

Version 3.06 VHK for European Commission 2011,  
modified by IZM for european commission 2014

EcoReport 2014: **INPUTS**  
Environmental Impact

**ECO-DESIGN OF ENERGY RELATED/USING PRODUCTS**

Nr	Product name Products	Date
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Pos nr	MATERIALS Extraction & Production Description of component	Weight in g	Category Click &select
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Pos nr	MATERIALS Extraction & Production Description of component	Weight in g	Category Click &select
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Pos nr	MATERIALS Extraction & Production Description of component	Weight in g	Category Click &select
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Pos nr	MATERIALS Extraction & Production Description of component	Weight in g	Category Click &select
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Pos nr	MATERIALS Extraction & Production Description of component	Weight in g	Category Click &select
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200			
<b>TOTAL</b>		<b>0</b>	

Pos nr	MANUFACTURING Description	Weight in g	Percentage Adjust
201	OEM Plastics Manufacturing (fixed)	0	
202	Foundries Fe/Cu/Zn (fixed)	0	
203	Foundries Al/Mg (fixed)	0	
204	Sheetmetal Manufacturing (fixed)	0	
205	PWB Manufacturing (fixed)	0	
206	Other materials (Manufacturing already included)	0	
207	Sheetmetal Scrap (Please adjust percentage only)	0	<input type="text" value="25%"/>

Pos nr	DISTRIBUTION (incl. Final Assembly) Description	Answer
208	Is it an ICT or Consumer Electronics product <15 kg ?	<input type="text" value="NO"/>
209	Is it an installed appliance (e.g. boiler)?	<input type="text" value="NO"/>
210	Volume of packaged final product in m <sup>3</sup>	<input type="text" value="0"/> in m3

Pos nr	USE PHASE indirect ErP impact Description	unit
211	ErP Product <u>service Life</u> , in years (see comment)	<input type="text" value="0"/> years
<u>Electricity</u>		
212	On-mode: Consumption per hour, cycle, setting, etc.	<input type="text" value="0"/> kWh
213	On-mode: No. of hours, cycles, settings, etc. / year	<input type="text" value="0"/> #
214	Standby-mode: Consumption per hour	<input type="text" value="0"/> kWh
215	Standby-mode: No. of hours / year	<input type="text" value="0"/> #

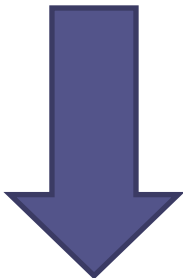
216	Off-mode: Consumption per hour	<input type="text" value="0"/>	kWh
217	Off-mode: No. of hours / year	<input type="text" value="0"/>	#
<b>TOTAL over ErP Product Life</b>			<b>0,00 MWh (=000 kWh)</b>
<u>Heat</u>			
218	Avg. Heat Power Output (when saving use a negative value)	<input type="text" value="0"/>	kW
219	No. of hours / year	<input type="text" value="0"/>	hrs.
220	Type and efficiency (Click & select)	<input type="text" value=""/>	
<b>TOTAL over ErP Product Life</b>			<b>0,00 GJ</b>
<u>Consumables (excl, spare parts)</u>			
221	Water	<input type="text" value="0"/>	m <sup>3</sup> /year
222	Auxilliary material 1 (Click & select)	<input type="text" value="0"/>	kg/ year
223	Auxilliary material 2 (Click & select)	<input type="text" value="0"/>	kg/ year
224	Auxilliary material 3 (Click & select)	<input type="text" value="0"/>	kg/ year
225	Refrigerant refill (Click & select type, even if there is no refill )	<input type="text" value="0"/>	kg/ year
<u>Maintenance, Repairs, Service</u>			
not affected		<input type="text" value=""/>	

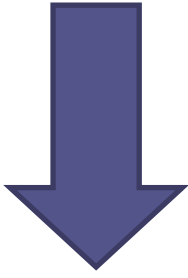
Pos nr	USE PHASE Description	direct ErP impact	unit
226	ErP Product (service) Life in years	<input type="text" value="0"/>	years
<u>Electricity</u>			
227	On-mode: Consumption per hour, cycle, setting, etc.	<input type="text" value="0"/>	kWh
228	On-mode: No. of hours, cycles, settings, etc. / year	<input type="text" value="0"/>	#
229	Standby-mode: Consumption per hour	<input type="text" value="0"/>	kWh
230	Standby-mode: No. of hours / year	<input type="text" value="0"/>	#
231	Off-mode: Consumption per hour	<input type="text" value="0"/>	kWh
232	Off-mode: No. of hours / year	<input type="text" value="0"/>	#
<b>TOTAL over ErP Product Life</b>			<b>0,00 MWh (=000 kWh)</b>
<u>Heat</u>			
233	Avg. Heat Power Output	<input type="text" value="0"/>	kW
234	No. of hours / year	<input type="text" value="0"/>	hrs.
235	Type and efficiency (Click & select)	<input type="text" value=""/>	
<b>TOTAL over ErP Product Life</b>			<b>0,00 GJ</b>
<u>Consumables (excl, spare parts)</u>			
236	Water	<input type="text" value="0"/>	m <sup>3</sup> /year
237	Auxilliary material 1 (Click & select)	<input type="text" value="0"/>	kg/ year
238	Auxilliary material 2 (Click & select)	<input type="text" value="0"/>	kg/ year
239	Auxilliary material 3 (Click & select)	<input type="text" value="0"/>	kg/ year
240	Refrigerant refill (Click & select type, even if there is no refill )	<input type="text" value="0"/>	kg/ year
<u>Maintenance, Repairs, Service</u>			
241	No. of km over Product-Life	<input type="text" value="0"/>	km / Product Life
242	Spare parts (fixed, 1% of product materials & manuf.)	<input type="text" value="0"/>	g

Pos nr	ENERGY TOTAL (=indirect + direct ErP impact in use phase)	unit
<u>Electricity</u>		
243	<b>TOTAL over Product Life of ERP</b>	<b>0,00 MWh (=000 kWh)</b>

	<u>Heat</u>		
244	extra for extraction and transport, ErP indirect		0%
245	extra for extraction and transport, ErP direct		0%
246	<b>TOTAL over Product Life of ERP indirect</b>	<b>0,00</b>	<b>GJ</b>
247	<b>TOTAL over Product Life of ERP direct</b>	<b>0,00</b>	<b>GJ</b>
	<u>Consumables (excl. spare parts)</u>		
248	<b>Water, Total over ErP Product Life</b>	0	m <sup>3</sup>
249	<b>Auxilliary material 1</b>	0	kg
250	<b>Auxilliary material 2</b>	0	kg
251	<b>Auxilliary material 3</b>	0	kg
252	<b>Refrigerant refill (Click &amp; select type, even if there is no refill )</b>	0	kg

economic inputs





### Inputs for EU-Totals & LCC

INPUTS FOR EU-Totals & economic Life Cycle Costs		unit
nr	Description	
A	Product Life	0 years
B	Annual sales	0 mln. Units/year
C	EU Stock	0 mln. Units
D	Product price	Euro/unit
E	Installation/acquisition costs (if any)	Euro/ unit
F	Fuel rate (gas, oil, wood)	Euro/GJ
G	Electricity rate	Euro/kWh
H	Water rate	Euro/m3
I	Aux. 1: None	Euro/kg
J	Aux. 2 :None	Euro/kg
K	Aux. 3: None	Euro/kg
L	Repair & maintenance costs	Euro/ unit
M	Discount rate (interest minus inflation)	4% %
N	Escalation rate (project annual growth of running costs)	4% %
O	Present Worth Factor (PWF) <i>(calculated automatically)</i>	0,00 (years)
P	Ratio efficiency STOCK: efficiency NEW, in Use Phase	1,00

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Material or Process select Category first !	Recyclable?
--	-------------


Category index (fixed)
------------------------

- 21
- 35
- 36
- 37
- 54
- 38

Category index (fixed)
------------------------

60	0
61	1
63	1
64	0
65	0

Subtotals
-----------

0

0

If product weight>0 and volume=0 then message "Fill in volume!" (often for

Note that this is the product service life of the ErP, not of the Affected Energy

0

66

86 -not applicable

material

84-Water per m3

86 -None

86 -None

86 -None

1-none; 0000

Subtotals

0

0

0

66

86-not applicable

material

84-Water per m3

86 -None

86 -None

86 -None

3-R404a; HFC blend; 3920

87

1%

Subtotals

0

66

Note that electricity and heat consumption are calculated over the ErP servi

Reduction of load will generally mean more part load operation, which will r

Duplication of row 211 so that, if the ErP only has a Direct Impact or only an  
If the ErP has both a direct and an indirect impact, the values must be equal;  
Electricity consumption of the ErP itself, split between 3 modes (on, standby

If this auxiliary material 1 is used in indirect impact (i.e. for the Affected Ene

If refrigerant weight >0 then message "Type?" is given

--> Fill in the result of the number of service trips x km per trip (assumed in r  
--> In the 'Results' sheet the spare parts fractions are split up (same %% as p



EoL

Pos	DISPOSAL & RECYCLING
nr	Description
253	product (stock) life L, in years
	<b>0</b>

86 -not applicable	
86-not applicable	
<u>material</u>	
84-Water per m3	
86 -None	
86 -None	
86 -None	
Average GWP is 0	

		curr
254	unit sales in million units/year	0,0
255	product & aux. mass over service life, in g/unit	C
256	total mass sold, in t (1000 kg)	C
	<u>Per fraction (post-consumer)</u>	1
		Bulk Plastics
257	current fraction, in % of total mass (or mg/unit Hg)	0,0%
258	fraction x years ago, in % of total mass	0,0%
259	CAGR per fraction r, in %	0,0%
	<i>current product mass in g</i>	0
260	stock-effect, total mass in g/unit	0
261	EoL available, total mass ('arising') in g/unit	0
262	EoL available, subtotals in g	
263	EoL mass fraction to re-use, in %	
264	EoL mass fraction to (materials) recycling, in %	29%
265	EoL mass fraction to (heat) recovery, in %	15%
266	EoL mass fraction to non-recov. incineration, in %	22%
267	EoL mass fraction to landfill/missing/fugitive, in %	33%
268	TOTAL	100%
269	EoL recyclability****, (click& select: 'best', '>avg', 'avg' (basecase); '< avg'; 'worst')	avg
		0%

L is product (stock) life = period between product purchased and pr  
PG=growth rate over period of L years= (value current - value L yea  
CAGR=Compound Annual Growth Rate =  $(1 + PG)^{(1/L)} - 1$  (^= to tl  
EoL available mass' or 'arising' = Total mass available for End-of-Li

'stock' = the surplus (or deficit) of mass in stock (in use or stored w  
period that equals the product life. stock= stock-effect arising - pr

're-use'= fraction of EoL available mass in components that can be  
fractions, taking into account the impact of collection, sorting, clea  
specific re-use credit found for a specific product deviates from the

'recycling'= fraction of EoL available mass that is recycled for its ma  
mentioned (values cannot be edited). For plastics, electronics, misc  
default values). The credit relates to the recycled mass and depends  
(e.g. heat recovery) and/or avoidance of operations for disposal of  
MJ/kg is < 50% of bulkplastics value) and remaining value at final d

For electronics (PWBs, ICs, controllers, displays, etc.) main credits c  
material mainly in fiberglass insulation) and avoidance of treatmer  
official electronics recycling rates to be low (in 2005: 20% for tools,  
recycling activities to be substantially higher. For miscellaneous ma  
determined beforehand. For 'Misc.', including refrigerants and Hg, r  
except metals (where it is assumed to be higher), a credit of 40% or  
guidance.

'(heat) recovery' = fraction of EoL available mass where the combi  
all other materials for which a feedstock energy value is given. The

'non-recov. incineration' = fraction of EoL available mass that is in  
combustibles) , the incineration plant has no clients for waste heat,  
Table 13, row 92) apply.

'**landfill/fugitive/missing**' = fraction of EoL available mass that goes to landfill (under conditions like most refrigerants and mercury) and that are unaccounted for (see Methodology Report Part 2, Table 13, row 89) apply.

'**recyclability**' relates to the potential of the new products to change the contamination of the mass to be recycled (see MEERP Methodology Report Part 2, Table 13, row 89) material in other applications. The recyclability does not influence forward looking, e.g. values different from 'avg' (=base case) should

normally 3 different auxiliaries is enough (e.g. paper&ink for printers, detergent&rinsing agent&sa

discount rate is a default given by the Commission (usually interest-inflation)

escalation rate is the real (inflation corrected) running cost price increase

present worth factor recalculates future returns to the present, taking into account the discount a

usually <1 ; stock efficiency (products sold ca. half a product lifetime ago) is worse than efficiency

legislation restrictions. VHK and the European Commission do

source, draft version and legal notice are mentioned.











aterial or process.

py & paste it to another EcoReport

hen you have to fill in the type in rows 240 and/or 225 respectively.







rgotten)

gy System

service life and not per year

not diminish (possibly even increase) maintenance and repairs effort of the Affected Energy System. Therefore it is not taken into account.

1 Indirect impact, just one of the tables has to be copied in the study report  
1; if not, there will be an error message here  
y, off) with 2 multipliers per mode (kWh and the functional parameter)

Energy System) and the ErP does not use the same type, then skip this line and fill in the auxiliary material (if any) in the next row.

mini-van)  
product's material fractions)



Please edit values with red font

Year	L years ago	period growth PG in %	CAGR in %/a
2000	0,000	0,0%	0,0%
2001	0	0,0%	0,0%
2002	0	0,0%	0,0%

2	3	4	5	6	7a	7b	7c	8	9		
TecPlastics	Ferro	Non-ferro	Coating	Electronics	Misc. , excluding refrigerant & Hg	refrigerant	Hg (mercury), in mg/unit	Extra	Auxiliaries	TOTAL (CARG avg.)	
0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0	0,0%	0,0%	0,0%	
0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0	0,0%	0,0%	0,0%	
0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0,0	0	0	0	
0	0	0	0	0	0	0	0,0	0	0	0	
0	0			0	0	0	0,0	0	0	0	
<b>AVG</b>											
<b>1%</b>										<b>5%</b>	0,0%
<b>29%</b>	94%			<b>50%</b>	<b>64%</b>	<b>30%</b>	<b>39%</b>	<b>60%</b>	<b>30%</b>	0,0%	
<b>15%</b>	0%			<b>0%</b>	<b>1%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>10%</b>	0,0%	
<b>22%</b>	0%			<b>30%</b>	<b>5%</b>	<b>5%</b>	<b>5%</b>	<b>10%</b>	<b>10%</b>	0,0%	
<b>33%</b>	5%			<b>19%</b>	<b>29%</b>	<b>64%</b>	<b>55%</b>	<b>29%</b>	<b>45%</b>	0,0%	
100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0,0%	
<b>avg</b>	<b>avg</b>	<b>avg</b>	<b>avg</b>	<b>avg</b>	<b>avg</b>	<b>avg</b>	<b>avg</b>	<b>avg</b>	<b>avg</b>	<b>avg</b>	
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

product discarded

years ago)/(value L years ago)

the power)

life (EoL) management = recycmax \* current fraction \* product mass, with recycmax=1/(1+CAGR)^L,

with consumer) due to growth (or decline) of the unit sales or the share of the materials fraction over a product mass\*current fraction ;'

re-used in new products. The generic credit relative to the re-used mass is 75% on all impacts and for all recycling, etc. (as opposed to MEEuP 2005, where the collection effort was calculated separately). In case the default it is recommended to adapt the mass fraction accordingly.

materials. For metals this is already included in the production impact, based roughly on the fraction of miscellaneous materials, refrigerants, mercury and the extra materials these values need to be edited (overwrite) on the main virgin material that will be displaced by the recycled mass, the remaining value at final disposal of hazardous substances (pyrolysis). E.g. for plastics the most popular displaced material is wood (e.g. 27% disposal is 50% of the feedstock energy and GWP value.

come from recovery of metals (Cu, Fe, tin, traces of Au, Pt, Pd), glass (from displays, cullet displaces virgin material of hazardous substances (e.g. Pb, Cd, etc.). Note that the WEEE recast impact assessment report found 27% for ITC equipment, 35-40% for TVs/monitors) but suspects actual, unreported (possibly incorrect) materials recycling fractions fully depend on the materials involved and a weighted average needs to be used. Credit comes from re-use after purification, avoiding treatment as hazardous waste, etc. For all materials, in all impacts is assumed related to the recycled mass. See MEErP Methodology Report Part 2 for more

combustion heat is used, e.g. for district heating. In the context of ErP it is assumed to apply only to plastics and credit is 75% of feedstock energy (net combustion value) and GWP.

incinerated without heat recovery, either because there is no effective contribution to the combustion (non-combustible, etc.. Impacts of 'incineration' as given in the Unit Indicator table (see MEErP Methodology Report Part 2,

to landfill, that escapes during use (for substances that are gaseous or evaporate at atmospheric pressure) and is not accounted for (illegal dumping etc.). Impacts of 'landfill' as given in the Unit Indicator table (see MEErP

regarding the course of the materials flows, e.g. due to faster pre-disassembly or other ways to bring about less waste (see Report Part 2). Therefore it is economically likely that the recycled mass at EoL will displace more virgin mass in the mass balance but it does give a reduction or increase up to 10% on all impacts of the recycled mass. It is to be filled in for design options.

alternatives for dishwashers, water filters & coffee for coffee-makers), etc. If not then use composite values

and escalation rates

of new products





























## Input parameters for the Recycling Benefit Rate

\*= Downcycling index k shows according to JRC the quality of the material

Material category	Material	Downcycling index k*	Recycling rate	Other Resources Total Energy (GER)
1-BlkPlastics	1 -LDPE	0,66		19,45
1-BlkPlastics	2 -HDPE	0,74		9,44
1-BlkPlastics	3 -LLDPE	0,4		18,50
1-BlkPlastics	4 -PP	0,39		18,17
1-BlkPlastics	5 -PS	0,7		21,68
1-BlkPlastics	6 -EPS	0,4		20,92
1-BlkPlastics	7 -HI-PS	0,4		23,06
1-BlkPlastics	8 -PVC	0,42		26,00
1-BlkPlastics	9 -SAN	0,4		22,35
1-BlkPlastics	10 -PET	0,41		11,92
1-BlkPlastics	11 -ABS	0,7		23,76
2-TecPlastics	12 -PA 6	0,61		29,88
2-TecPlastics	13 -PC	0,63		29,20
2-TecPlastics	14 -PMMA	0,4		27,55
2-TecPlastics	15 -Epoxy	0,4		35,18
2-TecPlastics	16 -Rigid PUR	0,4		26,06
2-TecPlastics	17 -Flex PUR	0,4		26,11
2-TecPlastics	18 -Talcum filler			
2-TecPlastics	19 -E-glass fibre			
2-TecPlastics	20 -Aramid fibre			
3-Ferro	22 -St sheet galv.			
3-Ferro	23 -St tube/profile			
3-Ferro	24 -Cast iron			
3-Ferro	25 -Ferrite			
3-Ferro	26 -Stainless 18/8 coil			
4-Non-ferro	27 -Al sheet/extrusion			
4-Non-ferro	28 -Al diecast			
4-Non-ferro	29 -Cu winding wire			
4-Non-ferro	30 -Cu wire			
4-Non-ferro	31 -Cu tube/sheet			
4-Non-ferro	32 -CuZn38 cast			
4-Non-ferro	33 -ZnAl4 cast			
4-Non-ferro	34 -MgZn5 cast			
5-Coating	39 -pre-coating coil			
5-Coating	40 -powder coating			
5-Coating	41 -Cu/Ni/Cr plating			
5-Coating	42 -Au/Pt/Pd			
6-Electronics	43 -LCD per m2 scrn			
6-Electronics	44 -CRT per m2 scrn			
6-Electronics	45 -big caps & coils			
6-Electronics	46 -slots / ext. ports			

6-Electronics	47 -IC's avg., 5% Si, Au	
6-Electronics	48 -IC's avg., 1% Si	
6-Electronics	49 -SMD/ LED's avg.	
6-Electronics	50 -PWB 1/2 lay 3.75kg/m2	
6-Electronics	51 -PWB 6 lay 4.5 kg/m2	
6-Electronics	52 -PWB 6 lay 2 kg/m2	
6-Electronics	53 -Solder SnAg4Cu0.5	
6-Electronics	98 -controller board	
7-Misc.	55 -Glass for lamps	
7-Misc.	56 -Bitumen	
7-Misc.	57 -Cardboard	
7-Misc.	58 -Office paper	
7-Misc.	59 -Concrete	
7-Misc.	91 -Refrigerant	

**recycling material**

**Resources & Waste**

**Emissions (Air)**

of which, electricity (in primary MJ)	Water (process)	Water (cooling)	Waste, non- haz./ landfill	Waste, hazardous/ incinerated	Greenhouse Gases in GWP100	Acidification, emissions
2,00	3,30		0,44	0,00	1,04	0,74
1,76	3,91		0,08	0,00	0,67	0,00
1,53	2,64		0,31	0,00	1,02	0,59
1,09	5,28		0,28	0,00	1,09	0,56
0,54	5,39		0,22	0,00	1,54	1,72
0,51	6,27		0,38	0,00	1,49	1,81
0,70	6,05		0,30	0,00	1,60	1,94
1,67	69,20		0,67	0,00	2,06	1,67
0,57	6,71		0,32	0,00	1,65	1,40
1,66	4,80		0,22	0,00	0,80	0,00
1,04	10,23		0,92	0,00	1,83	1,78
2,27	17,60		1,76	0,00	4,71	3,90
2,23	15,40		1,77	0,00	2,97	2,54
1,96	10,78		1,05	0,00	3,30	4,36
3,68	20,90		4,07	0,00	3,63	4,39
2,62	66,00		4,27	0,00	2,30	3,10
2,81	77,00		5,49	0,00	2,46	3,21





**Emissions (Water)**

Volatile Organic Compounds (VOC)	Persistent Organic Pollutants (POP)	Heavy Metals	PAHs	Particulate Matter (PM, dust)	Heavy Metals	Eutrophication	
0,01		0,00		0,00	0,04	0,00	0,27
0,00		0,00		0,00	0,05	0,00	0,06
0,00		0,00		0,00	0,06	0,00	0,39
0,00		0,00		0,00	0,03	0,00	1,65
0,00		0,00		0,00	0,06	0,00	0,55
0,00		0,00		0,00	0,07	0,00	1,25
0,00		0,00		0,00	0,07	0,00	0,60
0,00		0,00		0,00	0,12	0,48	1,84
0,00		0,00		0,00	0,07	0,00	2,81
0,04		0,03		0,00	0,04	0,00	2,06
0,00		0,00		0,00	0,12	0,33	6,30
0,00		0,00		0,00	0,22	8,33	18,72
0,00		0,00		0,00	0,27	0,03	5,04
0,00		0,00		0,00	0,20	0,48	20,68
0,00		0,00		0,00	0,60	0,01	96,50
0,00		0,00		0,00	0,29	7,34	31,86
0,00		0,00		0,00	0,33	0,57	56,86



Yes  
No

**ECO-DESIGN OF ENERGY-RELATED PRODUCTS**

**Life Cycle Impact (per unit) of Products**

Nr	Life cycle Impact per product:	Reference year
0	Products	2014

Life Cycle phases -->		PRODUCTION			DISTRI-	USE	EN
Resources Use and Emissions		Material	Manuf.	Total	BUTION		Disposal
<b>Materials</b>		<b>unit</b>					
1	Bulk Plastics	g		0		0	0
2	TecPlastics	g		0		0	0
3	Ferro	g		0		0	0
4	Non-ferro	g		0		0	0
5	Coating	g		0		0	0
6	Electronics	g		0		0	0
7	Misc.	g		0		0	0
8	Extra	g		0		0	0
9	Auxiliaries	g		0		0	0
10	Refrigerant	g		0		0	0
	<b>Total weight</b>	g		0		0	0
<b>Other Resources &amp; Waste</b>		<b>debet</b>					
11	Total Energy (GER)	MJ	0	0	0	0	0
12	of which, electricity (in primary MJ)	MJ	0	0	0	0	0
13	Water (process)	ltr	0	0	0	0	0
14	Water (cooling)	ltr	0	0	0	0	0
15	Waste, non-haz./ landfill	g	0	0	0	0	0
16	Waste, hazardous/ incinerated	g	0	0	0	0	0
<b>Emissions (Air)</b>							
17	Greenhouse Gases in GWP100	kg CO2 eq.	0	0	0	0	0
18	Acidification, emissions	g SO2 eq.	0	0	0	0	0
19	Volatile Organic Compounds (VOC)	g	0	0	0	0	0
20	Persistent Organic Pollutants (POP)	ng i-Teq	0	0	0	0	0
21	Heavy Metals	mg Ni eq.	0	0	0	0	0
22	PAHs	mg Ni eq.	0	0	0	0	0
23	Particulate Matter (PM, dust)	g	0	0	0	0	0
<b>Emissions (Water)</b>							
24	Heavy Metals	mg Hg/20	0	0	0	0	0
25	Eutrophication	g PO4	0	0	0	0	0

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**Life Cycle Impact (per unit) of Products**

Nr	Life cycle Impact per product per year of use:	Reference year
0	Products	2014

Life Cycle phases -->	PRODUCTION	DISTRI-	USE	EN
-----------------------	------------	---------	-----	----

Resources Use and Emissions		Material	Manuf.	Total	BUTION	Disposal		
<b>Materials</b>								
	<b>unit</b>							
1	Bulk Plastics	g			n.a.		n.a.	
2	TecPlastics	g			n.a.		n.a.	
3	Ferro	g			n.a.		n.a.	
4	Non-ferro	g			n.a.		n.a.	
5	Coating	g			n.a.		n.a.	
6	Electronics	g			n.a.		n.a.	
7	Misc.	g			n.a.		n.a.	
8	Extra	g			n.a.		n.a.	
9	Auxiliaries	g			n.a.		n.a.	
10	Refrigerant	g			n.a.		n.a.	
	<b>Total weight</b>	g			n.a.		n.a.	
<b>Other Resources &amp; Waste</b>								debet
11	Total Energy (GER)	MJ	n.a.	n.a.	n.a.	n.a.	n.a.	
12	of which, electricity (in primary MJ)	MJ	n.a.	n.a.	n.a.	n.a.	n.a.	
13	Water (process)	ltr	n.a.	n.a.	n.a.	n.a.	n.a.	
14	Water (cooling)	ltr	n.a.	n.a.	n.a.	n.a.	n.a.	
15	Waste, non-haz./ landfill	g	n.a.	n.a.	n.a.	n.a.	n.a.	
16	Waste, hazardous/ incinerated	g	n.a.	n.a.	n.a.	n.a.	n.a.	
<b>Emissions (Air)</b>								
17	Greenhouse Gases in GWP100	kg CO2 eq.	n.a.	n.a.	n.a.	n.a.	n.a.	
18	Acidification, emissions	g SO2 eq.	n.a.	n.a.	n.a.	n.a.	n.a.	
19	Volatile Organic Compounds (VOC)	g	n.a.	n.a.	n.a.	n.a.	n.a.	
20	Persistent Organic Pollutants (POP)	ng i-Teq	n.a.	n.a.	n.a.	n.a.	n.a.	
21	Heavy Metals	mg Ni eq.	n.a.	n.a.	n.a.	n.a.	n.a.	
22	PAHs	mg Ni eq.	n.a.	n.a.	n.a.	n.a.	n.a.	
23	Particulate Matter (PM, dust)	g	n.a.	n.a.	n.a.	n.a.	n.a.	
<b>Emissions (Water)</b>								
24	Heavy Metals	mg Hg/20	n.a.	n.a.	n.a.	n.a.	n.a.	
25	Eutrophication	g PO4	n.a.	n.a.	n.a.	n.a.	n.a.	

Table . EU Total Impact of NEW Products produced in reference year 2014 (over their lifetime)

Nr	EU Impact of New Models sold reference year over their lifetime:	Date
0	Products	2014

Life Cycle phases -->		PRODUCTION			DISTRI-	USE	EN	
Resources Use and Emissions		Material	Manuf.	Total	BUTION	Disposal		
<b>Materials</b>								
	<b>unit</b>							
1	Bulk Plastics	kt			0		0	
2	TecPlastics	kt			0		0	
3	Ferro	kt			0		0	
4	Non-ferro	kt			0		0	
5	Coating	kt			0		0	
6	Electronics	kt			0		0	
7	Misc.	kt			0		0	
8	Extra	kt			0		0	
9	Auxiliaries	kt			0		0	
10	Refrigerant	kt			0		0	
	<b>Total weight</b>	kt			0,0		0	
<b>Other Resources &amp; Waste</b>								debet
11	Total Energy (GER)	PJ	0	0	0	0	0	
12	of which, electricity (in primary PJ)	PJ	0	0	0	0	0	
13	Water (process)	mln. m3	0	0	0	0	0	
14	Water (cooling)	mln. m3	0	0	0	0	0	
15	Waste, non-haz./ landfill	kt	0	0	0	0	0	
16	Waste, hazardous/ incinerated	kt	0	0	0	0	0	

**Emissions (Air)**

17	Greenhouse Gases in GWP100	mt CO2 eq.	0	0	0	0	0	0
18	Acidification, emissions	kt SO2 eq.	0	0	0	0	0	0
19	Volatile Organic Compounds (VOC)	kt	0	0	0	0	0	0
20	Persistent Organic Pollutants (POP)	g i-Teq	0	0	0	0	0	0
21	Heavy Metals	ton Ni eq.	0	0	0	0	0	0
22	PAHs	ton Ni eq.	0	0	0	0	0	0
23	Particulate Matter (PM, dust)	kt	0	0	0	0	0	0

**Emissions (Water)**

24	Heavy Metals	ton Hg/20	0	0	0	0	0	0
25	Eutrophication	kt PO4	0	0	0	0	0	0

\*=Note: Mt= megatonnes (metric)=  $10^9$  kg; kt= kilotonnes (metric)=  $10^9$  g; ton( metric)=  $10^9$  g; g=gram=  $10^9$  ng ; mln. M3 = million cubic metres=  $10^9$  litres; PJ= petajoule

Table . EU Total Impact of STOCK of Products in reference year 2014 (produced, in use, discarded)

Nr	EU Impact of Products in reference year (produced, in use, discarded)***	Date
	Products	2014

Life Cycle phases -->		PRODUCTION			DISTRI-	USE	EN
Resources Use and Emissions		Material	Manuf.	Total	BUTION		Disposal
<b>Materials</b>		<b>unit</b>					
1	Bulk Plastics	kt		0		0	0
2	TecPlastics	kt		0		0	0
3	Ferro	kt		0		0	0
4	Non-ferro	kt		0		0	0
5	Coating	kt		0		0	0
6	Electronics	kt		0		0	0
7	Misc.	kt		0		0	0
8	Extra	kt		0		0	0
9	Auxiliaries	kt		0		0	0
10	Refrigerants	kt		0		0	0
	<b>Total weight</b>	kt		0		0	0
<b>Other Resources &amp; Waste</b>		debet					
8	Total Energy (GER)	PJ	0	0	0	0	0
9	of which, electricity (in primary PJ)	PJ	0	0	0	0	0
10	Water (process)	mln. m3	0	0	0	0	0
11	Water (cooling)	mln. m3	0	0	0	0	0
12	Waste, non-haz./ landfill	kt	0	0	0	0	0
13	Waste, hazardous/ incinerated	kt	0	0	0	0	0
<b>Emissions (Air)</b>							
14	Greenhouse Gases in GWP100	Mt CO2 eq.	0	0	0	0	0
16	Acidification, emissions	kt SO2 eq.	0	0	0	0	0
17	Volatile Organic Compounds (VOC)	kt	0	0	0	0	0
18	Persistent Organic Pollutants (POP)	g i-Teq	0	0	0	0	0
19	Heavy Metals	ton Ni eq.	0	0	0	0	0
	PAHs	ton Ni eq.	0	0	0	0	0
20	Particulate Matter (PM, dust)	kt	0	0	0	0	0
<b>Emissions (Water)</b>							
21	Heavy Metals	ton Hg/20	0	0	0	0	0
22	Eutrophication	kt PO4	0	0	0	0	0

\*\*=mt= megatonnes (metric)= 10<sup>9</sup> kg; kt= kilotonnes (metric)= 10<sup>9</sup> g; ton( metric)= 10<sup>9</sup> g; g=gram= 10<sup>9</sup> ng ; mln. M3 = million cubic metres= 10<sup>9</sup> litres; PJ= petaJoules= 10<sup>15</sup> J

\*\*\*=simplified model assuming produced=EOL

The totals annual impact in the table above allows comparison with EU totals and with other products, as regards resource consumption. These emissions, with electricity converted to a more familiar unit of TWh [1 TWh= 0.0105 PJ ] are given in the following table.

Table . Summary Environmental Impacts EU-Stock 2011, Products					
Main life cycle indicators	value	unit	%	EU totals	Reference
<b>Materials</b>					
Plastics	0,000	Mt	0,000%	48	Ref: Plastics Europe (demand by EU conversion)
Ferrous metals	0,000	Mt	0,000%	206	Ref: Iron & Steel Statistics Bureau [1]
Non-ferrous metals	0,000	Mt	0,000%	20	Ref: www.eaa.net et al. (Al 12,5+Cu 4,7 + ...)
<b>Other resources &amp; waste</b>					
Total Energy (GER)	0	PJ	0,000%	75 697	Eurostat, Gross Inland Consumption EU-27
of which, electricity	0	TWh	0,000%	2 800	Final end-use. Ref: Eurostat
Water (process)*	0	mln.m3	0,000%	247 000	Ref: http://ec.europa.eu/environment/water [1]
Waste, non-haz./ landfill*	0,00	Mt	0,000%	2 947	Ref: http://epp.eurostat.ec.europa.eu/statistic
Waste, hazardous/ incinerated*	0,00	kton	0,000%	89	ration of waste, total arising and by s
<b>Emissions (Air)</b>					
Greenhouse Gases in GWP100	0	mt CO2eq.	0,00%	5 054	Ref: EEA3 (CO2 4187 + CH4 416 + N2O 374)
Acidifying agents (AP)	0	kt SO2eq.	0,00%	22 432	Ref: EEA1 ( Nox 11 151 + Sox 7 339 + NH3)
Volatile Org. Compounds (VOC)	0	kt	0,00%	8 951	Ref: EEA1
Persistent Org. Pollutants (POP)	0	g i-Teq.	0,00%	2 212	Ref: EEA1 (dioxins and furans only)
Heavy Metals (HM)	0	ton Ni eq.	0,00%	5 903	Ref: EEA1 (Cd 118 + Hg 89 + Pb 2157 t); EEA1 (Cu 589 + Zn 6510 t)
PAHs	0	ton Ni eq.	0,00%	1 369	Ref: EEA1
Particulate Matter (PM, dust)	0	kt	0,00%	3 522	Ref: EEA1 (1400 kt PM2,5 + 2122 kt PM10)
<b>Emissions (Water)</b>					
Heavy Metals (HM)	0	ton Hg/20	0,00%	12 853	Ref: CML (As 17+Cd 21,3 + Cr 271 + Cu 169 + Ni 11200 t)
Eutrophication (EP)	0	kt PO4	0,00%	900	Ref: EEA2 (Baltic 861 N/5,4 P + North Sea 11200 N/ 14,2 P)
*= <b>caution: low accuracy for production phase</b>					
EEA1, European Environmental Agency, National emissions reported to the Convention on Long-range Transboundary Air Pollution (LRTAP Convention), EEA (Feb. 2011)					
EEA2, Source apportionment of nitrogen and phosphorus inputs into the aquatic environment, 2005. [Compare: CML value for EU-15, 1995 is 1 263 kt PO4 no data for aquatic emissions BOD, COD, DOC, TOC reported]					
EEA3: EEA, Annual European Community greenhouse gas inventory 1990–2007 and inventory report 2009, Submission to the UNFCCC Secretariat, 2009. (Transport, Use Change & Forestry)					
EC1, European Commission (DG ENV), Ambient air pollution by AS, CD and NI compounds, Position Paper, 2001. [data sources stem from ca. 1990, EU-15 results using multiplier 1,3 for EU-expansion and 55% emission reduction (e.g. Cd) 1990-2007; data are roughly in line with CML]					
Eurostat, Energy Balance Sheets 2007-2008, European Commission, edition 2010.					
VHK, Energy analysis of energy sector to final end use electricity and fuels (excl. transport & feedstock), based on Eurostat, elsewhere in this report					
CML, Centrum voor Milieukunde Leiden, Characterisation and Normalisation factors (CML-IA xls file Nov. 2010; extract Feb. 2011); data for EU-15, 1995. A and emission decrease 1995-2007 will balance.					
[1] from intermediate source: AEA, ENTR Lot 3 Sound and Imaging Equipment, preparatory Ecodesign study, Nov. 2010					

### 5.3. BaseCase Life Cycle Costs

The table below gives the Life Cycle Costs for the BaseCase, using the rates and prices given in par. 5.1. Furthermore, to c Present Value of the running costs --which is the specific viewpoint of Life Cycle Costing-- with the actual expenditure tod gives the total consumer expenditure in the EU27 per year.

<b>Table . Life Cycle Costs per product and Total annual expenditure (2005) in the EU-27</b>			
<b>Products</b>		<b>LCC new product</b>	
<b>Item</b>			<b>total annual consumer expenditure in EU27</b>
<b>D</b>	Product price	0	€ 0 mln.€
<b>E</b>	Installation/ acquisition costs (if any)	0	€ 0 mln.€
<b>F</b>	Fuel (gas, oil, wood)	0	€ 0 mln.€



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al Impact

Author  
vhk, izm

END-OF-LIFE		TOTAL
Recycl.	Stock	
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

see note!

credit		
0		0
0		0
0		0
0		0
0		0
0		0

0		0
0		0
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0		0
0		0
0		0
0		0

0		0
0		0

European Commission do not assume

notice are mentioned.

Author  
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D-OF-LIFE*	TOTAL
------------	-------

Recycl.	Stock	
---------	-------	--

n.a.	n.a.	n.a.
n.a.	n.a.	n.a.
n.a.	n.a.	n.a.
n.a.	n.a.	n.a.
n.a.	n.a.	n.a.
n.a.	n.a.	n.a.
n.a.	n.a.	n.a.
n.a.	n.a.	n.a.
n.a.	n.a.	n.a.
n.a.	n.a.	n.a.
n.a.	n.a.	n.a.

see note!

credit		
n.a.		n.a.
n.a.		n.a.
n.a.		n.a.
n.a.		n.a.
n.a.		n.a.
n.a.		n.a.

n.a.		n.a.
n.a.		n.a.
n.a.		n.a.
n.a.		n.a.
n.a.		n.a.
n.a.		n.a.
n.a.		n.a.

n.a.		n.a.
n.a.		n.a.

Author
vhk, izm

D-OF-LIFE*		TOTAL
Recycl.	Stock	

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

see note!

credit		
0	0	0
0	0	0
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0	0	0
0	0	0

es= 10<sup>9</sup> MJ (megajoules) = 10<sup>15</sup> Joules.

Author  
vhk, izm

D-OF-LIFE*		TOTAL
Recycl.	Stock	
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
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0	0	0
0	0	0
0	0	0

$10^9$  MJ (megajoules) =  $10^{15}$  Joules.

source use and emissions.  
ing summary table.

ence
rters) [1]
Zn 0,8 + Pb 0,8 + Ni 0,3)
7, 2007, in Net Calorific Value
ater/quantity/pdf/exec_summary.pdf
cs_explained/index.php?title=File:Gene selected economic activities.
4 + HFCs 63 + PFCs 4 + SF6 10)
3 876)
EA2 (As 337 + Ni 2843 t); CML (Cr 517 +
)
90 + Pb 2260 + Hg 14,3 + Ni 551 t + Zn
761 N/14,4 P + Danube/Black Sea 270
U-27 (national territory), 2007. (extract
4 eq. based on 1 370 kt N and 224 kt P;
total without LULUCF (Land-Use, Land-
recalculated by VHK to 2007, EU-27
ssumed that EU expansion to EU-17

Compare the discounted Net  
lay, the second column also

Use these fields to add extra materials to the eco-report, these materials will be added to the list a Extra, and the new materials will appear under material or process. The values are per kg material. 120 (category 'Extra') and for the Use phase in rows 121-125 (category 'Auxiliaries'). If the same material is used in both categories copy the data in both categories.

nr	Name material	Recycle %*	Primary Energy	Electr energy	feedstock	water proces
unit	New Materials production phase (category 'Extra')	%	MJ	MJ	MJ	L
100	Office paper (from recycled paper)		15,14	3,81		20,46
101	Office paper (from primary cellulose)		39,71	1,80		52,23
102						
103						
104						
105						
106						
107						
108						
109						
110						
111						
112						
113						
114						
115						
116						
117						
118						
119						
120						
	New Materials use phase (category 'Auxiliaries')					
121						
122						
123						
124						
125						

\* recycling rates are set in the Inputs sheet; leave this column blank

and can be selected on the input tab. Select category 8-  
 . Fill in new materials for production of the ErP in rows 1-  
 aterial is used in both production and use phase then

Water cool	waste haz	waste non	GWP	AD	VOC	POP	Hma	PAH
L	g	g	kg CO2 eq.	g SO2 eq.	mg	ng i-Teq	mg Ni eq.	mg Ni eq.
			0,93	2,57				
	0,00	0,02	1,20	9,09				


PM	HMw	EUP
g	mg Hg/20	mg PO4
2,45		0,35
8,45		0,74




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**ECO-DESIGN OF ENERGY-RELATED PRODUCTS**

Nr: Product: Products

**MATERIALS EXTRACTION & PRODUCTION**

nr	Product				Energy			Water		Waste	
	component	wght	cat.	material	GER	electr	feedst	water (proces)	water (cool)	naz. Waste	non-haz. Waste
		in g			MJ	MJ	MJ	ltr.	ltr.	g	g

1											
2											
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USE PHASE

nr	Product				Energy			Water		Waste	
	component	value	NDX		GER	electr	feedst	water proces	water (cool)	haz.	non-haz.
		in g			MJ	MJ	MJ	ltr.	ltr.	g	g
		<b>SUBTOT energy</b>									
211	ErP Product service Life in years (see comment)		years								
	<b>Electricity</b>										
212	On-mode: Consumption per hour, cycle, setting, etc.		kWh								
213	On-mode: No. of hours, cycles, settings, etc. / year		#								
214	Standby-mode: Consumption per hour		kWh								
215	Standby-mode: No. of hours / year		#								
216	Off-mode: Consumption per hour		kWh								
217	Off-mode: No. of hours / year		#								
	<b>TOTAL over Product Life of ERP</b>		<b>SUBSUBtot Elect</b>								
	<b>Heat</b>										
246	TOTAL over Product Life of ERP indirect		GJ								
247	TOTAL over Product Life of ERP direct		GJ								
	Consumables (excl. spare parts)		<b>SUBTOT Cons</b>								
248	Water, Total over ErP Product Life		m3	84-Water pe							
249	Auxilliary material 1		kg	86 -None							
250	Auxilliary material 2		kg	86 -None							
251	Auxilliary material 3		kg	86 -None							
225	Refrigerant refill (Click & select type, even if there is no refill )										
	Maintenance, Repairs, Service		<b>SUBTOT Main</b>								
241	No. of km over Product-Life		km / Product Life	87							
242	Spare parts (fixed, 1% of product materials & manuf.)		g	0,01							
	<b>TOTAL</b>										

DISPOSAL/RECYCLING

nr	Product				Energy			Water		Waste	
	component	weight share	NDX		GER	electr	feedst	water proces	water (cool)	haz.	non-haz.



		in %	in g		MJ	MJ	MJ	ltr.	ltr.	g	g
263	Re-use										
264	Recycle										
265	Recover										
266	Incinerate										
267-269	Landfill + unaccounted										
	<b>TOTAL</b>										
	of which										
263-265	reuse/recycle/recover										
266-269	incinerate/landfill										

**BASE TABLE EuP EcoReport: Materials & Energy Unit Indicators**

nr	Product material or process		recyc %	Energy			Water		Waste	
				GER	electr	feedst	water proces	water (cool)	haz.	non-haz.
				MJ	MJ	MJ	ltr.	ltr.	g	g
1	LDPE			77,80	13,31	51,54	3,00	45,00	4,45	44,19
2	HDPE			76,56	9,83	54,10	3,40	31,00	5,44	38,34
3	LLDPE			73,98	10,17	47,45	2,40	116,00	3,37	30,73
4	PP			72,69	7,26	52,72	4,80	40,00	4,43	28,14
5	PS			86,73	3,62	47,53	4,90	177,00	0,69	21,84
6	EPS			83,66	3,38	47,81	5,70	176,00	0,93	37,85
7	HI-PS			92,23	4,67	49,13	5,50	186,00	0,64	30,05
8	PVC			56,61	11,11	22,93	11,00	62,00	5,00	67,09
9	SAN		1	89,40	3,82	47,17	6,10	163,00	4,10	31,56

10	PET				78,80	13,37	38,83	7,30	36,00	1,60	92,15
11	ABS				95,02	6,95	45,77	9,30	165,00	10,00	91,93
12	PA 6				119,51	15,13	38,91	16,00	219,00	19,00	176,27
13	PC				116,81	14,86	37,99	14,00	114,00	10,00	176,55
14	PMMA				110,19	13,08	41,82	9,80	26,00	1,40	104,77
15	Epoxy				140,71	24,56	42,64	19,00	384,00	19,00	406,56
16	Rigid PUR				104,26	17,46	38,67	60,00	301,00	19,59	427,17
17	Flex PUR				104,46	18,72	39,79	70,00	298,00	32,39	548,77
18	Talcum filler				10,14			0,12		0,11	5,72
19	E-glass fibre				65,83	21,09	10,79	54,30	271,30	7,05	311,22
20	Aramid fibre				256,73	82,24	42,10	211,77	1058,09	27,51	1213,75
21	all plastic parts				40,85	24,59	1,41	0,37	11,60		128,00
22	St sheet galv.			5%	33,73	2,28	0,07				1721,52
23	St tube/profile			50%	16,57	4,57	-0,16				800,69
24	Cast iron			85%	9,82	0,13	-0,06	1,30	3,66		315,36
25	Ferrite				50,60	3,42	0,11	39,33			2582,28
26	Stainless 18/8 coil			63%	62,04	9,69	4,05	75,74	8,44		1000,00
27	Al sheet/extrusion			11%	192,62						360,00
28	Al diecast			85%	55,14						150,00
29	Cu winding wire				142,72					0,80	40,17
30	Cu wire				116,55					0,24	12,17
31	Cu tube/sheet			60%	50,92						13,97
32	CuZn38 cast			85%	38,45					0,45	43,12
33	ZnAl4 cast			85%	28,23			2,24		0,54	33,11
34	MgZn5 cast			50%	161,81			118,50	13,06	5,62	286,32
35	foundries Fe/Cu/Zn				2,20	1,32	0,08	0,02	0,62		6,88
36	foundries Al				6,51	3,92	0,22	0,06	1,85		20,39
37	sheetmetal plant				15,13	9,11	0,52	0,14	4,30		47,41
38	sheetmetal scrap				11,98	4,91	0,02			0,06	180,17
39	pre-coating coil				313,91	83,36	42,64	19,00	384,00	19,00	406,56
40	powder coating				357,21	61,31	42,64	19,00	384,00	20,69	491,77
41	Cu/Ni/Cr plating				2759,00	2583,90		187,00	1742,00	58,07	20000,00
42	Au/Pt/Pd per g			25%	225,32	202,52				26,06	187500,00
43	LCD per m2 scrn				3563,69	2269,95		44,85	670,00	1,04	52,27
44	CRT per m2 scrn				3168,58	2130,63		290,22		49,26	2468,35

45	big caps & coils				383,28			34,66	55,00	19,60	600,54
46	slots / ext. ports				187,07	59,31		74,66	255,36	17,10	307,66
47	large IC				8021,88	7950,80				236,69	8788,78
48	small IC				1786,73	1744,15				66,93	1807,38
49	SMD/ LED's avg.				2968,86	2885,56		925,44		130,68	2830,92
50	PWB 1/2 lay 3.75kg/m2				281,06	150,52	8,53	170,04	76,80	1733,25	2625,35
51	PWB 6 lay 4.5 kg/m2				367,18	146,16	8,53	485,05	76,80	1891,79	4073,31
52	PWB 6 lay 2 kg/m2				487,89	332,93	11,51	403,32	103,68	4255,85	2334,66
53	Solder SnAg4Cu0.5				233,95	193,71		70,20		4,53	227,90
54	PWB assembly				128,00	3,00	5,00	12,00	36,00	4,00	107,00
55	Glass for lamps				16,22	12,93		8,24		0,27	13,53
56	Bitumen				48,00			6,00			
57	Cardboard			90%	28,00	2,00	16,00			0,35	52,32
58	Office paper				40,00	6,42	27,00			0,35	68,05
59	Concrete			na	1,04					0,01	0,33
60	per m3 CE&ICT				2962,25	2,84	28,38			26,20	1318,10
61	per m3 appliances				700,10	2,84				5,51	277,21
62	per product				51,50					1,02	51,36
63	per m3 retail product				499,59					6,40	322,25
64	per m3 installed product				312,17					3,51	176,53
65	per retail product				58,97					1,09	54,78
66	Electricity per MWh				9000,00	9000,00			400,00	142,00	4638,00
67	Electric, η 96%, per GJ				2604,17	2604,17			116,00	41,09	1342,01
68	Elec. GSHP, η 288%, GJ				868,06	868,06			39,00	13,70	447,34
69	Gas, η 86%, atmospheric				1162,79						
70	Gas, η 90%, atmosph.				1111,11						
71	Gas, η 101%, condens.				990,10			-14,00			
72	Gas, η 103%, condens.				970,87			-20,00			
73	Oil, η 85%, atmosph.				1176,47						
74	Oil, η 95%, condens.				1052,63			-14,00			
75	Wood pellets, η 85%.				1176,47						383,35
76	Wood pellets, η 88%.				1136,36						370,28
77	Wood logs, η 67%.				1492,54						433,98
78	Wood logs, η 74%.				1333,33						434,66
79	Extra for fossil fuel extraction & transport: Gas +7% (row 68-73) , Oil +10% (row 72-73), for Wood pellet										

80	Toner				50,00	2,00	25,00	4,00	81,00	2,00	158,00
81	Detergent dishw.				32,00			0,76		0,74	37,10
82	Rinsing agent dish				20,00			0,48		0,46	23,19
83	Regeneration Salt dishw				1,50			0,04		0,03	1,74
84	Water per m3				6,30	6,30		1388,00	0,28	0,10	3,25
85	Vacuum cl. bags			50%	16,60	1,00				0,02	38,66
86											
87	Mini-van diesel				2,41						
88	repair parts				1% of total						
89	Landfill				68,32						225,94
90	Dumped Hg										
91	Refrigerant										
92	Incinerated				67,00						
93	Plastics, re-use, recyc.										
94	Mass fraction available for EoL management (per materials category)= $recycmax^*$ (total mass product + auxiliaries incl. refrigerants), with $recycmax = 1/(1+r)^L$ where $r$ =growth rate; $L$ =product stock life. The remainder is the s										
95	Re-use: 75% credit of all impacts, related to re-used mass per materials category										
96	Recycling: 40% credit of all impacts, related to recycled mass per materials category. Exception for ferro and non-ferro metals, where credit is overall 65-80% per metal (fixed), further differentiated per halfproduct and ahead										
97	Recovery (heat): 30% credit of all impacts, related to heat recovery mass (plastics and others with feedstock energy)										
98	Controller board										
					2239,50	1814,14	0,07	421,87	34,25	97,48	2083,86

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Emissions to Air							to Water	
GWP	AD	VOC	POP	HM	PAH	PM	Metal	EUP
kg CO2eq	g SO2eq	mg	ng i-Teq	mg Ni eq	mg Ni eq	g	mg Hg/20eq	mg PO4 eq
-	-	-	-	-	-	-	-	-

Emissions to Air							to Water	
GWP	AD	VOC	POP	HM	PAH	PM	Metal	EUP
kg CO2eq	g SO2eq	mg	ng i-Teq	mg Ni eq	mg Ni eq	g	mg Hg/20eq	mg PO4 eq
-	-	-	-	-	-	-	-	-



kg CO2eq	g SO2eq	mg	ng i-Teq	mg Ni eq	mg Ni eq	g	mg Hg/20eq	mg PO4 eq

Emissions to Air							to Water	
GWP	AD	VOC	POP	HM	PAH	PM	Metal	EUP
kg CO2eq	g SO2eq	mg	ng i-Teq	mg Ni eq	mg Ni eq	g	mg Hg/20eq	mg PO4 eq
1,90	7,44	0,49			0,14	0,92		26,62
1,81	6,09	0,16			0,34	0,86		29,82
1,86	5,91	0,07			0,10	1,40		39,18
1,97	5,61	0,02			0,38	0,75		164,56
2,79	17,22				120,84	1,50		55,49
2,70	18,13				60,84	1,80		124,63
2,90	19,43				60,80	1,80		59,54
2,16	14,99				0,03	2,90	2,81	313,99
3,00	13,98				0,39	1,70		281,00

3,11	34,37	1,30		2,27	1,45	5,00	0,00	380,26
3,32	17,77				1,81	2,90	1,94	629,84
8,56	39,04	0,01			0,40	5,40	49,02	1872,28
5,39	25,43				0,36	6,70	0,16	504,02
6,00	43,57				0,01	5,10	2,80	2068,02
6,59	43,94				0,12	15,00	0,04	9649,81
4,17	30,99				20,20	7,36	43,20	3185,80
4,48	32,11				20,17	8,24	3,33	5685,59
0,61	3,07	0,00	0,03	0,08	0,63	0,06	0,03	0,15
3,36	29,18	0,00			0,06	8,14	47,34	3151,38
13,09	113,80	0,02			0,25	31,77	184,63	12290,37
2,27	9,77	0,00			0,01	1,51		23,88
2,83	7,47	0,14	26,00	3,54	0,07	2,71	3,55	65,17
1,38	3,59	0,12	12,00	2,59	0,03	1,00	1,57	38,33
1,06	3,23	0,12	6,00	1,98	0,01	14,00	0,91	26,23
4,24	11,20	0,20	39,00	36,00	0,10	4,06	2,00	79,00
6,21	56,02	0,14	7,70	148,31	0,03	7,91	86,37	2327,93
10,35	67,30	0,07	4,99	3,63	96,54	16,92	35,02	4,95
3,55	15,62	0,07	33,49	0,84	17,67	4,05	6,47	1,21
7,37	303,83	0,03	3,97	56,52	5,53	3,03	6,00	158,20
6,20	292,10	0,01	3,74	55,06	5,38	2,84	94,09	154,52
2,73	62,60	0,00	10,29	33,09	5,36	1,46	37,65	61,88
1,81	35,04	0,01	25,50	57,10	3,44	1,23	8,89	15,12
1,10	6,25	0,01	60,00	2,19	0,90	1,23	0,33	0,67
18,38	45,03	0,07	27,35	2,60	48,75	9,14	17,89	3,62
0,12	0,53	0,00			0,00	0,08		1,28
0,36	1,56	0,00			0,00	0,24		3,80
0,84	3,62	0,00			0,00	0,56		6,00
0,80	3,59	0,09	10,77	25,00	0,01	0,52	0,81	0,04
15,56	59,15	0,80	0,39	1,01	0,23	15,32	0,42	9651,62
17,81	62,95	0,03	0,48	1,26	0,26	15,40	0,51	9652,07
124,68	1675,92	3,15	396,52	1935,00	5,04	52,86	153,00	95004,40
17,74	344,23	0,00	0,02	127,54	0,01	12,76	0,02	0,08
184,32	58,52	0,42	0,30	0,77	0,09	0,25	0,28	1,54
171,34	1076,61	0,80	13,95	933,13		2828,03	13,91	723,48

21,67	141,82	0,12	2,16	7,66	204,65	35,61	74,23	7,14
10,03	184,36	0,01	1,40	38,00	1,93	12,96	31,80	6469,73
505,41	2787,34	69,01	48,84	446,58	14,69	72,85	3740,00	21481,08
115,11	816,19	13,80	9,79	185,01	2,95	24,16	9,63	4296,34
167,00	1620,47	7,48	14,99	421,73	4,52	50,83	14,74	2195,50
11,22	213,76	2,33	2,71	36,15	3,57	5,08	84,50	3686,44
15,69	395,99	1,03	5,09	70,06	6,89	37,04	125,44	2442,75
20,21	219,39	0,07	3,02	32,80	3,28	6,42	326,39	2845,08
11,60	64,51	0,07	1,29	3,34	1,87	1,37		6,04
9,00	49,00	2,00		1,00	3,00	15,00		709,00
0,83	3,00	0,00	0,08	0,18	0,00	0,06	0,04	0,36
0,51	3,43	7,98	0,02	8,74	0,11	259,00	4,32	292,01
0,70	1,04	0,00	0,01	0,03	0,00	0,01	0,01	86,06
0,58	5,02	0,20	0,04	0,11	0,01	1,66	0,04	5288,39
0,19	1,15	0,00	0,11	0,36	0,00	0,04	0,00	0,01
231,39	811,03	39,30	7,45	67,06	42,85	903,63	2,07	34,95
46,67	150,15	15,73	1,57	14,01	35,74	3204,06	0,45	7,35
4,52	12,16	0,05	0,29	2,62	2,62	0,26	0,08	1,36
29,31	83,54	5,03	1,82	16,43	8,50	214,73	0,50	8,55
18,60	49,65	4,91	1,00	9,00	8,25	214,02	0,28	4,68
4,03	12,74	0,04	0,31	2,79	0,09	0,27	0,09	1,45
384,18	1700,00	201,00	21,00	91,00	21,00	36,00	38,74	1700,00
111,16	491,90	58,16	6,08	26,33	6,08	10,42	11,21	491,90
37,05	163,97	19,39	2,03	8,78	2,03	3,47	3,74	163,97
64,29	18,72	0,85			0,03	0,33		
61,43	17,89	0,81			0,03	0,31		
54,74	15,94	0,72			0,03	0,28		
53,68	15,63	0,71			0,03	0,27		
87,76	109,93	1,52			0,06	1,86		
78,52	98,36	1,36			0,05	1,66		
0,66	105,24	19,41	1,39		27,93	19,90		
0,34	85,90	9,37	1,34		26,93	19,22		
3,27	105,14	93,22	1,57		33,74	22,84		
9,66	106,15	313,04	1,76		43,04	76,70		

2,00	8,00	0,05	3,00	13,00		7,00	1,00	100,00
1,40	8,24	0,01	0,21		0,06	0,18	0,21	53600,98
0,87	5,15	0,01	0,13		0,04	0,11	0,13	0,61
0,07	0,39	0,00	0,01		0,00	0,01	0,01	0,05
0,27	1,19	0,14	0,01	0,06	0,01	0,03	0,03	1,19
0,98	3,43	0,00	0,01	0,02	0,00	0,01	0,01	324,25
0,19	0,19	38,90		0,52	0,52	8,82		
5,10	9,68	0,28	8,43	20,00		88,95	5,68	324,58
				5000,00				
5,02	10,00	0,14		18,00		85,00	5,70	325,00
<b>surplus(deficit) 'in stock', i.e. in use or stored with users.</b>								
<b>ly included in production impact.</b>								
125,42	994,05	4,59	11,01	427,33	51,24	821,30	106,40	2040,09

\* information contained therein.



Material	production method
1-BlkPlastics	1 -LDPE
1-BlkPlastics	2 -HDPE
1-BlkPlastics	2,5 -HDPE (recycled)
1-BlkPlastics	3 -LLDPE
1-BlkPlastics	4 -PP
1-BlkPlastics	5 -PS
1-BlkPlastics	6 -EPS
1-BlkPlastics	7 -HI-PS
1-BlkPlastics	8 -PVC
1-BlkPlastics	8,5 -PVC (recycled)
1-BlkPlastics	9 -SAN
1-BlkPlastics	10 -PET
1-BlkPlastics	10,5 -PET (recycled)
1-BlkPlastics	11 -ABS
2-TecPlastics	12 -PA 6
2-TecPlastics	13 -PC
2-TecPlastics	14 -PMMA
2-TecPlastics	15 -Epoxy
2-TecPlastics	16 -Rigid PUR
2-TecPlastics	17 -Flex PUR
2-TecPlastics	18 -Talcum filler
2-TecPlastics	19 -E-glass fibre
2-TecPlastics	20 -Aramid fibre
3-Ferro	22 -St sheet galv.
3-Ferro	23 -St tube/profile
3-Ferro	24 -Cast iron
3-Ferro	25 -Ferrite
3-Ferro	26 -Stainless 18/8 coil
4-Non-ferro	27 -Al sheet/extrusion
4-Non-ferro	28 -Al diecast
4-Non-ferro	29 -Cu winding wire
4-Non-ferro	30 -Cu wire
4-Non-ferro	31 -Cu tube/sheet
4-Non-ferro	32 -CuZn38 cast
4-Non-ferro	33 -ZnAl4 cast
4-Non-ferro	34 -MgZn5 cast
5-Coating	39 -pre-coating coil
5-Coating	40 -powder coating
5-Coating	41 -Cu/Ni/Cr plating
5-Coating	42 -Au/Pt/Pd
6-Electronics	43 -LCD per m2 scrn
6-Electronics	44 -CRT per m2 scrn
6-Electronics	45 -big caps & coils
6-Electronics	46 -slots / ext. ports
6-Electronics	47 -IC's avg., 5% Si, Au
6-Electronics	48 -IC's avg., 1% Si
6-Electronics	49 -SMD/ LED's avg.

Materials
1-BlkPlastics
2-TecPlastics
3-Ferro
4-Non-ferro
5-Coating
6-Electronics
7-Misc.
8-Extra



10-Energy	69 -Gas, atmospheric 86
10-Energy	70 -Gas, atmospheric 90
10-Energy	71 -Gas, condensing 101
10-Energy	72 -Gas, condensing 103
10-Energy	73 -Oil, atmospheric 85
10-Energy	74 -Oil, condensing 95
10-Energy	75 -Wood pellets 85
10-Energy	76 -Wood pellets 88
10-Energy	77 -Wood logs, low eff. 67
10-Energy	78 -Wood logs, higher eff. 74
NAME	"Refrigerants"
11-Refrig	1 -none; 0000
11-Refrig	2 -R134a; HFC; 1430
11-Refrig	3 -R404a; HFC blend; 3920
11-Refrig	4 -R407c; HFC blend; 1770
11-Refrig	5 -R410a; HFC blend; 2090
11-Refrig	6 -R290; propane; 3
11-Refrig	7 -R600a; iso-butane; 3
11-Refrig	8 -R744; CO2; 1
11-Refrig	9 -R717; ammonia; 0000
11-Refrig	

**Materials & Energy**  
**UNIT INDICATORS**

<b>Plastics in KG</b>	1	LDPE
	2	HDPE
	2,5	HDPE (recycled)
	3	LLDPE
	4	PP
	5	PS
	6	EPS
	7	HI-PS
	8	PVC
	8,5	PVC (recycled)
	9	SAN
	10	PET
	10,5	PET (recycled)
	11	ABS
	12	PA 6
	13	PC
	14	PMMA
15	Epoxy	
16	Rigid PUR	
17	Flex PUR	
Plastics fillers, reinforcements, additives	18	Talcum filler
	19	E-glass fibre
	20	Aramid fibre
OEM Manufacturing	21	all plastic parts
<b>Metals in KG</b>	22	St sheet galv.
	23	St tube/profile
	24	Cast iron
	25	Ferrite
	26	Stainless 18/8 coil
	27	Al sheet/extrusion
	28	Al diecast
	29	Cu winding wire
	30	Cu wire
	31	Cu tube/sheet
	32	CuZn38 cast
	33	ZnAl4 cast
	34	MgZn5 cast
	OEM Manufacturing	35
36		foundries Al
37		sheetmetal plant
38		sheetmetal scrap
Coating/plating KG	39	pre-coating coil

<b>Electronics KG</b>	40	powder coating
	41	Cu/Ni/Cr plating
	42	Au/Pt/Pd per g
	43	LCD per m2 scrn
	44	CRT per m2 scrn
	45	big caps & coils
	46	slots / ext. ports
	47	large IC
	48	small IC
	49	SMD/ LED's avg.
	50	PWB 1/2 lay 3.75kg/m2
	51	PWB 6 lay 4.5 kg/m2
	52	PWB 6 lay 2 kg/m2
	53	Solder SnAg4Cu0.5
54	PWB assembly	
<b>Miscellaneous</b>	55	Glass for lamps
	56	Bitumen
	57	Cardboard
	58	Office paper
	59	Concrete
<b>Final Assembly</b>	60	per m3 CE&ICT
	61	per m3 appliances
	62	per product
<b>Distribution &amp; Retail</b>	63	per m3 retail product
	64	per m3 installed product
	65	per retail product
<b>Use: Energy per MWh Electric</b>	66	Electricity per MWh
	67	Electric, $\eta$ 96%, per GJ
	68	Elec. GSHP, $\eta$ 288%, GJ
	69	Gas, $\eta$ 86%, atmospheric
	70	Gas, $\eta$ 90%, atmosph.
	71	Gas, $\eta$ 101%, condens.
	72	Gas, $\eta$ 103%, condens.
	73	Oil, $\eta$ 85%, atmosph.
	74	Oil, $\eta$ 95%, condens.

	75	Wood pellets, $\eta$ 85%.	
	76	Wood pellets, $\eta$ 88%.	
	77	Wood logs, $\eta$ 67%.	
	78	Wood logs, $\eta$ 74%.	
	79	Extra for fossil fuel extraction & transport: Gas +7%	
<b>Use Consumables per KG</b>	80	Toner	
	81	Detergent dishw.	
	82	Rinsing agent dish	
	83	Regeneration Salt dishw	
	84	Water per m3	
	85	Vacuum cl. bags	
	86		
	<b>Use: Maintenance</b>	87	Mini-van diesel
	88	repair parts	
<b>Disposal: Env. Costs per kg final product</b>	89	Landfill	
	90	Dumped Hg	
	91	Refrigerant	
	92	Incinerated	
	93	Plastics, re-use, recyc.	
<b>Disposal: Env Benefits of Re-use</b>	94	stock', i.e. in use or stored with users.	
	95	Re-use: 75% credit of all impacts, related to re-used	
	96	Recycling: 40% credit of all impacts, related to recyc production impact.	
	97	Recovery (heat): 30% credit of all impacts, related to	
	99	Recyclability: best/>avg/avg (basecase)/<avg/worst	
	98	Controller board	
	100	Office paper (from recycled paper)	
	101	Office paper (from primary cellulose)	
	102		0
	103		0
	104		0
	105		0
	106		0
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	Primary Energy (MJ)	energy (MJ)	fd(MJ)	water proces	Water cool	waste haz	waste non	GWP
0%	77,80	13,31	51,54	3,00	45,00	4,45	44,19	1,90
0%	76,56	9,83	54,10	3,40	31,00	5,44	38,34	1,81
0%	9,44	1,76		3,91		0,00	0,08	0,67
0%	73,98	10,17	47,45	2,40	116,00	3,37	30,73	1,86
0%	72,69	7,26	52,72	4,80	40,00	4,43	28,14	1,97
0%	86,73	3,62	47,53	4,90	177,00	0,69	21,84	2,79
0%	83,66	3,38	47,81	5,70	176,00	0,93	37,85	2,70
0%	92,23	4,67	49,13	5,50	186,00	0,64	30,05	2,90
0%	56,61	11,11	22,93	11,00	62,00	5,00	67,09	2,16
0%	26,00			69,20				2,06
0%	89,40	3,82	47,17	6,10	163,00	4,10	31,56	3,00
0%	78,80	13,37	38,83	7,30	36,00	1,60	92,15	3,11
0%	11,92	1,66		4,80		0,00	0,22	0,80
0%	95,02	6,95	45,77	9,30	165,00	10,00	91,93	3,32
0%	119,51	15,13	38,91	16,00	219,00	19,00	176,27	8,56
0%	116,81	14,86	37,99	14,00	114,00	10,00	176,55	5,39
0%	110,19	13,08	41,82	9,80	26,00	1,40	104,77	6,00
0%	140,71	24,56	42,64	19,00	384,00	19,00	406,56	6,59
0%	104,26	17,46	38,67	60,00	301,00	19,59	427,17	4,17
0%	104,46	18,72	39,79	70,00	298,00	32,39	548,77	4,48
	10,14	0,00	0,00	0,12	0,00	0,11	5,72	0,61
	65,83	21,09	10,79	54,30	271,30	7,05	311,22	3,36
	256,73	82,24	42,10	211,77	1058,09	27,51	1213,75	13,09
	40,85	24,59	1,41	0,37	11,60	0,00	128,00	2,27
5%	33,73	2,28	0,07	0,00	0,00	0,00	1721,52	2,83
50%	16,57	4,57	-0,16	0,00	0,00	0,00	800,69	1,38
85%	9,82	0,13	-0,06	1,30	3,66	0,00	315,36	1,06
	50,60	3,42	0,11	39,33	0,00	0,00	2582,28	4,24
63%	62,04	9,69	4,05	75,74	8,44	0,00	1000,00	6,21
11%	192,62	0,00	0,00	0,00	0,00	0,00	360,00	10,35
85%	55,14	0,00	0,00	0,00	0,00	0,00	150,00	3,55
0%	142,72	0,00	0,00	0,00	0,00	0,80	40,17	7,37
0%	116,55	0,00	0,00	0,00	0,00	0,24	12,17	6,20
60%	50,92	0,00	0,00	0,00	0,00	0,00	13,97	2,73
85%	38,45	0,00	0,00	0,00	0,00	0,45	43,12	1,81
85%	28,23	0,00	0,00	2,24	0,00	0,54	33,11	1,10
0,5	161,81	0,00	0,00	118,50	13,06	5,62	286,32	18,38
	2,20	1,32	0,08	0,02	0,62	0,00	6,88	0,12
	6,51	3,92	0,22	0,06	1,85	0,00	20,39	0,36
	15,13	9,11	0,52	0,14	4,30	0,00	47,41	0,84
	11,98	4,91	0,02	0,00	0,00	0,06	180,17	0,80
0%	313,91	83,36	42,64	19,00	384,00	19,00	406,56	15,56

0%	<b>357,21</b>	61,31	42,64	<b>19,00</b>	384,00	<b>20,69</b>	491,77	<b>17,81</b>
0%	<b>2759,00</b>	2583,90	0,00	<b>187,00</b>	1742,00	<b>58,07</b>	20000,00	<b>124,68</b>
0,25	<b>225,32</b>	202,52	0,00	<b>0,00</b>	0,00	<b>26,06</b>	#####	<b>17,74</b>
	<b>3563,69</b>	2269,95	0,00	<b>44,85</b>	670,00	<b>1,04</b>	52,27	<b>184,32</b>
	<b>3168,58</b>	2130,63	0,00	<b>290,22</b>	0,00	<b>49,26</b>	2468,35	<b>171,34</b>
	<b>383,28</b>	0,00	0,00	<b>34,66</b>	55,00	<b>19,60</b>	600,54	<b>21,67</b>
	<b>187,07</b>	59,31	0,00	<b>74,66</b>	255,36	<b>17,10</b>	307,66	<b>10,03</b>
	<b>8021,88</b>	7950,80	0,00	<b>0,00</b>	0,00	<b>236,69</b>	8788,78	<b>505,41</b>
	<b>1786,73</b>	1744,15	0,00	<b>0,00</b>	0,00	<b>66,93</b>	1807,38	<b>115,11</b>
	<b>2968,86</b>	2885,56	0,00	<b>925,44</b>	0,00	<b>130,68</b>	2830,92	<b>167,00</b>
	<b>281,06</b>	150,52	8,53	<b>170,04</b>	76,80	<b>1733,25</b>	2625,35	<b>11,22</b>
	<b>367,18</b>	146,16	8,53	<b>485,05</b>	76,80	<b>1891,79</b>	4073,31	<b>15,69</b>
	<b>487,89</b>	332,93	11,51	<b>403,32</b>	103,68	<b>4255,85</b>	2334,66	<b>20,21</b>
	<b>233,95</b>	193,71	0,00	<b>70,20</b>	0,00	<b>4,53</b>	227,90	<b>11,60</b>
	<b>128,00</b>	3,00	5,00	<b>12,00</b>	36,00	<b>4,00</b>	107,00	<b>9,00</b>
0%	<b>16,22</b>	12,93	0,00	<b>8,24</b>	0,00	<b>0,27</b>	13,53	<b>0,83</b>
0%	<b>48,00</b>	0,00	0,00	<b>6,00</b>	0,00	<b>0,00</b>	0,00	<b>0,51</b>
90%	<b>28,00</b>	2,00	16,00	<b>0,00</b>	0,00	<b>0,35</b>	52,32	<b>0,70</b>
0%	<b>40,00</b>	6,42	27,00	<b>0,00</b>	0,00	<b>0,35</b>	68,05	<b>0,58</b>
na	<b>1,04</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,01</b>	0,33	<b>0,19</b>
	<b>2962,25</b>	2,84	28,38	<b>0,00</b>	0,00	<b>26,20</b>	1318,10	<b>231,39</b>
	<b>700,10</b>	2,84	0,00	<b>0,00</b>	0,00	<b>5,51</b>	277,21	<b>46,67</b>
	<b>51,50</b>	0,00	0,00	<b>0,00</b>	0,00	<b>1,02</b>	51,36	<b>4,52</b>
	<b>499,59</b>	0,00	0,00	<b>0,00</b>	0,00	<b>6,40</b>	322,25	<b>29,31</b>
	<b>312,17</b>	0,00	0,00	<b>0,00</b>	0,00	<b>3,51</b>	176,53	<b>18,60</b>
	<b>58,97</b>	0,00	0,00	<b>0,00</b>	0,00	<b>1,09</b>	54,78	<b>4,03</b>
	<b>9000,00</b>	9000,00	0,00	<b>0,00</b>	400,00	<b>142,00</b>	4638,00	<b>384,18</b>
	<b>2604,17</b>	2604,17	0,00	<b>0,00</b>	116,00	<b>41,09</b>	1342,01	<b>111,16</b>
	<b>868,06</b>	868,06	0,00	<b>0,00</b>	39,00	<b>13,70</b>	447,34	<b>37,05</b>
	<b>1162,79</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>64,29</b>
	<b>1111,11</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>61,43</b>
	<b>990,10</b>	0,00	0,00	<b>-14,00</b>	0,00	<b>0,00</b>	0,00	<b>54,74</b>
	<b>970,87</b>	0,00	0,00	<b>-20,00</b>	0,00	<b>0,00</b>	0,00	<b>53,68</b>
	<b>1176,47</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>87,76</b>
	<b>1052,63</b>	0,00	0,00	<b>-14,00</b>	0,00	<b>0,00</b>	0,00	<b>78,52</b>

	<b>1176,47</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	383,35	<b>0,66</b>	
	<b>1136,36</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	370,28	<b>0,34</b>	
	<b>1492,54</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	433,98	<b>3,27</b>	
	<b>1333,33</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	434,66	<b>9,66</b>	
<b>(row 68-73) , Oil +10% (row 72-73), for Wood pellets and logs add 5% of row 72</b>									
	<b>50,00</b>	2,00	25,00	<b>4,00</b>	81,00	<b>2,00</b>	158,00	<b>2,00</b>	
	<b>32,00</b>	0,00	0,00	<b>0,76</b>	0,00	<b>0,74</b>	37,10	<b>1,40</b>	
	<b>20,00</b>	0,00	0,00	<b>0,48</b>	0,00	<b>0,46</b>	23,19	<b>0,87</b>	
	<b>1,50</b>	0,00	0,00	<b>0,04</b>	0,00	<b>0,03</b>	1,74	<b>0,07</b>	
	<b>6,30</b>	6,30	0,00	<b>1388,00</b>	0,28	<b>0,10</b>	3,25	<b>0,27</b>	
50%	<b>16,60</b>	1,00	0,00	<b>0,00</b>	0,00	<b>0,02</b>	38,66	<b>0,98</b>	
	<b>2,41</b>	0,00	0,00	0,00	<b>0,00</b>	<b>0,00</b>	<b>0,00</b>	<b>0,19</b>	
<b>and distribution of the product</b>									
	<b>68,32</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	225,94	<b>5,10</b>	
	<b>0,00</b>	0,00	0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	
								<b>0</b>	
	<b>67,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>5,02</b>	
	<b>6,51</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	3,24	<b>0,44</b>	

**Recycled mass per materials category**

**Recycled mass per materials category. Exception for ferro and non-ferro metals, where credit is overall 65%**

**Recycled heat recovery mass (plastics and others with feedstock energy)**

**(per materials category) with credit on recycled mass +10%/+5%/0/-5%/-10% (also for metals)**

	<b>2239,50</b>	1814,14	0,07	<b>421,87</b>	34,25	<b>97,48</b>	2083,86	<b>125,42</b>
<b>0,00</b>	<b>15,14</b>	3,81	0,00	<b>20,46</b>	0,00	<b>0,00</b>	0,00	<b>0,93</b>
<b>0,00</b>	<b>39,71</b>	1,80	0,00	<b>52,23</b>	0,00	<b>0,00</b>	0,02	<b>1,20</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>
<b>0,00</b>	<b>0,00</b>	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	0,00	<b>0,00</b>





AD	VOC	POP	Hma	PAH	PM	HMw	EP
7,44	0,49	0,00	0,00	0,14	0,92	0,00	26,62
6,09	0,16	0,00	0,00	0,34	0,86	0,00	29,82
0,00	0,00		0,00	0,00	0,05	0,00	0,06
5,91	0,07	0,00	0,00	0,10	1,40	0,00	39,18
5,61	0,02	0,00	0,00	0,38	0,75	0,00	164,56
17,22	0,00	0,00	0,00	120,84	1,50	0,00	55,49
18,13	0,00	0,00	0,00	60,84	1,80	0,00	124,63
19,43	0,00	0,00	0,00	60,80	1,80	0,00	59,54
14,99	0,00	0,00	0,00	0,03	2,90	2,81	313,99
1,67							1,84
13,98	0,00	0,00	0,00	0,39	1,70	0,00	281,00
34,37	1,30	0,00	2,27	1,45	5,00	0,00	380,26
0,00	0,04		0,03	0,00	0,04	0,00	2,06
17,77	0,00	0,00	0,00	1,81	2,90	1,94	629,84
39,04	0,01	0,00	0,00	0,40	5,40	49,02	1872,28
25,43	0,00	0,00	0,00	0,36	6,70	0,16	504,02
43,57	0,00	0,00	0,00	0,01	5,10	2,80	2068,02
43,94	0,00	0,00	0,00	0,12	15,00	0,04	9649,81
30,99	0,00	0,00	0,00	20,20	7,36	43,20	3185,80
32,11	0,00	0,00	0,00	20,17	8,24	3,33	5685,59
3,07	0,00	0,03	0,08	0,63	0,06	0,03	0,15
29,18	0,00	0,00	0,00	0,06	8,14	47,34	3151,38
113,80	0,02	0,00	0,00	0,25	31,77	184,63	12290,37
9,77	0,00	0,00	0,00	0,01	1,51	0,00	23,88
7,47	0,14	26,00	3,54	0,07	2,71	3,55	65,17
3,59	0,12	12,00	2,59	0,03	1,00	1,57	38,33
3,23	0,12	6,00	1,98	0,01	14,00	0,91	26,23
11,20	0,20	39,00	36,00	0,10	4,06	2,00	79,00
56,02	0,14	7,70	148,31	0,03	7,91	86,37	2327,93
67,30	0,07	4,99	3,63	96,54	16,92	35,02	4,95
15,62	0,07	33,49	0,84	17,67	4,05	6,47	1,21
303,83	0,03	3,97	56,52	5,53	3,03	6,00	158,20
292,10	0,01	3,74	55,06	5,38	2,84	94,09	154,52
62,60	0,00	10,29	33,09	5,36	1,46	37,65	61,88
35,04	0,01	25,50	57,10	3,44	1,23	8,89	15,12
6,25	0,01	60,00	2,19	0,90	1,23	0,33	0,67
45,03	0,07	27,350	2,600	48,752	9,14	17,89	3,62
0,53	0,00	0,000	0,000	0,001	0,08	0,00	1,28
1,56	0,00	0,000	0,000	0,002	0,24	0,00	3,80
3,62	0,00	0,00	0,00	0,00	0,56	0,00	6,00
3,59	0,09	10,77	25,00	0,01	0,52	0,81	0,04
59,15	0,80	0,39	1,01	0,23	15,32	0,42	9651,62

62,95	<b>0,03</b>	0,48	<b>1,26</b>	0,26	15,40	<b>0,51</b>	9652,07	
1675,92	<b>3,15</b>	396,52	<b>1935,00</b>	5,04	52,86	<b>153,00</b>	95004,40	
344,23	<b>0,00</b>	0,02	<b>127,54</b>	0,01	12,76	<b>0,02</b>	0,08	
58,52	<b>0,42</b>	0,30	<b>0,77</b>	0,09	0,25	<b>0,28</b>	1,54	
1076,61	<b>0,80</b>	13,95	<b>933,13</b>	0,00	2828,03	<b>13,91</b>	723,48	
141,82	<b>0,12</b>	2,16	<b>7,66</b>	204,65	35,61	<b>74,23</b>	7,14	
184,36	<b>0,01</b>	1,40	<b>38,00</b>	1,93	12,96	<b>31,80</b>	6469,73	
2787,34	<b>69,01</b>	48,84	<b>446,58</b>	14,69	72,85	<b>3740,00</b>	21481,08	
816,19	<b>13,80</b>	9,79	<b>185,01</b>	2,95	24,16	<b>9,63</b>	4296,34	
1620,47	<b>7,48</b>	14,99	<b>421,73</b>	4,52	50,83	<b>14,74</b>	2195,50	
213,76	<b>2,33</b>	2,71	<b>36,15</b>	3,57	5,08	<b>84,50</b>	3686,44	
395,99	<b>1,03</b>	5,09	<b>70,06</b>	6,89	37,04	<b>125,44</b>	2442,75	
219,39	<b>0,07</b>	3,02	<b>32,80</b>	3,28	6,42	<b>326,39</b>	2845,08	
64,51	<b>0,07</b>	1,29	<b>3,34</b>	1,87	1,37	<b>0,00</b>	6,04	
49,00	<b>2,00</b>	0,00	<b>1,00</b>	3,00	15,00	<b>0,00</b>	709,00	
3,00	<b>0,00</b>	0,08	<b>0,18</b>	0,00	0,06	<b>0,04</b>	0,36	
3,43	<b>7,98</b>	0,02	<b>8,74</b>	0,11	259,00	<b>4,32</b>	292,01	
1,04	<b>0,00</b>	0,01	<b>0,03</b>	0,00	0,01	<b>0,01</b>	86,06	
5,02	<b>0,20</b>	0,04	<b>0,11</b>	0,01	1,66	<b>0,04</b>	5288,39	
1,15	<b>0,00</b>	0,11	<b>0,36</b>	0,00	0,04	<b>0,00</b>	0,01	
811,03	<b>39,30</b>	7,45	<b>67,06</b>	42,85	903,63	<b>2,07</b>	34,95	
150,15	<b>15,73</b>	1,57	<b>14,01</b>	35,74	3204,06	<b>0,45</b>	7,35	
12,16	<b>0,05</b>	0,29	<b>2,62</b>	2,62	0,26	<b>0,08</b>	1,36	
83,54	<b>5,03</b>	1,82	<b>16,43</b>	8,50	214,73	<b>0,50</b>	8,55	
49,65	<b>4,91</b>	1,00	<b>9,00</b>	8,25	214,02	<b>0,28</b>	4,68	
12,74	<b>0,04</b>	0,31	<b>2,79</b>	0,09	0,27	<b>0,09</b>	1,45	
1700,00	<b>201,00</b>	21,00	<b>91,00</b>	21,00	36,00	<b>38,74</b>	1700,00	
491,90	<b>58,16</b>	6,08	<b>26,33</b>	6,08	10,42	<b>11,21</b>	491,90	
163,97	<b>19,39</b>	2,03	<b>8,78</b>	2,03	3,47	<b>3,74</b>	163,97	
18,72	<b>0,85</b>	0,00	<b>0,00</b>	0,03	0,33	<b>0,00</b>	0,00	
17,89	<b>0,81</b>	0,00	<b>0,00</b>	0,03	0,31	<b>0,00</b>	0,00	
15,94	<b>0,72</b>	0,00	<b>0,00</b>	0,03	0,28	<b>0,00</b>	0,00	
15,63	<b>0,71</b>	0,00	<b>0,00</b>	0,03	0,27	<b>0,00</b>	0,00	
109,93	<b>1,52</b>	0,00	<b>0,00</b>	0,06	1,86	<b>0,00</b>	0,00	
98,36	<b>1,36</b>	0,00	<b>0,00</b>	0,05	1,66	<b>0,00</b>	0,00	

105,24	<b>19,41</b>	1,39	<b>0,00</b>	27,93	19,90	<b>0,00</b>	0,00	
85,90	<b>9,37</b>	1,34	<b>0,00</b>	26,93	19,22	<b>0,00</b>	0,00	
105,14	<b>93,22</b>	1,57	<b>0,00</b>	33,74	22,84	<b>0,00</b>	0,00	
106,15	<b>313,04</b>	1,76	<b>0,00</b>	43,04	76,70	<b>0,00</b>	0,00	
8,00	<b>0,05</b>	3,00	<b>13,00</b>	0,00	7,00	<b>1,00</b>	100,00	
8,24	<b>0,01</b>	0,21	<b>0,00</b>	0,06	0,18	<b>0,21</b>	53600,98	
5,15	<b>0,01</b>	0,13	<b>0,00</b>	0,04	0,11	<b>0,13</b>	0,61	
0,39	<b>0,00</b>	0,01	<b>0,00</b>	0,00	0,01	<b>0,01</b>	0,05	
1,19	<b>0,14</b>	0,01	<b>0,06</b>	0,01	0,03	<b>0,03</b>	1,19	
3,43	<b>0,00</b>	0,01	<b>0,02</b>	0,00	0,01	<b>0,01</b>	324,25	
0,19	<b>38,90</b>	0,00	<b>0,52</b>	0,52	8,82	<b>0,00</b>	0,00	
9,68	0,28	8,43	20,00	0,00	<b>88,95</b>	5,68	<b>324,58</b>	
0,00	0,00	0,00	5000,00	0,00	0,00	0,00	0,00	
10,00	0,14	0,00	18,00	0,00	<b>85,00</b>	5,70	<b>325,00</b>	
1,52	0,13	0,00	1,00	0,00	<b>30,32</b>	0,00	<b>0,00</b>	
<b>30% per metal (fixed), further differentiated per halfproduct and already included in</b>								
994,05	4,59	11,01	427,33	51,24	<b>821,30</b>	106,40	<b>2040,09</b>	
2,57	0,00	0,00	0,00	0,00	<b>2,45</b>	0,00	<b>0,35</b>	
9,09	0,00	0,00	0,00	0,00	<b>8,45</b>	0,00	<b>0,74</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	
0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	<b>0,00</b>	







conditions for DSUM -->

- Cat
- 1-BlkPlastics
- Cat
- 2-TecPlastics
- Cat
- 3-Ferro
- Cat
- 4-Non-ferro
- Cat
- 5-coating
- Cat
- 6-Electronics
- Cat
- 7-Misc.
- Cat
- 8-Extra

ERROR-CHECKED TABLE FROM Uitreken sheet

1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0

30	0	0	0
31	0	0	0
32	0	0	0
33	0	0	0
34	0	0	0
35	0	0	0
36	0	0	0
37	0	0	0
38	0	0	0
39	0	0	0
40	0	0	0
41	0	0	0
42	0	0	0
43	0	0	0
44	0	0	0
45	0	0	0
46	0	0	0
47	0	0	0
48	0	0	0
49	0	0	0
50	0	0	0
51	0	0	0
52	0	0	0
53	0	0	0
54	0	0	0
55	0	0	0
56	0	0	0
57	0	0	0
58	0	0	0
59	0	0	0
60	0	0	0
61	0	0	0
62	0	0	0
63	0	0	0
64	0	0	0
65	0	0	0
66	0	0	0
67	0	0	0
68	0	0	0
69	0	0	0
70	0	0	0
71	0	0	0
72	0	0	0
73	0	0	0
74	0	0	0
75	0	0	0
76	0	0	0
77	0	0	0

78	0	0	0
79	0	0	0
80	0	0	0
81	0	0	0
82	0	0	0
83	0	0	0
84	0	0	0
85	0	0	0
86	0	0	0
87	0	0	0
88	0	0	0
89	0	0	0
90	0	0	0
91	0	0	0
92	0	0	0
93	0	0	0
94	0	0	0
95	0	0	0
96	0	0	0
97	0	0	0
98	0	0	0
99	0	0	0
100	0	0	0
101	0	0	0
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103	0	0	0
104	0	0	0
105	0	0	0
106	0	0	0
107	0	0	0
108	0	0	0
109	0	0	0
110	0	0	0
111	0	0	0
112	0	0	0
113	0	0	0
114	0	0	0
115	0	0	0
116	0	0	0
117	0	0	0
118	0	0	0
119	0	0	0
120	0	0	0
121	0	0	0
122	0	0	0
123	0	0	0
124	0	0	0
125	0	0	0

126	0	0	0
127	0	0	0
128	0	0	0
129	0	0	0
130	0	0	0
131	0	0	0
132	0	0	0
133	0	0	0
134	0	0	0
135	0	0	0
136	0	0	0
137	0	0	0
138	0	0	0
139	0	0	0
140	0	0	0
141	0	0	0
142	0	0	0
143	0	0	0
144	0	0	0
145	0	0	0
146	0	0	0
147	0	0	0
148	0	0	0
149	0	0	0
150	0	0	0
151	0	0	0
152	0	0	0
153	0	0	0
154	0	0	0
155	0	0	0
156	0	0	0
157	0	0	0
158	0	0	0
159	0	0	0
160	0	0	0
161	0	0	0
162	0	0	0
163	0	0	0
164	0	0	0
165	0	0	0
166	0	0	0
167	0	0	0
168	0	0	0
169	0	0	0
170	0	0	0
171	0	0	0
172	0	0	0
173	0	0	0

174	0	0	0
175	0	0	0
176	0	0	0
177	0	0	0
178	0	0	0
179	0	0	0
180	0	0	0
181	0	0	0
182	0	0	0
183	0	0	0
184	0	0	0
185	0	0	0
186	0	0	0
187	0	0	0
188	0	0	0
189	0	0	0
190	0	0	0
191	0	0	0
192	0	0	0
193	0	0	0
194	0	0	0
195	0	0	0
196	0	0	0
197	0	0	0
198	0	0	0
199	0	0	0
200	0	0	0
Totals PRODUCTION		0	
<b>MANUFACTURING</b>			
<b>Totals</b>			
<b>DISTRIBUTION</b>			
<b>Totals</b>			
<b>USE PHASE</b>			
Energy			
Consumables		0	
of which			
- water (in m3)		0	
- refrigerants, weight in g		0	
- auxiliaries, weight in g		0	
Maintenance		0	
<b>Totals USE PHASE</b>		0	

mass ratio

#DIV/0!	1
#DIV/0!	2
#DIV/0!	3
#DIV/0!	4
#DIV/0!	5
#DIV/0!	6
#DIV/0!	7
#DIV/0!	7a
#DIV/0!	7b
#DIV/0!	8
#DIV/0!	9a
#DIV/0!	9b
#DIV/0!	10

1 mg Hg= 5 mg Ni eq. (HMa)











0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
	0				
	0				
	0				
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
0	0	0,00	0,00	0,00	0,00
	0				
	0	0,00	0,00	0,00	0,00
	weight	GER	electr	feedst	water (proces)
		0,00	0,00	0,00	0,00
		0,00	0,00	0,00	0,00
		0,00	0,00	0,00	0,00
	0	0,00	0,00	0,00	0,00
		0,00	0,00	0,00	0,00
	0	0,00	0,00	0,00	0,00
	0	0,00	0,00	0,00	0,00
	0	0,00	0,00	0,00	0,00
	0	0,00	0,00	0,00	0,00

<i>column nr.</i>	9	10	11	12	13
<b>row</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

**Calculating impacts per materials fraction**

	weight	GER	electr	feedst	water (proces)
	g	MJ	MJ	MJ	ltr.
Bulk Plastics	0	0,00	0,00	0,00	0,00
TecPlastics	0	0,00	0,00	0,00	0,00
Ferro	0	0,00	0,00	0,00	0,00
Non-ferro	0	0,00	0,00	0,00	0,00
Coating	0	0,00	0,00	0,00	0,00
Electronics	0	0,00	0,00	0,00	0,00
Misc.	0	0,00	0,00	0,00	0,00
Misc. excl. refrigerant	0	0,00	0,00	0,00	0,00
Refrigerant	0	0,00	0,00	0,00	0,00
Extra	0	0,00	0,00	0,00	0,00
Aux (incl. water except weigl	0	0,00	0,00	0,00	0,00
Refrigerant refill	0	0	0	0	0
Maintenance	0	0	0	0	0
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<i>of which refigant total</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>of which mercury total</i>	<i>0,0000</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<b>Subtotals needed for MANUFACTURING</b>					
Fe/Cu/Zn foundries	0	0,00	0,00	0,00	0,00
Al/Mg foundries	0	0,00	0,00	0,00	0,00
sheetmetal	0	0,00	0,00	0,00	0,00
tube & wire	0	0,00	0,00	0,00	0,00
Controller board	0	0	0	0	0
Displays	0	0,00	0,00	0,00	0,00
PWB assembly	0	0	0	0	0













14 15 16 17 18 19 20  
 8 9 10 11 12 13 14

calculation HMA subtotals for e:  
 CRT, bitumen, stainless  
 electricity & copper

water (cool)	haz. Waste	non-haz. Waste	GWP	AD	VOC	POP
ltr.	g	g	kg CO2eq	g SO2eq	mg	ng i-Teq
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0	0	0	0	0	0	0
0	0	0	0	0	0	0
<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0	0	0	0	0	0	0
0,00	0,00	0,00	0,00	0,00	0,00	0,00
0	0	0	0	0	0	0













	21	22	23	24	25
	15	16	17	18	19
External damages LCC					
	0,00				
	0,00				

HMa	PAH	PM	HMw	EUP
mg Ni eq	mg Ni eq	g	mg Hg/20eq	mg PO4 eq
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0	0	0	0	0
0	0	0	0	0
<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00
0	0	0	0	0
0,00	0,00	0,00	0,00	0,00
0	0	0	0	0

2239,50	1814,14	0,07	421,87	34,25	97,48	2083,86	125,42	994,05
72,69	7,26	52,72	4,80	40,00	4,43	28,14	1,97	17,77
1039,10	1009,95	0,00	323,90	0,00	45,74	990,82	58,45	567,16
91,99	0,00	0,00	8,32	13,20	4,70	144,13	5,20	34,04
887,20	596,58	0,00	81,26	0,00	13,79	691,14	47,97	301,45
14,97	4,74	0,00	5,97	20,43	1,37	24,61	0,80	14,75
160,44	159,02	0,00	0,00	0,00	4,73	175,78	10,11	55,75
42,88	41,86	0,00	0,00	0,00	1,61	43,38	2,76	19,59
2,93	2,00	0,07	2,42	0,62	25,54	14,01	0,12	1,32

PWB	ext. ports	caps & coils	largeIC	smallIC	MD/ LED's a	solder
35%	24%	28%	8%	2%	2,40%	0,60%













4,59	11,01	427,33	51,24	821,30	106,40	2040,09
0,00	0,00	1,86	0,75	0,02	0,16	
2,62	5,25	147,60	1,58	17,79	5,16	768,42
0,03	0,52	1,84	49,12	8,55	17,81	1,71
0,22	3,91	261,28	0,00	791,85	3,90	202,57
0,00	0,11	3,04	0,15	1,04	2,54	517,58
1,38	0,98	8,93	0,29	1,46	74,80	429,62
0,33	0,24	4,44	0,07	0,58	0,23	103,11
0,00	0,02	0,20	0,02	0,04	1,96	17,07











nr			MJ	MJ
1	ERR	#VALUE!	#VALUE!	#VALUE!
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Totals #NAME?

			Total Gross Energy (MJ Primary)	Electricity (MJ Primary)
Manufacturing		MANUFACTURING TOTAL	0,00	0,00
OEM Plastics Manufacturing (fixed)	201		0,00	0,00

Foundries Fe/Cu/Zn (fixed)	202			0,00	0,00
Foundries Al/Mg (fixed)	203			0,00	0,00
Sheetmetal Manufacturing (fixed)	204			0,00	0,00
PWB Manufacturing (fixed)	205			0,00	0,00
Other materials (Manufacturing already included)	206				
Sheetmetal Scrap (Please adjust percentage only)	207			0,00	0,00
				4,00	5,00
				MJ	MJ
<b>DISTRIBUTION (incl. Final Assembly)</b>			<b>DISTRIBUTION TOTAL</b>	<b>0,00</b>	<b>0,00</b>
Description		0	per product 62	0,00	0,00
Is it an ICT or Consumer Electronics product <15 kg ?	208		ICT per m3 60	0,00	0,00
Is it an installed appliance (e.g. boiler)?	209	0	appliance per m3 61	0,00	0,00
			retail per m3 63	0,00	0,00
Volume of packaged final product in m3	210		installed per m3 64	0,00	0,00
			per retail product 65	0,00	0,00
				MJ	MJ
<b>USE PHASE</b>			<b>USE PHASE TOTAL</b>		
Description		#N/A			
Product Life in years	211		energy subtot	0,0	0,0
Energy					
ELECTRICITY Total over Product Life indirect ERP	243	elec	66	0,0	0,0
HEAT Total over Product Life indirect ERP	246	heat ir	86	0,0	0,0
HEAT Total over Product Life direct ERP	247	heat d	86	0,0	0,0
Consumables (excl. spare parts)			consumables subtot	0,00	0,00
Water	248		84	0,00	0,00
Auxilliary material 1 (Click & select)	249		86	0,00	0,00
Auxilliary material 2 (Click & select)	250		86	0,00	0,00
Auxilliary material 3 (Click & select)	251		86	0,00	0,00
Refrigerant (Click & select)	252		0	0,00	0,00
Maintenance, Repairs, Service			maintenance subtot	0,00	0,00
No. of km over Product-Life	241		87	0,00	0,00
Spare parts (fixed, 1% of product materials & manuf.)	242		spare parts (1%)	0,00	0,00
<b>DISPOSAL &amp; RECYCLING</b>			<b>weight share %</b>	<b>MJ</b>	<b>MJ</b>
Re-use	263		0,0%	0	0
Recycle	264		0,0%	0	0

0 Recover	265		0,0%	0	0
0 Incinerate	266		0,0%	0	0
0 Landfill + unaccounted	267-269		0,0%	0	0
TOTAL	270			0	0
of which					
0 reuse/recycle/recover	263-265		0,0%	0	0
0 incinerate/landfill	266-269		0,0%	0	0













0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
6,00	7,00	8,00	9,00	10,00	11,00	12,00	13,00	14,00	15,00	16,00	
MJ	water proces	Water cool	waste haz	waste non	GWP	AD	VOC	POP	HM	PAH	
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
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MJ	water proces	Water cool	waste haz	waste non	GWP	AD	VOC	POP	HM	PAH	
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
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0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
MJ	water proces	Water cool	waste haz	waste non	GWP	AD	VOC	POP	HM	PAH	
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

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PM	Heavy Metals to water	Eutr										
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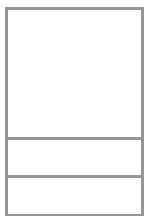
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## Impacts End-of-Life

Recycling credit	Rate (from Inputs)	Bulk Plastics
75%	1%	Re-use
40%	29%	Recycle
30%	15%	Recover

Recycling credit	Rate (from Inputs)	TecPlastics
75%	1%	Re-use
40%	29%	Recycle
30%	15%	Recover

Recycling credit	Rate (from Inputs)	Ferro
75%	1%	Re-use
40%	94%	Recycle
0%	0%	Recover

Recycling credit	Rate (from Inputs)	Non-ferro
75%	1%	Re-use
40%	94%	Recycle
0%	0%	Recover

Recycling credit	Rate (from Inputs)	Coating
75%	1%	Re-use
40%	94%	Recycle
0%	0%	Recover

Recycling credit	Rate (from Inputs)	Electronics
75%	1%	Re-use
40%	50%	Recycle
30%	0%	Recover

Recycling credit	Rate (from Inputs)	Misc. excl. refrigerant
75%	1%	Re-use
40%	64%	Recycle
30%	1%	Recover

Recycling credit	Rate (from Inputs)	Refrigerant
75%	1%	Re-use
40%	30%	Recycle
30%	0%	Recover

Recycling credit	Rate (from Inputs)	Hg(Mercury)
75%	1%	Re-use
40%	39%	Recycle
30%	0%	Recover

Recycling credit	Rate (from Inputs)	Extra
75%	1%	Re-use
40%	60%	Recycle

	30%	0%	Recover
<b>Recycling credit</b>	<b>Rate (from Inputs)</b>		<b>Aux. (excl. refrigerant)</b>
	75%	5%	Re-use
	40%	30%	Recycle
	30%	10%	Recover

**Calculation the Recycling Benefit Rate**

j                      k                      m                      n  
**Recycling Benefit per material**  
**Other Resources & Waste**

Material	production method	mass of recyclable material [g]	Total Energy (GER)	of which, electricity (in primary MJ)	Water (process)	Water (cooling)
1-BlkPlastics	1 -LDPE	0	0	0	0	0
1-BlkPlastics	2 -HDPE	0	0	0	0	0
1-BlkPlastics	3 -LLDPE	0	0	0	0	0
1-BlkPlastics	4 -PP	0	0	0	0	0
1-BlkPlastics	5 -PS	0	0	0	0	0
1-BlkPlastics	6 -EPS	0	0	0	0	0
1-BlkPlastics	7 -HI-PS	0	0	0	0	0
1-BlkPlastics	8 -PVC	0	0	0	0	0
1-BlkPlastics	9 -SAN	0	0	0	0	0
1-BlkPlastics	10 -PET	0	0	0	0	0
1-BlkPlastics	11 -ABS	0	0	0	0	0
2-TecPlastics	12 -PA 6	0	0	0	0	0
2-TecPlastics	13 -PC	0	0	0	0	0
2-TecPlastics	14 -PMMA	0	0	0	0	0
2-TecPlastics	15 -Epoxy	0	0	0	0	0
2-TecPlastics	16 -Rigid PUR	0	0	0	0	0
2-TecPlastics	17 -Flex PUR	0	0	0	0	0
2-TecPlastics	18 -Talcum filler	0	0	0	0	0
2-TecPlastics	19 -E-glass fibre	0	0	0	0	0
2-TecPlastics	20 -Aramid fibre	0	0	0	0	0
3-Ferro	22 -St sheet galv.	0	0	0	0	0
3-Ferro	23 -St tube/profile	0	0	0	0	0
3-Ferro	24 -Cast iron	0	0	0	0	0
3-Ferro	25 -Ferrite	0	0	0	0	0
3-Ferro	26 -Stainless 18/8 coil	0	0	0	0	0
4-Non-ferro	27 -Al sheet/extrusion	0	0	0	0	0
4-Non-ferro	28 -Al diecast	0	0	0	0	0
4-Non-ferro	29 -Cu winding wire	0	0	0	0	0
4-Non-ferro	30 -Cu wire	0	0	0	0	0
4-Non-ferro	31 -Cu tube/sheet	0	0	0	0	0
4-Non-ferro	32 -CuZn38 cast	0	0	0	0	0
4-Non-ferro	33 -ZnAl4 cast	0	0	0	0	0
4-Non-ferro	34 -MgZn5 cast	0	0	0	0	0
5-Coating	39 -pre-coating coil	0	0	0	0	0
5-Coating	40 -powder coating	0	0	0	0	0
5-Coating	41 -Cu/Ni/Cr plating	0	0	0	0	0
5-Coating	42 -Au/Pt/Pd	0	0	0	0	0
6-Electronics	43 -LCD per m2 scrn	0	0	0	0	0
6-Electronics	44 -CRT per m2 scrn	0	0	0	0	0
6-Electronics	45 -big caps & coils	0	0	0	0	0
6-Electronics	46 -slots / ext. ports	0	0	0	0	0

6-Electronics	47 -IC's avg., 5% Si, Au	0	0	0	0	0
6-Electronics	48 -IC's avg., 1% Si	0	0	0	0	0
6-Electronics	49 -SMD/ LED's avg.	0	0	0	0	0
6-Electronics	50 -PWB 1/2 lay 3.75kg/m2	0	0	0	0	0
6-Electronics	51 -PWB 6 lay 4.5 kg/m2	0	0	0	0	0
6-Electronics	52 -PWB 6 lay 2 kg/m2	0	0	0	0	0
6-Electronics	53 -Solder SnAg4Cu0.5	0	0	0	0	0
6-Electronics	98 -controller board	0	0	0	0	0
7-Misc.	55 -Glass for lamps	0	0	0	0	0
7-Misc.	56 -Bitumen	0	0	0	0	0
7-Misc.	57 -Cardboard	0	0	0	0	0
7-Misc.	58 -Office paper	0	0	0	0	0
7-Misc.	59 -Concrete	0	0	0	0	0
7-Misc.	91 -Refrigerant	0				



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## ErP EcoReport Manual

The ErP EcoReport facilitates the environmental impact analysis of Energy-related Products. The EcoReport, an MS Excel form, were redesigned and updated to make it suitable for Energy-related Products.

The EcoReport use the Bill-of-Materials, Energy and other resources used during product life, as well as key parameters for manufacturing, distribution and end-of-life as input parameters. With the Unit Indicators, the tool generates the environmental impacts for the indicators required for the 4 stages of product-life. These impacts are summarized on the "Output" worksheet.

Furthermore, for analysts, the outputs per single input item are given on the "Raw" worksheet. On the next pages "ErP EcoReport version 1" of 2011 is illustrated. Both the "Output" and "Raw" worksheets allow the production and printing of any type of graphs available in MS Excel from the given data. In parallel to the calculation of environmental impacts, the Input and Output worksheets of the latest versions of the ErP EcoReport also include sections to facilitate the calculation of average Life Cycle Costs per product and the calculation of the total expenditure of EU consumers in the most recent year. Please note that the total expenditure relates to the production and distribution of new products plus the emissions and resources of the stock in that year. The total expenditure is given in direct costs to the end users in one year; running costs are not discounted and it is not a summation of individual Life Cycle Costs.

### **INPUT for the worksheet ErP EcoReport**

#### **Step 1 Input Bill of Materials**

Open the ErP EcoReport and notice that there are four worksheets, "Input", "Raw", "Results" and "Extra Materials". The Input Worksheet starts with a section of 40 lines reserved for the Bill-of-Materials. When more lines are needed, the plus sign on the left can be used to extend the list to the original 200 lines. Descriptions of the components can be filled in manually or pasted from e.g. standard CAD-files. Product weights have to be filled in manually. For the selection of a Process or Material, first a main category has to be selected and subsequently in that category the right material or process; both from drop-down menu's.

In the BOM-section the weight per component is multiplied with the environmental Unit Indicators from the LCA Unit Indicators (see MEErP 2011 Methodology, Part 2). In the RAW Worksheet this can be seen. Also the product weights are summed per Category (Ferro, Non-Ferro, Bulk Plastics, etc.) and summed parameters are prepared for the manufacturing, distribution and en-of-life phases in the "Results" sheet.

#### **Step 2 Manufacturing**

The following section describes the (OEM) manufacturing of metals and plastics components. Most of this section uses fixed impacts on a weight basis (see explanations of rows 25, 34-37 of the table of LCA Unit Indicators in the MEErP 2011 Methodology, Part 2 report). Specific weights per process are calculated automatically from the BOM section. The only variable that can be edited is the percentage of sheetmetal scrap, i.e. the default 25% value can be changed.

#### **Step 3 Final assembly and Distribution**

The section on Final Assembly and Distribution covers all activities from OEM components to the final customer (rows 59-64 of of the table of LCA Unit Indicators in the MEErP 2011 Methodology, Part 2 report). The only design variable is volume of the final (packaged) product, but the impact also depends on what type of product is concerned. The latter is characterized by two Boolean (yes/no) variables.

#### **Step 4 Use Phase**

For the Use Phase, the average Product Life in years [which product life? The time in service or until end-of-life, technical or economic product life] has to be filled in. After that, the 'Electricity' subsection gives the option to fill in the electricity use split-up in 3 modes (on/standby/off mode). These modes can be used, but they don't have to be used; it is also possible to simply specify an aggregated annual energy use (in kWh) in the on-mode and fill in '1' in the next line. The thing to remember is that the energy use is given per year. The spreadsheet programme just sums the electricity use over the 3 modes and multiplies with the Product Life (in years).

### **For Energy related products**

The "Heat" consumption applies to stationary combustion installations using fossil fuels and more specifically for the product case of central heating boilers. It requires that the average heat output is filled in (in kW) as well as the number of hours the installation is supplying this heat output (or equivalent, if it is in part load). Under the heading 'Type and Efficiency' a number of standard heat generators with different efficiencies are presented. Starting with the ErP EcoReport version 3 [what are the ErP EcoReport versions 1 and 2?] and on request of the boiler manufacturers, the standard efficiency numbers can be varied within a pre-determined narrow bandwidth.

After the Heat subsection, the user can fill in the annual consumption in kg of other consumables like water, detergent, toner, paper, etc. Apart from water, the consumables can select up to 3 different consumable types per product from a drop-down list.

The last subsection deals with the travelling distance of maintenance and repair services, where the number of km over Product Life needs to be estimated. The following line –which cannot be edited– specifies the number of spare parts, presumably 1% of the impact of the BOM.

The Use Phase section uses the Unit Indicators from rows 57 (paper [this is a consumable, see above, row 57 < > rows 79-84]), 65-78 (electricity and heat), 79-84 (consumables), 86-87 (maintenance, repairs).

### **Step 5 Disposal & Recycling**

The last part of the environmental impact assessment deals with aspects of the end-of-life (EoL). Values displayed in red font can be edited (overwrite defaults).

Rows 253-256 are essential for the calculation of recycmax (see previous section), i.e. the mass<sup>[1]</sup> that is available for EoL-management, as a result of the product stock life (years between product purchased and product discarded<sup>[2]</sup>), the change in sales over a period that equals the product stock life, the change in the unit mass and –as a result– change in overall mass consumption.

Rows 257-262 deal with the final calculation of recycmax and the available EoL mass per materials fraction. The current relative fractions (in %) are given in Row 257 and the analyst can indicate how this relative fraction was in products x years ago (x=product stock life) in row 258. The sum of the percentages should always be 100%. Note that the calculation of mercury is different, i.e. data are in mg/unit. Mercury is not included in the overall mass balance (negligible mass compared to the rest); the whole mercury mass balance, even though there is a production and possible use phase impact, is included in this EoL section for practical reasons. Rows 260-262 give the automatic calculation of the EoL mass available.

Rows 263-267 give the destination of the EoL available mass over 5 fractions: re-use, recycling (material), recovery (heat), incineration and landfill/missing/fugitive. All values, except for the metals where the credit is already taken into account on the basis of the given fixed percentages, can be edited. The sum of the percentages should always be 100%. Background information of each destination is given in the footnotes to the table.

Row 269 deals with recyclability, the potential of the new products to change the course of the materials flows , e.g. due to faster pre- disassembly or other ways to bring about less contamination of the mass to be recycled (see MEERp Methodology Report Part 2) . Therefore it is economically likely that the recycled mass at EoL will displace more virgin material in other applications . The recyclability does not influence the mass balance but it does give a reduction or increase up to 10% on all impacts of the recycled mass. It is forward looking, e.g. values different from 'avg' (=base case) should only be filled in for design options. Row 269 contains dropdown-boxes allowing the analyst a choice between best, better than average ('>avg'), average ('avg', applies to basecase), worse than average ('<avg') and worst. The reasoning is that through an optimised pre-disassembly of larger metal, glass, etc. parts --before the rest of the product goes into a shredder-based recycling route-- the contamination of these materials is limited and therefore they are more likely to be recycled in applications where they displace virgin materials. The appropriate criteria for this class

**NEW in 2011:**

1.

Complete review of the EoL section, showing transparently the stock-effect (recycmax) and the materials flows per materials fraction.

2.

Recycling and recyclability of Electronics/Metals/Misc./Extra fractions was incorporated.

3.

Stock, recyclability and recycling values of the EXTRA MATERIALS were accommodated in the EoL section (values taken from the "EXTRA MATERIALS" sheet.)

**Step 6 Calculation of EU totals and life Cycle Costs**

After the inputs for calculating the environmental impacts, there is a small section that allows the calculation of EU totals and of the Life Cycle Costs. The Product Life (in years) is derived from the environmental section. Next the total annual EU sales and the installed EU stock, both in million units have to be given. Follows a section that asks the average price and –if applicable—the installation and maintenance costs of the product to the consumer (incl. taxes). For energy and water some default rates are given. Prices for other consumables can be filled in (see par. 6.8 of this report and the individual Product Cases). All these prices and rates can be adjusted. The same goes for the discount rate. What cannot be changed directly is the Present Worth Factor (in years). This is calculated from the discount rate, the escalation rate and the product life (see Chapter 6).

**NEW in 2011: The escalation rate, i.e. the annual growth rate of running costs (energy, water), is a new feature that allows the contractor to take into account energy price projections. (see Ch. 6)**

Finally, the last input in the LCC calculation is a rough indicator of the ratio between the energy consumption of the average new product and the energy consumption of the average product installed ('stock'). Approximately, if there has been no revolutionary growth or decrease in sales, the average product installed should equal the average new product a number of years ago, where the number of years equals half the product life. For instance, for whitegoods (refrigerators, dishwashers with a product life of ca. 15 years) this would be the average new product 7 to 8 years ago.

**OUTPUT Worksheet ErP EcoReport**

The Output Worksheet immediately reflects the changes in the Input Worksheet. The most important table in the output worksheet is the first one, which indicates the environmental impacts per product over its life-cycle, subdivided in production, distribution, use and end-of-life.

**NEW in 2011: The lines for ODP (air) emissions and emissions of POP to water, which both rendered negligible effect in the 2005 tool, were eliminated.**

From this table and the inputs for LCC and EU Totals the total environmental impact of all products sold in the most recent years can be calculated, over the coming years (up till and including the end-of-life). This is not shown here, because the table looks the same as above, only the accounting units are different and of course the data are different. Basically what has happened is that all figures in the table above are multiplied by the EU sales (in mln. units).

The third table is also derived from the two above. It copies the production, distribution and end-of-life figures from the second table to indicate the EU environmental impact in the current year. But the use phase data are not copied directly, but first multiplied with the 'Overall Improvement Ratio' to indicate the difference between the new sales and the current stock. Policy makers largely cannot influence this, because on average most of the impact was caused already half a product lifetime ago. But it tells them how the product fits in the current statistics and –together with the previous table—it tells them how much progress (or not) the sector is already making.

The fourth table uses the totals from the third table and compares these total annual impacts with the EU total annual impacts, regarding resource use and emissions. The percentage is shown in the fourth column and gives a direct insight in the impact of a product.

The following table of the Output worksheet calculates two parameters, that both relate to economic expenditure, but that are otherwise completely different. The first parameter is the Life Cycle Costs of one product to an end-user, i.e. a (potential) buyer that calculates the economic rationale of his or her investment decision today and that looks into the future in terms of discounted running costs. This is important for the Base Case and the evaluation of an appropriate target (see Chapter 7). The second parameter calculates the EU Total of all expenditure to end-users in the most recent year, i.e. the running costs are not discounted and for the running costs in the use phase the calculation starts from the installed stock.

The Input and Output worksheets of the ErP EcoReport can be used to calculate the average EU product –the so-called Base Case—but it can also be used to calculate the Base Case including one or more design options. With each design option the environmental and the economic profile of the product will change. When opening several instances of the ErP EcoReport in MS Excel and summarizing the outcomes in a new spreadsheet it is possible to experiment with the ranking of design options.

**NEW in 2011: At the very end of the RESULTS sheet, there is a table that presents the total impacts of the product as a fraction of the EU-27. For this the normalisation table in Chapter 2 is used. The result gives an immediate impression whether and on which impacts the product score can be called 'significant'.**

### **RAW Worksheet ErP EcoReport**

As mentioned before, the RAW worksheet gives the calculated results per line of the BOM and the lines of e.g. the Use Phase. Thereby it allows manual checking and –as the case may be—manual correction of business specific parameters. Also the RAW worksheet contains an exact spreadsheet copy of the Unit Indicator table that is used, also for easy checking. Please note that the RAW worksheet works only one way: It shows the results at the most detailed level, but the cells are filled in by calculations on the Input worksheet.

### **EXTRA MATERIALS Worksheet ErP EcoReport**

**NEW in 2011:** This new sheet contains a simple table, similar to table 28 in lay-out, that allows the user to define the Unit Indicators of materials or processes relevant for his/her own specific product. The contractor has to retrieve the LCI data (emissions and resources use) and then multiply with the LCIA multipliers mentioned in Chapter 6 and fill in the numbers expressed in the appropriate units.

## Data Sources

Data for recycled content was used from the following resources:

- Life cycle inventories for the manufacturing of recycled HDPE and recycled PET (input material under the category "Bulk plastics")
  
- Life cycle inventories for the manufacturing of recycled PVC (input material under the category "Bulk plastics")
  
- Life cycle inventories for the manufacturing of primary and recycled paper (see sheet "Extra Materials")

The downcycling index  $k$  was derived from prices published in market reports by [plasticker.de](http://plasticker.de)

Final Report – Life Cycle Inventory of 100% Postconsumer HDPE and PET recycled Resin from Postconsumer Containers and Packaging, The Plastics Division of the American Chemistry Council, Inc., The Association of Postconsumer Plastic Recyclers (APR), The National Association for PET Container Resources (NAPCOR), The PET Resin Association /DETRA/ Franklin Associates 2010  
The Eco-Footprint on VinyLoop – Benchmarking of the environmental impact of PVC compound recycled in the VinyLoop process with PVC compound produced in conventional route (virgin PVC compound and incineration). August 2012  
IFEU 2006: Ökologischer Vergleich von Büropapieren in Abhängigkeit vom Faserrohstoff/Ecologic comparison of office paper based on the fibre resource, IFEU, Heidelberg 2006

Market reports on primary and secondary plastics, September 2013:  
<http://plasticker.de/preise/marktbericht2.php?j=13&mt=9&quelle=bvse>

CRM indicator according to MEErP 2011

<b>Critical Raw Material</b>	<b>Weight in g per product</b>	<b>Characterization factor [kg Sb eq./kg]</b>	<b>CRM indicator</b>
Germanium (Ge)	0	18	0
Beryllium (Be)	0	12	0
Tantalum (Ta)	0	9	0
Indium (In)	0	9	0
Platinum Group metals (PGM)	0	8	0
Gallium (Ga)	0	8	0
Antimony (Sb)	0	1	0
Tungsten	0	0,2	0
Niobium (Nb)	0	0,04	0
Rare earth elements (Sc, Y, Nd)	0	0,03	0
Cobalt (Co)	0	0,02	0
Graphite (C)	0	0,01	0
Fluorspar (CaF <sub>2</sub> )	0	0,001	0
Magnesium (Mg)	0	0,0005	0
<b>CRM indicator</b>			<b>0</b>