

Statistics on the national arisings of E-scrap and the movement of E-scrap between countries

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The Context

- ➔ The BIR E-Scrap Committee decided to produce a definitive set of statistics on the national arising of E-Scrap and their movement between countries.
- ➔ A contract was granted to Harokopio University of Athens (Greece), after a tendering procedure, to collect, process and collate existing data on E-scrap in published reports and other sources.
- ➔ The collected data from all sources and the E-scrap estimation between 2016 and 2025 were presented in a Report entitled "*Statistics on the national arisings of E-scrap and the movement of E-scrap between countries*".

The Report:

Statistics on the national arisings of E-scrap and the movement of E-scrap between countries



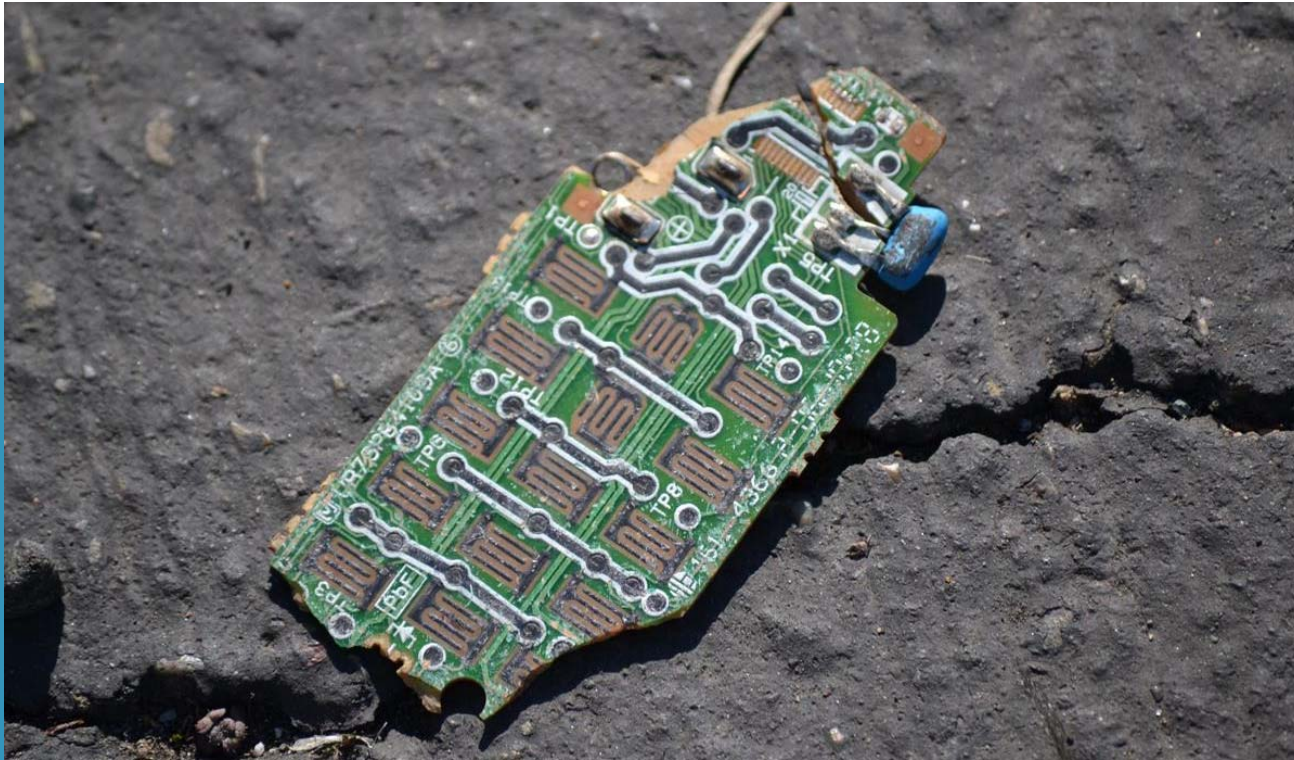
E-scrap: a definition

Both used and end-of-life **electrical** and **electronic** equipment, in whole or in part.

To account for differences that might exist in the types of EEE included in various data that were reviewed, the report breaks E-Scrap down into the following 4 primary categories:

- ➔ **Large household appliances:** washing machines, dishwashers, dryers, refrigerators, freezers, air-conditioners, etc.
- ➔ **Small household appliances:** vacuum cleaners, coffee machines, irons, toasters, etc.
- ➔ **Information and communication technologies:** PCs, laptops, mobile phones, telephones, fax machines, copiers, printers etc.
- ➔ **Consumer electronics:** televisions, VCR/DVD/CD players, Hi-Fi sets, radios, etc.



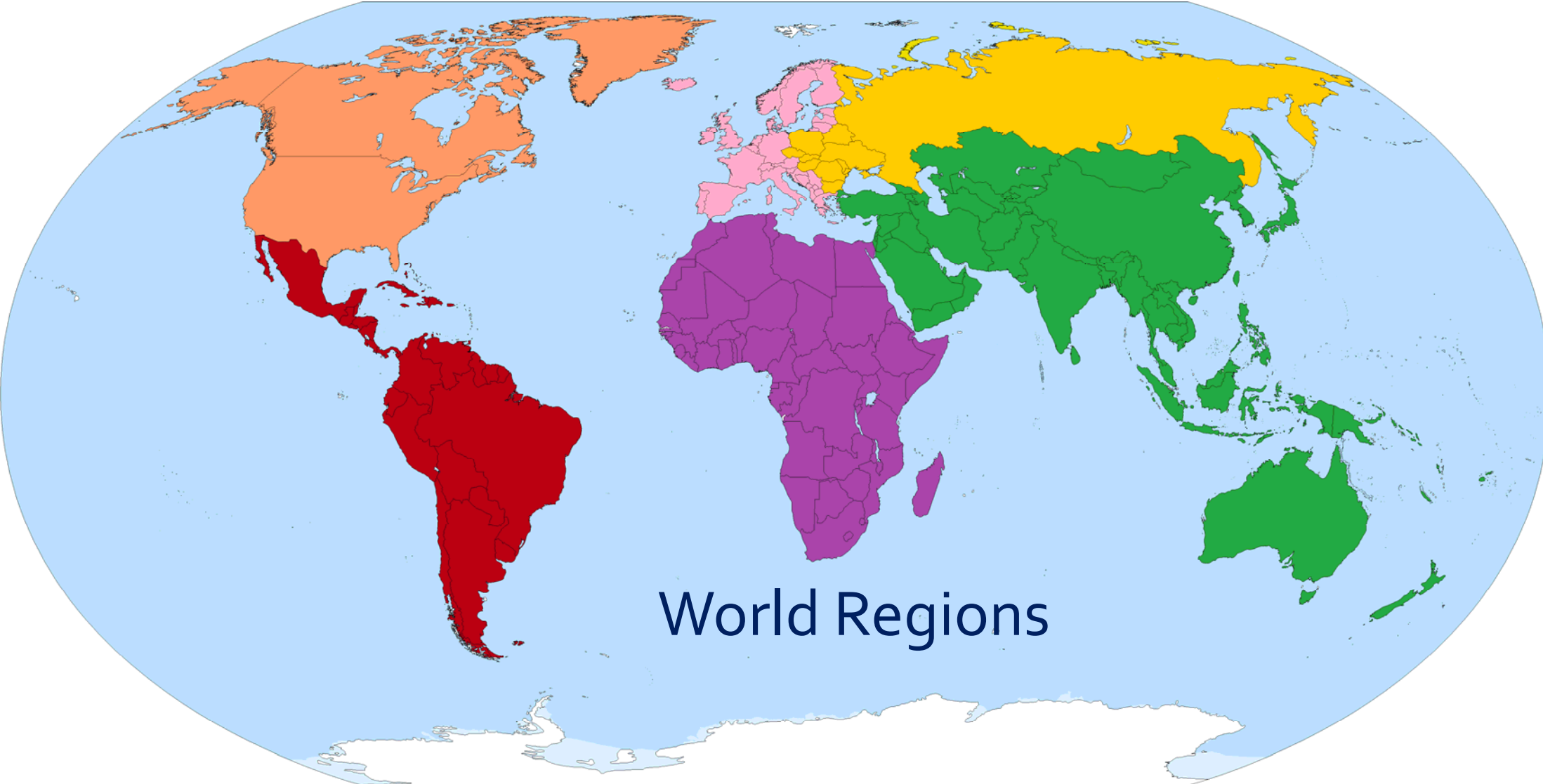


Worldwide amount of E-scrap

World Regions

The collected data was collated and presented for six geographical regions.

- ➔ African Countries
- ➔ Asia-Pacific Countries
- ➔ Eastern European Countries
- ➔ Latin American & Caribbean Countries
- ➔ USA and Canada
- ➔ Others (Western European and others except USA and Canada)



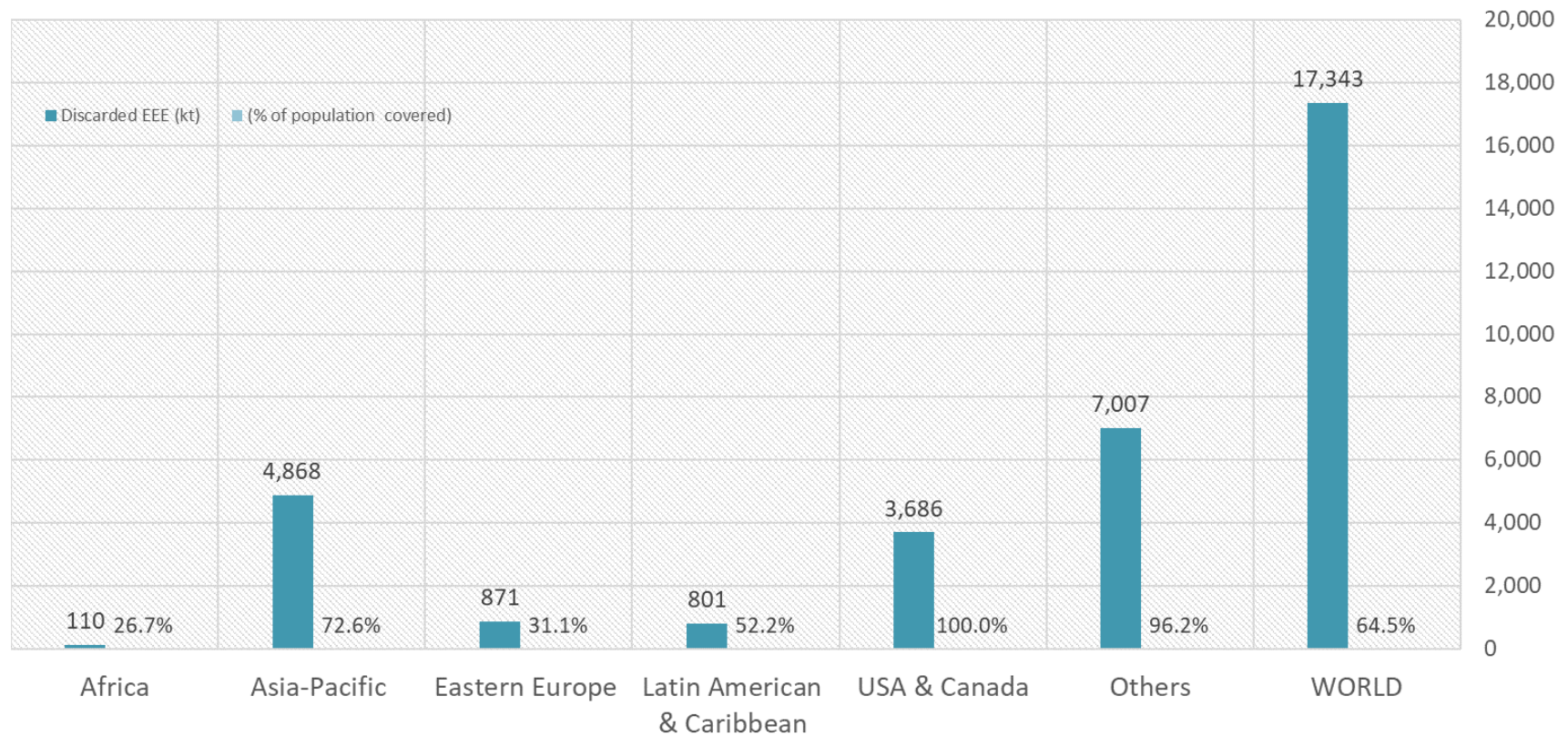
World Regions

E-scrap data collection, review and assessment

- ➔ Desktop study
- ➔ Review of published reports and research papers
- ➔ Data extraction from databases
- ➔ Data assessment
- ➔ Published data compilation and collation by country and E-scrap category for the years available
 - *Identification of severe data limitations and significant data gaps*



The Recorded Quantity of E-scrap Worldwide: Review of published data



Limitations of reported data

- The major constraint for the literature-based data review was the identification and reliability of “real” data. In many cases, the data were reported as “real”, derived from published sources (technical reports and journals), but in truth, they were just reliable estimations based on well-tested and widely accepted methodologies and models.
- Fully reliable E-scrap data at the global level is not yet available. Moreover, even where reliable data is available, there are significant issues in comparing data across countries as to date there is no single standard international definition of E-scrap.
- Reported data and datasets referred to different timeframes, making data collation and comparison between countries problematic.
- An example of these constrains is presented in the following table.

Limitations of reported data
[An example from Asia – Pacific countries]

Country	Year	E-scrap (tonnes)	E-scrap reported by type
China	2003	1,760,000	PCs, TVs, refrigerators, washing machines, air conditioners
Cambodia	2010	125,180 (items)	TVs, air conditioners, refrigerators, computers, mobile phones
Philippines	2014	69,860	Unspecified WEEE
Thailand	2014	160,538	Computers, mobile phones, TVs
Vietnam	2014	18,000	Unspecified e-waste
India	2007	382,979	Computers, printers, refrigerators, mobile phones, TVs
Turkey	2012	40,000	TVs, computer, DVD-VCD, air-conditioner, refrigerator, deep freeze, dish washer and washing machines
Australia	2007	60,000	Computers, TVs, mobile phones and fluorescent lamps
Cyprus	2014	7,819	E-scrap

Calculation of sales and estimation of e-scrap generation

Step 1

- The calculation of E-scrap generation is based on empirical data and statistical analysis.
- Data extracted from UN COMTRADE database. For EU, E-scrap data extracted from Eurostat
- The units are converted to weight using the average weight data per appliance type.

Step 2

- The E-scrap generated by any country is determined by applying the “Sales – Lifespan Distribution” method with empirical lifespan data.
- Lifespan data is mainly obtained from EU studies using the Weibull distribution.

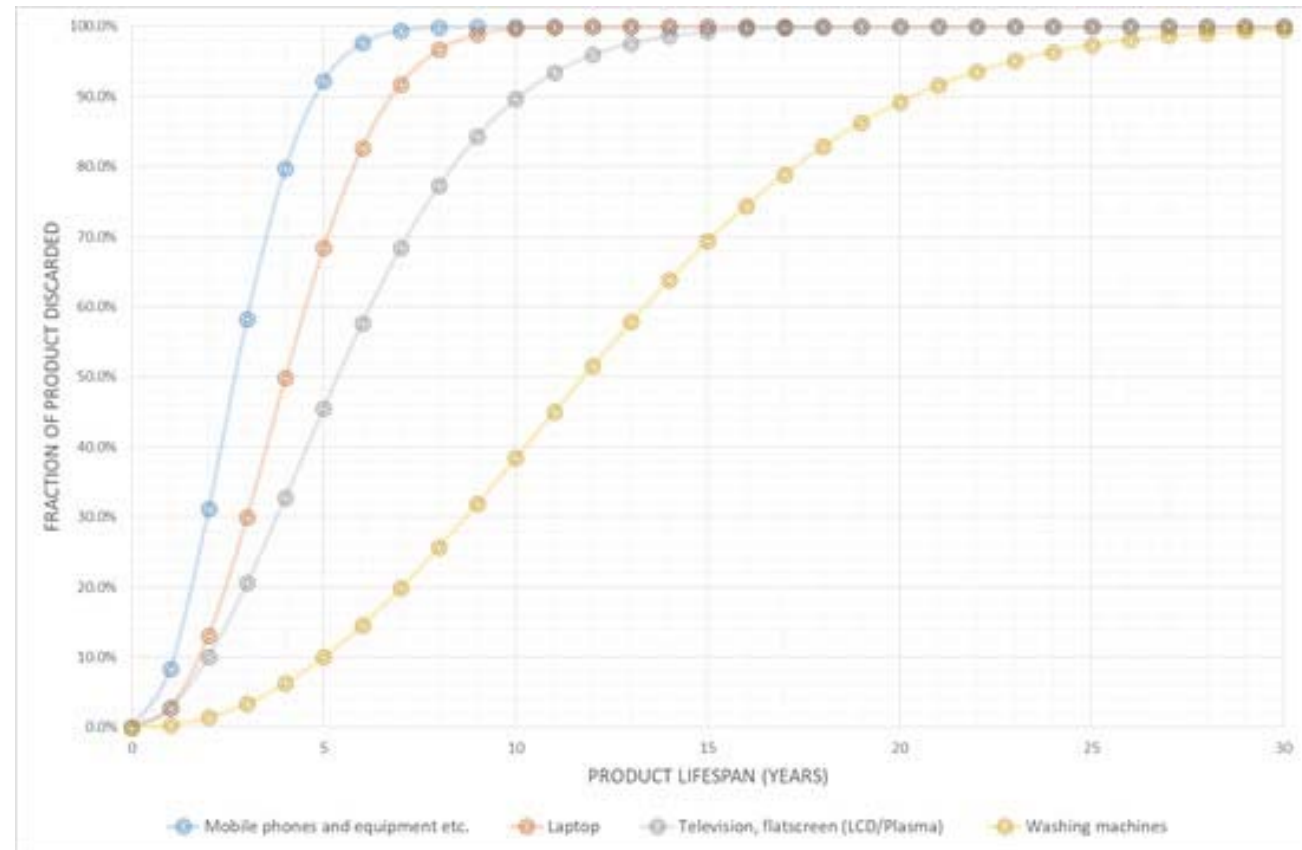
Step 3

- The E-scrap generated results for each country are assembled and presented for the six geographical regions.

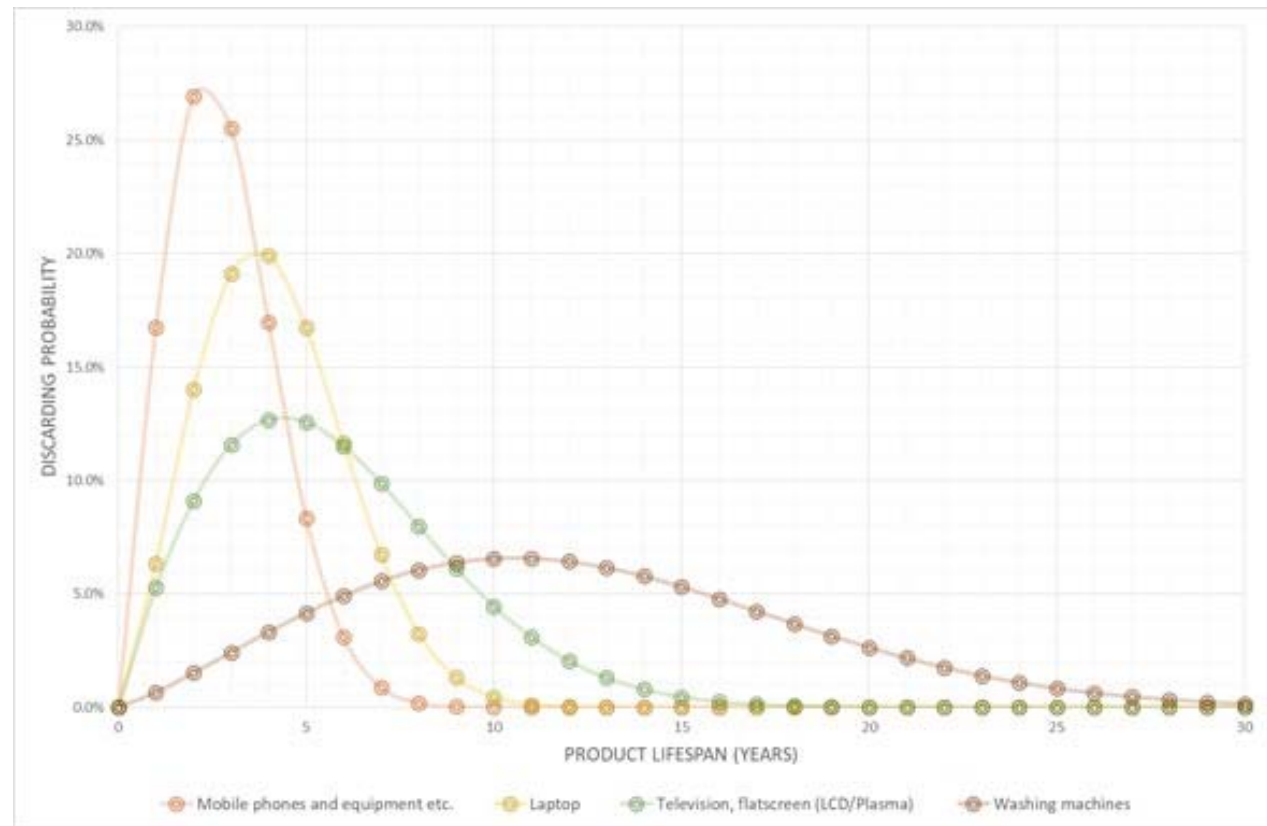


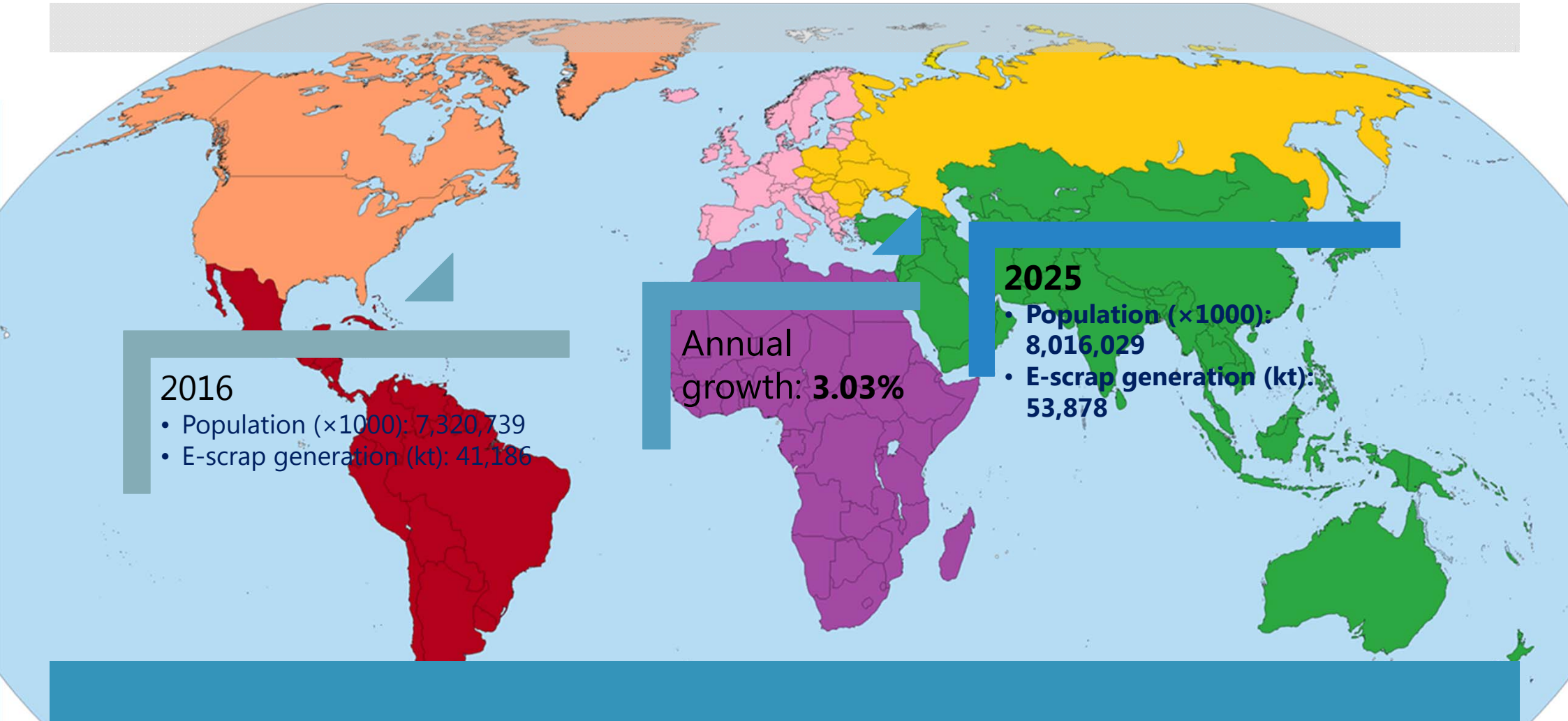
Weibull distribution

Weibull cumulative distribution function



Weibull probability distribution function





2016

- Population (×1000): 7,320,739
- E-scrap generation (kt): 41,186

Annual growth: **3.03%**

2025

- Population (×1000): 8,016,029
- E-scrap generation (kt): 53,878

Global E-scrap Generation

E-scrap generation

- Population (×1000): 1,196,824
- E-scrap generation (kt)
2016: 1,825 (1.5 kg/inh.)
2025: 2,635 (1.8 kg/inh.)
- Annual growth: **4.27%**

African countries



- Population (×1000): 4,402,260
- E-scrap generation (kt)
2016: 15,914 (3.6 kg/inh.)
2025: 23,709 (5.0 kg/inh.)
- Annual growth: **4.53%**

Asian-Pacific countries



E-scrap generation

- Population (×1000): 292,471
- E-scrap generation (kt)
 - 2016: 2,841 (9.7 kg/inh.)
 - 2025: 3,400 (11.9 kg/inh.)
- Annual growth: **2.02%**

Eastern European countries



- Population (×1000): 622,911
- E-scrap generation (kt)
 - 2016: 3,741 (6.0 kg/inh.)
 - 2025: 4,639 (6.8 kg/inh.)
- Annual growth: **2.42%**

Latin American & Caribbean countries



E-scrap generation

- Population (×1000): 360,405
- E-scrap generation (kt)
 - 2016: 7,877 (21.9 kg/inh.)
 - 2025: 9,246 (24.1 kg/inh.)
- Annual growth: **1.80%**

USA and Canada

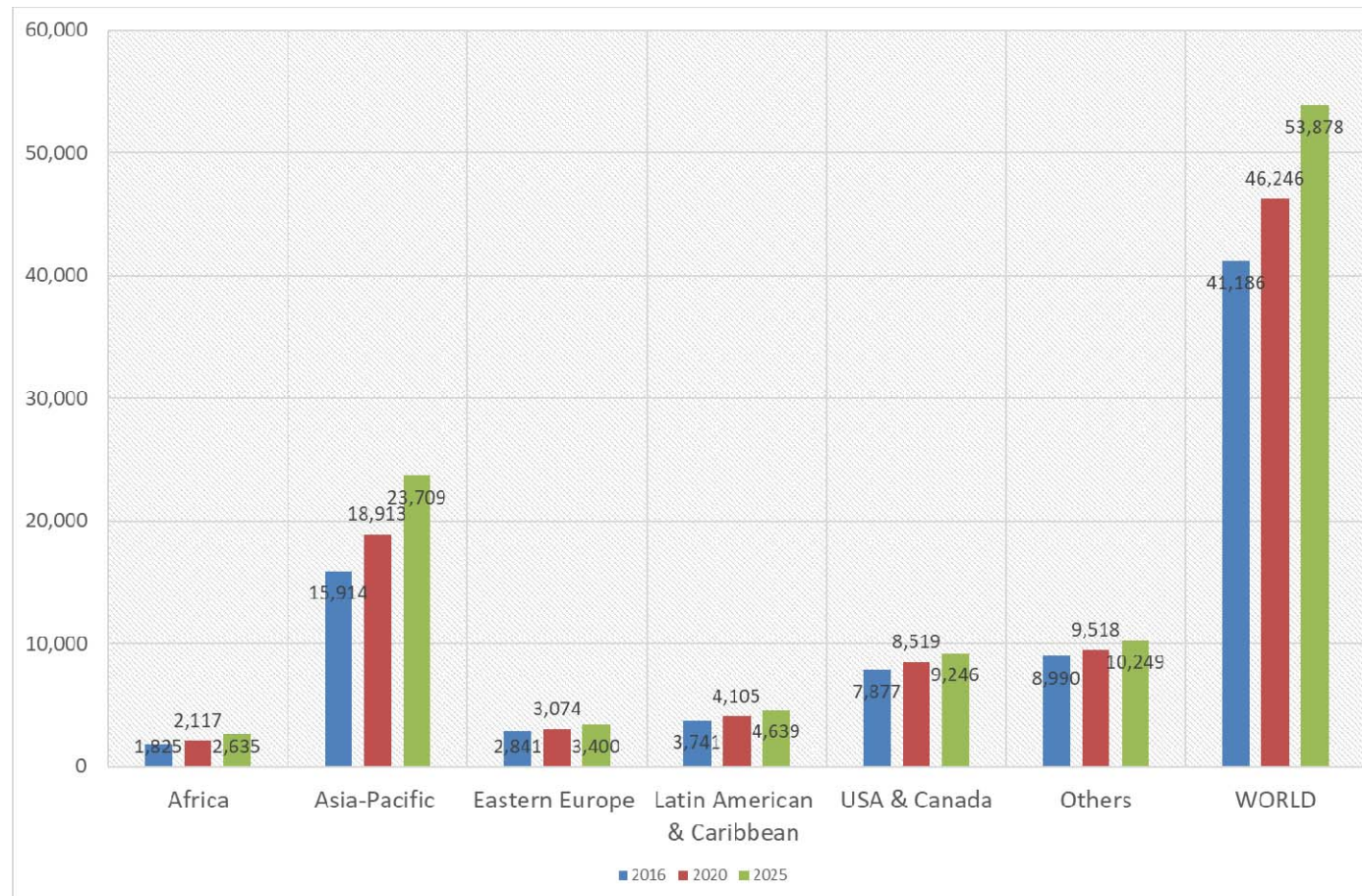


- Population (×1000): 445,867
- E-scrap generation (kt)
 - 2016: 8,990 (20.2 kg/inh.)
 - 2025: 10,249 (22.6 kg/inh.)
- Annual growth: **1.47%**

Other (Western European and others except USA and Canada)



Global e-scrap quantities 2016 – 2025 (kt)





Conclusions

Conclusions

- The USA and Canada together with the Western European countries have on average the highest per inhabitant generation of e-scrap, 21.9 and 20.2 kg/inh, respectively, in 2016. However, the Asia and Pacific countries, with low to moderate per inhabitant generation (3.6 kg/inh), are the highest e-scrap generators in terms of absolute quantity (almost 40% of the World's e-scrap generation).
- The market of EEE in the developed countries (with the exception of the Eastern European countries) appears, in all probability, to be a fairly saturated market. Moreover, taking in account the population size and current low generation per inhabitant in the Asia-Pacific countries, one can conclude that the future increase of E-scrap would mainly be derived from these nations and to a lesser extent from Africa.

Thank you!



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