

# Supplementary Materials

## Appendix A

Table A.1: Annual electricity consumption per household in the UK based on household type [1].

Household type	Annual electricity consumption per household (kWh)
Terraced house	3083 – 4399
Semi-detached house	4009
Detached house	4256
Bungalow	3789
Flat	3510
Pensioner household	3427 – 3853
Household with children	3672
Multiple person household with no dependent children	4232
<b>All households</b>	<b>3567</b>

Table A.2: Estimation of the UK household waste streams based on England data [2].

Category	Waste flow (million tonnes/year), England (2016)	Composition (%)	Waste flow (million tonnes/year), UK (2016) <sup>(ii)</sup>
Residual waste	12.5	55.0	15.1
Dry recycling	6.0	26.5	7.3
Other organics <sup>(i)</sup>	0.4	1.7	0.5
Separately collected food waste <sup>(i)</sup>	3.8	16.8	4.6
<b>Total</b>	<b>22.8</b>	<b>100.0</b>	<b>27.4</b>

Note:

<sup>(i)</sup> Other organics and separately collected food waste have been grouped into organic waste stream in the present study.

<sup>(ii)</sup> The waste flow for each category of waste has been calculated based on the assumption that the same composition of waste stream is generated across all regions in the UK.

Table A.3: Composition of residual waste in England [3].

Category	Composition (%) <sup>(i)</sup>	Normalised composition (%)	Waste flow (million tonnes/year), England (2016) <sup>(ii)</sup>	Waste flow (million tonnes/year), UK (2016) <sup>(ii)</sup>
Food waste	32.0	32.65	4.1	4.9
Paper and card	18.0	18.37	2.3	2.8
Plastics	14.0	14.29	1.8	2.2
Other materials <sup>(iii)</sup>	11.0	11.22	1.4	1.7
Garden waste	6.0	6.12	0.8	0.9
Glass	5.0	5.10	0.6	0.8
Sanitary	5.0	5.10	0.6	0.8
Textiles	4.0	4.08	0.5	0.6
Metals	3.0	3.06	0.4	0.5
<b>Total</b>	<b>98.0</b>	<b>100.0</b>	<b>12.5</b>	<b>15.1</b>

Note:

<sup>(i)</sup> The composition of residual waste is based on average England data between 2005-2009, obtained from VALORGAS report [3]. It has been assumed that the composition has not been changed over time.

<sup>(ii)</sup> These values have been calculated based on 12.5 million tonnes/year of residual waste in England and 15.1 million tonnes/year in the UK [2], respectively, assuming that the compositions of residual waste are the same across all regions in the UK.

<sup>(iii)</sup> Other materials include furniture, wood and mattresses.

Table A.4: Composition of dry recycling in England [2].

Category	Composition (%) <sup>(i)</sup>	Normalised composition (%)	Waste flow (million tonnes/year), England (2016) <sup>(ii)</sup>	Waste flow (million tonnes/year), UK (2016) <sup>(ii)</sup>
Paper and card	38.8	38.76	2.3	2.8
Glass	19.6	19.58	1.2	1.4
Other materials <sup>(iii)</sup>	15.0	14.99	0.9	1.1
WEEE and other scrap metals	10.3	10.29	0.6	0.7
Plastics	7.9	7.89	0.5	0.6
Metals	4.0	4.00	0.2	0.3
Textiles	2.0	2.00	0.1	0.1
IBA metal	2.5	2.50	0.2	0.2
<b>Total</b>	<b>100.1</b>	<b>100.0</b>	<b>6.0</b>	<b>7.3</b>

Note:

<sup>(i)</sup> The composition of dry recycling obtained from DEFRA's Digest of waste and resource statistics 2018 [2]. It has been assumed that the composition has not been changed over time.

<sup>(ii)</sup> These values have been calculated based on 6.0 million tonnes/year of dry recycling in England and 7.3 million tonnes/year in the UK [2], respectively, assuming that the compositions of dry recycling are the same across all regions in the UK.

<sup>(iii)</sup> Other materials include furniture, wood and mattresses.

Table A.5: LCIA based on 1 unit of electricity and 1 unit of household waste.

Impact category	Unit	Energy		Waste			
		Functional unit: Production of 1 kWh electricity		Functional unit: Treatment of 1 kg household waste			
		Grid electricity	Solar PV (3 kWp multi-Si)	Residual waste from household	Dry recycling from household	Source-separated food waste from household	Waste transport
Abiotic depletion potential (ADP), element	kg Sb eq.	5.54772E-07	3.26567E-06	2.76266E-07	-4.79026E-06	5.69117E-08	7.99725E-10
Abiotic depletion potential (ADP), fossil fuels	MJ	9.322871663	0.867014826	0.338843079	-48.22936	0.605580032	0.01842777
Global warming potential (GWP), 100 years	kg CO <sub>2</sub> eq.	0.832082452	0.081386917	0.553516325	-5.020161908	0.113015756	0.001293072
Ozone depletion potential (ODP)	kg CFC-11 eq.	2.91622E-08	1.02303E-08	3.64353E-09	-1.63415E-07	4.82006E-09	2.3413E-10
Human toxicity potential (HTP)	kg 1,4-DB eq.	0.223209596	0.109194315	4.682219885	-4.146463436	0.028948136	0.00021948
Freshwater aquatic ecotoxicity potential (FAEP)	kg 1,4-DB eq.	0.365774176	0.159616029	29.93667985	-2.494440803	0.118787462	4.02372E-05
Marine aquatic ecotoxicity potential (MAEP)	kg 1,4-DB eq.	1063.895312	349.2875469	169228.858	-38019.87619	83.02274329	0.146009316
Terrestrial ecotoxicity potential (TEP)	kg 1,4-DB eq.	0.003825408	0.000272394	0.000865754	-0.009602869	0.000403621	5.19329E-07
Photochemical oxidant creation potential (POCP)	kg C <sub>2</sub> H <sub>4</sub> eq.	0.000166419	2.79992E-05	4.49981E-05	-0.001686746	8.27914E-05	2.4103E-07
Acidification potential (AP)	kg SO <sub>2</sub> eq.	0.003945734	0.000506653	0.000210598	-0.028201339	0.000388508	6.11651E-06
Eutrophication potential (EP)	kg PO <sub>4</sub> <sup>-</sup> eq.	0.000986803	0.00025676	0.00096295	-0.006645861	0.000876799	1.29545E-06

## Appendix B

### Base Case

Description:

Source of energy supply in household

Grid electricity

Waste management in household

45% recycling rate. For residual waste, 29.1% to landfill and 70.9% to incineration.

Basis:

Total electricity consumption per household per year

3100 kWh

Total waste generation per household per year

1007 kg

Household recycling rate

45 %

Waste composition (by weight)

Residual waste

55 %

Dry recycling

26.5 %

Food waste (separately collected)

18.5 %

Distance of waste transport

50 km

Impact category	Unit	Energy		Waste				Sub-total	Total
		3100 kWh electricity	Sub-total	1007 kg household waste					
		Grid electricity		Residual waste	Dry recycling	Food waste	Waste transport		
ADP, element	kg Sb eq.	0.002	<b>0.002</b>	0.00015301	-0.00127831	1.06024E-05	4.02662E-05	<b>-0.001074427</b>	<b>0.001</b>
ADP, fossil fuels	MJ	28900.902	<b>28900.902</b>	187.6682393	-12870.2459	112.8165321	927.8382008	<b>-11641.92289</b>	<b>17258.979</b>
GWP, 100 years	kg CO <sub>2</sub> eq.	2579.456	<b>2579.456</b>	306.5650164	-1339.65531	21.05427035	65.10619196	<b>-946.9298272</b>	<b>1632.526</b>
ODP	kg CFC-11 eq.	0.00009	<b>0.000</b>	2.01797E-06	-4.3608E-05	8.97954E-07	1.17884E-05	<b>-2.89037E-05</b>	<b>0.000</b>
HTP	kg 1,4-DB eq.	691.950	<b>691.950</b>	2593.247483	-1106.5045	5.392892965	11.05079477	<b>1503.186671</b>	<b>2195.136</b>
FAEP	kg 1,4-DB eq.	1133.900	<b>1133.900</b>	16580.43014	-665.654001	22.12951016	2.025945312	<b>15938.93159</b>	<b>17072.832</b>
MAEP	kg 1,4-DB eq.	3298075.466	<b>3298075.466</b>	93727403.01	-10145794.1	15466.72196	7351.569067	<b>83604427.24</b>	<b>86902502.705</b>
TEP	kg 1,4-DB eq.	11.859	<b>11.859</b>	0.479497978	-2.56257367	0.075192523	0.026148232	<b>-1.981734937</b>	<b>9.877</b>
POCP	kg C <sub>2</sub> H <sub>4</sub> eq.	0.516	<b>0.516</b>	0.024922186	-0.45011658	0.015423626	0.012135842	<b>-0.397634922</b>	<b>0.118</b>
AP	kg SO <sub>2</sub> eq.	12.232	<b>12.232</b>	0.11663952	-7.52566838	0.072377053	0.307966165	<b>-7.028685646</b>	<b>5.203</b>

EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	3.059	<b>3.059</b>	0.533329861	-1.77348123	0.163343295	0.06522566	<b>-1.011582416</b>	<b>-0.216</b>
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## Scenario 1(a)

### Description:

Source of energy supply in household

Solar PV

Waste management in household

(a) 45% recycling rate. For residual waste, 29.1% to landfill and 70.9% to incineration.

### Basis:

Total electricity consumption per household per year 3100 kWh

Total waste generation per household per year 1007 kg

Household recycling rate 45 %

### Waste composition (by weight)

Residual waste 55.0 %

Dry recycling 26.5 %

Food waste (separately collected) 18.5 %

Distance of waste transport 50 km

Impact category	Unit	Energy		Waste				Sub-total	Total
		3100 kWh electricity	Sub-total	1007 kg household waste					
		Solar PV (3 kWp multi-Si)		Residual waste	Dry recycling	Food waste	Waste transport		
ADP, element	kg Sb eq.	0.010	<b>0.010</b>	0.00015301	-0.00127831	1.06024E-05	4.02662E-05	<b>-0.001074427</b>	<b>0.009</b>
ADP, fossil fuels	MJ	2687.746	<b>2687.746</b>	187.6682393	-12870.2459	112.8165321	927.8382008	<b>-11641.92289</b>	<b>-8954.177</b>
GWP, 100 years	kg CO <sub>2</sub> eq.	252.299	<b>252.299</b>	306.5650164	-1339.65531	21.05427035	65.10619196	<b>-946.9298272</b>	<b>-694.630</b>
ODP	kg CFC-11 eq.	0.00003	<b>0.000</b>	2.01797E-06	-4.3608E-05	8.97954E-07	1.17884E-05	<b>-2.89037E-05</b>	<b>0.000</b>
HTP	kg 1,4-DB eq.	338.502	<b>338.502</b>	2593.247483	-1106.5045	5.392892965	11.05079477	<b>1503.186671</b>	<b>1841.689</b>
FAEP	kg 1,4-DB eq.	494.810	<b>494.810</b>	16580.43014	-665.654001	22.12951016	2.025945312	<b>15938.93159</b>	<b>16433.741</b>
MAEP	kg 1,4-DB eq.	1082791.395	<b>1082791.395</b>	93727403.01	-10145794.1	15466.72196	7351.569067	<b>83604427.24</b>	<b>84687218.634</b>
TEP	kg 1,4-DB eq.	0.844	<b>0.844</b>	0.479497978	-2.56257367	0.075192523	0.026148232	<b>-1.981734937</b>	<b>-1.137</b>
POCP	kg C <sub>2</sub> H <sub>4</sub> eq.	0.087	<b>0.087</b>	0.024922186	-0.45011658	0.015423626	0.012135842	<b>-0.397634922</b>	<b>-0.311</b>
AP	kg SO <sub>2</sub> eq.	1.571	<b>1.571</b>	0.11663952	-7.52566838	0.072377053	0.307966165	<b>-7.028685646</b>	<b>-5.458</b>

EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	0.796	<b>0.796</b>	0.533329861	-1.77348123	0.163343295	0.06522566	<b>-1.011582416</b>	<b>-0.216</b>
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### Scenario 1(b)

Description:

Source of energy supply in household

Grid electricity

Waste management in household

(b) 60% recycling rate. For residual waste, 29.1% to landfill and 70.9% to incineration.

Basis:

Total electricity consumption per household per year

3100 kWh

Total waste generation per household per year

1007 kg

Household recycling rate

60 %

Waste composition (by weight)

Residual waste

40.0 %

Dry recycling

34.0 %

Food waste (separately collected)

26.0 %

Distance of waste transport

50 km

Impact category	Unit	Energy		Waste				Sub-total	Total
		3100 kWh electricity	Sub-total	1007 kg household waste					
		Grid electricity		Residual waste	Dry recycling	Food waste	Waste transport		
ADP, element	kg Sb eq.	0.002	<b>0.002</b>	0.00011128	-0.00164202	1.48776E-05	4.02662E-05	<b>-0.001475601</b>	<b>0.000</b>
ADP, fossil fuels	MJ	28900.902	<b>28900.902</b>	136.4859922	-16532.2452	158.3084068	927.8382008	<b>-15309.6126</b>	<b>13591.290</b>
GWP, 100 years	kg CO <sub>2</sub> eq.	2579.456	<b>2579.456</b>	222.9563755	-1720.83037	29.54414513	65.10619196	<b>-1403.223661</b>	<b>1176.232</b>
ODP	kg CFC-11 eq.	0.000	<b>0.000</b>	1.46761E-06	-5.6016E-05	1.26004E-06	1.17884E-05	<b>-4.14998E-05</b>	<b>0.000</b>
HTP	kg 1,4-DB eq.	691.950	<b>691.950</b>	1885.99817	-1421.34066	7.567510521	11.05079477	<b>483.2758179</b>	<b>1175.226</b>
FAEP	kg 1,4-DB eq.	1133.900	<b>1133.900</b>	12058.49464	-855.053996	31.05296212	2.025945312	<b>11236.51956</b>	<b>12370.419</b>
MAEP	kg 1,4-DB eq.	3298075.466	<b>3298075.466</b>	68165384.01	-13032599.1	21703.48678	7351.569067	<b>55161839.92</b>	<b>58459915.387</b>
TEP	kg 1,4-DB eq.	11.859	<b>11.859</b>	0.348725802	-3.29170839	0.10551298	0.026148232	<b>-2.811321373</b>	<b>9.047</b>
POCP	kg C <sub>2</sub> H <sub>4</sub> eq.	0.516	<b>0.516</b>	0.018125226	-0.57818923	0.021643013	0.012135842	<b>-0.526285153</b>	<b>-0.010</b>
AP	kg SO <sub>2</sub> eq.	12.232	<b>12.232</b>	0.084828742	-9.66696335	0.101562207	0.307966165	<b>-9.172606234</b>	<b>3.059</b>
EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	3.059	<b>3.059</b>	0.387876263	-2.27809374	0.229209464	0.06522566	<b>-1.595782358</b>	<b>1.463</b>

## Scenario 1(c)

### Description:

Source of energy supply in household

Solar PV

Waste management in household

(c) 60% recycling rate. For residual waste, 29.1% to landfill and 70.9% to incineration.

### Basis:

Total electricity consumption per household per year

3100 kWh

Total waste generation per household per year

1007 kg

Household recycling rate

60 %

### Waste composition (by weight)

Residual waste

40.0 %

Dry recycling

34.0 %

Food waste (separately collected)

26.0 %

Distance of waste transport

50 km

Impact category	Unit	Energy		Waste				Sub-total	Total
		3100 kWh electricity	Sub-total	1007 kg household waste					
		Solar PV (3 kWp multi-Si)		Residual waste	Dry recycling	Food waste	Waste transport		
ADP, element	kg Sb eq.	0.010	<b>0.010</b>	0.00011128	-0.00164202	1.48776E-05	4.02662E-05	<b>-0.001475601</b>	<b>0.009</b>
ADP, fossil fuels	MJ	2687.746	<b>2687.746</b>	136.4859922	-16532.2452	158.3084068	927.8382008	<b>-15309.6126</b>	<b>-12621.867</b>
GWP, 100 years	kg CO <sub>2</sub> eq.	252.299	<b>252.299</b>	222.9563755	-1720.83037	29.54414513	65.10619196	<b>-1403.223661</b>	<b>-1150.924</b>
ODP	kg CFC-11 eq.	0.00003	<b>0.000</b>	1.46761E-06	-5.6016E-05	1.26004E-06	1.17884E-05	<b>-4.14998E-05</b>	<b>0.000</b>
HTP	kg 1,4-DB eq.	338.502	<b>338.502</b>	1885.99817	-1421.34066	7.567510521	11.05079477	<b>483.2758179</b>	<b>821.778</b>
FAEP	kg 1,4-DB eq.	494.810	<b>494.810</b>	12058.49464	-855.053996	31.05296212	2.025945312	<b>11236.51956</b>	<b>11731.329</b>
MAEP	kg 1,4-DB eq.	1082791.395	<b>1082791.395</b>	68165384.01	-13032599.1	21703.48678	7351.569067	<b>55161839.92</b>	<b>56244631.316</b>
TEP	kg 1,4-DB eq.	0.844	<b>0.844</b>	0.348725802	-3.29170839	0.10551298	0.026148232	<b>-2.811321373</b>	<b>-1.967</b>
POCP	kg C <sub>2</sub> H <sub>4</sub> eq.	0.087	<b>0.087</b>	0.018125226	-0.57818923	0.021643013	0.012135842	<b>-0.526285153</b>	<b>-0.439</b>
AP	kg SO <sub>2</sub> eq.	1.571	<b>1.571</b>	0.084828742	-9.66696335	0.101562207	0.307966165	<b>-9.172606234</b>	<b>-7.602</b>
EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	0.796	<b>0.796</b>	0.387876263	-2.27809374	0.229209464	0.06522566	<b>-1.595782358</b>	<b>-0.800</b>

## Scenario 2(a)

### Description:

Source of energy supply in household

Grid electricity and energy from waste

Waste management in household

(a) 45% recycling rate. All residual waste is sent to EfW.

### Basis:

Total electricity consumption per household per year

3100 kWh

Total waste generation per household per year

1007 kg

Household recycling rate

45 %

### Waste composition (by weight)

Residual waste

55 %

Dry recycling

26.5 %

Food waste (separately collected)

18.5 %

Distance of waste transport

50 km

Impact category	Unit	Energy		Waste				Sub-total	Total
		3100 kWh electricity	Sub-total	1007 kg household waste					
		Grid electricity		Residual waste	Dry recycling	Food waste	Waste transport		
ADP, element	kg Sb eq.	0.002	<b>0.002</b>	-4.72E-04	-0.00127831	1.06024E-05	4.02662E-05	<b>-0.001699862</b>	<b>0.000</b>
ADP, fossil fuels	MJ	26582.503	<b>26582.503</b>	-2513.107085	-12870.2459	112.8165321	927.8382008	<b>-14342.69821</b>	<b>12239.805</b>
GWP, 100 years	kg CO <sub>2</sub> eq.	2372.534	<b>2372.534</b>	107.924768	-1339.65531	21.05427035	65.10619196	<b>-1145.570076</b>	<b>1226.964</b>
ODP	kg CFC-11 eq.	0.000	<b>0.000</b>	-9.16543E-05	-4.3608E-05	8.97954E-07	1.17884E-05	<b>-0.000122576</b>	<b>0.000</b>
HTP	kg 1,4-DB eq.	636.442	<b>636.442</b>	3531.814473	-1106.5045	5.392892965	11.05079477	<b>2441.753661</b>	<b>3078.196</b>
FAEP	kg 1,4-DB eq.	1042.940	<b>1042.940</b>	22886.87941	-665.654001	22.12951016	2.025945312	<b>22245.38086</b>	<b>23288.321</b>
MAEP	kg 1,4-DB eq.	3033507.416	<b>3033507.416</b>	131763331.1	-10145794.1	15466.72196	7351.569067	<b>121640355.4</b>	<b>124673862.783</b>
TEP	kg 1,4-DB eq.	10.907	<b>10.907</b>	-1.291021577	-2.56257367	0.075192523	0.026148232	<b>-3.752254492</b>	<b>7.155</b>
POCP	kg C <sub>2</sub> H <sub>4</sub> eq.	0.475	<b>0.475</b>	-0.06197747	-0.45011658	0.015423626	0.012135842	<b>-0.484534578</b>	<b>-0.010</b>
AP	kg SO <sub>2</sub> eq.	11.251	<b>11.251</b>	-1.263823021	-7.52566838	0.072377053	0.307966165	<b>-8.409148187</b>	<b>2.841</b>
EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	2.814	<b>2.814</b>	-0.010299647	-1.77348123	0.163343295	0.06522566	<b>-1.555211924</b>	<b>1.258</b>



## Scenario 2(b)

### Description:

Source of energy supply in household

Grid electricity and energy from waste

Waste management in household

(b) 60% recycling rate. All residual waste is sent to EfW.

### Basis:

Total electricity consumption per household per year

3100 kWh

Total waste generation per household per year

1007 kg

Household recycling rate

60 %

### Waste composition (by weight)

Residual waste

40.0 %

Dry recycling

34.0 %

Food waste (separately collected)

26.0 %

Distance of waste transport

50 km

Impact category	Unit	Energy		Waste				Sub-total	Total
		3100 kWh electricity	Sub-total	1007 kg household waste					
		Grid electricity		Residual waste	Dry recycling	Food waste	Waste transport		
ADP, element	kg Sb eq.	0.002	<b>0.002</b>	-0.000343582	-0.00164009	1.49006E-05	4.02662E-05	<b>-0.001928506</b>	<b>0.000</b>
ADP, fossil fuels	MJ	27214.794	<b>27214.794</b>	-1827.714244	-16512.7683	158.552964	927.8382008	<b>-17254.09135</b>	<b>9960.702</b>
GWP, 100 years	kg CO <sub>2</sub> eq.	2428.967	<b>2428.967</b>	78.49074038	-1718.80303	29.58978536	65.10619196	<b>-1545.616316</b>	<b>883.351</b>
ODP	kg CFC-11 eq.	0.000	<b>0.000</b>	-6.66577E-05	-5.595E-05	1.26199E-06	1.17884E-05	<b>-0.000109557</b>	<b>0.000</b>
HTP	kg 1,4-DB eq.	651.581	<b>651.581</b>	2568.592344	-1419.66615	7.579200924	11.05079477	<b>1167.556189</b>	<b>1819.137</b>
FAEP	kg 1,4-DB eq.	1067.747	<b>1067.747</b>	16645.0032	-854.046642	31.1009332	2.025945312	<b>15824.08344</b>	<b>16891.830</b>
MAEP	kg 1,4-DB eq.	3105662.339	<b>3105662.339</b>	95827877.19	-13017245.2	21737.01465	7351.569067	<b>82839720.56</b>	<b>85945382.904</b>
TEP	kg 1,4-DB eq.	11.167	<b>11.167</b>	-0.938924783	-3.28783037	0.105675978	0.026148232	<b>-4.094930942</b>	<b>7.072</b>
POCP	kg C <sub>2</sub> H <sub>4</sub> eq.	0.486	<b>0.486</b>	-0.045074524	-0.57750806	0.021676448	0.012135842	<b>-0.588770294</b>	<b>-0.103</b>
AP	kg SO <sub>2</sub> eq.	11.518	<b>11.518</b>	-0.919144015	-9.65557453	0.101719102	0.307966165	<b>-10.16503328</b>	<b>1.353</b>
EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	2.881	<b>2.881</b>	-0.007490652	-2.27540988	0.22956355	0.06522566	<b>-1.988111325</b>	<b>0.893</b>

## Scenario 2(c)

### Description:

Source of energy supply in household

Solar PV and energy from waste

Waste management in household

(c) 45% recycling rate. All residual waste is sent to EfW.

### Basis:

Total electricity consumption per household per year

3100 kWh

Total waste generation per household per year

1007 kg

Household recycling rate

45 %

### Waste composition (by weight)

Residual waste

55 %

Dry recycling

26.5 %

Food waste (separately collected)

18.5 %

Distance of waste transport

50 km

Impact category	Unit	Energy		Waste				Total	
		3100 kWh electricity	Sub-total	1007 kg household waste			Sub-total		
		Solar PV (3 kWp multi-Si)		Residual waste	Dry recycling	Food waste			Waste transport
ADP, element	kg Sb eq.	0.009	<b>0.009</b>	-0.000472425	-0.00127831	1.06024E-05	4.02662E-05	<b>-0.001699862</b>	<b>0.008</b>
ADP, fossil fuels	MJ	2472.138	<b>2472.138</b>	-2513.107085	-12870.2459	112.8165321	927.8382008	<b>-14342.69821</b>	<b>-11870.560</b>
GWP, 100 years	kg CO <sub>2</sub> eq.	232.060	<b>232.060</b>	107.924768	-1339.65531	21.05427035	65.10619196	<b>-1145.570076</b>	<b>-913.510</b>
ODP	kg CFC-11 eq.	0.000	<b>0.000</b>	-9.16543E-05	-4.3608E-05	8.97954E-07	1.17884E-05	<b>-0.000122576</b>	<b>0.000</b>
HTP	kg 1,4-DB eq.	311.348	<b>311.348</b>	3531.814473	-1106.5045	5.392892965	11.05079477	<b>2441.753661</b>	<b>2753.102</b>
FAEP	kg 1,4-DB eq.	455.117	<b>455.117</b>	22886.87941	-665.654001	22.12951016	2.025945312	<b>22245.38086</b>	<b>22700.497</b>
MAEP	kg 1,4-DB eq.	995931.040	<b>995931.040</b>	131763331.1	-10145794.1	15466.72196	7351.569067	<b>121640355.4</b>	<b>122636286.407</b>
TEP	kg 1,4-DB eq.	0.777	<b>0.777</b>	-1.291021577	-2.56257367	0.075192523	0.026148232	<b>-3.752254492</b>	<b>-2.976</b>
POCP	kg C <sub>2</sub> H <sub>4</sub> eq.	0.080	<b>0.080</b>	-0.06197747	-0.45011658	0.015423626	0.012135842	<b>-0.484534578</b>	<b>-0.405</b>
AP	kg SO <sub>2</sub> eq.	1.445	<b>1.445</b>	-1.263823021	-7.52566838	0.072377053	0.307966165	<b>-8.409148187</b>	<b>-6.965</b>
EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	0.732	<b>0.732</b>	-0.010299647	-1.77348123	0.163343295	0.06522566	<b>-1.555211924</b>	<b>-0.823</b>

## Scenario 2(d)

### Description:

Source of energy supply in household

Solar PV and energy from waste

Waste management in household

(d) 60% recycling rate. All residual waste is sent to EfW.

### Basis:

Total electricity consumption per household per year

3100 kWh

Total waste generation per household per year

1007 kg

Household recycling rate

60 %

### Waste composition (by weight)

Residual waste

40.0 %

Dry recycling

34.0 %

Food waste (separately collected)

26.0 %

Distance of waste transport

50 km

Impact category	Unit	Energy		Waste				Sub-total	Total
		3100 kWh electricity	Sub-total	1007 kg household waste					
		Solar PV (3 kWp multi-Si)		Residual waste	Dry recycling	Food waste	Waste transport		
ADP, element	kg Sb eq.	0.010	<b>0.010</b>	-0.000343582	-0.00164009	1.49006E-05	4.02662E-05	<b>-0.001928506</b>	<b>0.008</b>
ADP, fossil fuels	MJ	2530.940	<b>2530.940</b>	-1827.714244	-16512.7683	158.552964	927.8382008	<b>-17254.09135</b>	<b>-14723.151</b>
GWP, 100 years	kg CO <sub>2</sub> eq.	237.580	<b>237.580</b>	78.49074038	-1718.80303	29.58978536	65.10619196	<b>-1545.616316</b>	<b>-1308.036</b>
ODP	kg CFC-11 eq.	0.000	<b>0.000</b>	-6.66577E-05	-5.595E-05	1.26199E-06	1.17884E-05	<b>-0.000109557</b>	<b>0.000</b>
HTP	kg 1,4-DB eq.	318.754	<b>318.754</b>	2568.592344	-1419.66615	7.579200924	11.05079477	<b>1167.556189</b>	<b>1486.310</b>
FAEP	kg 1,4-DB eq.	465.942	<b>465.942</b>	16645.0032	-854.046642	31.1009332	2.025945312	<b>15824.08344</b>	<b>16290.025</b>
MAEP	kg 1,4-DB eq.	1019620.228	<b>1019620.228</b>	95827877.19	-13017245.2	21737.01465	7351.569067	<b>82839720.56</b>	<b>83859340.792</b>
TEP	kg 1,4-DB eq.	0.795	<b>0.795</b>	-0.938924783	-3.28783037	0.105675978	0.026148232	<b>-4.094930942</b>	<b>-3.300</b>
POCP	kg C <sub>2</sub> H <sub>4</sub> eq.	0.082	<b>0.082</b>	-0.045074524	-0.57750806	0.021676448	0.012135842	<b>-0.588770294</b>	<b>-0.507</b>
AP	kg SO <sub>2</sub> eq.	1.479	<b>1.479</b>	-0.919144015	-9.65557453	0.101719102	0.307966165	<b>-10.16503328</b>	<b>-8.686</b>
EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	0.750	<b>0.750</b>	-0.007490652	-2.27540988	0.22956355	0.06522566	<b>-1.988111325</b>	<b>-1.239</b>

### Scenario 3(a)

Description:

Source of energy supply in household

Grid electricity

Waste management in household

45% recycling rate. For residual waste, 29.1% to landfill and 70.9% to incineration.

Basis:

Total electricity consumption per household per year

2790 kWh

(10% less than base case value of 3100 kWh)

Total waste generation per household per year

1007 kg

Household recycling rate

45 %

Waste composition (by weight)

Residual waste

55 %

Dry recycling

26.5 %

Food waste (separately collected)

18.5 %

Distance of waste transport

50 km

Impact category	Unit	Energy		Waste				Sub-total	Total
		2790 kWh electricity	Sub-total	1007 kg household waste					
		Grid electricity		Residual waste	Dry recycling	Food waste	Waste transport		
ADP, element	kg Sb eq.	0.002	<b>0.002</b>	0.00015301	-0.00127831	1.06024E-05	4.02662E-05	<b>-0.001074427</b>	<b>0.000</b>
ADP, fossil fuels	MJ	26010.812	<b>26010.812</b>	187.6682393	-12870.2459	112.8165321	927.8382008	<b>-11641.92289</b>	<b>14368.889</b>
GWP, 100 years	kg CO <sub>2</sub> eq.	2321.510	<b>2321.510</b>	306.5650164	-1339.65531	21.05427035	65.10619196	<b>-946.9298272</b>	<b>1374.580</b>
ODP	kg CFC-11 eq.	0.00008	<b>0.000</b>	2.01797E-06	-4.3608E-05	8.97954E-07	1.17884E-05	<b>-2.89037E-05</b>	<b>0.000</b>
HTP	kg 1,4-DB eq.	622.755	<b>622.755</b>	2593.247483	-1106.5045	5.392892965	11.05079477	<b>1503.186671</b>	<b>2125.941</b>
FAEP	kg 1,4-DB eq.	1020.510	<b>1020.510</b>	16580.43014	-665.654001	22.12951016	2.025945312	<b>15938.93159</b>	<b>16959.442</b>
MAEP	kg 1,4-DB eq.	2968267.920	<b>2968267.920</b>	93727403.01	-10145794.1	15466.72196	7351.569067	<b>83604427.24</b>	<b>86572695.158</b>
TEP	kg 1,4-DB eq.	10.673	<b>10.673</b>	0.479497978	-2.56257367	0.075192523	0.026148232	<b>-1.981734937</b>	<b>8.691</b>
POCP	kg C <sub>2</sub> H <sub>4</sub> eq.	0.464	<b>0.464</b>	0.024922186	-0.45011658	0.015423626	0.012135842	<b>-0.397634922</b>	<b>0.067</b>
AP	kg SO <sub>2</sub> eq.	11.009	<b>11.009</b>	0.11663952	-7.52566838	0.072377053	0.307966165	<b>-7.028685646</b>	<b>3.980</b>
EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	2.753	<b>2.753</b>	0.533329861	-1.77348123	0.163343295	0.06522566	<b>-1.011582416</b>	<b>1.742</b>

## Scenario 3(b)

### Description:

Source of energy supply in household

Grid electricity

Waste management in household

45% recycling rate. For residual waste, 29.1% to landfill and 70.9% to incineration.

### Basis:

Total electricity consumption per household per year

3100 kWh

Total waste generation per household per year

906.3 kg

(10% less than base case value of 1007 kg)

Household recycling rate

45 %

### Waste composition (by weight)

Residual waste

55 %

Dry recycling

26.5 %

Food waste (separately collected)

18.5 %

Distance of waste transport

50 km

Impact category	Unit	Energy		Waste				Sub-total	Total
		3100 kWh electricity	Sub-total	906.3 kg household waste					
		Grid electricity		Residual waste	Dry recycling	Food waste	Waste transport		
ADP, element	kg Sb eq.	0.002	<b>0.002</b>	0.000137709	-0.00115048	9.54213E-06	3.62395E-05	<b>-0.000966985</b>	<b>0.001</b>
ADP, fossil fuels	MJ	28900.902	<b>28900.902</b>	168.9014154	-11583.2213	101.5348789	835.0543808	<b>-10477.7306</b>	<b>18423.172</b>
GWP, 100 years	kg CO <sub>2</sub> eq.	2579.456	<b>2579.456</b>	275.9085147	-1205.68978	18.94884332	58.59557277	<b>-852.2368445</b>	<b>1727.219</b>
ODP	kg CFC-11 eq.	0.00009	<b>0.000</b>	1.81617E-06	-3.9247E-05	8.08158E-07	1.06096E-05	<b>-2.60133E-05</b>	<b>0.000</b>
HTP	kg 1,4-DB eq.	691.950	<b>691.950</b>	2333.922735	-995.85405	4.853603669	9.945715296	<b>1352.868004</b>	<b>2044.818</b>
FAEP	kg 1,4-DB eq.	1133.900	<b>1133.900</b>	14922.38712	-599.0886	19.91655915	1.823350781	<b>14345.03843</b>	<b>15478.938</b>
MAEP	kg 1,4-DB eq.	3298075.466	<b>3298075.466</b>	84354662.71	-9131214.65	13920.04976	6616.412161	<b>75243984.51</b>	<b>78542059.981</b>
TEP	kg 1,4-DB eq.	11.859	<b>11.859</b>	0.431548181	-2.3063163	0.067673271	0.023533409	<b>-1.783561443</b>	<b>10.075</b>
POCP	kg C <sub>2</sub> H <sub>4</sub> eq.	0.516	<b>0.516</b>	0.022429967	-0.40510492	0.013881264	0.010922257	<b>-0.35787143</b>	<b>0.158</b>
AP	kg SO <sub>2</sub> eq.	12.232	<b>12.232</b>	0.104975568	-6.77310155	0.065139348	0.277169548	<b>-6.325817081</b>	<b>5.906</b>
EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	3.059	<b>3.059</b>	0.479996875	-1.59613311	0.147008966	0.058703094	<b>-0.910424174</b>	<b>2.149</b>

## References

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