

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
(PRINCIPAL BENCH)

Execution Application No. 04/2024 in Original Application No. 512/2018
With M.A. No.09/2024 in Original Application No. 512/2018

Petitioner : Sri.Shailesh Singh

Vs

Respondent(s) : State of Kerala & Others

REPORT FILED BY THE SENIOR ENVIRONMENTAL ENGINEER, REGIONAL
OFFICE, ERNAKULAM FOR AND ON BEHALF OF THE KERALA STATE
POLLUTION CONTROL BOARD

Adv. Jogy Scaria.

ADDITIONAL STANDING COUNSEL FOR THE 8TH RESPONDENT:

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
(PRINCIPAL BENCH)

Execution Application No. 04/2024 in Original Application No. 512/2018
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Dated this the 15th Day Of May 2024

Jogy Scaria, Advocate

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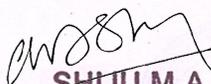
Respondent(s): State of Kerala & Others

**REPORT FILED BY THE 8th RESPONDENT IN THE ABOVE CASE IN
COMPLAINE WITH THE ORDER OF HON'BLE NGT DATED 15.01.2021**

I, Shiju M A, aged 46 years, S/o Late M C Ayyankutty, residing at Meenangadi, Wayanad Senior Environmental Engineer, Kerala State Pollution Control Board, Legal Cell, Ernakulam, do hereby solemnly affirm and state as follows:

1. I am the Senior Environmental Engineer, Kerala State Pollution Control Board (hereinafter referred to as Board), and duly authorized to represent the 8th respondent in the above case. I am aware of the facts affirmed by me in this report. I am swearing this report based on the best of my knowledge, information and belief and the facts revealed from the records.
2. The above Execution Application No. 04/2024 in Original Application No. 512/2018 With M.A. No.09/2024 in Original Application No.

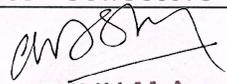



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512/2018 is filed by Sri. Shailesh Singh S/o Mr. Babu Singh seeking compliance of the directions issued by Tribunal in the order dated 15.01.2021 passed in OA Nos. 512/2018, 621/2018 and 1001/2019. The progress on the action plan for enforcement of E-Waste Rules in the state is given below.

S.No.	Challenges / Activities	Stakeholder responsible for implementation	Action	Status of implementation
1	Inventorization of e-waste generation	SPCBs/PCCs	SPCBs /PCCs to complete this activity within one year.	The Board has prepared inventory of e-waste through National Institute for Interdisciplinary Science and Technology (NIIST) based on GST data and the soft copy of the same is attached as Annexure 1 . The e-waste collected during the previous years and submitted in Annual Reports are attached as Annexure 2
2	Identification of Producers who have not registered at E-waste EPR Portal	CPCB, Custom department, Ministry of commerce and Ministry of electronics & telecommunication	This is a continuous activity for which support of SPCBs/PCCs/Custom department/ Ministry of Commerce, Ministry of Electronics and telecommunication is required.	The Board had started verification of collection points of producers and violations were already reported to CPCB. The Board had done random verification of these collection centers.
3	Verification of facilities of recyclers for their infrastructure and records	SPCBs/PCCs/CPCB	This is a continuous activity.	In Kerala, there is one Recycling Unit namely Sahya Solutions Group of Waste Management, Peruvanthanam, Idukki. The physical verification of the same is under progress
4	Checking of informal trading, dismantling, and recycling	SPCBs/PCCs/ District Administration	SPCBs/PCCs in coordination with District Administration has to carry out quarterly drive for checking of	Kerala SPCB has initiated actions for checking informal trading, dismantling and recycling of e-waste in its State. Instructions given to all District Collectors requesting




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<p>of waste</p>		<p>this activity.</p>	<p>to take actions on Checking of informal trade, dismantle & recycle of e-waste; facilitate collection for incentivizing - setup recycling & disposal of e-waste; Governance framework for monitoring compliance, IEC plan to be firmed up and strengthen enforcement at district level and the matter is being followed up.</p> <ul style="list-style-type: none"> • Clean Kerala Company is the collection agency of the Government and is collecting e-waste from institutions. There are 33 numbers of collection centers and some of these are having consent /authorization of the Board and having agreement with Producers/PROs/recyclers. • Collection drive by registered agency, M/s. Eco solutions Pvt. Ltd. collected T E-waste during out of which 90% is from informal sector especially from scrap feeders and scrap pickers. Recently they have agreement with Thiruvananthapuram Corporation and collected 0.7T of e-waste through deposition center. E-waste collection drive conducted by some Panchayath (eg: Poonjar GP) jointly with Eco Solutions. • The registered recycler namely Sahya Solutions in agreement with the local bodies has initiated an integrated waste collection. This registered recycler has been empanelled by the Government for the collection, storage, dismantling and recycling in DBOT mode. Further developments are going on. • The Board is in association with Scrap Merchants
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				<p>Association initiated actions to bring them under the consent purview. Awareness programmes were conducted by the Board officials to informal sector and for Verification of systems provided by producers for collection of e-waste. Instructions given to Suchitwa Mission conduct awareness drives to bring informal to formal sector so that collected e-waste could be disposed through authorized dismantlers/ recyclers.</p>
5	Facilitate collection and disposal of e- waste	SPCBs/PCCs/ District Administration/ CPCB	State Government to formulate mechanism for collection and for incentivizing setting up of recycling facilities.	<ul style="list-style-type: none"> • The Clean Kerala Company has prepared a calendar for waste collection including e-waste based on which the collection is progressing • The registered recycler namely Sahya Solutions in agreement with the local bodies has initiated an integrated waste collection. This registered recycler has been empanelled by the Government for the collection, storage, dismantling and recycling in DBOT mode. Further developments are going on. • Collection drive by registered agency, M/s. Eco solutions Pvt. Ltd. collected T E-waste during out of which 90% is from informal sector especially from scrap feeders and scrap pickers. Recently they have agreement with Thiruvananthapuram Corporation and collects e-waste through Haritha Karma Sena. • In addition, an online vehicle tracking system is being developed by the Kerala State Pollution Control Board to track the movement of solid waste both within and outside



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				the state of Kerala. The tracking of e-waste will be also included the system.
6	Governance framework for monitoring compliance	SPCBs/PCCs/ District Administration/ CPCB	Monitoring to be ensured at city/district and state levels for which nodal officers (state environmental secretary, district collector, CMD/Commissioners) to be designated.	Direction was issued to the District Collectors to entrust District Level Monitoring Committee for the implementation of E-Waste Management Rules. The matter is being followed up.
7	Capacity building at district/State/ CPCB level	SPCBs/PCCs/ District Administration /CPCB	Special workshops to educate functionaries in government/NGOs be run over one year.	<p>The Board conducted meeting with Kerala Scrap Merchants Association and discussed with them the necessity of bringing all scrap dealers under Rules' purview.</p> <ul style="list-style-type: none"> • The guideline for scrap dealers has been prepared by the Board. The copy is attached as <u>Annexure 3</u> • The Board had conducted discussion with Kerala State Electronic Service Technician's Association, an association of service/repair centers and initiated activities to bring them also under rule's purview. • The Board had categorized refurbishers under white category so that they can get registration easily without any hurdles in submitting application and actions progressing to bring all under consent purview. There is only one refurbisher identified in the State.



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				<ul style="list-style-type: none"> • The Board could not issue consent to unauthorized e-waste collection centers. Hence action is being taken in some districts under the initiative of Kerala Scrap Merchants Association to enter into agreement between district unit of the association and authorized e-waste processing centers. • Action is also being done by Suchitwa Mission to formation of guideline for scrap merchants so as to bring them under the purview of the local bodies. These dealers have to produce correct details of e-waste available with them to the Board or Local Bodies for correct inventorisation. The Board is to work on the matter.
8	IEC plan be firmed up and executed	SPCBs/PCCs/ District Administration /CPCB	<p>State Government to firm up IEC plan for educating public at large about the system of collection, incentive structure and facilities for recycling.</p> <p>The IEC Plan to be executed over one year.</p>	<p>The State Government is focussing on Green Industry Policy development and e-waste management is also one of the activities. Further development is going on. Instructions given to all District Collectors requesting to take actions on IEC plan to be firmed up and strengthen enforcement at district level.</p>



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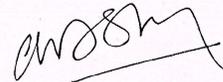
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9	Strengthen system of enforcement	SPCBs/PCCs/ District Administration/ CPCB	Quarterly review of violations and enforcement actions at city/district/state level and quarterly reports to be filed with CPCB.	<p>Already an enforcement squad is constituted in Kerala vide order G.O.No.673/2023/LSGD dated 21.03.2023. Further actions are being taken.</p> <p>Instructions given to all District Collectors requesting to take actions on Checking of informal trade, dismantle & recycle of e-waste, Facilitate collection for incentivizing - setup recycling & disposal of e-waste, Governance framework for monitoring compliance, IEC plan to be firmed up and strengthen enforcement at district level and the matter is being followed up.</p> <p>Directions are given to DOs to conduct market survey for the identification of brands/producers who have not obtained EPR and to conduct verification of the systems provided by the producers for collection of e-waste by conducting inspection to the collection centres and furnish report.</p>
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It is humbly submitted that all earnest efforts are being taken for the compliance of the directions of the Hon'ble National Green Tribunal and for the compliance of the E-waste Management Rules.

All the facts stated above are true to the best of my knowledge, information and belief.

Dated this the 15th day of May 2024



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<p>Quarterly review of violations and enforcement actions at city/districtal level and quarterly reports to be filed with CPCB.</p>	<p>SPCB/PCA District Administration CPCB</p>	<p>Strengthening of enforcement system of</p>	<p>1</p>
<p>Already an enforcement order is issued in Kerala vide order G.O.No.673/2023/SPD dated 21.03.2023. Further actions are being taken.</p> <p>Instructions given to all District Collectors requesting to take action on checking of informal trade, dismantle & recycle of e-waste, facilitate collection for incinerating & setup recycling & disposal of e-waste.</p> <p>Government framework for monitoring compliance, IEC plan to be framed, up and strengthen enforcement at district level and the matter is being followed up.</p> <p>Directions are given to DDOs to conduct market survey for the identification of producers/processors who have not obtained EPR and to conduct survey on the basis of information provided by the producers for collection of e-waste. By conducting inspection to the collection centres and furnish result.</p>			

All the facts stated above are true to the best of my knowledge, information and belief.

It is humbly submitted that all earnest efforts are being taken for the compliance of the directions of the Hon'ble National Green Tribunal and for the compliance of the E-waste Management Rules.

Dated this 13th day of May 2024

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Dated this the 15th Day Of May 2024

Jogy Scaria, Advocate

ADDITIONAL STANDING COUNSEL FOR THE RESPONDENT:




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Inventory of Electrical and Electronic Equipment's (EEE) Waste under Guidelines on Implementation of E-Waste (Management) Rules, 2016 in the State of Kerala



Sponsor

Kerala State Pollution Control Board (KSPCB)

June 2022

**CSIR – National Institute for Interdisciplinary
Science and Technology (NIIST), Govt. of India,
Thiruvananthapuram, Kerala - 695019**



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EXECUTIVE SUMMARY

1. Due to rapid industrialization and urbanization, an improved standard of living and a high obsolescence rate, there has been an increased use of electrical and electronic equipment. This increased use has led to an increase in the quantum of E-waste over the past years and is likely to increase over time.
2. The Kerala State Pollution Control Board (KSPCB) has approached CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram, which is a constituent Laboratory of the Council of Scientific and Industrial Research (CSIR) to make an inventory of EEE Goods in the state of Kerala.
3. The E-waste (Management) Rules, 2016 provides methodology to estimate E-waste generation based on consumer sales and categorizes Electrical and Electronic Equipment (EEE) items into two categories viz. Information Technology and Telecommunication Equipment and Consumer Electrical and Electronics Equipment. The methodology primarily consists of collecting sales tax data for all the equipment and items and the calculation is based on the "end of life" or "Average life" of that particular item.
4. E-waste inventORIZATION is very important to understand the generation of e-waste in the coming years and proactively frame a management plan for the same. Sales data was collected from the GST office, Thiruvananthapuram for various categories of electrical and electronic items.
5. The taxation system in the country follows the Harmonized System of Nomenclature (HSN) Code, whereas the E-waste rules (2016) prescribes different item code for these items. The sales tax data GSTR1 was received for the 9 HSN codes viz. 8415, 8413, 8443, 8450, 8469, 8471, 8517, 8528 and 8539. Various items of E-waste Rules (2016) were categorized into appropriate HSN code.
6. The total sales in all HSN codes are 17758.65 Cr, 23715.45 Cr and 27152.41 Cr for the years 2017-2018 (July-March), 2018-19 (April-March) and 2019-20 (April-March) respectively.




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7. Purchase made from e-commerce websites are included only if the seller is situated in Kerala and has a registered GST number in the state of Kerala.
8. There are some items like user terminals (ITEW-9), Telex (ITEW-11) and answering systems (ITEW-16) which are not in use nowadays, these items are not categorized in any of the HSN codes described in the report.
9. As per the computations made with the methodology given, the total weight of all items sold in the state of Kerala is 72552 T, 103199 T & 104445 T for the year 2017-2018, 2018-2019 & 2019-2020 and same will be E-waste after the end of life of all items which is in the range of next 5-10 Years.



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ABBREVIATION

ASSOCHAM	Associated Chambers of Commerce and Industry of India
BFR	Brominated Flame Retardants
BPO	Business Process Outsourcing
CAGR	Compound Annual Growth Rate
CFC	Chlorofluorocarbons
CPCB	Central Pollution Control Board
CRT	Cathode-Ray Tube
DLMC	District Level Monitoring Committee
EEE	Electrical and Electronic Equipment
EPR	Extended Producer Responsibility
GIS	Geographic Information System
GST	Goods and Service Tax
HC	Hydrocarbon
HCFC	Hydro Chloro Fluoro Carbon
HFC	Hydrofluorocarbons
HSN CODE	Harmonized System of Nomenclature Code
IT-ITeS	Information Technology & Information Technology Enabled Services
KPMG	Klynveld Peat Marwick Geodeler
KSPCB	Kerala State Pollution Control Board
MoEF & CC	Ministry of Environment, Forest and Climate Change
PRO	Producer Responsibility Organization
SPCB	State Pollution Control Board
TPA	Tonnes per Annum
UN	United Nation
WCO	World Customs Organization



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CHAPTER 1

INTRODUCTION

1.1 General

The rapid increase of technology in the 21st century has led to great involvement in the increased production of electronic gadgets. The Information Technology & Information Technology Enabled Services (IT-ITeS) sector is a field that is undergoing fast evolution and is changing the outline of Indian business standards. This sector includes software development, consultancies, software management, online services, and Business Process Outsourcing (BPO). Growth in IT and communication sectors has enhanced the usage of electronic equipment more and more rapidly. Faster upgradation of electronic products is forcing consumers to discard old electronic products very quickly, which, in turn, adds to e-waste to the solid waste stream. This has led to an exponential increase in e-waste generation. People tend to switch over to the newer models and the life of products has also decreased.

In 2019, the world generated a striking 53.6 million tons of e-waste, an average of 7.3 kg per capita. According to the Global E-Waste Monitor 2020, India generates about 3.23 million tons of e-waste annually and ranks third among e-waste producing countries, after China and the United States. About 95 per cent of India's e-waste is recycled in the informal sector and in a crude manner. A report on e-waste presented by the United Nations (UN) in World Economic Forum on January 24, 2019, points out that the waste stream reached 48.5 million tonnes in 2018 and the figure is expected to double if nothing changes. India's e-waste generation has risen nearly 43 per cent between FY18 and FY20. The pandemic-induced increase in use of electronic devices is set to accentuate this problem soon. A study by KPMG and ASSOCHAM says computer equipment account for almost 70 per cent of E-waste in India, followed by telecom/phones (12 per cent), electrical equipment (8 per cent) and medical equipment (7 per cent). E-waste is growing at a compound annual growth rate (CAGR) of about 30 per cent in the country. The global e-waste generated by year is shown in Figure 1.1 below




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Source: GEM-2020

Figure 1.1: Global E-waste generated by year

Since India is highly deficient in precious mineral resources while untreated E-waste goes to landfill, there is a need for an elegant, regulated E-waste recovery regime which would generate jobs as well as wealth. E-waste is largely made up of metals, plastics and glass which, once salvaged, give precious metals such as copper, iron, tin, nickel, lead, zinc, silver, gold and palladium. Printed circuit boards contain rare and precious metals such as ruthenium, rhodium, palladium, osmium, iridium and platinum - together referred to as the Platinum Group Metals. Valuable metals such as copper, silver, gold, and platinum could be recovered from e-waste, if they are scientifically processed. The presence of lethal substances such as liquid crystal, lithium, mercury, nickel, polychlorinated biphenyls (PCBs), selenium, arsenic, barium, brominated flame retardants, cadmium, chrome, cobalt, copper, and lead makes it very hazardous if e-waste is dismantled and processed in an unpolished manner without enough basic techniques. E-waste poses a huge hazard to humans, animals, and the environment.

The presence of heavy metals and highly deadly substances such as mercury, lead, beryllium, and cadmium pose a significant threat to the environment even in minute quantities.

1.2 E-Waste: An Emerging Waste System

The rising problem of e-waste sounds like a bigger weight on recycling e-waste and better e-waste management. The emergence of e-waste is an indicator of the growth of modernity and economic growth. E-waste management in the current scenario plays an important role in maintaining the hazardous waste which is emitted from various electronic gadgets after the end of life. In working conditions, Electrical and Electronic equipment (EEE) does not pose any visible threat to consumers, but it will become toxic after the end of life, so it is necessary to maintain proper disposal of e-waste. Apart from many industries, electronic industry is said to be the most igneous of all over the world for its uniqueness and making life easiest.

Laws to manage e-waste have been in place in India since 2011, mandating that only authorized dismantlers and recyclers shall collect e-waste. E-waste (Management) Rules, 2016 was enacted on October 1, 2017. Over 21 products (Schedule-I) were included under the purview of these rules. These rules also extended its purview to components or consumables or parts or spares of Electrical and Electronic Equipment (EEE), along with their products. The rule has strengthened the Extended Producer Responsibility (EPR), which is the global best practice to ensure the take-back of end-of-life products. A new arrangement called Producer Responsibility Organization (PRO) has been introduced to strengthen EPR further. The producers must meet targets, which should be 20 per cent of the waste generated by their sales. This will increase by 10 per cent annually for the next five years. The law also says that the responsibility of producers is not confined to waste collection, but also to ensure that the waste reaches the authorized recycler/dismantler.

1.3 E-waste Quantum: Indian Scenario

Globalization and fast-growing technologies replace older technologies making e-waste as one of the fastest waste streams in the world. According to a 2020 report by the Central Pollution Control Board (CPCB), India generated 1,014,961 tonnes of e-waste in FY 2019-2020 - up by 32% from FY 2018-2019. Of this, the report found that only 3.6% and 10% were actually collected in the country in 2018 and 2019, respectively. Almost 70% e-waste is being generated by ten states in the country (Rajya



Sabha Report). Due to the rapid development in the software sector Indian Information technology has a prominent global presence today. The increase in the use of electronic products, consumption rates and its higher obsolescence rate leads to higher generation of e-waste.

The higher increase in obsolescence rate of electronic products and import of electronic products from abroad creates a complex scenario for solid waste management. A Major issue arises in electronic products and their disposal management after the end of life. Among the top ten cities generating e-waste, Mumbai topped the list as it generated an estimated 1,20,000 tonnes of e-waste annually. Delhi and Bengaluru ranked second and third, with 98,000 and 92,000 tonnes of e-waste generation respectively (Source: ASSOCHAM- KPMG). Maharashtra ranks first in the generation of electronic waste, followed by Tamil Nadu and Andhra Pradesh. The Graph of top E-waste Generators state-wise is shown in Fig 1.2 below.

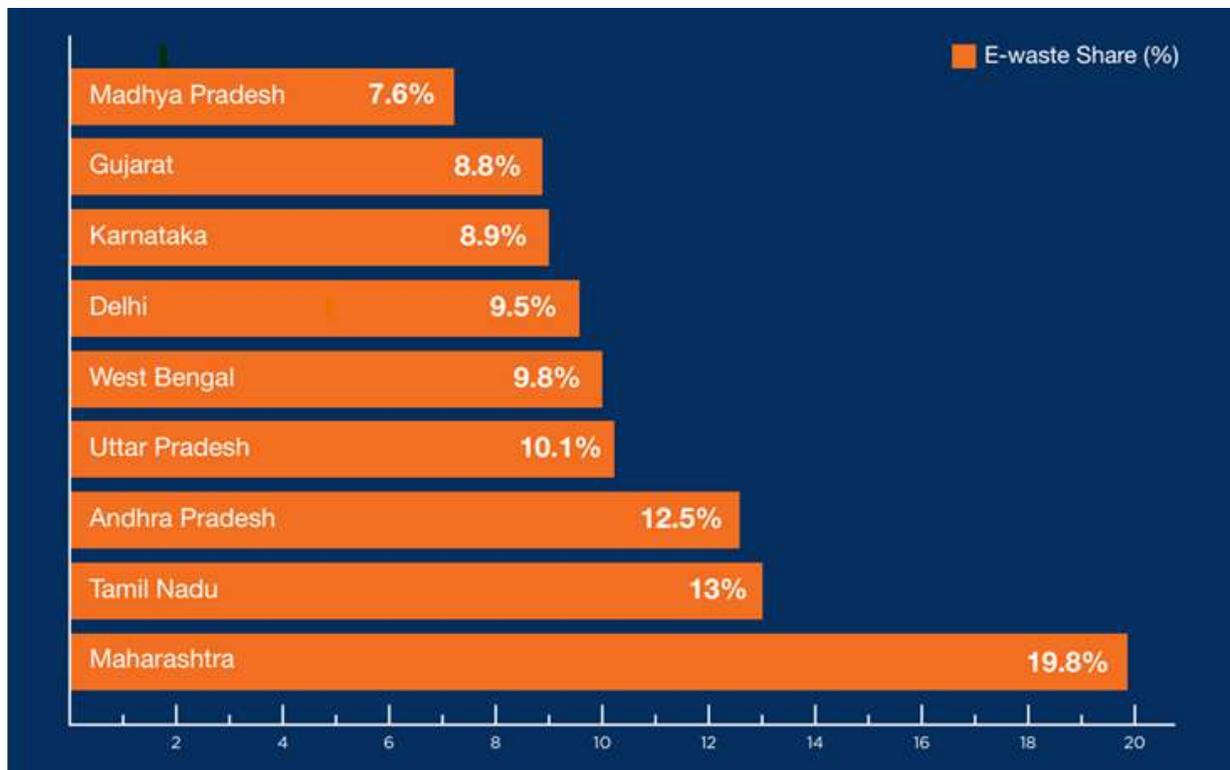


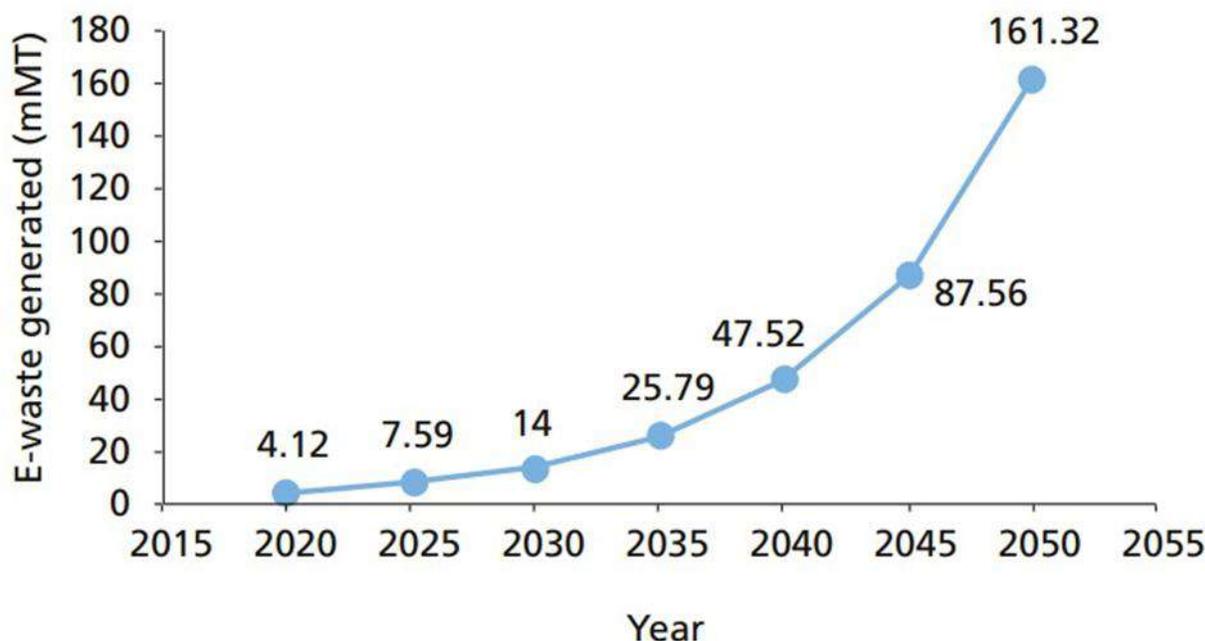
Figure 1.2: Top E-waste generators (State-wise)

Source: NEC Technologies India Private Limited 2018 in association with ASSOCHAM



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Even if we extrapolate based on a best-case scenario of 13 per cent growth, by 2025, India will be producing 7 million tonnes of e-waste annually, which will increase to over 160 million tonnes by 2050. Graphical presentation of the projected E-waste generation in India is shown in **Figure 1.3** below.



Source: CSE, 2020

Figure 1.3 Graphical presentation of projected E-waste generation in India

According to the list prepared by the various SPCB/PCCs, as on 06-12-2021, India has 468 registered e-waste recyclers, accredited by the state governments to process E-waste.

1.4 Objectives of the study

The main aim of the study is to carry out a comprehensive inventORIZATION of E-waste in the Kerala State.

- ◆ To estimate the future generation of E-waste based on the sales data for the years 2017-18, 2018-19 and 2019-20.
- ◆ To estimate the category-wise (Schedule-I of E-waste (management) Rules 2016) generation of E-waste based on the sales data up to maximum "End of life" or Average life" of individual equipment.




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1.5 Scope of the study

The scope of the study is framed to comprehensively determine the future generation of E-waste in the state of Kerala. The main scope includes collection of sales tax data for the state of Kerala and its statistical analysis. Bifurcation of sales tax data based on various HSN codes and item codes given in the E-waste Management Rules (2016).




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CHAPTER 2

E-WASTE: DEFINITION, COMPOSITION & ITS HAZARDS

2.1 E-Waste – Definition

The term e-waste represents electronic and electrical equipment's waste products after their end of life. Different definitions are given for e-waste in different countries that can be identified based on secondary data collected from the Act / law, regulations and various scientific and technical publications.

2.2 Definitions of E-waste in Indian Regulations

E-waste is one of the emerging serious health issues and India is the third E-waste producer in the world. The generation of E-waste in each year changes according to the consuming power and also the replacement of new technology with the old one. In India, approximately 3.23 million tons of E-waste is generated every year and an unestimated amount of E-waste is imported from different countries around the world. (Baldé, C. P., Forti V., Gray, V., Kuehr, R., & Stegmann, P. (2017), *Global E-waste monitor 2020*).

According to the E-waste management rule 2016 “e-waste” means *electrical and electronic equipment, whole or in part discarded as waste by the consumer or bulk consumer as well as rejects from manufacturing, refurbishment’ and repair processes; electrical and electronic equipment’ means equipment which are dependent on electric current or electro-magnetic field in order to become functional.*

2.3 Sources of E-waste

The source of E-waste is discarded mobile phones, refrigerator, television, computers, laptops, printers, radios, calculators and other electronic equipment including household equipment. A large amount of E-waste is generally produced from industries, manufacturing sectors, producers and bulk consumers etc. The amount of E-waste produced by the household is comparatively very less.

2.4 E-Waste Components and its Composition

The electric and electronic equipment contain certain common components such as metal, motor/compressor, cooling mechanism, plastic, insulation, glass, LCD, rubber, wiring/ electrical,



transformer, magnetron, circuit board, fluorescent lamp, incandescent lamp, heating element, thermostat, BFR-containing plastic, batteries, CFC/HCFC/HFC/HC, external electric cables, refractory ceramic fibers, radioactive substances and electrolyte capacitors (over L/D 25 mm). The "Building Block" of each item is formed by these components and thereby they can be easily "identified" and "removable".

Different kinds of components can be seen in large household appliances such as washing machines, refrigerators etc. It may contain an electric motor, circuit board, a transformer, capacitor, switches, plastic casing, wiring, thermal insulation and metal casing that may contain flame retardants, etc. Due to advancement in technology, energy efficiency of these items improved. The IT and Telecommunication equipment sectors are remarkably going with the trend of "micro miniaturization", while CRTs are being replaced by LCD Screens. Components present in each electric and electronic equipment varies accordingly, for further treatment and dismantling process, e-waste is separated into smaller components. The **Table 2.1** given below shows the details of components found in electric and electronic equipment.

Table 2.1: Components found in electrical and electronic equipment

SL NO	Component in electrical and electronics	Information Technology and Telecommunication equipment			Consumer Electrical and electronics equipment		
		Personal Computer	Laptop	Cellular Telephone	Television	Refrigerator	Washing Machine
1	Metal	✓	✓	✓	✓	✓	✓
2	Motor \ Compressor	✓	✓	-	-	✓	✓
3	Cooling	-	✓	-	-	✓	-
4	Plastic	✓	✓	✓	✓	✓	✓
5	Insulation	-	-	--	-	✓	
6	Glass	✓	✓	✓	-	✓	✓
7	CRT	✓	-	-	✓	-	-
8	LCD	✓	✓	✓	✓	--	-
9	Rubber	-	-	-	-	✓	✓



10	Wiring	✓	✓	-	✓	✓	✓
11	Transformer	✓	✓	-	✓	-	-
12	Circuit Boards	✓	✓	✓	✓	✓	✓
13	Fluorescent lamp	-	✓	✓	-	-	-
14	Incandescent lamp	-	-	-	-	✓	-
15	Heating element	-	-	-	-	-	✓
16	Thermostat	-	-	-	-	✓	✓
17	BFR – containing plastic	-	✓	✓	✓	✓	-
18	External electric cables	✓	✓	-	✓	✓	✓

(Source: Guidelines for environmental sound management of e-waste, MoEF&CC, March 2008)

2.5 Composition of E-waste

According to different categories, the composition of E-waste is diverse and differs in products. Various components are present in electronic equipment and it varies according to the product's chemical composition. Due to evolution of technology, physical composition of global e-waste will change but its chemical composition is predicted to be stable. It also contains highly toxic substances such as cadmium, mercury, lead and flame retardants, which is highly dangerous to human health as well as to the nature. It also contains gold, silver, platinum, palladium, copper etc., in which Iron and steel constitute about 50% of the waste followed by plastics (21%), non-ferrous metals (13%) and other constituents. Table 2.2 given below shows the details of the composition of components in electrical and electronic equipment and Figure 2.1 shows the graphical representation of the same.

Table 2.2: Composition of components in electrical and electronic equipment

Electrical and Electronic equipment	Iron (%)	Non-Fe metal (%)	Glass (%)	Plastic(%)	Electronic components (%)	Other (%)
Refrigerator	64.4	6	1.4	13	-	15.1
Washing machine	59.8	4.6	2.6	1.5	-	31.5



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Personal computers	53.3	8.4	15	23.3	17.3	0.7
Television sets	5.3	5.4	62	22.9	0.9	3.5
Cellular telephones	8	20	10.6	59.6	-	1.8
Copying equipment	58	8	1	9	2	16
Fluorescent lamps	0.6	1.4	93.9	-	-	4.1
Air conditioners	55	24	-	11	3	7

(Source: Guidelines for environmental sound management of e-waste, MoEF&CC, March 2008, Waste from electrical and electronic equipment. European Environment Agency, www.unep.or.jp/ietc/spc/activities/e-waste/2_WEEE_E-waste_MngtRprt.pdf)

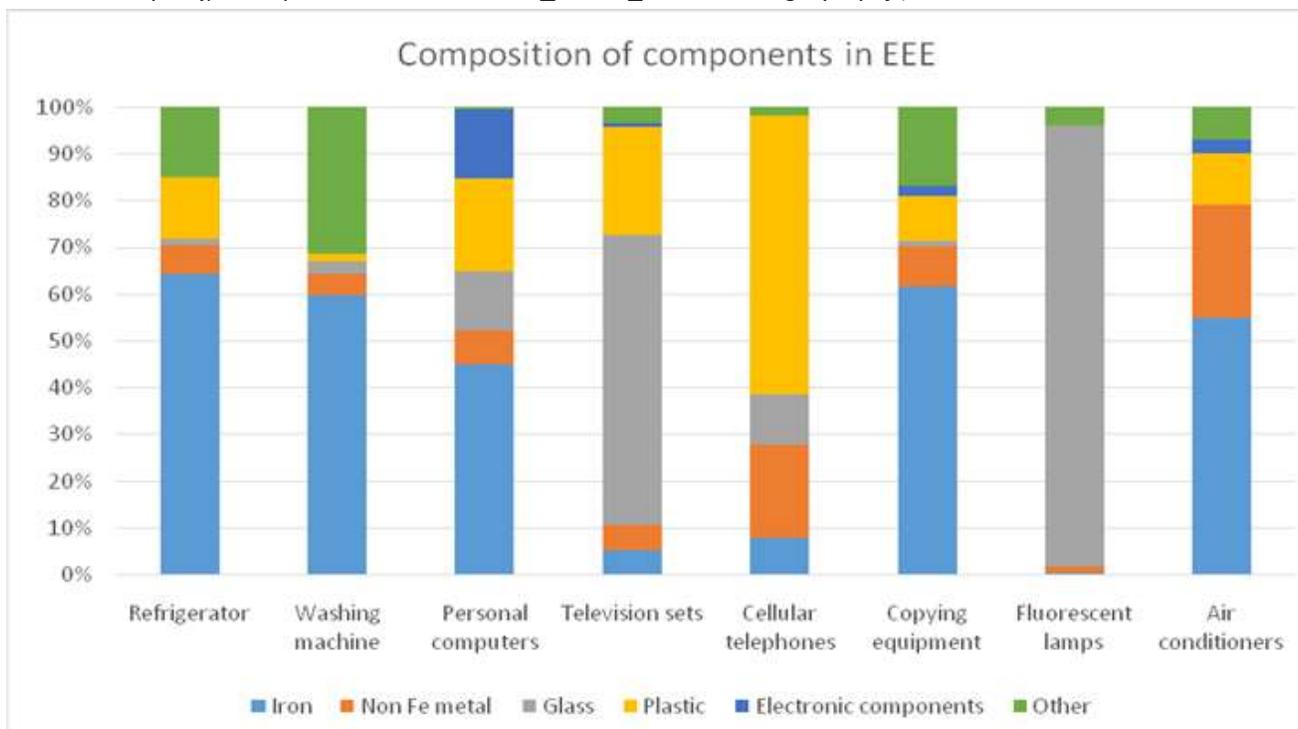


Figure 2.1 Graphical representation of composition of components in Electrical and Electronic equipment

2.6 Hazards E-waste

The composition of e-waste is very assorted and varies in products across diverse categories. It contains more than a thousand different substances, which fall under the “hazardous” and “non-hazardous”



categories. Broadly, it comprises of ferrous and non-ferrous metals, plastics, glass, wood & plywood, printed circuit boards, concrete and ceramics, rubber and other items. Non-ferrous recyclable metals are copper, aluminium and precious metals such as silver, gold, platinum, palladium etc. The presence of elements like lead, mercury, arsenic, cadmium, selenium and hexavalent chromium and flame retardants beyond threshold quantities in e-waste categorizes them as hazardous waste. Personal Computer, Monitor and Laptop represent IT and telecom which is a main category of e-waste.

E-waste components are metal, motor / compressor, plastic, insulation, glass, LCD, electrical wiring, transformer, circuit board, fluorescent lamp, brominated flame retardants (BFR) -containing plastic, batteries and external electric cables. Plastic, circuit board, wiring/electrical and external electric cables are found in all items. BFR containing plastic and fluorescent lamps are present in laptop. CRT is found in PC while LCD and batteries are found in PC and laptop. The possible hazardous substance found in E-waste are Phthalate plasticize, BFR, Lead, Antimony, Mercury, Phosphorous, Beryllium, Flame retardants, Lithium, Cadmium. The substances inside the above-mentioned components, which cause most concern are the heavy metals such as lead, mercury, cadmium and chromium (IV), Poly Chlorinated Biphenyls, plastics and circuit boards that contain brominated flame retardants (BFRs). BFR can give rise to dioxins and furans during incineration. Others are arsenic, asbestos, nickel and copper. These may act as catalyst to increase formation of dioxins during incineration. The **Table 2.3** given below shows the details of health concerns of given metals

Table 2.3: Details of health concerns of given metals

Chemical	Source in Electronic Products	Health Concerns
Antimony	CRTs, Printed Circuit Boards, etc.	Very hazardous in event of ingestion, hazardous in event of skin of eye contact, and inhalation. Causes damage to the blood, kidneys, lungs, nervous system, liver and mucous membranes.
Arsenic	Used to make transistors	Soluble inorganic arsenic is acutely toxic and intake of inorganic arsenic over a long period can lead to chronic arsenic poisoning. Effects, which can take years to develop, include skin lesions, peripheral neuropathy, gastro-



		intestinal symptoms, diabetes, renal system effects, cardiovascular disease and cancer.
Barium	Front Panel of CRTs	Short term exposure causes muscle weakness and damage to heart, liver and spleen. It also produces brain swelling after short exposure.
Beryllium	Motherboards of computers	Carcinogenic (causing lung cancer), and inhalation of fumes and dust can cause chronic beryllium disease or berylliosis and skin diseases such as warts.
Cadmium	Chip resistors and semiconductors	Has toxic, irreversible effects on human kidney, the skeletal system and the respiratory system, and is health and accumulates in kidney and liver (Op. cit.). Has toxic effects on the classified as a human carcinogen.
Chloro-Fluorocarbons (CFCs)	In older fridges and coolers	Found to destroy the ozone layer and is a potent greenhouse gas. Direct exposure can cause unconsciousness, shortness of breath and irregular heartbeat. Can also cause confusion, drowsiness, coughing, sore throat, difficulty in breathing and eye redness and pain. Direct skin contact with some types of CFCs can cause frostbite or dry skin.
Cobalt	Rechargeable batteries and coatings for hard disk drivers	Hazardous in case of inhalation and ingestion and is an irritant of the skin. Has carcinogenic effects and is toxic to lungs. Repeated or prolonged exposure can produce target organs damage
Copper	Used as conductor	Very hazardous in case of ingestion, in contact with the eyes and when inhaled. An irritant of the skin and toxic to lungs and mucous membranes. Repeated or prolonged exposure can produce target organs damage.




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Dioxins	Created when electronics are burnt in open air	Highly toxic and can cause chloracne, reproductive and developmental problems, damage the immune system, interfere with hormones and cause cancer.
Gallium	Integrated circuits, optical electronics, etc.	Hazardous in case of skin (may produce burns) and eye contact, ingestion and inhalation. Severe over exposure can result in death. Toxic to Lungs and mucous membranes. Repeated or prolonged exposure can produce target organs damage.
Hexavalent Chromium	Used as corrosion protection of untreated and galvanized steel plates and a decorator or hardener for steel housings Osuagwu & Ikerionwu, 2010)	Damages kidneys, the liver and DNA. Asthmatic bronchitis has been linked to this substance (Osuagwu & Ikerionwu, 2010). Causes irritation of the respiratory system (asthma) and skin, liver and kidney damage, increased or reduced blood leukocytes, eosinophilia, eye injury, and is a known carcinogen.
Indium	LCD Screens	Can be absorbed into the body by inhalation or ingestion. Is irritating to the eyes and respiratory tract and may have long term effects on the kidneys. Environmental effects have not been investigated and information on its effects on human health is lacking therefore utmost care must be taken.

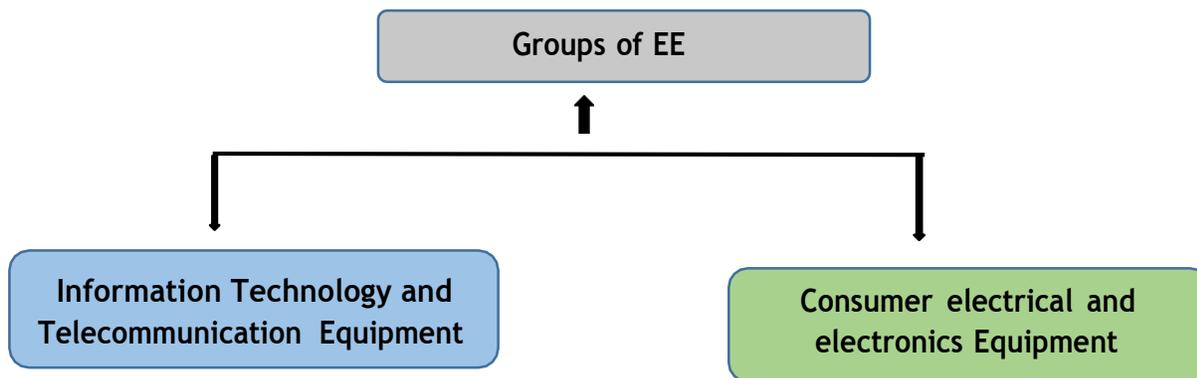
(Source: Effect of electronic waste on human health –A Review, Volume 10, Issue 9 Ver. I (Sep. 2016), Mahipal Singh Sankhla, Mayurikumari, Manisha Nandan, Shriyash Mohril, Gaurav Pratap Singh, Bhaskar Chaturvedi, Dr. Rajeev Kumar)




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CHAPTER 3
REGULATORY FRAMEWORK ON E-WASTE

In India, there were no specific environmental regulations for e-waste until the E-waste Management and Handling rules were notified in 2011. None of the then environmental laws had any direct reference to electronic waste or referred to its handling as hazardous in nature. The E-waste management rules later notified in 2016 covered almost every aspect of E-waste management. As per E-waste (Management) Rules 2016, Electrical and electronic equipment can be broadly classified into two categories viz.



Information Technology and Telecommunication Equipment	Consumer Electrical and electronics Equipment
Centralized data processing: Mainframe, Minicomputer	Television sets (including sets based on (Liquid Crystal Display and Light Emitting Diode technology)
Personal Computing: Personal Computers (Central Processing Unit with input and output devices	Refrigerator
Personal Computing: Laptop Computers (Central Processing Unit with input and output devices)	Washing Machine
Personal Computing: Notebook Computers	Air-conditioners excluding centralized air-conditioning plants




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Personal Computing: Notepad Computers	Fluorescent and other Mercury containing lamps
Printers including cartridges Facsimile	
Copying equipment	
Electrical and electronic typewriters	
User terminals and systems Telex	
Telephones	
Pay telephones	
Cordless telephones	
Cellular telephones	
Feature phones	
Smart phones	
Answering systems	

Estimation of E-Waste generation was done using equipment wise statistics of E -waste generation in numbers. E-waste generated by producer for a specific EEE category code is to be estimated based on quantity (number or weight) of EEE placed in the market in the previous years and taking into consideration the average life of the equipment. Such an estimate is carried out using the following method, the generation of e-waste from end-of-life products:

E-waste generation (weight or number) in the financial year 'x – y' = Sales in the financial year '(x-z) - (y-z)'

where, 'x – y' = financial year in which generation is estimated, and

z = Average life span of EEE.

The Average life of the EEE to be used in the above formula is given below in Table 3.1

Table 3.1: Category wise average life of EEE as per E-waste Guidelines, 2016

Sl. No.	Categories of electrical and electronic equipment	EEE Code	Average Life
i.	Information technology and telecommunication equipment		
	Centralized data processing:	ITEW1	
	Mainframe		10 Years
	Minicomputer		5 Years



	Personal Computing: Personal Computers (Central Processing Unit with input and output devices)	ITEW2	6 Years
	Personal Computing: Laptop Computers (Central processing Unit with input and output devices)	ITEW3	5 Years
	Personal Computing: Notebook Computers	ITEW4	5 Years
	Personal Computing: Notepad Computers	ITEW5	5 Years
	Printers including cartridges	ITEW6	10 Years
	Copying equipment	ITEW7	8 Years
	Electrical and electronic typewriters	ITEW8	5 Years
	User terminals and systems	ITEW9	6 Years
	Facsimile	ITEW10	10 Years
	Telex	ITEW11	5 Years
	Telephones	ITEW12	9 Years
	Pay telephones	ITEW13	9 Years
	Cordless telephones	ITEW14	9 Years
	Cellular telephones	ITEW15	
	Feature phones	ITEW15	7 Years
	Smart phones	ITEW16	5 Years
	Answering systems		5 Years
	Consumer electrical and electronics:		
ii.	Television sets (including sets based on (Liquid Crystal Display and Light Emitting Diode technology)	CEEW1	9 Years
	Refrigerator	CEEW2	10 Years
	Washing Machine	CCEW3	9 Years
	Air-conditioners excluding centralized air conditioning plants	CCEW4	10 Years
	Fluorescent and other Mercury containing lamps	CEEW5	2 Years


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CHAPTER 4

METHODOLOGY

4.1 Methodology

In order to execute the E-waste inventorization in Kerala, it is essential to identify the different steps and procedures to find out the flow chain for electrical and electronic equipment (EEE) and E-waste in the study area linking with different stake holders. The methodology adopted in this inventorization involves the collection of sales tax data from the Office of the Commissioner of State Tax, State Goods & Services Tax Department (GST office) Thiruvananthapuram, Kerala. The methodology for this study was developed through several research, literature reviews and apprehends the application of a standard approach to estimate E-waste in Kerala. A systematic work plan was developed, and the study was proceeded as per the work plan. The methodology for this project is based on many key steps. This section describes the various phases of the study and the methodology adopted and work flow of the study as shown in Fig 4.1 below




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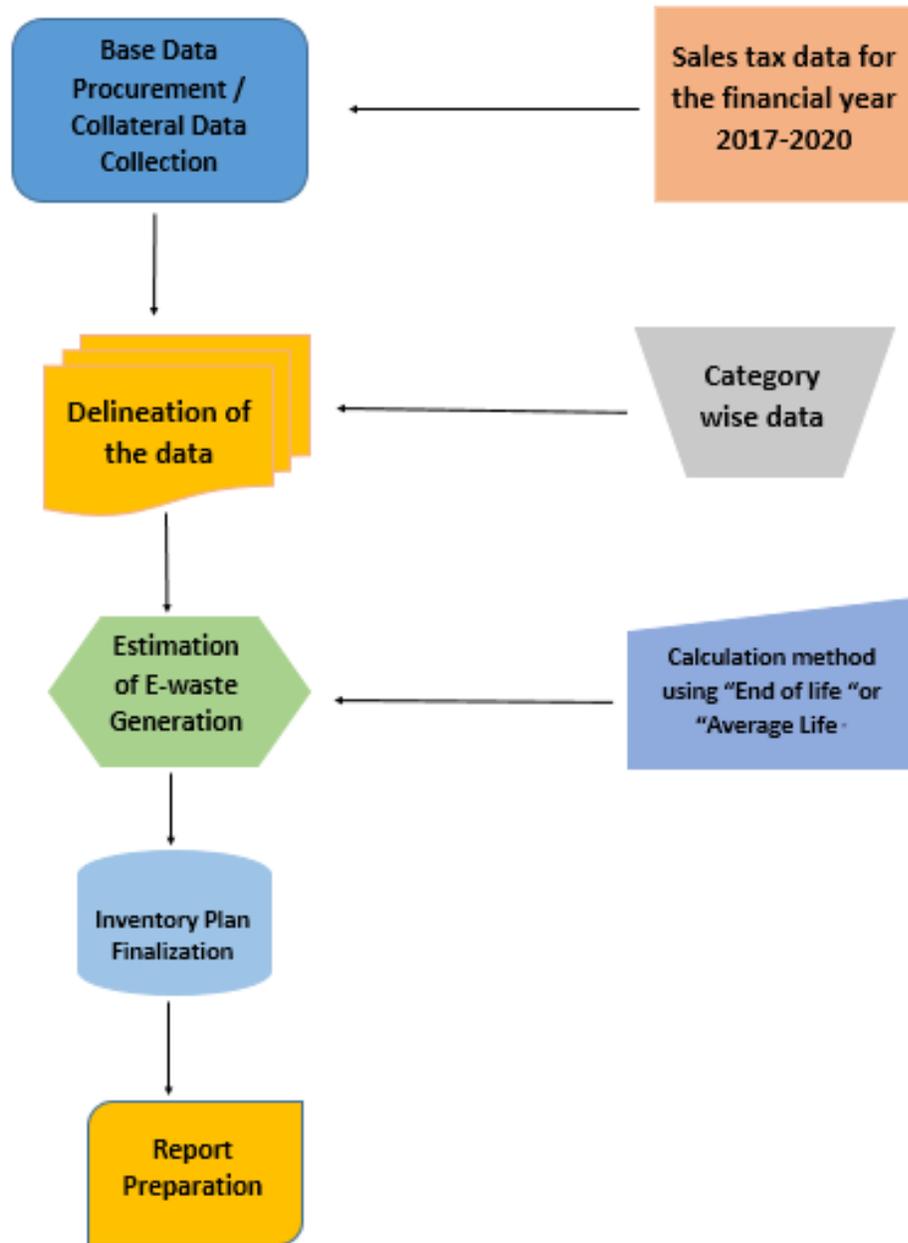


Figure 4.1: Workflow of the study

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The first phase of the study is the primary data collection, which includes Base data procurement/collateral data collection. In this study, sales data of electronic items has been applied to a calculation method using "End of life" or "Average life" of individual equipment to estimate the theoretical waste arising from each item. Kerala state sales tax data for the years 2017-18, 2018-19 and 2019-20 were collected. Category wise compilation of sales tax data as per E-waste (Management) Rules 2016 was done. Estimation of E-waste based on "end of life" as per the methodology given in E-waste (Management) Rules 2016 for IT & Telecom and consumer electrical and electronics were applied.

For example,

For financial year 2016-17,

$x - y = 2016 - 17$ (April 2016 to March 2017)

If EEE, for which generation is to be estimated, is ITEW 15 means cellular phones that is either smart phone or feature phones then

$z = 5$ years or $z = 7$ years

1. The estimated generation of end-of-life ITEW 15 i.e., smart phone in the FY 2016-17

=sales in the (FY year 2016-5 – 2017-5)

=sales in the financial year 2011-12

OR

2. The estimated generation of end-of-life ITEW 15 i.e., feature phone in the FY 2016-17

=sales in the (FY year 2016-7 – 2017-7) either in terms of weight or number

=sales in the financial year 2009-10 in terms of weight or number.

Therefore, the generation of the end of life of a smart phone in the FY 2016-17 equals sales in the financial year 2011 –12 either in terms of weight or number. Similarly, the generation of the end of life of feature phone equals sales in the financial year 2009-2010 either in terms of weight or number.




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4.2 E-waste Producers and Recyclers in Kerala

Industry and Government has realized that there is an immediate need to modernize the inventory process to make it globally competitive. Therefore, the overall objective of this project is to identify suitable strategic development plan to make an inventory of EEE Goods. The locations of producers making e-goods and having collection centers in Kerala are plotted in GIS Database is shown in **Figure 4.2** below and the collection centers is shown in **Figure 4.3**



A handwritten signature in black ink, appearing to read "Shiju M.A.", written over a horizontal line.

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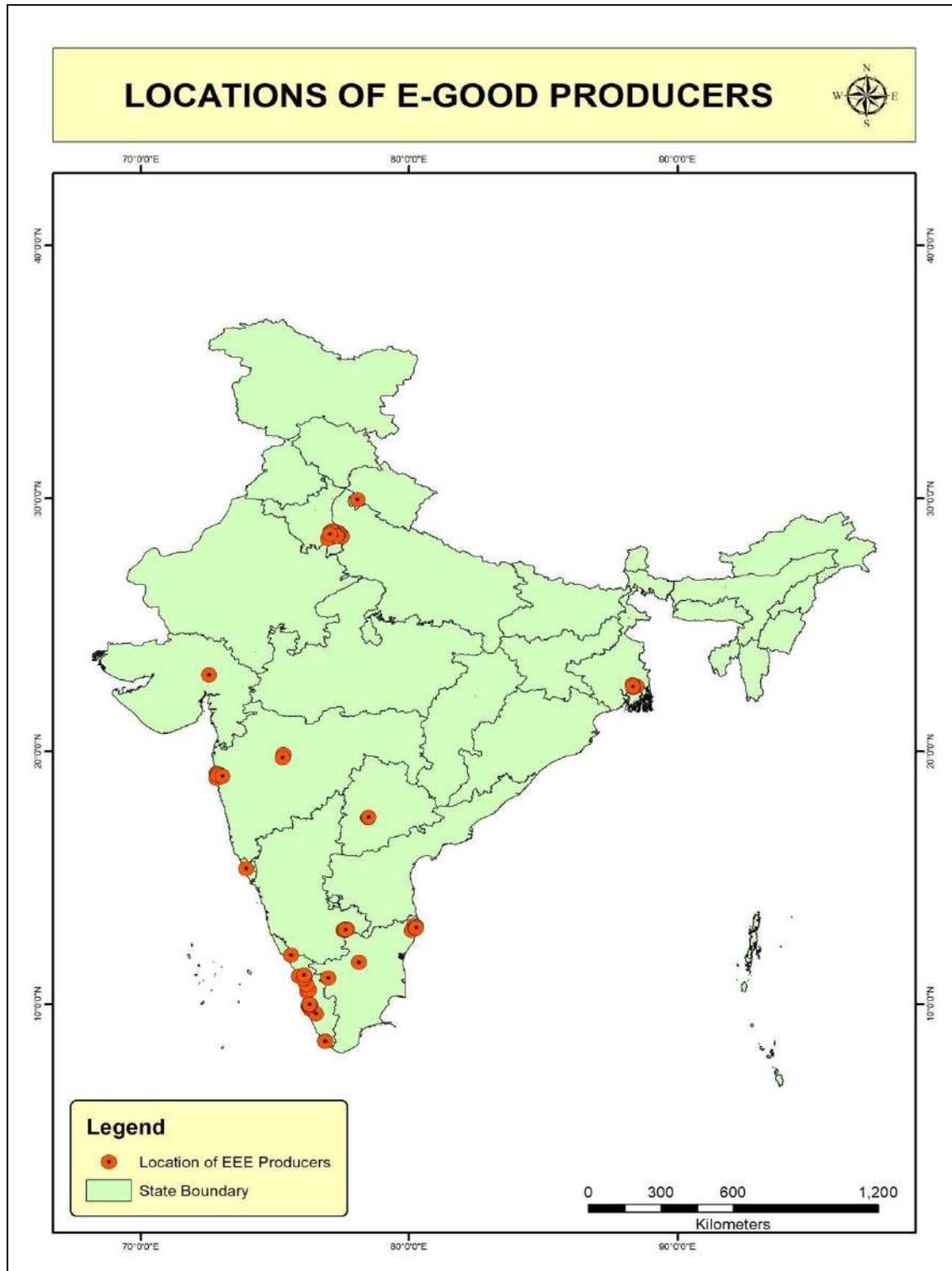


Figure4.2: Location of E-goods producers in India having collection center inKerala



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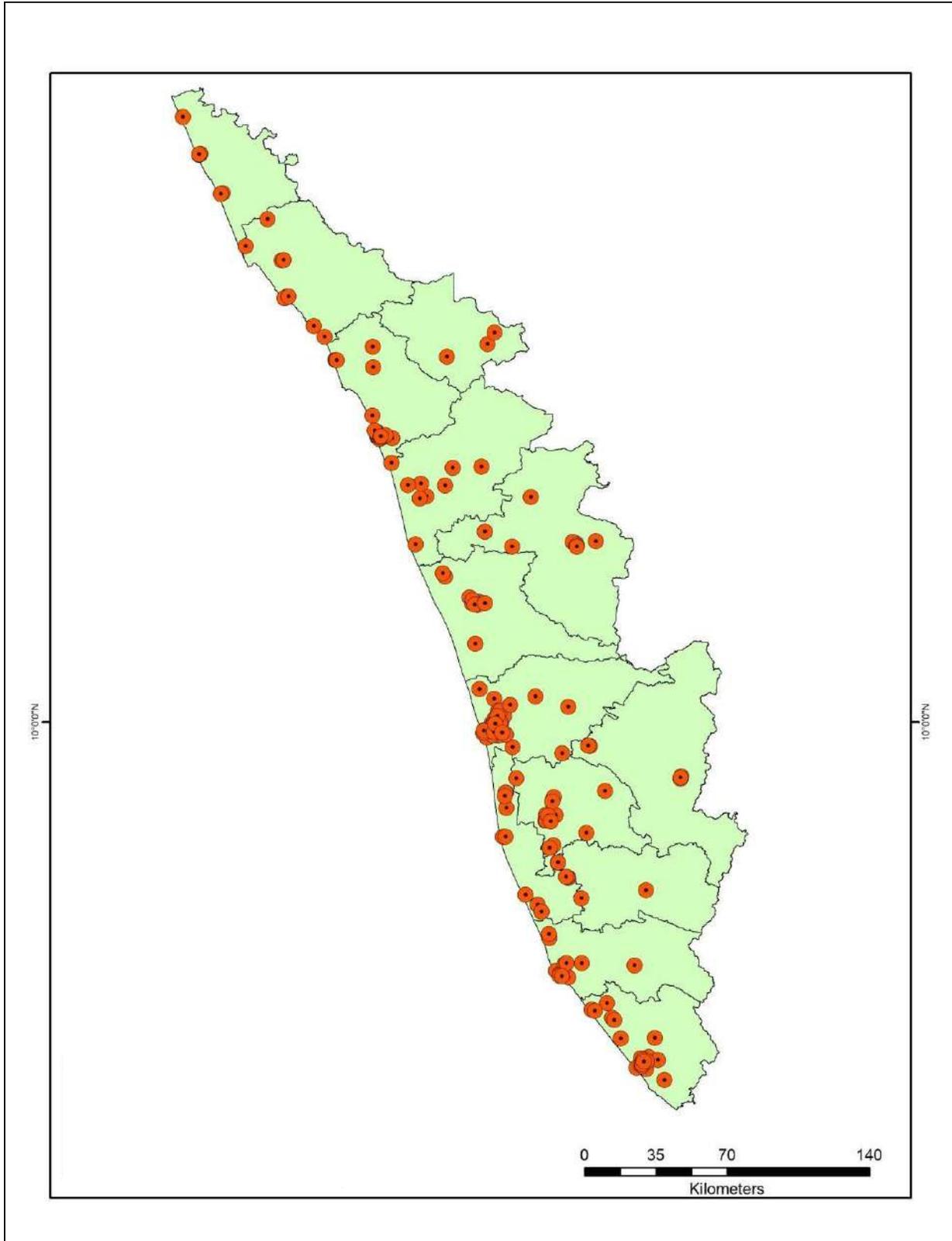


Figure 4.3: Location of Collection Centers in Kerala



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CHAPTER 5

E-WASTE INVENTORIZATION

5.1 About E-waste Inventorization

The growth of e-waste in the present scenario is due to the rapid increase of the electronic industry around the world, which is contributing three times that of urban waste (Source: Electronic waste: A case study, Gupta Reena, Sangita and Kaur Varinder). This electronic equipment's after the end of life becoming scrap and it will accumulate into massive dumps and occupy landfill space. The leachate from the electronic equipment's will be hazardous and toxic to the environment such as soil, air, water etc. It will pollute the environment and causes various problems in the particular area. It is very important to estimate the generation of E-waste so that competent authorities can timely prepare their management plans.

As per E-waste (Management) Rules 2016, the electrical and electronic equipment's categories are divided into two types: (i) IT and Telecommunication Equipment and (ii) Consumer Electricals and Electronics. After the completion of their useful life, this electronic equipment's are discarded and contribute a huge amount of electronic waste at the end of life which is commonly known as E-waste.

In India, organized dismantling of E-waste is available on two sites i.e., Chennai and Bangalore. Most of the E-waste dismantling sites are handled by unorganized sectors. There is no reliable database of the total amount of E-waste in the state of Kerala. At the same time, no scientific evidence exists regarding the application of a standard approach and methodology to estimate E-waste in India. E-waste management guidelines give a methodology for the estimation of E-waste based on sales data. Therefore, an attempt has been made to establish an approach and methodology to quantify E-waste in the Indian context under the Guidelines on implementation of E-waste in India.

5.2 Estimation of E-waste based on sales data

The data acquisition from the GST department was the next step involved. Based on details collected from the sales tax department-waste generated for the given "end of life" or "Average life" is



calculated. Sales tax data is obtained from the GST office, Thiruvananthapuram, Kerala. The sales data was in terms of total GSTR1 (Turnover) for separate HSN (Harmonized system of nomenclature) codes. The GST data obtained is from July 2017 - March 2020. The data received from the GST Department consists of categories of electrical and electronic goods and their particular 'Harmonized System Nomenclature' Code (HSN).

The WCO (World Customs Organization) developed it as a multipurpose international product nomenclature that first came into effect in 1988 with the vision of facilitating the classification of goods all over the World in a systematic manner. HSN is a six-digit code that classifies more than 5000 products, arranged in a legal and logical structure. To achieve uniform classification, the HSN is supported by well-defined rules and is accepted worldwide. The HSN details of the commodities pertains to electronic and electrical items are listed below in **Table 5.1**.

Table 5.1: Categories of EEE goods with their respective HSN Codes

Sl. No	Categories of electrical and electronic goods	HSN code
1	Air-conditioning machines, comprising a motor-driven fan and elements for changing the temperature and humidity, including those machines in which the humidity cannot be separately regulated	8415
2	Refrigerators, freezers and other refrigerating or freezing equipment, electric or other; heat pumps other than air conditioning machines of heading 8415	8418
3	Parts and accessories of printers, copying machines and facsimile machines, n.e.s.(excluding of printing machinery used for printing by means of plates, cylinders and other printing components of heading 8442)	8443
4	Household or laundry-type washing machines, including machines which both wash and dry	8450
5	Typewriters and word-processing machines (excluding automatic data-processing machines and units there of heading 8443 and laser, thermal and electro sensitive printers)	8469
6	Automatic data processing machines and units thereof and Laptops etc.	8471



7	Telephones for cellular networks or for other wireless networks. Telephone sets; other apparatus for the transmission or reception of voice, images or other data, including apparatus for communication in a wired or wireless network (such as a local or wide area network), other than transmission or reception apparatus of heading 8443, 8525, 8527 or 8528	8517
8	Monitors and projectors, not incorporating television reception apparatus; reception apparatus for television, whether or not incorporating radio-broadcast receiver or sound or video recording or reproducing apparatus [other than computer monitors not exceeding 20 inches] substituted on 27/07/2018 with [other than computer monitors not exceeding 20 inches, set top box for television and Television set (including LCD and LED television) of screen size not exceeding 68 cm]	8528
9	Electrical Filaments or discharge lamps (inserted w.e.f: 14/11/2017 including sealed beam lamp units and ultra-violet or infra-red lamps; arc lamps [other than LED lamps]	8539

Summary of items falling under HSN code as per E-waste management rules 2016. The details of the same is given below in **Table 5.2**

Table 5.2: Synchronizing HSN codes with item codes given in E-waste management rule 2016

Sl.No	HSN code	Description	Code as per the E-waste management rule 2016	Description	Average life or end of life
1	8415	Air-conditioning machines, comprising a motor-driven fan and elements for changing the temperature and humidity, including those machines in which the humidity cannot be separately regulated	CCEW4	Air conditioners excluding centralized air conditioning plants	10 Years
2	8418	Refrigerators, freezers and other refrigerating or freezing equipment, electric or other; heat pumps other than air conditioning machines of	CCEW2	Refrigerator	10 Years



		heading 8415			
3	8443	Parts and accessories of printers, copying machines and facsimile machines, n.e.s, (excluding of printing machinery used for printing by means of plates, cylinder and other printing components of heading 8442	ITEW-6	Printers including cartridges	10 Years
			ITEW-7	Copying Equipment	8 years
			ITEW-10	Facsimile	10 years
4	8450	Household or laundry-type washing machines, including machines which both wash and dry	CCEW3	Washing Machine	9 Years
5	8469	Typewriters and word- processing machines (excluding automatic data-processing machines and units there of heading 8443 and laser, thermal and electro sensitive printers.	ITEW-8	Electrical and electronic typewriter	5 Years
6	8471	Automatic data processing machines and units thereof and Laptops etc.	ITEW-1	Centralized computing, mainframe and minicomputer	10 years 5 years
			ITEW-2	Personal computing: Personal computers (Central processing units with input and output device)	6 Years
			ITEW-3	Personal computing: Laptops (Central processing units with input and output device)	5 Years
			ITEW-4	Personal computing: Note book	5 Years
			ITEW-5	Personal computing: Note pad	5 Years
7	8517	Telephones for cellular networks or	ITEW 12	Telephones	9 Years



		for other wireless networks. Telephone sets; other apparatus for the transmission or reception of voice, images or other data, including apparatus for communication in a wired or wireless network (such as a local or wide area network), other than transmission or reception apparatus of heading 8443, 8525, 8527 or 8528	ITEW 13	Pay telephones	9 Years
			ITEW 14	Cordless telephones	9 Years
			ITEW 15	Cellular telephones, feature phones and smart phone	7 Years 5 Years
8	8528	Monitors and projectors, not incorporating television reception apparatus; reception apparatus for television, whether or not incorporating radio-broadcast receiver or sound or video recording or reproducing apparatus [other than computer monitors not exceeding 20 inches] substituted on 27/07/2018 with [other than computer monitors not exceeding 20 inches, set top box for television and Television set (including LCD and LED television) of screen size not exceeding 68 cm]	CEEW1	Television sets, including sets based on Liquid crystal display and light emitting diode	9 Years
9	8539	Electrical Filaments or discharge lamps (inserted w.e.f : 14/11/2017 including sealed beam units and ultra-violet or infra-red lamps ;arc lamps [other than LED lamps]	CEEW5	Fluorescent and other Mercury containing lamps	2 years

Many items fall together under single category of HSN code. In those circumstances, since the sales tax data is provided for HSN code, it is not possible to compute E-waste for individual items in a particular HSN Code. **Figure 5.1** below gives the “match-making” of HSN Code and E-waste items as per E-waste management rules, 2016.




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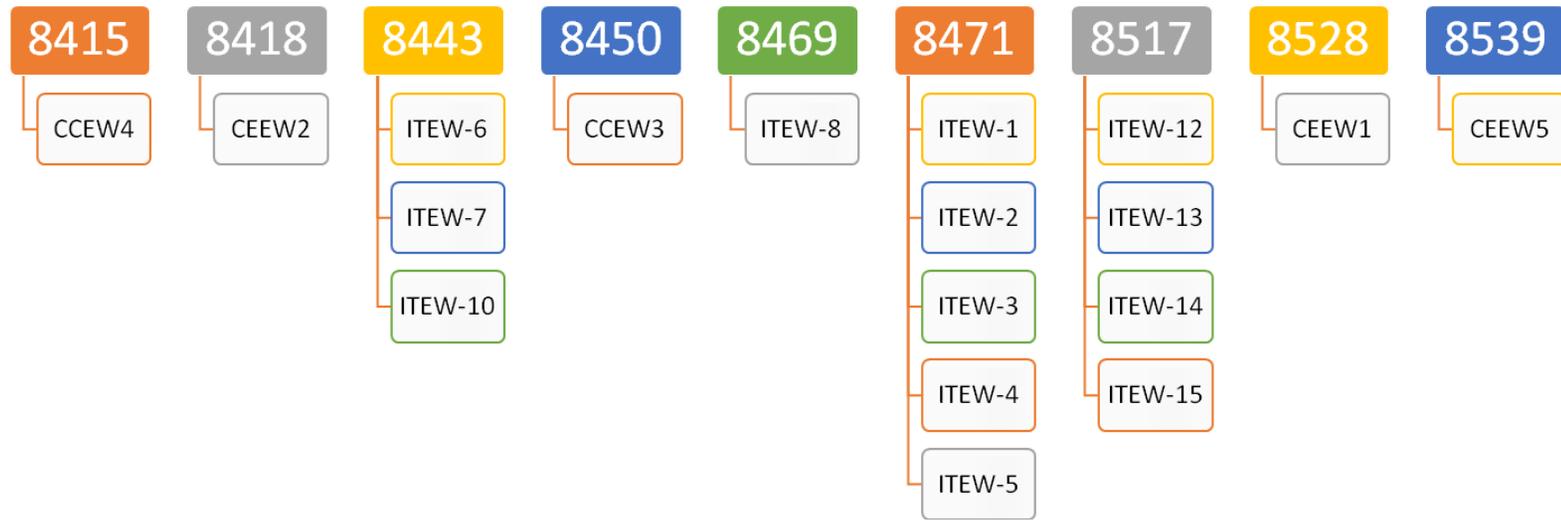


Figure 5.1 Pictorial representation of matchmaking of HSN Code and codes of EEE as per E-waste Management Rules, 2016



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Data received from the GST Department includes the total turnover of that electrical and electronic equipment with their respective HSN Codes for the years 2017-18 (July to March), 2018-19 (April to March), 2019-2020 (April to March). From the data, we can identify the turnover for the particular item in the given time period. The total turnover for the mentioned HSN codes is 17758.65 Cr, 23715.45 Cr and 27152.41 Cr for the years 2017-18 (July- march), 2018-19 (April-March) and 2019-20 (April-March) respectively.

The **Table 5.3** given below shows the details of the Turnover of EEE Goodswith their HSN Codes for mentioned years.

Table 5.3: Turnover of EEE goods with their HSN Codes

HSN Code	Turnover (GSTR1) (in Rs.)		
	2017-18 (July to March)	2018 -19 (April to March)	2019 -20 (April to March)
8415	16163317307	25841915682	26091055101
8418	18374082580	24948291465	28492445709
8443	5440257989	7849201748	6330474116
8450	11381977648	16085795374	15205514331
8469	406696.69	7917349.25	3599632.51
8471	22825185092	29085166649	40414768535
8517	77599288334	100719041251	124783452775
8528	21421055033	27537636058	26389750051
8539	4380913130	5079546534	3813062990
Grand Total (in Rs.)	177586483808.00	237154512110.00	271524123240.00
Grand Total in Crores	17758.65	23715.45	27152.41



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The **Figure 5.2** given below shows the details of the Chart diagram representing turnover of EEE Goods with their HSN code for the mentioned years.

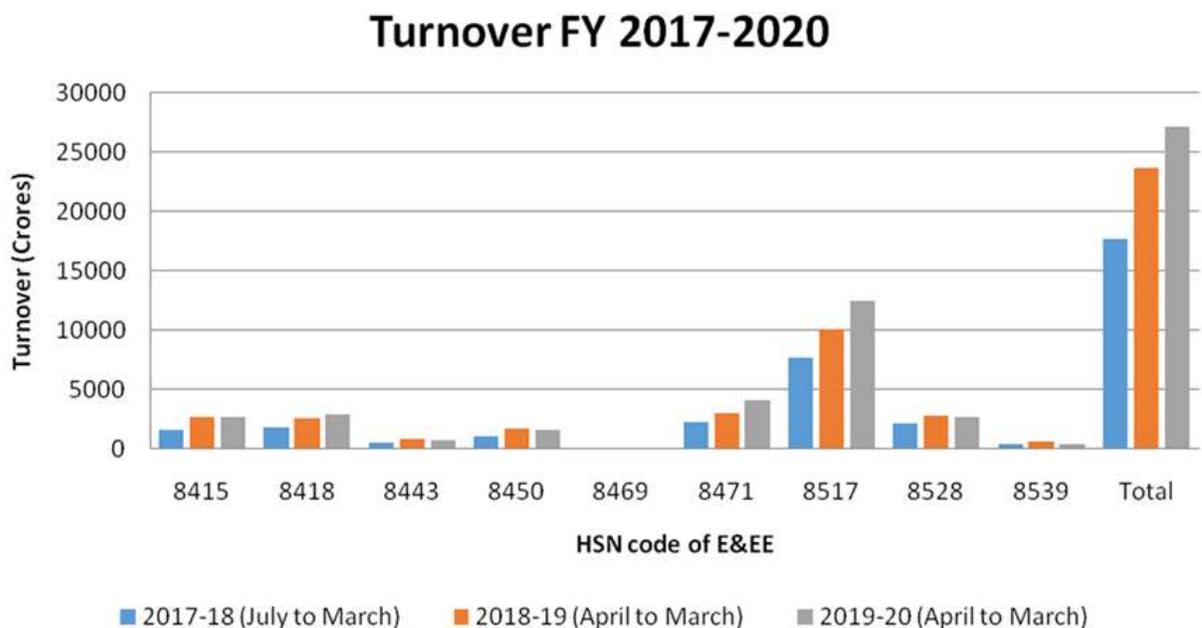


Figure 5.2: Chart diagram representing a turnover of EEE goods with their HSN code

Based on the desk research, E-commerce websites, departmental websites and market sense, the average price of various EEE items were worked out and given in **Table 5.4**. The average price of various EEE was used in calculating total number of units of particular EEE sold in the market in a particular year.

Table 5.4: Average price of items

HSN	Categories of electrical and electronic goods	Average Price (In Rs.)
8415	Air-conditioning machines, comprising a motor-driven fan and elements for changing the temperature and humidity, including those machines in which the humidity cannot be separately regulated	36808
8418	Refrigerators, freezers and other refrigerating or freezing equipment, electric or other; heat pumps other than air conditioning machines of heading 8415	30332
8443	Parts and accessories of printers, copying machines and facsimile machines, n.e.s. (excluding of printing machinery used for printing by means of plates, cylinders and other printing components of heading 8442)	12000



8450	Household or laundry-type washing machines, including machines which both wash and dry	18031
8469	Typewriters and word-processing machines (excluding automatic data-processing machines and units there of heading 8443 and laser, thermal and electro sensitive printers)	10567
8471	Automatic data processing machines and units thereof and Laptops etc.	35000
8517	Telephones for cellular networks or for other wireless networks. Telephone sets; other apparatus for the transmission or reception of voice, images or other data, including apparatus for communication in a wired or wireless network (such as a local or wide area network), other than transmission or reception apparatus of heading 8443, 8525, 8527 or 8528	12755
8528	Monitors and projectors, not incorporating television reception apparatus; reception apparatus for television, whether or not incorporating radio-broadcast receiver or sound or video recording or reproducing apparatus [other than computer monitors not exceeding 20 inches] substituted on 27/07/2018 with [other than computer monitors not exceeding 20 inches, set top box for television and Television set (including LCD and LED television) of screen size not exceeding 68 cm]	16061
8539	Electrical Filaments or discharge lamps (inserted w.e.f: 14/11/2017 including sealed beam lamp units and ultra-violet or infra-red lamps; arc lamps [other than LED lamps]	3522

After calculating the average price, EEE goods sold for the given financial years from 2017-2020 is determined by dividing the GST turnover by the average price of items. Average price of items was derived from various authentic sources and literature reviews. The **Table 5.5** below shows the details of number of electronic equipment's sold for different years.




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Table 5.5: Number of Electronic and Electrical Equipment sold

HSN Code	EEE Sold		
	2017-18 (July to March)	2018-19 (April to March)	2019-20 (April to March)
8415	439125	702073	708842
8418	605766	822507	939353
8443	453355	654100	527539
8450	631245	892119	843298
8469	38	750	340
8471	652148	831004	1154707
8517	6083833	7896436	9783101
8528	1333731	1714565	1643095
8539	1243871	1442233	1082641

Table 5.5 above shows the details of the number of electronic equipment's sold for the year (2017-2020). It shows a reasonable amount of rise in EEE sales. It determines the growth and development of technology and modernization. Industry and Government has realized that there is an immediate need to modernize the inventory process to make it globally competitive. Therefore, the overall objective of this project is to identify suitable strategic development plan to make an inventory of the EEE Goods. One of the major concerns in case of E-waste is its disposal after the end of life. Teaching people how to reuse, recycle and dispose electronic products will help them to behave more responsible towards the environment.



5.3 E-waste generation in terms of quantum

By multiplying the respective sales of the electronic equipment with the average weight of that EEE gives us the quantum of E-waste generation after the end of life of the product. The average weight of the EEE equipment considered is shown in the table below

Table 5.6 - Average weight of items

Electrical & Electronic Equipment (EEE) HSN Code	Average Weight (In Kg)
8415	40
8418	27.5
8443	6.5
8450	35
8469	1
8471	2.5
8517	0.095
8528	8
8539	0.33




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Table 5.7 HSN Code wise sale of electronic equipment's in tonnes in financial years

HSN Code	EEE Goods Sold		
	2017-18 (July to March)	2018 -19 (April to March)	2019 -20 (April to March)
8415	17565	28083	28353
8418	16658	22619	25832
8443	2947	4251	3429
8450	22093	31224	29515
8469	0.038	0.75	0.34
8471	1630	2077	2886
8517	578	750	929
8528	10669	13716	13145
8539	410	476	357
Total (tonnes)	72553	103198	104449

The **Table 5.7** given above shows the details of e-waste generation in tonnes after the end life of specific products. The total weight of EEE goods (in tonnes) sold is 72553 tonnes, 103198 tonnes and 104449 tonnes in the years 2017-18 (July-March), 2018-19 (April- March) and 2019-20 (April-March) respectively. The same will be the E-waste after their respective end of life. **Figure 5.3** given below represents the weight of EEE items sold



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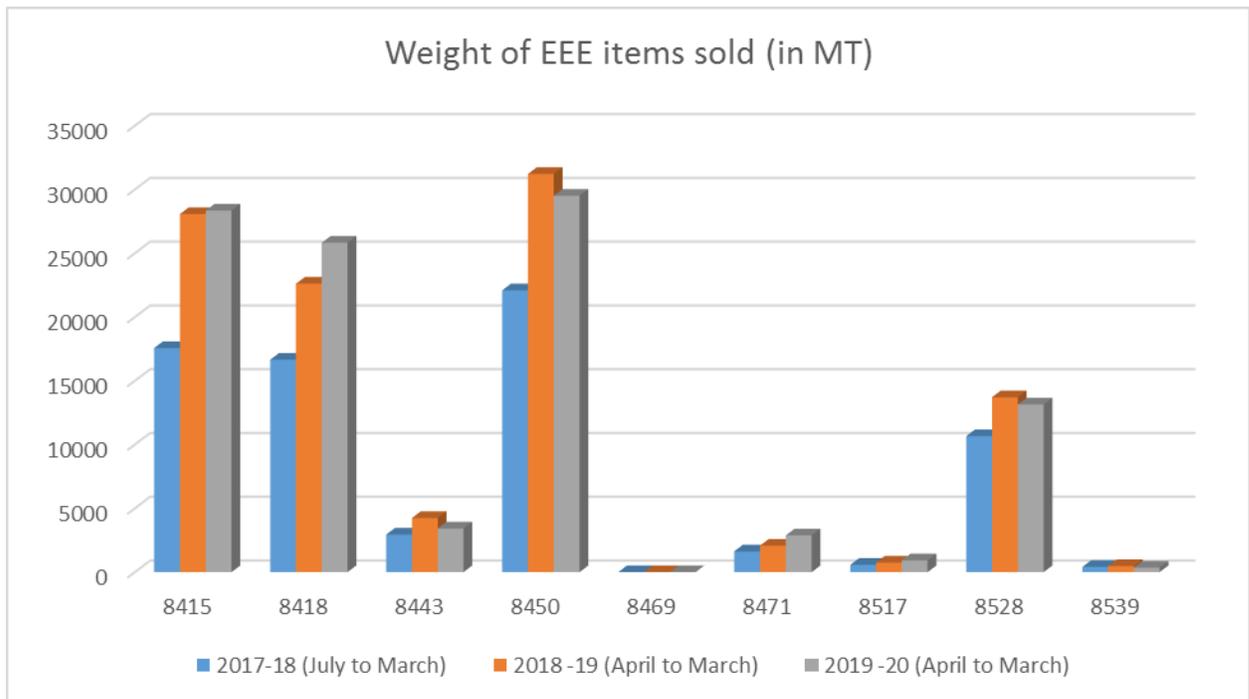


Figure 5.3: Weight of EEE items sold

5.4 Generation of E-waste as per HSN code and item code

The HSN Code 8415 denotes “Air-conditioning machines, comprising a motor-driven fan and elements for changing the temperature and humidity, including those machines in which the humidity cannot be separately regulated “As per E-waste management guidelines 2016, CCEW4 (Air conditioners excluding centralized air conditioning plants) comes under this HSN Code. The average life of CCEW4 is 10 years. As the estimation is done on the basis of sales in the years 2017-2018,2018-2019 & 2019-2020, the E-waste estimated for the years 2027-2028, 2028-2029 & 2029-2030 is 17565 T, 28083 T & 28353 T respectively.

The HSN Code 8418 denotes “Refrigerators, freezers and other refrigerating or freezing equipment, electric or other; heat pumps other than air conditioning machines of heading 8415 “As per E-waste management guidelines 2016, CEEW2 (Refrigerator) comes under this HSN Code. The average life of CEEW2 is 10 years. As the estimation is done on the basis of sales in the years 2017-2018,2018-2019 & 2019-2020, the E-waste estimated for the years 2027-2028, 2028-2029 & 2029-2030 is 16658 T, 22619 T & 25832 T respectively.

The HSN Code 8443 denotes *“Parts and accessories of printers, copying machines and facsimile machines, n.e.s. (excluding of printing machinery used for printing by means of plates, cylinders and other printing components of heading 8442) “As per the E-waste management guidelines 2016, ITEW-6 (Printer including cartridge), ITEW-7 (Copying equipment) & ITEW-10 (Facsimiles) comes under this HSN code. The average life of ITEW- 6 ITEW-7 & ITEW-10 is 10 years, 8 Years & 10 Years respectively. In this case average life is taken as 9 years. As the estimation is done on the basis of sales in the years 2017- 2018, 2018-2019 & 2019-2020, the E-waste estimated for the years 2026-2027, 2027-2028 & 2028-2029 is 2947 T, 4251 T & 3429 T respectively.*

The HSN Code 8450 denotes *“Household or laundry-type washing machines, including machines which both wash and dry”*. As per the E-waste management guidelines 2016, CCEW3 (Washing Machine) comes under this HSN code. The average life of CCEW3 is 9 years. As the estimation is done on the basis of sales in the years 2017-2018, 2018-2019 & 2019-2020, the E-waste estimated for the years 2026-2027, 2027-2028 & 2028-2029 is 22093 T, 31224 T & 29515 T respectively.

The HSN code 8469 denotes *“Typewriters and word-processing machines (excluding automatic data-processing machines and units thereof of heading 8443 and laser, thermal and electro sensitive printers)”*. As per the E-waste management guidelines 2016, ITEW-8 (Electrical and electronic typewriter) comes under this HSN code. The average life of ITEW-8 is 5 years. As the estimation is done on the basis of sales in the years 2017-2018, 2018- 2019 & 2019-2020, the E-waste estimated for the years 2022-2023, 2023-2024 & 2024-2025 is 0.038 T, 0.75 T & 0.34 T respectively.

The HSN code 8471 denotes *“Automatic data processing machines and units thereof and Laptops etc.”* As per the E-waste management guidelines 2016, ITEW-1 (Centralized computing, mainframe and minicomputer), ITEW-2 (Personal computing: Personal computers (Central processing units with input and output device), ITEW-3 (Personal computing: Laptops (Central processing units with input and output device), ITEW-4 (Personal computing: Note book) & ITEW-5 (Personal computing: Note pad) comes under this HSN code. The average life of ITEW-1, ITEW-2, ITEW-3, ITEW-4 & ITEW-5 is 10 years, 5 years, 6 Years, 5 years and 5 years respectively. In this case average life is taken as 6 years. As the estimation is done on the basis of sales in the years 2017-2018, 2018-2019 & 2019-2020, the E-waste estimated for the years 2023 – 2024, 2024 – 2025 &



2025-2026 is 1630 T, 2077 T & 2886 T respectively.

The HSN code 8417 denotes "Telephones for cellular networks or for other wireless networks. Telephone sets; other apparatus for the transmission or reception of voice, images or other data, including apparatus for communication in a wired or wireless network (such as a local or wide area network), other than transmission or reception apparatus of heading 8443, 8525, 8527 or 8528" As per the E-waste management guidelines 2016, ITEW 12 (Telephones), ITEW 13 (Pay telephones), ITEW 14 (Cordless telephones) & ITEW 15 (Cellular telephones, feature phones and smart phone) comes under this HSN code. The average life of ITEW 12, ITEW 13, ITEW 14 & ITEW 15 is 9 Years, 9 Years, 9 Years & (7 Years, 5 Years) respectively. In this case average life is taken as 10 years. As the estimation is done on the basis of sales in the years 2017-2018, 2018-2019 & 2019-2020, the E-waste estimated for the years 2027-2028, 2028-2029 & 2029-2030 is 578 T, 750 T & 929 T respectively.

The HSN code 8528 denotes "Monitors and projectors, not incorporating television reception apparatus; reception apparatus for television, whether or not incorporating radio-broadcast receiver or sound or video recording or reproducing apparatus [other than computer monitors not exceeding 20 inches] substituted on 27/07/2018 with [other than computer monitors not exceeding 20 inches, set top box for television and Television set (including LCD and LED television) of screen size not exceeding 68 cm]" As per the E-waste management guidelines 2016, CEEW1 (Television sets, including sets based on Liquid crystal display and light emitting diode) comes under this HSN code. The average life of CEEW1 is 9 years. As the estimation is done on the basis of sales in the years 2017-2018, 2018-2019 & 2019-2020, the E-waste estimated for the years 2026-2027, 2027-2028 & 2028-2029 is 10669 T, 13716 T & 13145 T respectively.

The HSN code 8539 denotes "Electrical Filaments or discharge lamps (inserted w.e.f: 14/11/2017 including sealed beam lamp units and ultra-violet or infra-red lamps; arc lamps [other than LED lamps]". As per the E-waste management guidelines 2016, CEEW5 (Fluorescent and other mercury containing lamps) comes under this HSN code. The average life of CEEW 5 is 2 years. As the estimation is done on the basis of sales in the years 2017-2018, 2018-2019 & 2019-2020, the E-waste estimated for the years 2019-2020, 2020-2021 & 2021-2022 is 410 T, 476 T & 357 T respectively.



Table 5.8 Generation of E-waste in coming years

EEE code	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
CCEW4	17565	28083	28353								17565	28083	28353
CEEW2	16658	22619	25832								16658	22619	25832
ITEW-6													
ITEW-7	2947	4251	3429							2947	4251	3429	
ITEW-10													
CCEW3	22093	31224	29515								22093	31224	29515
ITEW-8	0.038	0.75	0.34			0.038	0.75	0.34					
ITEW-1													
ITEW-2													
ITEW-3	1630	2077	2886				1630	2077	2886				
ITEW-4													
ITEW-5													
ITEW-12													
ITEW-13	578	750	929								578	750	929
ITEW-14													
ITEW-15													
CEEW1	10669	13716	13145							10669	13716	13145	
CEEW5	410	476	357	476	357								
			410										
Total			410	476	357	0.038	1630.75	2077.34	2886	35709	83992	97541	55114



The weight of EEE items sold (in Tonnes)



E-waste generation (in Tonnes) after the "End of Life" of each individual equipment



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CHAPTER 6

E-WASTE MANAGEMENT, HANDLING AND AWARENESS

6.1 E-Waste Management

Electrical and electronic equipment (EEE) contains both valuable and dangerous materials, and if the hazardous materials are not disposed in an environmentally acceptable manner at the end of their useful lives, they can cause considerable harm to the environment and human health. The E-waste management and handling sector in India could be divided mainly in two categories viz. Formal and Informal sector.

Ideally, the formal sector should play a major role in E-waste management and handling. However, the fact cannot be denied that efficient E-waste management is still in development stage and informal sectors play a major role in E-waste management. As far as formal sector is concerned only 6 % of the E-waste generated is recycled of which 5% is recycled through the formal sector (MAIT-GTZ, 2008).

As per CPCB, there are a total of 181 authorized E-waste recyclers with a total capacity of 462626.42 TPA for E-waste recycling. However, in Kerala there are no notified E-waste recyclers.

There are mainly three levels of treatment given to collected E-waste. 1st level treatment consists of decontamination, dismantling-manual/mechanized breaking and segregation. The output of the first level treatment is segregated into hazardous waste like CFC, Mercury switches, batteries and capacitors. The output from 1st level treatment then feeds to 2nd level treatment where in it undergoes unit operations like hammering, shredding, special treatment processes comprising of CRT treatment consisting of separation of funnels and screen glass, electromagnetic separation, eddy current separation and density separation using water. Finally, E-waste reached to 3rd level of treatment where the main focus is to recover ferrous & non-ferrous metals, plastics and other items that have some economic value.

Needless to say, all the above processes shall comply with the E-waste, management Rules, 2016 and EPR have to be followed.

At the same time, periodic awareness activities for individual families and bulk consumers shall be held. It will briefly highlight the negative consequences of incorrect E-waste management on



the environment and human health. It should also include the advantages of efficient E-waste treatment and resource recovery.

Present status of E-Waste Management in Kerala (As per KSPCB quarterly report)

In Kerala, as per the E-waste management rule 2016 rules and regulations, certain measures are taken to implement the e-waste management effectively by SPCB. Action have been taken for identification of Non-EPRA Producers, however no non-EPRA producers have been identified. Due to absence of authorized dismantlers and recyclers in the state of Kerala, verification of e-waste collection centres is not carried out in any of the quarters. The District Level Monitoring Committee (DLMC) constituted as per OA606/2018, has been entrusted to look into the matter on E-waste Rule implementation. The board has taken actions for checking informal trading of E-Waste. From the informal sector, 185 tonnes of E-waste have been disposed of to registered recyclers by Eco Friendly Solutions, Erattupetta, Kottayam during the fourth quarter. Also, about 44 tons of E-waste has been transferred by Clean Kerala Company to an authorized recycler during this quarter. A project proposal for an E-waste dismantling unit has been submitted by Eco Friendly Solutions, Erattupetta, Kottayam before the state government for consideration. Governance frame work for monitoring compliance, DLMC was constituted as per OA 606/2018 and has been entrusted to look into the matter on E-waste Rule implementation.

Table 6.1: Details of Tube lights and CFLs received by KEIL for disposal during 2017- 2018.

Manifest No	Receipt Date	Supplier	Types of waste	Quantity (MT)
00025	4-4-2017	BSES Kerala power	Fused Tube light	0.031
00024	18-4-2017	The Travancore Mats and Matting	Fused Tube light	0.135
00026	03-5-2017	Petro Net LNG	Fused Tube light	0.451
00051	05-12-2017	Amala Cancer Hospital Society, Thrissur	Fused Tube light	0.043
00053	05-12-2017	IGA Tech Industrial Electronics Pvt Ltd	Fused Tube light	0.029
00028	27-5-2017	Registrar, High Court of Kerala	Fused Tube light	0.610
00029	29-5-2017	Registrar, High Court of Kerala	Fused Tube light	0.611
00022	2-6-2017	BPCL, Kochi Refinery	Fused Tube light	0.270
00031	29-6-2017	Vasundhara Sarovar, Alleppy	Fused Tube light	0.028
00032	21-7-2017	Don Bosco Hospital	Fused Tube light	0.220



00037	8-8-2017	Eloor Municipality	Tube light Contaminated	13.345
00038	10-10 -2017	Tata Global Beverages, Munnar	Fused Tube lights (LED) ink cartridges	0.145
00039	21-10-2017	FCI-OEN, Mulanthuruthy	Fused Tube light	0.070
00043	25-10 -2017	Kitex Children's wear Ltd	Fused CFL	0.237
00042	25-10 -2017	Kitex Garments Ltd, Kizhkkambalam	Fused Tube light	0.256
00056	02-02-2018	Travancore Cochin Chemicals Ltd. (TCC)	Fused Tube light	0.345
00062	14-02-2018	N.C. John & Sons, Alleppy	Fused Tube light	0.029
00061	28-02-2018	Kitex Ltd, Kizhkkambalam	Fused Tube light	0.200
00035	28-10-2017	Kitex Garments (Processing) Ltd,	Fused Tube light	0.047
00052	30-12-2017	Extra wave Pvt, Ltd, Cherthala	Fused Tube light	0.127
			Total	17.229

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CHAPTER 7

SUMMARY & CONCLUSION

- (i) The E-waste inventory of Kerala state was carried out following the E-waste Management Rules, 2016.
- (ii) Sales tax data for the Kerala state was collected from the GST office situated in the capital city, Thiruvananthapuram, Kerala. The GST data provided was for the years 2017-18 (July-March), 2018-19 (April-March) and 2019-20 (April –March)
- (iii) The main objective of this project is to estimate the generation of E-waste based on the sales data for the years 2017-18, 2018-19 and 2019-20 and to estimate the category- wise (Schedule-I of E-waste (management) Rules 2016) generation of e-waste based on the sales data up to the maximum “End of life” or “Average life” of individual equipment in the state of Kerala. For estimation, the EEE items brought from other countries are not included
- (iv) Sales tax data was provided in Harmonized system of Nomenclature (HSN) codes for various categories of EEE items. The sales data included purchases made from e- commerce websites. However, it should be noted that sellers situated only in Kerala are included in sales tax data.
- (v) Based on the description of the HSN code and items given in E-waste Management Rules, 2016, various EEE items were identified in HSN codes. The estimation was carried out based on the average end of life of EEE equipment.
- (vi) Based on the total GSTR1 turn-over and average price of EEE items, the number of units sold in a particular year was estimated and weight was calculated based on the average weight of an individual EEE item.
- (vii) The total GSTR1 turn over for the years 2017-18(July-March), 2018-19(April-March) and 2019-20 (April-March) was 17758.65cr, 23715.45cr and 27152.41cr respectively.
- (viii) Based on the total sales, the average price of items and the average weight, the weight of EEE goods sold in the years 2017-18 (July-March), 2018-19 (April-March) and 2019-20(April-March) is estimated to be 72553 tonnes, 103198 tonnes and 104449 tonnes respectively.



- (ix) The same will be E-waste after the average end of life of EEE items given in Schedule-I.
- (x) There are many items falling in combination under single HSN codes, in that cases estimation could not be done for individual EEE items and estimation is made for HSN code.
- (xi) As far as recycling is concerned, there is no notified recycling center in the state of Kerala. However, based on the meeting with various stake holders, it is known that there are significant number of recyclers and refurbishers that exist in informal sectors. These are the people who are yet to register themselves with KSPCB.
- (xii) As the technology and electronic devices has improved drastically in last two decades, the use of "User terminal and systems, Telex and Answering machines" is redirected to minimal use or became obsolete. All these items are replaced by state-of-the-art devices and these devices are already categorized in various HSN codes. Hence, these items are not included categorically in the estimation of E-waste. However, the fact has to be kept in mind that the identical devices are already been accounted in the estimation of E-waste.
- (xiii) There is no mechanism in place to quantify purchases made through e-commerce whose seller is situated outside of Kerala. The E-waste which is going to be generated as part of that purchase cannot be quantified in the present work. However, it is recommended that KSPCB shall take in cognizance all the fulfillment center of e-commerce platform situated in Kerala.




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Annexure-I**Summary of Annual Report Submitted to CPCB by KSPCB for The Year 2020-21**

- (i) Number of authorized manufacturer, refurbisher, collection center, dismantler and recycler for management of e-waste in the state or Union territory under these rules.

Sr.no	Type	Number
1	Manufacturer	0
2	EPR Authorized Producers	13
3	Refurbished	1
4	Collection Centers	30
5	Dismantles	1
6	Recycler	0
7	Bulk Consumer	41

Source: Annual Report (E-waste, 2020-21), KSPCB

- (ii) District wise list of authorized, manufacturer, refurbisher, collection centre, dismantler and recycler for management of e-waste in the State

District	Manu facture	Producer	Refurbisher	Collection Centres	Dismantler	Recycler	Bulk Consumer
Thiruvananthapuram	--	2	--	5	--	--	10
Kollam	--	--	--	--	--	--	1
Pathanamthitta	--	--	--	--	--	--	--
Alappuzha	--	1	--	1	--	--	4
Kottayam	--	--	--	1	--	--	2
Idukki	--	--	--	--	--	--	1
Ernakulam (DO-1 and DO-2) & ESC Eloor	--	2	1	11	1	--	17
Thrissur	--	2	--	1	--	--	2
Palakkad	--	1	--	1	--	--	2
Malappuram	--	4	--	-	--	--	



Kozhikode	--	.	--	2	--	--	1
Wayanad	--	.	--	1	--	--	
Kannur	--	1	---	5	--	--	1
Kasargod	--	.	--	2	--	.	--
Total	--	13	--	30	--	0	--

(iii) List of Producers having EPR authorization of CPCB

1	Meezan Electronic Scales Private Limited, Groi. 2nd floor,8/308A, Braight Building. Calicut Road, Majeñ, Malappuram.Kerala-676121
2	Kadco systems. 9/539/13.Kadavyenclave.SreeLakshmiNarayana Palace Casino Complex, Casino Hotel, Kokkalai. Thrissur- 680021
3	Arif Kayyalakkakalh, UPC World.15/182. C. D, E, F Sivapuram, Kannur
4	Mango Agro Products,16/256, Ponganamkadu, Therambam Road P.O, Kurichikkara, Thrissur, Kerala- 680028
5	Chilton Refrigeration Industries,62/3820/21/22/23, Chilton Refrigeration Industñes, C L Anand Lane MG Road, Emakulam, Cochin. Kerala- 682011
6	Launmark India Pvt Ltd,8/12-B, Ulavaipu P.O Poochakkal.Cherthala@appuzha688526
7	SCSOFT Technologies Pvt Ltd. Ground Floor, Leela Info park Building, Techno Park, Kariyavakom.Trivandrurn-695581
8	Gulliver Productions, TPXI/556, Panambra Thenhipalam. Malappuram, Kerala- 673 636
9	Asianet digital Network Pvt Ltd, 2A, Second floor. Camival Techno Park, (Leela Infopark), Kazhakuttom.KaryavattomP.O, Trivandrum -695 581
10	Ceetron Technologies,15/283, Vrindavan Building. UP Hill, PostujlQ6, Middle Hill, Malappuram, Kerala - 676505

11	Care Centre Private Limited, 13/1036. MR Light Tower, Near Railway overbridge, Pakammed, Palakkad. Kerala - 679303
12	Compu World, CDE, 20/786, Mekkamannil Tower, Ring Road, Manjeri, Malappuram, Kerala - 676121
13	KLX Cloud IT Private Limited. Door No. XXIV 103, CN 10, Church Nagar, Angamaly P. O. Ernakulam, Kerala - 683 572

(iv) List of E-waste Collection Centres Name and Address of the unit

1	Earth Sense Recyclers Private Limited ,8/194, K. Pudor, Kanjikode, Palakkad-678621
2	M/s. Al Ameen Industries IDA, Yazhakkulam South, Vazhakkulam P.O, Ernakulam- 683105
3	Aspire Greens Kandanthara, Allapra P.O, Perumbavoor, Ernakulam-683553
4	M/. Bismillah enterprises, Ponjassery P.O, Perumbavoor, Ernakulam-683547
5	The Green, Mudickal Po, Nematode, Ernakulam
6	M/s. Suvarna traders (E-waste storage & Trading) Mavinchuvadu, A.M. Road, Mudical P.O, Perumbavoor
7	Zain Industries Ponjassery P O, Perumbavoor
8	Microhard Systems 9365724
9	S AND S POLYMERS, Mudickal P O, Perumbavoor, 683547
10	Clean Kerala Company, TC-29/1732, State Municipal House, Vazhuthacaud, Thiruvananthapuram
11	Venad Steel Corporation, TC-52/1888, Near Merry Land Studio, Vellayani Junction, Nemom, Thiruvananthapuram
12	Kerala Enviro Infrastructure Ltd TSDf Project, FACT (CD) campus, Ambalamedu, Kochi - 682303
13	Microage Networks & Solutions, Kochi



14	Progressiv-E recycling and Trading, Thrissur
15	Bright Care, 1st Floor, Fashion Tower, Kannur
16	SR Communication, HB Arcade, LIC Junction, Payyannur, Kannur
17	UPC World, 15/182/ Sivapuram, Kannur
18	Eco Friendly Solutions, 2/680/E, Kadaplackal Building, Vadakkekara, Erattupeta, Kottayam, Ph: 9447778525
19	Al-Jazeera Furniture & scrap Dealer, TC-20/1434, Pallivilakam, Kunjalimoodu, Karamana P.O., Thiruvananthapuram- 695 012
20	Golden Key Trading, Vattiyode, Kudappanakunnu, Trivandrum- 05
21	Plan at Earth, Building No. VII/91A, Near Vayalkara, Juma Masjid, Kunnukara, Ernakulam - 683 578
22	Smartex, Golden Arcade Building, new Bus stand, Kasaragod - 671 121
23	E-Planet, North Kottenchery, Kanhangad, Kasaragod -671 315
24	Karo Sambhav Collection centre address in calicut - 12/36 (New) 34/179M, Soorya Gayathri, Thadambattu, Thazham, Kozhikode- 673 010
25	Karo Sambhav Collection centre address in Thiruvananthapuram- New TC No. 79/2152, Old TC 42/921, located Near Muttathara Co-operative Bank, Muttathara, Vallakadavu, Thiruvananthapuram - 695 008
26	RPC- Blue Star Limited, Agility Logistic Pvt.Limited Cochin
27	Madona Care Centre, Allen's Cube, Paradise Rod, Janatha Junction, Vyttila, Kochi - 682 019

(v) List of E-waste Refurbishing Units




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1	M/s. Next Marketing A.M.Road, Nedumthode, Mudickal P.O, Perumbavoor- 683547
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(vi) List of E-waste Dismantling Units

1	Kerala Enviro Infrastructure Ltd. TSDF Project, FACT(CD) campus, Ambalamedu, Kochi-682303
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Categories of waste collected along with their quantities on a monthly average basis

Sl No	Number of Authorized manufacturer, refurbisher, collection center, dismantler and recycler for management of e-waste in the state or Union territory under these rules.	Quantity of information technology and telecommunication equipment, Consumer electrical and Electronics as per schedule-I (MT/year)	Remark
1	Manufacturer	NIL	
2	Refurbisher	2.216	
3	Collection Centre	1456	
4	Dismantler	31.4	
5	Recycler	NIL	
6	Bulk Consumer	4.54	Fluorescent tubes and incandescent bulbs mercury containing lamps and LED lamps- 235 nos
	TOTAL(MT/Year)	1494	




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Summary Statement collected code wise for the period 2020-2021(Annexure II A)

SI No	Equipment Code	Weight (MT/Year)
1	ITEW1	27.66
	ITEW2	
	ITEW3	
	ITEW4	
	ITEWS	
	ITEW6	
	ITEW7	
	ITEW8	
	ITEW9	
	ITEW10	
	ITEW11	
	ITEW12	
	ITEW13	
	ITEW14	
	ITEW15	
	ITEW16	
2	CEEW1	88.33
	CEEW2	
	CEEW3	
	CEEW4	
	CEEWS	
3	Items (without code) in MT/year	1378.06
	TOTAL (1+2+3) in MT/year	1494 T




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END OF THE REPORT




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Kerala State Pollution Control Board
Regional Office
Gandhi Nagar, Kochi-682020

E- WASTE ANNUAL REPORT 2022-2023

To,

The Chairman,
Central Pollution Control Board,
(Ministry of Environment And Forests)
Government Of India, 'Parivesh Bhawan',
East Arjun Nagar, Delhi- 110 0032

1	Number of authorized manufacturer, refurbisher, collection centre, dismantler and recycler for management of e-waste in the State or Union territory under these rules	:	Annexure I
2	Categories of waste collected along with their quantities on a monthly average basis	:	Annexure II
3	A Summary Statement code-wise of e-waste collected	:	The annual reports are being submitted by the producers / bulk consumers without specifying the category without code
4	Details of materials recovered from recycling e-waste collected	:	471.55 MT (in Kerala)
5	Quantity of CFL received at Treatment, Storage and Disposal facility (kg)	:	CFL/ Tube light – 20.88645 MT
The above report is for the period from 01/04/2022 to 31/03/2023			

Date:

Place: Thiruvananthapuram

Chairman or the Member Secretary
State Pollution Control Board




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 Kerala State Pollution Control Board
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ANNEXURE – I

List of authorized manufacturer, refurbisher, collection centre, dismantler and
recycler to management of e-waste in the State of Kerala

Sl.No.	Type	Numbers
1	Manufacturer	00
2	EPR Authorized Producers	61
3	Refurbisher	01
4	Collection Centre	59
5	Dismantler	01 operating & 01 under construction
6	Recycler	01
7	Bulk Consumer	61




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ANNEXURE – I A

List of authorized manufacturer, refurbisher, collection centre, dismantler and
recycler to management of e-waste in the State of Kerala

District	Manufacturer	Producer	Refurbisher	Recycler	Collection centers	Dismantler	Bulk Consumer
Thiruvananthapuram		04		-	06	-	11
Kollam		03		-	02	-	1
Pathanamthitta		-		-	-	-	2
Alappuzha		01		-	03	-	4
Kottayam		02		-	04	-	2
Idukki		-		01	01	-	1
Ernakulam		36	01		17	01	32
Thrissur		04		-	-	-	3
Palakkad		02		-	02	-	2
Malappuram		04		-	01	-	-
Kozhikode	-	03		-	06	-	2
Wayanad	-	-		-	-	-	-
Kannur	-	02		-	07	-	1
Kasargode	-	-		-	10	-	-
Total	00	61	01	01	59	01	61

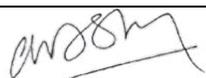



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*List of producers having EPR authorization from CPCB with Name & Address

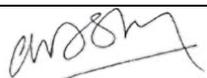
Sl. No	Company Name	Address
1	PHOENIX EQUIPMENTS	GROUND FLOOR, 68/2294, CHARTHANKOTTA COMPLEX,, OK MADHAVI AMMA ROAD, KACHERIPADI, Ernakulam, Kerala, 682018, Ernakulam, Ernakulam, KERALA - 682018
2	Rhydo Technologies (P) Ltd.	Golden Plaza Building, Opp. Mymoon Theatre, Chittoor Road, Cochin, Ernakulam, KERALA - 682018
3	BOXPUSH INDIA PRIVATE LIMITED	PAADAM STOP, 28/1363B, KP VALLON ROAD, KADAVANTHRA,, KADAVANTHRA,KOCHI,ERNAKULAM,KERALA-682020,INDIA, KERALA, Ernakulam, KERALA - 682020
4	KELHOME IMPEX	PEEDUKAYIL BUILDING, I/514 I, ASOKAPURAM, ALUVA, Ernakulam, Kerala, 683101, , Ernakulam, Ernakulam, KERALA - 683101
5	PPC TECHNOLOGIES INDIA PRIVATE LIMITED	C-400, EDYAR INDUSTRIAL DEVELOPMENT AREA, KADANGALLUR VILLAGE, PARAVUR TALUK, ERNAKULAM, Ernakulam, Ernakulam, KERALA - 683110
6	Hygiene Medical Systems	VI/372 - VI/373, Vettikkal P. O. Mulanthuruthy, Ernakulam, Mulanthuruthy, Ernakulam, KERALA - 682314
7	TERAROBOTS INDIA	11/2943, RAJAGIRI VALLEY SUB POST OFFICE, NILAMPATHINJIMUGAL ROAD THRIKKAKAARA MUNICIPALITY, KAKKANAD, ERNAKULAM, KERALA, Ernakulam, KERALA - 682039
8	RENQ POWER SOLUTIONS INDIA PRIVATE LIMITED	Ward No.XVII, Building No.222, Vellookunnel Building, Erattupetta, Aruvithura, Kottayam, Kerala, 686122, , Kottayam, Kottayam, KERALA - 686122
9	ADTECH SYSTEMS LIMITED	First Floor, T C 30/1868-1, EMMAR GRANDE, HARITA GIRI,KANJIRAMPARA, THIRUVANANTHAPURAM, Thiruvananthapuram, Kerala, 695030, , Thiruvananthapuram, Thiruvananthapuram, KERALA - 695030
10	Qinn Technologies	1st Floor, HARWIN Plaza,, High Road,Ollur P.O, Trhissur, Thrissur, KERALA - 680306
11	SIGN SOLUTIONS	NO V/219N FIRST FLOOR, KK TOWER, CHANDRAPURA JUNCTION MANJAPRA, ERNAKULAM, ERNAKULAM,, KERALA,, Ernakulam, KERALA - 683581
12	WISE WELD	NO:63/1157-B,GROUND FLOOR,MIG-163, GANDHI NAGAR ,KOCHI, KOCHI, Ernakulam, KERALA - 682020
13	FORERUN COMPUTERS AND SYSTEMS PRIVATE LIMITED	Forerun Computers and Systems Private Limited, 56/1619 A,, K.P.VALLON Road, Kadavanthra, Ernakulam, Kerala, 682020, Ernakulam, Ernakulam, KERALA - 682020




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14	TECHNOWAVE ID SYSTEMS (P) LIMITED	FIRST FLOOR, UNIT NO 1 J, PHASE 1 CARNIVAL INFOPARK, Kakkanad, Kakkanad, Kochi, Ernakulam, Kerala, 682042, Kochi, Ernakulam, KERALA - 682042
15	Gravity Terrain Private Limited	47/2932, Athira Store, South Bazar, Caltex Road, Caltex, Kannur, KERALA - 670002
16	SPANIO IMPEX	0, 17/1905B, M N COMPLEX, EAST KOTTAPARAMBA, KOZHICODE, Kozhikode, Kerala,, , Kozhikode, Kozhikode, KERALA - 673001
17	J.J. POWER TOOLS	2ND FLOOR, TMC-23/23U, NOORI COMPLEX, CHIRAVAKKU, TALIPARAMBA, Kannur, Kerala, 670141, , TALIPARAMBA, Kannur, KERALA - 670141
18	Mediapro Audio Visual Pvt Ltd	4/1594 Ebas Chamber Near Vallathol, Junction Anijkath Lane Thrikkakara, Ernakulam, Ernakulam, KERALA - 682021
19	EMINENCE TECHNOLOGIES	V/382,, PATHIRAKATTUKAVU KALAMASSERY KALAMASSERY ERNAKULAM, KERALA, Ernakulam, KERALA - 683104
20	STALLION ONEBYTE PRIVATE LIMITED	28/1363-B, STALLION HOUSE, K.P. VALLON ROAD, KADAVANTHRA, Ernakulam, Kerala - 682020, , Ernakulam, Ernakulam, KERALA - 682020
21	DIGITAL MEDIA	1/687, PULLAPPALLIL BUILDING, KURUPPANTHARA, MANJOOR, , KERALA, Kottayam, KERALA - 686603
22	GADGEON MEDICAL SYSTEMS PRIVATE LIMITED	First Floor, 37/1100, Fathima Tower, Off Seaport- Airport Road, Kakkanad, Thrikkakara, Ernakulam, Kerala, 682021, , Ernakulam, Ernakulam, KERALA - 682021
23	TECHSYS TECHNOLOGY	A4,17/114,BARAMCO BUILDING,, JAIL ROAD CROSS,CALICUT, KOZHICODE, Kozhikode, KERALA - 673004
24	SPIDER TECHNO SOFT PRIVATE LIMITED	No.63/154, Room No.80, DD Milestone,, Kadavanthra, Ernakulam, Kerala, 682020, Ernakulam, Ernakulam, KERALA - 682020
25	Bitvoice Solutions Private Limited	Heavenly Plaza, Door No.XI /275- J-8, Civil lane Road, Chembumukku, Vazhakkala, Kochi, Ernakulam, KERALA - 682021
26	XL TEKNOLOGIES	XVIII/49A, Craysol Building, University Road, Kalamassery, Cochin, Ernakulam, KERALA - 682022
27	KCM APPLIANCES PRIVATE LIMITED	42/45 E, PANACHIKKAL TOWER,, MISIRI, THURAKKAL, NARUKARA PO, MANJERI, Malappuram, KERALA - 676122
28	HITECH MACHINERIES AND EQUIPMENTS	IV/540-C,D,E,J,K,L, Thottumugham, Aluva, Ernakulam, Kerala, 683105, , Thottumugham, Aluva, Ernakulam, KERALA - 683105




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29	AGAPPE DIAGNOSTICS LTD	IX/592 A, AGAPPE HILLS, PATTIMATTOM, KUNNATHUNADU, Ernakulam, Kerala, 683562, , Ernakulam, Ernakulam, KERALA - 683562
30	VKL INTERNATIONAL	GROUND, NO.15/313-C, NEAR S.N.D.P.H.S.S, NADAKKAVU. P.O,, UDAYAMPEROOR, MANAKUNNAM VILLAGE,, ERNAKULAM, Ernakulam, KERALA - 682307
31	NIBIT INTERNATIONAL PRIVATE LIMITED	Behind West Hill Engineering College, 71/2674, JJ Flat, West Hill, West Hill, Kozhikode, Kozhikode, Kerala, 673005, , KOZHICODE, Kozhikode, KERALA - 673005
32	MEEZAN ELECTRONIC SCALES PRIVATE LIMITED	GROUND FLOOR, 8/308A, BRAIGHT BUILDING, CALICUT ROAD,, MANJERI, Malappuram,, MANJERI, Malappuram, KERALA - 676121
33	NAVEENA ZEAL TECHNOLOGIES	XII/562-564, NEAR KIZHAKKAMBALAM MARKET, KIZHAKKAMBALAM III, KIZHAKKAMBALAM, , Ernakulam, Kerala, 683562, KERALA, Ernakulam, KERALA - 683562
34	Didactic Systems India Private Limited	2ND FLOOR, No 6/858-M, SUITE 675, VALAMKOTTIL TOWERS, JUDGEMUKKU, THRIKKAKARA P.O, KAKKANAD, Ernakulam, Kerala, 682021, , KAKKANAD, Ernakulam, KERALA - 682021
35	MAKIMPACT INDIA PRIVATE LIMITED	28/1363B, KP Vallon Road, Kochi, Ernakulam, Kerala, 682020, , Ernakulam, Ernakulam, KERALA - 682020
36	Ace Finepack Private Limited	41/902903, Mahavir Building, Pullepady Junction, Ernakulam, Ernakulam, Kerala, 682035, , Ernakulam, Ernakulam, KERALA - 682035
37	CHILTON REFRIGERATION INDUSTRIES	62/3820,21,22,23 C.L.ANAND LANE, , M.G ROAD, ERNAKULAM, ERNAKULAM, Ernakulam, KERALA - 682011
38	Kadco Systems	9/539/13, Kadavy Enclave, Sree Lakshmi Narayana Palace Casino Complex, Casino Hotel, Kokkalai,, Thrissur, Thrissur, KERALA - 680021
39	V-Guard Industries Limited	42/962, V-Guard Industries Ltd,, vennala High School road, Vennala,, Ernakulam, Ernakulam, KERALA - 682028
40	AKS INTERNATIONAL	ROTARY ROAD, IV/37F1, ASK INTERNATIONAL, MARKET P O,, MUVATTUPUZHA, Ernakulam, Kerala, 686673, Kerala, Ernakulam, KERALA - 686673
41	SBJ ASSOCIATES	DOOR NO - 1551 H,FIDHA ZAHRA ARCADE,, PANNITHADAM ROAD,KECHERY, ERANELLUR,, , Thrissur, Thrissur, KERALA - 680501
42	V3 Global Trade and Technology Corporation	First Floor, No.KMC/44/1172, NBT Towers, Shastri Junction, Kadapakada Road, Kollam, Kollam, Kerala, 691001, , Kollam, Kollam, KERALA - 691001
43	NETLINK ICT PRIVATE LIMITED	X/24 A, B, CRT BUILDING, JUPITER JUNCTION, OLIYAPPURAM P O, KOOTHATTUKULAM, , Ernakulam, Ernakulam, KERALA - 686662




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44	MR.LIGHT TECHNOLOGY PVT.LTD	5/502, MAHIMAS BUILDING, PATTAMBI, PATTAMBI, Palakkad, Kerala, 679303, PATTAMBI, Palakkad, KERALA - 679303
45	Terumo Penpol Private Limited	Bhadra Towers, TC No. 29/2923, Vazhuthacaud- Cotton Hill Road, Thycaud P.O, Thiruvananthapuram, , Thiruvananthapuram, Thiruvananthapuram, KERALA - 695014
46	SAT VISION	46/2728, SAT VISION, HOTEL RAJA INTERNATIONAL, THAMARAKKULAM, Kollam, Kerala, 691001, 46/2728, SAT VISION, HOTEL RAJA INTERNATIONAL, THAMARAKKULAM, Kollam, Kerala, 691001, KOLLAM, Kollam, KERALA - 691001
47	ASIANET DIGITAL NETWORK PRIVATE LIMITED	TECHNOPARK, 2A 2ND FLOOR, LEELA INFOPARK, KAZHAKUTTOM, TRIVANDRUM, Thiruvananthapuram,, trivendram, Thiruvananthapuram, KERALA - 695301
48	LAUNMARK INDIA PRIVATE LIMITED	Olavaipu P O, 12M, Cristal Plaza, Poochakkal, Panavally, Cherthala, Alappuzha, KERALA - 688526
49	NORDEN COMMUNICATION PRIVATE LIMITED	3/173A, MADAVANA, PANANGAD, KUMBALAM, Ernakulam, Kerala, 682506, , Ernakulam, Ernakulam, KERALA - 682506
50	INNOVATIVE TECHNOLOGIES	2/132, FIDAS BUILDING, ALUVA-PERUMBAVOOR ROAD, THOTTUMUGHAM P.O. ALUVA, ALUVA, Ernakulam, KERALA - 683105
51	LABX	TC 95/2004 (1),(2), Dev Atrium, Padinjattil Lane, Kumarapuram, Medical College P O, THIRUVANANTHAPURAM, Thiruvananthapuram, KERALA - 695011
52	MR CARE CENTRE PRIVATE LIMITED	13/1036, MR LIGHT TOWER, NEAR RAILWAY OVERBRIDGE,, PATTAMBI, Palakkad, Kerala, 679303, Palakkad, Palakkad, KERALA - 679303
53	VALUE ADDED TYRE SOLUTIONS PRIVATE LIMITED	XVII/40, S.P.W Road,, Thaikkattukara, Aluva, Ernakulam, Kerala, 683106, , Ernakulam, Ernakulam, KERALA - 683106
54	HYKON INDIA LIMITED	HYKON HOUSE 974, IKKANDA WARRIER ROAD, THRISSUR, Kerala-680001, , THRISSUR, Thrissur, KERALA - 680001
55	PIXCOM SYSTEMS PRIVATE LIMITED	THIRD FLOOR, 31/1049-13, DE GRAND MALL, PERINTHALMANNA, Malappuram, Kerala, 679322, , Malappuram, Malappuram, KERALA - 679322
56	ORSHEL	XII/444, ORSHEL, THERAYYATH HOUSE, PARAKULAM, KOLLAM, KERALA, 691602, , KOLLAM, Kollam, KERALA - 691602
57	TRITVAM CARE SERVICES	16/1-A-4 ,OPP METRO PILLAR NO.125, FACING NH 544, ADJACENT TO CITY FUELS, AMBATTUKAVU, ALUVA, Ernakulam, KERALA - 683106




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58	NEW INDIA ENGINEERING STORES	42/334, ASTIN TOWERS, AMBEDKAR ROAD, VENNALA P.O., Ernakulam, Kerala, 682028, , Ernakulam, Ernakulam, KERALA - 682028
59	SPRINGFIELD COOLHUB PRIVATE LIMITED	FIRST FLOOR,259E ,SPRINGFIELD AVENUE ELAVOOR KAVALA, , ANGAMALY, Ernakulam, KERALA - 683576
60	BABIN TECHNOLOGIES.PVT.LTD	CP9/66, KINFRA TECHNO INDUSTRIAL PARK, KAKKANCHERY, CALICUT UNIVERSITY POST, Malappuram, Kerala, 673635, , MALAPPURAM, Malappuram, KERALA - 673635
61	SREE AMBAL MARKETING.	FIRST FLOOR, CC NO.XLI/435, SREE AMBAL MARKETING, SELMAN CHAMBERS, A.L .JACOB ROAD, Ernakulam, Kerala, 682035, , Ernakulam, Ernakulam, KERALA - 682035

*List of refurbishing unit with Name & Address

01	Nest Marketing	<u>A.M Road, Nedumthode, murickal P.O, perumbavoor KERALA - 683547</u>
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*List of collection centers with Name & Address

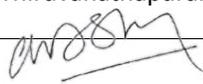
1	THOPPIL TRADERS	MUTHUKAD, MUPPATHADAM P.O.,
2	MEGATRON AUTOMATION SYSTEMS	KALAPARAMBATH BUILDING, THATTAMAPADY,KARUMALLOOR P.O. ERNAKULAM, PIN :683511
3	Green Tech Echo Consultancy	Cheriyela, Alummoodu P.o, Kollam-691577
4	EARTH CARE SOLUTIONS	DOOR NO. 11/118 PUTHENCruz, ERNAKULAM ,KERALA, PIN - 682308
5	MRK OLD SCRAP	NEDUMKANDAM P.O NEDUMKANDAM
6	AL- JAZEERA FURNITURE AND SCRAP DEALER	TC 20/1434, PALLIVILAKAM, KUNJALIMOODU, KARAMANA P O, TRIVANDRUM
7	KGF SCRAP TRADING AND RECYCLING CO	51/537D, Highway Arcade, NH 47, Thykoodam, Vyttila, Kerala
8	ORE ENTERPRISES	PEZHAKKAPPILLY , MUVATTUPUZHA , ERNAKULAM . KERALA ,PIN 686673
9	BHARATH TRADERS	PUNNORKODE, PAZHAMTHOTTAM P.O. - 683565




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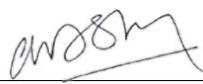
10	T S K TRADERS	13/120, PARAPPANANGADI, MALAPPURAM
11	GREEN LAND ECO INDUSTRIES	ERAPPUMPARA PATTIMATTOM - 683562
12	DILA ENTERPRISES	VADUTHALA JETTY P O AROOKUTTY
13	NEXTGEN TRADING SOLUTIONS	DOOR NO 41/304-E1, KARUVELIL, K D PLOT, KALAMASSERY, THRIKKAKKARA NORTH, ERNAKULAM
14	Green Tech Echo Consultancy	Cheriyela, Alummoodu P.o, Kollam-691577
15	PRIYA BOTTLES	PALAPARAMBA ROAD NIRMALAGIRI (PO) KANNUR 670643
16	ECO FRIENDLY SOLUTIONS	VETTAH BUSINESS ZONE MELAMPARA P.O, THALAPPALAM, KOTTAYAM
17	MSH E WASTE COLLECTION	ERATTUPETTA P.O ERATTUPETTA
18	M/s GLOBAL TRADERS	KANDANTHARA ALLAPRA P O PERUMBAVOOR ERNAKULAM PIN - 683556
19	white mart Vengatu	Home Appliances Vengat Buildings, Nileswar, kasargode
20	M/s GLOBAL TRADERS	KANDANTHARA ALLAPRA P O PERUMBAVOOR ERNAKULAM PIN - 683556
21	STAR GOLD BOTTLES	M S BABURAJ ROAD, KALLAI P.O., KOZHIKODE
22	A N H TRADERS	CHETTIKAD PATHIRAPALLY P O ALAPPUZHA
23	FAH SCRAP MERCHANT	PULICKAL BUILDING, MUTTOM JN ERATTUPETTA
24	N S N. SCRAP	N S N. SCRAP, KULANGARAPARAMBU, PAZHAYANGADI JN, PURAKKAD P.O ALAPPUZHA
25	Earth Sense Reeyclers private Limited	8,,/194 K. Pudur, Kanjikode ,Palakkad -678621
26	Al Ameen Industries IDA,	Vazhakkulam South , Vazhakkulam P.O Ernakulam-683105
27	Aspire Greens Kandanthara	Allapara P.O,Perumbavoor, Ernakulam-683535
28	Bismillah enterprises,	Ponjassery P.O perumbavoor, Ernakulam-683547
29	Hassan Traders	MudickalP.oNedumthodu, Ernakulam
30	Zain Industries	Ponjassery P.O Perumbavoor
31	Clean Kerala Company	TC-29/1732, State Municipal House, Vazhuthacaud, Thiruvananthapuram




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32	Venad Steel Corporation	TC- 52/1888, Near Merry Land Studio, Vellayani Junction, Nemom,
33	Golden key Trading	Vattiyode, Kudappanakunnu, Trivandrum-05
34	Bright Care,	1 st Floor, Fashion Tower, Kannur
35	Will Rech Communications,	Yatheem Ghana Bldg, Jubilee Road, Thalassery
36	UPC Word,	15/182/Sivapuram, Kannur
37	Eco Friendly Solutions,	2/689/E, Kadaplackal Buiding, Vadakkekara, Erattupeta, Kottayam, Ph 9447778525
38	Al- Jazeera Furniture & scrap Dealer,	Tc -20 /1434, Pallivilakam, Kunjalimoodu. Karamana P.O Thiruvanathapuram -695012
39	Kerala Enciro Infrastructrure Ltd TSDf Project,	FACT (CD) Campus, Ambalamedu, Kochi-682303
40	Plan at Earth	Building No VII/91A , Near Vayalkara Juma Masjid, Kunnukara, Ernakulam-683578
41	E-Planet,	North Kttenchery , Kannhangad , Kasaragod-671315
42	E-Planet,	Iconic Tower Uppala Kasargode
43	Karo Sambhav Collection centre	12/36(New) 34/179M Soorya Gayathri, Thadambattu, Thazham, Kozhikode-673010
44	Karo Sambhav Collection centre	New TC No . 79/2152. old Tc 42/921 , located Near Muttathara Co-operative Bank, Muttathara, Vallakadavu, Thiruvananthapuram-695008
45	Asianet Satellite Communciation Ltd	Room No 8/1236 (1) & 8/1236 (1A) 3 RD (1A) 3RD Floor JRj Building Complex Near Mucipal Bustan D ottapalam Palakkad 679101
46	Asianet Satellite Communciation Ltd Building	No.6/695- J, Vijayavihar KC Arcade Opp Busstand, Feroke Kozhikode 673631
47	Asianet Satellite Communciation Ltd	"Fayas 23/394 Kuttinilayamparamba Vattakinar Mcenchanda Nr Sakthi Authomobiles Kallai P.O Calicut 673003




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48	Asianet Satellite Communciation Ltd	Sreyas Building 36/1172/ Opp EEC Market Blasusser Road ThadampattuthazhamVenageri Kozhikode 673010
49	Asianet Satellite Communciation Ltd	Kannanscomple X Chettipeedika Kannur 670
50	Asianet Satellite Communciation Ltd	Aneez Palace Road, Lifloor , D oor No.19/79, A.V. K Nair Road Thalaseri 690101
51	Asianet Satellite Communciation Ltd	fathimaComplex. Kovilpall y Junction , KanhangadKasrgod 671315
52	Enrich Automation,17/425,C-3,	Golden Tower New Indore Stadium Calicut
53	Spanker Infotech,	1 st floor, prestige Centre, Sub- Registrar office Road, Near Training School Kannur
54	Nandilath G- mart	Athinhal, Manikoth Kanjangadu, Kasargodu 671531
55	National Radio Electronics,	Kottacherikasargode 671315
56	White Mart Microcorpus	City Gate Building Chandragiri Road Kasargode 671317
57	National Electronics CO	Main Road, perla, Kasargode-6771552
58	My G	NerBusstandpadoor Complex Kasargode
59	MYG	North KottacheryPuthiyavalappuKuanangadu

*List of dismantling unit with Name & Address

01	Kerala Enviro Infrastructure ltd	FACT CD Campus, Ambalamedu, Kochi, Kerala – 682 303
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*List of recycling unit with Name & Address

01	Sahya Solutions Group of Waste Management	<u>3/310, Badayil Estate, Meloram P.O Peruvanthanam, Idukki,</u> KERALA
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ANNEXURE – II

Categories of waste collected along with their quantities on a annually average basis
(for the year 2022-23)

Sl. No.	Authorized, manufacturer, refurbisher, collection centre, dismantler and recycler for management of e-waste in the State of Union territory under these rules	Quantity of information and telecommunication equipment, consumer electrical and electronics as per Schedule-1	Remarks
1	Manufacturer	Nil	
2	Refurbisher	37.28 MT	
3	Collection Centre	835.433 MT	By authorized collection centers in kerala
4	Dismantler	53.22809 MT	*Tube Light/ CFL – 20.88645 MT * E- waste – 32.34089 MT
5	Recycler	471.55 MT	In kerala
6	Bulk consumer	67.78 MT	
	Total	1465.27109 MT	




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Form-5		
(see rule 18(1))		
E-Waste Annual Report for the period 2021-2022		
1	Number of authorized manufacturer, refurbisher, collection centre, dismantler and recycler for management of e-waste in the State or Union territory under these rules	: Annexure-I
2	Categories of waste collected along with their quantities on a monthly average basis	: Annexure-II It may kindly be noted that the Board has done an inventory on the details obtained from GST through CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), Govt. of India , Trivandrum.soft copy of inventory is attached
3	A Summary Statement code-wise of e-waste collected	: Some of the annual returns do not contain category code details (available details enclosed as Annexure-II A)
4	Details of materials recovered from recycling e-waste collected	: No recycling facility
5	Quantity of CFL received at Treatment, Storage and Disposal facility (kg)	: 26212Kg (26.212 T)
The above report is for the period from 01.04.2021 to 31.03.2022		




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ANNEXURE – I

List of authorized manufacturer, refurbisher, collection centre, dismantler and
recycler to management of e-waste in the State of Kerala

Sl.No.	Type	Numbers
1	Manufacturer	0
2	EPR Authorized Producers	16
3	Refurbisher	1
4	Collection Centre	36
5	Dismantler	1 under operation ✓ 1 under construction
6	Recycler	nil
7	Bulk Consumer	61



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ANNEXURE – I

List of authorized manufacturer, refurbisher, collection centre, dismantler and recycler to management of e-waste in the State of Kerala

District	Manufacturer	Producer	Refurbisher	Recycler	Collection centers	Dismantler	Bulk Consumer
Thiruvananthapuram	-	2		-	5	-	11
Kollam	-	-		-	-	-	1
Pathanamthitta	-	-		-	-	-	2
Alappuzha	-	1		-	-	-	4
kottayam	-	-		-	-	-	2
idukki	-	-		-	-	-	1
Ernakulam DO-1	-	5	1	-	9	1	32
Ernakulam DO-2	-						
ESC Eloor	-						
Trissur	-	2		-	-	-	3
Palakkad	-	1		-	2	-	2
Malappuram	-	4		-	-	-	-
Kozhikkode	-	-		-	5	-	2
Wayanad	-	-		-	-	-	-
Kannur	-	1		-	6	-	1
Kasargode	-	-		-	9	-	-
Total	0	16	1	0	36	1	61




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List of Producers having EPR authorization of CPCB

Name and Address of the unit

1	Meezan Electronic Scales Private Limited, Ground floor,8/308 A,Braight Building, Calicut Road,Majeri,Malappuram,Kerala-676121
2	Kadc systems, 9/539/13,Kadavyenclave, SreeLakshmiNarayana PalaceCasinoComplex, CasinoHotel, Kokkalai, Thrissur-680021
3	Arif Kayyalakkath,UPC World,15/182,C,D,E,F Sivapuram,Kannur
4	Mango Agro Products,16/256,Ponganamkadu, Therambam Road P.O,Kurichikkara,Thrissur,Kerala-680028
5	Chilton Refrigeration Industries,62/3820/21/22/23 ,Chilton Refrigeratin Industries,C L Anand Lane MG Road.Ernakulam Cochin,Kerala-682011
6	Launmark India Pvt Ltd,8/12-B,Ulavaipu P.O Poochakkal,Cherthala,Alappuzha688526
7	SCSOFT Technologies Pvt Ltd, Ground Floor,Leela Infopark Building, Technopark, Kariyavattom,Trivandrum-695581
8	Gulliver Productions, TPXI/556, Panambra Thenhipalam,Malappuram, Kerala- 673 636 K
9	Asianet Digital Network Pvt Ltd, 2A Second floor, Carnival Techno Park, (Leela infopark) , Karyavattom PO , Trivandrum
10	Ceetron Technologies,15/283, Vrindavan Building, UP Hill, PostujtQ6, Middle Hill,Malappuram, Kerala - 676505
11	Care CentrePrivate Limited, 13/1036, MR LightTower, Near Railwayoverbridge, Pattammed,Palakkad,Kerala - 679303
12	Compu World,CDE, 20/786, Mekkamannil Tower, RingRoad, Manjeri, Malappuram, Kerala - 676121
13	KLX Cloud ITPrivate Limited, Door No. XXIV 103, CN 10, Church Nagar,Angamaly P. O. Ernakulam, Kerala - 683 572
14	M/s Spider Techno Soft Private Limited No.63/ 154,Room no.-80,DD Milestone , Kadavanthra ,Ernakulam ,Kerala-682020
15	M/s Jumi Technologies Pvt.ltd Hs -11,11/275- J -251.Heavenly Plaza,Vazhakkala,Thrakkara,Ernakulam,Kerala-682021
16	M/S Bitvoice Solutions Private Limited Heavenly Plaza ,Door No -Xi/275-Js,Civil Line Road Chembukkavu,Vazhakkala Kakkanad ,Ernakulam,Kerala- 682021



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List of E-waste Collection Centers

<u>Sl</u> <u>no</u>	<u>Collection centres</u>
1	Earth Sense Recyclers Private Limited, 8/194, K. Pudur, Kanjikode, Palakkad – 678621
2	Al Ameen Industries IDA, Vazhakkulam South, Vazhakkulam P.O, Ernakulam - 683105
3	Aspire Greens Kandanthara, Allapra P.O, Perumbavoor, Ernakulam – 683553
4	Bismillah enterprises, Ponjassery P.O, Perumbavoor, Ernakulam – 683547
5	Hassan Traders, Mudickal Po, Nedumthodu, Ernakulam
6	Zain Industries Ponjassery P O, Perumbavoor
7	Clean Kerala Company, TC-29/1732, State Municipal House, Vazhuthacaud, Thiruvananthapuram
8	Venad Steel Corporation TC-52/1888, Near Merry Land Studio, Vellayani Junction, Nemom, Thiruvananthapuram
9	Golden Key Trading, Vattiyode, Kudappanakunnu, Trivandrum- 05
10	Bright Care, 1st Floor, Fashion Tower, Kannur
11	Will Tech Communications, Yatheem Ghana Bldg, Jubilee Road, Thalassery
12	UPC World, 15/182/ Sivapuram, Kannur
13	Eco Friendly Solutions, 2/680/E, Kadaplackal Building, Vadakkekara, Erattupeta, Kottayam, Ph: 9447778525
14	Al-Jazeera Furniture & scrap Dealer, TC-20/1434, pallivilakam, Kunjalimoodu, Karamana P.O., Thiruvananthapuram- 695




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15	Kerala Enviro Infrastructure Ltd TSDF Project, FACT (CD) campus, Ambalamedu, Kochi – 682303
16	Plan at Earth, Building No. VII/91A, Near Vayalkara, Juma Masjid, Kunnukara, Ernakulam - 683 578
17	E-Planet, North Kottenchery, Kanhangad, Kasargod -671 315
18	E-Planet, Iconic Tower Uppala Kasargode
19	Karo Sambhav Collection centre 12/36 (New) 34/179M, Soorya Gayathri, Thadambattu, Thazham, Kozhikode- 673 010
20	Karo Sambhav Collection centre New TC No. 79/2152, Old TC 42/921, located Near Muttathara Co-operative Bank, Muttathara, Vallakadavu, Thiruvananthapuram - 695 008
21*	Asianet Satellite Communciation Ltd ,Room No:8/1236 (1) & 8/1236 (1A) 3RD floor JRJBuilding Complex Near MuncipalBustan d Ottapalam Palakkad 679101.
22*	Asianet Satellite Communciation Ltd, Building No. 6/695 - J, Vijayavihar K C Arcade Opp. Busstand, Feroke Kozhikode 673631
23*	Asianet Satellite Communciation Ltd, "Fayas" 23/394, Kuttinilayam Par amba, Vattakinar Meenchanda Nr, Sakthi Authomobiles Kallai PO, Calicut 673003
24*	Asianrt Satellite Communciation Ltd, Sreyas Building, 36/117 2/ Opp: EEC Market Balussery Road, Thadampattutha zham, Vengeri kozhikode 673010
25*	Asianet Satellite Communication Ltd, Kannanscomple x, chettipeedika Kannur 670
26*	Asianet Satellite Communication Ltd, Aneez Palace Road, Li Floor, Door No. 19/79, A.V.K Nair Road, Thalassery 690101
27*	Asianet Satellite Communication Ltd, Fathima Complex, Kovilpally Junction, Kanhangad Kasargod 671315
28*	Enrich Automation, 17/425, C-3, Golden Tower, New Indore Stadium, Calicut
29*	Spanker Infotech, 1st Floor, Prestige Centre, Sub- Registrar Office Road, Near Training School Kannur
30*	Nandilath G-mart Athinhal, Manikoth kanjangadu, kasargodu 671531




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31	National Radio Electronics, Kottacheri Kasargode 671315
32*	White Mart Microcorpus, City Gate Building, Chandragiri Road, Kasargode 671317
33	National Electronics CO, Main Road, Perla, Kasargode-671552
34*	MyG Near Busstand Padoor Complex, Kasargode
35*	MyG North Kottachery Puthiyavalappu Kanangadu
36*	White Mart Vengatu, Home Appliances Vengat Buildings, Nileswar, Kasargode

*- collection centers specified by producers in their EPR plan

List of E-waste refurbishing unit
Name and Address of unit

1	Next Marketing A.M. Road, Nedumthode, Mudickal PO, Perumabavoor
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List of E-waste Dismantling unit
Name and Address of unit

1	Kerala Enviro Infrastructure Ltd TSDf Project, FACT (CD) Campus, Ambalamedu, Kochi-682303
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ANNEXURE – II

Categories of waste collected along with their quantities on a annually average basis
(for the year 2021-22)

Sl. No.	Authorized, manufacturer, refurbisher, collection centre, dismantler and recycler for management of e-waste in the State of Union territory under these rules	Quantity of information and telecommunication equipment, consumer electrical and electronics as per Schedule-1	Remarks
1	Manufacturer	Nil	
2	Refurbisher	26.5 T	
3	Collection Centre	1123.232 T	
4	Dismantler	32.096 T	
5	Recycler	Nil	
6	Bulk consumer	67.78 T	
	Total	1249.608 T	




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Summary statement collected code wise for the period 2021-2022 (Annexure II A)

Sl No	Equipment code	Weight (T/Year)
1	ITEW1	55.629
	ITEW2	
	ITEW3	
	ITEW4	
	ITEW5	
	ITEW6	
	ITEW7	
	ITEW8	
	ITEW9	
	ITEW10	
	ITEW11	
	ITEW12	
	ITEW13	
	ITEW14	
	ITEW15	
	ITEW16	
2	CEEW1	18.028
	CEEW2	
	CEEW3	
	CEEW4	
	CEEW5	
3	Items(without code) in T/Year	1175.951
	TOTAL(1+2+3) in T/Year	1249.608




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KERALA STATE POLLUTION CONTROL BOARD

കേരള സംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡ്

Pattom P.O., Thiruvananthapuram – 695 004

പട്ടം പി.ഒ., തിരുവനന്തപുരം - 695 004

PCB/HO/SEE-3/TECH/130/2021

Date: 26/10/2021

Guidelines for consenting scrap collection centres

A meeting was convened by the Chairman of the Board on 01.10.2021 with the State Committee members of the Kerala Scrap Merchants Association. In the meeting, it was decided to formulate guidelines for bringing the scrap collection centers in Kerala under the consent purview of the Board. Accordingly, these guidelines are formulated.

1. Scrap collection is the basic step in the recycling of waste for the purpose of converting it into a new product. There are more than 10,000 scrap collection centers in Kerala employing around 3.5 lakhs people.
2. The quantum of waste recycled in Kerala is very low and recycling needs to be encouraged. This can be achieved by organizing and recognizing scrap collection centers.
3. The materials recycled by scrap merchants include paper (book, magazine, news paper) plastic (PET bottles, carry bags), cartons, metal (Iron, steel, Bronze, Copper, Tin & Aluminum), glass, e-waste, battery waste, old fridge/washing machine, tyre/tube/flap, rubber items, PVC (poly vinyl chloride) etc.
4. Materials that are rejected by scrap merchants include sandal (chappal), rexine bags, thermocol, fibre items, PU (polyurethane used in the chappal/sandal soles) etc. It is illegal to collect any bio-medical or hazardous waste.
5. Scrap is collected from households by the unorganized rag pickers. As per rule 15 (b) of the Solid Waste Management Rules, 2016, the local bodies are required to establish a system to recognize organizations of waste pickers or informal waste collectors and promote and establish a system for integration



of these authorized waste-pickers and waste collectors to facilitate their participation in solid waste management including door to door collection of waste. The term rag picker/waste-pickers/waste collectors, in these guidelines are replaced by the term pickup person. Materials collected by the pickup person are brought to the scrap collection centres where it is segregated, bailed/shredded and packed in bundles. The packed materials are then dispatched to various processing centres which are located mostly outside Kerala.

6. Most of the scrap collection centres occasionally receives e-waste and battery waste even though they are not authorized battery waste or e-waste collection centres.
7. Electrical scrap is usually dismantled manually in the centre to recover metals. Glass bottle received is usually broken to reduce the volume. Metal is usually cut using manual or hand cutter. Breaking of fluorescent tubes shall not be done in the unit
8. At present there is no proper record keeping in the centres and hence there is no quantification of various types of wastes collected for recycling.
9. Scrap collection centres are equivalent to MCF/MRF (Material Collection Facilities/Material Recovery Facilities) of the local bodies. However, these are private facilities collecting much more waste than that collected by MCF/MRF of the Local Bodies.
10. All the scrap collection centres in Kerala shall be brought under the consent purview of the Board. The Board is required to create a complete database of the scrap collection centres in Kerala.
11. Automobile scrapping centres are governed by the CPCB norms and are not covered in these guidelines.
12. Consent applications shall be processed based on the following:-
 - (i) Those units collecting bottles, plastic and metal and having no machinery are categorized as white. Those units having machinery as per item 12.5 of these guidelines are classified as green.



- (ii) Most of the scrap collection centres occasionally receives discarded batteries. Centres receiving scrap battery are categorized as 'green'. It is to be ensured that batteries are handled as per Battery (Management and Handling) Rules 2001, Hazardous and other wastes (Management and Transboundary Movement) Rules 2016. No processing is permitted in the collection centre. The battery scrap shall be transported only to authorized recyclers having consent/ authorization of the Board or the concerned SPCB in the case of interstate transport.
- (iii) It is a known fact that most of the scrap collection centres receives e-waste even though they are not authorized e-waste collection centres. The collection of e-waste shall be on behalf of registered dismantlers/registered recyclers/producers. Those units collecting e waste are categorized as green and the conditions for collection centres under e-waste Management Rules, 2016 shall be incorporated as consent condition. No processing is permitted in the collection centre. The e waste shall be transported only to authorized recyclers having consent/ authorization of the Board or the concerned SPCB in the case of interstate transport.
- (iv) The minimum facility required for scrap collection centre is a fully enclosed building/shed with door opening for to and fro movement of the scrap. While submitting application for the consent of the Board, the applicant shall report the quantum of waste that can be stored in the building/shed. Storing the scrap outside the building shall not be permitted and needs to be considered as a consent condition violation. Sufficient measures to prevent fire shall be provided.
- (v) Machinery permitted in scrap collection centres are bailer machines (used for compressing scrap metal and waste material into dense block), shredding machines and hand cutter (for metal cutting). No other machinery is permitted. Facilities for neutralization of battery water with soak pit facilities shall be provided in all scrap collection centres receiving scrap battery.



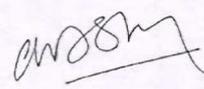
- (vi) Facilities for recording the quantity of scrap received/scrap dispatched shall be provided in all centres. Separate records shall be maintained for battery, e waste and battery scrap. Usually, scrap collection centres are classified as retailers and wholesalers. Recording data shall be done at retailer level in order to avoid duplication of data. These details shall be prepared and compiled into an annual report. The Association shall provide training to its members in this regard. This data shall be shared with the local bodies and the Kerala State Pollution Control Board. Such data will be highly useful in the preparation of Annual Report under the Solid Waste Management Rules, 2016, Plastic Waste (Management & Handling Rules, e-waste Management Rules, 2016, Battery (Management and Handling) Rules 2001. It shall also be reported as to where each of the items are dispatched for processing.
- (vii) The scrap collection centres shall have own fleet of pickup men and women. Dependence on external agencies in this regard shall be avoided as far as possible.
- (viii) The Association shall organize adequate training to the pickup people. The pickup people shall also be equipped with adequate safety gears and equipments. They are also need to be recognized by the concerned LSGD.
- (ix) It is an encouraging fact that the All Kerala Scrap Merchants Association is bringing out a mobile application for the public, the vendors and the pickup people. In the next stage, the vehicles transporting the scrap to the collection centres and from the collection centres to the processing centres shall be GPS tagged.
- (x) Consent fee need be collected only from the month of approval of these guidelines.
- (xi) The scrap collection centres shall ensure that no nuisance to nearby residents occur by way of noise, dust or acidic water. Necessary fire fighting facilities shall be provided for preventing fires.



- (xii) Approved copy of these guidelines may be forwarded to all Local Bodies and District Administration.


MEMBER SECRETARY




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