

From 4 kg to 65%. Can WEEE do that?

Jaco Huisman

**Institute for Sustainability
and Peace (UNU-ISP)**

Hermann-Ehlers-Str. 10
53113 Bonn, Germany



United Nations University

 **TU Delft**

Collection in EU 27 (2005, 2009)



Put on market - POM
 WEEE arising - WA
 WEEE Collected
 & Treated

	2005:	2009:
Put on market - POM	10.4 Mton**	11.9 Mton**
WEEE arising - WA	≈ 7.9 Mton**	≈ 8.8 Mton**
WEEE Collected & Treated	2.2 Mton* 28% of WEEE	>3.2 Mton** 36% of WEEE

* UNU WEEE Review study, 2007

** Update under StEP ADDRESS project as of 27-4-2010

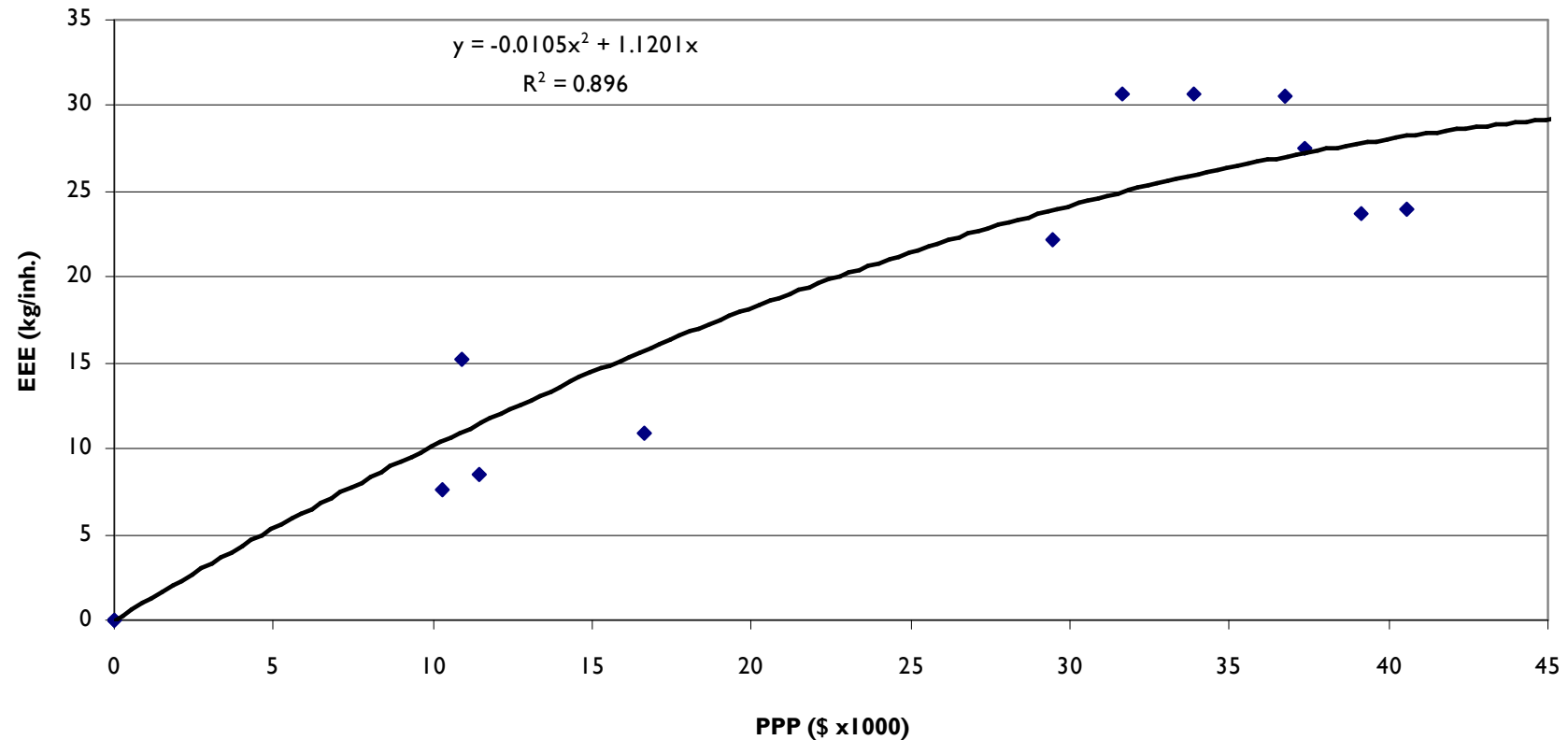


United Nations University – WEEE Recast Expert Opinion

2008 data



Correlatie EEE PPP USD



Purchasing power parity (PPP) is a measure for the actual purchasing power of consumers based on a fixed basket of goods/ services and levels out account currency effects compared to GDP.



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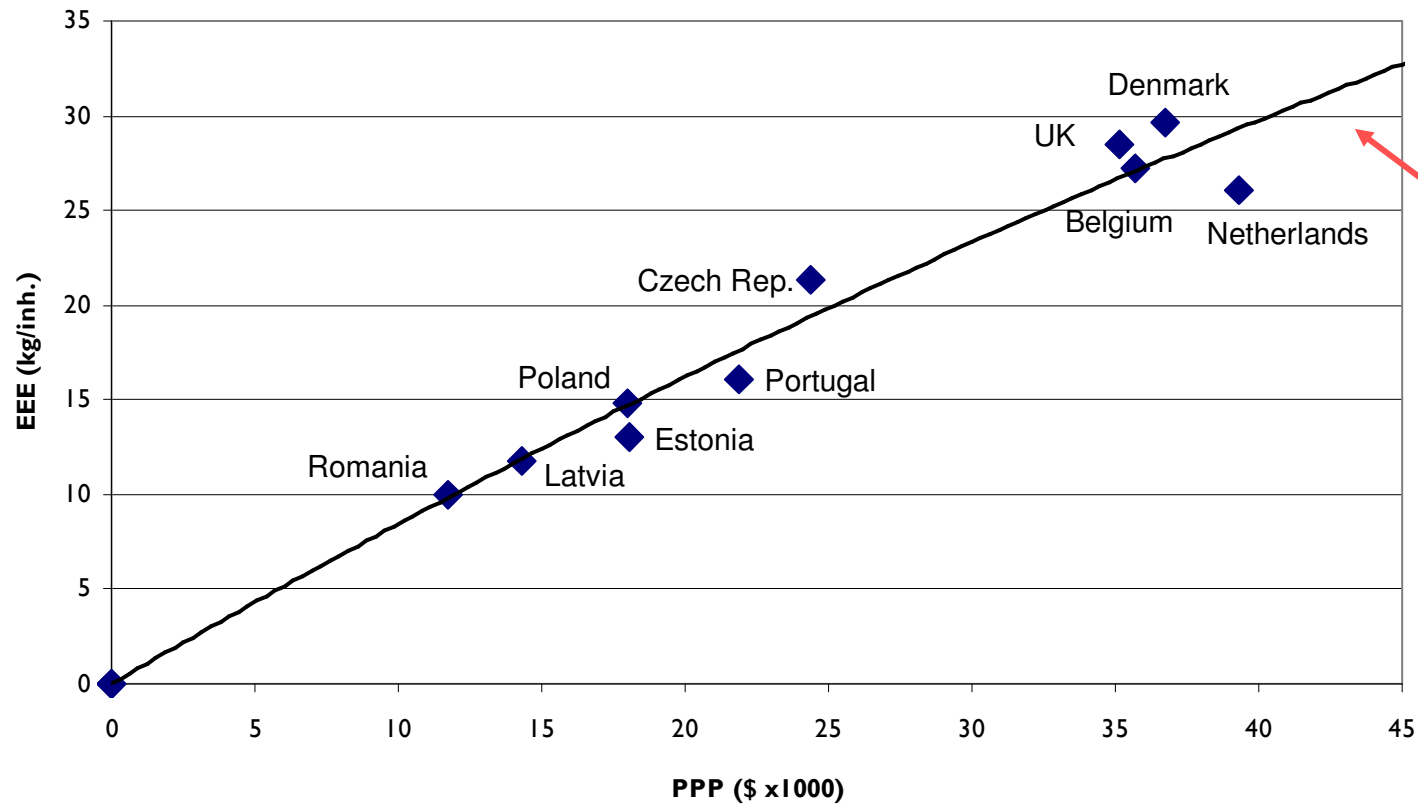


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– Continuous update by StEP ADDRESS project

EEE Put on Market per Capita in 2009 as function of GDP (PPP values)

2009 data!!!



Collection in EU 27 (2005, 2009)



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2013: 45% - 3 yrs POM: **5.5 Mton**

2016: 65% - 3 yrs POM: **8.8 Mton**

* UNU WEEE Review study, 2007

** Update under StEP ADDRESS project as of 27-4-2010



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Collection targets per country



WEEE/head (kg/ inh)	2013	2016	WEEE/head (kg/ inh)	2013	2016
EU27+2	45% (3yr)	65% (3yr)	EU27+2	45% (3yr)	65% (3yr)
Austria	13.5	21.2	Lithuania	6.0	10.1
Belgium	12.5	19.6	Luxembourg	24.7	38.7
Bulgaria	4.6	7.9	Malta	8.8	13.9
Cyprus	10.9	17.2	Netherlands	13.5	21.2
Czech Republic	9.3	15.2	Norway	17.3	26.5
Denmark	13.0	20.4	Poland	7.2	11.9
Estonia	6.8	11.1	Portugal	8.2	12.7
Finland	12.3	19.5	Romania	4.8	8.5
France	12.0	18.8	Slovak Republic	8.6	14.3
Germany	12.2	19.1	Slovenia	10.6	17.3
Greece	11.0	17.1	Spain	10.5	16.2
Hungary	7.2	11.9	Sweden	12.8	20.5
Ireland	13.3	20.7	Switzerland	14.6	22.5
Italy	10.5	16.1	United Kingdom	12.6	19.9
Latvia	5.4	9.0	EU27 av.	10.9	17.2



2009 Collection Amounts (‘reported quantities’)

2009, kg/inh.	POM 3yr	WEEE	C&T	% of WA	% of POM
Sweden	27.3	22.0	16.5	75%	60%
Denmark	27.6	22.2	14.2	64%	51%
Belgium	26.6	20.4	8.3	41%	31%
United Kingdom	26.6	21.4	7.0	33%	26%
Netherlands	29.0	20.0	6.1	31%	21%
Latvia	13.6	8.8	2.7	30%	20%
Czech Rep.	18.9	16.0	4.3	27%	23%
Estonia	16.2	9.8	1.9	20%	12%
Italy	23.3	17.3	3.2	19%	14%
Poland	13.3	11.1	1.5	13%	11%
Romania	9.6	7.5	0.9	12%	10%



65%: Can WEEE do that?

FACTS:

- ❖ Some products are (environmentally) more important than others
- ❖ Registers for POM are in most cases still not reliable (free-riding)
- ❖ Moderate uncertainty about WEEE amounts POM
- ❖ High uncertainty about WEEE Arisings (only few studies available)
- ❖ WEEE composition changes over time (screens 22% to 12%)
- ❖ The average product life is varying significantly per collection category and per country!
- ❖ To determine the 2013 int. target, 2010-2012 POM data is needed
- ❖ 2009: Not even Sweden, Norway and Denmark are achieving 65%

CONSEQUENCES:

- ❖ One cannot decide on collection target details at this point in time
- ❖ Unfortunately: 2013 target cannot be based on WEEE Arisings



65%: Can WEEE do that?

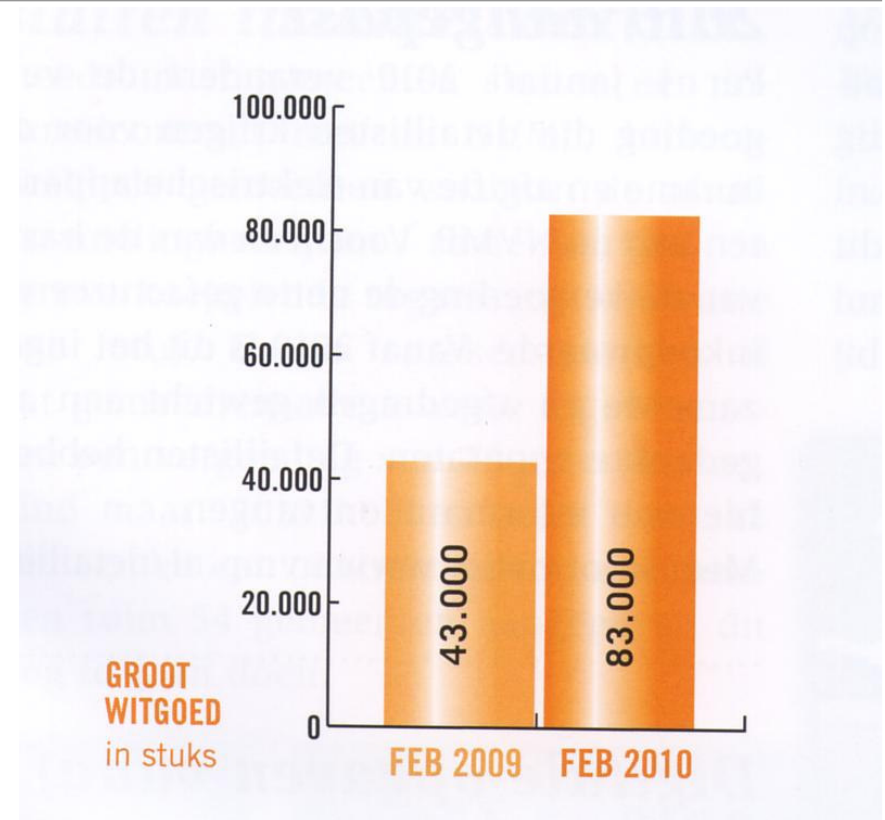
SUGGESTIONS:

- ❖ Develop generic rules later to **convert the chosen collection target from a percentage to a number of kg's per collection category per country as a guideline for the coming year** by Comitology procedure/ Commission?? (+ allow more collection categories when they exist)
 1. Set initial target per collection category per country (f.i. based on EEE estimates)
 2. Allow deviations per country when evidence is provided (f.i. non-saturated markets, higher average life-times of collection stream, etc.)
 3. Compare target with the actual collection annually (do return stream sampling and assessments of WEEE leakage streams).
 4. The results + new POM data can then be used to repeat step 1.
- ❖ In case of competing schemes: Assign fair share of collection responsibility and enforce. **Add penalties for non-performers/ Reward those collecting more**



Collection target and financing

- ❖ Financial incentives work!
 - Buy equipment from collection points (see Art.5; 12)
 - Add mandatory hand-in of WEEE to assigned compliance schemes only. **This puts pressure on both parties to come to mutual agreements**
 - Allow Visible Fee upon choice or develop another collection rewarding mechanism to acquire the necessary funds
 - Remove artificial B2B/B2C and historic/new difference.
 - Remove LHHA, Medical and Prof. Equipment from scope
 - Maintain consumer education



Number of white-goods collected
Since Jan. 2010: 95% of municipalities under NVMP contract, receive now 79 €/ ton collected



IPR Works? YES: COUNTERPRODUCTIVE !!!

- ❖ There is an intrinsic negative link between environmental performance and financing, even for products with a positive end-of-life-value:

Collect more → costs more

Treat better → costs more



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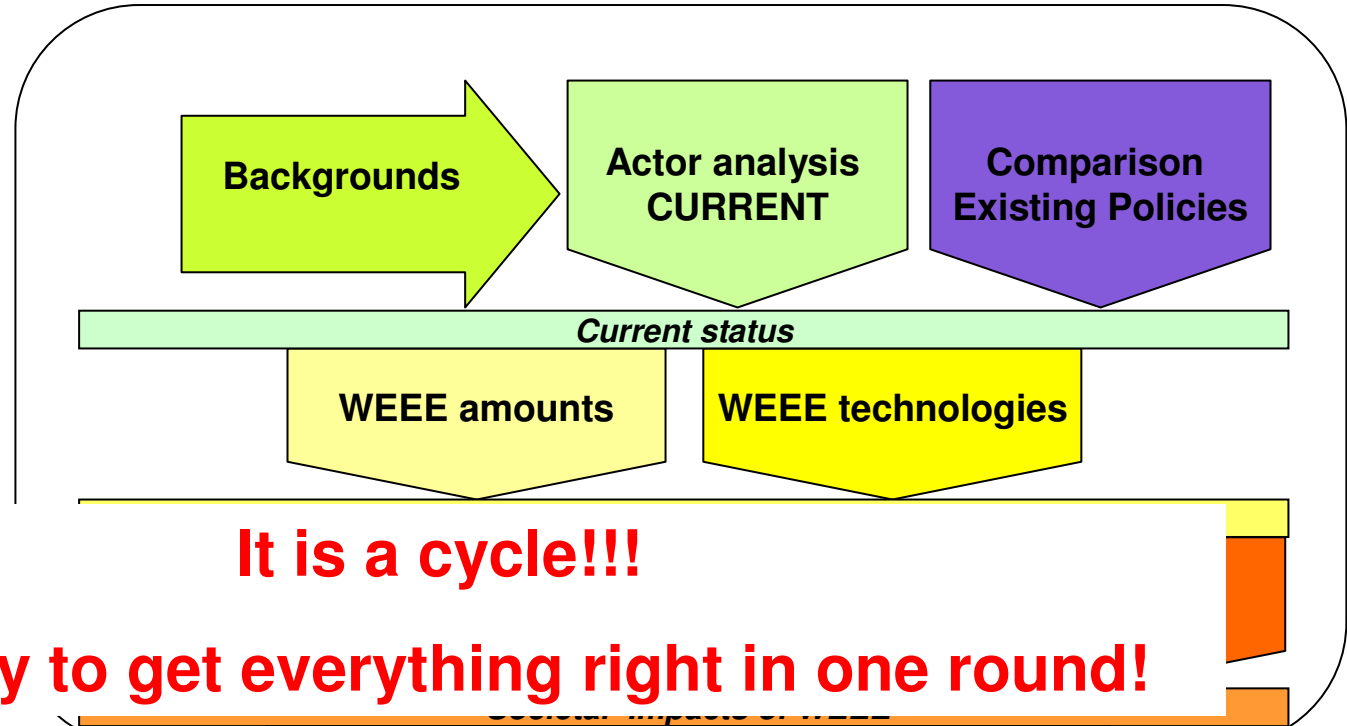
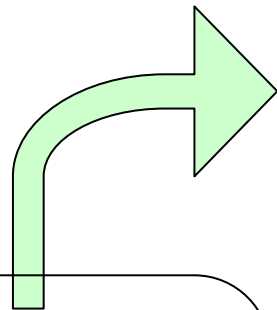
Extra slides



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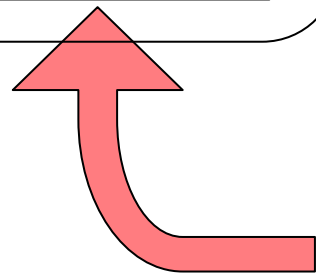
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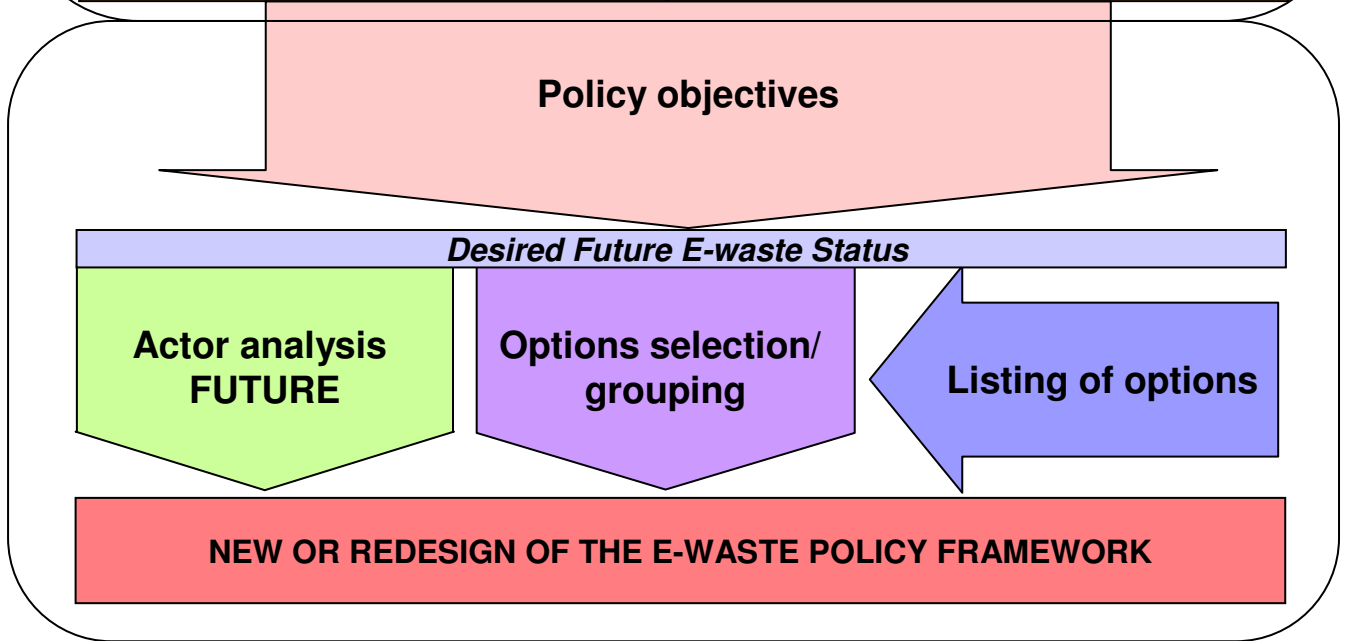
It is a cycle!!!

Do not try to get everything right in one round!

Conditions for success



Future



Gradual change in composition WEEE

	2008 WEEE Arising vs. Put on Market Composition	WA	POM
#	Treatment Category	% of total	% of total
A	Large Household Appliances	27.9%	30.7%
B	Cooling and freezing	17.7%	17.0%
C	Small Domestic Appliances	31.1%	38.2%
D	Screens	21.6%	12.5%
E	Gas Discharge Lamps	1.7%	1.6%
		100.00%	100.00%



Changing WEEE composition over time

#	Treatment Category	2008 Abbrev.	WEEE Arising		EEE Put on Market	Difference
			% of total	% of total		
A	Large Household Appliances	(LHHA)		28.2%	30.7%	9%
1A	Large Household Appliances	(LHHA)	27.7%		29.0%	
10	Automatic dispensers	(Aut.Disp.)	0.2%		0.5%	
8	Medical devices	(Med.)	0.1%		0.7%	
9	Monitoring and control instruments	(M&C)	0.2%		0.5%	
B	Cooling and freezing	(C&F)		17.7%	17.0%	-4%
1B	Cooling and freezing	(C&F)	17.7%		17.0%	
C	Small Domestic Appliances	(SDA)		30.8%	38.2%	24%
1C	Large Household Appliances (smaller items)	(LHHA-small)	3.6%		4.0%	
2	Small Household Appliances	(SHHA)	7.0%		10.0%	
3A	IT and Telecom excl. CRT's	(IT ex CRT)	8.0%		8.8%	
4A	Consumer Electronics excl. CRT's	(CE ex CRT)	7.8%		6.0%	
5A	Lighting equipment - Luminaries	(LUM)	0.7%		2.2%	
6	Electrical and electronic tools	(Tools)	3.5%		4.4%	
7	Toys, leisure and sports equipment	(Toys)	0.1%		2.8%	
D	SCREENS	(CRT)		21.6%	12.5%	-42%
3B	CRT monitors	(IT CRT)	8.2%		0.0%	
4B	CRT TV's	(CE CRT)	13.1%		0.0%	
3C	LCD monitors	(IT FDP)	0.2%		4.8%	
4C	Flat Panel TV's	(CE FDP)	0.1%		7.7%	
E	Gas Discharge Lamps	(Lamps)		1.7%	1.6%	-6%
5B	Lighting equipment – Lamps	(Lamps)	1.7%		1.6%	
			100.00%		100.00%	



New Estimates for WEEE Amounts

2008 WEEE Collection% EU27+2	2008	2013	2016
Treatment Category	% of EEE POM 3yr	% of EEE POM 3yr	% of EEE POM 3yr
Large Household Appliances	32%		
Cooling and freezing	27%		
Small Domestic Appliances	28%	45%	65%
Screens	32%		
Gas Discharge Lamps	28%		



WEEE/head (kg/ inh)	2009		2013			2016 target		
			45% target of 3 yrs			65% target of 3 yrs		
	EU27+2	POM -> WA ->	POM -> WA ->	POM	POM -> WA ->	POM		
Austria	28.9	22.2	31.9	24.5	13.5	32.9	25.4	21.2
Belgium	26.9	20.6	29.5	22.7	12.5	30.5	23.4	19.6
Bulgaria	9.8	7.4	11.5	8.7	4.6	12.4	9.3	7.9
Cyprus	23.1	17.6	25.9	19.7	10.9	26.8	20.5	17.2
Czech Republic	19.3	14.6	22.6	17.2	9.3	23.8	18.1	15.2
Denmark	27.6	21.1	30.7	23.6	13.0	31.7	24.4	20.4
Estonia	14.7	11.1	16.5	12.5	6.8	17.4	13.2	11.1
Finland	26.1	20.0	29.3	22.4	12.3	30.3	23.3	19.5
France	25.7	19.6	28.3	21.7	12.0	29.2	22.4	18.8
Germany	26.0	19.8	28.8	22.1	12.2	29.8	22.9	19.1
Greece	23.8	18.1	25.8	19.7	11.0	26.6	20.3	17.1
Hungary	15.1	11.4	17.7	13.4	7.2	18.6	14.1	11.9
Ireland	29.2	22.4	31.2	24.0	13.3	32.1	24.7	20.7
Italy	22.7	17.3	24.3	18.5	10.5	25.0	19.1	16.1
Latvia	11.8	8.9	13.3	10.0	5.4	14.1	10.6	9.0
Lithuania	13.0	9.8	14.9	11.3	6.0	15.8	11.9	10.1
Luxembourg	47.9	38.3	58.3	37.9	24.7	60.1	39.0	38.7
Malta	18.8	14.2	20.9	15.8	8.8	21.6	16.4	13.9
Netherlands	29.1	22.3	31.8	24.5	13.5	33.0	25.4	21.2
Norway	37.0	28.7	40.1	31.4	17.3	41.0	32.2	26.5
Poland	14.6	11.0	17.7	13.4	7.2	18.6	14.1	11.9
Portugal	17.5	13.2	19.1	14.5	8.2	19.7	14.9	12.7
Romania	9.8	7.4	12.6	9.5	4.8	13.4	10.1	8.5
Slovak Republic	17.2	13.0	21.2	16.1	8.6	22.3	17.0	14.3
Slovenia	22.2	16.9	25.8	19.7	10.6	27.0	20.6	17.3
Spain	22.9	17.4	24.4	18.6	10.5	25.1	19.2	16.2
Sweden	27.1	20.7	30.6	23.5	12.8	32.0	24.6	20.5
Switzerland	31.3	24.1	34.0	26.3	14.6	35.0	27.1	22.5
United Kingdom	26.6	20.3	29.9	23.0	12.6	31.0	23.8	19.9
Average WEE	23.0	17.6	25.8	19.5	10.9	26.8	20.3	17.2

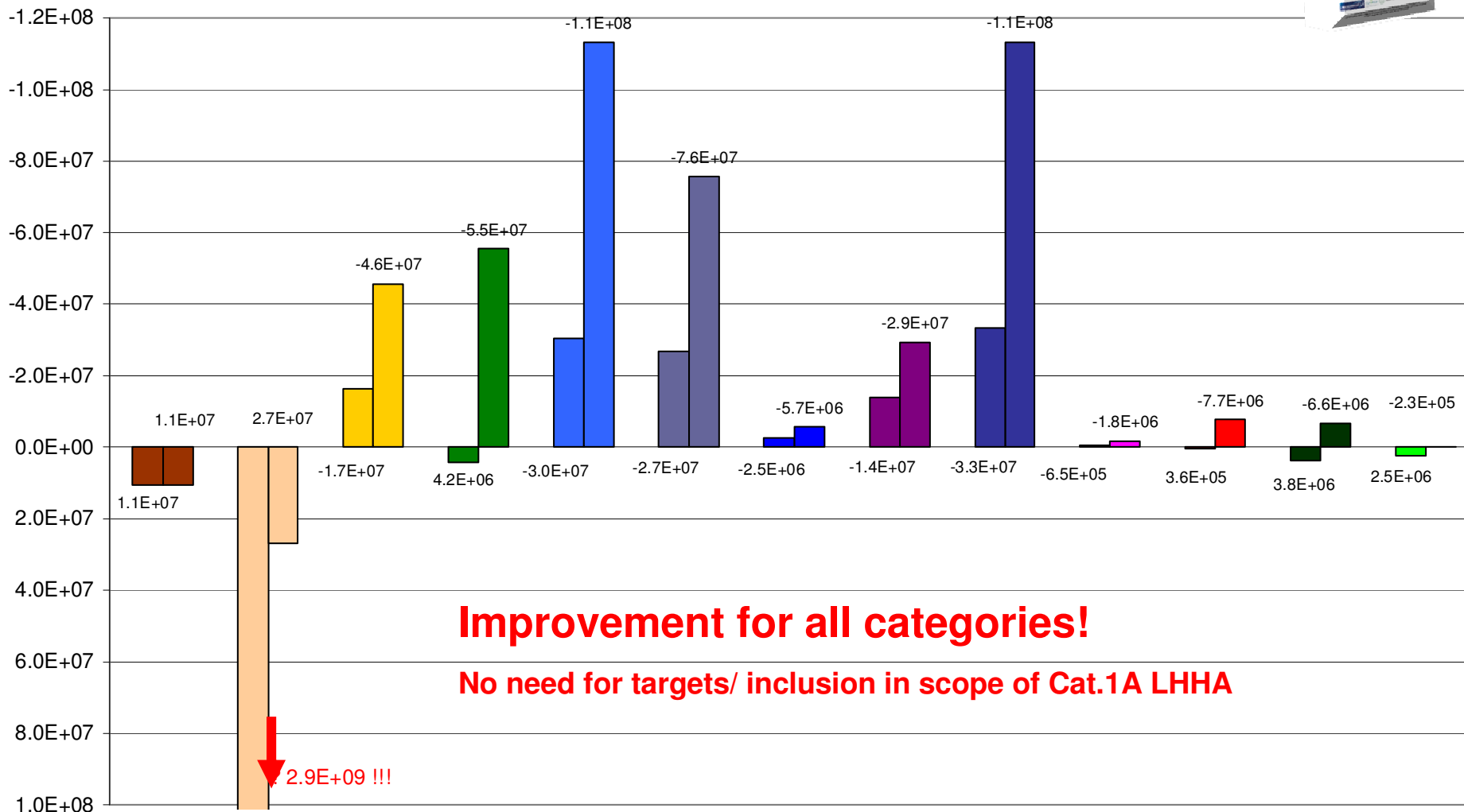
Why higher targets?

Left bar: 2005 status (2.2Mt), right bar: 2011 pot. status (5.3 Mt)



? (in Pts avoided environmental impact)

Eco-Indicator'99 H/A weighted, total WEEE arising, 2005 (left bar) to 2011 (right bar)

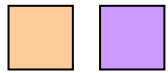


? (in Pts environmental burden)

- LHHA
- C&F
- LHHA-small
- SHA
- IT ex CRT
- IT FDP
- CE ex CRT
- CE CRT
- CE FDP
- Lamps
- Tools
- Toys

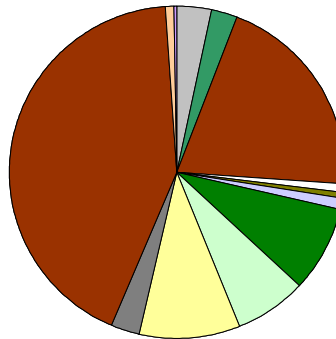
Different environmental priorities

Fridges & Freezers* (CFC containing)

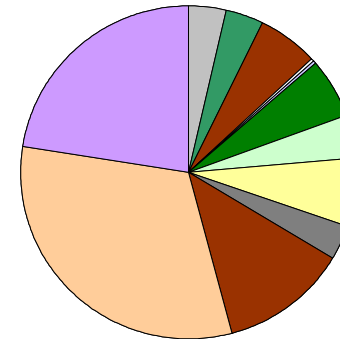


* Eco-Indicator'99

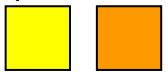
Weight



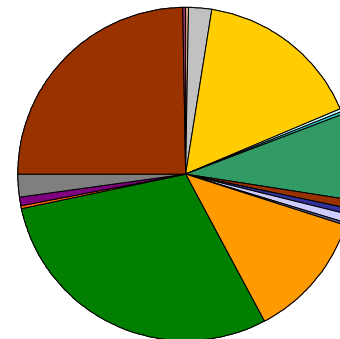
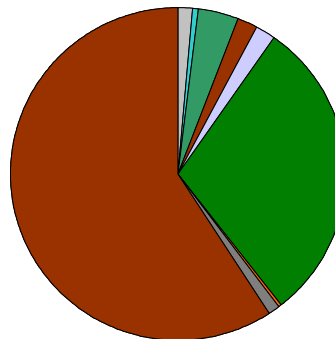
Environmental Weight



IT equipment** (Precious metals)



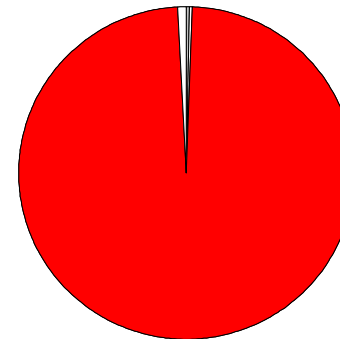
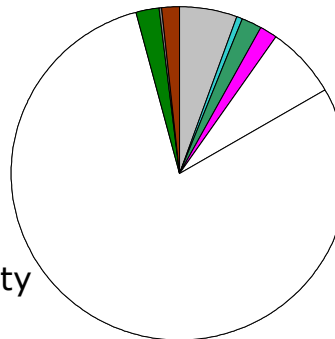
** Eco-Indicator'99



Lamps*** (Mercury)



*** CML2-Terrestrial Ecotoxicity



- Al (general)
- Cu
- Fe
- Glass (white)
- Hg
- Oil
- Other/inerts
- PCB
- Plastics general
- PS (polystyrene, high impact)
- PUR
- PVC
- Stainless steel
- Steel low alloyed
- Cyclopentane
- Isobutane
- CFC11
- CFC12
- Ag
- Al (general)
- As
- Au
- Be
- Bi
- Br
- Cd
- Ceramics
- Cl
- Co
- Cr
- Cu
- Fe
- Hg
- Glass (LCD)
- Liquid Crystals
- Mn
- Ni
- Other/inerts
- other plastics
- Pb
- Pd
- Plastics general
- PVC
- Sb
- Sn
- Stainless steel
- Steel low alloyed
- Zn
- Al (general)
- Au
- Br
- Ceramics
- Cl
- Cr
- Cu
- Epoxy
- Fe
- Fluorescent powder
- Glass (white - low quality)
- Hg
- Glass (white - high quality)
- Ni
- Pb
- Pd
- Plastics general
- Sb
- Sn
- Stainless steel
- Steel low alloyed
- Zn

Main advice: Grouping of options

	Collection target	Recycling target	Specific Treatment Requirement *
Large Household (1A,10)*	NO	NO	NO
Cooling and Freezing (1B)	YES	Maybe	YES: CFC's
Small Household: 1C,2A,3A,4A,6,7	YES	YES: For plastic recycling	YES: NiCd from Cat. 6
CRT containing (3B, 4B)	YES	YES: For CRT glass	YES: Control over PbO
Flat panels (3C, 4C)	YES	Maybe	YES: Hg removal from LCD
Gas discharge lamps	YES	Maybe for HQ glass	YES: Hg removal

