2nd NATIONAL WORKSHOP ON CHEMICALS AND WASTE STATISTICS

Agency for Statistics of Bosnia and Herzegovina, Sarajevo, Bosnia and Herzegovina

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DAY 3 - Thursday 07 February 2019

Presentation about national e-waste statistics/general waste statistics

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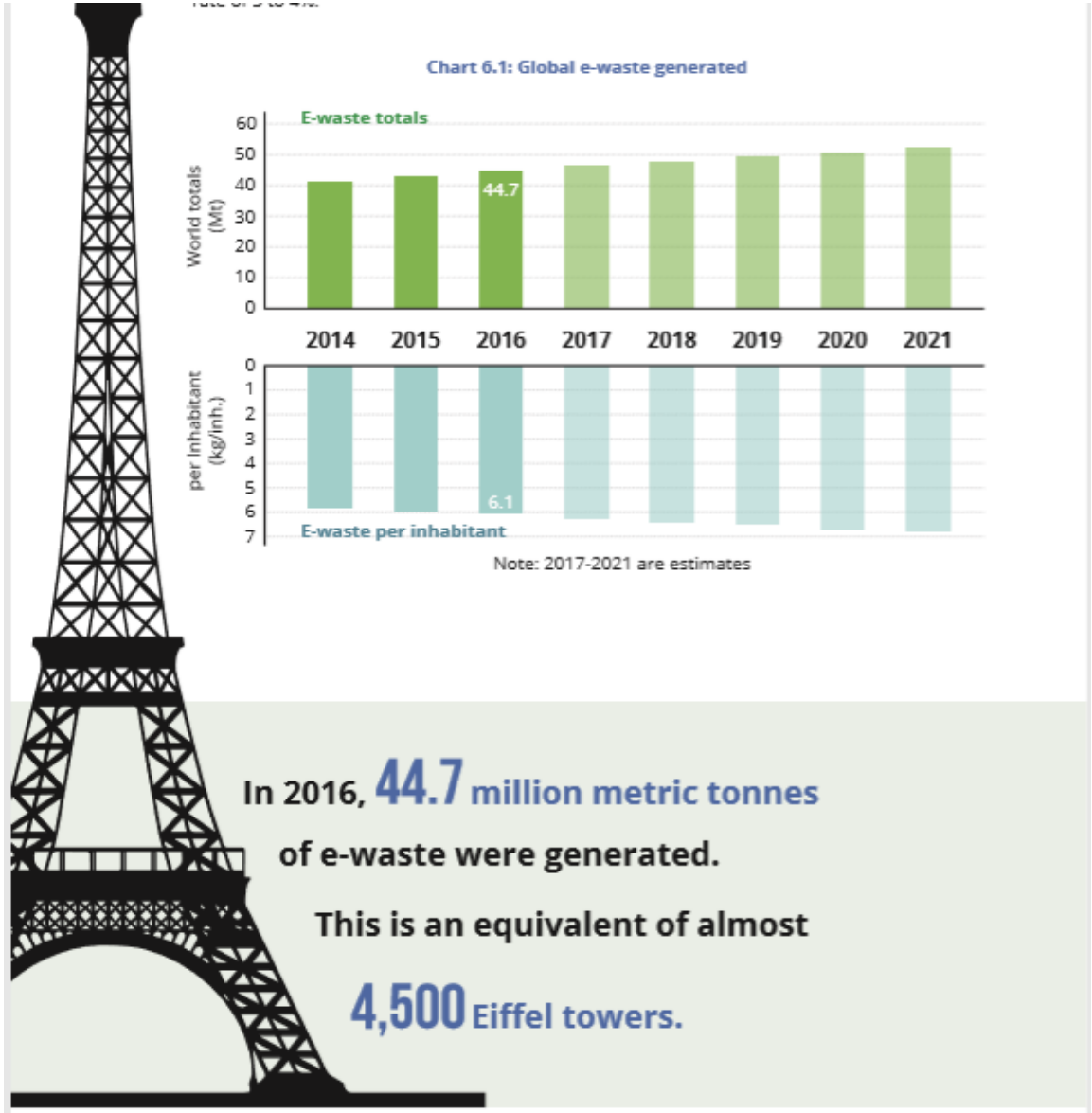
1. Global e-waste

Generation of E-waste has grown to 44.7 Million Metric Tonnes Annually – Equivalent to Almost 4,500 Eiffel Towers

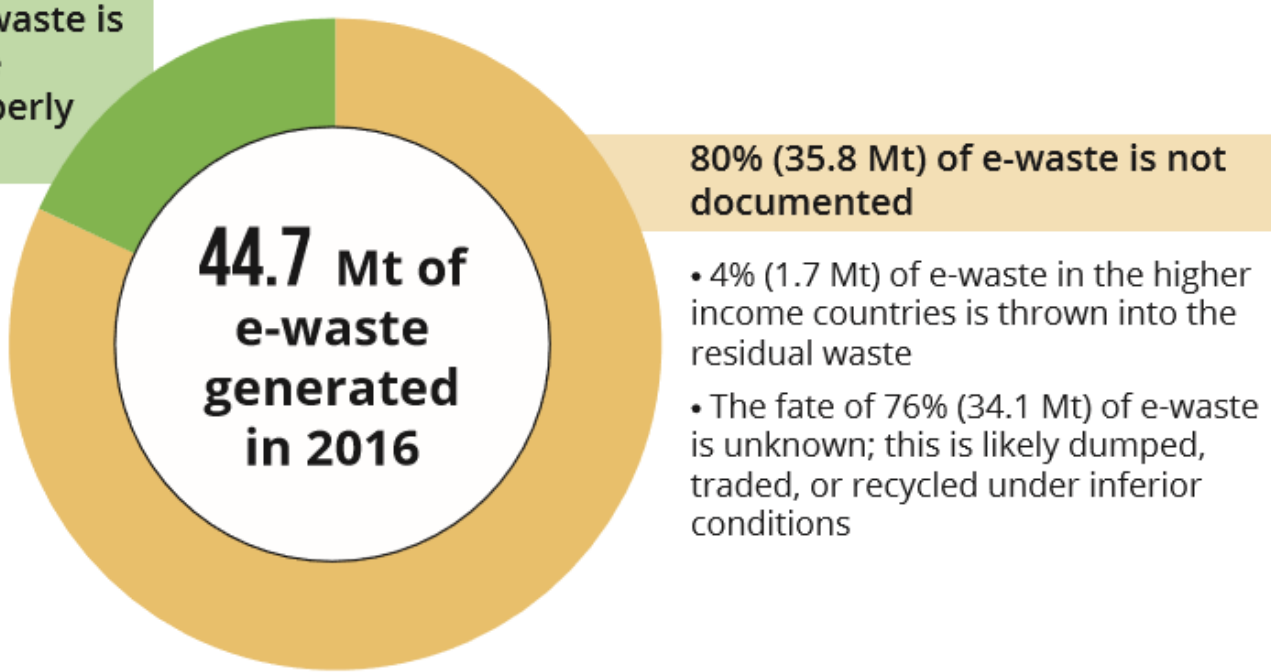
The growing amount of e-waste is the result of several trends. The global information society is growing at great speed. It is characterized by an increasing number of users and rapid technological advances that are driving innovation, efficiency, and social and economic development. By 2017, close to half the world's population uses the internet and most people in the world have access to mobile networks and services. Many people own more than one information and communication technology (ICT) device, and replacement cycles for mobile phones and computers, and also for other devices and equipment, are becoming shorter. At the same time, disposable incomes in many developing countries are increasing and a growing global middle-class is able to spend more on electrical and electronic equipment, consequently generating more e-waste. Current trends suggest that the amount of e-waste generated will increase substantially over the next decades, and that better data to track these developments are needed.



Only 20% of E-waste Generated Is Documented To Be Collected and Recycled

Of those 44.7 Mt, approximately 1.7 Mt are thrown into the residual waste in higher-income countries, and are likely to be incinerated or land-filled. Globally, only 8.9 Mt of e-waste are documented to be collected and recycled, which corresponds to 20% of all the e-waste generated.

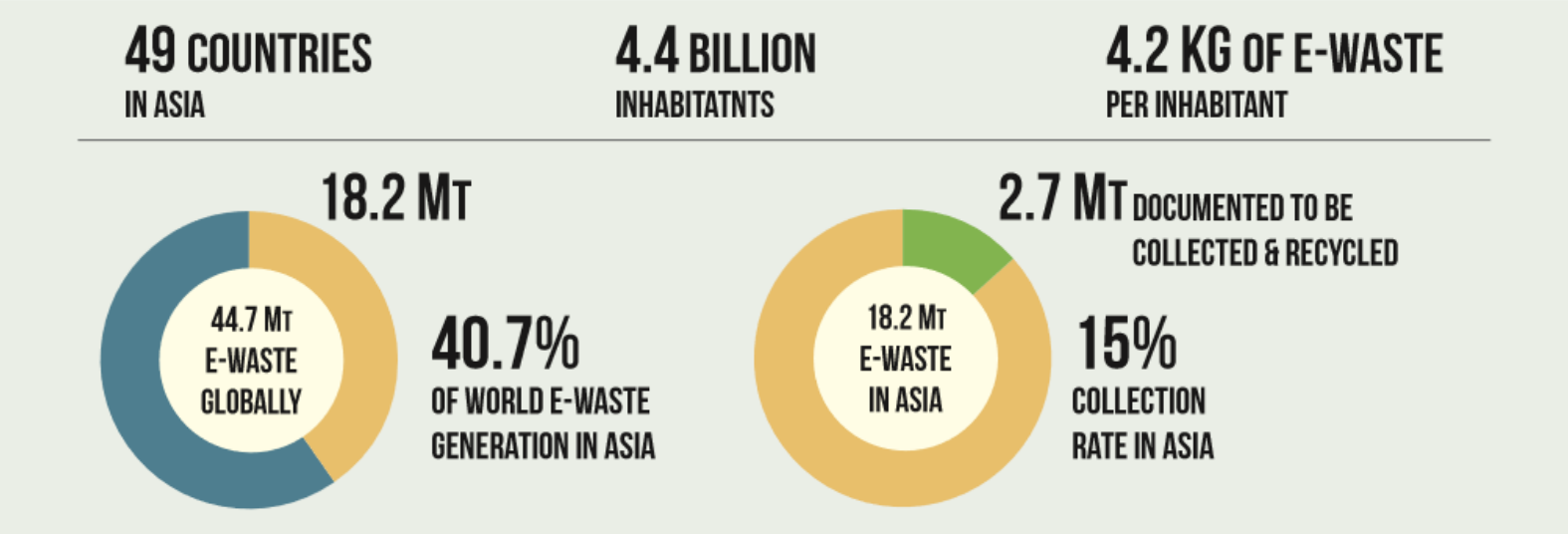
Collection methods of e-waste in 2016



Asia Generates the Greatest Amounts of E-waste; Africa the Least, Both in Total and Per Inhabitant

In 2016, Asia was the region that generated by far the largest amount of e-waste (18.2 Mt), followed by Europe (12.3 Mt), the Americas (11.3 Mt), Africa (2.2 Mt), and Oceania (0.7 Mt). While the smallest in terms of total e-waste generated, Oceania was the highest generator of e-waste per inhabitant (17.3 kg/inh), with only 6% of e-waste documented to be collected and recycled. Europe is the second largest generator of e-waste per inhabitant with an average of 16.6 kg/inh; however, Europe has the highest collection rate (35%). The Americas generate 11.6 kg/inh and collect only 17% of the e-waste generated in the countries, which is comparable to the collection rate in Asia (15%). However, Asia generates less e-waste per inhabitant (4,2 kg/inh). Africa generates only 1.9 kg/inh and little information is available on its collection rate. The report provides regional breakdowns for Africa, Americas, Asia, Europe, and Oceania.

E-waste snapshot: Asia



Only 41 Countries Have Official E-waste Statistics

The low collection rate compared to the total amount of e-waste generated is partly explained by the fact that only 41 countries have official e-waste statistics. For 16 other countries, e-waste quantities were gathered from research and estimated. The fate of a large majority of the e-waste (34.1 Mt) is simply unknown. In countries where there is no national e-waste legislation in place, e-waste is likely treated as other or general waste. This is either land-filled or recycled, along with other metal or plastic wastes. There is the high risk that the pollutants are not taken care of properly, or they are taken care of by an informal sector and recycled without properly protecting the workers, while emitting the toxins contained in e-waste.

More Countries Adopt E-waste Legislation

Although the e-waste challenge is on the rise, a growing number of countries are adopting e-waste legislation. Currently, 66% of the world population is covered by national e-waste management laws, an increase from 44% that were covered in 2014.

World population (and number of countries) covered by e-waste legislation in 2014 and 2017

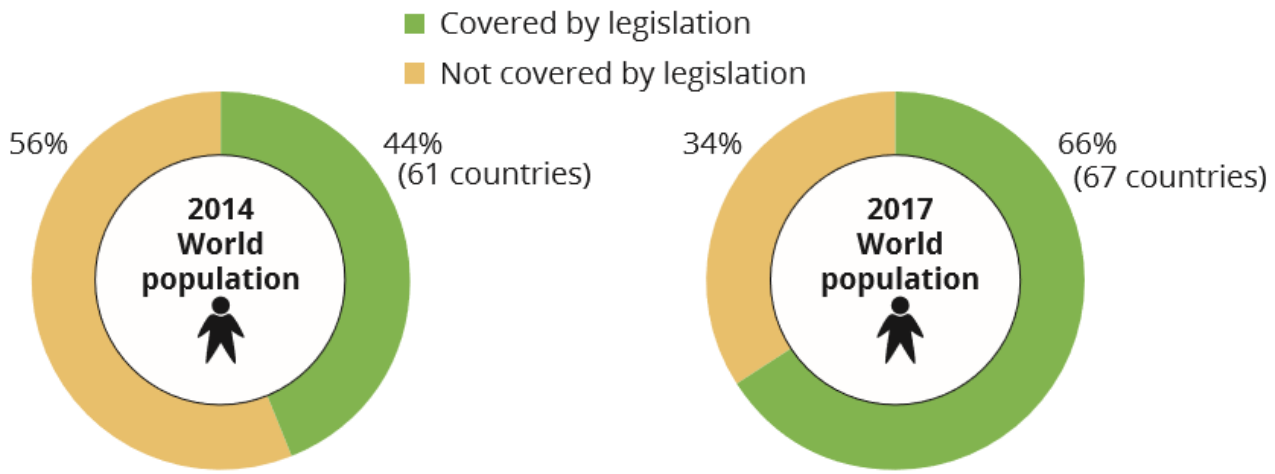
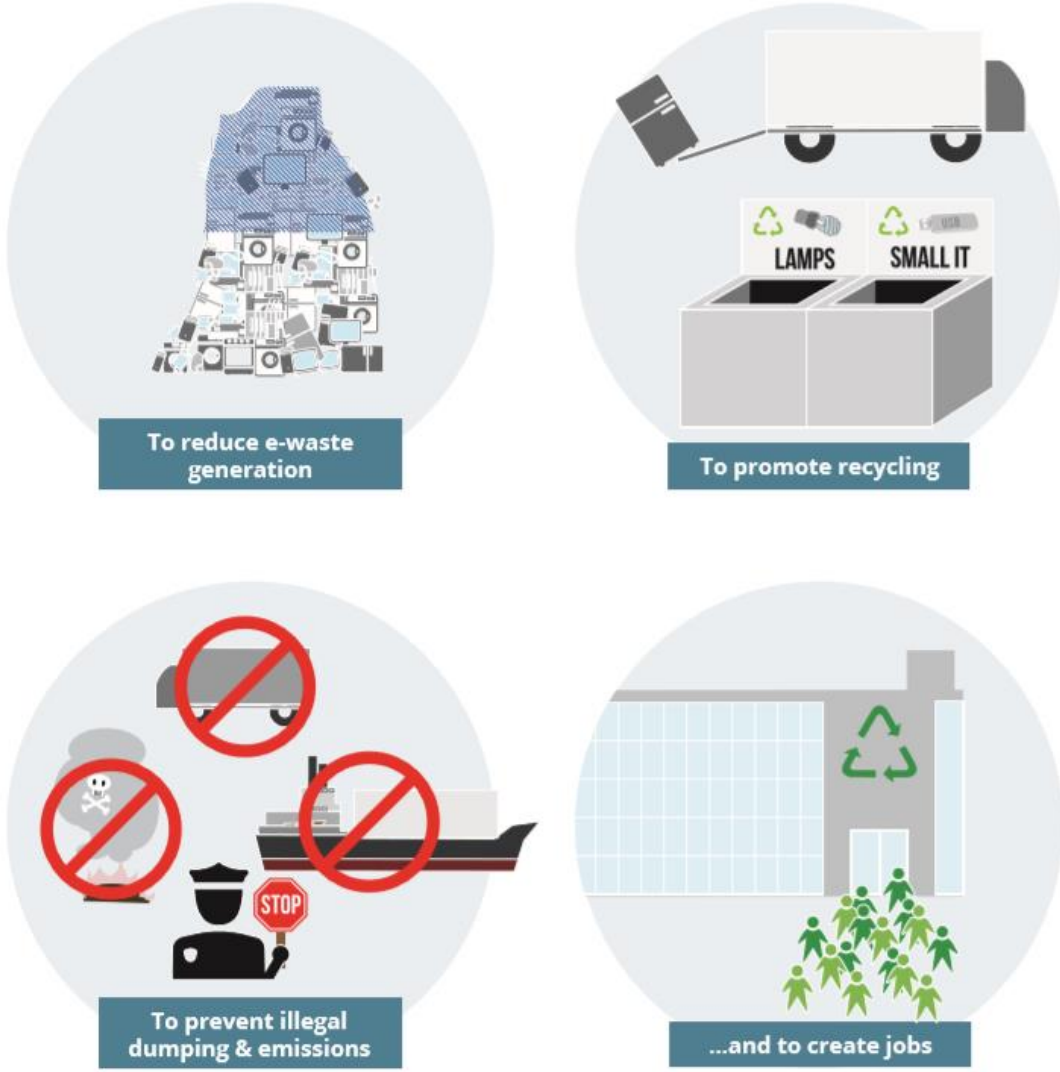


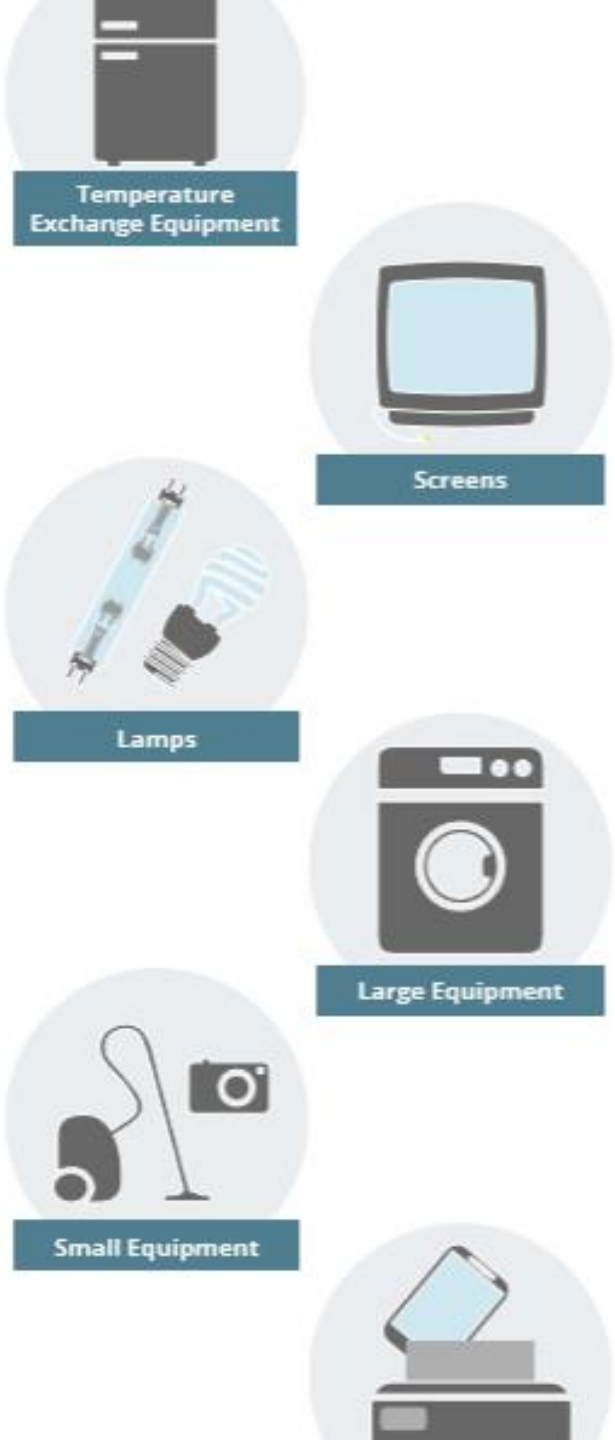
Illustration 4.3: What better e-waste data is used for



What is e—waste?

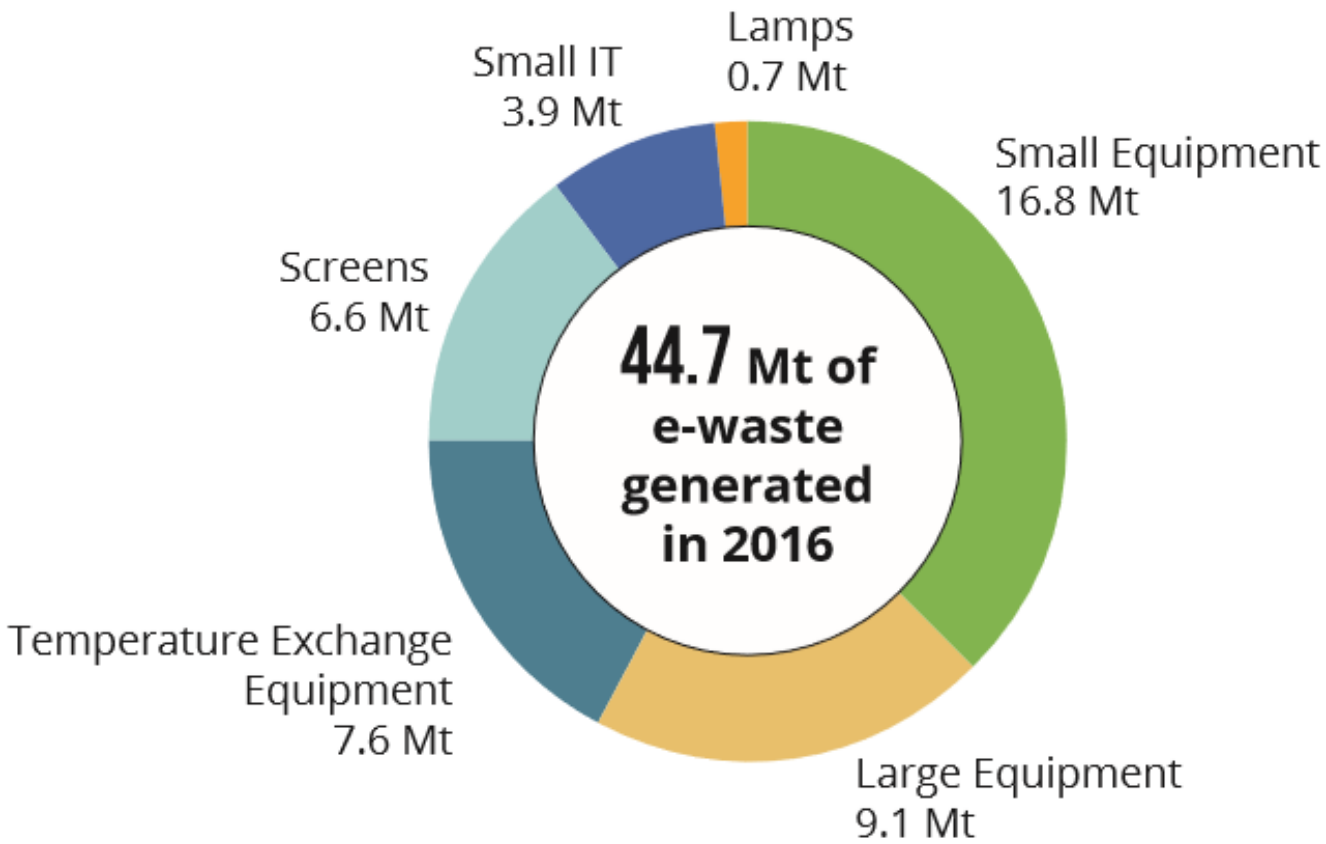
It covers six waste categories

Each product of the six e-waste categories has a different lifetime profile, which means that each category has different waste quantities, economic values, as well as potential environmental and health impacts, if recycled inappropriately. Consequently, the collection and logistical processes and recycling technology differ for each category, in the same way as the consumers' attitudes when disposing of the electrical and electronic equipment also vary.



- E-waste is a complex mixture of materials and components that because of their hazardous content, and if not properly managed, can cause major environmental and health problems. Moreover, the production of modern electronics requires the use of scarce and expensive resources (e.g. around 10% of total gold worldwide is used for their production). To improve the environmental management of e-waste and to contribute to a circular economy and enhance resource efficiency the improvement of collection, treatment and recycling of electronics at the end of their life is essential.
- EEE also contains rare earth, hazardous, and scarce metals. Common hazardous materials found in e-waste are: heavy metals (such as mercury, lead, cadmium etc.) and chemicals (such as CFCs/ chlorofluorocarbon or various flame retardants).

Chart 6.5: Estimates of e-waste totals per category in 2016

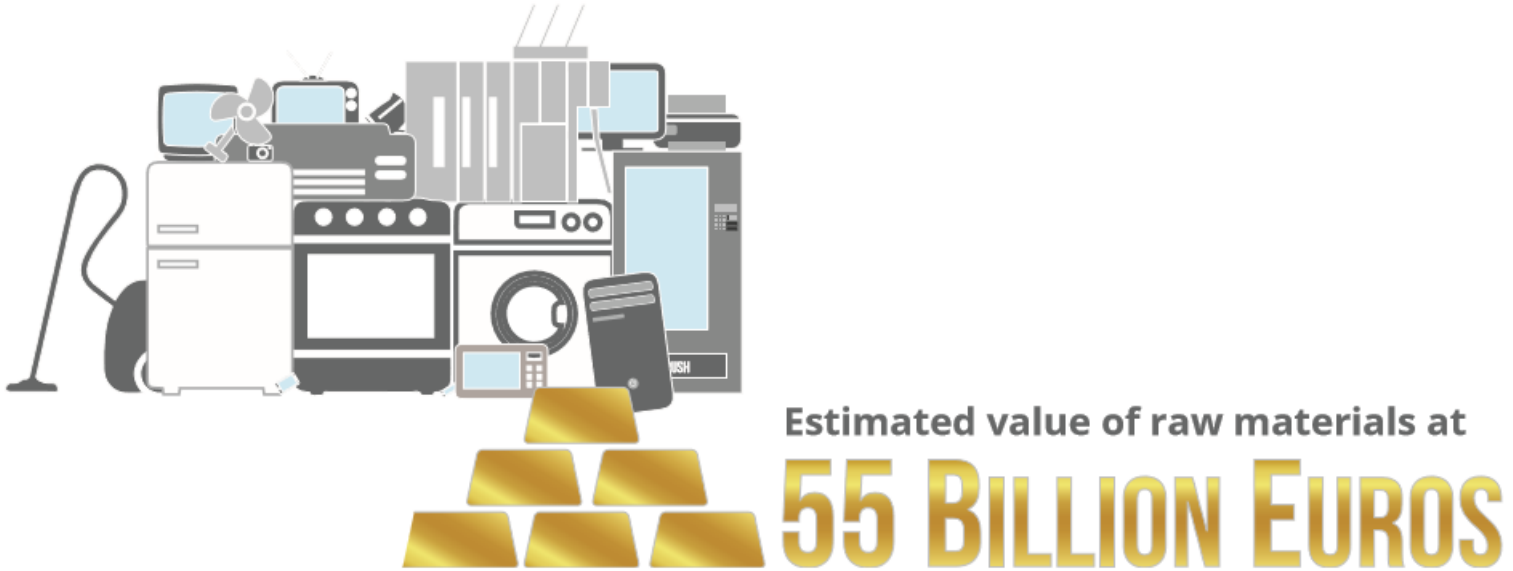


The global quantity of e-waste in 2016 is mainly comprised of Small Equipment (16.8 Mt), Large Equipment (9.1 Mt), Temperature Exchange Equipment (7.6 Mt), and Screens (6.6 Mt). Lamps and Small IT represent a smaller share of the global quantity of e-waste generated in 2016, 0.7 Mt and 3.9 Mt respectively.

Huge Amounts of Raw Materials Are Wasted

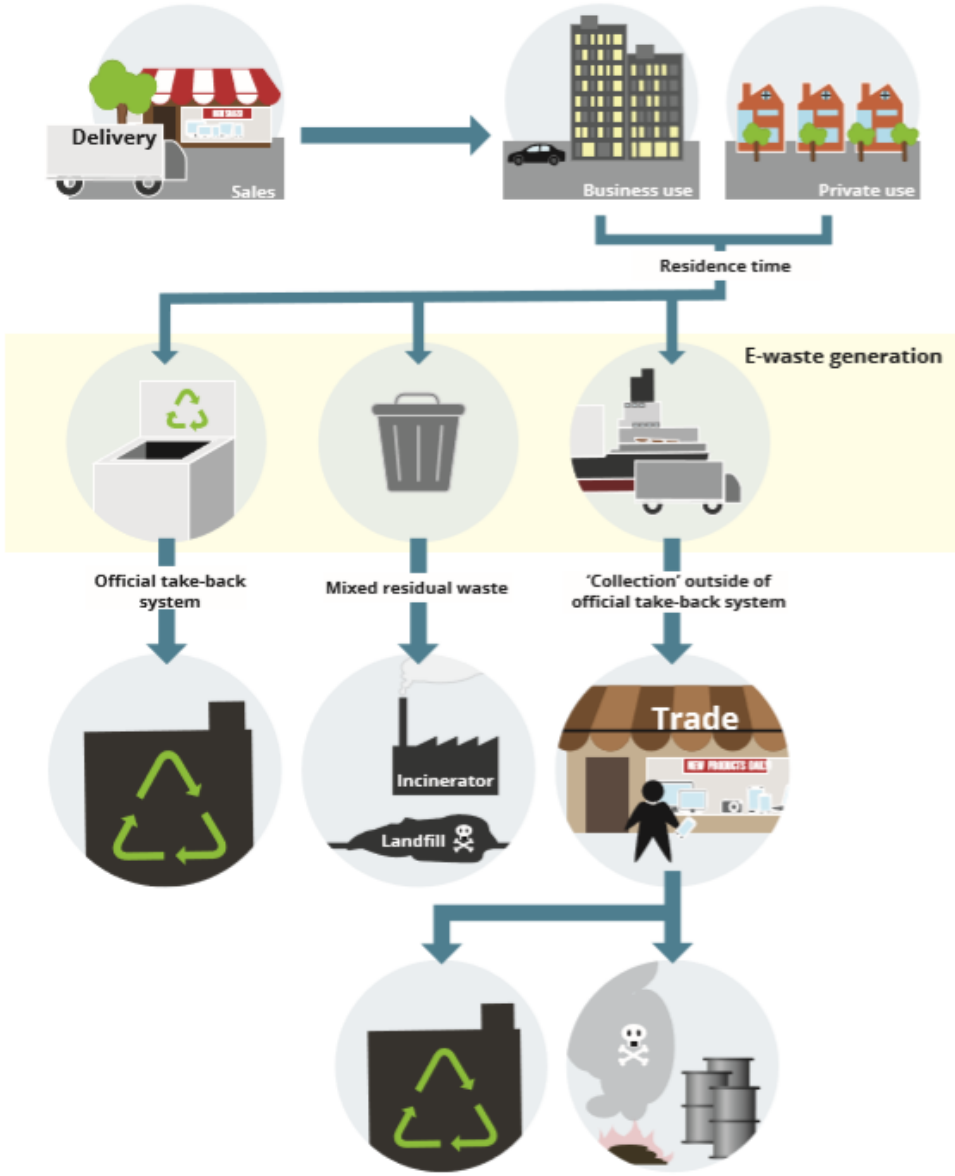
E-waste statistics are not only relevant in terms of the environmental impact; there is also an important economic component to the debate. The total value of all raw materials present in e-waste is estimated at approximately 55 Billion Euros in 2016, which is more than the 2016 Gross Domestic Product of most countries in the world. The value of secondary raw materials after waste management is just a fraction of the value of its components or the price of used appliances. Circular economy models need to be adopted to encourage closing the loop of materials through better design of components, recycling, reusing, etc., while mitigating the environmental pollution. Therefore, the circular economy concept offers huge economic and employment opportunities for e-waste management; the presented 55 Billion Euros of secondary materials is an underestimate of those economic opportunities. This calls for the development of proper legislation to manage e-waste that's supported by data to show both the environmental and economic benefits the the better management of e-waste.

Potential value of raw materials in e-waste in 2016



Standards and Methodologies to Measure E-waste

Illustration 5.1: Life cycle of EEE into e-waste, and the most common e-waste management scenarios



- # Classifications for E-waste

For each electrical or electronic product, its original function, environmental relevancy, weight, size, and material composition differ considerably. Taking these differences into account, the categorization of EEE, and thus e-waste, can be grouped into roughly 54 homogeneous product types, referred to as the UNU-KEYS (See Annex 1).

- # Measuring Framework of E-waste Statistics

The main lifecycle of EEE into e-waste, and the waste management that generally occurs, can be summarized into four distinct phases. The four phases describe market entry, stock, e-waste generated, and waste management.

Phase 1: Market Entry

Phase 2: Stock

Phase 3: E-waste Generated

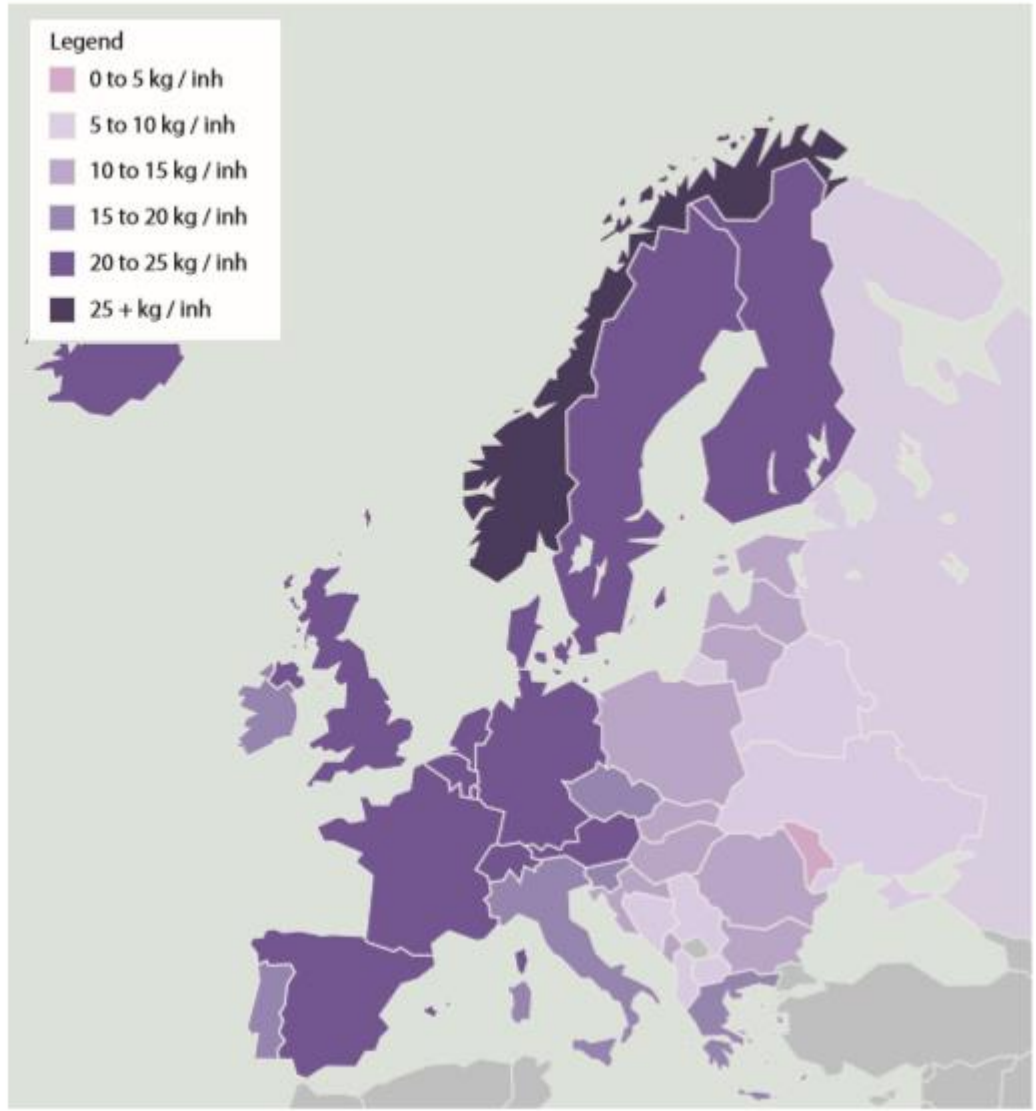
Phase 4: E-waste Management

1. E-waste Collection Scenario 1: The Official Take-Back System
2. E-waste Collection Scenario 2: Mixed Residual Waste
3. Scenarios 3+4: The Collection Outside the Official Take-Back System

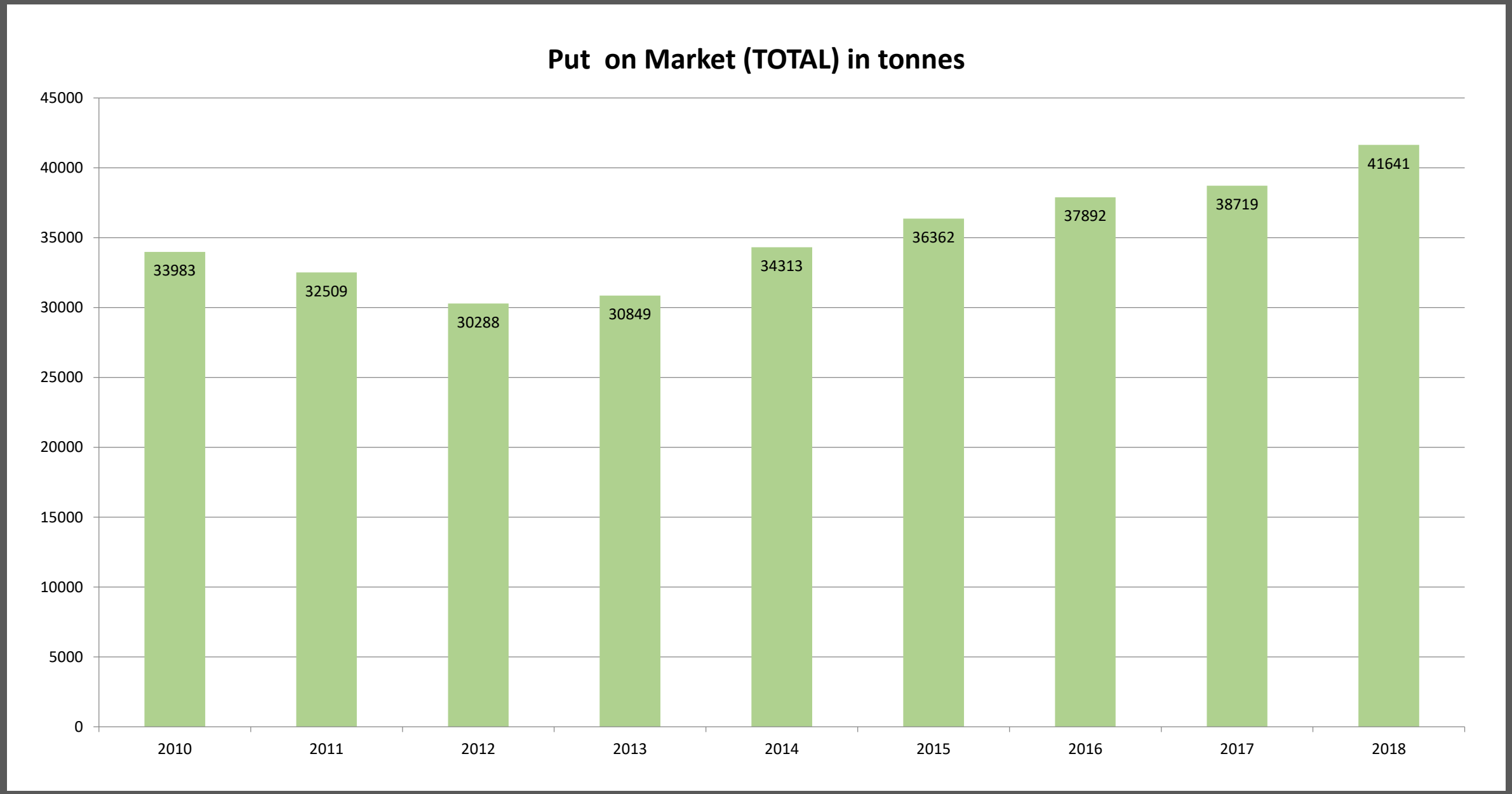
a) Countries with Developed Waste Management

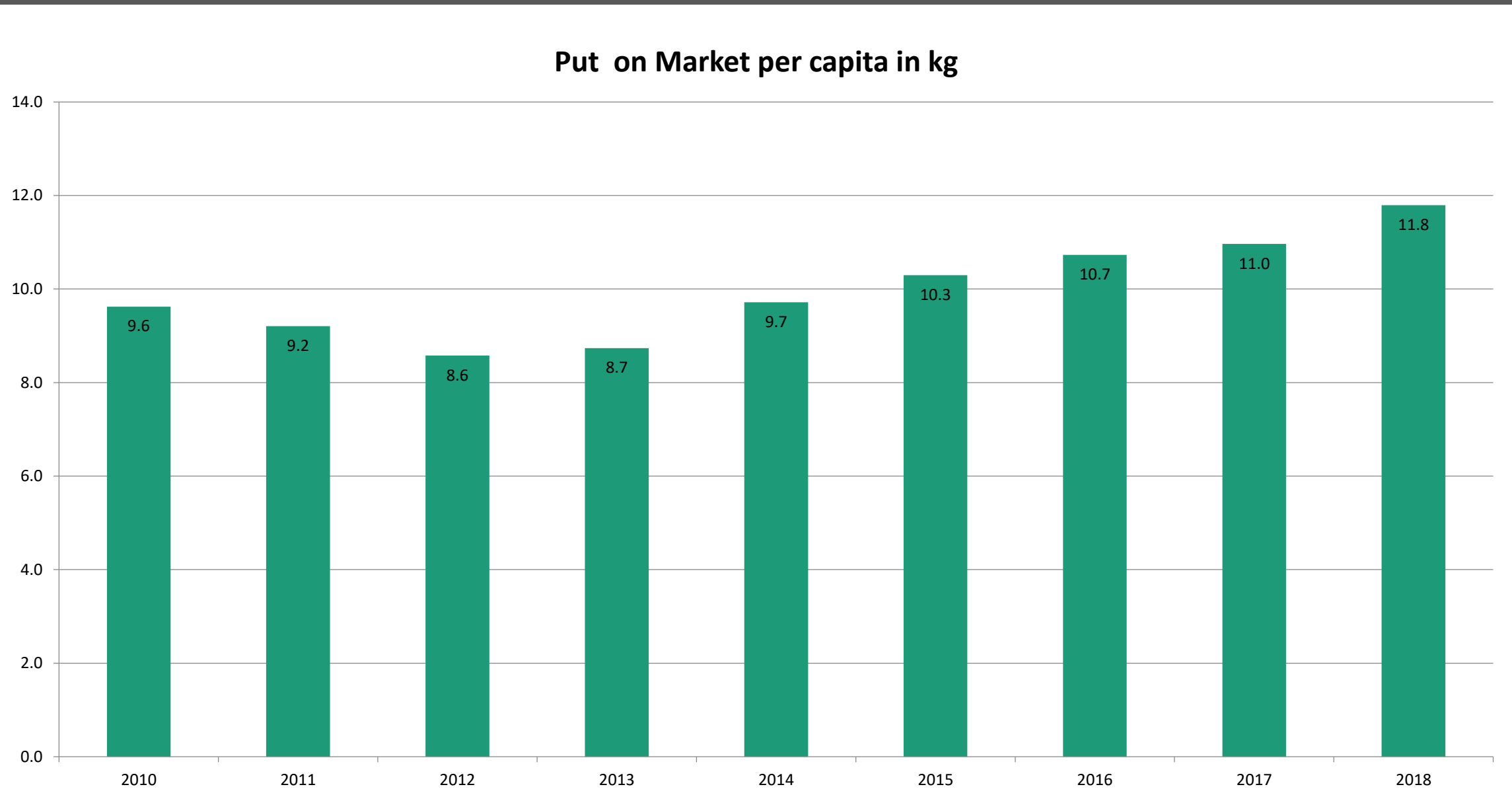
b) Countries With No Developed Waste Management Infrastructure

2. EUROPE
E-waste
Status and Trends

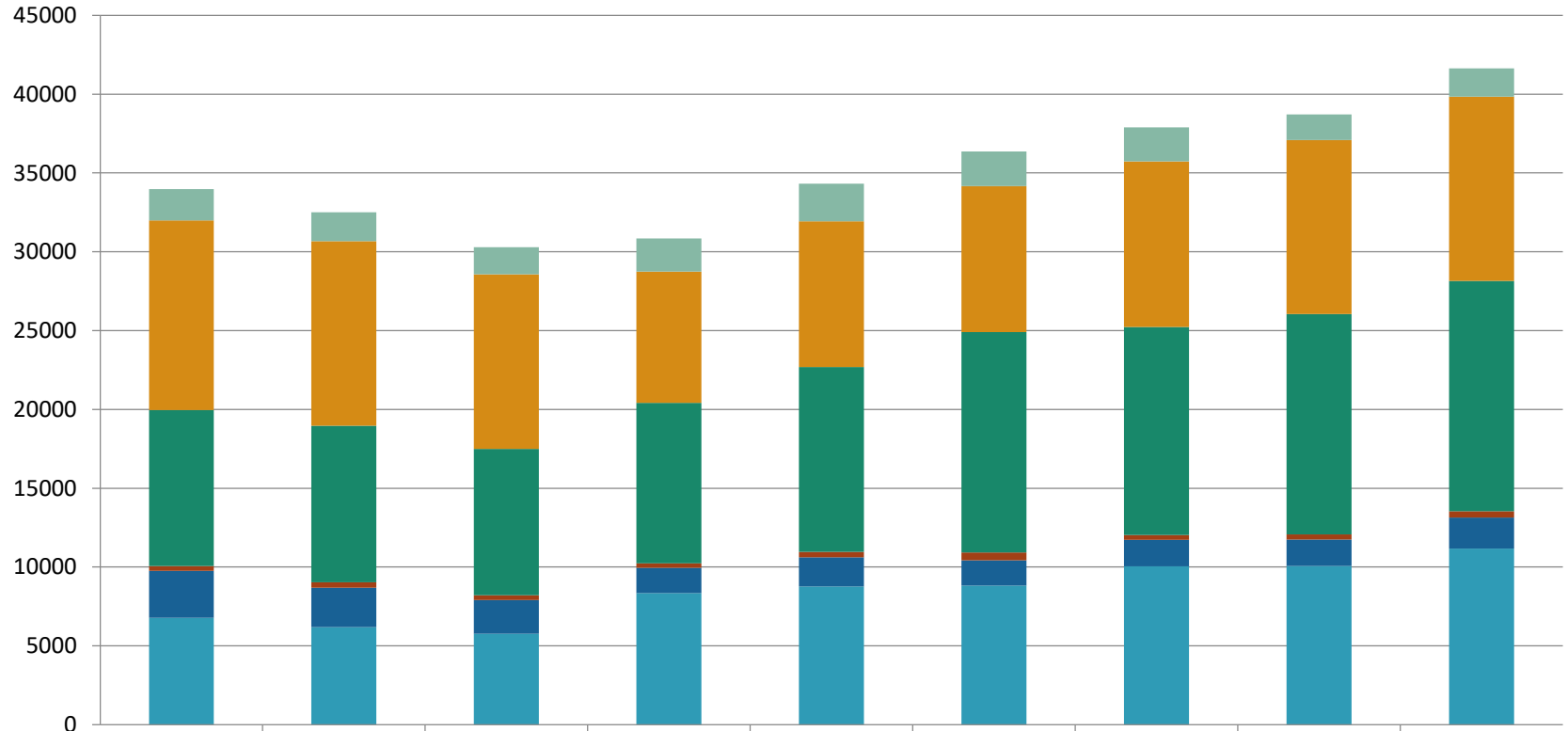

Legend
0 to 5 kg / inh
5 to 10 kg / inh
10 to 15 kg / inh
15 to 20 kg / inh
20 to 25 kg / inh
25 + kg / inh

3. Bosnia and Herzegovina E-waste Status and Trends


Put on Market (TOTAL) in tonnes
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
33983
32509
30288
30849
34313
36362
37892
38719
41641
2010
2011
2012
2013
2014
2015
2016
2017
2018

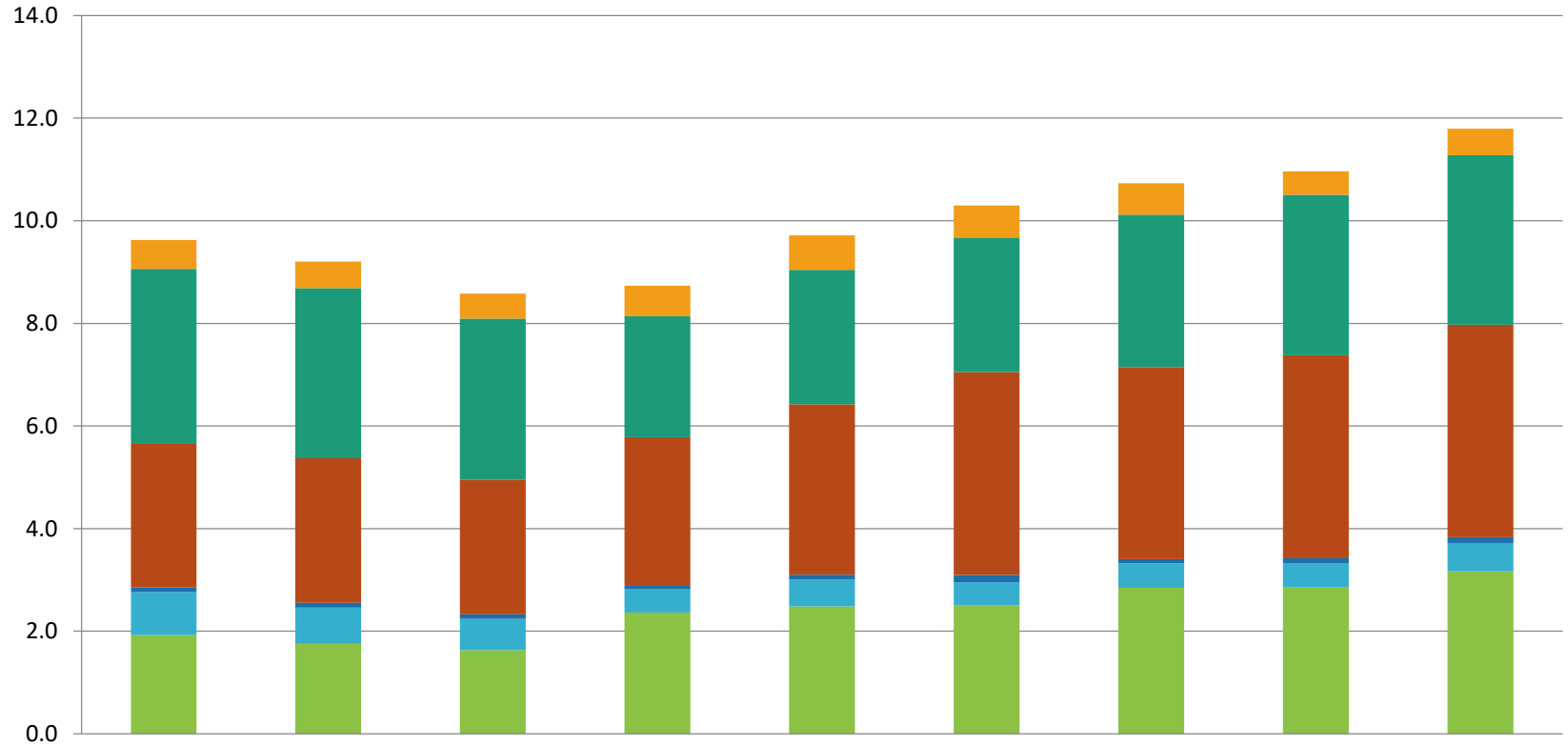

Put on Market per capita in kg
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
9.6
9.2
8.6
8.7
9.7
10.3
10.7
11.0
11.8
2010
2011
2012
2013
2014
2015
2016
2017
2018

Put on Market (EU6) in tonnes

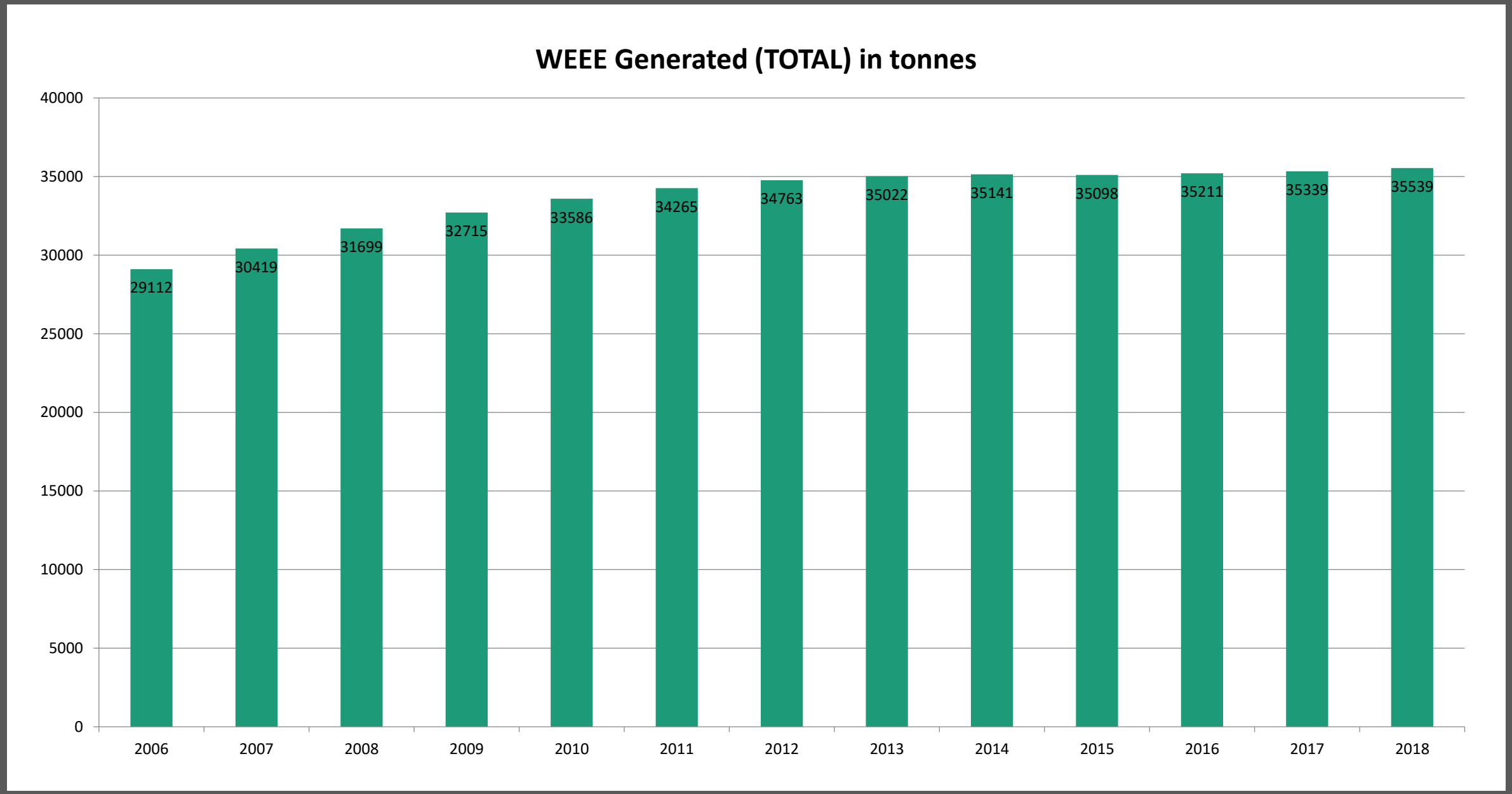


	2010	2011	2012	2013	2014	2015	2016	2017	2018
Small IT and telecommunication equipment	1991.39681	1827.19525	1714.57411	2114.58334	2379.33029	2194.66789	2164.83531	1621.65473	1807.38541
Small equipment	12035.4966	11711.72738	11085.52475	8325.97272	9246.69957	9267.2103	10495.86067	11044.03559	11685.93543
Large equipment	9884.00256	9938.56911	9268.63905	10174.87845	11733.58147	13977.9373	13199.50895	13976.8166	14614.28617
Lamps	309.49763	342.06483	306.79759	288.19795	337.4647	486.27471	311.54366	325.55815	393.10625
Screens, monitors, and equipment containing screens (..)	2973.2814	2501.74821	2153.19396	1601.96104	1851.34936	1610.34007	1669.74201	1682.23295	1963.65597
Temperature exchange equipment	6788.98698	6187.40501	5759.2683	8343.60443	8764.25692	8825.67152	10050.86343	10068.63914	11176.1651

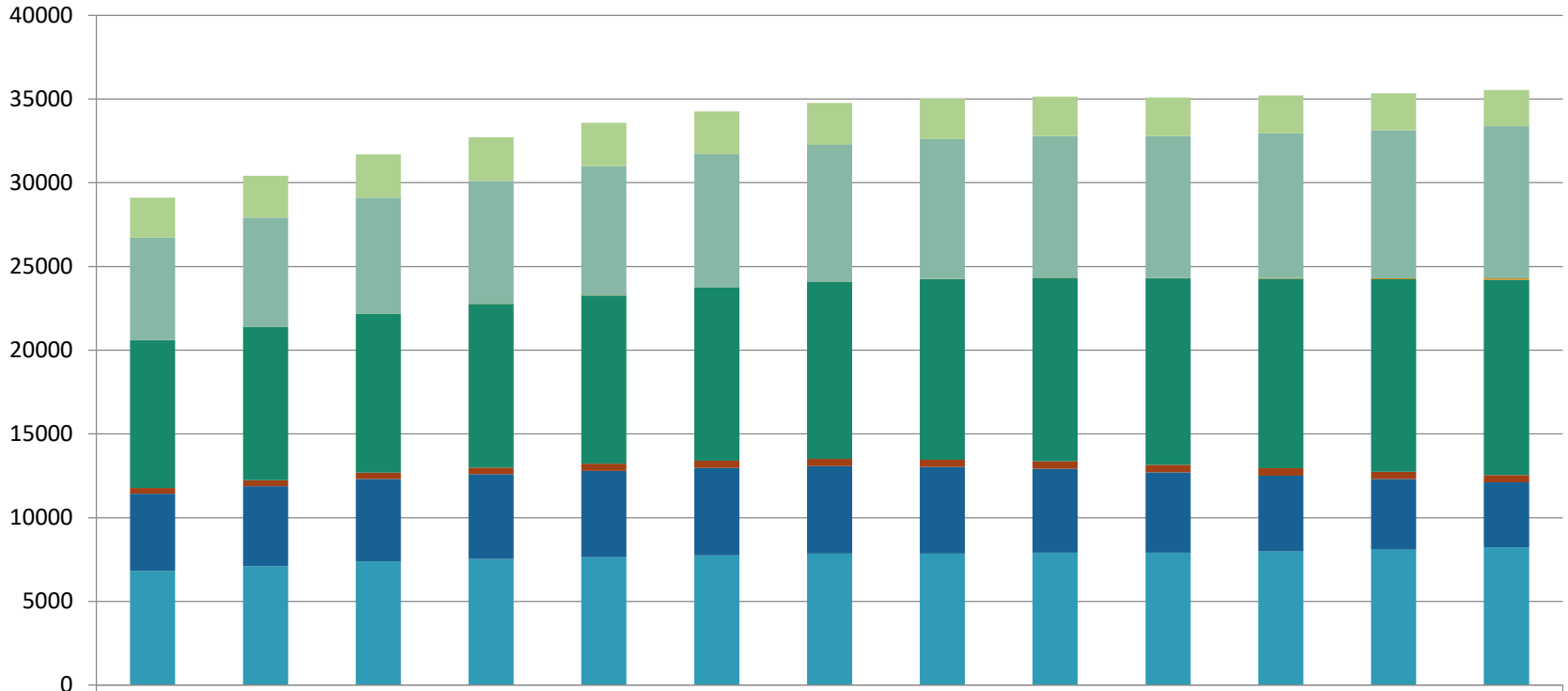
Put on Market (EU6) per capita in kg



	2010	2011	2012	2013	2014	2015	2016	2017	2018
Small IT and telecommunication equipment	0.6	0.5	0.5	0.6	0.7	0.6	0.6	0.5	0.5
Small equipment	3.4	3.3	3.1	2.4	2.6	2.6	3.0	3.1	3.3
Large equipment	2.8	2.8	2.6	2.9	3.3	4.0	3.7	4.0	4.1
Lamps	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Screens, monitors, and equipment containing screens (..)	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.6
Temperature exchange equipment	1.9	1.8	1.6	2.4	2.5	2.5	2.8	2.9	3.2

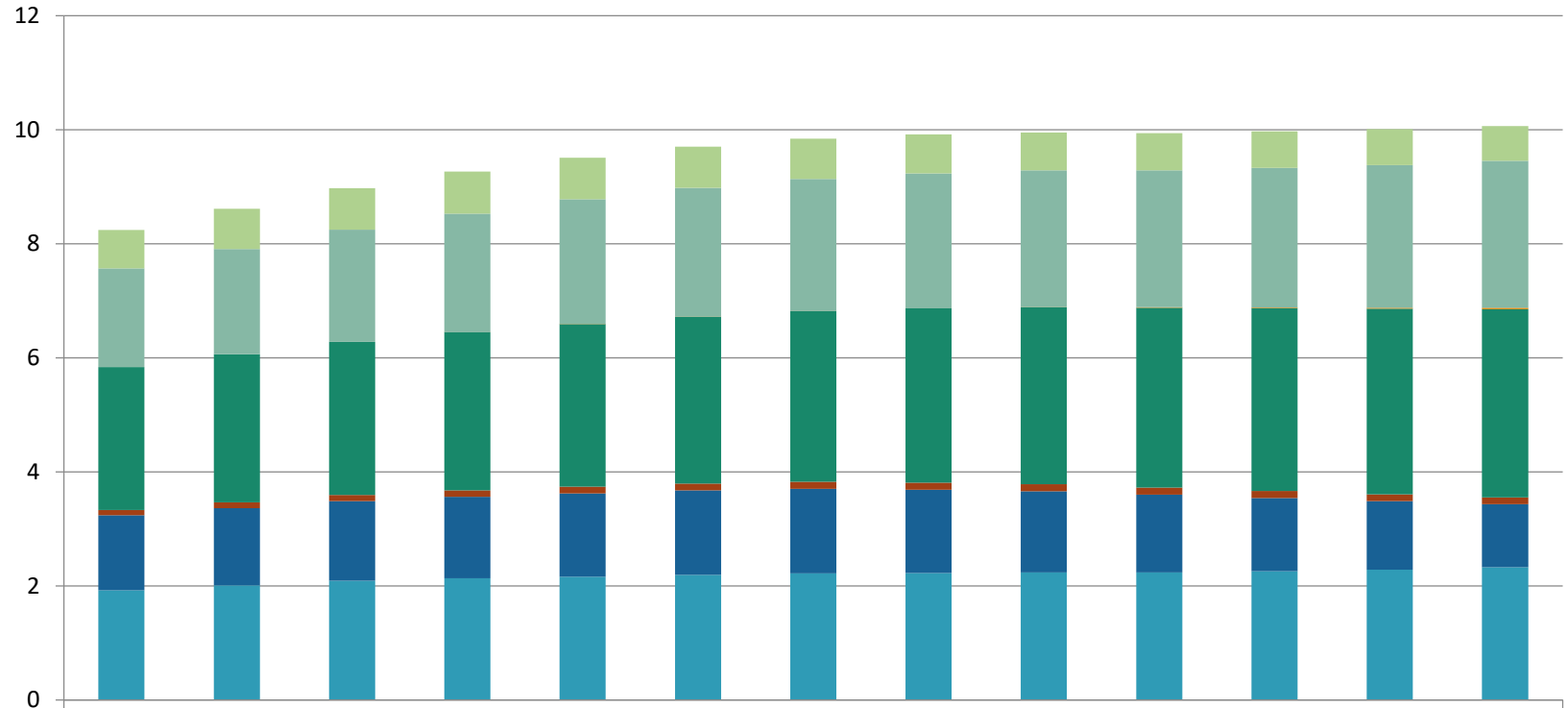

WEEE Generated (TOTAL) in tonnes
40000
35000
30000
25000
20000
15000
10000
5000
0
29112
30419
31699
32715
33586
34265
34763
35022
35141
35098
35211
35339
35539
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

WEEE Generated (EU6) in tonnes



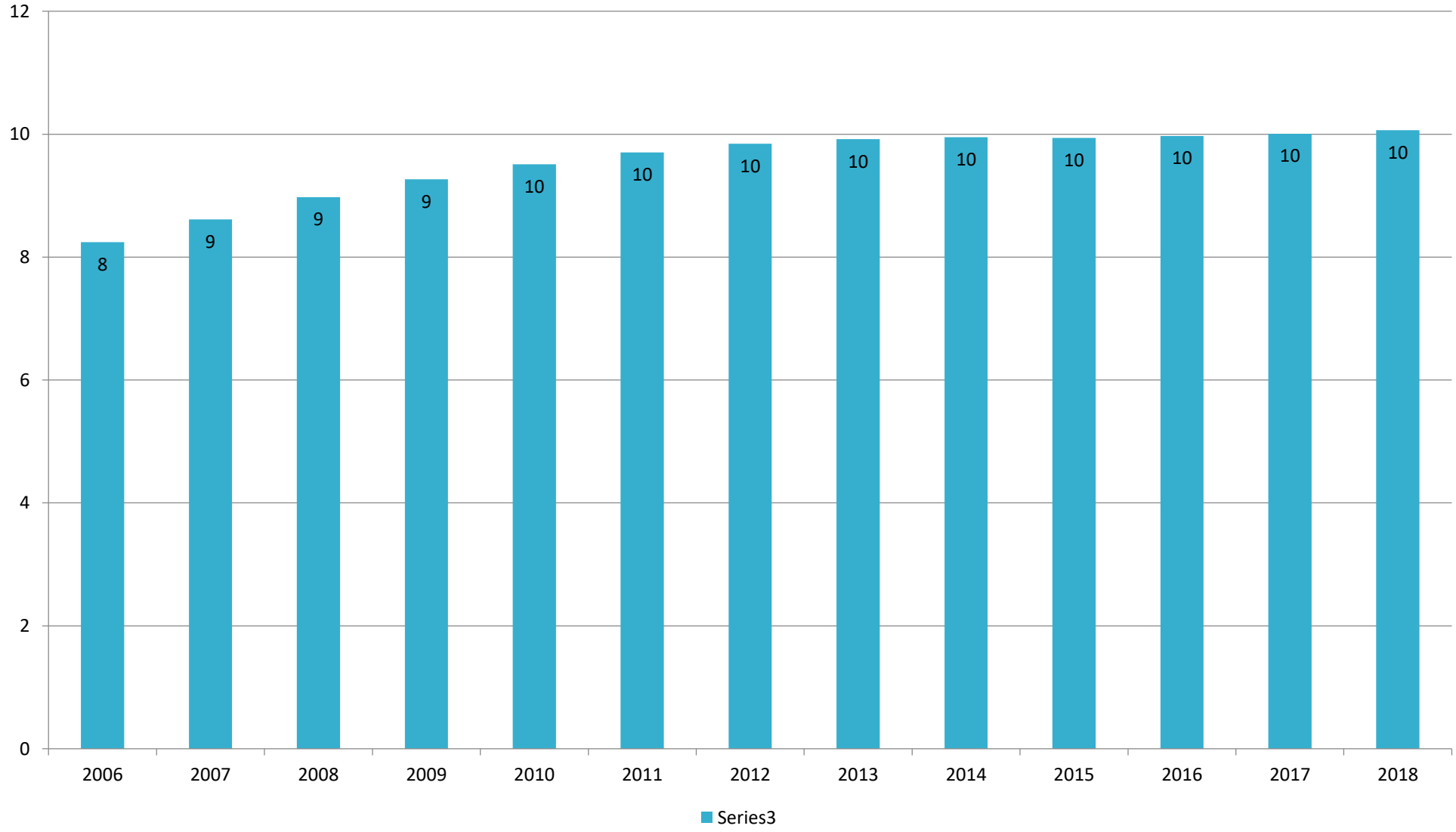
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Small IT and telecommunication equipment	2391	2492	2580	2601	2582	2552	2490	2408	2345	2301	2265	2210	2158
Small equipment	6111	6519	6945	7346	7727	7982	8188	8361	8459	8479	8633	8833	9092
Photovoltaic panels (incl. converters)	0	0	0	0	0	0	1	5	11	22	38	61	90
Large equipment (excluding photovoltaic panels)	8840	9165	9478	9779	10057	10324	10563	10781	10961	11146	11321	11493	11653
Lamps	335	356	378	399	416	431	441	444	442	442	440	433	425
Screens, monitors, and equipment containing screens (..)	4628	4782	4926	5056	5159	5225	5229	5161	5019	4809	4539	4227	3897
Temperature exchange equipment	6807	7104	7391	7535	7644	7752	7850	7862	7904	7900	7975	8082	8224

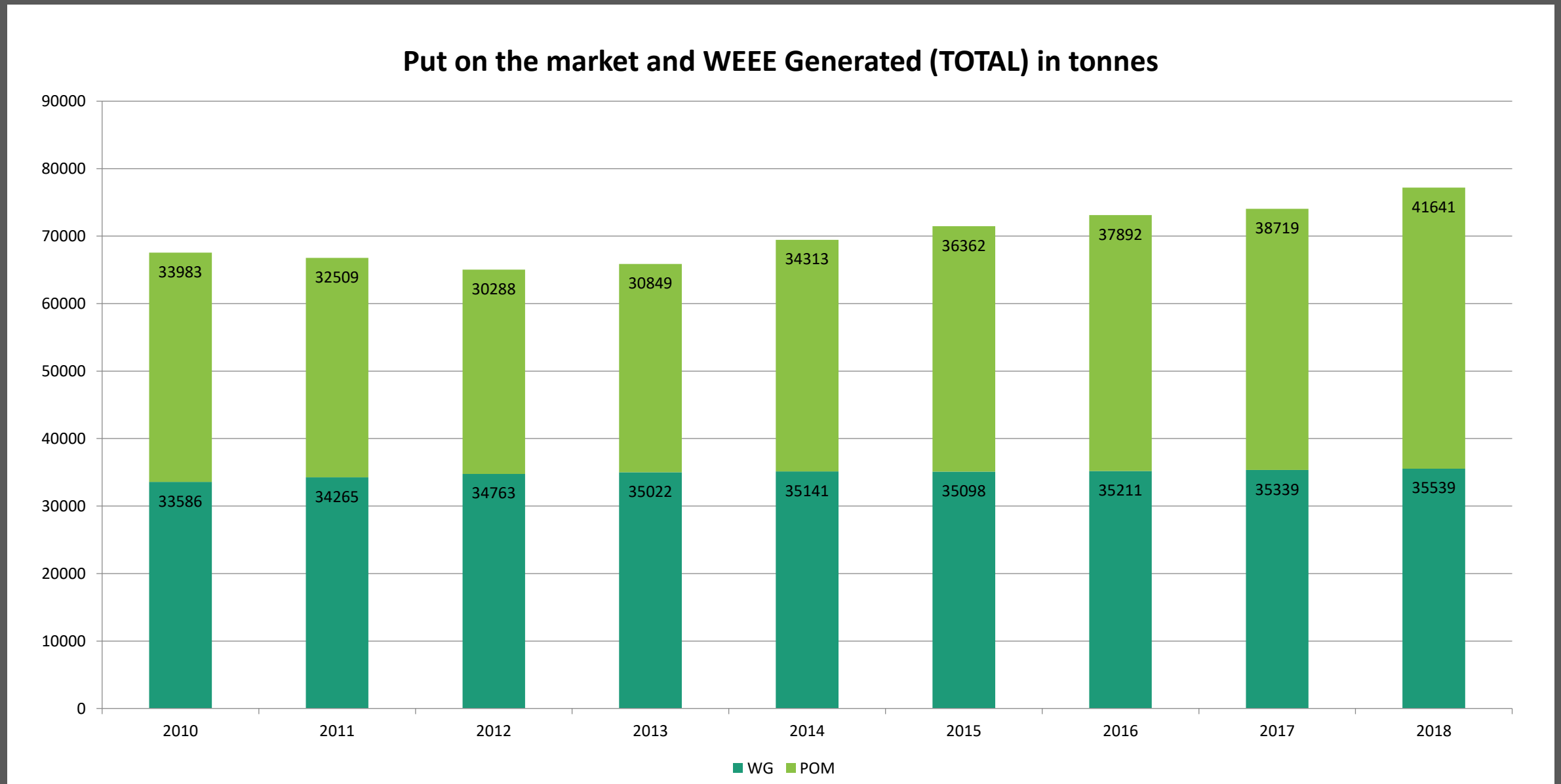
WEEE Generated (EU6) per capita in kg



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Small IT and telecommunication equipment	1	1	1	1	1	1	1	1	1	1	1	1	1
Small equipment	2	2	2	2	2	2	2	2	2	2	2	3	3
Photovoltaic panels (incl. converters)	0	0	0	0	0	0	0	0	0	0	0	0	0
Large equipment (excluding photovoltaic panels)	3	3	3	3	3	3	3	3	3	3	3	3	3
Lamps	0	0	0	0	0	0	0	0	0	0	0	0	0
Screens, monitors, and equipment containing screens (..)	1	1	1	1	1	1	1	1	1	1	1	1	1
Temperature exchange equipment	2	2	2	2	2	2	2	2	2	2	2	2	2

WEEE Generated (TOTAL) per capita in kg




Put on the market and WEEE Generated (TOTAL) in tonnes
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
33983
32509
30288
30849
34313
36362
37892
38719
41641
33586
34265
34763
35022
35141
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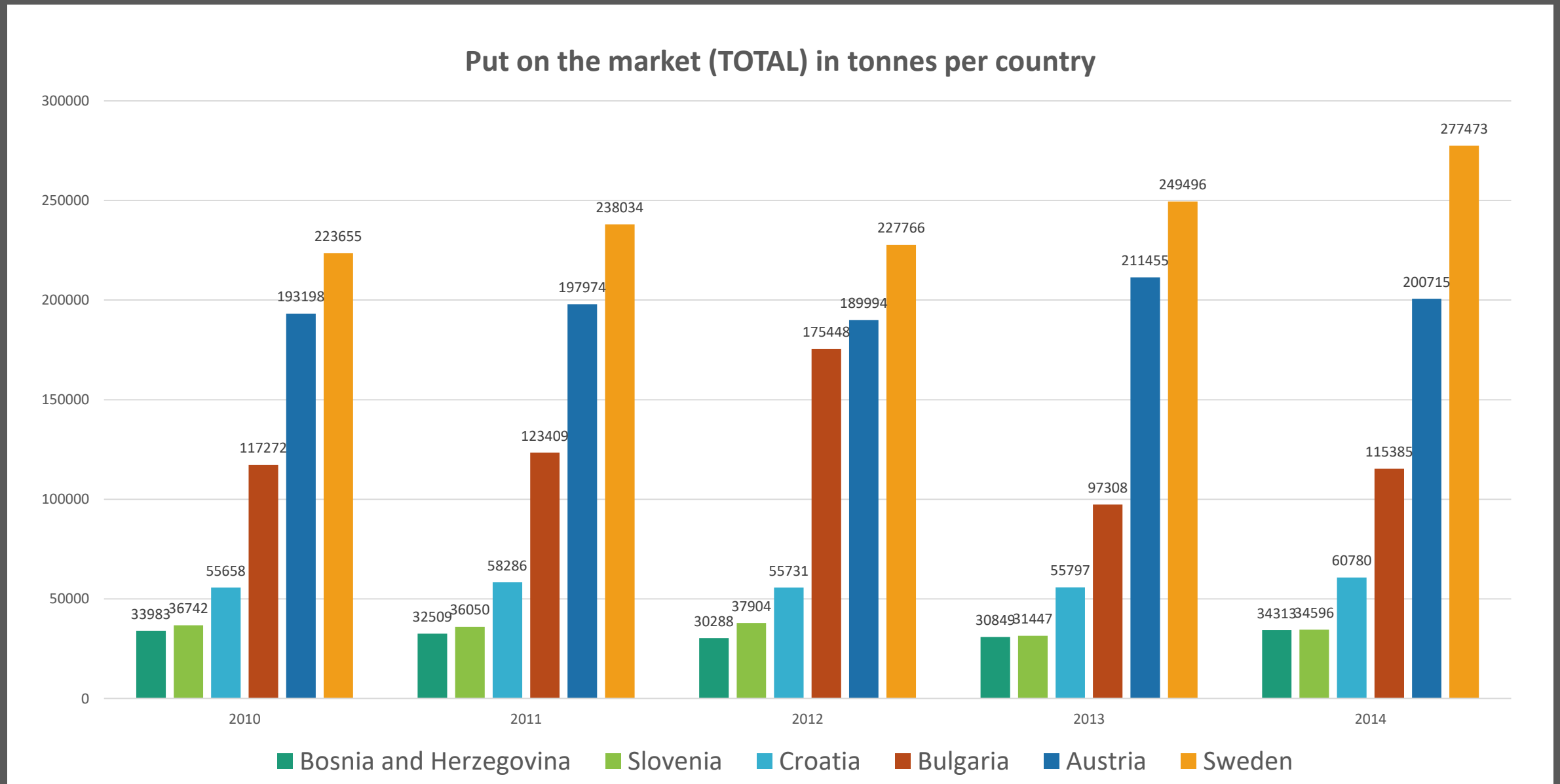
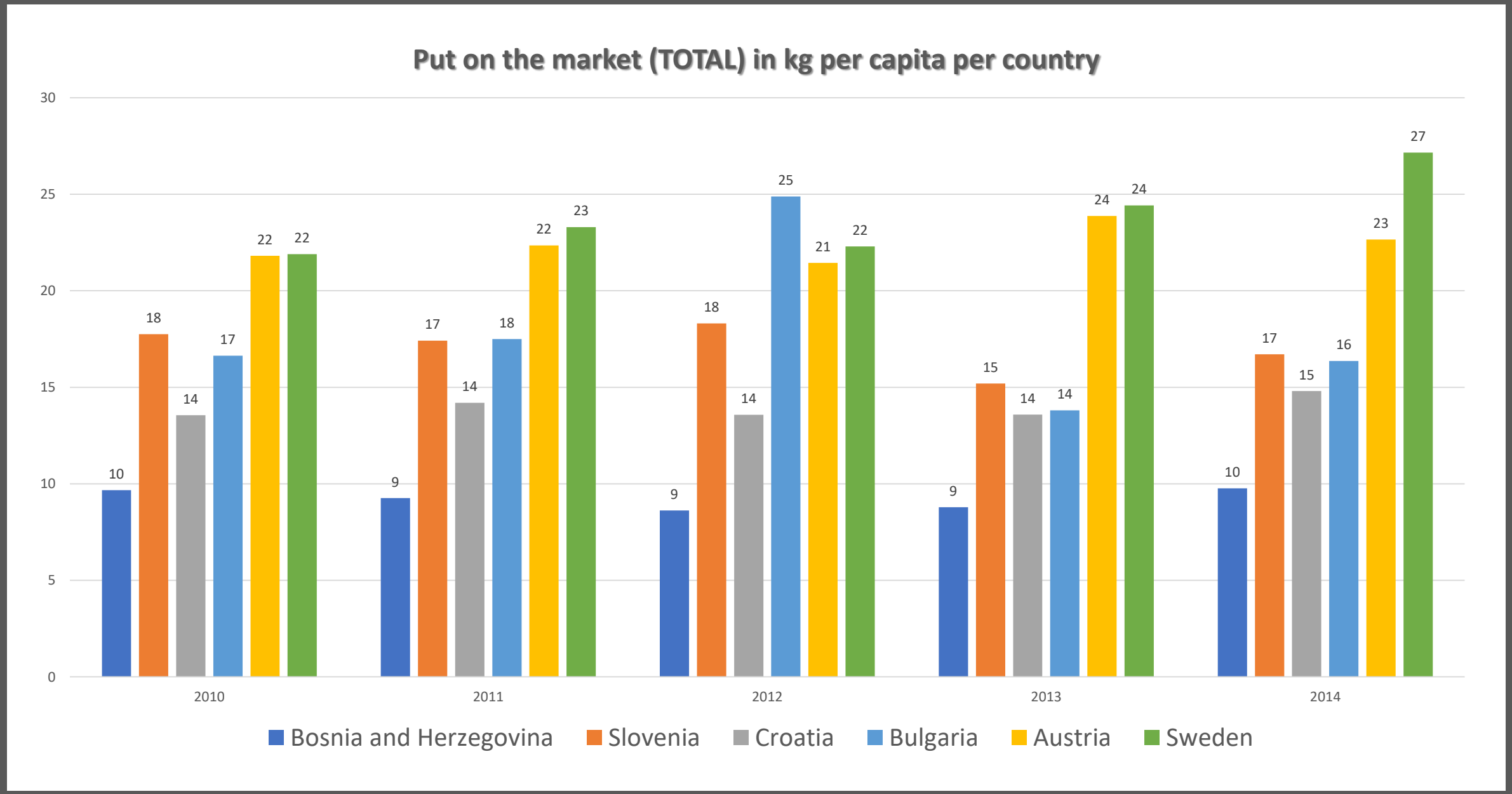
35211
35339
35539
2010
2011
2012
2013
2014
2015
2016
2017
2018
WG
POM


Put on the market (TOTAL) in tonnes per country
300000
250000
200000
150000
100000
50000
0
2010
2011
2012
2013
2014
33983
36742
55658
117272
193198
223655
32509
36050
58286
123409
197974
238034
30288
37904
55731
175448
189994
227766
30849
31447
55797
97308
211455
249496
34313
34596
60780
115385
200715
277473
Bosnia and Herzegovina
Slovenia
Croatia
Bulgaria
Austria
Sweden


Put on the market (TOTAL) in kg per capita per country
30
25
20
15
10
5
0
10
18
14
17
22
22
9
17
14
18
22
23
9
18
14
25
21
22
9
15
14
14
24
24
10
17
15
16
23
27
2010
2011
2012
2013
2014
Bosnia and Herzegovina
Slovenia
Croatia
Bulgaria
Austria
Sweden