mitigation costs in €/t CO2e	-	39	47	90

*** END OF COMPARISON SCENARIO REPORT ***