



**FINAL REPORT**

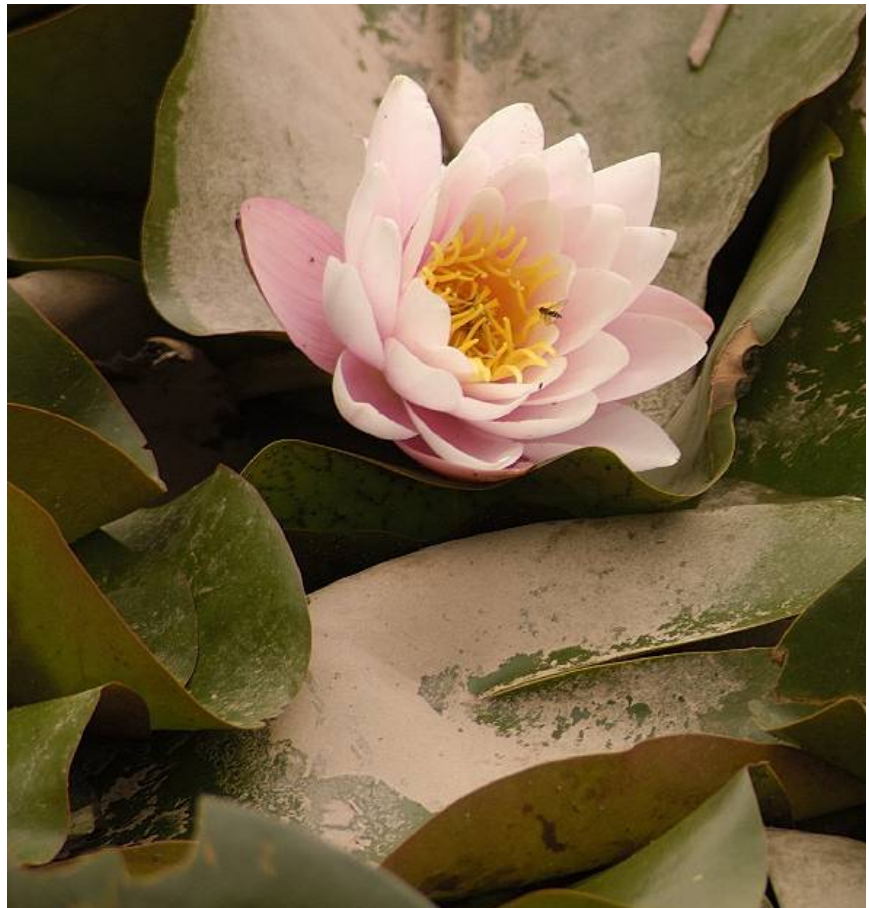
**ASSESSMENT OF THE OPTIONS TO IMPROVE THE MANAGEMENT OF BIO-WASTE  
IN THE EUROPEAN UNION**

**ANNEX C: Policy scenarios 3 and 3a**

**STUDY CONTRACT NR 07.0307/2008/517621/ETU/G4**

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MANAGEMENT OF BIO-WASTE IN THE EUROPEAN  
UNION**



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## LIST OF ABBREVIATIONS

AD	Anaerobic digestion
MBT	Mechanical biological treatment
ABPR	Animal By-Products Regulation
ACR+	Association of Cities and Regions for Recycling and Sustainable Resource management
BAT	Best available techniques
BIR	Bureau of International Recycling
BMW	Biodegradable municipal waste
BREF	BAT Reference Documents
CEWEP	Confederation of European Waste-to-Energy Plants
EEA	European Environment Agency
EEB	European Environmental Bureau
ETC/SCP	European Topic Centre on Sustainable Consumption and Production
FEAD	European Federation of Waste Management and Environmental Services
FGW	Fruit and garden waste
IPPC	Integrated Pollution Prevention and Control
ITT	Invitation to tender
LCA	Life cycle analysis
MSW	Municipal solid waste
VFG	Vegetable fruit and garden waste

## C. Third policy scenario; low recycling

### C.1 Definition and methodology

#### C.1.1 Definition

The third policy scenario is determined by, on the one hand, general assumptions that apply to every policy scenario and, on the other hand, specific assumptions on prevention and recycling targets that will be met in policy scenarios 3 and 3a.

##### C.1.1.1 General assumptions

- The compost that will be generated in this policy scenario will fulfil the same quality requirements as described in policy scenario 1
- The amount of bio-waste *recycled* is assessed as the sum of
  - The input of bio-waste for compost production minus the rejects and recycling residues
  - The input to AD minus rejects and recycling residues, assuming that the digestate will be used as a recycled product or that it will be further composted and used as compost.
  - The input of bio-waste for home composting
- Bio-waste can be considered as recycled under the condition that the compost or digestate generated at the end of the process will effectively be used or marketed as a product.
- Only waste that is collected source separated can be recycled. All treatment activities performed on mixed waste fractions are either to be considered as final treatment (like landfill or incineration without energy recovery) or preparatory activities (like MBT either in aerobic or anaerobic conditions).
- Use of digestate or compost that does not fulfil the quality standards for free use (e.g. after mixed waste composting or MBT), and that is applied as an intermediary or final landfill cover, is not considered recycling.
- MBT of mixed waste including a fraction of bio-waste leads to different fractions, some of which are recyclable and are effectively recycled (e.g. sorted out metal fractions). However, the output of the MBT process can no longer be considered as bio-waste and therefore the recycling of MBT-output is not included in the scope of this study on recycling bio-waste.
- Home composting is a recycling method which does not require collection.
- Home composting or backyard composting is considered recycling under the conditions that the home composting programme is well funded, well structured and monitored. Waste that is just left in the backyard does not count as "home composting". The costs linked to the funding, structuring and monitoring of home composting will not be included in the analysis. Allowing home composting to be included in the recycling target accommodates the needs of areas with low population density.
- The output of home composting must fulfil the same quality standards as centralised composting. This can be monitored by sample assessment.
- As the scenarios always imply an increase of separate collection and recycling compared to the baseline, we assume that the quantities of food and garden waste that go to every recycling option never drop below the quantities assumed in the

baselines. In other words, it is assumed that no switch from AD to composting (or vice versa) takes place: all changes in the quantities are due to increases in selective collection.

- Following timeframe is set for the recycling targets and for prevention.
  - No deviation from the baseline is expected as long as the recycling targets do not enter into force.
  - As starting date for the deviation from the baseline policy scenarios, we will take 2013. 2017 would then be the date for the interim targets and 2020 the date for the final target.
  - We assume that four years after the entry into force, an interim target has to be met which corresponds to 40% of the distance between the start value in 2013 and the final target.
  - We assume that progress between the different targets will be piecemeal linear.

### C.1.1.2 Specific assumptions for policy scenario 3

- The quantities of waste generated are the same as under the baseline – the effects of prevention are not taken into account.
- Home composting will take place in the same proportion as in the baseline policy scenario, it will contribute to reaching the recycling targets.
- The target for recycling in 2020 is the midpoint between the current EU27 average and the current rate in the Member State with the highest recycling rates. See Section 0 for the details of the calculation of this target.

From the evaluation of the second policy scenario and from the development of the baseline targets we have learned that Member States will need to make a considerable effort to reach the Landfill Directive Targets. This will be done partially by final treatment or energy recovery techniques or preparatory techniques (like incineration or MBT) but as well through recycling initiatives like (windrow) composting or backyard composting.

It can be presumed that several Member States will show in the baseline a recycling performance which is higher than the proposed target in this third policy scenario.

**If it turns out that recycling under policy scenario 3 is lower than under the baseline, then, for the purposes of the cost-benefit analysis, it will be assumed that the country will stick to the baseline scenario with respect to the share of recycling.**

## C.1.2 Methodology

### C.1.2.1 Basic methodology

The policy scenarios have been defined starting from the baseline.

1. The bio-waste is split up between A% green waste and B% food (kitchen) waste. See paragraph C.1.2.3 .
2. It is assumed that the relative shares of landfilling, incineration and MBT in the treatment of the waste that is not collected separately remains as in the baseline.
3. The recycling target  $T_r$  in 2020 is determined as the sum of:
  - Home composting
  - 60% of the food waste that is not home composted
  - 90% of the garden waste that is not home composted

It is assumed that in 2017 an interim target has to be met which corresponds to 40% of the distance between the start value in 2013 and the final target. Between the two, target recycling percentages are evolving linearly.

It is assumed that the member states will give priority to the separate collection of garden waste and that it is feasible for all of them to meet 70% selective collection of garden waste by 2020. Progression to this target is assumed to evolve in the same way as the progression to the overall recycling target (unless separate collection is already higher in the baseline, in which case the baseline will be chosen).

The amount of food waste that is collected separately is assumed to be equal to the quantity that is needed to meet the overall recycling target, taking the separate collection rate of garden waste as given.

4. It is assumed that all garden waste that is collected separately *in addition* to the baseline is recycled in IVC.
5. It is assumed that all food waste that is collected separately *in addition* to the baseline is sent either to IVC, or to AD, depending on the recycling option that yields the highest net benefits to society (see paragraph C.1.2.4).
6. The results of this development are shown in a table with the distribution over the different treatment methods.
7. Based on this, differences in costs and benefits, compared to the baseline, will be assessed.

#### C.1.2.2 Specific assumptions for policy scenario 3a

Scenario 3a is identical to scenario 3, except that all food waste that is collected separately in addition to the baseline is sent to AD, which is the recycling technology that yields the highest benefits in terms of GHG emission reductions.

#### C.1.2.3 Values for the ratio between green waste and food (kitchen) waste.

Data sources on the difference between green waste and food waste are rather scarce. Determining elements can be of a climatologic, cultural or economic nature. A gradient could be assumed from north to south and as well from east to west.

**Austria** reports for 2004 1310 Ktonnes source separated municipal green waste (consisting of grass, leaves, cuttings from shrubs and trees, waste from the tending of graves) from households and municipal services. For the same year it reports 150 Ktonnes source separated kitchen and canteen waste. This would give the ratio of 10% kitchen waste and 90% garden waste for the source separated collected bio-waste. This ratio is not representative for the total amount of bio-waste generated, as food waste and green waste are not collected separately in the same way.

**Estonia** reports in 2005 the composition of biodegradable municipal waste as follows: kitchen waste 43 %, paper, cardboard (incl. packages) 28 %, garden waste 18 %, wood 5 %, others 6 %. This would mean that bio-waste defined as the sum of municipal kitchen waste + garden waste is composed of 70% kitchen waste and 30% garden waste

**Malta** report that 38,7% of the municipal waste is composed of food waste in 2003. No data on garden waste are available.

**The UK** reports data on waste arisings in 2008:

	England	Wales	Scotland	Northern Ireland	Total UK
food waste	5546	672	363	99	6680
green waste	3502	427	191	274	4394

This would result in the following distribution of food and green waste in bio-waste:

	England	Wales	Scotland	Northern Ireland	Total UK
food waste	61,3%	61,2%	65,5%	26,5%	60,3%
green waste	38,7%	38,8%	34,5%	73,5%	39,7%

Northern Ireland is not consistent with the other data, and will not be considered. Based on the data from the three other regions a weighed ratio would be food waste 61,5%, garden waste 38,5%

**Bulgaria** reports in its Implementation Programme of Directive 1999/31/EC on Landfilling the following estimation on the composition of the waste generated, split up over the size of the village the households are living in:

	3000 and less	3-25000 inhabitants	25-50000 inhabitants	above 50 000
Food	4,86 %	12,56 %	20,85 %	20,85 %
garden green waste	14,12 %	14 %	5,53 %	5,53 %
inhabitants	19,48	20,4	7,47	52,65

Weighed against the distribution of inhabitants in Bulgaria this would give 64% food waste and 36% garden waste.

Taking into account the scarce data, the following expert assessment can be made. Northern countries have relatively more food waste than southern countries, EU-15 countries have relatively less food waste than EU-15 countries:

- The EU-15 countries of the north have a ratio of **61%** food waste and **39%** garden waste, following the UK model. This is applied on AT, BE, DE, DK, FIN, FR, IE, LU, NL, SV, UK

- The EU-15 countries of the south have a ratio of 56% food waste and 44% garden waste. The same gradient from north to south is used as with the EU-12 countries. This is applied to ES, GR, IT, PT
- The EU-12 countries of the north have a ratio of 70% food and 30% garden waste, following the Estonian model. This is applied on EE, LT, LV, PL, CZ, SK, HU
- The EU-12 countries of the south have a ratio of 64% food waste and 36% garden waste, following the Bulgarian model. This is applied on BG, CY, MT, RO, SL

#### C.1.2.4

#### The choice between composting and anaerobic digestion of food waste

Table 1 shows the optimal treatment technique for source separated food waste for each member state, using the lowest cost to society (under the social cost metric) which is Scenario 3, and the lowest Greenhouse Gas impact which is Scenario 3a.

Table 1: Optimal treatment technique for source separated food waste

Country	Lowest Social Cost (Scenario 3)	Lowest GHG Impact (Scenario 3a)
AT	AD (vehicle)	AD (vehicle)
BE-BR	IVC	AD (vehicle)
BE-FL	IVC	AD (vehicle)
BE-WL	IVC	AD (vehicle)
BG	IVC	AD (vehicle)
CY	AD (elec)	AD (CHP)
CZ	AD (grid)	AD (CHP)
DK	IVC	AD (CHP)
EE	IVC	AD (CHP)
FI	IVC	AD (vehicle)
FR	IVC	AD (vehicle)
DE	IVC	AD (CHP)
EL	IVC	AD (CHP)
HU	IVC	AD (vehicle)
IE	IVC	AD (CHP)
IT	IVC	AD (CHP)
LV	IVC	AD (vehicle)
LT	IVC	AD (vehicle)
LU	IVC	AD (vehicle)
MT	AD (elec)	AD (CHP)
NL	IVC	AD (CHP)

PL	AD (elec)	AD (CHP)
PT	IVC	AD (CHP)
RO	IVC	AD (CHP)
SK	AD (vehicle)	AD (vehicle)
SI	IVC	AD (vehicle)
ES	IVC	AD (vehicle)
SE	AD (vehicle)	AD (vehicle)
UK	IVC	AD (CHP)

### C.1.2.5 Value for the “low” recycling target

The “low” recycling target is assessed based on the performances of the Member States in the actual situation. Based on the retrieved data in the data gathering exercise, the values in the baseline 2007 are used as the best available, harmonised indicator.

The “low” recycling target is calculated as follows:

$R_{avg}$  = the average recycling performance for 2007 by all Member States

$R_{top}$  = the top recycling performance for 2007 by the front running Member State

$Tr$  = recycling target =  $(R_{avg} + R_{top}) / 2$

Table 2 illustrates the calculation method to find the best performing Member State on recycling. The same calculation method as for 35.1.1 is used, but applied to the baseline year 2007.

Table 2 Recycling performances in baseline year 2007

	A	B	C	D	E
LU	76,5	0	0,00	68,85	68,85
BE-FL	68,4	9,8	6,70	55,53	62,23
DK	60	0	0,00	54,00	54,00
AT	52	29	15,08	33,23	48,31
DE	50	0	0,00	45,00	45,00
NL	48,5	0	0,00	43,65	43,65
BE-W	48	0	0,00	43,20	43,20
SV	32,5	15,5	5,04	24,72	29,75
IR	21	30	6,30	13,23	19,53
SF	21	0	0,00	18,90	18,90

IT	20	0	0,00	18,00	18,00
EE	16,3	48	7,82	7,63	15,45
LT	17	0	0,00	15,30	15,30
UK	14	0	0,00	12,60	12,60
BE-BR	9,75	23	2,24	6,76	9,00
HU	9,5	40	3,80	5,13	8,93
SL	6	0	0,00	5,40	5,40
CZ	4,5	0	0,00	4,05	4,05
ES	4	0	0,00	3,60	3,60
FR	4	0	0,00	3,60	3,60
PT	2,4	0	0,00	2,16	2,16
SK	2	0	0,00	1,80	1,80
PL	0,5	100	0,50	0,00	0,50
CY	0	0	0,00	0,00	0,00
LV	0	0	0,00	0,00	0,00
BG	0	0	0,00	0,00	0,00
RO	0	0	0,00	0,00	0,00
MT	0	0	0,00	0,00	0,00
GR	0	0	0,00	0,00	0,00

When reading this table, take into account that it is a benchmarking of the performance of Member States as it could be found today, but based on data gathered for the years between roughly 2002 and 2006.

Due to its very small size Luxembourg is favoured in setting up a performing source separate collection system. It is not representative for the other Member States. We propose not to use the Luxembourg result as a target value. The values for the Belgian regions cannot be used either, because they are formally no Member State. The average value for Belgium, weighed on the population in the three regions (Flanders 0,6 million, Wallonia 0,3 million and Brussels 0,1 million inhabitants), is 51,2%.

We take as  $R_{top}$  the value for Denmark = 54%. For  $R_{avg}$  we use a weighed average over all EU-27 Member States based on the total generation of municipal waste. This quantity is added in kilotonnes in column F of the table above. The average recycling value is then 19%. The target value  $T_r$  is then  $(54+19)/2 = 36,5\%$ .

## C.2 Results

### C.2.1 Austria

**Ratio food and garden waste:** we assume 61% food and 39% garden waste, according to paragraph C.1.2.3: A = 39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using AD for vehicles is preferred, according to paragraph C.1.2.4. Scenario 3 and scenario 3a are therefore identical.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	33%	90%	55.0%	33%	90%	55.0%
2014	33%	90%	55.5%	33%	90%	55.5%
2015	34%	90%	56.0%	34%	90%	56.0%
<b>2016</b>	35%	90%	56.5%	35%	90%	56.5%
2017	36%	90%	57.0%	36%	90%	57.0%
2018	37%	90%	57.5%	37%	90%	57.5%
2019	38%	90%	58.0%	38%	90%	58.0%
2020	38%	90%	58.5%	38%	90%	<b>58.5%</b>

Table 3: policy scenario 3 for Austria

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	0	0	528.927	195.630	451.641	256.815	177.114	1.610.127
2014	0	0	533.484	187.440	458.557	260.748	179.826	1.620.055
2015	0	0	530.308	186.324	465.160	264.503	182.416	1.628.710
2016	0	0	527.075	185.188	471.813	268.286	185.025	1.637.387
2017	0	0	523.784	184.032	478.517	272.098	187.654	1.646.084
2018	0	0	520.436	182.856	485.271	275.939	190.302	1.654.804
2019	0	0	517.029	181.659	492.076	279.808	192.971	1.663.544
2020	0	0	513.565	180.442	498.932	283.707	195.660	1.672.306

In this case, scenario 3 is identical to scenario 3a because Austria already reaches the targets in the baseline. As a result, both have zero incremental impact

**C.2.2 Bulgaria**

**Ratio food and garden waste:** we assume 64% food and 36% garden waste, according to paragraph C.1.2.3: A = 36

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred for Scenario 3 while for Scenario 3a it is AD with the compressed biogas used in vehicles.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	1%	23%	9.0%	1%	23%	9.0%
2014	1%	25%	10.0%	4%	32%	13.8%
2015	2%	28%	11.0%	6%	38%	17.6%
<b>2016</b>	2%	30%	12.0%	8%	44%	21.4%
2017	2%	33%	13.0%	11%	51%	25.1%
2018	2%	35%	14.0%	13%	57%	28.9%
2019	2%	38%	15.0%	15%	64%	32.7%
2020	3%	40%	16.0%	18%	70%	<b>36.5%</b>

Table 4: policy scenario 3 for Bulgaria

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	653.432	0	163.358	272.263	82.936	24.773	0	1.196.761
2014	636.303	0	159.076	265.126	140.053	29.522	0	1.230.080
2015	572.457	0	208.166	260.208	187.151	34.724	0	1.262.707
2016	500.775	0	250.387	250.387	232.257	39.734	0	1.273.541
2017	384.475	0	336.416	240.297	277.772	45.069	0	1.284.030
2018	367.915	0	321.926	229.947	323.654	50.732	0	1.294.173
2019	302.238	0	345.415	215.884	364.024	55.827	0	1.283.388
2020	282.836	0	323.241	202.026	403.415	61.085	0	1.272.603

Table 5: policy scenario 3a for Bulgaria

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	653.432	0	163.358	272.263	82.936	24.773	0	1.196.761
2014	636.303	0	159.076	265.126	121.859	29.522	18.195	1.230.080
2015	572.457	0	208.166	260.208	151.173	34.724	35.978	1.262.707
2016	500.775	0	250.387	250.387	178.521	39.734	53.736	1.273.541
2017	384.475	0	336.416	240.297	206.001	45.069	71.772	1.284.030
2018	367.915	0	321.926	229.947	233.583	50.732	90.071	1.294.173
2019	302.238	0	345.415	215.884	257.119	55.827	106.904	1.283.388
2020	282.836	0	323.241	202.026	279.973	61.085	123.442	1.272.603

Table 6: Bulgaria policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-444	-371	-272	1.086	0	0	0
Total GHG implications including organic carbon for the year 2020		0	-171	-53	-56	125	0	0	-156
Total GHG implications excluding organic carbon for the year 2020		0	-128	24	-11	24	0	0	-91
<b>Costs all in € thousands (thousand separator as '.')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 2.395	-€ 15.518	-€ 3.641	€ 12.834	€ 0	€ 0	-€ 8.720
	Total Costs NPV (2013-2020)	€ 0	-€ 9.358	-€ 43.174	-€ 12.044	€ 42.211	€ 0	€ 0	-€ 22.366
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 1.962	-€ 9.675	-€ 2.615	€ 9.587	€ 0	€ 0	-€ 4.666
	Total Costs NPV (2013-2020)	€ 0	-€ 7.667	-€ 26.918	-€ 8.651	€ 31.539	€ 0	€ 0	-€ 11.698
Environmental	Financial Costs NPV (2020)	€ 0	-€ 6.139	-€ 1.268	-€ 1.420	€ 768	€ 0	€ 0	-€ 8.059
	Total Costs NPV (2013-2020)	€ 0	-€ 23.992	-€ 3.528	-€ 4.697	€ 2.515	€ 0	€ 0	-€ 29.703
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 8.101	-€ 10.943	-€ 4.036	€ 10.355	€ 0	€ 0	-€ 12.725
	Total Costs NPV (2013-2020)	€ 0	-€ 31.660	-€ 30.446	-€ 13.349	€ 34.054	€ 0	€ 0	-€ 41.400

Table 7: Bulgaria policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-444	-371	-272	586	0	500	0
Total GHG implications including organic carbon for the year 2020		0	-171	-53	-56	60	0	45	-177
Total GHG implications excluding organic carbon for the year 2020		0	-128	24	-11	1	0	-10	-125
<b>Costs all in € thousands (thousand separator as ',')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 2.395	-€ 15.518	-€ 3.641	€ 5.453	€ 0	€ 9.332	-€ 6.769
	Total Costs NPV (2013-2020)	€ 0	-€ 9.358	-€ 43.174	-€ 12.044	€ 18.511	€ 0	€ 29.964	-€ 16.101
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 1.962	-€ 9.675	-€ 2.615	€ 4.120	€ 0	€ 6.937	-€ 3.196
	Total Costs NPV (2013-2020)	€ 0	-€ 7.667	-€ 26.918	-€ 8.651	€ 13.984	€ 0	€ 22.273	-€ 6.979
Environmental	Financial Costs NPV (2020)	€ 0	-€ 6.139	-€ 1.268	-€ 1.420	€ 269	€ 0	-€ 79	-€ 8.637
	Total Costs NPV (2013-2020)	€ 0	-€ 23.992	-€ 3.528	-€ 4.697	€ 912	€ 0	-€ 253	-€ 31.559
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 8.101	-€ 10.943	-€ 4.036	€ 4.388	€ 0	€ 6.858	-€ 11.833
	Total Costs NPV (2013-2020)	€ 0	-€ 31.660	-€ 30.446	-€ 13.349	€ 14.896	€ 0	€ 22.020	-€ 38.538

### C.2.3 Belgium Brussels

**Ratio food and garden waste:** we assume 61% food and 39% garden waste, according to paragraph C.1.2.3.: A =39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred for Scenario 3 while for Scenario 3a it is AD with the compressed biogas used in vehicles.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	5%	30%	15.0%	5%	30%	15.0%
2014	5%	30%	15.0%	7%	36%	18.1%
2015	5%	30%	15.0%	8%	41%	21.1%
<b>2016</b>	5%	30%	15.0%	10%	47%	24.2%
2017	5%	30%	15.0%	11%	53%	27.3%
2018	5%	30%	15.0%	12%	59%	30.4%

2019	5%	30%	15.0%	14%	64%	33.4%
2020	5%	30%	15.0%	15%	70%	<b>36.5%</b>

Table 8: policy scenario 3 for Belgium-Brussels

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	0	0	156.791	0	0	7.747	19.922	184.460
2014	0	0	151.680	0	5.686	8.053	19.717	185.137
2015	0	0	146.528	0	11.414	8.083	19.789	185.814
2016	0	0	141.334	0	17.184	8.112	19.861	186.491
2017	0	0	136.098	0	22.995	8.142	19.933	187.168
2018	0	0	130.821	0	28.848	8.171	20.005	187.845
2019	0	0	125.502	0	34.742	8.201	20.078	188.522
2020	0	0	120.141	0	40.678	8.230	20.150	189.199

Table 9: policy scenario 3a for Belgium-Brussels

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	0	0	156.791	0	0	7.747	19.922	184.460
2014	0	0	151.680	0	4.126	8.053	21.278	185.137
2015	0	0	146.528	0	8.282	8.083	22.921	185.814
2016	0	0	141.334	0	12.468	8.112	24.577	186.491
2017	0	0	136.098	0	16.685	8.142	26.244	187.168
2018	0	0	130.821	0	20.931	8.171	27.922	187.845
2019	0	0	125.502	0	25.208	8.201	29.611	188.522
2020	0	0	120.141	0	29.515	8.230	31.312	189.199

Table 10: Belgium-Brussels policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	0	-162	0	162	0	0	0
Total GHG implications including organic carbon for the year 2020		0	0	-29	0	19	0	0	-10
Total GHG implications excluding organic carbon for the year 2020		0	0	4	0	4	0	0	8
<b>Costs all in € thousands</b> (thousand separator as '.)									
Financial (Private)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 6.525	€ 0	€ 2.638	€ 0	€ 0	-€ 3.887
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 20.518	€ 0	€ 8.295	€ 0	€ 0	-€ 12.224
Financial (Social)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 4.025	€ 0	€ 1.872	€ 0	€ 0	-€ 2.152
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 12.656	€ 0	€ 5.888	€ 0	€ 0	-€ 6.769
Environmental	Financial Costs NPV (2020)	€ 0	€ 0	-€ 485	€ 0	€ 149	€ 0	€ 0	-€ 336
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 1.525	€ 0	€ 469	€ 0	€ 0	-€ 1.056
Net Cost to Society	Financial Costs NPV (2020)	€ 0	€ 0	-€ 4.510	€ 0	€ 2.021	€ 0	€ 0	-€ 2.488
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 14.181	€ 0	€ 6.357	€ 0	€ 0	-€ 7.825

Table 11: Belgium-Brussels policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	0	-162	0	117	0	44	0
Total GHG implications including organic carbon for the year 2020		0	0	-29	0	13	0	4	-12
Total GHG implications excluding organic carbon for the year 2020		0	0	4	0	0	0	-1	4
<b>Costs all in € thousands</b> (thousand separator as '.)									
Financial (Private)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 6.525	€ 0	€ 1.683	€ 0	€ 1.355	-€ 3.487
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 20.518	€ 0	€ 5.291	€ 0	€ 4.260	-€ 10.967
Financial (Social)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 4.025	€ 0	€ 1.197	€ 0	€ 1.021	-€ 1.807
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 12.656	€ 0	€ 3.764	€ 0	€ 3.210	-€ 5.683
Environmental	Financial Costs NPV (2020)	€ 0	€ 0	-€ 485	€ 0	€ 108	€ 0	-€ 74	-€ 450
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 1.525	€ 0	€ 340	€ 0	-€ 231	-€ 1.416
Net Cost to Society	Financial Costs NPV (2020)	€ 0	€ 0	-€ 4.510	€ 0	€ 1.305	€ 0	€ 947	-€ 2.257
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 14.181	€ 0	€ 4.104	€ 0	€ 2.978	-€ 7.099

### C.2.4 Belgium-Flanders

**Ratio food and garden waste:** we assume 61% food and 39% garden waste, according to paragraph C.1.2.3.: A = 39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred for Scenario 3 while for Scenario 3a it is AD with the compressed biogas used in vehicles.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	56%	90%	71.5%	56%	90%	71.5%
2014	57%	90%	72.0%	57%	90%	72.0%
2015	58%	90%	72.5%	58%	90%	72.5%
<b>2016</b>	59%	90%	73.0%	59%	90%	73.0%
2017	60%	90%	73.5%	60%	90%	73.5%
2018	61%	90%	74.0%	61%	90%	74.0%
2019	62%	90%	74.5%	62%	90%	74.5%
2020	63%	90%	75.0%	63%	90%	<b>75.0%</b>

Table 12: policy scenario 3 for Belgium-Flanders

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	0	0	327.324	24.637	653.414	132.449	97.129	1.234.953
2014	0	0	322.280	24.258	654.956	133.664	102.476	1.237.634
2015	0	0	317.210	23.876	656.436	134.884	107.907	1.240.314
2016	0	0	312.116	23.493	657.855	136.108	113.423	1.242.995
2017	0	0	306.997	23.107	659.212	137.336	119.024	1.245.676
2018	0	0	301.852	22.720	660.505	138.568	124.711	1.248.356
2019	0	0	296.683	22.331	661.736	139.803	130.483	1.251.037
2020	0	0	291.489	21.940	667.605	141.043	131.640	1.253.718

In this case, scenario 3 is identical to scenario 3a because Flanders already reaches the targets in the baseline. As a result, both have zero incremental impact

### C.2.5 Belgium-Wallonia

**Ratio food and garden waste:** we assume 61% food and 39% garden waste, according to paragraph C.1.2.3.: A = 39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred, according to paragraph C.1.2.4.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	41%	90%	60.0%	41%	90%	60.0%
2014	41%	90%	60.0%	41%	90%	60.0%
2015	41%	90%	60.0%	41%	90%	60.0%
<b>2016</b>	41%	90%	60.0%	41%	90%	60.0%
2017	41%	90%	60.0%	41%	90%	60.0%
2018	41%	90%	60.0%	41%	90%	60.0%
2019	41%	90%	60.0%	41%	90%	60.0%
2020	41%	90%	60.0%	41%	90%	<b>60.0%</b>

Table 13: policy scenario 3 for Belgium-Wallonia

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	0	0	282.682	0	334.979	42.402	46.643	706.706
2014	0	0	283.550	0	331.753	42.532	51.039	708.874
2015	0	0	284.416	0	328.501	42.662	55.461	711.041
2016	0	0	285.284	0	325.223	42.793	59.910	713.209
2017	0	0	286.151	0	321.920	42.923	64.384	715.377
2018	0	0	287.018	0	322.895	43.053	64.579	717.544
2019	0	0	287.885	0	323.870	43.183	64.774	719.712
2020	0	0	288.752	0	324.846	43.313	64.969	721.880

In this case, scenario 3 is identical to scenario 3a because Wallonia already reaches the targets in the baseline. As a result, both have zero incremental impact

## C.2.6 Cyprus

**Ratio food and garden waste:** we assume 64% food and 36% garden waste, according to paragraph C.1.2.3: A =39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using AD (elec) is preferred for Scenario 3, while for Scenario 3a it is AD with combined heat and power.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	1%	18%	6.7%	1%	18%	6.7%
2014	1%	21%	8.0%	3%	28%	12.1%
2015	1%	25%	9.3%	6%	35%	16.1%
<b>2016</b>	1%	28%	10.7%	8%	42%	20.2%
2017	1%	32%	12.0%	10%	49%	24.3%
2018	1%	35%	13.3%	13%	56%	28.4%
2019	1%	39%	14.7%	15%	63%	32.4%
2020	1%	42%	16.0%	18%	70%	<b>36.5%</b>

Table 14: policy scenario 3 for Cyprus

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	46.176	0	0	98.123	9.792	515	0	154.606
2014	44.690	0	0	94.966	15.946	762	2.464	158.828
2015	43.768	0	0	93.008	20.323	1.066	4.941	163.106
2016	42.499	0	53.123	37.186	24.724	1.420	7.503	166.456
2017	41.148	0	51.435	36.005	29.245	1.834	10.166	169.833
2018	39.716	0	49.645	34.752	33.886	2.310	12.930	173.239
2019	37.979	0	47.474	33.232	38.419	2.834	15.706	175.645
2020	24.874	0	45.225	42.964	43.017	3.419	18.553	178.051

Table 15: Cyprus policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-44	-52	-52	76	0	72	0
Total GHG implications including organic carbon for the year 2020		0	-14	-6	-12	8	0	5	-20
Total GHG implications excluding organic carbon for the year 2020		0	-10	4	-3	0	0	-3	-12
<b>Costs all in € thousands (thousand separator as '')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 124	-€ 2.211	-€ 807	€ 376	€ 0	€ 1.271	-€ 1.496
	Total Costs NPV (2013-2020)	€ 0	-€ 541	-€ 6.158	-€ 2.440	€ 1.264	€ 0	€ 3.914	-€ 3.961
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 84	-€ 1.350	-€ 565	€ 302	€ 0	€ 935	-€ 762
	Total Costs NPV (2013-2020)	€ 0	-€ 364	-€ 3.761	-€ 1.708	€ 1.015	€ 0	€ 2.881	-€ 1.937
Environmental	Financial Costs NPV (2020)	€ 0	-€ 524	-€ 112	-€ 316	€ 28	€ 0	-€ 133	-€ 1.057
	Total Costs NPV (2013-2020)	€ 0	-€ 2.282	-€ 311	-€ 954	€ 93	€ 0	-€ 410	-€ 3.865
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 608	-€ 1.462	-€ 881	€ 329	€ 0	€ 802	-€ 1.820
	Total Costs NPV (2013-2020)	€ 0	-€ 2.646	-€ 4.072	-€ 2.663	€ 1.108	€ 0	€ 2.471	-€ 5.802

Table 16: Cyprus policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-44	-52	-52	76	0	72	0
Total GHG implications including organic carbon for the year 2020		0	-14	-6	-12	8	0	5	-20
Total GHG implications excluding organic carbon for the year 2020		0	-10	4	-3	0	0	-4	-12
<b>Costs all in € thousands (thousand separator as '')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 124	-€ 2.211	-€ 807	€ 376	€ 0	€ 1.603	-€ 1.163
	Total Costs NPV (2013-2020)	€ 0	-€ 541	-€ 6.158	-€ 2.440	€ 1.264	€ 0	€ 4.939	-€ 2.936
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 84	-€ 1.350	-€ 565	€ 302	€ 0	€ 1.177	-€ 520
	Total Costs NPV (2013-2020)	€ 0	-€ 364	-€ 3.761	-€ 1.708	€ 1.015	€ 0	€ 3.627	-€ 1.192
Environmental	Financial Costs NPV (2020)	€ 0	-€ 524	-€ 112	-€ 316	€ 28	€ 0	-€ 155	-€ 1.079
	Total Costs NPV (2013-2020)	€ 0	-€ 2.282	-€ 311	-€ 954	€ 93	€ 0	-€ 476	-€ 3.931
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 608	-€ 1.462	-€ 881	€ 329	€ 0	€ 1.023	-€ 1.599
	Total Costs NPV (2013-2020)	€ 0	-€ 2.646	-€ 4.072	-€ 2.663	€ 1.108	€ 0	€ 3.150	-€ 5.123

## C.2.7

### Czech Republic

Ratio food and garden waste: we assume 70% food and 30% garden waste, according to paragraph C.1.2.3.: A =39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using AD (grid) is preferred for Scenario 3, while for Scenario 3a it is AD with combined heat and power.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	17%	60%	30.0%	17%	60%	30.0%
2014	17%	60%	30.0%	18%	60%	30.5%
2015	17%	60%	30.0%	19%	60%	31.0%
<b>2016</b>	18%	62%	31.0%	19%	62%	32.1%
2017	18%	64%	32.0%	20%	64%	33.2%
2018	19%	66%	33.0%	21%	66%	34.3%
2019	19%	68%	34.0%	21%	68%	35.4%
2020	20%	70%	35.0%	22%	70%	<b>36.5%</b>

Table 17: policy scenario 3 for Czech Republic

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	421.556	0	301.111	481.778	464.572	0	51.619	1.720.636
2014	432.747	0	309.105	494.568	480.336	0	62.266	1.779.021
2015	443.686	0	316.918	507.069	496.046	0	73.488	1.837.208
2016	443.148	0	316.534	506.455	520.254	0	78.318	1.864.708
2017	442.375	0	315.982	505.572	544.927	0	83.253	1.892.109
2018	441.369	0	315.263	504.421	570.065	0	88.293	1.919.411
2019	433.270	0	309.478	495.165	586.380	0	91.981	1.916.274
2020	291.562	0	364.453	558.828	602.638	0	95.657	1.913.138

Table 18: Czech Republic policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-50	-39	-62	0	0	151	0
Total GHG implications including organic carbon for the year 2020		0	-9	-2	-5	0	0	11	-5
Total GHG implications excluding organic carbon for the year 2020		0	-6	2	-1	0	0	-2	-7
<b>Costs all in € thousands</b> (thousand separator as ' ')									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 301	-€ 1.241	-€ 1.130	€ 0	€ 0	€ 2.510	-€ 162
	Total Costs NPV (2013-2020)	€ 0	-€ 1.761	-€ 4.541	-€ 4.279	€ 0	€ 0	€ 10.655	€ 74
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 156	-€ 729	-€ 820	€ 0	€ 0	€ 1.892	€ 188
	Total Costs NPV (2013-2020)	€ 0	-€ 914	-€ 2.667	-€ 3.105	€ 0	€ 0	€ 8.034	€ 1.347
Environmental	Financial Costs NPV (2020)	€ 0	-€ 479	-€ 96	-€ 209	€ 0	€ 0	-€ 691	-€ 1.475
	Total Costs NPV (2013-2020)	€ 0	-€ 2.808	-€ 353	-€ 791	€ 0	€ 0	-€ 2.933	-€ 6.884
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 636	-€ 825	-€ 1.029	€ 0	€ 0	€ 1.202	-€ 1.288
	Total Costs NPV (2013-2020)	€ 0	-€ 3.722	-€ 3.020	-€ 3.896	€ 0	€ 0	€ 5.101	-€ 5.537

Table 19: Czech Republic policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-50	-39	-62	0	0	151	0
Total GHG implications including organic carbon for the year 2020		0	-9	-2	-5	0	0	9	-6
Total GHG implications excluding organic carbon for the year 2020		0	-6	2	-1	0	0	-4	-9
<b>Costs all in € thousands</b> (thousand separator as ' ')									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 301	-€ 1.241	-€ 1.130	€ 0	€ 0	€ 2.373	-€ 298
	Total Costs NPV (2013-2020)	€ 0	-€ 1.761	-€ 4.541	-€ 4.279	€ 0	€ 0	€ 10.075	-€ 505
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 156	-€ 729	-€ 820	€ 0	€ 0	€ 1.971	€ 266
	Total Costs NPV (2013-2020)	€ 0	-€ 914	-€ 2.667	-€ 3.105	€ 0	€ 0	€ 8.367	€ 1.681
Environmental	Financial Costs NPV (2020)	€ 0	-€ 479	-€ 96	-€ 209	€ 0	€ 0	-€ 604	-€ 1.389
	Total Costs NPV (2013-2020)	€ 0	-€ 2.808	-€ 353	-€ 791	€ 0	€ 0	-€ 2.564	-€ 6.516
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 636	-€ 825	-€ 1.029	€ 0	€ 0	€ 1.367	-€ 1.123
	Total Costs NPV (2013-2020)	€ 0	-€ 3.722	-€ 3.020	-€ 3.896	€ 0	€ 0	€ 5.803	-€ 4.835

## C.2.8

### Denmark

**Ratio food and garden waste:** we assume 61% food and 39% garden waste, according to paragraph C.1.2.3.: A =39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred for Scenario 3, while for Scenario 3a it is AD with combined heat and power.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	2%	95%	44.0%	2%	95%	44.0%
2014	2%	95%	44.0%	2%	95%	44.0%
2015	2%	95%	44.0%	2%	95%	44.0%
<b>2016</b>	2%	95%	44.0%	2%	95%	44.0%
2017	2%	95%	44.0%	2%	95%	44.0%
2018	2%	95%	44.0%	2%	95%	44.0%
2019	2%	95%	44.0%	2%	95%	44.0%
2020	2%	95%	44.0%	2%	95%	<b>44.0%</b>

Table 20: policy scenario 3 for Denmark

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	0	0	810.667	0	605.105	31.848	0	1.447.620
2014	0	0	818.067	0	610.629	32.138	0	1.460.834
2015	0	0	823.290	0	614.527	32.344	0	1.470.161
2016	0	0	828.514	0	618.426	32.549	0	1.479.488
2017	0	0	833.737	0	622.325	32.754	0	1.488.816
2018	0	0	838.960	0	626.224	32.959	0	1.498.143
2019	0	0	844.183	0	630.123	33.164	0	1.507.470
2020	0	0	849.407	0	634.021	33.370	0	1.516.797

In this case, scenario 3 is identical to scenario 3a because Denmark already reaches the targets in the baseline. As a result, both have zero incremental impact

## C.2.9

### Estonia

**Ratio food and garden waste:** we assume 70% food and 30% garden waste, according to paragraph C.1.2.3.: A =30

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred for Scenario 3, while for Scenario 3a it is AD with combined heat and power.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	15%	50%	25.1%	15%	50%	25.1%
2014	15%	53%	26.5%	16%	53%	27.2%
2015	16%	55%	27.9%	17%	55%	28.7%
<b>2016</b>	17%	58%	29.3%	18%	58%	30.3%
2017	18%	61%	30.8%	19%	61%	31.8%
2018	18%	64%	32.2%	20%	64%	33.4%
2019	19%	67%	33.6%	21%	67%	34.9%
2020	20%	70%	35.0%	22%	70%	<b>36.5%</b>

Table 21: policy scenario 3 for Estonia

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	33.600	0	103.548	144.616	60.377	33.962	0	376.103
2014	31.895	0	101.217	142.310	68.716	34.077	0	378.215
2015	30.447	0	99.586	140.949	75.281	33.967	0	380.229
2016	28.812	0	97.221	138.515	81.533	33.394	0	379.475
2017	27.221	0	94.854	136.031	85.634	34.932	0	378.672
2018	25.674	0	92.483	133.498	89.705	36.460	0	377.820
2019	24.004	0	89.490	130.016	93.099	37.713	0	374.322
2020	22.400	0	86.536	126.536	96.414	38.936	0	370.823

Table 22: policy scenario 3a for Estonia

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	33.600	0	103.548	144.616	60.377	33.962	0	376.103
2014	31.895	0	101.217	142.310	66.150	34.077	2.566	378.215
2015	30.447	0	99.586	140.949	72.180	33.967	3.101	380.229
2016	28.812	0	97.221	138.515	77.919	33.394	3.614	379.475
2017	27.221	0	94.854	136.031	81.509	34.932	4.125	378.672
2018	25.674	0	92.483	133.498	85.072	36.460	4.633	377.820
2019	24.004	0	89.490	130.016	87.997	37.713	5.102	374.322
2020	22.400	0	86.536	126.536	90.852	38.936	5.562	370.823

Table 23: Estonia policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-1	-11	-17	29	0	0	0
Total GHG implications including organic carbon for the year 2020		0	0	0	-2	3	0	0	0
Total GHG implications excluding organic carbon for the year 2020		0	0	1	0	1	0	0	1
<b>Costs all in € thousands</b> (thousand separator as '.)									
Financial (Private)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 297	-€ 198	€ 348	€ 0	€ 0	-€ 147
	Total Costs NPV (2013-2020)	€ 0	-€ 21	-€ 1.241	-€ 791	€ 1.454	€ 0	€ 0	-€ 600
Financial (Social)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 199	-€ 141	€ 256	€ 0	€ 0	-€ 84
	Total Costs NPV (2013-2020)	€ 0	-€ 17	-€ 832	-€ 563	€ 1.068	€ 0	€ 0	-€ 343
Environmental	Financial Costs NPV (2020)	€ 0	€ 0	-€ 5	-€ 59	€ 22	€ 0	€ 0	-€ 42
	Total Costs NPV (2013-2020)	€ 0	-€ 32	-€ 21	-€ 234	€ 92	€ 0	€ 0	-€ 196
Net Cost to Society	Financial Costs NPV (2020)	€ 0	€ 0	-€ 204	-€ 200	€ 278	€ 0	€ 0	-€ 126
	Total Costs NPV (2013-2020)	€ 0	-€ 49	-€ 853	-€ 797	€ 1.160	€ 0	€ 0	-€ 539

Table 24: Estonia policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-1	-11	-17	0	0	29	0
Total GHG implications including organic carbon for the year 2020		0	0	0	-2	0	0	1	-1
Total GHG implications excluding organic carbon for the year 2020		0	0	1	0	0	0	-1	-1
<b>Costs all in € thousands</b> (thousand separator as ',')									
Financial (Private)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 297	-€ 198	€ 0	€ 0	€ 488	-€ 8
	Total Costs NPV (2013-2020)	€ 0	-€ 21	-€ 1.241	-€ 791	€ 0	€ 0	€ 2.037	-€ 17
Financial (Social)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 199	-€ 141	€ 0	€ 0	€ 422	€ 81
	Total Costs NPV (2013-2020)	€ 0	-€ 17	-€ 832	-€ 563	€ 0	€ 0	€ 1.759	€ 348
Environmental	Financial Costs NPV (2020)	€ 0	€ 0	-€ 5	-€ 59	€ 0	€ 0	-€ 46	-€ 110
	Total Costs NPV (2013-2020)	€ 0	-€ 32	-€ 21	-€ 234	€ 0	€ 0	-€ 192	-€ 479
Net Cost to Society	Financial Costs NPV (2020)	€ 0	€ 0	-€ 204	-€ 200	€ 0	€ 0	€ 376	-€ 28
	Total Costs NPV (2013-2020)	€ 0	-€ 49	-€ 853	-€ 797	€ 0	€ 0	€ 1.567	-€ 131

C.2.10

Finland

**Ratio food and garden waste:** we assume 61% food and 39% garden waste, according to paragraph C.1.2.3: A =39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred for Scenario 3 while for Scenario 3a it is AD with the compressed biogas used in vehicles.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	10%	60%	29.5%	10%	60%	29.5%
2014	11%	63%	31.0%	11%	63%	31.0%
2015	12%	65%	32.5%	12%	65%	32.5%
<b>2016</b>	13%	67%	34.0%	13%	67%	34.0%
2017	14%	69%	35.5%	14%	69%	35.5%
2018	15%	71%	37.0%	15%	71%	37.0%
2019	16%	73%	38.5%	16%	73%	38.5%
2020	18%	75%	40.0%	18%	75%	<b>40.0%</b>

Table 25: policy scenario 3 for Finland

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected	
2013	517.253	0	172.418	0	202.010	14.429	72.146	978.257	0
2014	453.432	0	223.332	0	203.716	15.203	85.135	980.818	0
2015	444.733	0	219.048	0	204.543	15.980	99.075	983.379	0
2016	435.983	0	214.738	0	204.484	16.761	113.975	985.940	0
2017	427.180	0	210.402	0	203.532	17.546	129.839	988.500	0
2018	418.327	0	206.042	0	201.681	18.335	146.677	991.061	0
2019	409.422	0	201.656	0	198.923	19.127	164.494	993.622	0
2020	400.466	0	197.244	0	195.252	19.924	183.298	996.183	0

In this case, scenario 3 is identical to scenario 3a because Finland already reaches the targets in the baseline. As a result, both have zero incremental impact

### C.2.11 France

**Ratio food and garden waste:** we assume 61% food and 39% garden waste, according to paragraph C.1.2.3: A =39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred for Scenario 3 while for Scenario 3a it is AD with the compressed biogas used in vehicles.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	2%	19%	9.0%	2%	19%	9.0%
2014	3%	22%	10.0%	4%	28%	13.8%
2015	3%	24%	11.0%	6%	35%	17.6%
<b>2016</b>	3%	26%	12.0%	8%	42%	21.4%
2017	3%	28%	13.0%	10%	49%	25.1%
2018	3%	31%	14.0%	12%	56%	28.9%
2019	4%	33%	15.0%	13%	63%	32.7%
2020	4%	35%	16.0%	15%	70%	<b>36.5%</b>

Table 26: policy scenario 3 for France

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	5.897.414	1.156.356	3.353.431	1.156.356	1.143.648	0	0	12.707.205
2014	5.059.689	1.099.932	3.189.804	1.649.898	1.758.798	0	0	12.758.121
2015	4.751.238	1.055.831	3.167.492	1.583.746	2.250.731	0	0	12.809.037
2016	3.640.836	1.011.343	3.034.030	2.427.224	2.746.519	0	0	12.859.953
2017	3.479.295	0	3.865.883	2.319.530	3.246.161	0	0	12.910.869
2018	3.316.366	0	3.684.851	2.210.910	3.749.660	0	0	12.961.786
2019	3.152.048	0	3.502.276	2.101.365	4.257.013	0	0	13.012.702
2020	2.986.343	0	3.318.159	1.990.895	4.768.221	0	0	13.063.618

Table 27: policy scenario 3a for France

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	5.897.414	1.156.356	3.353.431	1.156.356	1.143.648	0	0	12.707.205
2014	5.059.689	1.099.932	3.189.804	1.649.898	1.620.555	0	138.243	12.758.121
2015	4.751.238	1.055.831	3.167.492	1.583.746	1.988.832	0	261.899	12.809.037
2016	3.640.836	1.011.343	3.034.030	2.427.224	2.359.985	0	386.533	12.859.953
2017	3.479.295	0	3.865.883	2.319.530	2.734.015	0	512.147	12.910.869
2018	3.316.366	0	3.684.851	2.210.910	3.110.921	0	638.738	12.961.786
2019	3.152.048	0	3.502.276	2.101.365	3.490.704	0	766.309	13.012.702
2020	2.986.343	0	3.318.159	1.990.895	3.873.363	0	894.858	13.063.618

Table 28: France policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-1.860	-4.401	-4.753	11.014	0	0	0
Total GHG implications including organic carbon for the year 2020		0	-1.106	-802	-991	1.283	0	0	-1.616
Total GHG implications excluding organic carbon for the year 2020		0	-838	56	-184	239	0	0	-728
<b>Costs all in € thousands (thousand separator as '.')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 26.811	-€ 172.008	-€ 96.074	€ 169.153	€ 0	€ 0	-€ 125.740
	Total Costs NPV (2013-2020)	€ 0	-€ 76.394	-€ 561.273	-€ 333.786	€ 550.675	€ 0	€ 0	-€ 420.779
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 18.823	-€ 111.161	-€ 67.742	€ 124.811	€ 0	€ 0	-€ 72.916
	Total Costs NPV (2013-2020)	€ 0	-€ 53.634	-€ 362.727	-€ 235.352	€ 406.395	€ 0	€ 0	-€ 245.318
Environmental	Financial Costs NPV (2020)	€ 0	-€ 49.290	-€ 55.755	-€ 33.959	€ 7.518	€ 0	€ 0	-€ 131.486
	Total Costs NPV (2013-2020)	€ 0	-€ 140.446	-€ 181.934	-€ 117.983	€ 24.499	€ 0	€ 0	-€ 415.863
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 68.113	-€ 166.916	-€ 101.701	€ 132.329	€ 0	€ 0	-€ 204.402
	Total Costs NPV (2013-2020)	€ 0	-€ 194.080	-€ 544.661	-€ 353.335	€ 430.894	€ 0	€ 0	-€ 661.181

Table 29: France policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-1.860	-4.401	-4.753	7.415	0	3.599	0
Total GHG implications including organic carbon for the year 2020		0	-1.106	-802	-991	778	0	324	-1.796
Total GHG implications excluding organic carbon for the year 2020		0	-838	56	-184	15	0	-73	-1.025
<b>Costs all in € thousands (thousand separator as ',')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 26.811	-€ 172.008	-€ 96.074	€ 95.868	€ 0	€ 98.742	-€ 100.282
	Total Costs NPV (2013-2020)	€ 0	-€ 76.394	-€ 561.273	-€ 333.786	€ 317.027	€ 0	€ 314.811	-€ 339.616
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 18.823	-€ 111.161	-€ 67.742	€ 71.385	€ 0	€ 74.561	-€ 51.780
	Total Costs NPV (2013-2020)	€ 0	-€ 53.634	-€ 362.727	-€ 235.352	€ 236.063	€ 0	€ 237.718	-€ 177.933
Environmental	Financial Costs NPV (2020)	€ 0	-€ 49.290	-€ 55.755	-€ 33.959	€ 4.461	€ 0	-€ 7.245	-€ 141.789
	Total Costs NPV (2013-2020)	€ 0	-€ 140.446	-€ 181.934	-€ 117.983	€ 14.751	€ 0	-€ 23.099	-€ 448.711
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 68.113	-€ 166.916	-€ 101.701	€ 75.845	€ 0	€ 67.316	-€ 193.569
	Total Costs NPV (2013-2020)	€ 0	-€ 194.080	-€ 544.661	-€ 353.335	€ 250.813	€ 0	€ 214.619	-€ 626.643

C.2.12

Germany

Ratio food and garden waste: we assume 61% food and 39% garden waste, according to paragraph C.1.2.3: A =39

Choice of composting or AD for food waste: Based upon the cost assessment of treatment methods, we assume that recycling of food waste using AD (grid) is preferred, according to paragraph C.1.2.4.

Scenario 3 and scenario 3a are therefore identical.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	25%	80%	50.0%	25%	80%	50.0%
2014	25%	80%	50.0%	25%	80%	50.0%
2015	25%	80%	50.0%	25%	80%	50.0%
<b>2016</b>	25%	80%	50.0%	25%	80%	50.0%
2017	25%	80%	50.0%	25%	80%	50.0%
2018	25%	80%	50.0%	25%	80%	50.0%

2019	25%	80%	50.0%	25%	80%	50.0%
2020	25%	80%	50.0%	25%	80%	<b>50.0%</b>

Table 30: policy scenario 3 for Germany

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	0	0	5.271.550	3.230.950	7.312.150	0	1.190.350	17.005.001
2014	0	0	5.273.150	3.231.931	7.229.319	0	1.275.762	17.010.162
2015	0	0	5.274.750	3.232.911	7.146.436	0	1.361.226	17.015.323
2016	0	0	5.276.350	3.233.892	7.063.501	0	1.446.741	17.020.484
2017	0	0	5.277.950	3.234.872	6.980.514	0	1.532.308	17.025.644
2018	0	0	5.279.550	3.235.853	6.897.476	0	1.617.926	17.030.805
2019	0	0	5.281.149	3.236.834	6.814.386	0	1.703.597	17.035.966
2020	0	0	5.282.749	3.237.814	6.816.450	0	1.704.113	17.041.126

In this case, scenario 3 is identical to scenario 3a because Germany already reaches the targets in the baseline. As a result, both have zero incremental impact

### C.2.13

#### Greece

**Ratio food and garden waste:** we assume 56% food and 44% garden waste, according to paragraph C.1.2.3: A =44

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred for Scenario 3, while for Scenario 3a it is AD with combined heat and power.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	1%	8%	4.2%	1%	8%	4.2%
2014	1%	10%	5.0%	2%	19%	9.5%
2015	1%	12%	5.8%	4%	27%	14.0%
<b>2016</b>	1%	13%	6.7%	5%	36%	18.5%
2017	2%	15%	7.5%	6%	44%	23.0%
2018	2%	17%	8.3%	8%	53%	27.5%
2019	2%	18%	9.2%	9%	61%	32.0%
2020	2%	20%	10.0%	10%	70%	<b>36.5%</b>

Table 31: policy scenario 3 for Greece

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	580.932	0	10.562	1.520.986	91.847	0	0	2.204.327
2014	556.806	0	10.124	1.457.820	212.543	0	0	2.237.293
2015	531.315	0	9.660	1.391.079	314.520	0	0	2.246.574
2016	505.593	0	9.193	1.323.735	417.333	0	0	2.255.854
2017	479.642	0	8.721	1.255.791	520.981	0	0	2.265.135
2018	453.461	0	8.245	1.187.245	625.464	0	0	2.274.415
2019	427.051	0	7.765	1.118.097	730.782	0	0	2.283.695
2020	400.411	0	7.280	1.048.349	836.936	0	0	2.292.976

Table 32: policy scenario 3a for Greece

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	580.932	0	10.562	1.520.986	91.847	0	0	2.204.327
2014	556.806	0	10.124	1.457.820	196.243	0	16.300	2.237.293
2015	531.315	0	9.660	1.391.079	284.031	0	30.489	2.246.574
2016	505.593	0	9.193	1.323.735	372.538	0	44.795	2.255.854
2017	479.642	0	8.721	1.255.791	461.764	0	59.217	2.265.135
2018	453.461	0	8.245	1.187.245	551.708	0	73.756	2.274.415
2019	427.051	0	7.765	1.118.097	642.371	0	88.412	2.283.695
2020	400.411	0	7.280	1.048.349	733.752	0	103.184	2.292.976

Table 33: Greece policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-513	-12	-1.941	2.467	0	0	0
Total GHG implications including organic carbon for the year 2020		0	-4	-2	-616	287	0	0	-335
Total GHG implications excluding organic carbon for the year 2020		0	-3	1	-129	48	0	0	-83
<b>Costs all in € thousands</b> (thousand separator as '.')									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 52	-€ 395	-€ 38.067	€ 28.417	€ 0	€ 0	-€ 10.096
	Total Costs NPV (2013-2020)	€ 0	-€ 10.736	-€ 1.272	-€ 96.664	€ 91.502	€ 0	€ 0	-€ 17.170
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 41	-€ 247	-€ 27.331	€ 21.324	€ 0	€ 0	-€ 6.296
	Total Costs NPV (2013-2020)	€ 0	-€ 8.621	-€ 797	-€ 69.403	€ 68.664	€ 0	€ 0	-€ 10.157
Environmental	Financial Costs NPV (2020)	€ 0	-€ 154	-€ 34	-€ 16.173	€ 1.598	€ 0	€ 0	-€ 14.763
	Total Costs NPV (2013-2020)	€ 0	-€ 32.044	-€ 109	-€ 41.069	€ 5.144	€ 0	€ 0	-€ 68.078
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 195	-€ 281	-€ 43.504	€ 22.922	€ 0	€ 0	-€ 21.059
	Total Costs NPV (2013-2020)	€ 0	-€ 40.665	-€ 906	-€ 110.472	€ 73.808	€ 0	€ 0	-€ 78.235

Table 34: Greece policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-513	-12	-1.941	2.051	0	416	0
Total GHG implications including organic carbon for the year 2020		0	-4	-2	-616	218	0	31	-373
Total GHG implications excluding organic carbon for the year 2020		0	-3	1	-129	2	0	-16	-145
<b>Costs all in € thousands</b> (thousand separator as '.')									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 52	-€ 395	-€ 38.067	€ 21.700	€ 0	€ 10.043	-€ 6.770
	Total Costs NPV (2013-2020)	€ 0	-€ 10.736	-€ 1.272	-€ 96.664	€ 70.019	€ 0	€ 32.119	-€ 6.534
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 41	-€ 247	-€ 27.331	€ 16.364	€ 0	€ 8.013	-€ 3.243
	Total Costs NPV (2013-2020)	€ 0	-€ 8.621	-€ 797	-€ 69.403	€ 52.801	€ 0	€ 25.627	-€ 393
Environmental	Financial Costs NPV (2020)	€ 0	-€ 154	-€ 34	-€ 16.173	€ 1.182	€ 0	-€ 571	-€ 15.749
	Total Costs NPV (2013-2020)	€ 0	-€ 32.044	-€ 109	-€ 41.069	€ 3.815	€ 0	-€ 1.825	-€ 71.232
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 195	-€ 281	-€ 43.504	€ 17.546	€ 0	€ 7.442	-€ 18.993
	Total Costs NPV (2013-2020)	€ 0	-€ 40.665	-€ 906	-€ 110.472	€ 56.615	€ 0	€ 23.802	-€ 71.626

### C.2.14 Hungary

**Ratio food and garden waste:** we assume 70% food and 30% garden waste, according to paragraph C.1.2.3: A =30.

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred for Scenario 3 while for Scenario 3a it is AD with the compressed biogas used in vehicles.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	24%	93%	44.6%	24%	93%	44.6%
2014	25%	94%	45.6%	25%	94%	45.6%
2015	26%	94%	46.6%	26%	94%	46.6%
<b>2016</b>	27%	95%	47.6%	27%	95%	47.6%
2017	27%	95%	47.6%	27%	95%	47.6%
2018	27%	95%	47.6%	27%	95%	47.6%
2019	27%	95%	47.6%	27%	95%	47.6%
2020	27%	95%	47.6%	27%	95%	<b>47.6%</b>

Table 35: policy scenario 3 (and 3a) for Hungary

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	663.368	0	116.946	262.664	645.734	193.675	0	1.882.387
2014	617.605	0	116.709	306.557	670.146	202.250	0	1.913.267
2015	571.633	0	116.394	350.032	694.903	211.025	0	1.943.986
2016	525.545	0	116.000	393.000	720.000	220.000	0	1.974.545
2017	533.636	0	117.786	399.050	731.084	223.387	0	2.004.943
2018	541.684	0	119.562	405.068	742.110	226.756	0	2.035.180
2019	549.689	0	121.329	411.055	753.077	230.107	0	2.065.257
2020	557.651	0	123.087	417.009	763.986	233.440	0	2.095.172

In this case, scenario 3 is identical to scenario 3a because Hungary already reaches the targets in the baseline. As a result, both have zero incremental impact

C.2.15 Ireland

Ratio food and garden waste: we assume 61% food and 39% garden waste. according to paragraph C.1.2.3: A =39

Choice of composting or AD for food waste: Based upon the cost assessment of treatment methods. we assume that recycling of food waste using IVC is preferred. according to paragraph C.1.2.4.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	13%	47%	26.0%	13%	47%	24.4%
2014	14%	50%	28.0%	14%	50%	27.4%
2015	16%	52%	30.0%	16%	52%	29.7%
<b>2016</b>	18%	57%	33.0%	18%	57%	33.0%
2017	20%	61%	36.0%	20%	61%	36.0%
2018	23%	66%	40.0%	23%	66%	40.0%
2019	27%	73%	45.0%	27%	73%	45.0%
2020	31%	80%	50.0%	31%	80%	<b>50.0%</b>

Table 36: policy scenario 3 for Ireland

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	277.250	0	207.938	207.938	163.166	58.447	21.918	936.656
2014	182.694	0	255.772	292.310	184.724	65.364	34.103	1.014.966
2015	37.268	0	335.409	372.676	201.245	70.276	47.916	1.064.790
2016	37.387	0	336.485	373.873	224.658	77.341	66.293	1.116.038
2017	37.029	0	333.262	370.291	245.781	83.315	87.481	1.157.159
2018	35.967	0	323.705	359.673	273.351	91.117	115.095	1.198.909
2019	34.135	0	307.218	341.354	307.218	100.544	150.816	1.241.286
2020	32.107	0	288.966	321.073	333.916	115.586	192.644	1.284.292

In this case. scenario 3 is identical to scenario 3a because Ireland already reaches the targets in the baseline.

## C.2.16 Italy

**Ratio food and garden waste:** we assume 56% food and 44% garden waste. according to paragraph C.1.2.3: A =44

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods. we assume that recycling of food waste using IVC is preferred. according to paragraph C.1.2.4.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	30%	50%	36.7%	30%	50%	36.7%
2014	33%	53%	40.0%	33%	53%	40.0%
2015	37%	55%	43.3%	37%	55%	43.3%
<b>2016</b>	<b>40%</b>	<b>58%</b>	<b>46.7%</b>	<b>40%</b>	<b>58%</b>	<b>46.7%</b>
2017	44%	61%	50.0%	44%	61%	50.0%
2018	48%	64%	53.3%	48%	64%	53.3%
2019	51%	67%	56.7%	51%	67%	56.7%
2020	55%	70%	60.0%	55%	70%	<b>60.0%</b>

Table 37: policy scenario 3 for Italy

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	2.478.402	0	758.694	1.820.867	2.476.849	0	451.445	7.986.257
2014	2.302.847	0	719.640	1.775.112	2.638.679	0	559.720	7.995.998
2015	2.086.829	0	725.854	1.723.902	2.789.778	0	679.376	8.005.739
2016	1.923.715	0	683.988	1.667.220	2.930.103	0	810.454	8.015.480
2017	1.725.422	0	682.144	1.605.044	3.059.615	0	952.995	8.025.220
2018	1.612.349	0	637.440	1.499.859	3.178.273	0	1.107.039	8.034.961
2019	1.464.136	0	627.487	1.394.415	3.286.037	0	1.272.627	8.044.702
2020	1.353.146	0	579.920	1.288.711	3.382.866	0	1.449.800	8.054.443

In this case. scenario 3 is identical to scenario 3a because Italy already reaches the targets in the baseline.

## C.2.17 Latvia

**Ratio food and garden waste:** we assume 70% food and 30% garden waste. according to paragraph C.1.2.3: A =30

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods. we assume that recycling of food waste using IVC is preferred. according to paragraph C.1.2.4.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	2%	38%	12.5%	2%	38%	12.5%
2014	2%	45%	15.0%	4%	45%	16.1%
2015	3%	53%	17.5%	5%	53%	19.5%
<b>2016</b>	3%	60%	20.0%	7%	60%	22.9%
2017	3%	68%	22.5%	9%	68%	26.3%
2018	4%	75%	25.0%	10%	75%	29.7%
2019	4%	83%	27.5%	12%	83%	33.1%
2020	4%	90%	30.0%	14%	90%	<b>36.5%</b>

Table 38: policy scenario 3 for Latvia

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	127.219	0	0	137.820	35.970	1.893	0	302.902
2014	130.682	0	0	141.573	49.488	2.922	0	324.665
2015	128.851	0	0	139.588	61.087	4.087	0	333.613
2016	126.660	0	0	137.215	73.024	5.478	0	342.377
2017	124.119	0	0	134.463	85.271	7.107	0	350.960
2018	121.238	0	0	131.341	97.797	8.984	0	359.360
2019	116.831	0	0	126.567	109.458	11.007	0	363.863
2020	89.821	0	0	141.677	119.941	13.124	0	364.564

Table 39: policy scenario 3a for Latvia

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	127.219	0	0	137.820	35.970	1.893	0	302.902
2014	130.682	0	0	141.573	45.778	2.922	3.710	324.665
2015	128.851	0	0	139.588	54.295	4.087	6.791	333.613
2016	126.660	0	0	137.215	62.997	5.478	10.027	342.377
2017	124.119	0	0	134.463	71.859	7.107	13.412	350.960
2018	121.238	0	0	131.341	80.856	8.984	16.941	359.360
2019	116.831	0	0	126.567	89.056	11.007	20.402	363.863
2020	89.821	0	0	141.677	96.245	13.124	23.697	364.564

Table 40: Latvia policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-34	0	-61	95	0	0	0
Total GHG implications including organic carbon for the year 2020		0	1	0	-14	12	0	0	-2
Total GHG implications excluding organic carbon for the year 2020		0	0	0	-3	3	0	0	1
<b>Costs all in € thousands (thousand separator as '.')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	€ 13	€ 0	-€ 1.297	€ 1.439	€ 0	€ 0	€ 156
	Total Costs NPV (2013-2020)	€ 0	-€ 737	€ 0	-€ 2.564	€ 4.572	€ 0	€ 0	€ 1.272
Financial (Social)	Financial Costs NPV (2020)	€ 0	€ 11	€ 0	-€ 924	€ 1.066	€ 0	€ 0	€ 153
	Total Costs NPV (2013-2020)	€ 0	-€ 605	€ 0	-€ 1.826	€ 3.385	€ 0	€ 0	€ 954
Environmental	Financial Costs NPV (2020)	€ 0	€ 27	€ 0	-€ 370	€ 95	€ 0	€ 0	-€ 248
	Total Costs NPV (2013-2020)	€ 0	-€ 1.449	€ 0	-€ 730	€ 303	€ 0	€ 0	-€ 1.876
Net Cost to Society	Financial Costs NPV (2020)	€ 0	€ 38	€ 0	-€ 1.294	€ 1.161	€ 0	€ 0	-€ 95
	Total Costs NPV (2013-2020)	€ 0	-€ 2.053	€ 0	-€ 2.556	€ 3.688	€ 0	€ 0	-€ 922

Table 41: Latvia policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-34	0	-61	0	0	95	0
Total GHG implications including organic carbon for the year 2020		0	1	0	-14	0	0	9	-5
Total GHG implications excluding organic carbon for the year 2020		0	0	0	-3	0	0	-2	-4
<b>Costs all in € thousands (thousand separator as '.)</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	€ 13	€ 0	-€ 1,297	€ 0	€ 0	€ 2,152	€ 868
	Total Costs NPV (2013-2020)	€ 0	-€ 737	€ 0	-€ 2,564	€ 0	€ 0	€ 6,834	€ 3,534
Financial (Social)	Financial Costs NPV (2020)	€ 0	€ 11	€ 0	-€ 924	€ 0	€ 0	€ 1,684	€ 771
	Total Costs NPV (2013-2020)	€ 0	-€ 605	€ 0	-€ 1,826	€ 0	€ 0	€ 5,350	€ 2,919
Environmental	Financial Costs NPV (2020)	€ 0	€ 27	€ 0	-€ 370	€ 0	€ 0	-€ 34	-€ 377
	Total Costs NPV (2013-2020)	€ 0	-€ 1,449	€ 0	-€ 730	€ 0	€ 0	-€ 107	-€ 2,286
Net Cost to Society	Financial Costs NPV (2020)	€ 0	€ 38	€ 0	-€ 1,294	€ 0	€ 0	€ 1,651	€ 395
	Total Costs NPV (2013-2020)	€ 0	-€ 2,053	€ 0	-€ 2,556	€ 0	€ 0	€ 5,243	€ 633

**C.2.18 Lithuania**

**Ratio food and garden waste:** we assume 70% food and 30% garden waste. according to paragraph C.1.2.3: A =30

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods. we assume that recycling of food waste using IVC is preferred according to paragraph C.1.2.4.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	4%	58%	23.0%	4%	58%	23.0%
2014	4%	60%	24.0%	5%	60%	25.0%
2015	4%	63%	25.0%	7%	63%	26.9%
<b>2016</b>	4%	65%	26.0%	9%	65%	28.8%
2017	4%	68%	27.0%	10%	68%	30.8%
2018	4%	70%	28.0%	12%	70%	32.7%
2019	5%	73%	29.0%	13%	73%	34.6%

2020	5%	75%	30.0%	15%	75%	<b>36.5%</b>
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Table 42: policy scenario 3 for Lithuania

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	188.731	0	120.102	120.102	121.717	6.406	0	557.058
2014	182.939	0	116.416	116.416	130.712	7.984	0	554.467
2015	177.436	0	112.914	112.914	138.954	9.658	0	551.876
2016	171.976	0	109.440	109.440	147.004	11.425	0	549.285
2017	166.560	0	105.993	105.993	154.863	13.285	0	546.694
2018	161.188	0	102.574	102.574	162.531	15.235	0	544.103
2019	155.859	0	99.183	99.183	170.011	17.274	0	541.511
2020	150.574	0	95.820	95.820	177.305	19.401	0	538.920

Table 43: policy scenario 3a for Lithuania

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	188.731	0	120.102	120.102	121.717	6.406	0	557.058
2014	182.939	0	116.416	116.416	125.088	7.984	5.624	554.467
2015	177.436	0	112.914	112.914	128.311	9.658	10.643	551.876
2016	171.976	0	109.440	109.440	131.389	11.425	15.615	549.285
2017	166.560	0	105.993	105.993	134.323	13.285	20.540	546.694
2018	161.188	0	102.574	102.574	137.114	15.235	25.417	544.103
2019	155.859	0	99.183	99.183	139.764	17.274	30.247	541.511
2020	150.574	0	95.820	95.820	142.275	19.401	35.030	538.920

Table 44: Lithuania policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-63	-40	-40	143	0	0	0
Total GHG implications including organic carbon for the year 2020		0	-20	-3	-6	17	0	0	-12
Total GHG implications excluding organic carbon for the year 2020		0	-15	2	-1	4	0	0	-11
<b>Costs all in € thousands (thousand separator as '.')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 415	-€ 1,393	-€ 533	€ 2,150	€ 0	€ 0	-€ 191
	Total Costs NPV (2013-2020)	€ 0	-€ 1,345	-€ 4,516	-€ 1,727	€ 6,968	€ 0	€ 0	-€ 619
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 340	-€ 835	-€ 379	€ 1,591	€ 0	€ 0	€ 36
	Total Costs NPV (2013-2020)	€ 0	-€ 1,104	-€ 2,708	-€ 1,230	€ 5,157	€ 0	€ 0	€ 115
Environmental	Financial Costs NPV (2020)	€ 0	-€ 811	-€ 148	-€ 146	€ 138	€ 0	€ 0	-€ 968
	Total Costs NPV (2013-2020)	€ 0	-€ 2,630	-€ 481	-€ 474	€ 448	€ 0	€ 0	-€ 3,137
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 1,152	-€ 984	-€ 526	€ 1,729	€ 0	€ 0	-€ 932
	Total Costs NPV (2013-2020)	€ 0	-€ 3,734	-€ 3,189	-€ 1,704	€ 5,605	€ 0	€ 0	-€ 3,022

Table 45: Lithuania policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-63	-40	-40	0	0	143	0
Total GHG implications including organic carbon for the year 2020		0	-20	-3	-6	0	0	13	-16
Total GHG implications excluding organic carbon for the year 2020		0	-15	2	-1	0	0	-3	-18
<b>Costs all in € thousands (thousand separator as '.')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 415	-€ 1,393	-€ 533	€ 0	€ 0	€ 3,241	€ 901
	Total Costs NPV (2013-2020)	€ 0	-€ 1,345	-€ 4,516	-€ 1,727	€ 0	€ 0	€ 10,507	€ 2,919
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 340	-€ 835	-€ 379	€ 0	€ 0	€ 2,543	€ 988
	Total Costs NPV (2013-2020)	€ 0	-€ 1,104	-€ 2,708	-€ 1,230	€ 0	€ 0	€ 8,245	€ 3,203
Environmental	Financial Costs NPV (2020)	€ 0	-€ 811	-€ 148	-€ 146	€ 0	€ 0	-€ 67	-€ 1,173
	Total Costs NPV (2013-2020)	€ 0	-€ 2,630	-€ 481	-€ 474	€ 0	€ 0	-€ 218	-€ 3,803
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 1,152	-€ 984	-€ 526	€ 0	€ 0	€ 2,476	-€ 185
	Total Costs NPV (2013-2020)	€ 0	-€ 3,734	-€ 3,189	-€ 1,704	€ 0	€ 0	€ 8,027	-€ 600

## C.2.19

### Luxemburg

**Ratio food and garden waste:** we assume 61% food and 39% garden waste. according to paragraph C.1.2.3: A =39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred according to paragraph C.1.2.4.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	40%	95%	65.0%	40%	95%	65.0%
2014	40%	95%	65.0%	40%	95%	65.0%
2015	40%	95%	65.0%	40%	95%	65.0%
<b>2016</b>	40%	95%	65.0%	40%	95%	65.0%
2017	40%	95%	65.0%	40%	95%	65.0%
2018	40%	95%	65.0%	40%	95%	65.0%
2019	40%	95%	65.0%	40%	95%	65.0%
2020	40%	95%	65.0%	40%	95%	<b>65.0%</b>

Table 46: policy scenario 3 for Luxembourg

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected	
2013	32.206	0	0	0	49.644	0	10.168	92.018	0
2014	32.460	0	0	0	50.035	0	10.248	92.743	0
2015	32.713	0	0	0	50.425	0	10.328	93.467	0
2016	31.319	0	1.648	0	50.817	0	10.408	94.192	0
2017	31.560	0	1.661	0	51.207	0	10.488	94.916	0
2018	31.801	0	1.674	0	51.598	0	10.568	95.641	0
2019	32.041	0	1.686	0	51.989	0	10.648	96.365	0
2020	32.282	0	1.699	0	52.380	0	10.728	97.090	0

In this case, scenario 3 is identical to scenario 3a because Luxembourg already reaches the targets in the baseline.

**C.2.20 Malta**

**Ratio food and garden waste:** we assume 64% food and 30% garden waste. according to paragraph C.1.2.3: A =30

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods. we assume that recycling of food waste using AD for electricity is preferred according to paragraph C.1.2.4.. Therefore. scenario 3 and scenario 3a are identical for Malta.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	0%	18%	6.7%	0%	18%	6.7%
2014	0%	22%	8.0%	3%	29%	12.1%
2015	0%	26%	9.3%	5%	36%	16.1%
<b>2016</b>	0%	29%	10.7%	8%	43%	20.2%
2017	0%	33%	12.0%	10%	49%	24.3%
2018	0%	37%	13.3%	13%	56%	28.4%
2019	0%	40%	14.7%	15%	63%	32.4%
2020	0%	44%	16.0%	18%	70%	<b>36.5%</b>

Table 47: policy scenario 3 for Malta

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	6.845	0	0	61.606	0	4.889	0	73.341
2014	6.677	0	0	60.090	1.874	6.075	1.217	75.933
2015	6.588	0	0	59.288	2.842	7.332	2.508	78.557
2016	6.480	0	0	58.316	3.870	8.663	3.883	81.212
2017	6.352	0	0	57.171	4.962	10.068	5.346	83.899
2018	6.205	0	0	55.849	6.118	11.549	6.896	86.617
2019	5.943	0	0	53.491	7.223	12.901	8.400	87.958
2020	5.671	0	0	51.040	8.359	14.289	9.949	89.309

Table 48: Malta policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-7	0	-66	35	0	38	0
Total GHG implications including organic carbon for the year 2020		0	-3	0	-10	4	0	3	-7
Total GHG implications excluding organic carbon for the year 2020		0	-2	0	-1	0	0	-2	-5
<b>Costs all in € thousands (thousand separator as '.')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 34	€ 0	-€ 1.427	€ 175	€ 0	€ 715	-€ 571
	Total Costs NPV (2013-2020)	€ 0	-€ 109	€ 0	-€ 4.539	€ 588	€ 0	€ 2.169	-€ 1.891
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 25	€ 0	-€ 978	€ 141	€ 0	€ 535	-€ 327
	Total Costs NPV (2013-2020)	€ 0	-€ 79	€ 0	-€ 3.113	€ 472	€ 0	€ 1.623	-€ 1.096
Environmental	Financial Costs NPV (2020)	€ 0	-€ 130	€ 0	-€ 272	€ 97	€ 0	-€ 105	-€ 411
	Total Costs NPV (2013-2020)	€ 0	-€ 412	€ 0	-€ 867	€ 325	€ 0	-€ 319	-€ 1.273
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 154	€ 0	-€ 1.251	€ 237	€ 0	€ 430	-€ 738
	Total Costs NPV (2013-2020)	€ 0	-€ 491	€ 0	-€ 3.979	€ 797	€ 0	€ 1.304	-€ 2.370

Table 49: Malta policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-7	0	-66	35	0	38	0
Total GHG implications including organic carbon for the year 2020		0	-3	0	-10	4	0	3	-7
Total GHG implications excluding organic carbon for the year 2020		0	-2	0	-1	0	0	-2	-5
<b>Costs all in € thousands (thousand separator as '.')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 34	€ 0	-€ 1.427	€ 175	€ 0	€ 894	-€ 392
	Total Costs NPV (2013-2020)	€ 0	-€ 109	€ 0	-€ 4.539	€ 588	€ 0	€ 2.710	-€ 1.350
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 25	€ 0	-€ 978	€ 141	€ 0	€ 665	-€ 198
	Total Costs NPV (2013-2020)	€ 0	-€ 79	€ 0	-€ 3.113	€ 472	€ 0	€ 2.017	-€ 703
Environmental	Financial Costs NPV (2020)	€ 0	-€ 130	€ 0	-€ 272	€ 97	€ 0	-€ 119	-€ 425
	Total Costs NPV (2013-2020)	€ 0	-€ 412	€ 0	-€ 867	€ 325	€ 0	-€ 362	-€ 1.316
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 154	€ 0	-€ 1.251	€ 237	€ 0	€ 546	-€ 622
	Total Costs NPV (2013-2020)	€ 0	-€ 491	€ 0	-€ 3.979	€ 797	€ 0	€ 1.655	-€ 2.019

### C.2.21

### The Netherlands

**Ratio food and garden waste:** we assume 61% food and 39% garden waste. according to paragraph C.1.2.3: A =39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred, according to paragraph C.1.2.4.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	20%	90%	51.5%	20%	90%	51.5%
2014	21%	90%	52.0%	21%	90%	52.0%
2015	22%	90%	52.5%	22%	90%	52.5%
<b>2016</b>	23%	90%	53.0%	23%	90%	53.0%
2017	24%	90%	53.5%	24%	90%	53.5%
2018	25%	90%	54.0%	25%	90%	54.0%
2019	25%	90%	54.5%	25%	90%	54.5%
2020	26%	90%	55.0%	26%	90%	<b>55.0%</b>

Table 50: policy scenario 3 for the Netherlands

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	215.057	0	994.639	134.411	1.098.980	0	328.267	2.771.354
2014	213.897	0	989.274	133.686	1.115.161	0	333.100	2.785.118
2015	212.715	0	983.807	132.947	1.131.448	0	337.965	2.798.882
2016	211.511	0	978.238	132.194	1.147.841	0	342.862	2.812.646
2017	210.285	0	972.568	131.428	1.164.340	0	347.790	2.826.410
2018	209.037	0	966.795	130.648	1.180.944	0	352.749	2.840.173
2019	207.767	0	960.921	129.854	1.197.655	0	357.741	2.853.937
2020	206.474	0	954.944	129.047	1.214.471	0	362.764	2.867.701

In this case, scenario 3 is identical to scenario 3a because The Netherlands already reach the targets in the baseline.

**C.2.22**

**Poland**

**Ratio food and garden waste:** we assume 70% food and 30% garden waste, according to paragraph C.1.2.3: A =39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using AD for electricity is preferred, according to paragraph C.1.2.4. Scenario 3 and scenario 3a are therefore identical.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	1%	17%	6.7%	1%	17%	6.7%
2014	1%	20%	8.0%	4%	27%	12.1%
2015	1%	23%	9.3%	6%	34%	16.1%
<b>2016</b>	<b>2%</b>	<b>27%</b>	<b>10.7%</b>	<b>8%</b>	<b>41%</b>	<b>20.2%</b>
2017	2%	30%	12.0%	11%	49%	24.3%
2018	2%	33%	13.3%	13%	56%	28.4%
2019	2%	37%	14.7%	15%	63%	32.4%
2020	3%	40%	16.0%	18%	70%	<b>36.5%</b>

Table 51: policy scenario 3 for Poland

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	1.205.680	0	415.752	2.536.085	296.965	0	0	4.454.482
2014	1.246.875	0	410.929	2.451.488	494.050	0	70.102	4.673.444
2015	1.286.124	0	615.274	2.200.429	649.398	0	140.221	4.891.446
2016	1.323.439	0	611.377	2.141.028	816.385	0	216.259	5.108.488
2017	1.358.830	0	806.292	1.866.338	994.934	0	298.176	5.324.570
2018	1.392.310	0	793.759	1.782.725	1.184.967	0	385.932	5.539.693
2019	932.892	0	777.593	2.177.478	1.386.405	0	479.488	5.753.856
2020	852.096	0	757.816	2.179.170	1.599.172	0	578.805	5.967.059

Table 52: Poland policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	0	-1.881	-2.862	2.574	0	2.169	0
Total GHG implications including organic carbon for the year 2020		0	0	-324	-309	278	0	161	-194
Total GHG implications excluding organic carbon for the year 2020		0	0	232	-33	2	0	-101	100
<b>Costs all in € thousands (thousand separator as '.)</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 109.985	-€ 42.126	€ 13.126	€ 0	€ 45.814	-€ 93.171
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 211.908	-€ 204.532	€ 41.614	€ 0	€ 135.487	-€ 239.339
Financial (Social)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 66.932	-€ 29.586	€ 10.527	€ 0	€ 35.711	-€ 50.280
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 128.958	-€ 143.648	€ 33.373	€ 0	€ 105.610	-€ 133.622
Environmental	Financial Costs NPV (2020)	€ 0	€ 0	-€ 2.264	-€ 9.205	€ 10.051	€ 0	-€ 11.605	-€ 13.023
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 4.362	-€ 44.694	€ 31.867	€ 0	-€ 34.320	-€ 51.510
Net Cost to Society	Financial Costs NPV (2020)	€ 0	€ 0	-€ 69.196	-€ 38.791	€ 20.578	€ 0	€ 24.106	-€ 63.303
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 133.320	-€ 188.342	€ 65.240	€ 0	€ 71.290	-€ 185.132

Table 53: Poland policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	0	-1.881	-2.862	2.574	0	2.169	0
Total GHG implications including organic carbon for the year 2020		0	0	-324	-309	278	0	143	-212
Total GHG implications excluding organic carbon for the year 2020		0	0	232	-33	2	0	-119	82
<b>Costs all in € thousands (thousand separator as '.)</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 109.985	-€ 42.126	€ 13.126	€ 0	€ 54.039	-€ 84.946
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 211.908	-€ 204.532	€ 41.614	€ 0	€ 159.811	-€ 215.015
Financial (Social)	Financial Costs NPV (2020)	€ 0	€ 0	-€ 66.932	-€ 29.586	€ 10.527	€ 0	€ 41.201	-€ 44.791
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 128.958	-€ 143.648	€ 33.373	€ 0	€ 121.844	-€ 117.388
Environmental	Financial Costs NPV (2020)	€ 0	€ 0	-€ 2.264	-€ 9.205	€ 10.051	€ 0	-€ 13.803	-€ 15.220
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 4.362	-€ 44.694	€ 31.867	€ 0	-€ 40.819	-€ 58.008
Net Cost to Society	Financial Costs NPV (2020)	€ 0	€ 0	-€ 69.196	-€ 38.791	€ 20.578	€ 0	€ 27.398	-€ 60.011
	Total Costs NPV (2013-2020)	€ 0	€ 0	-€ 133.320	-€ 188.342	€ 65.240	€ 0	€ 81.025	-€ 175.397

**C.2.23 Portugal**

**Ratio food and garden waste:** we assume 56% food and 44% garden waste. according to paragraph C.1.2.3: A =44

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods. we assume that recycling of food waste using IVC is preferred. according to paragraph C.1.2.4.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	1%	22%	8.4%	1%	22%	8.4%
2014	1%	25%	9.5%	3%	31%	13.4%
2015	1%	27%	10.6%	6%	38%	17.2%
<b>2016</b>	1%	30%	11.7%	8%	44%	21.1%
2017	1%	33%	12.8%	11%	51%	24.9%
2018	1%	36%	13.8%	13%	57%	28.8%
2019	1%	39%	14.9%	15%	64%	32.6%
2020	1%	42%	16.0%	18%	70%	<b>36.5%</b>

Table 54: policy scenario 3 for Portugal

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	556.884	0	713.508	469.871	124.748	14.394	20.791	1.900.196
2014	412.673	0	693.291	544.729	209.228	19.909	25.339	1.905.170
2015	300.452	0	679.971	600.904	272.214	26.280	30.324	1.910.145
2016	241.852	0	665.093	604.630	336.514	33.515	33.515	1.915.119
2017	230.631	0	634.234	576.576	405.208	36.722	36.722	1.920.093
2018	219.348	0	603.206	548.369	474.254	39.945	39.945	1.925.068
2019	208.003	0	572.009	520.008	543.651	43.185	43.185	1.930.042
2020	196.598	0	540.643	491.494	613.400	46.440	46.440	1.935.016

Table 55: policy scenario 3a for Portugal

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	556.884	0	713.508	469.871	124.748	14.394	20.791	1.900.196
2014	412.673	0	693.291	544.729	180.324	19.909	54.243	1.905.170
2015	300.452	0	679.971	600.904	214.891	26.280	87.646	1.910.145
2016	241.852	0	665.093	604.630	250.625	33.515	119.403	1.915.119
2017	230.631	0	634.234	576.576	290.606	36.722	151.324	1.920.093
2018	219.348	0	603.206	548.369	330.791	39.945	183.409	1.925.068
2019	208.003	0	572.009	520.008	371.179	43.185	215.657	1.930.042
2020	196.598	0	540.643	491.494	411.771	46.440	248.069	1.935.016

Table 56: Portugal policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-273	-719	-649	1.641	0	0	0
Total GHG implications including organic carbon for the year 2020		0	-116	-90	-136	190	0	0	-152
Total GHG implications excluding organic carbon for the year 2020		0	-87	37	-27	37	0	0	-40
<b>Costs all in € thousands (thousand separator as ',')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 3.168	-€ 23.992	-€ 11.211	€ 22.463	€ 0	€ 0	-€ 15.907
	Total Costs NPV (2013-2020)	€ 0	-€ 10.888	-€ 78.528	-€ 36.358	€ 73.259	€ 0	€ 0	-€ 52.516
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 1.634	-€ 15.381	-€ 7.428	€ 16.430	€ 0	€ 0	-€ 8.012
	Total Costs NPV (2013-2020)	€ 0	-€ 5.616	-€ 50.343	-€ 24.089	€ 53.599	€ 0	€ 0	-€ 26.449
Environmental	Financial Costs NPV (2020)	€ 0	-€ 4.412	-€ 1.813	-€ 3.800	€ 1.317	€ 0	€ 0	-€ 8.707
	Total Costs NPV (2013-2020)	€ 0	-€ 15.162	-€ 5.933	-€ 12.324	€ 4.302	€ 0	€ 0	-€ 29.117
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 6.045	-€ 17.194	-€ 11.228	€ 17.748	€ 0	€ 0	-€ 16.719
	Total Costs NPV (2013-2020)	€ 0	-€ 20.778	-€ 56.276	-€ 36.413	€ 57.901	€ 0	€ 0	-€ 55.566

Table 57: Portugal policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-273	-719	-649	836	0	804	0
Total GHG implications including organic carbon for the year 2020		0	-116	-90	-136	85	0	72	-186
Total GHG implications excluding organic carbon for the year 2020		0	-87	37	-27	1	0	-20	-96
<b>Costs all in € thousands (thousand separator as '.)</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 3,168	-€ 23,992	-€ 11,211	€ 8,791	€ 0	€ 18,111	-€ 11,468
	Total Costs NPV (2013-2020)	€ 0	-€ 10,888	-€ 78,528	-€ 36,358	€ 30,062	€ 0	€ 57,225	-€ 38,488
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 1,634	-€ 15,381	-€ 7,428	€ 6,486	€ 0	€ 16,721	-€ 1,235
	Total Costs NPV (2013-2020)	€ 0	-€ 5,616	-€ 50,343	-€ 24,089	€ 22,180	€ 0	€ 52,832	-€ 5,036
Environmental	Financial Costs NPV (2020)	€ 0	-€ 4,412	-€ 1,813	-€ 3,800	€ 541	€ 0	-€ 1,339	-€ 10,823
	Total Costs NPV (2013-2020)	€ 0	-€ 15,162	-€ 5,933	-€ 12,324	€ 1,849	€ 0	-€ 4,232	-€ 35,803
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 6,045	-€ 17,194	-€ 11,228	€ 7,027	€ 0	€ 15,382	-€ 12,058
	Total Costs NPV (2013-2020)	€ 0	-€ 20,778	-€ 56,276	-€ 36,413	€ 24,028	€ 0	€ 48,600	-€ 40,839

C.2.24

Romania

Ratio food and garden waste: we assume 64% food and 36% garden waste. according to paragraph C.1.2.3: A =36

Choice of composting or AD for food waste: Based upon the cost assessment of treatment methods. we assume that recycling of food waste using IVC is preferred. according to paragraph C.1.2.4.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	1%	25%	9.4%	1%	25%	8.0%
2014	1%	27%	10.4%	3%	33%	13.4%
2015	1%	30%	11.3%	6%	40%	17.8%
2016	1%	32%	12.2%	8%	46%	21.6%
2017	1%	35%	13.2%	10%	52%	25.3%
2018	1%	37%	14.1%	13%	58%	29.0%
2019	1%	40%	15.1%	15%	64%	32.8%
2020	1%	42%	16.0%	18%	70%	36.5%

Table 58: policy scenario 3 for Romania

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	1.327.903	0	0	1.760.244	305.460	16.077	0	3.409.684
2014	1.401.534	0	0	1.857.848	511.479	23.606	0	3.794.467
2015	1.405.102	0	0	1.862.577	677.804	31.478	0	3.976.960
2016	1.335.457	0	0	1.770.257	815.238	38.792	0	3.959.744
2017	1.266.365	0	0	1.678.669	950.712	46.782	0	3.942.527
2018	1.197.825	0	0	1.587.815	1.084.234	55.437	0	3.925.311
2019	1.129.838	0	0	1.497.693	1.215.816	64.748	0	3.908.095
2020	1.062.404	0	0	1.408.303	1.345.466	74.705	0	3.890.878

Table 59: policy scenario 3a for Romania

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	1.327.903	0	0	1.760.244	305.460	16.077	0	3.409.684
2014	1.401.534	0	0	1.857.848	453.025	23.606	58.454	3.794.467
2015	1.405.102	0	0	1.862.577	557.682	31.478	120.121	3.976.960
2016	1.335.457	0	0	1.770.257	637.036	38.792	178.202	3.959.744
2017	1.266.365	0	0	1.678.669	714.938	46.782	235.773	3.942.527
2018	1.197.825	0	0	1.587.815	791.399	55.437	292.835	3.925.311
2019	1.129.838	0	0	1.497.693	866.429	64.748	349.387	3.908.095
2020	1.062.404	0	0	1.408.303	940.036	74.705	405.429	3.890.878

Table 60: Romania policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-939	0	-2.384	3.323	0	0	0
Total GHG implications including organic carbon for the year 2020		0	269	0	-805	382	0	0	-153
Total GHG implications excluding organic carbon for the year 2020		0	201	0	-162	74	0	0	113
<b>Costs all in € thousands (thousand separator as '.')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	€ 3.750	€ 0	-€ 52.983	€ 40.201	€ 0	€ 0	-€ 9.033
	Total Costs NPV (2013-2020)	€ 0	-€ 19.798	€ 0	-€ 104.501	€ 132.252	€ 0	€ 0	€ 7.952
Financial (Social)	Financial Costs NPV (2020)	€ 0	€ 3.047	€ 0	-€ 37.965	€ 29.999	€ 0	€ 0	-€ 4.919
	Total Costs NPV (2013-2020)	€ 0	-€ 16.085	€ 0	-€ 74.879	€ 98.719	€ 0	€ 0	€ 7.755
Environmental	Financial Costs NPV (2020)	€ 0	€ 9.737	€ 0	-€ 20.275	€ 2.407	€ 0	€ 0	-€ 8.131
	Total Costs NPV (2013-2020)	€ 0	-€ 51.404	€ 0	-€ 39.989	€ 7.881	€ 0	€ 0	-€ 83.512
Net Cost to Society	Financial Costs NPV (2020)	€ 0	€ 12.784	€ 0	-€ 58.239	€ 32.405	€ 0	€ 0	-€ 13.050
	Total Costs NPV (2013-2020)	€ 0	-€ 67.489	€ 0	-€ 114.868	€ 106.600	€ 0	€ 0	-€ 75.757

Table 61: Romania policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-939	0	-2.384	1.683	0	1.640	0
Total GHG implications including organic carbon for the year 2020		0	269	0	-805	170	0	146	-219
Total GHG implications excluding organic carbon for the year 2020		0	201	0	-162	2	0	-38	4
<b>Costs all in € thousands (thousand separator as '.')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	€ 3.750	€ 0	-€ 52.983	€ 15.711	€ 0	€ 37.029	€ 3.507
	Total Costs NPV (2013-2020)	€ 0	-€ 19.798	€ 0	-€ 104.501	€ 53.720	€ 0	€ 118.744	€ 48.164
Financial (Social)	Financial Costs NPV (2020)	€ 0	€ 3.047	€ 0	-€ 37.965	€ 11.866	€ 0	€ 28.402	€ 5.351
	Total Costs NPV (2013-2020)	€ 0	-€ 16.085	€ 0	-€ 74.879	€ 40.573	€ 0	€ 91.079	€ 40.688
Environmental	Financial Costs NPV (2020)	€ 0	€ 9.737	€ 0	-€ 20.275	€ 770	€ 0	-€ 827	-€ 10.594
	Total Costs NPV (2013-2020)	€ 0	-€ 51.404	€ 0	-€ 39.989	€ 2.632	€ 0	-€ 2.651	-€ 91.411
Net Cost to Society	Financial Costs NPV (2020)	€ 0	€ 12.784	€ 0	-€ 58.239	€ 12.636	€ 0	€ 27.575	-€ 5.244
	Total Costs NPV (2013-2020)	€ 0	-€ 67.489	€ 0	-€ 114.868	€ 43.206	€ 0	€ 88.428	-€ 50.724

## C.2.25 Slovakia

**Ratio food and garden waste:** we assume 70% food and 30% garden waste. according to paragraph C.1.2.3: A =30

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods. we assume that recycling of food waste using AD (vehicle) is preferred. according to paragraph C.1.2.4. Scenario 3 and scenario 3a are therefore identical.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	3%	35%	14.8%	3%	35%	14.8%
2014	4%	40%	17.0%	6%	40%	18.2%
2015	5%	45%	19.2%	8%	45%	21.3%
<b>2016</b>	5%	50%	21.3%	10%	50%	24.3%
2017	6%	55%	23.5%	12%	55%	27.4%
2018	6%	60%	25.7%	14%	60%	30.4%
2019	7%	65%	27.8%	16%	65%	33.5%
2020	8%	70%	30.0%	18%	70%	<b>36.5%</b>

Table 62: policy scenario 3 for Slovakia

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	228.699	0	132.405	240.736	96.436	8.386	0	706.662
2014	223.512	0	138.940	241.635	113.048	12.561	9.183	738.879
2015	218.507	0	145.671	242.785	130.058	17.735	16.340	771.097
2016	210.730	0	153.998	243.152	147.381	23.992	24.061	803.314
2017	200.256	0	163.845	242.734	164.934	31.416	32.347	835.532
2018	187.187	0	175.111	241.532	182.632	40.090	41.197	867.749
2019	173.670	0	185.648	239.545	200.392	50.098	50.612	899.966
2020	171.662	0	183.500	236.775	223.724	55.931	60.592	932.184

Table 63: Slovakia policy Scenario 3 and 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-41	-67	-126	0	0	234	0
Total GHG implications including organic carbon for the year 2020		0	19	-7	-33	0	0	22	1
Total GHG implications excluding organic carbon for the year 2020		0	15	2	-6	0	0	-5	6
<b>Costs all in € thousands (thousand separator as '')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	€ 505	-€ 2.165	-€ 3.217	€ 0	€ 0	€ 4.133	-€ 743
	Total Costs NPV (2013-2020)	€ 0	-€ 1.159	-€ 6.099	-€ 5.546	€ 0	€ 0	€ 12.651	-€ 153
Financial (Social)	Financial Costs NPV (2020)	€ 0	€ 313	-€ 1.350	-€ 2.229	€ 0	€ 0	€ 2.882	-€ 383
	Total Costs NPV (2013-2020)	€ 0	-€ 717	-€ 3.803	-€ 3.842	€ 0	€ 0	€ 8.823	€ 461
Environmental	Financial Costs NPV (2020)	€ 0	€ 967	-€ 510	-€ 1.238	€ 0	€ 0	-€ 317	-€ 1.099
	Total Costs NPV (2013-2020)	€ 0	-€ 2.217	-€ 1.437	-€ 2.135	€ 0	€ 0	-€ 970	-€ 6.759
Net Cost to Society	Financial Costs NPV (2020)	€ 0	€ 1.280	-€ 1.860	-€ 3.467	€ 0	€ 0	€ 2.565	-€ 1.482
	Total Costs NPV (2013-2020)	€ 0	-€ 2.935	-€ 5.240	-€ 5.977	€ 0	€ 0	€ 7.853	-€ 6.299

## C.2.26

### Slovenia

**Ratio food and garden waste:** we assume 64% food and 36% garden waste. according to paragraph C.1.2.3: A =36

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods. we assume that recycling of food waste using AD (grid) is preferred. according to paragraph C.1.2.4. Scenario 3 and scenario 3a are therefore identical.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	9%	41%	20.4%	9%	41%	20.4%
2014	10%	45%	22.5%	11%	45%	23.2%
2015	11%	49%	24.6%	12%	49%	25.4%
<b>2016</b>	12%	53%	26.7%	13%	53%	27.6%
2017	13%	58%	28.8%	14%	58%	29.9%
2018	13%	62%	30.8%	15%	62%	32.1%
2019	14%	66%	32.9%	17%	66%	34.3%
2020	15%	70%	35.0%	18%	70%	<b>36.5%</b>

Table 64: policy scenario 3 for Slovenia

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	90.946	0	93.879	108.548	75.263	0	0	368.636
2014	88.837	0	91.703	106.031	86.638	0	0	373.208
2015	87.021	0	89.828	103.864	95.722	0	0	376.436
2016	85.161	0	87.908	101.644	104.950	0	0	379.663
2017	83.257	0	85.943	99.371	114.320	0	0	382.891
2018	81.308	0	83.931	97.045	123.834	0	0	386.118
2019	79.315	0	81.874	94.667	133.490	0	0	389.346
2020	62.321	0	79.771	107.192	143.289	0	0	392.573

Table 65: policy scenario 3a for Slovenia

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	90.946	0	93.879	108.548	75.263	0	0	368.636
2014	88.837	0	91.703	106.031	83.972	0	2.666	373.208
2015	87.021	0	89.828	103.864	92.541	0	3.182	376.436
2016	85.161	0	87.908	101.644	101.243	0	3.706	379.663
2017	83.257	0	85.943	99.371	110.081	0	4.239	382.891
2018	81.308	0	83.931	97.045	119.053	0	4.781	386.118
2019	79.315	0	81.874	94.667	128.160	0	5.330	389.346
2020	62.321	0	79.771	107.192	137.401	0	5.889	392.573

Table 66: Slovenia policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-9	-10	-11	30	0	0	0
Total GHG implications including organic carbon for the year 2020		0	-2	-1	-1	3	0	0	-1
Total GHG implications excluding organic carbon for the year 2020		0	-1	0	0	1	0	0	-1
<b>Costs all in € thousands (thousand separator as '.')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 74	-€ 289	-€ 164	€ 400	€ 0	€ 0	-€ 126
	Total Costs NPV (2013-2020)	€ 0	-€ 360	-€ 1.181	-€ 593	€ 1.636	€ 0	€ 0	-€ 498
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 38	-€ 173	-€ 111	€ 291	€ 0	€ 0	-€ 31
	Total Costs NPV (2013-2020)	€ 0	-€ 186	-€ 707	-€ 401	€ 1.190	€ 0	€ 0	-€ 104
Environmental	Financial Costs NPV (2020)	€ 0	-€ 96	-€ 44	-€ 59	€ 21	€ 0	€ 0	-€ 177
	Total Costs NPV (2013-2020)	€ 0	-€ 468	-€ 178	-€ 214	€ 87	€ 0	€ 0	-€ 772
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 134	-€ 216	-€ 170	€ 312	€ 0	€ 0	-€ 208
	Total Costs NPV (2013-2020)	€ 0	-€ 654	-€ 885	-€ 615	€ 1.276	€ 0	€ 0	-€ 877

Table 67: Slovenia policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-9	-10	-11	0	0	30	0
Total GHG implications including organic carbon for the year 2020		0	-2	-1	-1	0	0	2	-2
Total GHG implications excluding organic carbon for the year 2020		0	-1	0	0	0	0	0	-2
<b>Costs all in € thousands (thousand separator as '.')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 74	-€ 289	-€ 164	€ 0	€ 0	€ 613	€ 87
	Total Costs NPV (2013-2020)	€ 0	-€ 360	-€ 1,181	-€ 593	€ 0	€ 0	€ 2,505	€ 371
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 38	-€ 173	-€ 111	€ 0	€ 0	€ 479	€ 157
	Total Costs NPV (2013-2020)	€ 0	-€ 186	-€ 707	-€ 401	€ 0	€ 0	€ 1,958	€ 664
Environmental	Financial Costs NPV (2020)	€ 0	-€ 96	-€ 44	-€ 59	€ 0	€ 0	-€ 41	-€ 239
	Total Costs NPV (2013-2020)	€ 0	-€ 468	-€ 178	-€ 214	€ 0	€ 0	-€ 169	-€ 1,028
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 134	-€ 216	-€ 170	€ 0	€ 0	€ 438	-€ 82
	Total Costs NPV (2013-2020)	€ 0	-€ 654	-€ 885	-€ 615	€ 0	€ 0	€ 1,789	-€ 364

## C.2.27 Spain

**Ratio food and garden waste:** we assume 56% food and 44% garden waste. according to paragraph C.1.2.3: A = 44

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods. we assume that recycling of food waste using IVC is preferred. according to paragraph C.1.2.4.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	8%	17%	10.7%	8%	17%	11.3%
2014	9%	19%	11.8%	10%	26%	15.9%
2015	10%	21%	12.9%	11%	34%	19.4%
<b>2016</b>	11%	23%	14.3%	13%	41%	22.8%
2017	12%	25%	15.6%	14%	48%	26.2%
2018	13%	26%	17.0%	15%	55%	29.6%
2019	13%	28%	18.4%	16%	63%	33.1%
2020	14%	30%	19.8%	18%	70%	<b>36.5%</b>

Table 68: policy scenario 3 for Spain

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	3.901.160	0	1.455.124	3.570.856	712.914	79.213	339.483	10.058.748
2014	3.682.230	0	1.420.167	3.401.598	1.156.023	101.152	354.032	10.115.202
2015	3.518.964	0	1.402.664	3.281.086	1.479.431	125.874	363.637	10.171.656
2016	3.356.464	0	1.382.073	3.159.025	1.808.914	153.422	368.212	10.228.109
2017	3.193.677	0	1.359.446	3.035.415	2.144.515	183.837	367.673	10.284.563
2018	3.026.668	0	1.338.719	2.910.258	2.468.179	217.161	380.032	10.341.017
2019	2.860.099	0	1.315.228	2.783.551	2.795.248	253.438	389.905	10.397.470
2020	2.728.317	0	1.254.628	2.655.297	3.104.815	292.710	418.157	10.453.924

Table 69: policy scenario 3a for Spain

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	3.901.160	0	1.455.124	3.570.856	712.914	79.213	339.483	10.058.748
2014	3.682.230	0	1.420.167	3.401.598	1.074.523	101.152	435.532	10.115.202
2015	3.518.964	0	1.402.664	3.281.086	1.375.535	125.874	467.533	10.171.656
2016	3.356.464	0	1.382.073	3.159.025	1.682.378	153.422	494.748	10.228.109
2017	3.193.677	0	1.359.446	3.035.415	1.995.095	183.837	517.093	10.284.563
2018	3.026.668	0	1.338.719	2.910.258	2.295.632	217.161	552.580	10.341.017
2019	2.860.099	0	1.315.228	2.783.551	2.599.330	253.438	585.823	10.397.470
2020	2.728.317	0	1.254.628	2.655.297	2.885.283	292.710	637.689	10.453.924

Table 70: Spain policy Scenario 3 summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-3.008	-1.317	-2.883	7.208	0	0	0
Total GHG implications including organic carbon for the year 2020		0	-1.563	-227	-699	817	0	0	-1.671
Total GHG implications excluding organic carbon for the year 2020		0	-1.170	59	-139	137	0	0	-1.113
<b>Costs all in € thousands (thousand separator as ',')</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 11.304	-€ 44.287	-€ 45.116	€ 85.306	€ 0	€ 0	-€ 15.401
	Total Costs NPV (2013-2020)	€ 0	-€ 38.206	-€ 141.952	-€ 150.004	€ 286.383	€ 0	€ 0	-€ 43.779
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 16.944	-€ 28.030	-€ 35.074	€ 63.973	€ 0	€ 0	-€ 16.075
	Total Costs NPV (2013-2020)	€ 0	-€ 57.268	-€ 89.844	-€ 116.615	€ 214.641	€ 0	€ 0	-€ 49.086
Environmental	Financial Costs NPV (2020)	€ 0	-€ 58.738	-€ 6.846	-€ 19.706	€ 4.984	€ 0	€ 0	-€ 80.306
	Total Costs NPV (2013-2020)	€ 0	-€ 198.522	-€ 21.943	-€ 65.521	€ 16.684	€ 0	€ 0	-€ 269.302
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 75.682	-€ 34.876	-€ 54.780	€ 68.957	€ 0	€ 0	-€ 96.381
	Total Costs NPV (2013-2020)	€ 0	-€ 255.790	-€ 111.787	-€ 182.136	€ 231.325	€ 0	€ 0	-€ 318.388

Table 71: Spain policy Scenario 3a summary results

Incremental changes from baseline		Waste prevention	Landfill	Incineration	MBT	Composting	Backyard composting	Anaerobic digestion	Total
Total Waste Movement (2013-2020), thousand tonnes		0	-3.008	-1.317	-2.883	6.159	0	1.049	0
Total GHG implications including organic carbon for the year 2020		0	-1.563	-227	-699	654	0	79	-1.755
Total GHG implications excluding organic carbon for the year 2020		0	-1.170	59	-139	10	0	-18	-1.259
<b>Costs all in € thousands (thousand separator as '.)</b>									
Financial (Private)	Financial Costs NPV (2020)	€ 0	-€ 11.304	-€ 44.287	-€ 45.116	€ 69.838	€ 0	€ 20.898	-€ 9.972
	Total Costs NPV (2013-2020)	€ 0	-€ 38.206	-€ 141.952	-€ 150.004	€ 226.890	€ 0	€ 80.375	-€ 22.897
Financial (Social)	Financial Costs NPV (2020)	€ 0	-€ 16.944	-€ 28.030	-€ 35.074	€ 52.583	€ 0	€ 15.947	-€ 11.519
	Total Costs NPV (2013-2020)	€ 0	-€ 57.268	-€ 89.844	-€ 116.615	€ 170.832	€ 0	€ 61.333	-€ 31.562
Environmental	Financial Costs NPV (2020)	€ 0	-€ 58.738	-€ 6.846	-€ 19.706	€ 4.159	€ 0	-€ 675	-€ 81.806
	Total Costs NPV (2013-2020)	€ 0	-€ 198.522	-€ 21.943	-€ 65.521	€ 13.512	€ 0	-€ 2.595	-€ 275.069
Net Cost to Society	Financial Costs NPV (2020)	€ 0	-€ 75.682	-€ 34.876	-€ 54.780	€ 56.742	€ 0	€ 15.272	-€ 93.324
	Total Costs NPV (2013-2020)	€ 0	-€ 255.790	-€ 111.787	-€ 182.136	€ 184.344	€ 0	€ 58.738	-€ 306.631

C.2.28

Sweden

**Ratio food and garden waste:** we assume 61% food and 39% garden waste. according to paragraph C.1.2.3: A = 39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods. we assume that recycling of food waste using AD (vehicle) is preferred according to paragraph C.1.2.4.

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	23%	62%	38.0%	23%	62%	38.0%
2014	23%	64%	39.0%	23%	64%	39.0%
2015	24%	65%	40.0%	24%	65%	40.0%
<b>2016</b>	24%	65%	40.0%	24%	65%	40.0%
2017	24%	65%	40.0%	24%	65%	40.0%
2018	24%	65%	40.0%	24%	65%	40.0%

2019	24%	65%	40.0%	24%	65%	40.0%
2020	24%	65%	40.0%	24%	65%	<b>40.0%</b>

Table 72: policy scenario 3 for Sweden

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	0	0	1.182.514	24.133	516.458	118.329	104.771	1.946.205
2014	0	0	1.168.313	23.843	525.917	121.952	114.330	1.954.355
2015	0	0	1.153.952	23.550	535.109	125.600	124.292	1.962.504
2016	0	0	1.158.744	23.648	530.763	126.122	131.377	1.970.653
2017	0	0	1.163.536	23.746	526.361	126.643	138.516	1.978.802
2018	0	0	1.168.327	23.843	521.906	127.165	145.710	1.986.951
2019	0	0	1.173.119	23.941	517.396	127.686	152.958	1.995.100
2020	0	0	1.177.910	24.039	512.832	128.208	160.260	2.003.249

In this case, scenario 3 is identical to scenario 3a because Sweden already reaches the targets in the baseline.

### C.2.29 United Kingdom

**Ratio food and garden waste:** we assume 61% food and 39% garden waste, according to paragraph C.1.2.3: A =39

**Choice of composting or AD for food waste:** Based upon the cost assessment of treatment methods, we assume that recycling of food waste using IVC is preferred, according to paragraph C.1.2.4

The following table gives progression to the recycling targets:

	Baseline			Target		
	Food	Garden	Overall	Food	Garden	Overall
2013	21%	71%	40.4%	21%	71%	40.4%
2014	23%	73%	42.5%	23%	73%	42.5%
2015	26%	74%	44.6%	26%	74%	44.6%
<b>2016</b>	<b>29%</b>	<b>75%</b>	<b>46.7%</b>	<b>29%</b>	<b>75%</b>	<b>46.7%</b>
2017	31%	76%	48.8%	31%	76%	48.8%

2018	34%	78%	50.8%	34%	78%	50.8%
2019	36%	79%	52.9%	36%	79%	52.9%
2020	39%	80%	55.0%	39%	80%	<b>55.0%</b>

Table 73: policy scenario 3 for United Kingdom

Year	landfill	incineration D10	incineration R01	MBT	composting	backyard composting	anaerobic digestion	total biowaste collected
2013	4.895.823	0	1.682.939	1.070.961	4.047.399	0	1.141.574	12.838.697
2014	4.369.667	0	1.851.554	1.184.994	4.215.102	0	1.259.057	12.880.374
2015	3.866.924	0	2.005.072	1.288.975	4.378.422	0	1.382.659	12.922.051
2016	3.387.854	0	2.143.336	1.382.798	4.537.305	0	1.512.435	12.963.728
2017	2.999.371	0	2.199.539	1.466.359	4.691.699	0	1.648.435	13.005.404
2018	2.630.074	0	2.245.185	1.539.556	4.907.877	0	1.724.389	13.047.081
2019	2.280.171	0	2.280.171	1.602.282	5.125.339	0	1.800.795	13.088.758
2020	1.949.870	0	2.304.391	1.654.435	5.344.087	0	1.877.652	13.130.435

In this case, scenario 3 is identical to scenario 3a because the United Kingdom already reaches the targets in the baseline.

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