Büyükdere Cad. No: 102 Maya Akar Center
B Blk K: 18 D:71 34394 Esentepe - Şişli
İstanbul | Türkiye
0212 275 52 52 0850 360 2 333 (AEEE)
0212 273 29 99 aeee@tubisad.org.tr
www.tyk.org.tr

TÜBİSAD
AEEE YETKİLENDİRİLMİŞ KURULUŞU | WEEE COMPLIANCE SCHEME

TUBISAD Compliance Scheme

Summary Report on Domestic EEE/WEEE Inventory

Prepared By

- Meltem Bağdatlı / Secretary General - TUBISAD
- Nilüfer Selen Tanner / WEEE Manager- TUBISAD
- İlkay Haluk Onay / Coordinator Environmental Officer – TUBISAD
- Şükrü Aykan Gürcü / WEEE Recycling Specialist – TUBISAD
- Bengisu Evrensel / Environmental Engineer – TUBISAD
- Mehmet Yeşilot / Environmental Engineer – TUBISAD

Data Analysis and Evaluation

- Mehmet Kılınç / PhD Candicate – Istanbul University Departmant of Econometrics
- Güliz Karaarslan Semiz / Assist. Prof. – Ağrı İbrahim Çeçen University Department of Mathematics and Science Education

Format and Chronologies

- Irmak Zeynep Özdemir / Student – Terakki Foundations Schools Campus of Teperören / High School

Design

- Merve Kürkçü / Graphic Designer - Istanbul Aydın University - Faculty of Fine Arts Graphic Department

EXECUTIVE SUMMARY

TUBISAD a 42-year-old Nongovernmental Organization is assigned as Extended Producer Responsibility (EPR) organization for Waste Electrical and Electronic Equipment (WEEE) management, dd. 2015 by the Ministry of Environment and Urbanization of Turkish Republic.

As part of its reporting duties, TUBISAD Compliance Scheme conducts a survey each year titled "Domestic Electrical and Electronic Equipment (EEE) and WEEE", feeding data into the biannual TUBISAD Domestic EEE/WEEE Inventory Report.

The very limited number of previous studies guestimate domestic WEEE potential in Turkey by dividing the amount of WEEE received by a few recycling plants and by calculating per person WEEE amounts. No study that the TUBISAD WEEE Team has encountered so far, distinguishes Business-to-Business (B2B) from Business-to-Consumer (B2C) fractions. This elevates the governmental expectancy on EPR Organizations' WEEE collection efforts and is then reflected on collection quotas in relevant legislation.

Büyükdere Cad. No: 102 Maya Akar Center
B Blk K: 18 D:71 34394 Esentepe - Şişli
İstanbul | Türkiye
0212 275 52 52 0850 360 2 333 (AEEE)
0212 273 29 99 aeee@tubisad.org.tr
www.tyk.org.tr

Knowing that *The Global E-waste Monitor 2020* as a collaborative effort of the Sustainable Cycles (SCYCLE) Programme and the United Nations Institute for Training and Research (UNITAR), The International Telecommunication Union (ITU), and The International Solid Waste Association (ISWA) covers WEEE amounts from Turkey we would like to provide our findings.

Critical Points on "Domestic EEE and WEEE Inventory"

The study reaches out to households thru K12 grade students. Students answer an online questionnaire (Attach. 1) as part of the annual WEEE access campaign named "Students Collect WEEE!". The research is unique given the fact that no similar study was performed before to define the amount of EEE in use and WEEE kept in households in Turkey.

The main headings covered in the report are:

- *Examination of the Survey data:* application of the study, access to teachers and students, and the method of data analysis
- *EEE and WEEE Assessment*: EEE and WEEE evaluations are made by taking into account the education level, school types, and place of residence. In addition to this information, EEE and WEEE evaluation specific to cities and districts with a sufficient number of observations are also included in this section.
- *Evaluation of the average lifespan of EEE*: Participants answers based on place of residence, school type, and education level were organized geographically and reflected on city-specific findings
- *Evaluation of TUBISAD Activities based on answers to survey questions:* Nationwide WEEE activities performed by TUBISAD are evaluated in comparison to survey results.
- *Circular Electronics: The amount of* WEEE accessed by TUBISAD and its evaluation by circularity point of view is evaluated.
- "Strengths, Weaknesses, Opportunities, Threats" (SWOT) Analysis

The report covers the evaluations and Turkey projections in line with the headings "**Evaluation of EEE and WEEE**" and " **Lifespans of Domestic EEE**". The results that were obtained are compared with TUBISAD field operations.

During the 2018 – 2019 and 2019 – 2020 academic years, a total of 20,762 surveyees participated in the study. These participants were spread out among 92 different districts of 21 cities in Turkey. After elimination of false and deviating data points, a total number of 17,171 surveyees from 52 districts were selected as eligible for analysis. The R Program was used to analyze data and analysis was interpreted and included in the report for both academic years separately, as well as jointly.

Büyükdere Cad. No: 102 Maya Akar Center
B Blk K: 18 D:71 34394 Esentepe - Şişli
İstanbul | Türkiye
0212 275 52 52 0850 360 2 333 (AEEE)
0212 273 29 99 aeee@tubisad.org.tr
www.tyk.org.tr

In "TUBISAD Domestic EEE/WEEE Inventory Report" participants were classified into subgroups based on:

- place of residence (urban / rural),
- school type (private / public)
- education level (kindergarten, primary, secondary, high school)

The Republic of Turkey Ministry of Environment and Urbanization classifies WEEE in six main categories in The Regulation on Control of WEEE. TUBISAD as EPR Organization is authorized to access the third and fourth categories named in The Regulation on Control of WEEE published official gazette number 29314 and dated April 2, 2015. Therefore; the survey aims to seek answers to more specific questions for categories under TUBISAD responsibility. Whereas a more generalized question set is presented to participants for appliances falling under the remaining categories.

Categories of WEEE:

1. Fridges – Refrigerators – Air Conditioning Appliances
2. Large Household Appliances
3. TV and Monitors
4. IT and Telecomunications Equipment
5. Lighting Equipment
6. Small Household Appliancess

If the same data points were analyzed under "WEEE Directive 2012/19 / EU Annex III" similar to Global E-Waste Monitor 2017; the amount of EEE/WEEE per person would have been higher due to the shift between categories in The Regulation on Control of WEEE of Turkey and WEEE Directive 2012/19/EU Annex III.

Some critical findings based on different criteria are as below:

Büyükdere Cad. No: 102 Maya Akar Center
B Blk K: 18 D:71 34394 Esentepe - Şişli
İstanbul | Türkiye
0212 275 52 52 0850 360 2 333 (AEEE)
0212 273 29 99 aeee@tubisad.org.tr
www.tyk.org.tr

Summary Data Table

The Evaluation of Electrical and Electronic Equipment (EEE)

Average values according to academic years	2018-2019 Academic Year		2019-2020 Academic Year	
	Piece /household	Kg/household – Kg/person	Piece /household	Kg/household – Kg/person
	8.93	96.4 – 28.3	9.25	95.7 – 28.17

All Data
(2018 – 2019 and 2019 – 2020 academic years' data are evaluated collectively.)

		Units/Household
Place of residence	RURAL	8.11
	URBAN	9.05
School types	PUBLIC SCHOOLS	8.94
	PRIVATE SCHOOLS	10,08
Education levels	KINDERGARTEN	7.28
	PRIMARY SCHOOL	8.21
	SECONDARY SCHOOL	9.69
	HIGH SCHOOL	9.16

The Evaluation of Waste Electrical and Electronic Equipment (WEEE)

Average values according to academic years	2018-2019 Academic Year		2019-2020 Academic Year	
	Units /household	Kg/person	Units /household	Kg/person
	0.82	1.031	1.07	1.407

All Data
(2018 – 2019 and 2019 – 2020 academic years' data are evaluated collectively.)

		Units/Household	Kg/Person
The average amount of WEEE according to students' place of residence	RURAL	0.86	1.61
	URBAN	1.14	1.08
The average amount of WEEE according to school types	PUBLIC SCHOOLS	0.89	1.13
	PRIVATE SCHOOLS	0.74	0.78
The average amount of WEEE according to students' education levels	KINDERGARTEN	0.42	0.54
	PRIMARY SCHOOL	0.47	0.50
	SECONDARY SCHOOL	1.28	1.72
	HIGH SCHOOL	0.77	0.96

The Predicted Data for Turkey

(The data are calculated according to the 3rd and 4th Categories WEEE determined in The Regulation on Control of WEEE in Turkey.)

	The Amount of 3rd and 4th Categories WEEE (kg/person)	The Amount of all Categories WEEE (kg/person)	The Amount of 3rd and 4th Categories WEEE in Turkey (tons)	The Amount of all Categories WEEE in Turkey (tons)*
TYK Survey Data are calculated according to the 3rd and 4th Categories WEEE determined in The Regulation on Control of WEEE.	0.625	1.11	52,000	92,000

Büyükdere Cad. No: 102 Maya Akar Center
B Blk K: 18 D:71 34394 Esentepe - Şişli
İstanbul | Türkiye
0212 275 52 52 0850 360 2 333 (AEEE)
0212 273 29 99 aeee@tubisad.org.tr
www.tyk.org.tr

TYK Survey Data are calculated according to the BIT and Tv&Monitors Categories determined in "WEEE Directive 2012/19 / EU Annex III .)	0.49	2.01	41,000	170,000

The Collective Evaluation of WEEE and EEE (in the piece)		
Type of EEE (Top 5 EEE having the biggest and lowest ratio.)	**The Ratio in EEE (%)**	**The Ratio AEEE (%)**
Tablets and Mobile Phones	11.20%	7.60%
Chargers	9.90%	7.30%
TV and Monitors	9.30%	4.20%
Lighting Equipment	8.70%	5.00%
Large Household Appliances	8.40%	1.80%
…	…	….
Telephones	3.40%	9.50%
Printers	2.80%	11.20%
Game Consoles	2.60%	11.70%
Camera	3.60%	12.30%

The Evaluation of EEE's Lifespans		**Average Lifespans of EEE (year)**
Place of residence	RURAL	4.4
	URBAN	4.4
School types	PUBLIC SCHOOLS	4.2
	PRIVATE SCHOOLS	4.4
Education levels	KINDERGARTEN	5.2
	PRIMARY SCHOOL	4.6
	SECONDARY SCHOOL	4.2
	HIGH SCHOOL	4.2

** Deviations need to be taken into consideration due to a more generalized set of questions for categories: 1,2,5,6.*

Data Interpretation:

It was observed that in the households of students who are studying and living in urban areas, the amount of EEE was higher. When the WEEE in homes is evaluated, it is observed that in the households of students who are studying in public schools living in rural areas, the amount of WEEE is higher. The results obtained from the evaluations made in the aforementioned categories may be influenced by various situations such as socioeconomic conditions and differences in place of residence and these are not considered within the scope of this report.

The above findings also conclude that; as the awareness increases on environmentally sound acts by age, the domestic EEE is consumed more efficiently which extends the device's lifespan.

Büyükdere Cad. No: 102 Maya Akar Center
B Blk K: 18 D:71 34394 Esentepe - Şişli
İstanbul | Türkiye
0212 275 52 52 0850 360 2 333 (AEEE)
0212 273 29 99 aeee@tubisad.org.tr
www.tyk.org.tr

When analyzing the data, it was seen that most popular domestic:

- EEE: tablets, mobile phones, and chargers
- WEEE: cameras, game consoles, and printers.

While cameras and game consoles are not among the most common EEE in homes, the fact that they are the first among the WEEE is that smartphones have the features to replace these products with contemporary technology. These results from the survey data confirm that the development in technology and the introduction of new products to meet the needs, affect the variety of WEEE found in households.

When the above-mentioned outputs are summarized numerically; it is possible to conclude that;

- Tablets and mobile phones, which have the largest share among EEE by 11.2% on a quantity basis, have a share of 7.6% among WEEE.
- Chargers with a 9.9% share of EEE have a 7.3% share of waste, following tablets and mobile phones,
- TVs and monitors form a significant share within selected EEEs at 9.3%, but their share in WEEE is relatively smaller at a rate of 4.2%.
- The share of large household appliances and refrigerators on an item basis among EEE is respectively 8.4% and 8.1%, while their share among WEEE decreases to 1.8% and 1.7%.

The fact that the least common WEEE at homes are refrigerators and large household appliances are confirmed by reasons as they reach the waste character late due to:

- their longer service life,
- not suitable for storing the same way small devices are stored,
- there is no emotional connection of users with this group unlike data containing devices.

The study in some parts is based on assumptions such as; each student participating in the survey represents one household. Therefore; it is possible to make a strong estimate on:

- the amount of Domestic WEEE is approximately 1.0 kg/person, for the 2018 - 2019 academic year,
- the amount of Domestic WEEE is 1.4 kg/person, for the 2019 – 2020 academic year,
- Consolidated data, indicates that the amount of domestic WEEE is 1.11 kg/person.

Büyükdere Cad. No: 102 Maya Akar Center
B Blk K: 18 D:71 34394 Esentepe - Şişli
İstanbul | Türkiye
0212 275 52 52 0850 360 2 333 (AEEE)
0212 273 29 99 aeee@tubisad.org.tr
www.tyk.org.tr

The above calculations made according to The Regulation on Control of WEEE under the heading "The Predicted Data for Turkey" on Summary Data Table (Pg.4) are calculated according to the "WEEE Directive 2012/19 / EU Annex III" data that the Global E-Waste Monitor 2017 research was based on; the amount of WEEE per person is 2.04 kg. According to this calculation, approximately 170,000 tons of WEEE can be assumed in the houses. Within this amount, the total of WEEE in the 3rd and 4th categories is calculated as 41,000 tons. The difference between calculations according to the The Regulation on Control of WEEE and the Global E-waste Monitor 2017 report depends on the category difference in the The Regulation on Control of WEEE of category distinctions in WEEE Directive 2012/19/EU Annex III.

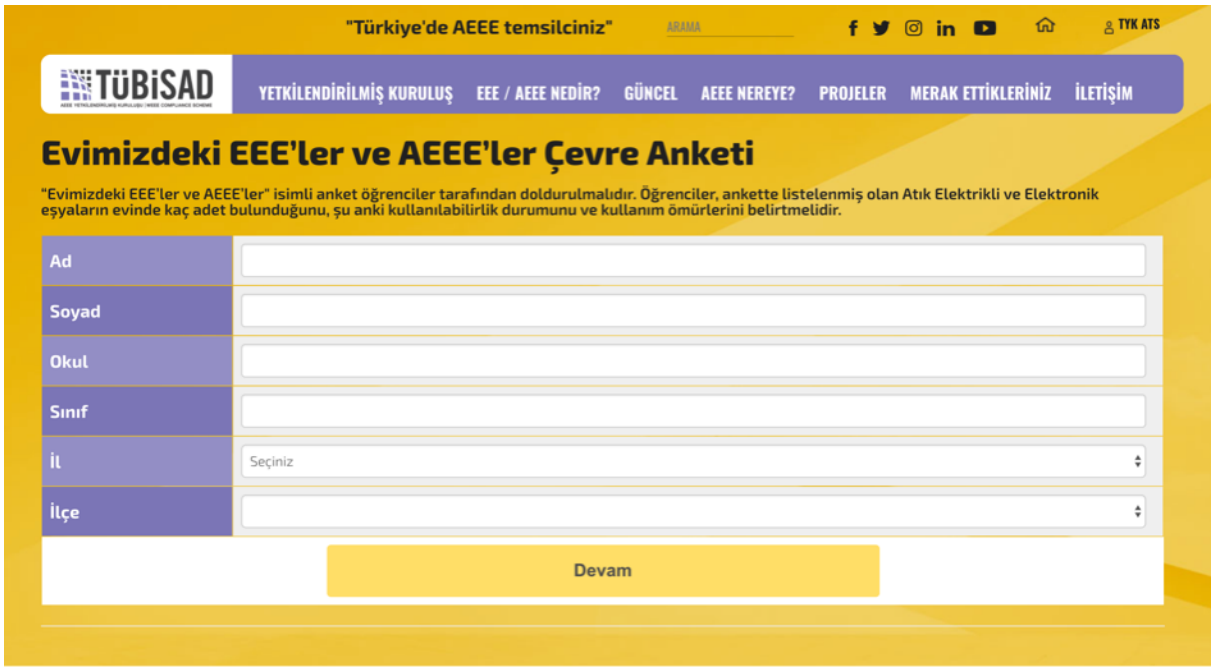
Some critical observations were also made on the lifespan of devices based on the data points. It was found that:

- All EEE's except the camera, speaker, and charger reached the WEEE quality before the manufacturer suggested lifespan. However, this data does not mean that EEE is completely unusable. The possibility of the EEEs being purchased for renewal or being utilized in the second-hand market may cause their usage lifespan to be shorter than expected.
- The total lifespan for the EEEs currently in use was predicted as 4.39 years. According to the manufacturer's instructions updated according to Turkey's consumption habits, the average lifespan of EEEs covered in the survey is 6.3 years, regardless of EEE type.
- The shorter use and frequent renewal of devices increase domestic WEEE volume.

The results obtained in line with the analyses carried out were compared with the activities carried out by TUBISAD. Accordingly, it is seen that the collection rates are higher in the cities where the municipalities which have a longer cooperation period with TUBISAD are located. It was observed that the amount of WEEE in the houses calculated by the survey data points is collected more in these cities in terms of ratio. When evaluating the collection rates, it should be taken into account that the evaluated cities' "Students Collect WEEE!" campaign and the waste accumulated in the waste collection centers of the municipalities are included in the calculation and the waste from the school campaign carried out in the 2019 - 2020 academic year which has not yet been collected is not included. Besides, WEEE was collected from the campaigns and projects created by TUBISAD to provide WEEE access in 81 cities such as "Recycle Into Education" and "Don't Waste! Donate" as well as from other collection networks and channels are not included in these calculations. On the other hand, it should not be forgotten that WEEE that is calculated as being kept in houses should be evaluated within the scope of the liabilities of different authorized organizations in the same category.

Büyükdere Cad. No: 102 Maya Akar Center
B Blk K: 18 D:71 34394 Esentepe - Şişli
İstanbul | Türkiye
0212 275 52 52 0850 360 2 333 (AEEE)
0212 273 29 99 aeee@tubisad.org.tr
www.tyk.org.tr

Attachment – 1



Büyükdere Cad. No: 102 Maya Akar Center
B Blk K: 18 D:71 34394 Esentepe - Şişli
İstanbul | Türkiye
0212 275 52 52 0850 360 2 333 (AEEE)
0212 273 29 99 aeee@tubisad.org.tr
www.tyk.org.tr

Büyükdere Cad. No: 102 Maya Akar Center
B Blk K: 18 D:71 34394 Esentepe - Şişli
İstanbul | Türkiye
0212 275 52 52 0850 360 2 333 (AEEE)
0212 273 29 99 aeee@tubisad.org.tr
www.tyk.org.tr