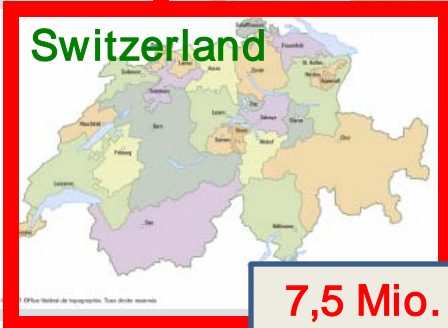
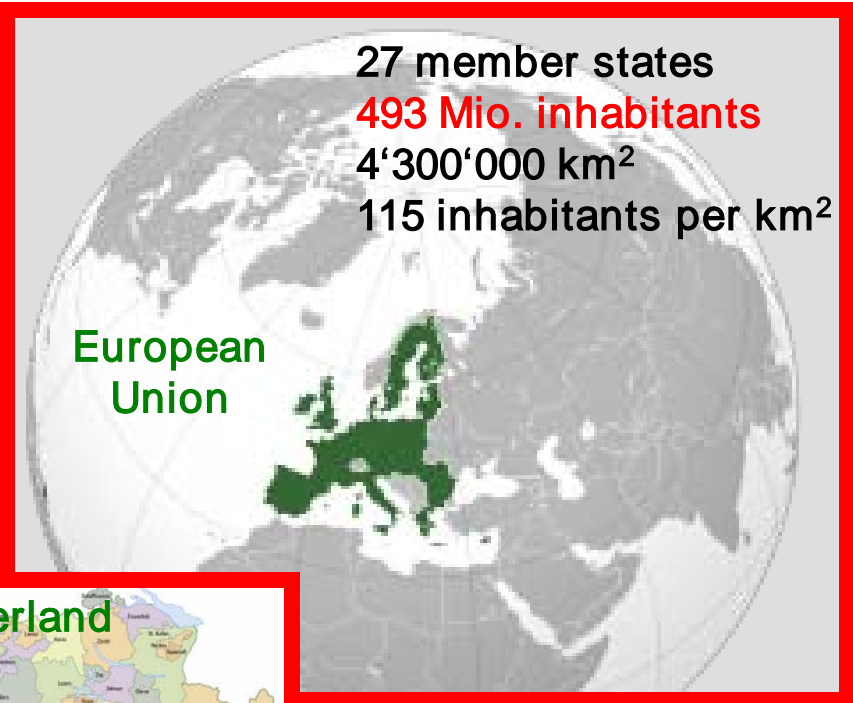


Residuos Electronicos





42 Mio. inhabitants
 1 140 000 km²
 37 inhabitants per km²



7,5 Mio. inhabitants
 41 000 km²
 182 inhabitants per km²

RAEE (WEEE) ?

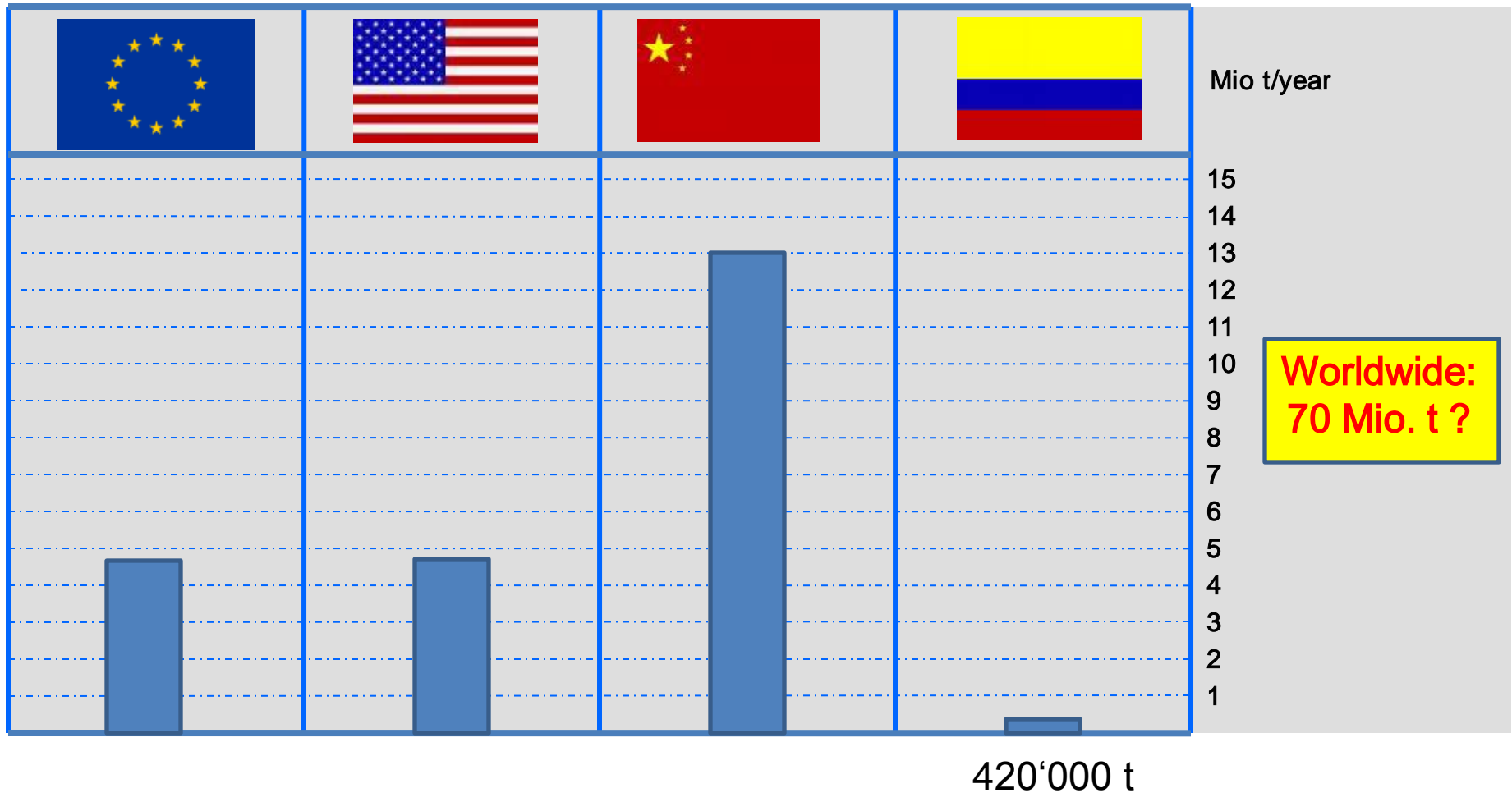
Residuos de Aparatos Eléctricos y Electronicos

All products with:



- Consumables (Toner, CD's etc.) ???
- Parts (Repair and Refurbishment) ???
- Accessories ???
- Cables ???
- Installation Material???
-

The fastest growing waste-stream in the world



~ 10 kg per inhabitant/year

E-Waste (EU and Latin-America)

The ten WEEE categories (Europe):

Large household appliances
Small household appliances
IT and Telecom
Consumer electronics
Lighting equipment
Electrical/electronic tools
Toys and sports equipment
Medical devices
Monitoring/control instruments
Automatic dispensers

The five RELAC categories (Latin America):

Appliances containing refrigerants
Large and mid-size home appliances
Lighting fixtures
Appliances with monitors/screens/displays
Other electrical and electronic equipment

Historical waste / Orphans / Clones

1.1.2012

Products installed before 1.1.2012

Historical waste











Products installed after 1.1.2012

Actual waste

Products installed before or after
1.1.2012, but „no name or dead“

Orphans / Clone

Market Input and Take-back Volumes in Europe

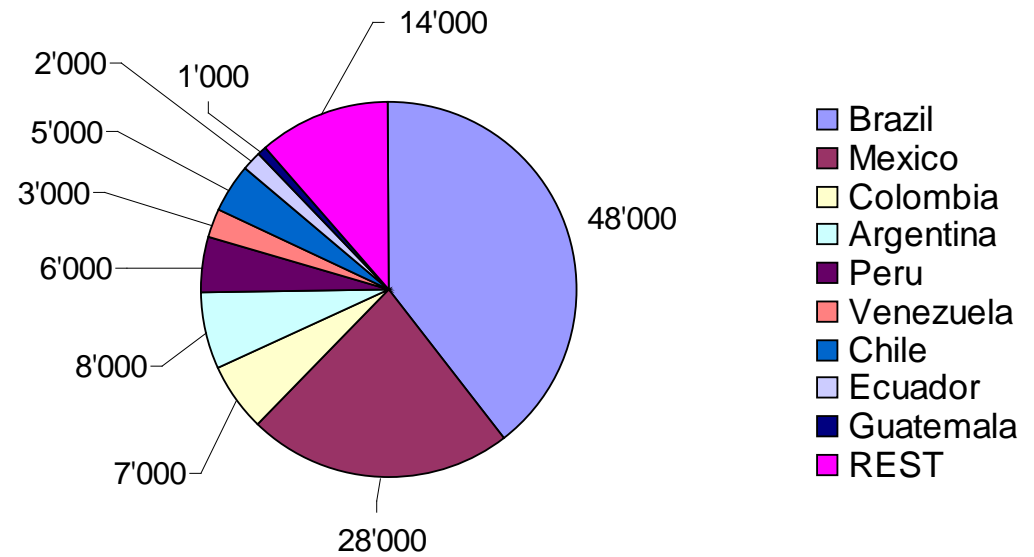
									
Large household	Small household	IT and telecom	Consumer electronics	Lighting equipment	Electronic tools	Toys, sport equipment	Medical devices	Monitoring instruments	Automatic dispensers
market input in Europe, 11 to 30 kg per capita									
57%	9%	12%	12%	3%	4%	2%	<1%	<1%	<1%
Take-back in Switzerland, 15 kg per capita									
39%	11%	23%	19%	3%	1%	1%	<1%	1%	<1%

Computer waste in Latin-America

Latin America



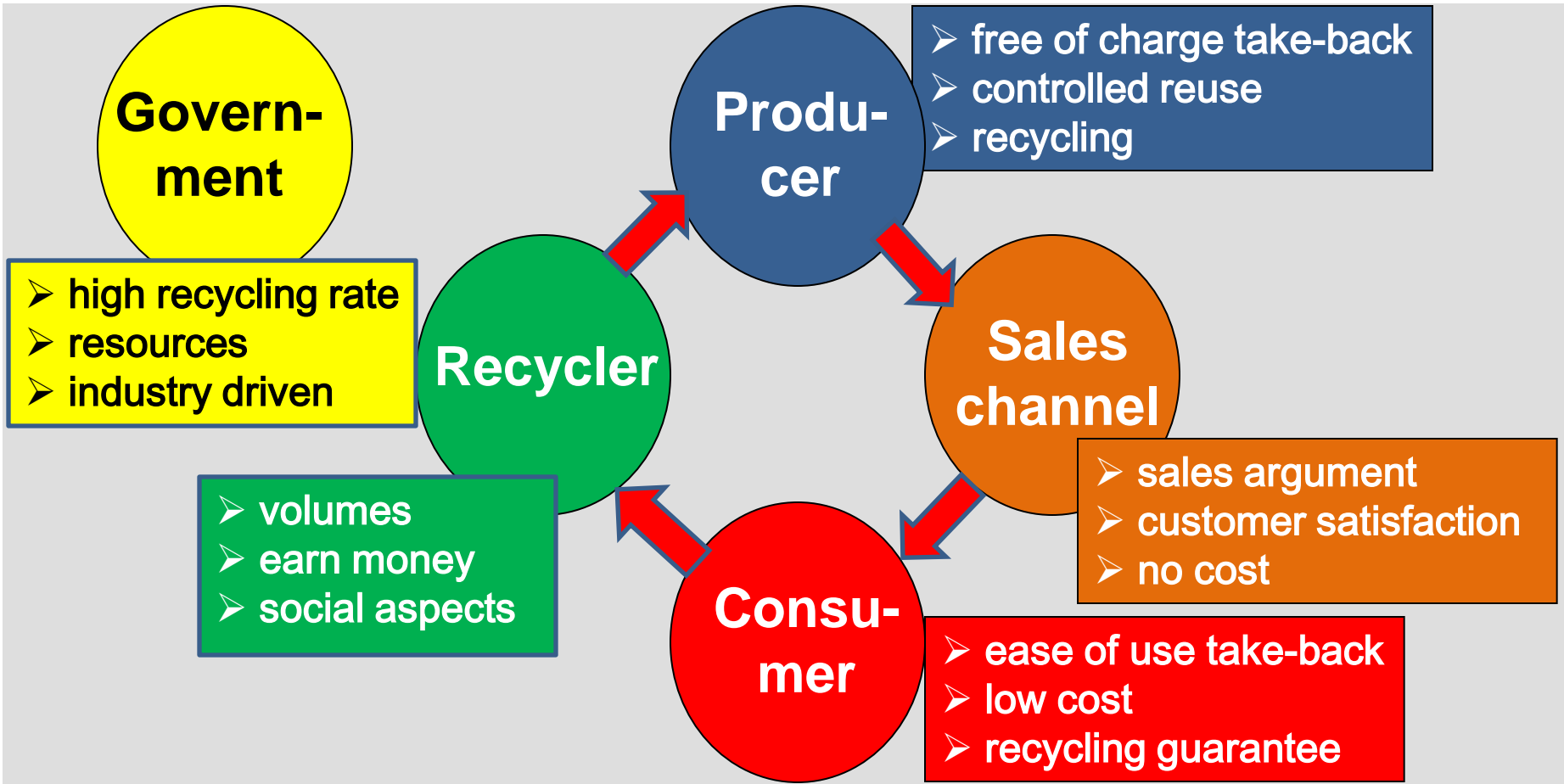
Estimated computer waste quantities Latin-America



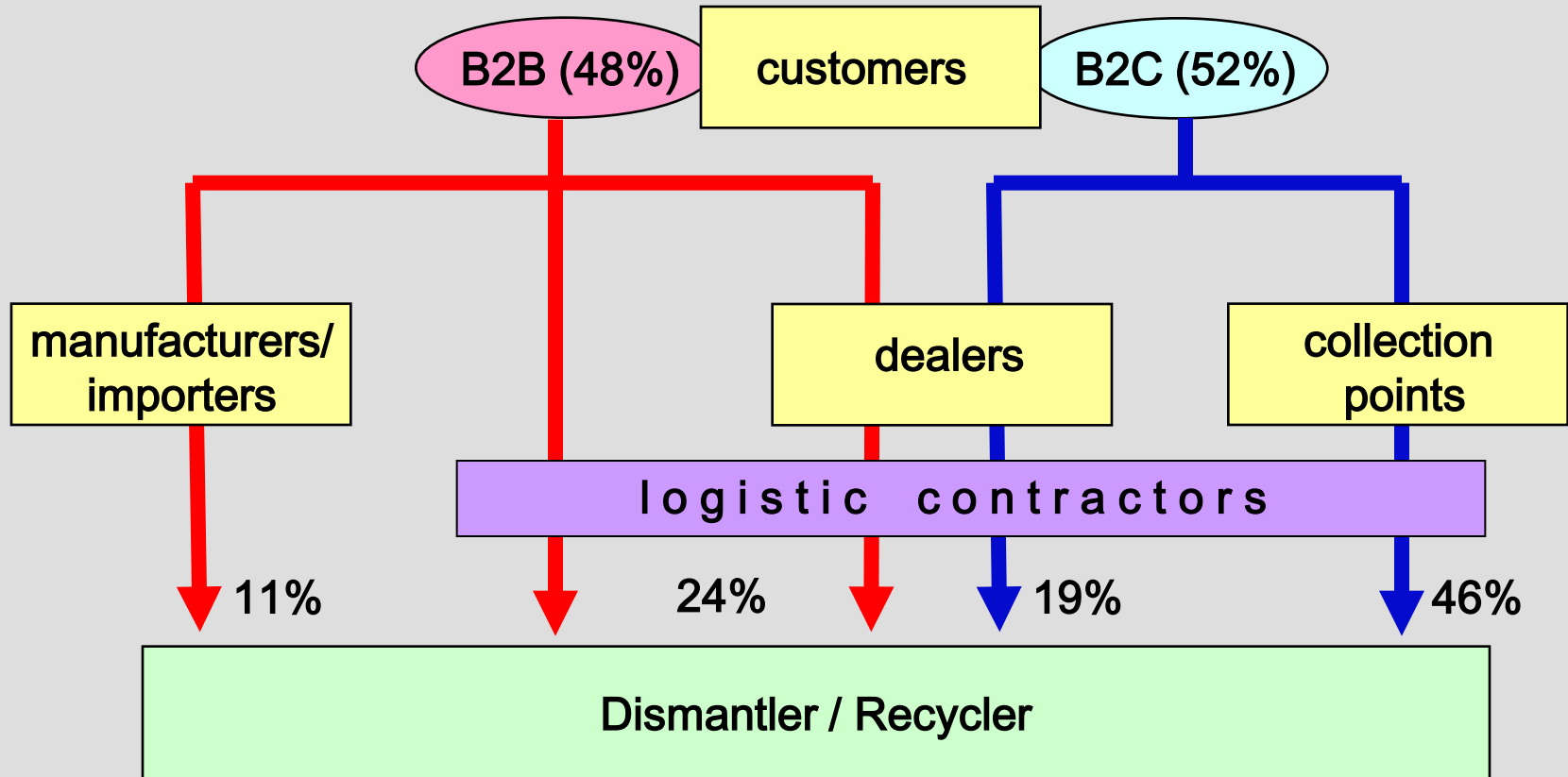
Estimations by Empa

- An estimated 120'000 t of **computer waste** needs to be discarded in Latin America every year, a quantity which is estimated to triple by 2015

Who are the actors? What do they want?



Take-back IT and Consumer Electronics (example Switzerland)



Cost or Revenue ?



(2009 /30 PRO in Europe / 1,6 Mio t / = €0.30 per kg)

	Cost	Revenue
Collection	X	
Logistics	X	
Recycling	X	X
Packaging etc.	X	
Administration	X	
Balance	X	X



Dependent on **products**,
quality and service!

Collection 11%	Logistics 26%	Recycling & control 46%	Packaging batteries 13%	Admin. 4%	(Switzerland)
-------------------	------------------	-------------------------------	-------------------------------	--------------	---------------

Why close material cycles in e-waste?

Toxic vs. precious substances

Recovery of toxic and hazardous substances

Heavy metals (Hg, Pb, Cd), halogens (Br, Cl, F), etc.

> **Decontamination**

Recovery of basic and precious materials

Au, Ag, Pd, Cu, Al, Fe.,.etc.

> **Valorization**

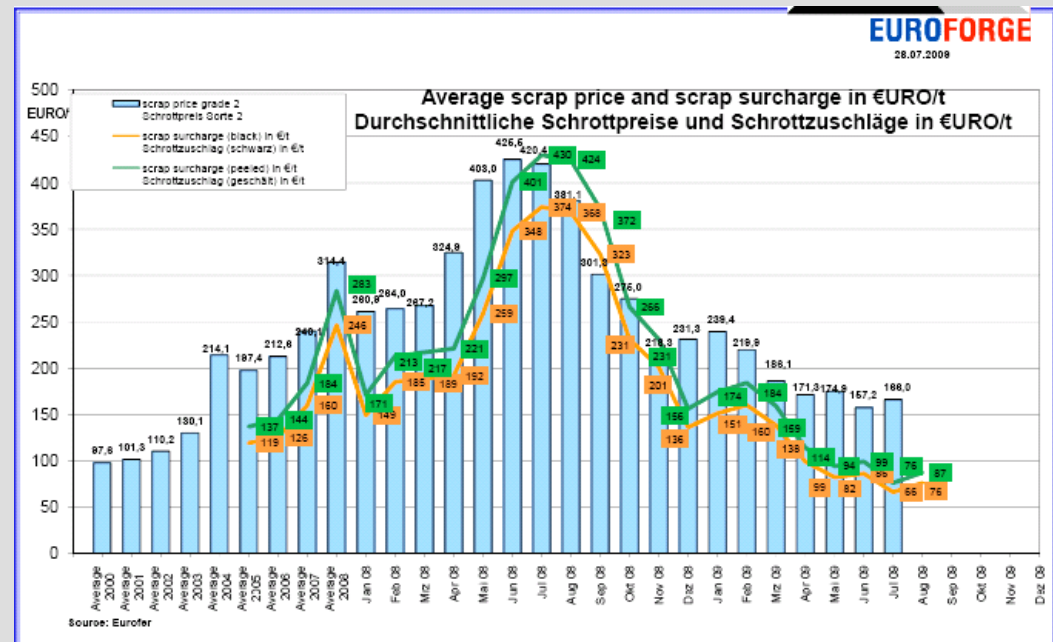


Raw materials



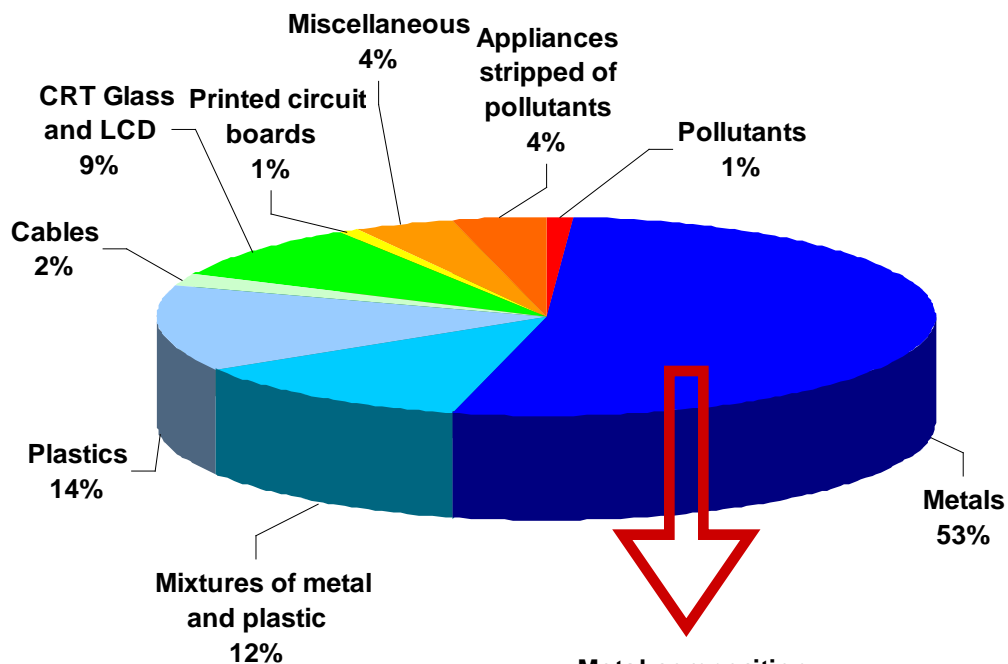
Result Switzerland 2008: (all Systems)

61 300 t Metals
16 100 t Plastics
10 700 t Glass
11 800 t Metal-plastic mix
1 100 t Boards
2 100 t Cable
3 200 t Miscellaneous
1 100 t Pollutants (1%)
107 400 t Total

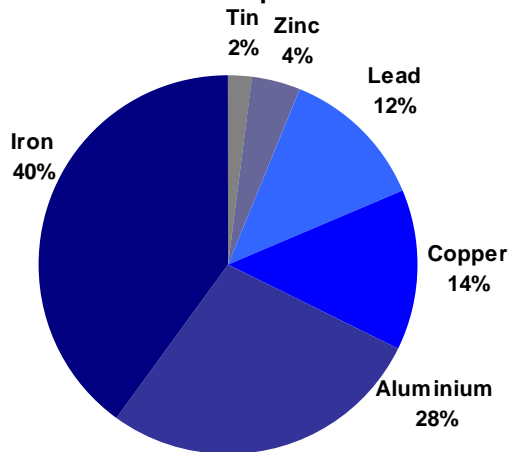


Composition of products

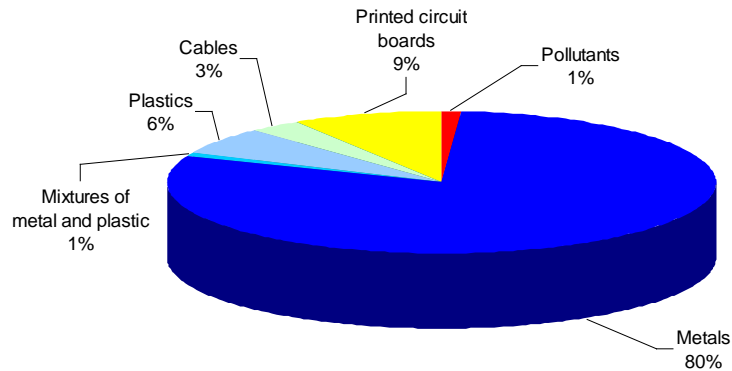
Average composition (in weight %)



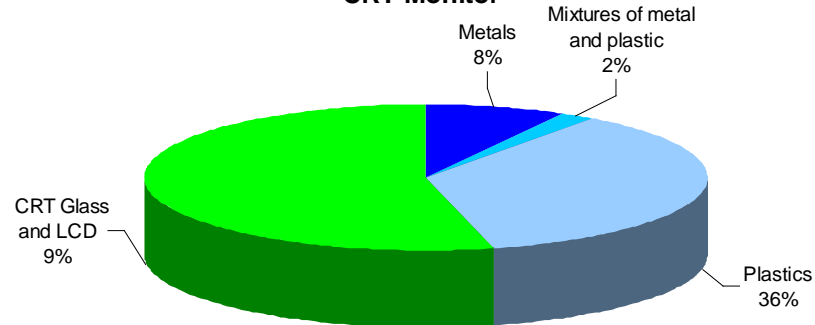
Metal composition



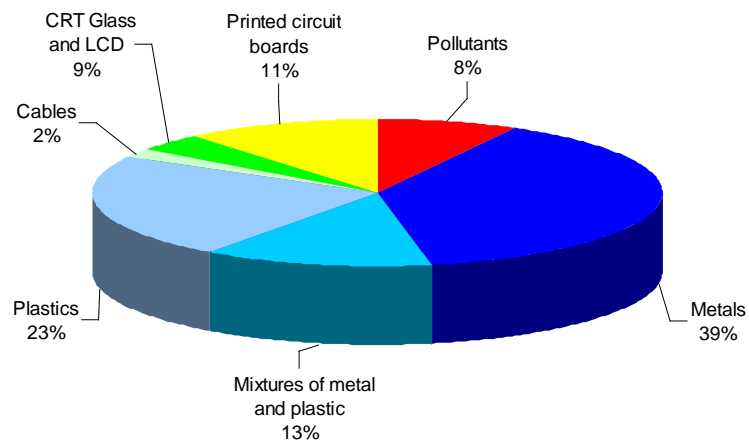
PC/Server



CRT Monitor



Notebook



The “dark side” of e-waste recycling



Thank you for your attention





Peter Bornand
International Consultant
Sonnenhof 23
CH 8121 Benglen
Switzerland

Tel. 0041 (0)44 737 34 29
E-Mail: bornand@ggaweb.ch

