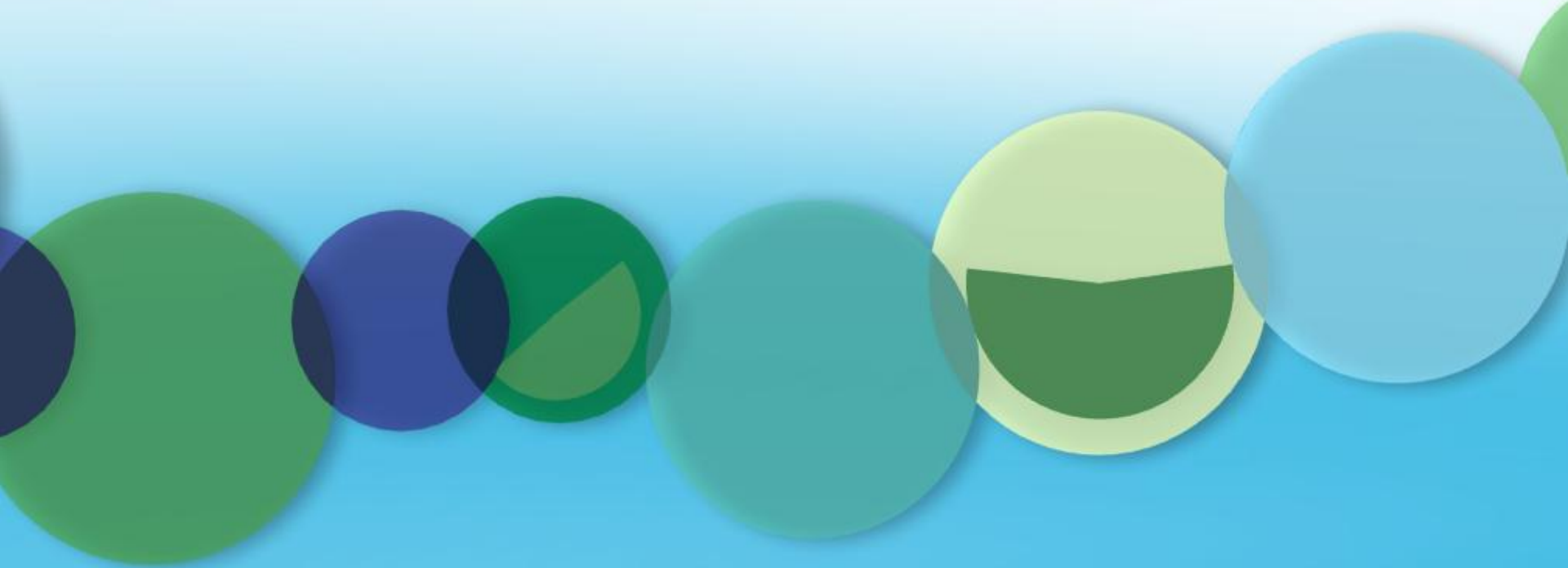



Jaco Huisman

United Nations University





THE DUTCH WEEE FLOWS



...The European Directive needed to be implemented by the end of August 2006 in national law, which only The Netherlands and Greece fulfilled in time...



WHY?

WHY?

- What is the problem?
- How to reach the new target?
- Who is responsible?
- Where is all this WEEE?
- How much will it cost ?
- What is the problem really?

WHY?

- What is **my** problem?
- How can **I** reach the new target?
- What is **my** responsibility?
- Where is **my** WEEE?
- How much will it cost **me** ?
- What is **my** problem really?

COMPLEX E-WASTE STREAM

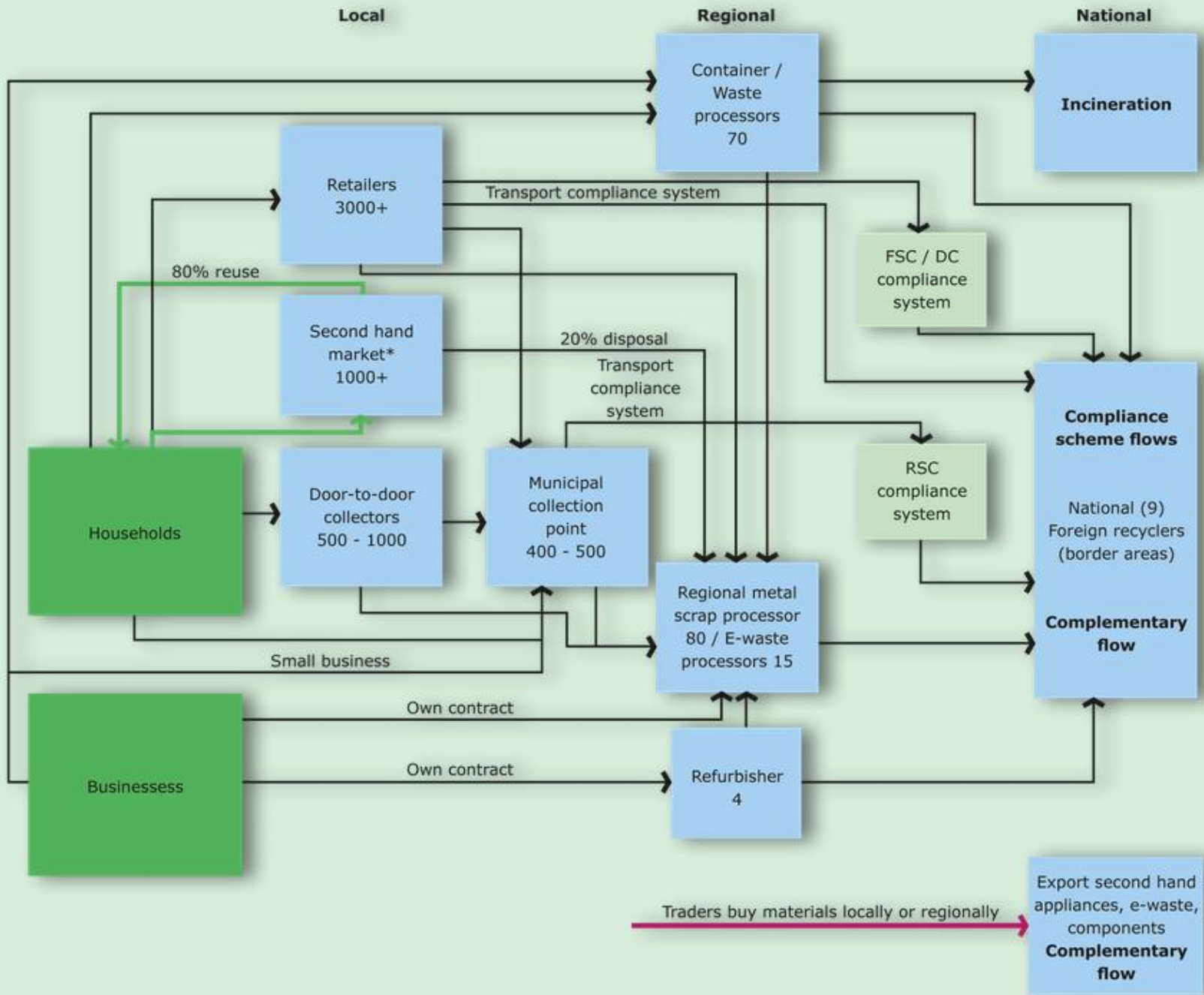
- History
 - UNU Review study, 2007
 - GfK possession studies, 2007
 - W+B Complementary streams, 2008
- Pieces per HH 2007
 - 59 appliances per household
- Scope
 - > 900 product types
 - 10 old categories, 6 new
 - 58 UNU groups

WEEE POLDER MODEL

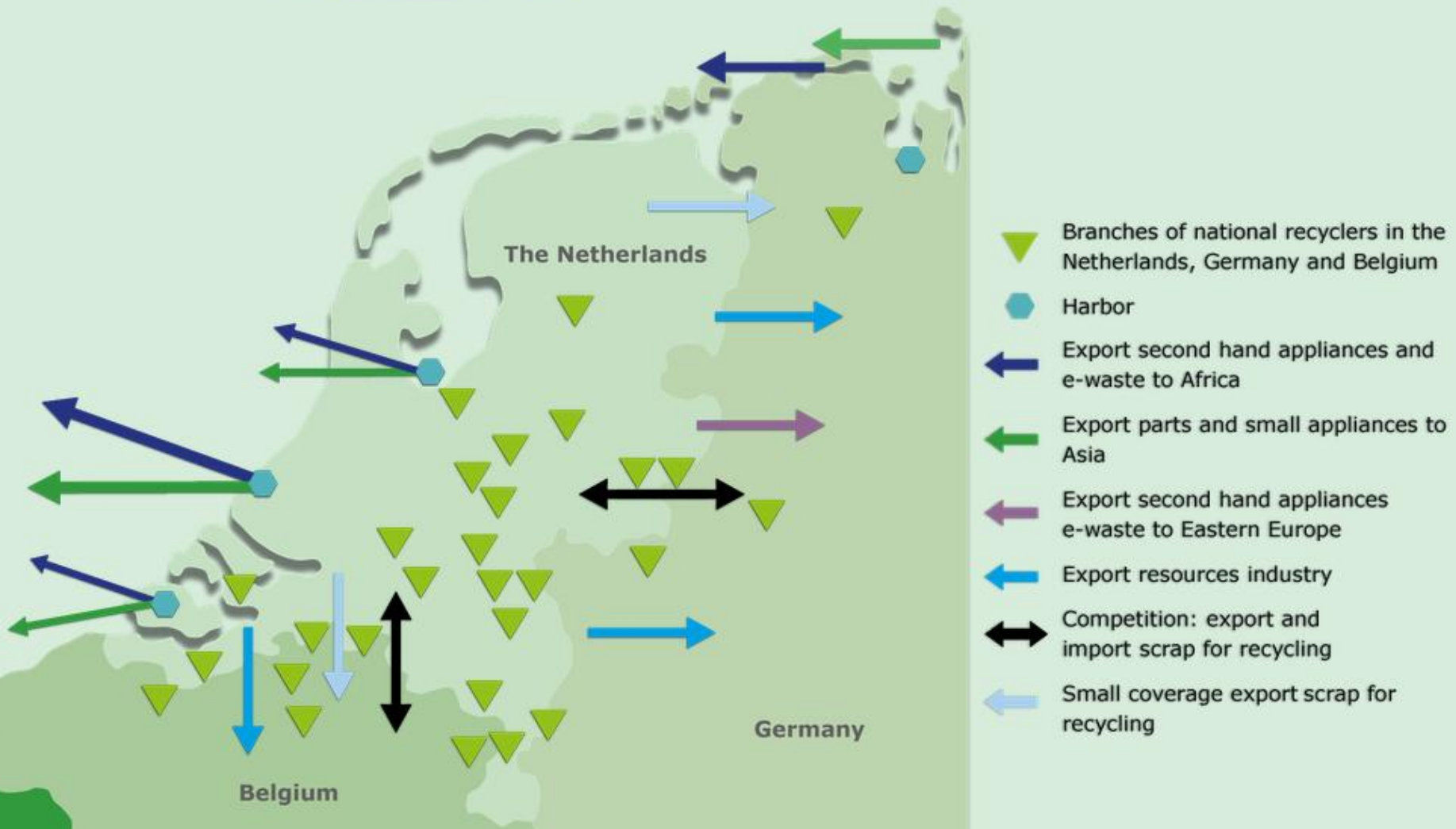
- Statistics NL
- EERA
- MRF
- Human Environment and Transport Inspectorate
- Wecycle
- NL Agency



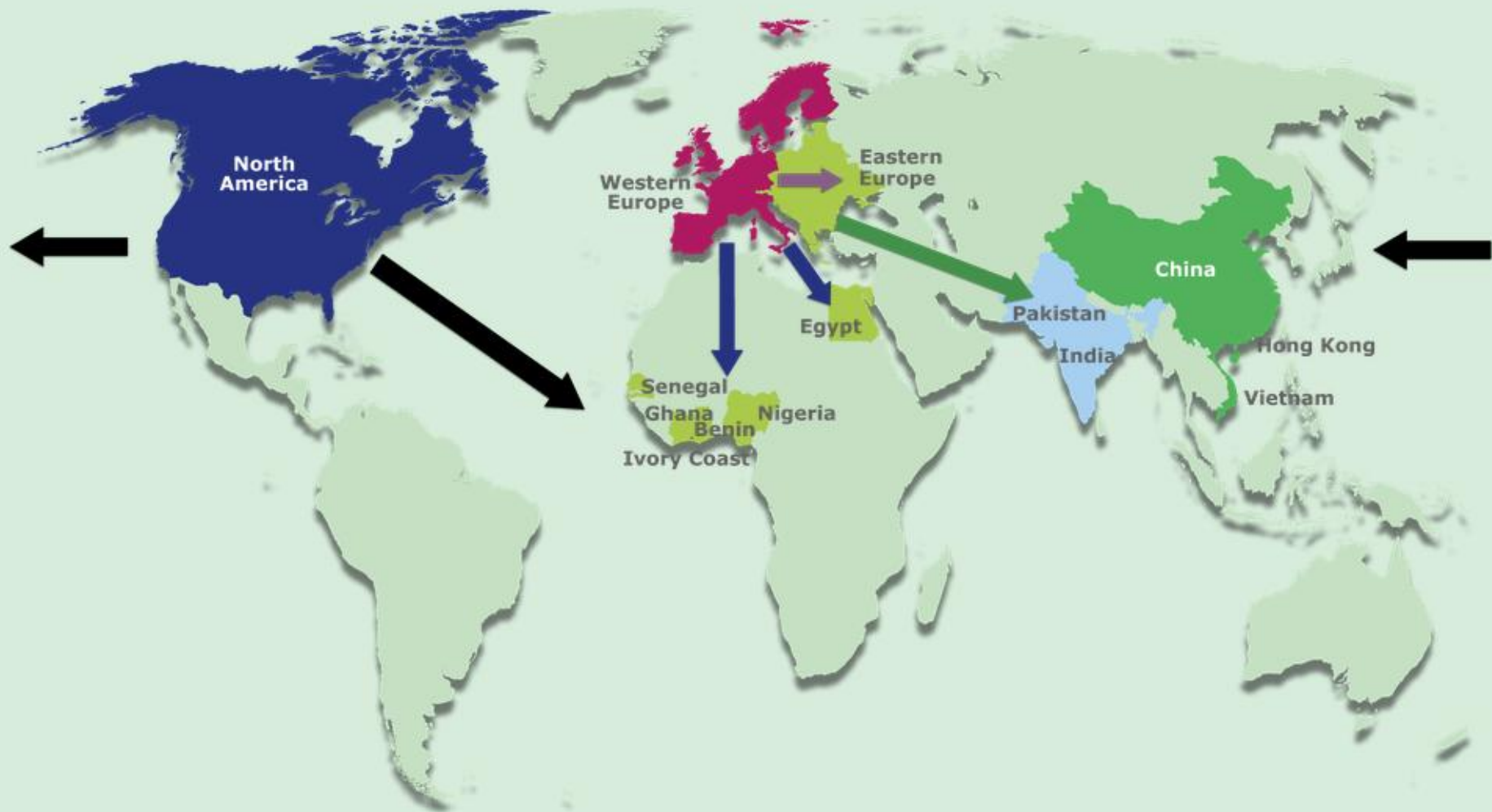
THE WEEE MARKET STRUCTURE



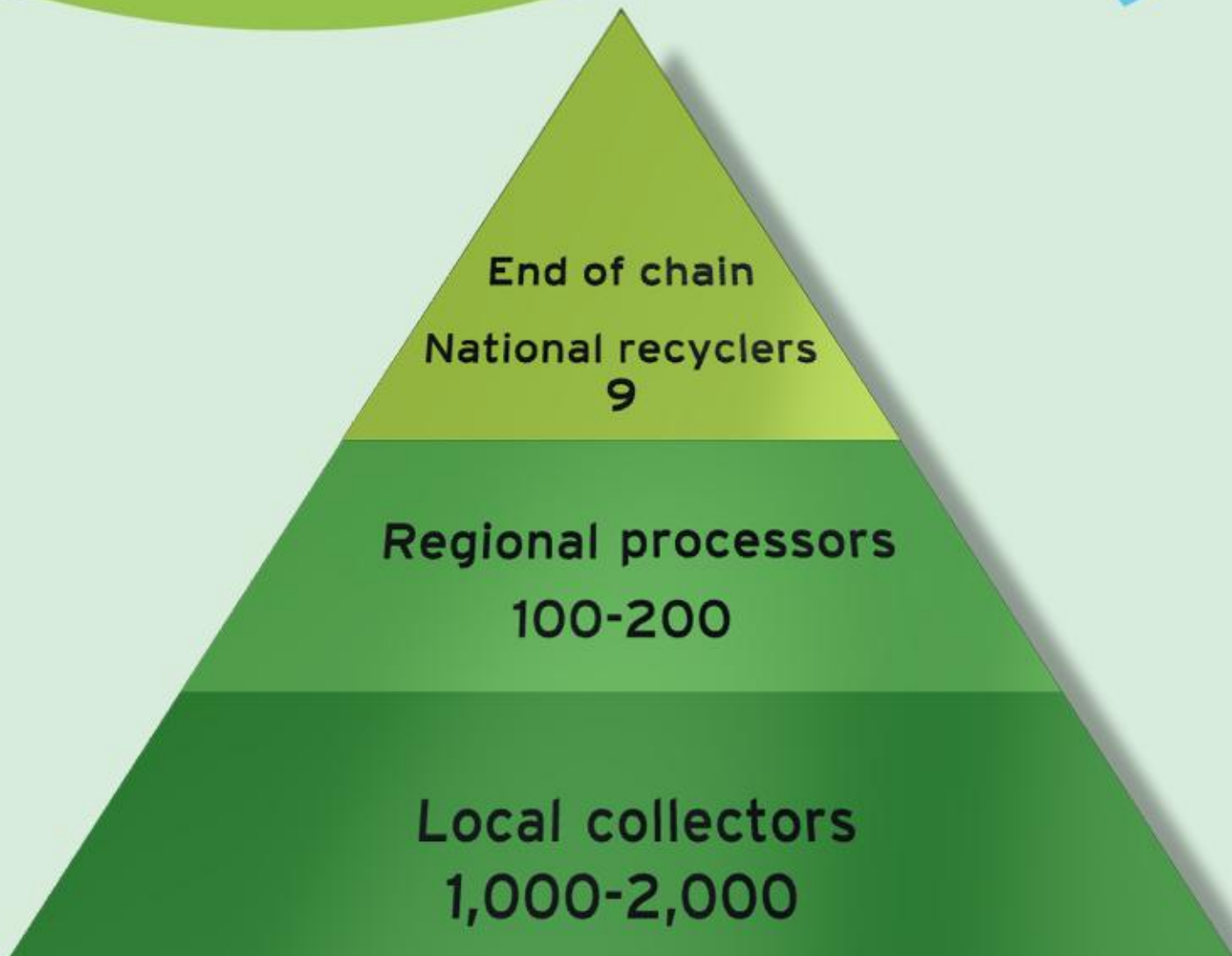
THE WEEE MARKET



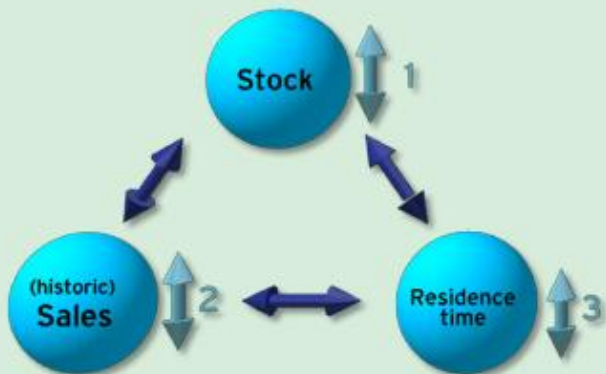
THE WEEE MARKET



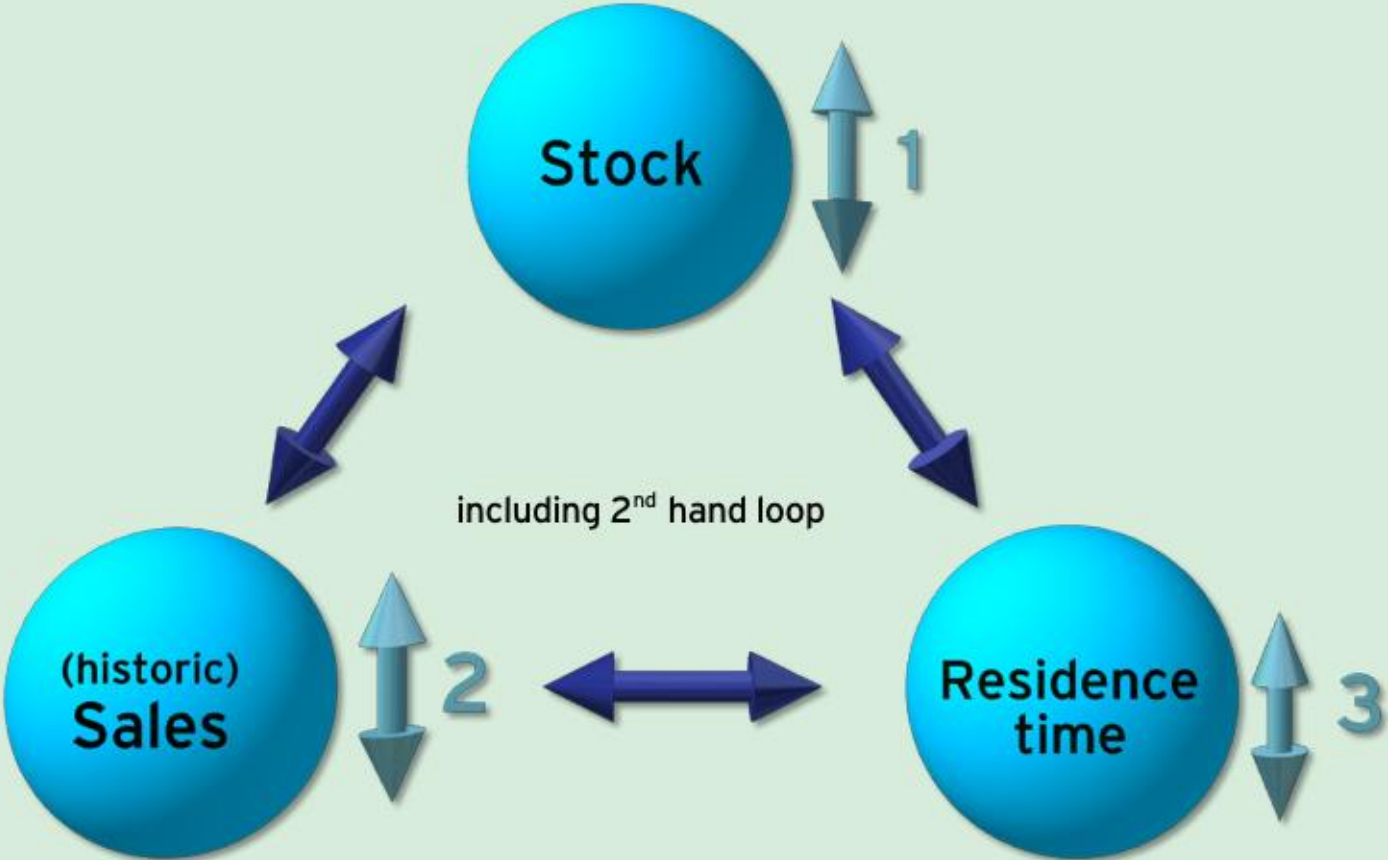
THE WEEE CHAIN MODEL



THE WEEE CHAIN MODEL



HISTORIC POM



x 1000

700

600

500

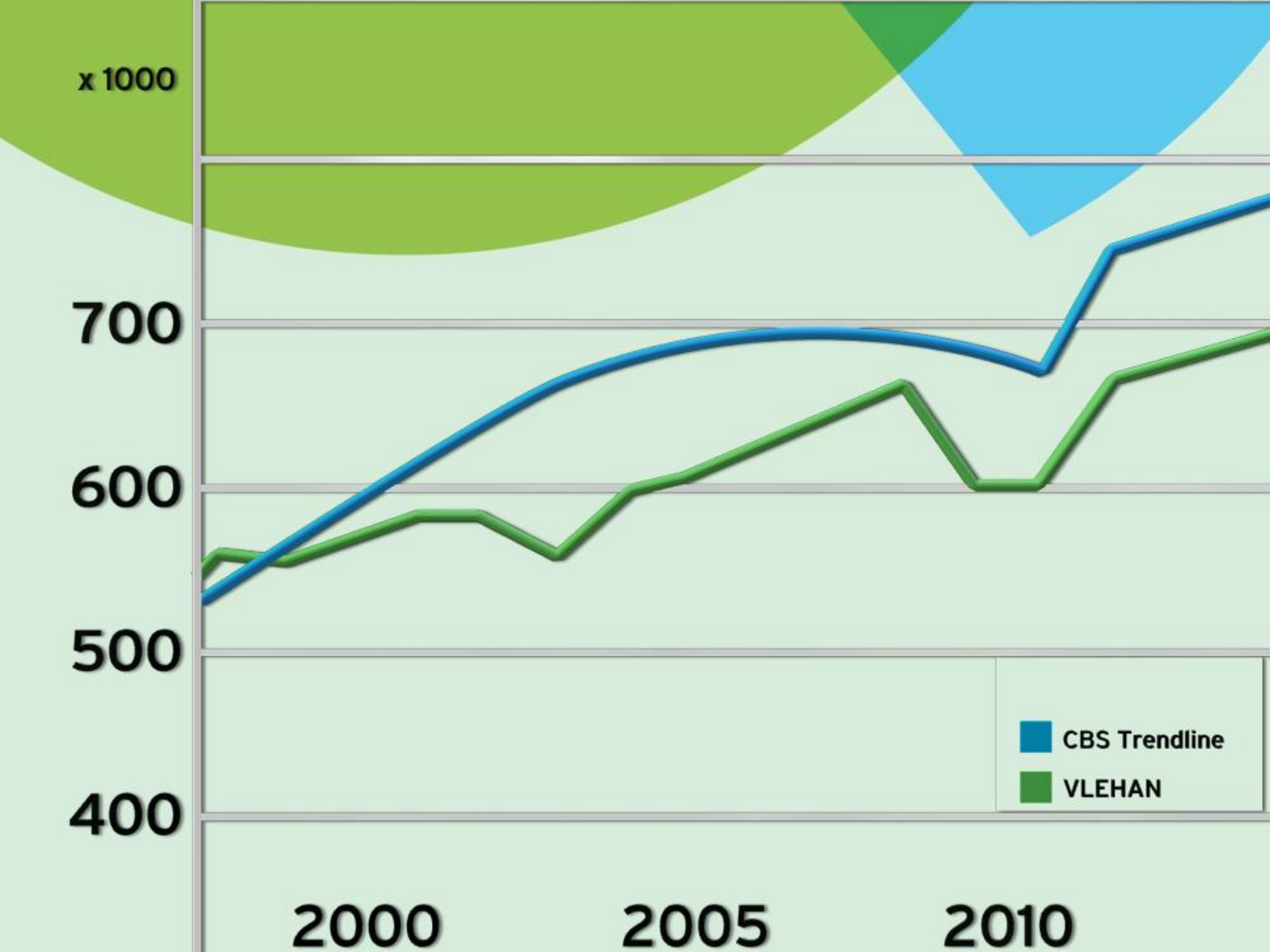
400

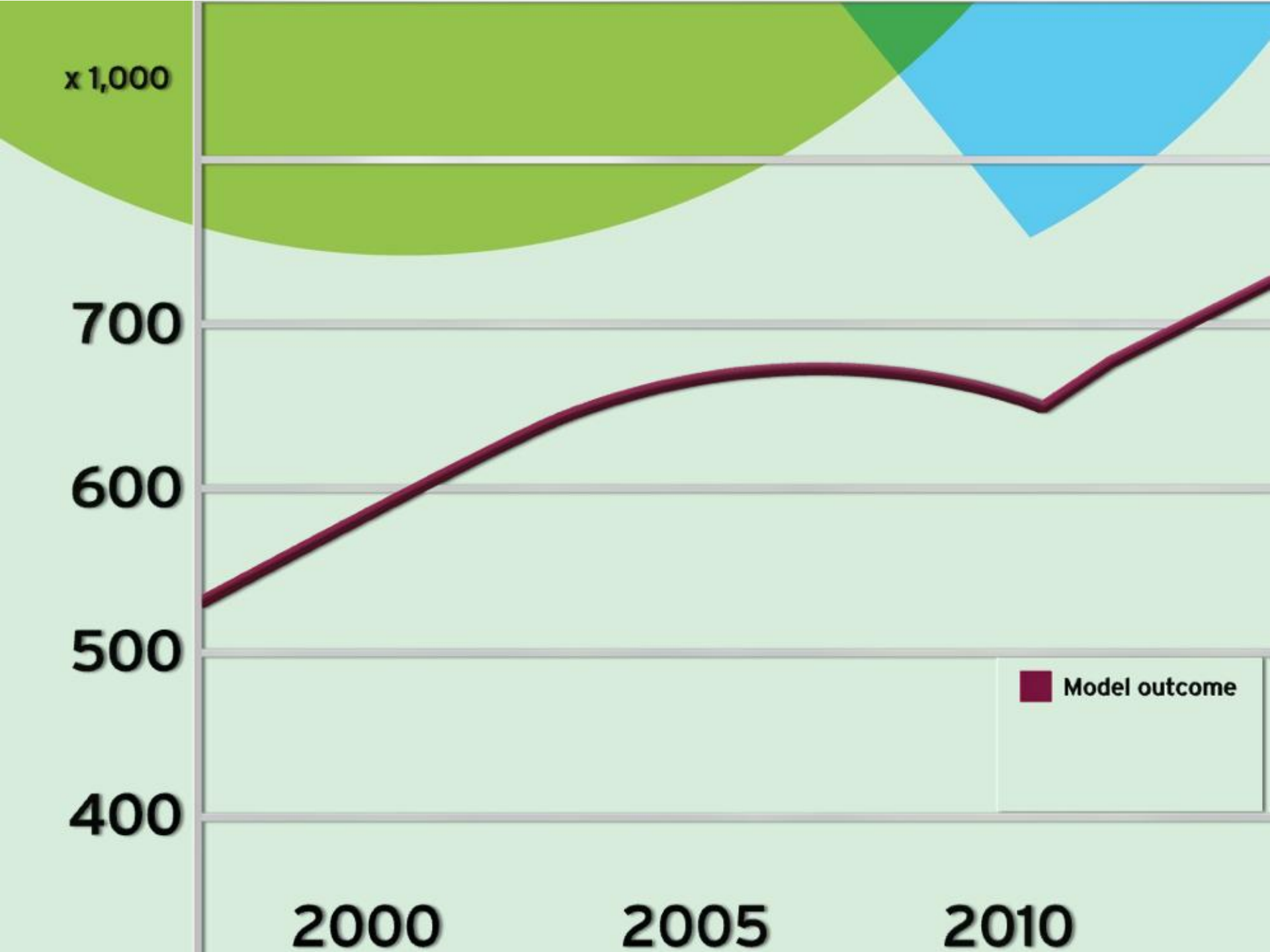
2000

2005

2010

CBS Trendline
VLEHAN





weight per piece

+33%



+26%



+5%

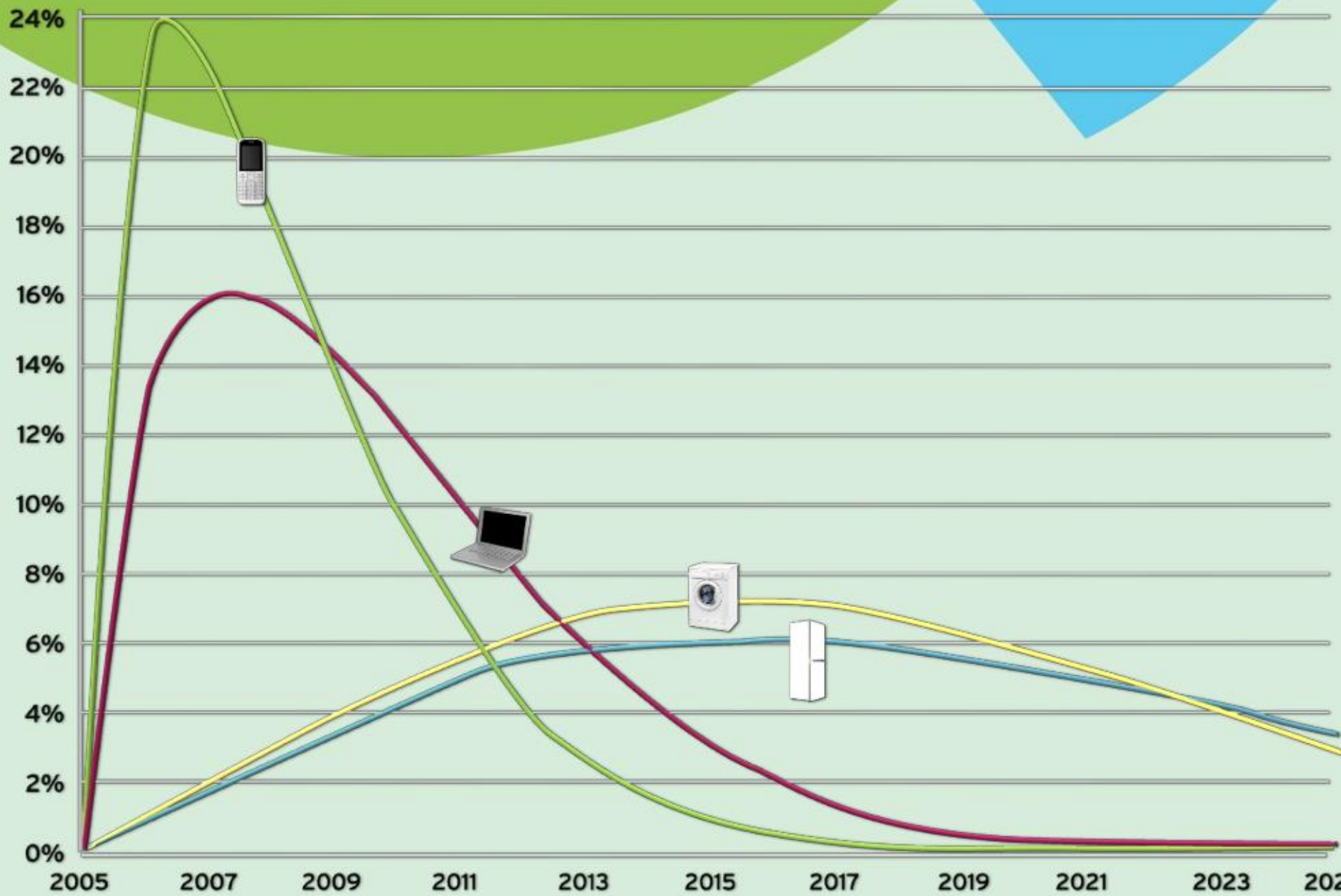


-25%



-28%







Shorter lifespans of all EEE

17% for Screens

12% for SHA

10% for IT

10% for Lamps

7% for LHA

4% for C&F

4% for PROF

TOTAL WEIGHT

Pieces **X** **Weight** **X** **Residence time**

=

Total Weight

PIECES PER HOUSEHOLD

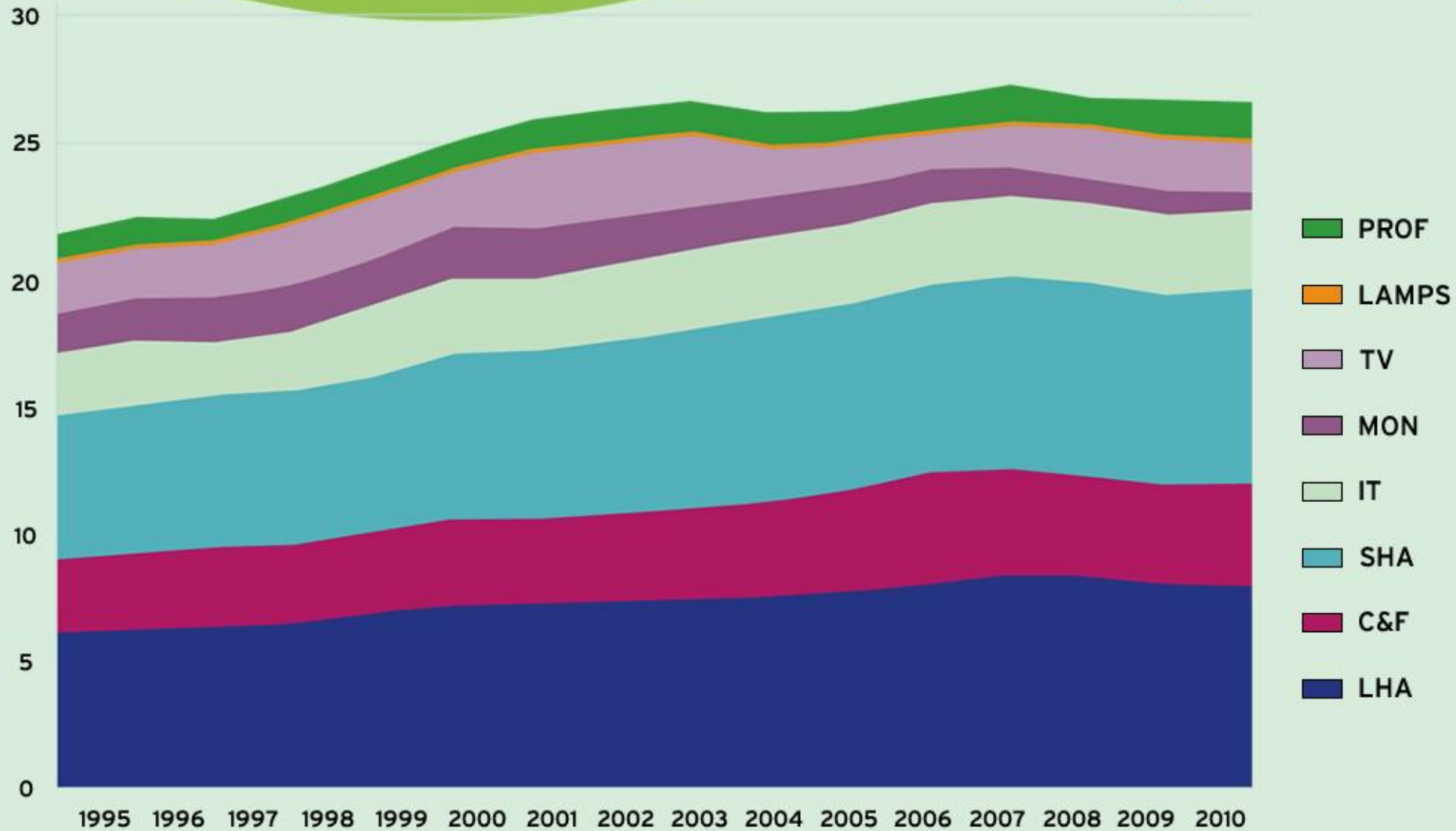
per HH	LHA	C&F	SHA	IT	SCREENS	TOTAL*
2007	3.3	2.2	36	5.4	3.6	59
2010	3.6	2.2	63	21	3.4	93

*excl. lamps, lum.

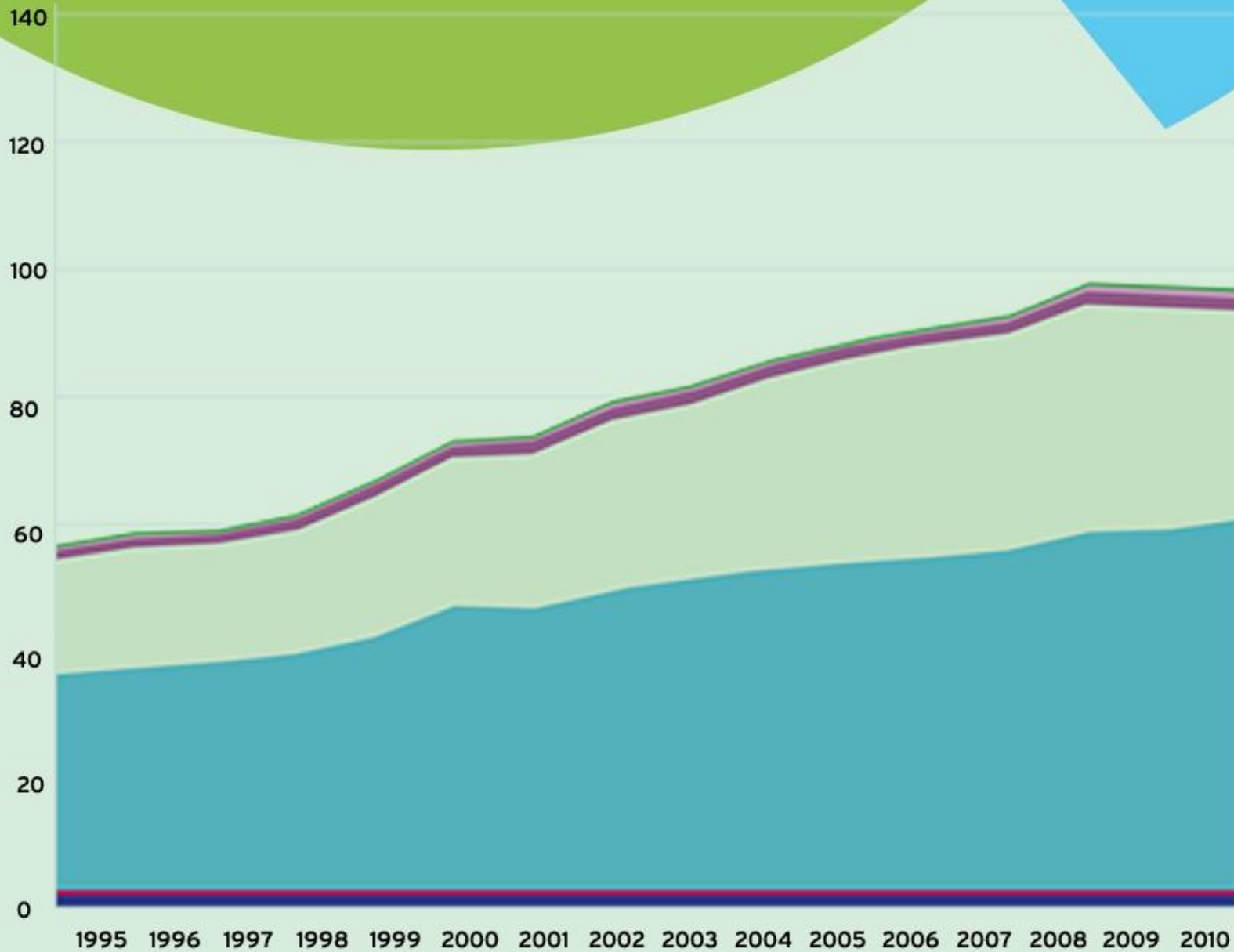
TRENDS IN POM

- LHA: growth mainly due to more HH
- C&F: heavier per piece
- SHA: more, lighter per piece
- IT: large growth in pieces, much lighter
- Screens: from CRT to LCD

POM in kg/inh



POM in million pieces



- PROF
- LAMPS
- TV
- MON
- IT
- SHA
- C&F
- LHA

WEEE + USED EEE GENERATED

2010 in KG/INH	LHA	C&F	SHA	IT	MON	TV	LAMPS	PROF	TOTAL (KG/INH)
WEEE + used EEE generated	6.39	2.95	6.44	3.00	1.80	1.85	0.22	1.03	23.7
WEEE + used EEE ratio	81%	76%	86%	99%	237%	106%	80%	71%	89%



EXPORT USED EEE



- Harbor
- Export second hand appliances and e-waste to Africa
- Export parts and small appliances to Asia
- Export second hand appliances e-waste to Eastern Europe
- Export resources industry
- Competition: export and import scrap for recycling
- Small coverage export scrap for recycling

WEEE NL 2010

2010 in KG/INH	LHA	C&F	SHA	IT	MON	TV	LAMPS	PROF	TOTAL (KG/INH)
WEEE + used EEE generated	6.39	2.95	6.44	3.00	1.80	1.85	0.22	1.03	23.7
Export used EEE	0.26	0.60	0.24	0.60	0.26	0.49	0.00	0.20	2.7
WEEE generated 2010 NL	6.13	2.36	6.20	2.40	1.53	1.36	0.22	0.83	21.0
WEEE/EEE ratio (excl. export)	78%	61%	83%	79%	202%	78%	80%	57%	79%

WEEE NL 2010





RECYCLING FLOWS 2010

COMPLIANCE SCHEME FLOWS

Collection Results (kg/inh)		LHA	C&F	SHA	IT + MON	TV	TOTAL
Municipalities	2010	0.50	0.96	1.48	1.19	1.01	5.2

COMPLIANCE SCHEME FLOWS

Collection Results (kg/inh)		LHA	C&F	SHA	IT + MON	TV	TOTAL
Municipalities	2010	0.50	0.96	1.48	1.19	1.01	5.2
Retail	2009	0.36	0.41	0.06	0.14	0.01	1.0
Retail	2010	1.36	0.56	0.11	0.23	0.01	2.3

MARKET SURVEY

- National level: 9 recyclers
- Regional level: 150 processors total from which 80 do WEEE
- Validated amounts: national and regional amounts match:
bandwidth 104-115 ktons
- Pre-shredder/ mono-flows:
 - recycled in NL: 88 kton
 - mono-flows = 60%, pre-shredder is 40%
 - WEEE in pre-shredder is 3.5% at least
 - recycled ex. NL: 16 kton, mainly pre-shredder







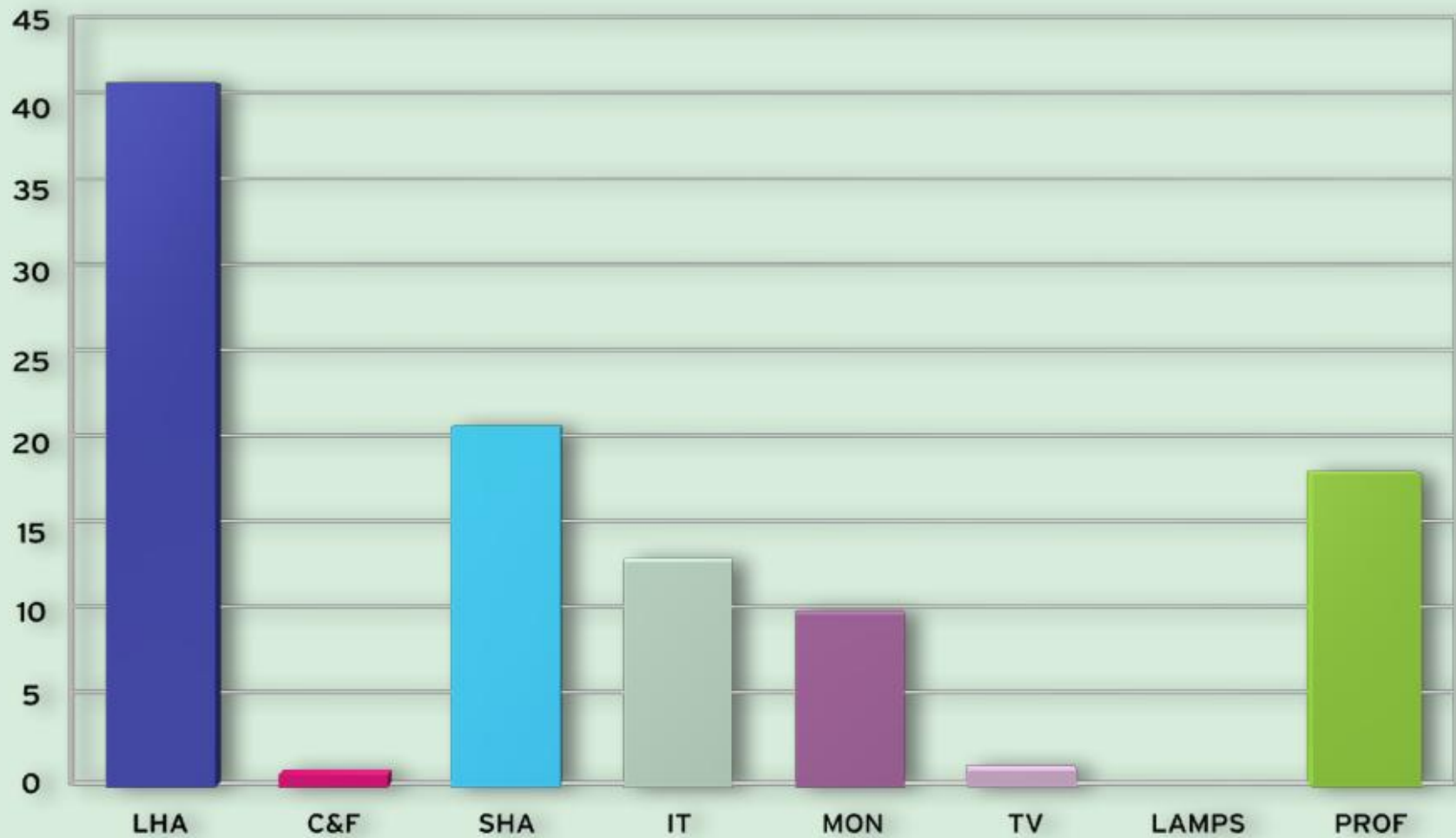
The Netherlands

Germany

Belgium

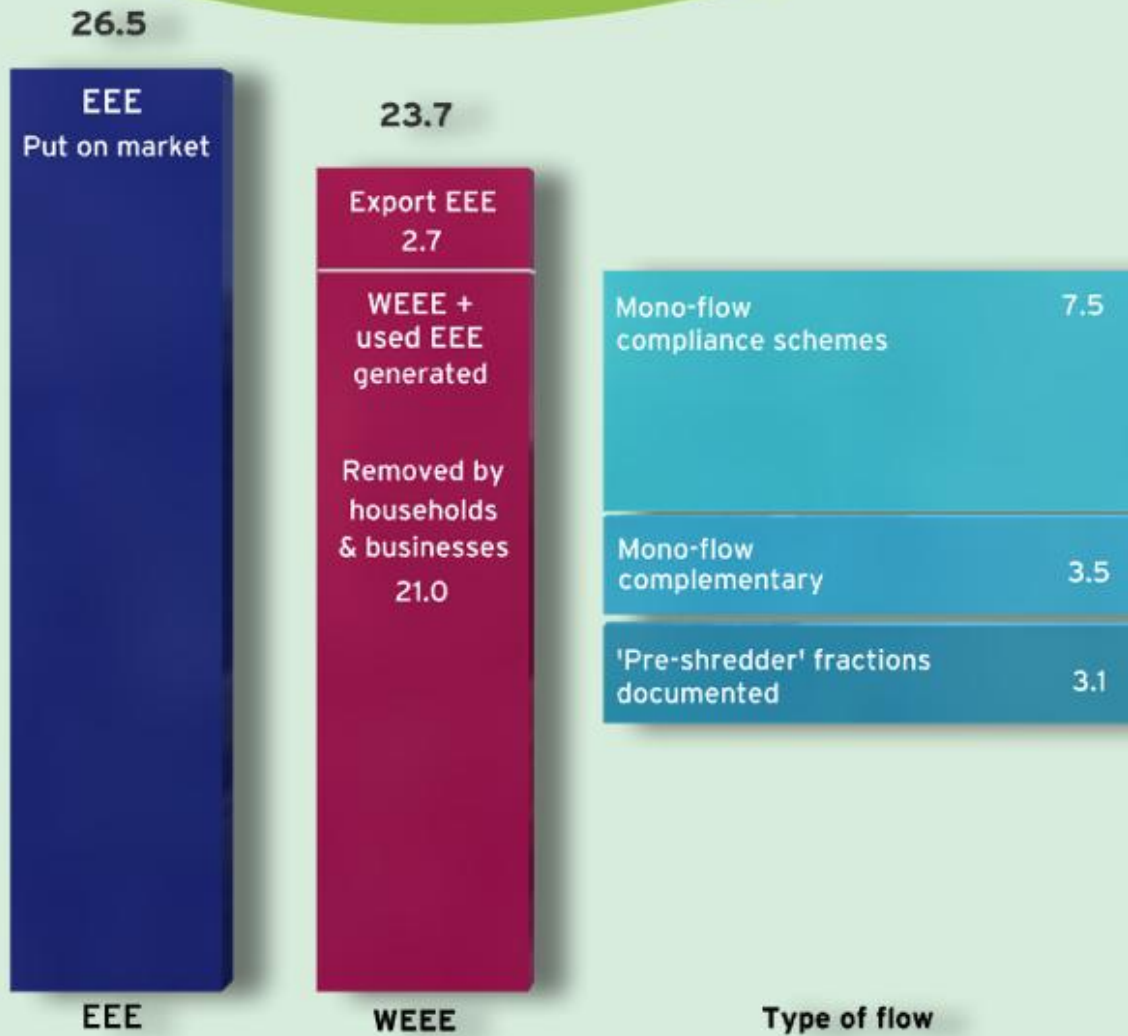
-  Competition: export and import scrap for recycling
-  Small coverage export scrap for recycling

RECYCLING FLOWS



COMPLEMENTARY FLOWS

2010 in KG/INH	LHA	C&F	SHA	IT	MON	TV	LAMPS	PROF	TOTAL (KG/INH)	TOTAL (KTON)
Wecycle/ICT~Milieu	1.86	1.53	1.60	0.61	0.61	1.25	0.10	0.00	7.5	125
Complementary recycling	2.81	0.39	1.45	0.70	0.56	0.05	0.01	0.63	6.6	110







WASTE BIN

WASTE BIN

- 2.3 kg/inh (2.1 for HH)
- Several hundred sorting analyses
- Mainly SHA, small IT and HH luminaires



PAY-AS-YOU-THROW

1 KG PER INHABITANT LESS

THE WEEE CHAIN MODEL

Step 1

START OF THE FLOWS

- EEE Put On Market to WEEE Generated

Step 2

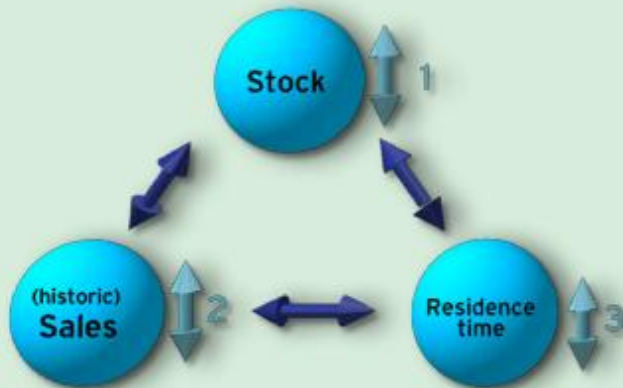
WEEE FLOWS

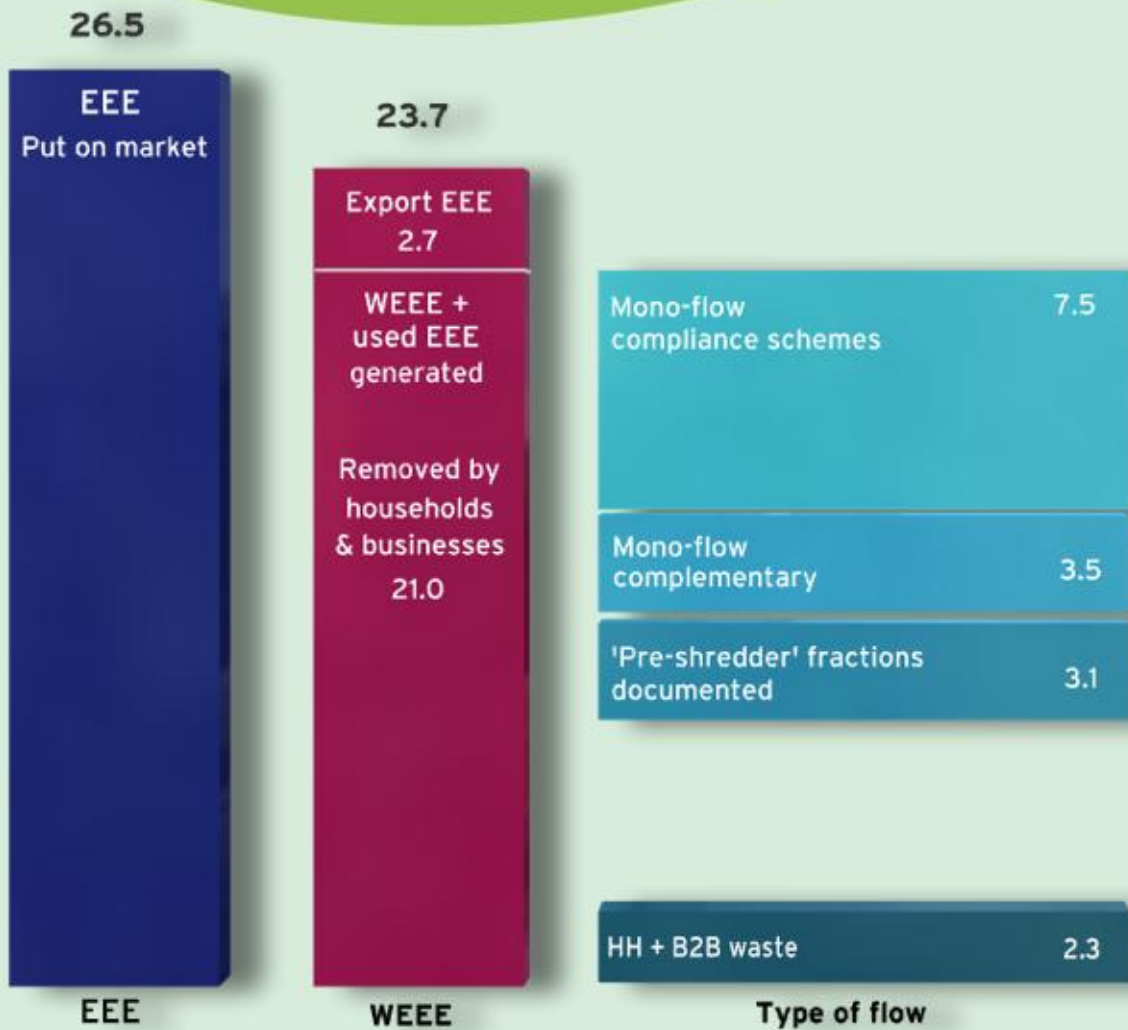
- Origin
- Flows
- Reuse/refurbishing

Step 3

END OF THE FLOWS

- Import
- Export
- Recycling





EEE

WEEE

Type of flow

THE WEEE CHAIN MODEL

- To avoid 'return loops'
- To split NL and non-NL WEEE
- To improve allocation per collection category
- To allocate B2B and HH
- 'Most logic' solution, free from interpretation

DOCUMENTED VERSUS NOT (YET) DOCUMENTED

Result:

Documented flows

Not (yet) documented flows

- Identifiable
- Not identifiable

26.5



EEE

23.7



WEEE

Mono-flow compliance schemes	7.5
Mono-flow complementary	3.5
'Pre-shredder' fractions documented	3.1
Not (yet) documented	3.9 - 5.1
Additional pre-shredder	1.0 - 1.3
Dismantled parts/installations	0.9 - 1.4
Other/scope	1.4 - 1.8
WEEE export	0.4 - 0.8
HH + B2B waste	2.3

Type of flow

MASS BALANCE 2010

2010 in KG/INH	LHA	C&F	SHA	IT	MON	TV	LAMPS	PROF	TOTAL (KG/INH)	TOTAL (KTON)
EEE POM 2010	7.88	3.88	7.50	3.03	0.76	1.74	0.27	1.46	26.5	440
Export used EEE	0.26	0.60	0.24	0.60	0.26	0.49	0.00	0.20	2.7	44
WEEE generated 2010 NL	6.13	2.36	6.20	2.40	1.53	1.36	0.22	0.83	21.0	349
Wecycle/ICT~Milieu	1.86	1.53	1.60	0.61	0.61	1.25	0.10	0.00	7.5	125
Compl. recycling B2B + HH	2.81	0.39	1.45	0.70	0.56	0.05	0.01	0.63	6.6	110
Waste/incineration	0.00	0.00	1.64	0.54	0.00	0.00	0.11	0.00	2.3	38

26.5



EEE

23.7



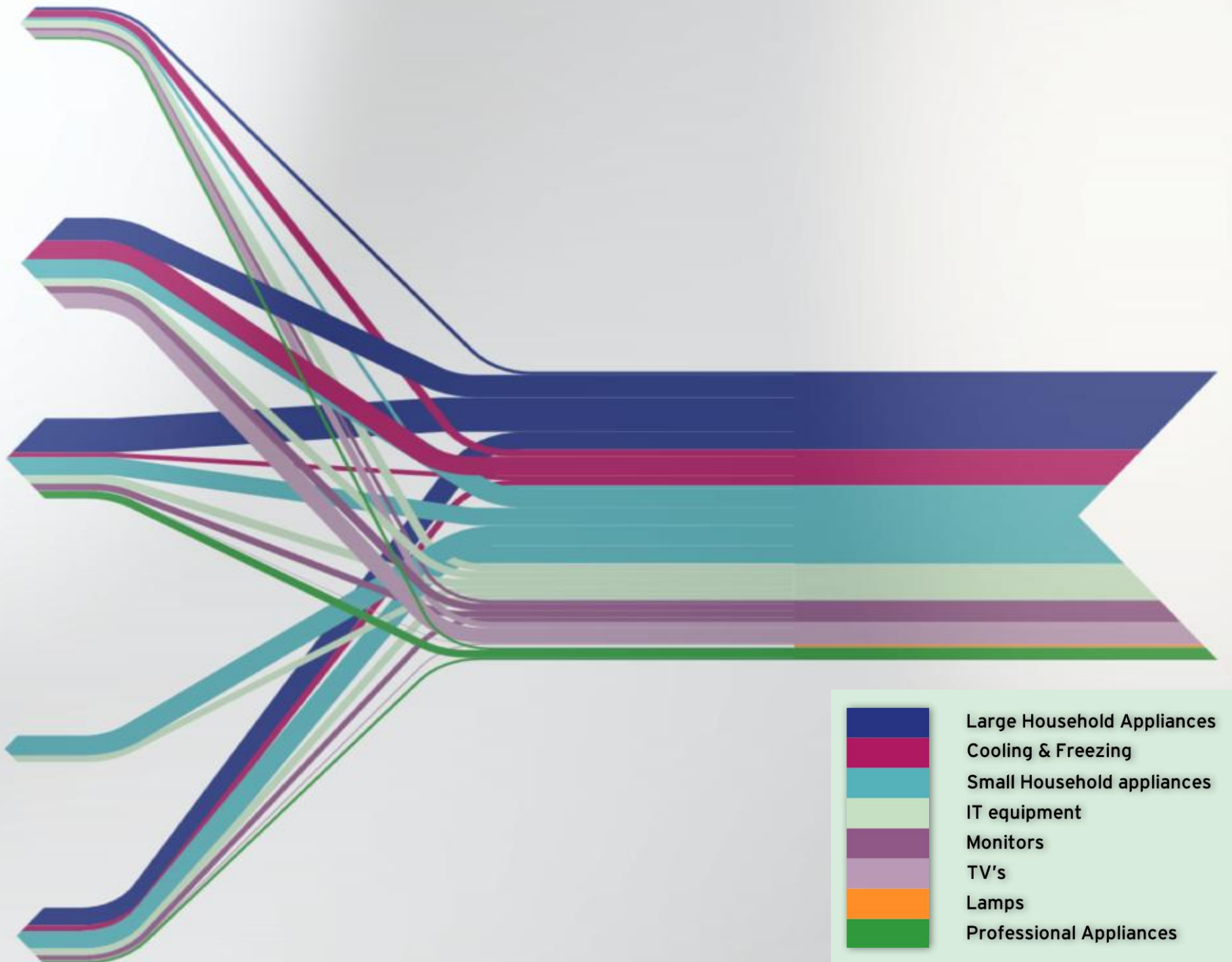
WEEE

Mono-flow compliance schemes	7.5
Mono-flow complementary	3.5
'Pre-shredder' fractions documented	3.1
Not (yet) documented	3.9 - 5.1
Additional pre-shredder	1.0 - 1.3
Dismantled parts/installations	0.9 - 1.4
Other/scope	1.4 - 1.8
WEEE export	0.4 - 0.8
HH + B2B waste	2.3

Type of flow

Export reuse	2.7
Contracted formal recycling	7.5
Minimum complementary recycling	6.6
Not yet defined	1.8 - 2.8
Not-identifiable	2.0 - 2.4
Incineration	2.3

End of logistics chain



CONCLUSIONS POM

- POM 2010 is 26.5 kg/inh
- POM 2007-2009 (POM 3yrs) is 26.8 kg/inh
- POM not reported (same comparison basis) 4.5 kg/inh
- A dedicated and transferable method is developed for analysing a country's POM independently

26.5



EEC

24.9



NEED



Type of flow



End of business plans

CONCLUSIONS WEEE

- WEEE generated incl. used EEE is 23.7 kg/inh
- Export of used EEE is at least 2.7 kg/inh (9% of POM 3yrs)
- WEEE generated NL is 21.0 kg/inh, 78% of POM 3 yrs
- The ratios WEEE/ POM is above the long term trend from the past and will remain around 90% for the coming years

26.5



EEE

23.7



WEEE



Type of flow

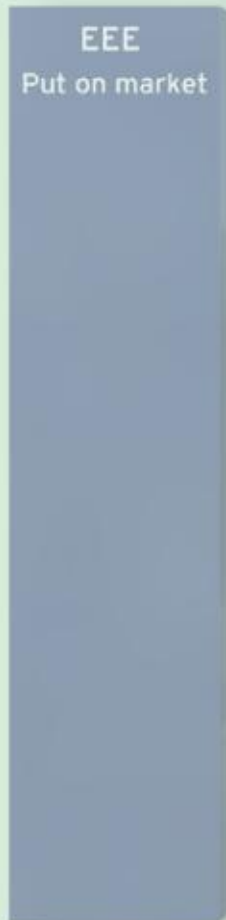


End of logistics chain

CAN WEEE REACH THE TARGET?

compared to POM (2007–2009) = 26.8

26.5



EEE

23.7



WEEE



Type of flow

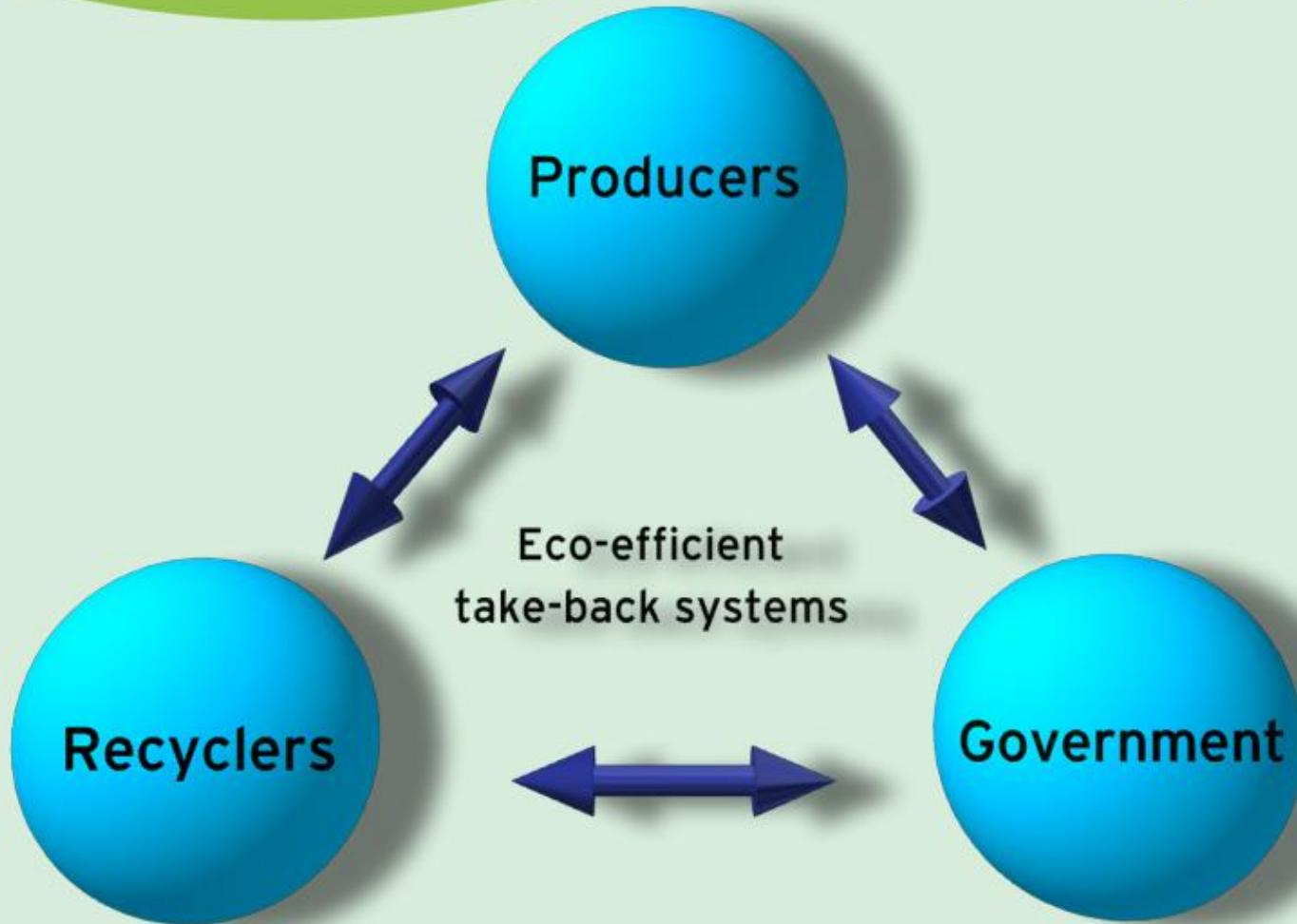


End of logistics chain



CONSEQUENCES

JOINT RESPONSIBILITIES



Jaco Huisman

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**UNITED NATIONS
UNIVERSITY**

UNU-ISP

Institute for Sustainability and Peace