Malaysia
Ministry of Natural Resources & Environment (DOE)
Department of Environment

The Project for Development of Mechanism for Household E-Waste Management in Malaysia (Phase 2)

Project Completion Report

May 2018

Japan International Cooperation Agency (JICA)

EX Research Institute Ltd.

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1 Outline of the Project

1.1 Background of the Project

Waste from electrical and electronic equipment (here-in-after referred to as "E-waste") contains hazardous substances such as lead, mercury and cadmium. Disposal of such E-waste in an inappropriate manner potentially causes serious impacts upon human health and environment through contamination of air, water and soil. On the other hand, it contains important valuable recyclable resources, such as rare metals; therefore their recycling and resource recovery are of great importance. E-waste currently draws much attention in terms of its environmental concerns as well as resource recovery.

In Malaysia, the waste from electric and electronic manufacturing industries, also defined as industrial "E-waste" is controlled under the manifest system called "e-SWIS" or "Electronic Scheduled Waste Information System" in accordance with the Environmental Quality (Scheduled Waste) Regulations 2005 (P.U. (A) 294/2005) under the Environmental Quality Act 1974 of Malaysia. However, there is no legal/regulatory system to control E-waste or used electric/electronic home appliances from household so far.

As a response to the situation above, JICA International Cooperation Agency (JICA), at the request of the Government of Malaysia, implemented "The Project for Model Development for E-Waste Collection, Segregation and Transportation from Household for Recycling" during 2011-2013 for the purpose of establishing a suitable model of managing E-waste from household, taking the Penang island as the area of conducting E-waste collection pilot project.

After the above Project, JICA conducted "The Baseline Study on E-waste Management in Southeast Asia (2013-2014)" in which the monitoring/assessment of the E-waste management situation in Penang island Malaysia was carried out with the recommendations for further replication and transfer of the experience to other cities in Malaysia as well as to other countries such as Thailand and Indonesia.

In the meantime, the Department of Environment (DOE), the Ministry of Natural Resources and Environment of the Government of Malaysia expanded the pilot E-waste collection project of "Penang Model" to other provinces including Perak, Selangor, Johor, Melaka, and Kuala Lumpur in cooperation with the relevant stakeholders under the name of "E-waste Alam Alliance", which was launched by DOE in December 2013. Learnt from the experiences above, DOE is currently in the process of drafting the new E-waste management regulation under the principle of "Shared Responsibilities" that incorporates the concept of "Extended Producers' Responsibility (EPR)" into the regulation with the responsibilities of other stakeholders. DOE plans to submit this regulation to

the Attorney General's Chambers of Malaysia (AGC) for its official establishment and implementation with the promulgation by the Minister of Natural Resources and Environment (NRE).

To identify the scope of technical cooperation that best meet the needs of Malaysia in line with the current trend of legal/regulatory/policy framework development over the household E-waste management, JICA sent another survey mission to discuss and determine the details of the next technical cooperation project. The survey found that DOE needed transfer of experience and know-how on household E-waste management including the basic legal/regulatory framework, time frame and schedule of works, analytical methodology and works for estimating the overall cost of collection and recycling, recycling fee charging and collection system, management of the fund raised from the collected recycling fees, and so forth.

The current project, "The Project for Development of Mechanism for Household E-waste Management" is planned and conducted in accordance with the agreement between the Government of Malaysia and Japan, specified in the Record of Discussions (R/D) concluded in March 2015 after a series of discussions between JICA and relevant government stakeholders of Malaysia, represented by the Department of Environment, the Ministry of Natural Resources and Environment.

1.2 Project Title

PROJECT FOR DEVELOPMENT OF MECHANISMFOR HOUSEHOLD E-WASTE MANAGEMENT IN MALASYIA

1.3 Scope of the Project

The Project targets 6 items of E-waste as shown below.

- TV（including cathode-ray TV and flat TV）;
- Refrigerator;
- Washing machine (including cloth dryer);
- Air conditioner;
- Personal computer (including desktop and laptop types); and
- Mobile phone（including feature phone, smart phone, and tablet PC）.

1.4 Project Period

Although the project period was 2 (two) years and 7 (seven) months between June 2015 and December 2017, it was extended to June 2018 with the expanded scope of pilot project activities. This report summarizes the project activities all through the renewed project period.

1.5 Project Implementation Area Covered

In the beginning, the Project covers only the Malaysian Peninsula; however, it was extended to the whole territory of Malaysia including Sabah and Sarawak based on the agreement between the

Ministry of Natural Resources and Environment of Malaysia and JICA. Project Development Matrix (PDM) and Plan of Operation (P/O) was so amended.

1.6 Overall Goal of the Project

The overall goal of the Project is set as "Sustainable collection and environmentally sound recycling of household E-waste is implemented".

1.7 Project Purpose

The Project puropose is that "Implementing mechanism such as legal structure, organization, system for sustainable collection and environmentally sound recycling of household E-waste is prepared.

1.8 Relevant Stakeholders of the Project in Malaysia

1.8.1 Project Counterpart

The Malaysian counterpart of the Project is Department of Environment, the Ministry of Natural Resources and Environment (DOE-NRE), Malaysia.

1.8.2 Other Relevant Stakeholders

To formulate the various guidelines in relation to household E-waste management, i.e. guidelines for E-waste collection, recycling, reporting, recycling fee, and recycling fund management body, DOE, established under the Project 3 (three) taskforces, which are organized by the representatives of public and private stakeholders as shown in the table below.

Taskforce 1	Members
Taskforce 1 (Guidelines for household E-waste collection and reporting)	▪ Local Government（Kuala Lumpur, Shah Alam, Petaling Jaya, Subang Jaya, Putra Jaya） ▪ National Solid Waste Management Department (JPSPN), Ministry of Housing and Local Government ▪ Municipal Solid Waste Collection Concessionaires (SWM, E. Idaman, Alam Flora） ▪ Senheng Electric (Retailer of electric and electronic home appliances) ▪ Federation of Malaysian Electrical Appliances Dealers Association (FOMEDA) ▪ The Selangor and Federal Territory (KL) Electrical Home Appliance Dealers' Association (SWEDA) ▪ Tzu-Chi (NGO) ▪ Federation of Malaysian Consumers Associations (FOMCA) ▪ Malaysia Retailers Association (MRA) ▪ Federation of Malaysian Manufacturers (FMM) ▪ AEON (Retailer) ▪ The National ICT Association of Malaysia (PIKOM) ▪ The Japanese Chamber of Trade and Industry, Malaysia (JACTIM) ▪ Association of Scheduled Waste Recyclers, Malaysia (ANSWERS)
Taskforce 2 (Guidelines for household E-waste recycling and fee)	▪ Ministry of International Trade and Industry（MITI） ▪ Ministry of Finance（MOF） ▪ Ministry of Domestic Trade, Cooperatives and Consumerism (KPDNKK) ▪ Royal Malaysian Customs Department (JKDM) ▪ Malaysian Investment Development Authority (MIDA) ▪ Energy Commission

Taskforce 1	Members
	▪ Sabah Environment Management Board ▪ Federation of Malaysian Consumers Associations (FOMCA) ▪ Federation of Malaysian Consumers Associations (FOMCA) ▪ The National ICT Association of Malaysia (PIKOM) ▪ The Japanese Chamber of Trade and Industry, Malaysia (JACTIM) ▪ Association of Scheduled Waste Recyclers, Malaysia (ANSWERS)
Taskforce 3 (Guideline on operation of Recycling Fund Management Body)	▪ Ministry of Finance (MOF) ▪ Ministry of International Trade and Industry (MITI) ▪ Economic Planning Unit (EPU)

1.8.3 Project Beneficiaries

Direct Beneficiary:	Central and local DOE staff members involved in household E-waste management
Indirect Beneficiary:	All stakeholders involved in household E-waste management

1.9 Tasks and Project Activities

The Project consists of the 11 (eleven) tasks as shown in the table below.

Task 1	Development of household E-waste inventory system (Output in PDM: Mechanism for regularly updating the inventory of household E-waste is created.
Task 2	Formulation of the guidelines for household E-waste collection (Output in PDM: Guideline on effective collection of household E-waste for the Regulation is created.)
Task 3	Formulation of the guidelines for household E-waste Recycling (Output in PDM: Guideline on requirements for environmentally sound recycling for the Regulation is developed.)
Task 4	Formulation of the guidelines for establishment of household E-waste reporting system (Output in PDM: Guideline on reporting system for managing household E-waste for the Regulation is developed.)
Task 5	Formulation of the guidelines for determination of the recycling fees of household E-waste (Output in PDM: Guideline on the fee structure for sustainable collection and environmentally sound recycling of household E-waste for the Regulation is developed.)
Task 6	Formulation of the guidelines for establishment and management of household E-waste recycling fund (Output in PDM: Guideline for Fund Management Board for the Regulation is developed.)
Task 7	Implementation of the pilot project on household E-waste collection (Output in PDM: Pilot project on household E-waste collection system is conducted to verify the feasibility of the system as well as to provide inputs to the Guidelines on collection.)
Task 8	Implementation of the pilot project on household E-waste recycling and fee (Output in PDM: Pilot project on household E-waste recycling system and fee mechanism is conducted to verify the feasibility of the system as well as to provide inputs to the Guidelines on recycling and fee.)

Task 9	Implementation of the pilot project on household E-waste reporting (Output in PDM: Pilot project on household E-waste reporting system is conducted to verify the feasibility of the system as well as to provide inputs to the Guidelines on reporting.)
Task 10	Implementation of the awareness raising activities on household E-waste recycling (Output in PDM: Awareness raising activities for relevant stakeholders are conducted.)
Task 11	Capacity development of DOE and relevant government agencies on household E-waste recycling (Output in PDM: Capacity among DOE and related government agencies for sustainable household E-waste management is developed.)

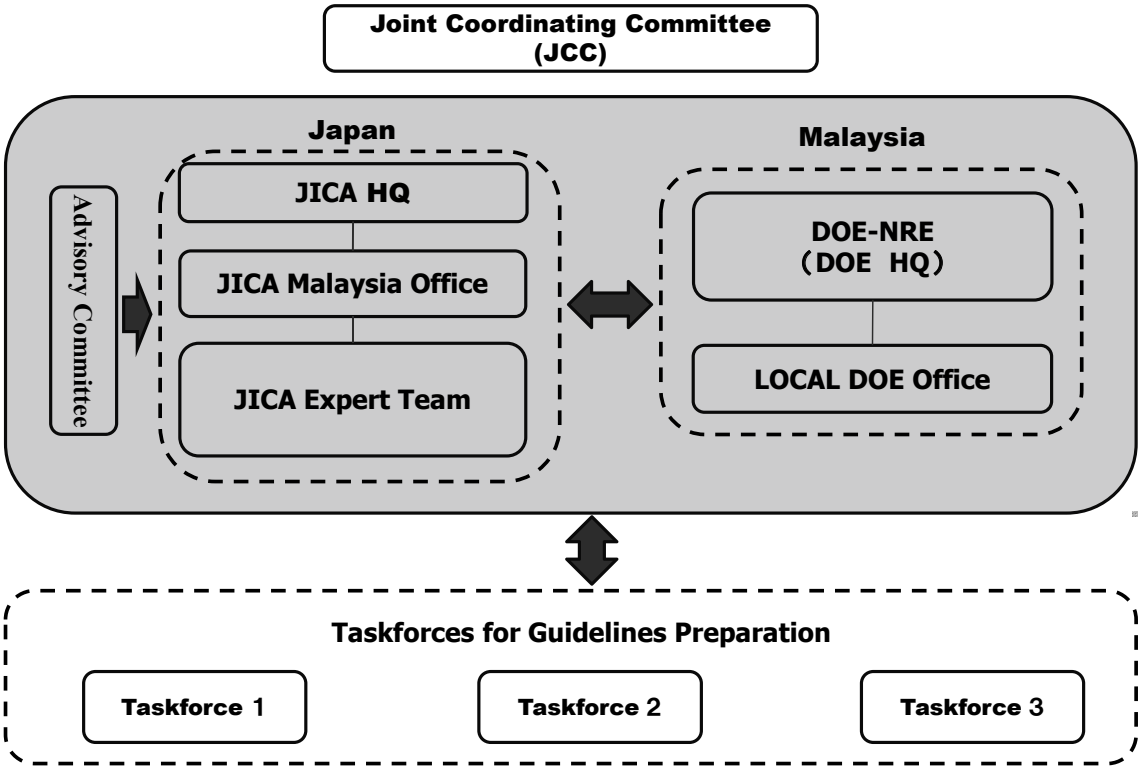
1.10 Basic Policies of Project Implementation

The Project was implemented in accordance with the following basic policies.

Policy 1	Joint Implementation with the Malaysian counterparts in accordance with the agreed Project Design Matrix (PDM)
Policy 2	Capacity Development through the Project
Policy 3	Establishment of the consultation platform for and cooperation among the relevant stakeholders for proper E-waste management
Policy 4	Establishment of the E-waste management mechanism with its focus on field level implementation in cooperation with local DOE units
Policy 5	Input of Japanese knowledge and experiences from the Japanese experts and practitioners of household E-waste management

1.11 Organizational Mechanism for Project Implementation

The Project was implemented under the organizational mechanism shown in the figure below.



2 Project Activities

Contents and results of the Project activities are outlined by each task below.

2.1 Task 1 : Development of household E-waste inventory system

The following project activities were carried out as Task 1.

2.1.1 Household E-waste Inventory and Flow Survey in Malaysia (Activity 1-1 and 1.2)

The household E-waste inventory and flow survey was started in September 2015 by the contracted local consultant and completed in August 2016 with submission fo the final report.

The survey was conducted through questionnnaires and interviews of 1,000 sampled household E-waste stakeholders. The sampled stakeholders were mainly categorized into two types, i.e. household E-waste generation sources (including household, offices and other business entities) and receivers of such E-waste (including collectors, traders, recyclers and treaters).

Table 2-1: Number of samples by regions and categories)

Region	Categories				
	Household	Offices	Institutional/ Commercial Entities	Others	Recyclers
Central Region (Kuala Lumpur, Selangor, Putra/Cyber Jaya)	150	40	40	25	100
Northern Region (Kedah, Perak, Penang)	120	25	25	25	50
Southern Region (Johor, Negeri Sembilan, Melaka)	120	25	25	25	25
Eastern Coast (Kelantan, Terengganu, Pahang)	90	20	20	25	25
合計	480	110	110	100	200

In conducting the survey, the contracted local consultant hired interviewers and trained them before sending them for the field interviews.

Training of the interviewers

Field interview survey

2.1.2 Major Findings of the Survey

Major findings from the household E-waste inventory/flow survey are outlined as follows.

(1) Average age of use

As shown in the figure below, Air conditioner and refrigerator scored the longest age of use, subsequently followed by washing machine/cloth dryer, and TV while personal computer and mobile phone had relatively shorter age of use. Comparing the urban and rural areas, rural household kept longer period of using household E-appliances for all 6 items.

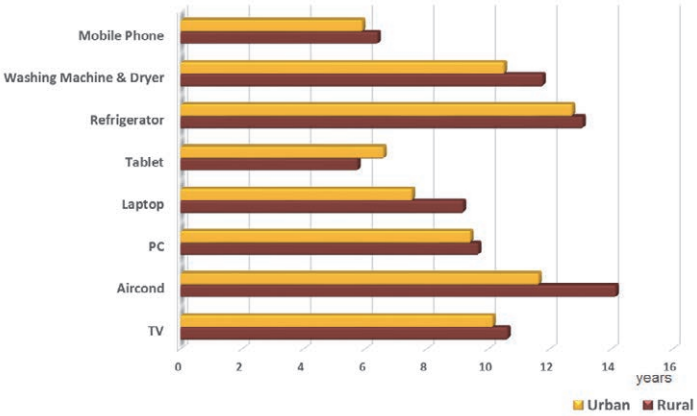


Figure 2-1: Average Age of Use by types of E-appliances for urban and rural regions

(2) Ownership of household E-appliances

The number of E-appliances owned by household was the most in mobile phone of 4 units per hosehold while tablet PC was the least as less than 1 unit per household. As shown in the figure below, number of E-appliances ownership was different depending upon income level of household.

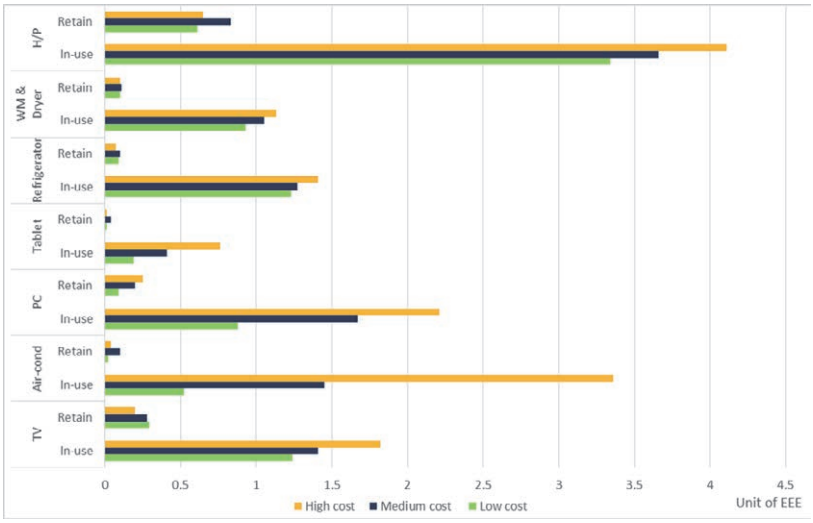


Figure 2-2: Number of household E-appliances ownership by income levels

(3) E-waste Flow (from generation sources to its final destinations for recycling, treatment and disposal

As shown in the figure below, the flow of E-waste is diverse. The result of E-waste flow survey indicated that the trade prices of E-waste were the highest when they were sold to repair shops and secondhand dealers while they were sometimes tranferred for free to scrap dealers and/or volunteer organizations. The prices of E-waste strongly depends upon the market prices of recyclable materials contained in E-waste.

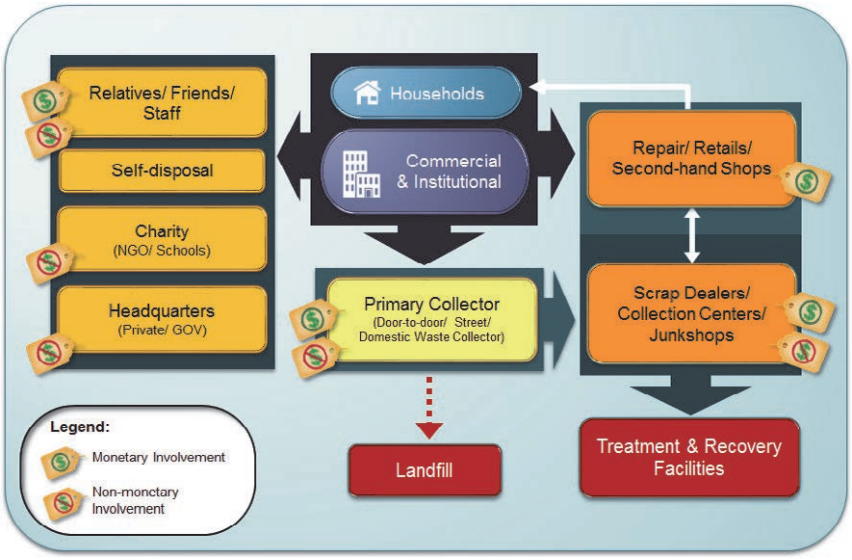


Figure 2-3: Outline of E-waste Flow in Malaysia

Detailed results of the survey is shown in the Annex to this Report.

(4) Current and future projection of household E-waste generation in Malaysia

JICA Expert Team, working together with DOE, conducted projection of the current and future generation of E-waste (6 items) based on the data available domestically and internationally of E-appliance shipment in accordance with the methodology below.

(a) Collection of domestic sales of E-appliances in Malaysia

Domestic sales of E-appliances in Malaysia is to be estimated by applying the equation below.

Domestic sales (units/year)

＝Domestic production (units/year)＋Import (units/year)－Export (units/year)

＊More precisely, wholesale units from domestic stock needs to be added to the above.

Due to limited availability of shipment and sales data, the Project utilized the sales data of relevant E-apploances during 1985-2015, which are obtained from the following data sources.

- JEITA (Japan Electronics and Information Technology Industries Association)
- JEMA (The Japan Electrical Manufacturers' Association)
- JRAIA (The Japan Refrigeration and Air Conditioning Industry Association)
- Euromonitor International Ltd. (Consumer Asia)
- BMI Research

(b) Projection of the future domestic sales

The projection of the future domestic sales of relevant E-appliances are made by utilizing the domestic sales data of past 30 years in accordance with the assumptions below:

- Assuming that the marginal prevalence rate is 80%, the annual sales of E-appliances that reached 80% would be constant in the future as the replacement of the owned ones; and
- As to the E-appliances that did not reach the prevalence rate of 80%, their domestic sales would increase in the way of past trend until they reach 80%.

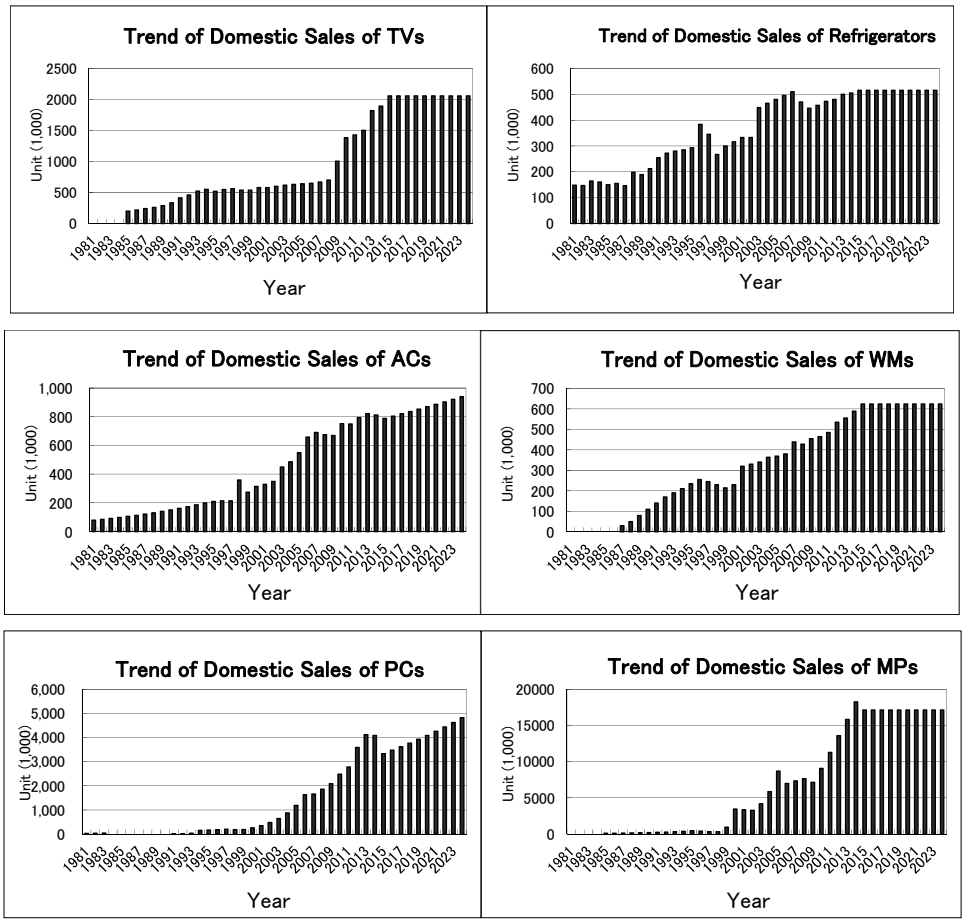


Figure 2-4: Projection of domestic sales of E-appliances (6 items)

(c) Projection of current and future generation of E-waste (6 items)

First, the so-called remaining probability (percentage of the E-appliance in use after its sale in subsequent years) of the sold and owned E-appliances were estimated by utilizing the following data:

- Average age of use by types of E-appliances (obtained from E-waste inventory and flow survey)
- Ownership of E-appliances by household (obtained from E-waste inventory and flow survey)
- Annual domestic sales data of E-aapliances for the past 30 years (1985-2015)

Projection was made by applying the so-called “Weibull Distributio Model, which is a probability distribution model widely utilized to statistically describe degradation phenomenon and life of various machineries and equiipment including home appliances.

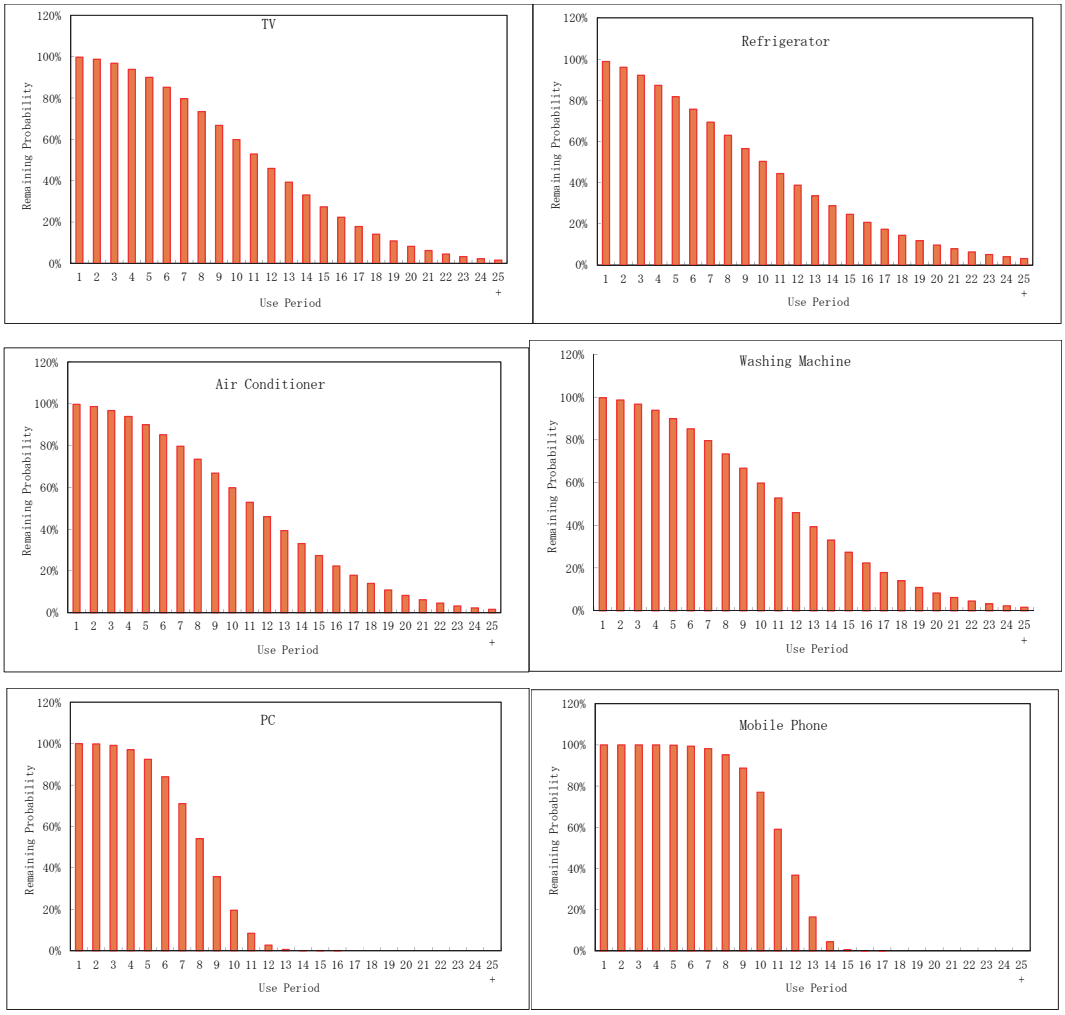


Figure 2-5: Projection of the trend of remaining probability of 6 items

(d) Projection of the current and future generation of E-waste (6 items)

By utilizing the estimations obtained in (b) and (c) above, the current and future generations of E-waste are estimated by each of 6 items, as shown in the figure on next page.

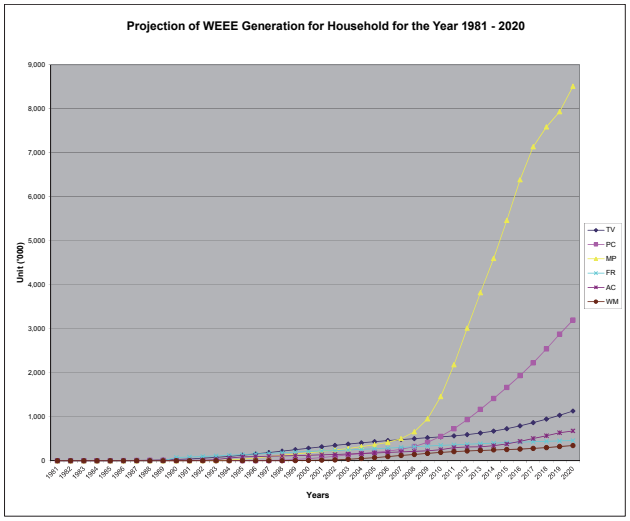


Figure 2-6: Estimated generation of E-waste by each of 6 items (2016-2025)

As shown in the figure above, personal computers and mobile phones, that have comparatively shorter lives of use with lower prevalence rates, are expected to rapidly increase their generation as E-waste while the other 4 items will also gradually increase their generation. More detailed data on future projection of E-waste generation is available in Annex to this report.

2.1.3 Establishment of the E-waste Inventory Database and the Mechanism for Regular Data Renewal (Activity 1-3）

To build and regularly renew E-waste inventory, DOE must establish a concrete mechanism of data collection from the relevant stakeholders.

The E-waste inventory consists of the database to estimate the future generation of E-waste and the database of annual amount of E-waste collected and recycled in Malaysia. By combining these two databases with their regular renewal, the future needs of E-waste recycling can be identified to formulate the future policy, strategy and plan of E-waste management.

To build and maintain these two database, DOE is required to collect baseline data from relevant stakholders. As for the databse to estimate the future generation of E-waste, the data on domestic shipment and sales as well as import and export of relevant E-aplliances (6 items) need to be collected from E-appliance manufacturers, traders and custom department. Regarding the amount of E-waste collection and recycling, the data must be provided by E-waste collectors and recyclers.

As there is no above-mentioned data collection mechanism in Malaysia, the Project set the obligation of providing these data upon relevant stakeholders in the “Household E-waste Reporting Guideline”.

Once, these data sets are provided by the relevant stakholders in accordance with the enforcement of the guideline, E-waste inventory will be regularly updated to increase the accuracy of the future estimated generation of E-waste, by which more appropriate E-waste management plan can be formulated.

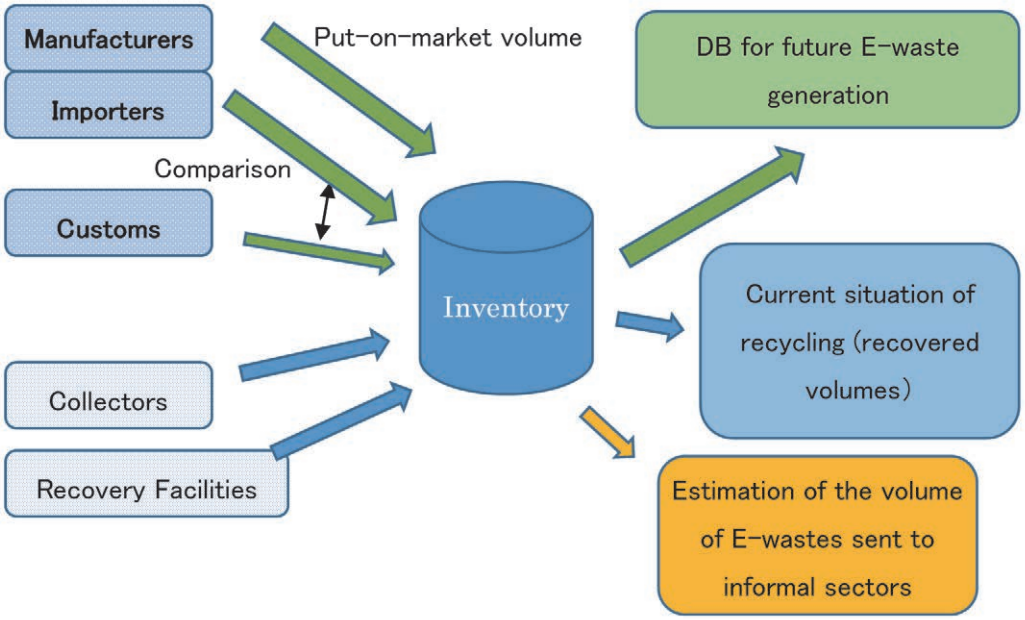


Figure 2-7: Image diagram of E-waste inventory data collection and update mechanism

2.1.4 Survey on Good Practice of Collection and Recycling of Fluorescent Tubes, Rechargeable Batteries and Small-Sized E-waste (Activity 1-4)

In the beginning of the project, JICA Expert Team, inviting staff memebrs of DOE, held a workshop on "Japanese Good Practice of Collection and Recycling of Fluorescent Tubes, Rechargeable Batteries and Small-Sized E-waste", in which overall legal and regulatory mechanism and good practices of managing these items were presented and discussed.

Subsequently, the Project conducted the counterpart training program in Japan in January 2016. The program included a detailed lecture on the Japanese institutional mechansim of small-sized E-waste management by the Ministry of Economy, Trade and Industry (METI), lectures on local level efforts of small-sized E-waste by Toyama Prefectural Government and site visits and interviews to small-sized E-waste recyclers.

In November 2016, DOE and JICA Expert Team jointly conducted the E-waste field visits to Taiwan, in which the overall mechanism of fluorescent tubes collection and recycling with fee collection and disbursement mechanism were surveyed through the interviews to the relevant government agencies and visits to recycling facilities.

2.1.5 Recommendations on Collection and Recycling Mechanism of Fluorescent Tubes and Rechargeable Batteries (Activity 1-5)

The Project recommended that fluorescent tubes and rechargeable batteries would be added to the 6 items of the new mechanism of household E-waste management to be introduced in the future when the following conditions are met by the DOE's actions.

(1) Projection of the current and future generation of fluorescent tubes and rechargeable batteries based on collection of the relevant data;
(2) Establishment of the collection mechanism based on separation of these items at sources of generation;
(3) Setting the standard for recycling and treatment of these items and identification of standard technological system for each item;
(4) Estimation of collection and recycling cost based on (3) above; and
(5) Establishment of cost sharing mechanism (including estimation of recycling fee of each item)

2.1.6 Identification of small-sized E-waste to be regulated (Activity 1-6)

Since no official discussion had never been made in Malaysia on management of small-sized E-waste in the beginning of the Project, JICA Expert Team first briefed to DOE on the instituional mechanism of small-sized E-waste in Japan including the types of small-sized E-waste subject to this mechanism.

As to the small-sized E-waste items to be regulated, JICA Expert Team and DOE reached the common understanding that it would involved big risks if DOE determined the regulated items with very limited data on them. Instead, the Project decided to temporarily designate 18 small-sized E-waste items to further investigate their amount and potential environemntal impacts before determining their regulation.

The above 18 small-sized E-waste items were selected from the 28 items controlled under the "Japanese Small-Sized E-waste Management Act" in view of their prevalence in Malaysia.

（Desiganted Small-Sized E-waste Items）

① Telephones (landline), facsimiles and other wired communication device
② Radio receivers
③ Video equipment (digital camera, video camera, DVD recorder/player, car navigation, car TV, etc.)
④ Audio equipment (digital audio player, stereo set, etc.)
⑤ Printers
⑥ Image/video display equipment (projectors)
⑦ Sewing machine (electric)
⑧ Electrical tools
⑨ Electric office equipment (calculator, electronic dictionary, word processor, etc.)

⑩ Optical Camera

⑪ Electrical kitchen equipment (Electrical rice cooker, microwave, etc.)

⑫ Other household electrical equipment (clothes iron, electrical vacuum sweeper, hair dryer, etc.)

⑬ Electrical exercise machinery

⑭ Electrical gardening machinery/equipment

⑮ Electric/electronic music instruments

⑯ Electric/electronic toys

⑰ Air conditioning equipment (electric fun, dehumidifier, etc.)

⑱ Electric/electronic measuring equipment (health meter, blood pressure gauge, electronic thermometer, etc.)

2.2 Task 2: Formulation of the Guidelines for Household E-waste Collection

The following project activities were carried out as Task 2.

2.2.1 Preparation of the requirement for household E-waste collectors (Activity 2-1）

Referring to other countries regulations as well as the existing relevant regulations in Malaysia on collectors of municipal solid waste and industrial scheduled waste, the requirement for household E-waste collectors are determined and provided in the "Guideline for Collection of Household E-waste" as shown in the table below.

Table 2-2: Requirement for Household E-waste Collectors

Items	Requirement
Collection and transfer	・ Official registration as household E-waste collector at DOE ・ Transfer of E-waste to licensed household E-waste recyclers
Handling and storage	・ Proper storage of collected E-waste ・ Prohibition on dismantling of E-waste ・ Storage facility requirement
Transfer	・ Responsibilities regarding transfer of E-waste to the licensed E-waste recyclers ・ Prohibition on transfer of E-waste and any of its components and materials to informal/unauthorized dealers ・ Reporting duties of collection activities to DOE

2.2.2 Enforcement Viability Evaluation of the Collectors' Requirement (Activity 2-2)

"The Guideline for Collection of Household E-waste", including the requirement determined in 2.2.1 above, was tested of its enforcement viability in the pilot project on E-waste collection, which was implemented during 2017-2018 (Detail of the pilot project is shown in Annex to this Report).

2.2.3 Identification of Improvement Points and Incorporation into the Guideline (Activity 2-3)

Based on the results of pilot project above, the contents of the Guideline are added and revised for its finalization.

2.2.4 Assumption of Household E-waste Collection System for Analysis of Collection Cost (Activity 2-4 and 2-5)

In its beginning stage, the Project assumed the need of establishing the logistic centers for E-waste collection and transportation all over the territory of Malaysia. A comprehensive survey was planned to indetify the locations of such centers.

However, as the Project found that there are sufficient collection and transportation infrastructure and network had been built by the existing collectors, household E-waste collection system was assumed with the existing infrastructure and network of collectors for its cost analysis. The assumed collectors of hosuehold E-waste were as shown in the table below.

Table 2-3: Assumed Key Players in Collection of Household E-waste

Category	Collectors	Collectors' Profile
Leading NGO in collection of recyclable materials	▪ Tzu Chi	▪ The most active NGO in collection and recycling in Malaysia. Nation-wide collection of recyclable materials are carried through their local collection centers for the long time.
Municipal solid waste (MSW) collection concessionaires	▪ Alam Flora ▪ SWM Environment ▪ E. Idaman	▪ MSW collection companies having concession agreements with the Malaysian Government. Each company is respectively in charge of collecting MSW in Northern, Central and Southern regions of Malaysian Peninsula.
Retailers of Household E-appliances	▪ Senheng ▪ TBM ▪ AEON	▪ Large-scale retailers of household E-appliances having nation-wide logistic network.

As to the secondary trnasportation of household E-waste after its collection from generation sources, the above collectors used their own trucks to the recyclers or recyclers collected them from the collectors' facilities. In estimating the collection cost of hosuehold E-waste, the Project assumed the collection system as illustrated in the figure on next page.

Figure 2-8: Assumption on collection route of Household E-waste

The key assumptions applied in estimation of the collection cost of household E-waste are as follows.

(For Malaysian Peninsula)

① The Malaysian Peninsular was divided into northern, central and southern region, each of which has the final receivers of household E-waste. Their locations are determined based on the existing facilities of major recyclers of scheduled waste.

② On average, 5 ton capacity trucks drive 300 kilometer per day to collect and transport household E-waste.

(Sabah and Sarawak Regions)

① As there is no potential recycler of household E-waste identified in Sabah and Sarawak regions, it was assumed that the collected E-waste would be transported to the recycling facilities located in Malaysian Peninsula by utilizing both land and sea transport.

② Sea transport will start from the 3 (three) sea ports in Sabah and Sarawak Regions. Daily drive of 300 kilometer by trucks will be made within Sabah and Sarawak Regions and Malaysian Peninsula respectively.

The details of collection cost estimation is specified in the "Guideline on Recycling Fee" in the Annex to this Report.

2.2.5 Preparation of the Guideline for Collection of Household E-waste (Activity 2-6)

Based on the results of the activity above (2-1~2-5), the Project prepared the Guideline for Collection of Household E-waste. In its prerparation, the Project regularly held the meetings of Taskforce 1 organized by the relevant stakeholders while having workshops and seminars on the Guideline. The final meeting of Taskforce 1 held in April 2018 approved the final Guideline (See the "Guideline for Collection of Household E-waste in the Annex to this Report.)..

2.3 Task 3: Formulation of the Guideline for Household E-waste Recycling

The following project activities were carried out as Task 3.

2.3.1 Survey on E-waste recycling and pollution control technologies (Activity 3-1)

The Project conducted the field survey on and interviews to the existing recyclers of scheduled waste licensed by DOE and repair/refurbish facilities of E-waste (including informal ones). Key findings are as follows:

- There is a market of repaired second-hand E-appliances, where a certain amount of household E-waste entered. In the process of repair, some improper handling such as release of CFCs and disposal of residues were found. There is no legal and regulatory control of these repair and refurbish activities so that the current situation will continue without any legal and regulatory mechanism.
- Some of the existing recyclers have its own wide collection network. If proper financial mechanism or incentives are built and provided, proper collection and recycling can be built for 6 items.
- Some of the existing recyclers dealt with household E-waste by utilizing their own technologies, in which valuable recyclable materials are taken with little attentions to proper handling of hazardous substances such as lead and mercury as well as CFCs due to their technological limitation and lowered economic feasibility by investing in such technologies including pollution control equipment.
- No law and regulation is provided regarding the handling of hazardous substances contained in household E-waste. There is also no official indicators/parameters of evaluating the performance of recyclers.
- Although some existing recyclers have technological capabilities of recycling household E-waste, they relied only on their technological information and data, which are sometimes not in compliance with the international standard for E-waste recycling.
- It is critical to set the common technological standard for recycling of household E-waste based on the internationally authorized rules.

2.3.2 Identification on the Requirement for Environmentally Sound Recycling, treatment and disposal of household E-waste (Activity 3-2）

In determining the requirement for environmentally sound recycling of household E-waste, the Project reviewed the technological standards applied in Japan, Taiwan and EU countries. Based on these reviews, the Project decided to provide the following key contents in the Guideline for Recycling of Household E-waste.

- Introduction of licensing system for household E-waste recyclers;
- Rules of handling focused materials for each type of regulated household E-waste items;
- Minimum recycling rate targets set by each type of regulated household E-waste items; and
- Introduction of reporting obligation of licensed recyclers on their performance in accordance with the regulated reporting form.

2.3.3 Preparation of the Guideline for Recycling of Household E-waste (Activity 3-3）

Based on the results of Project Activities above (3-1 and 3-2), the Project prepared the Gudeline for Recycling of Household E-waste. In its prerparation, the Project regularly held the meetings of Taskforce 2 organized by the relevant stakeholders while having workshops and seminars on the Guideline. The final meeting of Taskforce 2 held in April 2018 approved the final Guideline (See the “Guideline for Recycling of Household E-waste in the Annex to this Report.).

2.4 Task 4: Formulation of the Guideline for Establishment of Household E-waste Reporting System

The following project activities were carried out as Task 4.

2.4.1 Survey on Reporting System in Other Countries (Activity 4-1)

To identify the data to be reported by the relevant stakholders of E-waste management and determine their reporting forms, the Project made a review of the existing reporting mechanism in Japan, Taiwan and other countries.

2.4.2 Identification of Data Reporting Requirement and Preparation of Reporting Forms (Activity 4-2）

Based on the reviews conducted in Section 2.4.1 above, the data reporting requirement were identified for each stakeholder of household E-waste management (including manufacturers and importers of household E-appliances, E-waste collectors, and recyclers). They were translated to respective reporting forms as a part of the Guideline for Household E-waste Reporting System.

2.4.3 Identification of the Reporting System for Determining the Recycling Fee of Household E-waste (Activity 4-3)

The Project plans to collect recycling fees from manufacturers and importers of the regulated hosuehold E-appliances (6 items) based on their put-on-market amount. To determine the recycling fees, the overall system of controlling the reports by manufacturers and importers of household E-aapliances and E-waste collectors and recyclers needs to be established. Therefore, the Project, with the reporting forms prerpared in 2.4.2 above, provided the overall reporting system for household E-waste management in the Guideline for Household E-waste Reporting System.

2.4.4 Preparation of the Guideline for Household E-waste Reporting System (Activity 4-4)

Based on the results of project activities above (4-1~4-3), the Project prepared the Guideline for Recycling of Household E-waste. In its preparation, the Project regularly held the meetings of

Taskforce 1 organized by the relevant stakeholders while having workshops and seminars on the Guideline. The final meeting of Taskforce 1 held in April 2018 approved the final Guideline (See the "Guideline for Household E-waste Reporting System in the Annex to this Report.).

2.5 Task 5: Formulation of the Guideline for Determination of the Recycling Fees of Household E-waste

The following project activities were carried out as Task 5.

2.5.1 Analysis of the Cost Required for Sustainable Collection and Environmentally Sound Recycling of Household e-waste (Activity 5-1)

Based on the collection system of household E-waste assumed in Section 2.2.4 and the Guideline for Recycling of Household e-waste prepared in Section 2.3, The cost of collection and recycling was estimated for each regulated E-waste item. The methodology and results of estimation is detailed in the Guideline for Recycling Fee of Household E-waste in the Annex to this Report.

2.5.2 Estimation of the Recycling Fee paid by Consumers and EPR Fee paid by Manufacturers and Importers of regulated E-Appliances (Activity 5-2)

In the beginning of the Project, it is planned that the cost of hosuehold E-waste collection and recycling would be shared by consumers and manufacturers/importers of regulated E-appliances.

However, a series of discussions with DOE and other relevant government agencies, the Project reached the common understanding on the serious difficulty of chargeing the recycling fees directly to the consumers under the current political and economic situations in Malaysia. Therefore, we finally decided to combine recycling fee and EPR fee to be primarily shouldered by manufacturers and importers of the regulated E-appliances as the "Recycling Fee".

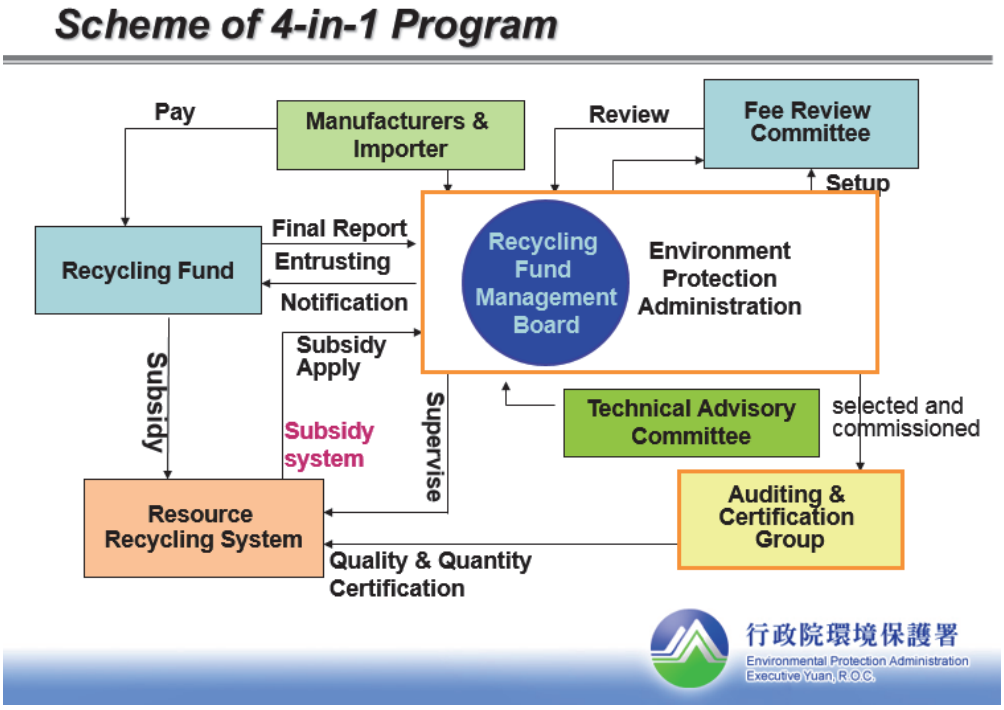
On the other hand, the Project agreed to allow the manufacturers and importers to request consumers of partially shouldering the recycling fee at the time of selling the new regulated E-appliances by incorporating the fee into their prices.

Detailed recycling fee collection mechanism is shown in the Guideline for Household Recycling Fee in the Annex to this Report.

2.5.3 Survey on Fee Collection and Disbursement Mechanism in Household E-waste Management in Other Countries (Activity 5-3)

There is an example of manufacturer/importer based fee collection and disbursement mechanism for household E-waste management in Taiwan. As shown in the figure on next page, Taiwan established the Recycling Fund Management Board under the Environment Protection Administration with the following roles and responsibilities.

- Management of fee collection and disbursement mechanism
- Supervision of E-waste flow from generation sources to their final destinations
- Real time supervision of E-waste recycling facilities with CCTV
- Registration, licensing and management of relevant stakeholders



Source: EPA: Recycling Fund Management Board "Innovative Management System of Resource Recycling in Taiwan".

Figure 2-9: Fee collection and Disbursement Mechanism in Taiwan

The results of the above survey on fee collection and disbursement mechanism in Taiwan was reported in Taskforce meetings to identify the issues of its application to Malaysia.

Table 2-4: Recycling Fee Collection and Disbursement Mechanism in Taiwan and its implications for application in Malaysia

Mechanism in Taiwan	Implications for Application in Malaysia
1. Mechanism for determining the recycling fee and subsidy rates ▪ Recycling Fee rate review committee decides the fee and subsidy rate in consideration of the E-waste collection and recycling rates, market values of recyclables and energy-saving potentials of E-appliances. ▪ 20% of the collected recycling fees are reserved for management and operation of the overall mechanism.	▪ Establishment of similar committee is required. ▪ The cost of managing the overall mechanism needs to be incorporated in estimating the total amount of recycling fee collected in addition to the total cost of collection and recycling of household E-waste.
2. Supervision of E-waste Recyclers ▪ Supervisors of the E-waste recyclers are dispatched on site of each recycling facility.	▪ Human resources required for supervising E-waste recyclers need to be carefully considered.
3. **Supervising points** ▪ Check of received E-waste (any dismantling or missing of key valuable components and materials) ▪ Number of units and weight	▪ How to check the input and output of E-waste (by number of unit or by weight). ▪ How to supervise the recyclers dealing with other E-

Mechanism in Taiwan	Implications for Application in Malaysia
▪ Check the numbers and weights of designated components and materials before and after recycling (including all recyclables and residues)	waste than regulated items (Separation of process lines, etc.)

2.5.4 Recommendations on Appropriate Fee Collection and Disbursement Mechanism in Malaysia (Activity 5-4)

Based on the activity 2.5.3 above, the Project recommended the fee collection and disbursement mechansim to be managed by the "Recycling Fund Management Body" as illustrated in the figure below.

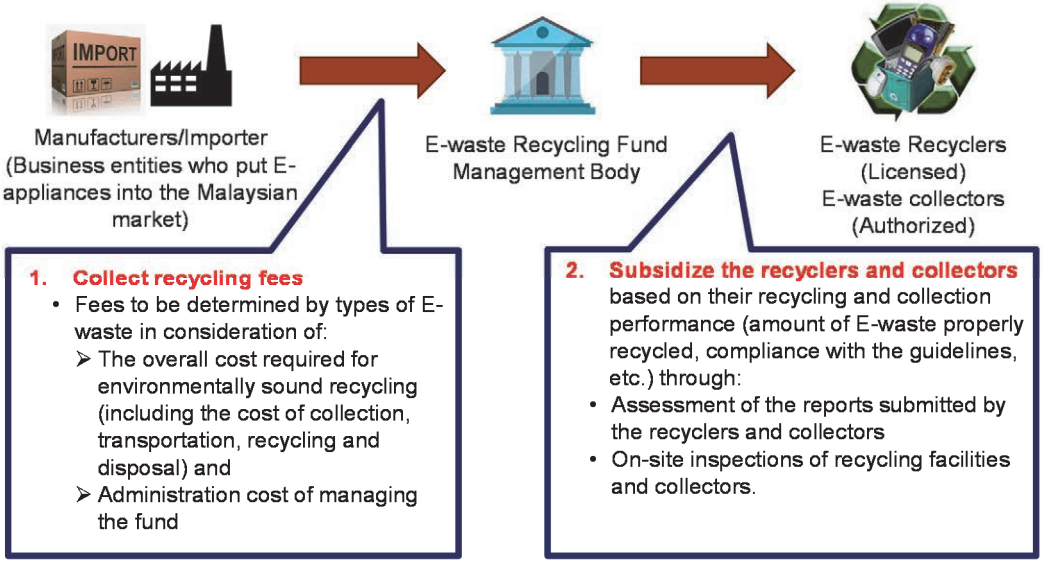


Figure 2-10: Recommended Recycling Fee Collection and Disbursement Mechanism under the Recycling Fund Management Body in Malaysia

In accordance with the recommended mechanism above, the schedule of "Recycling Fund Management Body" was formulated as the Guideline for establishment of Recycling Fund Management Body as the project activity under Task 6 below.

2.5.5 Preparation of the Guideline for Household E-waste Recycling Fee (Activity 5-5)

Based on the project activities above (5-1~5-4), the Gudeiline for Hosuehold E-waste Recycling Fee was prepared. In its prerparation, the Project regularly held the meetings of Taskforce 2 organized by the relevant stakeholders while having workshops and seminars on the Guideline. The Project also held a series of discussions with the manufacturers and importers of regulated E-appliances such as "Recycling Worling Group of the Japanese Chamber of Trade and Industry, Malaysia (JACTIM), the members of which aggregatively shared appoximately 60% of major E-aapliances sales in Malaysia. The meeting of Taskforce 2 held in April 2018 approved the final Guideline (See the "Guideline for Househild E-waste Recycling Fee in the Annex to this Report.).

2.6 Task 6: Formulation of the Guideline for Establishment and Management of Household E-waste Recycling Fund

The following project activities were carried out as Task 6.

2.6.1 Review of Other Countries' Examples (Activity 6-1: Same as Activity 5-3)

The Project conducted a comparative review of the financial (fund) management mechanism in Japan, Taiwan and EU countries and hold a workshop to share the knowledge and discuss their implications for their application in Malaysia.

2.6.2 Establishment of the Basic Framework of the Financial (Fund) Mechanism in Malaysia (Activity 6-2: Same as Activity 5-4)

Based on the project activity in Section 2.6.1 above, the basic framework of financial (fund) mechanism in Malaysia was recommended.

2.6.3 Preparation of the Schedule of Recycling Fund Management Body (Guideline for Management and Operation of the Recycling Fund) (Activity 6-3)

Based on the project activities above (6-1 and 6-2), the Schedule of Recycling Fund Management Body (Guideline for Management and Operation of the Recycling Fund) was prepared. In its preparation, the Project regularly held the meetings of Taskforce 3 organized by the relevant stakeholders while having workshops and seminars on the Guideline. The results of the Taskforce 3 meetings were also shared with the members of Taskforce 1 and 2 for discussion and exchange of opinions. The meeting of Taskforce 3 held in April 2018 approved the final Schedule (See the "Schedule of Recycling Fund Management Body in the Annex to this Report.).

2.7 Task 7: Implementation of the Pilot Project on Household E-waste Collection

The following project activities were carried out as Task 7.

2.7.1 Identification of the current flow of household E-waste into informal sector and its pricing mechanism (Activity 7-1)

(1) Interview Survey to Household Appliances Delivery workers

According to the prior surveys carried out in Malaysia, many of the hosuehold E-waste were collected by the delivery workers of new E-appliances and transferred to informal recyclers. Based on this finding, the Project conducted the interview survey to the delivery workers. They basically delivered 3 (three) items, i.e. TV, Refrigerator, and Washing Machine (including cloth dryer). On the other

hand, air conditioners are delivered by by installers while most of the personal computers and mobile phones are directly taken by consumers on site with no delivery.

The results of interview survey to delivery workers are as follows.

① Fees charged to consumers at the time of collecting the used E-appliances

As to the 3 (three) items above, delivery workers charge the fees to the consumers when collecting the replaced E-appliances.

Table 2-5: Collection Fees of Replaced E-appliances by Delivery Workers

No	Items	Fee Paid by Consumer to Delivery Workers (RM/pcs)
1	Television	RM 5- RM 10
2	Washing Machines	RM 5- RM 15
3	Refrigerators	RM 5- RM 20

② Prices of selling the collected E-waste from consumers

Depending upon the conditions of collected E-waste, delivery workers sold them to repair/second-hand shops or scrap dealers. The variation of selling prices of collected E-waste are as follows

Table 2-6: Selling Price to Repair/Second-Hand Shops

No	Items	Selling Price by the Delivery Workers to repair shops / secondhand shops (RM/pcs)
1	Television	RM 30- RM 50
2	Washing Machines	RM 20- RM 50
3	Refrigerators	RM 50- RM 80

Table 2-7: Selling Price to Scrap Dealers (Informal Recyclers)

No	Items	Selling Price by the Delivery Workers to Informal Sector (RM/pcs)
1	Television	RM 2- RM 10
2	Washing Machines	RM 5- RM 20
3	Refrigerators	RM 5- RM 40

③ Profit margins of delivery workers

Profit margins of delivery workers are estiamted as follows.

Table 2-8: Profit Margins of Delivery Workers

No	Items	Range of Income Generated for the Delivery Workers (RM/pcs)
1	Television	RM 2- RM 50
2	Washing Machines	RM 5- RM 50
3	Refrigerators	RM 5- RM 80

Depending upon the conditions of collected E-waste, there was a big difference in their selling price although delivery workers usually obtained some income even by selling them to scrap dealers.

(2) Interview survey to informal dealers of E-waste

The Project also carried out the interview survey to informal dealers of E-waste. It was found that most of them did not accept refrigerators and washing machines due to the following reasons:

- Big size and difficult in handling as well as necessity of larger space for their storage;
- High cost of transportation to the buyers; and
- Low market values and profit margins

As to the other 4 (four) items (TV, Air Conditioners, Personal Computers, and Mobile Phones), they bought from household, offices and retailers with a certain price. Their selling price to the informal recyclers are as shown in the table below.

Table 2-9: Selling Prices to Informal Recyclers (Scrap Dealers)

Selling Prices (RM/pcs)	
Television	RM18.50
Air-conditioner	RM59.80
Computer	RM17.60
Handphone	RM2.00

Although the survey did not obtain the profit margins of these informal dealers, it can be utilized as the parmeters to determine the level of monetary incentives to be given to them diverse their flow to the licensed recyclers as shown in the table below.

Table 2-10: Assumptions of profit margins of informal dealers

Items	Selling Price	Buying Prices			
		25%	50%	75%	100%
	RM/pcs				
Television	18.50	13.90	9.30	4.60	FOC
Air-conditioner	59.80	44.90	29.90	15.00	FOC
Computer	17.60	13.20	8.80	4.40	FOC
Handphone	2.00	1.50	1.00	0.50	FOC

2.7.2 Pilot Project (Social Experiment) of Household E-waste Collection (Activity 7-2）

To assess enforcement viability of the Household E-waste Collection Guideline, social experiment of E-waste collection was condicted for 6 months from October 2017 to March 2018 in cooperation with the existing collectors of municipal solid waste and recyclable materials.

Opinions and recommendations given by the pilot project particpants all through the period of pilot projects were prensented in Taskforce 1 meetings to incorporate them into the Guideline for its

finalization. The details of the pilot porject is described in "Outline and Results of Pilot Project on Hosuehold E-waste Collection and Reporting" in the Annex to this Report.

2.8 Task 8: Implementation of the Pilot Project on Household E-waste Recycling and Fee

The following project activities were carried out as Task 8.

2.8.1 Identification on Current Conditions of E-waste Recycling (Handling of Focused Materials and Recycling Rate) (Activity 8-1)

The pilot project on recycling of household E-waste was implemented for the purpose of:

- Identifying the achievable recycling rate target for each regulated E-waste item; and
- Identifying the standard process for proper handling and treatment of focused materials

To serve these purposes, the Project, selecting 10 key local E-waste recyclers, conducted so-called "Field Recycling Test", including dismantling and separation process in their premises.

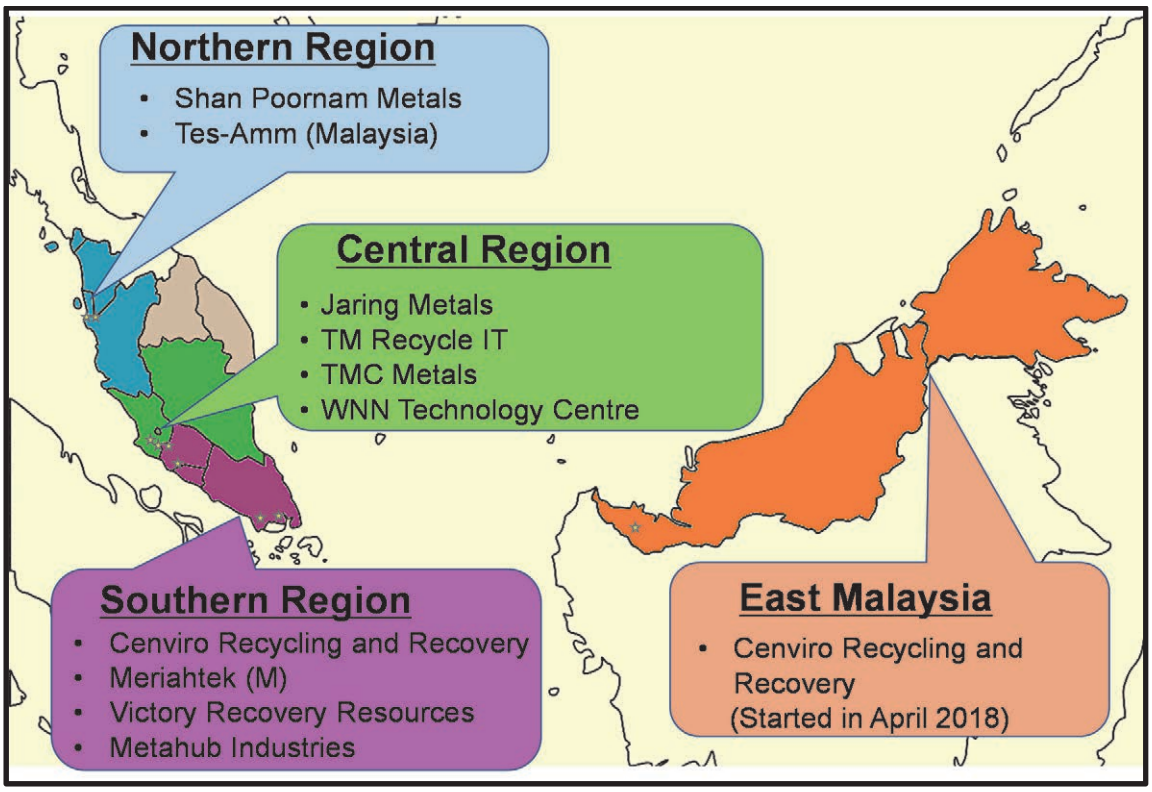


Figure 2-11: Distribution of Key local E-waste Recyclers participating in Pilot Project

The total number of E-waste units tested reached, in total of 6 regulated items, more than 1,000. Based on the dismantling and separation data of these items, the standard recycling process and recycling rate targets were determined for each regulated E-waste item.

Table 2-11: Number of E-waste Units tested in the Pilot Project

Item		Quantity (unit)
Television (TV)	CRT	110
	Flat Screen	90
Washing machine (currently top/front loading type combined)		31
Air-conditioning		25
Refrigerator		60
Desktop PC	CPU	118
	CRT monitor	120
	Flat screen	132
Notebook PC		137
Mobile phone	smart phone	115
	old type	85

(1) Implementation Procedure of Field Recycling Test

The field recycling test was implmented in accordance with the procedure given below.

① Preparation of the E-waste units and dismantling/separation tools

DOE and JICA Expert Team visited 10 selected E-waste recyclers to determine the types and number of E-wste units to be tested. Each selected recycler prepared the dismantling and separation lines with necessary equipment and tools.

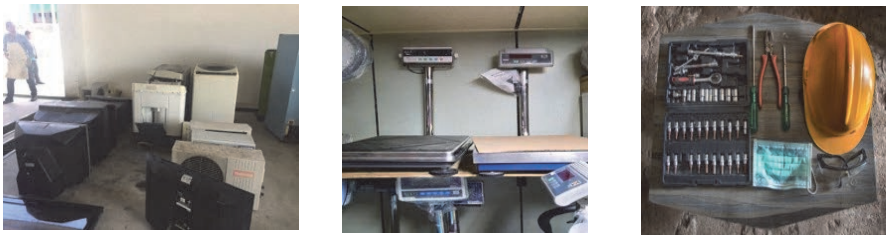


Figure 2-12: Collected E-waste and Dismantling/Separation tools by Recyclers

② Labelling and Weighing of each E-waste

Before initiating the field recycling test, every unit of collected E-waste was weighed, recorded, and labelled with its unique number and identitiy.

Figure 2-13: Weighing, Recording and Labelling of E-waste

③ Implementation of Field Recycling Test (Dismantling and Separation)

Each collected E-waste was dismantled and separated.

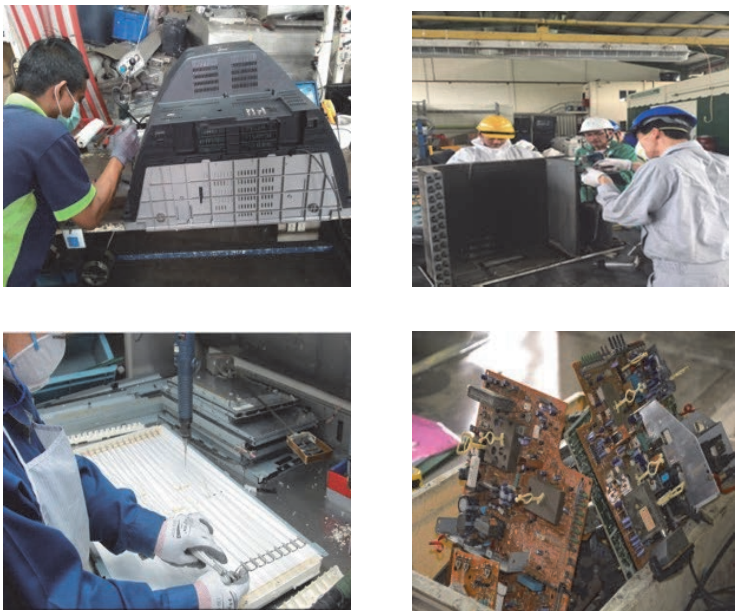


Figure 2-14: Dismantling and Separation Test of E-waste

④ Weighing and recording of dismantled and separated components and materials

All the dismantled and separated components and materials are weighed and recorded by types per unit. The data collected from this field recyckling test was utilized as the baseline for determining the recycling rate target for each regulated E-waste item.

Figure 2-15: Weighing/Recording of Dismantled/Separated Components and Materials

(2) Analysis of the Recycling Test Results and incorporation into Recycling Guideline

Based on the analysis of the recycling test results above, the standard recycling process, rules of handling focus materials, and recycling rate targets are determined for each regulated E-wste item to be incorporated into the Guideline for Recycling of Household E-waste (See the Guideline in Annex to this Report.).

2.8.2 Analysis of E-waste Recycling Cost (Activity 8-2)

While conducting the field recycling tests in the recyclers' premises, the Project collected the cost data in relation to recycling from each recycler to estiamte the recycling cost for each regulated E-waste

item in accordance with the standard recycling process determined in Activity 8-1 above. Details of cost estimation procedure and its results are available in the Guideline for Household E-waste Recycling Fee in the Annex to this Report.

2.9 Task 9: Implementation of the Pilot Project on Household E-waste Reporting

The following project activities were carried out as Task 9.

2.9.1 Implementation of the Pilot Project on E-waste Flow Management with the use of E-waste Manifest System (Activity 9-1)

In cooperation with the existing collectors and recyclers of household E-waste, the Project conducted the field test of E-waste Manifest System as the measure for preventing the diversion of E-waste to informal sector. The opinions and comments from the particpating stakeholders are presented and discussed in Taskforce 1 meetings to determine how to incorporate them into addition and revision of the Guideline for household E-waste Reporting.

The issues identified form the pilot project to be considered for revision of the Guideline are:

- How to share the collection and recycling cost of E-waste with unknown/unidentified manufacturers;
- How to address the lowering of economic feasibility of recycling due to missing or extraction of valuable components and materials before reaching the E-waste items to the recyclers;
- How to count the number of units for desktop computers, of which monitors and CPUs does not come together as a complete unit;
- How to further categorize E-waste items to reflect the cost of their recycling (by size, weights, brands, etc.);
- How to address the issue of low feasibility of E-waste collection for some low valued items; and
- How to address the issue of lower buying price of E-waste by licensed E-waste recyclers in comparison with informal recyclers.

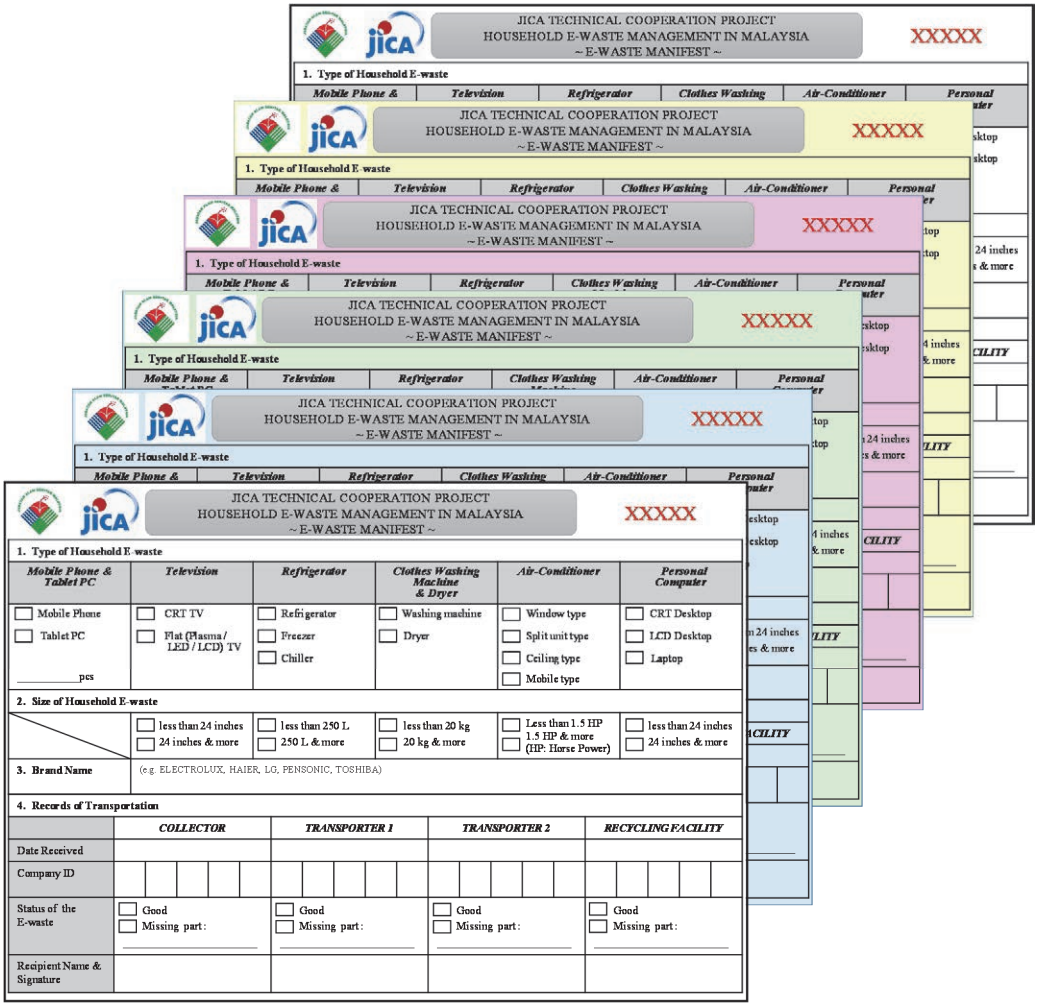


Figure 2-16: E-waste Manifest Sheets utilized in the Pilot Project

（A 6-ply manifest sheet was appropriated for each collected E-waste item）

The results of the pilot project and feedback from particpating E-waste collectors and recyclers were compiled and presented in the Taskforce 1 meetings for determining how to incorporate them into the Guideline for its finalization. The details of pilot project were given in the “Outline and Results of Pilot Project on Household E-waste Collection and Reporting in the Annex to this Report.

2.9.2 Testing of Reporting Put-on-Market Amount of the Regulated E-appliances (Activity 9-2)

Put-on-Market amount data of the regualted E-appliances is the key to estimation of the future E-waste generation as well as to determination of the recycling fee to be charged to manufacturers and importers. The Project prepared the draft reporting form of put-on-market amount/volume of E-aapliances and conduct a series of consultations with the manuafcturers and importers to finalize the form to be incorporated in the Guideline for Household E-waste Reporting System for its finalization.

2.10 Task 10: Implementation of the Awareness Raising Activities on Household E-waste Recycling

The following project activities were carried out as Task 10.

2.10.1 Development of the Tools for Raising Awareness of Citizen on Household E-waste Recycling (Activity 10-1)

In conjunction with the Project Launching Event held on 2 Novemebr 2015, JICA Expert Team and DOE developed a leaflet of household E-waste recycking designed to raise awareness of children by providing the key infromation and data with cartoon animation as shown in the figure below.

The project also published information materials on E-waste in the form of a calendar to provide more matured information designed to addres awareness raising of adults, as shown in the figure below.

These awareness raising tools were widely distributed by DOE and their local offices through various opportunities of their events and activities.

The project also established the Poject homepage within the website of DOE-NRE as the platform of disclosing all the project information, data, activites and output.

(URL: http://www.doe.gov.my/household-ewaste/)

Top Page

Introduction of the Project

Roles and responsibilities of the Stakeholders

Location of E-waste Collection Centers

Figure 2-17: Outline of the Contents of Project Homepage

Taking every possible opportunity of DOE-sponsored events and exhiitions, the Project provides exhibition tools consisting of dismantled household E-waste to visually display the components and materials that are valuable as recyvclables as well as hazardous to the environment if improperly handled, as shown in the figure below.

Exhibits of dismantled components of E-waste

Dismantled washing machine and flat TV

Audio equipment and laptop computer

Dismantled components of washing machine

Figure 2-18: Exhibits of dismantled E-waste (prepared by DOE)

2.10.2 Discussions on Awareness Raising Activities for General Public (Activity 10-2)

The Project, in cooperation with Strategic Communication Division of DOE, established the Working Group on Awareness Raising Activities to periodically discuss the plan of awareness raisining activitiy on household E-waste. This Working Group was in charge of developing and distributiopn of the awareness raising tools of the Project as well as discussions on the possible cooperation with other ministries such as the Ministry of Education to develop a joint awareness raising activities on household E-waste in schools as a part of Environmental Education.

2.10.3 Joint Implementation of Awareness Raising Activities between DOE and JICA (Activity 10-3)

As mentioned in Section 2.10.1 above, the Project conducted various awareness raising activites with DOE by actively participating in their events through setting up the booth for exhibition of awareness raising tools and materials.

In 2018, the Project also develped a short animation film titled as “Give Us New Life” to inform elementary and secondary school students of the importance of proper handling of hosuehold E-waste. This short fil,m will be provided as the basic education tool of household E-waste management through various media (See the awareness raising materials in Annex to this Report.).

2.11 Task 11: Capacity Development of DOE and Relevant Government Agencies on Household E-waste Management

The following project activities were carried out as Task 11.

2.11.1 Establishment of the Mechanism to Keep Stakeholder Consultation on Household E-waste management (Activity 11-1)

The Project estabished 3 taskforces as the platform to discuss the key 6 guidelines on household E-waste management (collection, recycling, reporting, fee, and recycling fund management mecchanism). The members of these taskforces are selected from the representatives of public and private stakeholders. The meetings of these taskforces provided the opportunities to exchange views of each stakholder to build consensus on the provisions of the guidelines.

These taskforces will be kept as the platform for discussions of new hosuehold E-waste management mechanism to be introduced with the enforcement of the “Scheduled E-waste Regulation”. The household E-waste Recycling Fund, which is recommended to be established to manage the fee collection and disbursement mechanism will also be supervised by the third-party committees organized by the key stakeholders of hosuehold E-waste management.

2.11.2 Implementation of Stakeholder Consultation Meetings (Activity 11-2)

The meetings of the 3 taskforces held for discussions on the provisions of 6 guidelines on household E-waste managenet provided practically provided the wide opportunities of consultations by various public and private stakholders as well as bulding the common understanding and consensus on introduction of the new mechanism for household E-waste management.

2.11.3 Development and Implementation of Capacity Development Program for DOE Staff Members on Household E-waste Management (Activity 11-3)

In the beginning of the Project, JICA Expert Team had a series of discussions with the cuntrpart staff members of DOE on capacity development program during the project period and agreed to implement the program consisting of the following project activities.

① A series of training seminars on good practices of household E-waste management in Japan and other countries (by JICA Expert Team);

② On-the-job training through joint field research on household E-waste management between JICA Expert and DOE (Field visits, investigations and interviews to relevant stakeholders);

③ Joint Implementation of the Pilot Project on household E-waste collection, recycling and reporting: and

④ Operation of Taskforces under the initiative of DOE

2.11.4 Seminars on Household E-waste Management in Japan and Other Countries (Activity 11-4)

The examples of household E-waste management in Japan and other countries are shared among the DOE staff members through seminars and workshops. JICA Expert Team also presented them in the seminar held in November 2015, co-organized with the Project Launching Ceremony.

2.11.5 Implementation of the Counterpart Training in Japan (Activity 11-5)

The project conducted the counterpart training in Japan twice during the project period. The outline of each counterpart training program is as shown below

(1) The 1st Counterpart Training in Japan (from 24 January to 31 January 2016)

① Trainees

Name	Position in DOE
Mr. ROSLI Zul	Senior Principal Assistant Director, Hazardous Substances Division
Mr. KHIRUDDIN Mohamad Idris	Senior Principal Assistant Director, Water & Marine Division
Ms. Fenny Wong Nyuk Yin	Principal Assistant Director, Hazardous Substances Division
Ms. ROSNI Ismail	Principal Assistant Director, Hazardous Substance Division
Ms. NOR IWANI Basri	Assistant Director, Hazardous Substances Division

② Training Program

Date	Place/lecturers	Training program
1/25	10:00-12:30 JICA Tokyo International Centre	▪ Briefing of the program
	14:00-15:00 JICA Expert Team	▪ Briefing of the purpose and expected output of the training program.
	15:00-19:00 Lecture 1 (by Mr. Takagi, Institute of Environment Design and Research)	▪ Outline of the Electric Home Appliance Act of Japan
1/26	10:00-12:00 Ministry of Economy, Trade and Industry	▪ Outline of small-size E-waste Act of Japan
	13:00-13:30 E-waste Recycling committee meeting	▪ Observation of the meeting
	14:30-15:30 Designated E-waste collection center in Tokyo	▪ Investigation of the activities in E-waste collection center ▪ E-waste manifest management system in collection centers.
1/27	8:30-10:30 Small-size E-waste Recycling Facility (Toyama)	▪ Investigation of small-size E-waste recycling
	10:30-11:30 Toyama Prefectural Government	▪ Local Policies, Strategies and Plans on small size E-waste management system
	11:30-12:00 Collection center of small size E-waste (Toyama)	▪ Observation of Collection Activities
	13:30-17:00 Household E-waste Recycling Facility (Toyama)	▪ Observation on recycling of 4 items (TV, Fridge, Washing Machine, and Air Conditioner)
1/28	9:30-12:00 Ministry of Economy, Trade and Industry	▪ Outline of Electrical Home Appliances Act and its Enforcement ▪ Recycling of Rechargeable batteries
	13:00-14:00 Electrical home appliance retailer (Tokyo)	▪ Manifest management, Fee collection, etc. by retailer
	14:30-17:00 Association of Electric Home Appliances	▪ Manifest information management system ▪ Fee collection and disbursement mechanism
1/29	9:30-11:00 Small retailer shop	▪ Activity of small retailer shop in E-waste Management
	13:00-15:30 Wrap-up (JICA HQ)	▪ Reporting on the findings from the counterpart training (by Trainees)

(2) The 2nd Counterpart Training in Japan (from 30 July to 5 August 2017)

① Trainees

Name	Position in DOE
Mr. Mokthar Bin Abdul Majid	Director Deputy General (Operation) Department of Environment
Mr. ROSLI Zul	Senior Principal Assistant Director, Hazardous Substances Division (Taskforce 2 Chairperson)
Ms. Fenny Wong Nyuk Yin	Principal Assistant Director, Hazardous Substances Division (Taskforce 3 Chairperson)
Ms. ROSNI Ismail	Principal Assistant Director, Hazardous Substance Division (taskforce 1 Chairperson)
Ms. Cressida Karen Chung	Assistant Director, Hazardous Substance Division
Ms. NOR IWANI Basri	Assistant Director, Hazardous Substances Division
Ms. Nor Azah Binti Masrom	Assistant Director, Hazardous Substances Division

② Training Program

Date	Place/lecturers	Training Program
7/31	9:30-12:00 JICA Kansal Center	▪ Briefing of the Program
	13:30-14:00 JICA Expert Team	▪ Orientation
	14:00-14:45 JICA Expert (Mr. Furukawa)	▪ Lecture on the roles of manufacturers in household E-waste management.
	14:45-15:15 Panasonic (Mr. Nagahama)	▪ Manufacturer's view on E-waste management in Malaysia.
	15: 30-17:00 Discussion with the Project Advisory Committee Members	▪ Discussions and Exchange of views on E-waste management in Malaysia.
8/1	10:00-12:00 Fluorescent tubes collection center	▪ Observation of fluorescent tube collection activities
	13:30-15:00 Fluorescent tubes recycling center	▪ Observation of fluorescent tube recycling activities
	15:30-17:00 Rechargeable batteries collection and recycling facilities	▪ Observation of rechargeable batteries collection and recycling activities.
8/2	11:00-17:00 E-waste recycling facility	▪ Observation on recycling of 4 items (TV, Fridge, Washing Machine, and Air Conditioner)
8/3	10:00-10:30 Small sized E-waste collection center	▪ Observation of small sized E-waste reception/buying facility.
	11:00-11:30 Plastic recycling facility	▪ Observation of E-waste based plastic recycling (advanced recycling technology)
	14:00-16:00 Metal Smelting facility	▪ Observation of advanced recycling of printed circuit boards.
8/4	10:00-11:30 Wrap up	▪ Reporting on the findings from the counterpart training (by Trainees)

2.11.6 Regional Workshop on Household E-waste Management (Activity 11-6)

The regional workshop on Household E-waste Management was jointly held by DOE and JICA for 2 days between 22nd and 23rd of November 2017, inviting government reprensetatives from neigboring countries including Thailand, Indonesia, Viet Nam, the Philippines, Singapore, and Taiwan for the purpose of exchanging the information and views of household E-waste mamagement while introducing the current efforts of building the new mechanism under the Project in Malaysia. The details of the regional workshop is presented in the "Proceeding of Regional Workshop on Household E-waste Management" in the Annex to this Report.

2.11.7 Development of the Training Modules (Materials) for Household E-waste Management (Activity 11-7)

To train the staff members of central and local DOE on household E-waste management, the Project developed a series of training modules (materials) with their focus on the contents of the Guidelines developed in the Project (See the "Training Module on Household E-Waste management" in the Annex to this Report for its details.).

2.11.8 Trainers' Training on household E-waste Management (Activity 11-8)

The 4 (Four) staff members of DOE, who had been jointly conducting the Project all through the project period, was trained as the trainer of household E-waste management in Malaysia as described in the table below.

Table 2-12: Trainers of Household E-waste Management in Malaysia

Name	Position in DOE and Main Roles as Trainers
Ms. Fenny Wong Nyuk Yin	Principal Assistant Director, Hazardous Substances Division (Taskforce 3 Chairperson) ▪ Training Program Leader (E-waste Policy Lecturer)
Ms. Cressida Karen Chung	Assistant Director, Hazardous Substance Division ▪ Sub-leader (Recycling/fee guideline Lecturer)
Ms. NOR IWANI Basri	Assistant Director, Hazardous Substances Division ▪ Sub-leader (Collection/Reporting Lecturer)
Ms. Nor Azah Binti Masrom	Assistant Director, Hazardous Substances Division ▪ Sub-leader (Public Education/Awareness Raising Lecturer)

2.11.9 Roadmap for Actions to be Taken for Enforcement of Scheduled E-waste Regulation in Malaysia (Activity 11-9)

The Project prepared the roadmap for actions to be taken by DOE to enforce the new management mechanism of household E-waste in accordance with the Scheduled E-waste Management Regulation, which is now under final review by the Attorney General Chamber of Malaysia.

Table 2-13: Roadmap for Actions to be taken for Enforcement of Scheduled E-waste Management Regulation

Category of Actions	Roadmap for Actions
Announcement and Enforcement of the laws and regulations	▪ Proceed the final approval process of the amendment to Environmental Quality Act and Scheduled E-waste Regulations.
Implementation of Collection Guideline	▪ Registration of household E-waste collectors (Start registration with issuance of registration certificate, development of collector database) ▪ Supervision and monitoring of registered collectors (including on-site investigations)
Implementation of Recycling Guideline	▪ Start licensing household E-waste recyclers (Evaluation of submitted licensing forms, issuance of licensing certificates, development of recyclers database) ▪ Supervision and monitoring of licensed recyclers (Evaluation of the reports, on-site investigations, etc.)
Implementation of Recycling Fee Guideline	▪ The first recycling fee and subsidy rates to be determined and officially announced. ▪ Collection of recycling fee to be started.
Implementation of Reporting Guideline e	▪ Establishment of reporting system (paper-based or electronic-based) ➢ Reporting by manufacturers and importers (put-on market volume) ➢ Reporting by collectors and recyclers (collection and recycling volume) ▪ Start operation of E-waste inventory system (Database management, Production of

Category of Actions	Roadmap for Actions
	Annual report, etc.)
Implementation of the schedule of recycling fund management body	▪ Establishment of Recycling Fund ➢ Appointment of Directors ➢ Appointment and recruitment of staff members ➢ Formulation of the fund management plan ▪ Opening of management office (Opening of fund management account)
Public Relations	▪ Public relations of the new mechanism (pamphlets, video, media disclosure, etc.) ▪ Explanatory sessions to the relevant stakeholders

3 Ingenuity, Issues and learnings in Project Implementation

This Project aims at transferring social engineering technologies such as policy formulation, legal and regulatory establishment, and development of institutional and financial mechanism. It was totally different from the prior technical assistance projects with their focus on hardware or its enegineering technologies. Accumulated knowledge and experience is the key to implementation of the technical assistance project of this kind. In this respect, there are different types of unique efforts required as well as unique issues and learnings from the Project.

Those unique efforts, issues and learnings identified in the course of implementing the Project are described below.

3.1 Critical Issue of limited availability of baseline information and data

The first critical issue faced by the Project was the limited availability of information and data. Although the Project expected shortage of information and data on the activities of informal sector, it did not expect the lack of basic data on household E-aapliances such as import and export volumes as well as domestic sales. These sets of data are critical in formulating the policy, strategy and plan on household E-waste management as we are not able to even project the current and future E-waste generation.

To address this issue, the Project first conducted a large scale interview survey with 1,000 samples to identify the current ownership of regulated household E-applainces. In the same time, the Project also suggested to build the mechanism of regularly collecting these basic data from the most reliable sources, in this case, from manufacturers and importers.

Lack of baseline data and information of this kind acutally happens in many developing countries. In this case, it is of greater importance than providing the hardware database system for us to help creating the institutional mechanism of regular collection of basseline information and data from proper sources, that may involve amendment of the existing laws and regulations in relation to provision of infromation and data from the relevant stakehoders. We have been experiencing many cases in which we collected the primary information and data by conducting a series of field interviews and site surveys to identify the current conditions of the country. However, most of these collected infromation and data will be useless in 10 years if no update is carried out. In this regard, estabishemnt of sustainable data collection and update mechanism is the key components of technical assistance especially in preparing the sector policies, strategies and master plan.

3.2 Know How of Assistance in Formulation of Policies, Laws and Regulations, and establishment of Institutional/Social System

In conducting transfer of so-called soft technologies (policies, strategies, laws and regulations, and institutional/social system), knowledge in such subjects are required while the experience in establishing the new legal, regulatory and institutional system is also important. In this reagrd, it is very fortunate for this project to involve the expert who have been practically involved in the development process of household E-waste management in Japan and Germany.

Another key of success in the Project is in early involvement of relevant stakeholders of having different interest in the process of preparing the new guidelines on household E-waste management. In creating the new instituional and social system, consensus building process among the stakholders of different interests is the most critical path. This early invilvement also serves for raising the sense of ownership of the new mechanism among the involved stakeholders.

3.3 Applicability of Japanese knowledge and experience with its limitation

The request of this technical assistance project comes from the expectation on the knowledge and prior experience household E-waste management in Japan, from which there are many things to learn and to be applied in Malaysia.

However, utilization of the Japanese knowledge and experinece is not just the replication of same system in other countries. We must consider the difference in rules of behavior and mindset originating from the historical, social and cultural background of each country. We have to carefully chose which knowledge and experience can be applicable to the reciepient countries.

In this respect, we are required to objectively evaluate our own mechansim by comparing it with other mechanisms applied in other countries. In the case of this Project, it is fortunate that we were able to have the objective viewpoint of comparing the different household E-waste management mechanism among various countries.

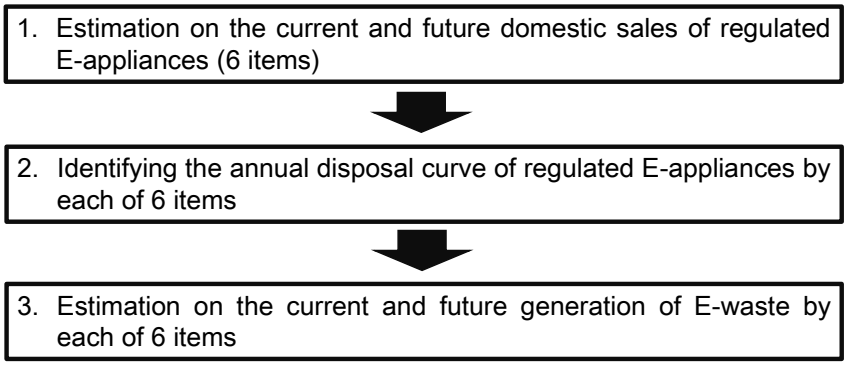
Annex 1

Scheduled E-waste Inventory Database

ANNEX 1: Scheduled E-waste Inventory Database

This scheduled E-waste inventory database consists of the following sets of data and parameters that are utilized for estimating the current and future generation of scheduled E-waste and their results.

The above estimation was conducted in accordance with the following steps.



1. Estimation on the current and future domestic sales of regulated E-appliances (6 items)

As the first step, the current and future domestic sales of regulated 6 (six) E-appliances were estimated based on the past sales data of each regulated E-appliance. The future sales of E-appliances were forecasted by applying statistical regression analysis while taking into account the upper limit of penetration rate of each regulated E-appliance. Since no complete data sets are readily available in Malaysia, the following data sources are utilized:

- JEMA: Japan Electrical Manufactures Association
- JEITA: Japan Electronics and Information Technology Industries Association)
- JRAIA: Japan Refrigeration and Air Conditioning Industry Association）
- Consumer Asia International
- Euromonitor
- BMI

The following tables and figures show the estimation results.

(1) TV

Table 1: Estimated Domestic Sales of TV (Unit: 1,000)

Calendar Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Domestic Sales	200	220	240	260	290	335	415	460	523	552

Calendar Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Domestic Sales	520	550	560	540	540	580	580	600	620	630

Calendar Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Domestic Sales	640	650	670	700	1,005	1,385	1,428	1,502	1,819	1,891

Calendar Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Domestic Sales	2,058	2,058	2,058	2,058	2,058	2,058	2,058	2,058	2,058	2,058

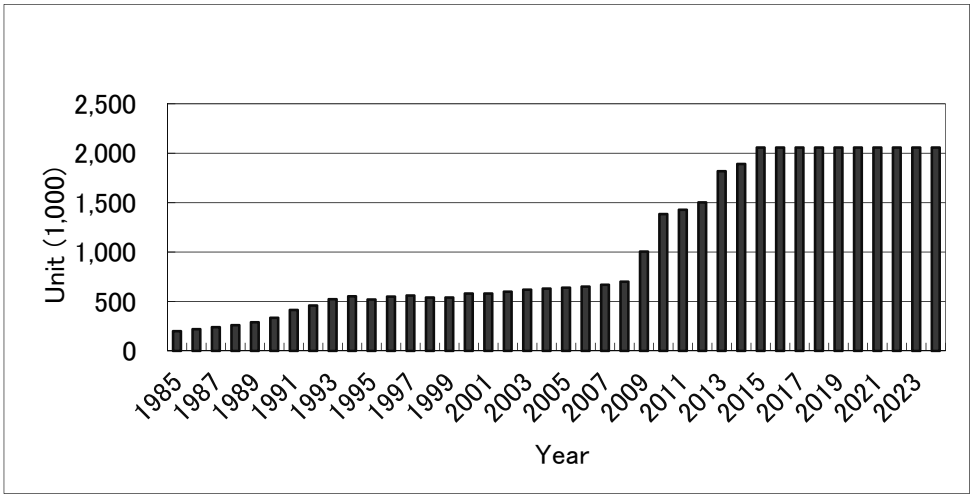


Figure 1: Current and Future domestic sales of TV

(2) Air Conditioner

Table 2: Estimated Domestic Sales of Air Conditioner (Unit: 1,000)

Calendar Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Domestic Sales	106	114	122	131	141	151	162	174	187	200

Calendar Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Domestic Sales	210	215	215	360	275	315	330	350	450	486

Calendar Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Domestic Sales	550	658	690	674	669	751	749	793	821	811

Calendar Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Domestic Sales	789	804	820	836	852	869	886	903	921	939

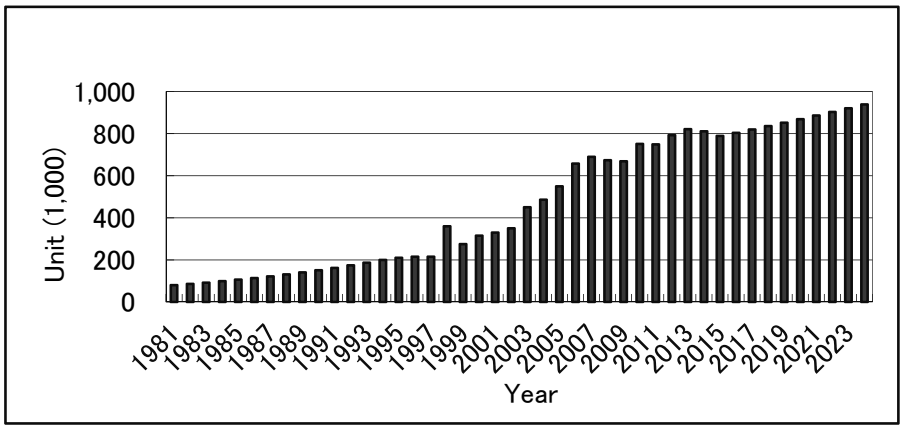


Figure 2: Current and Future domestic sales of Air Conditioner

(3) PC (Personal Computer)

Table 3: Estimated Domestic Sales of PC (Unit: 1,000)

Calendar Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Domestic Sales							20	20	33	151

Calendar Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Domestic Sales	166	183	200	178	189	257	349	474	644	875

Calendar Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Domestic Sales	1,190	1,623	1,660	1,862	2,086	2,481	2,785	3,587	4,122	4,084

Calendar Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Domestic Sales	3,332	3,471	3,616	3,767	3,925	4,089	4,260	4,438	4,624	4,818

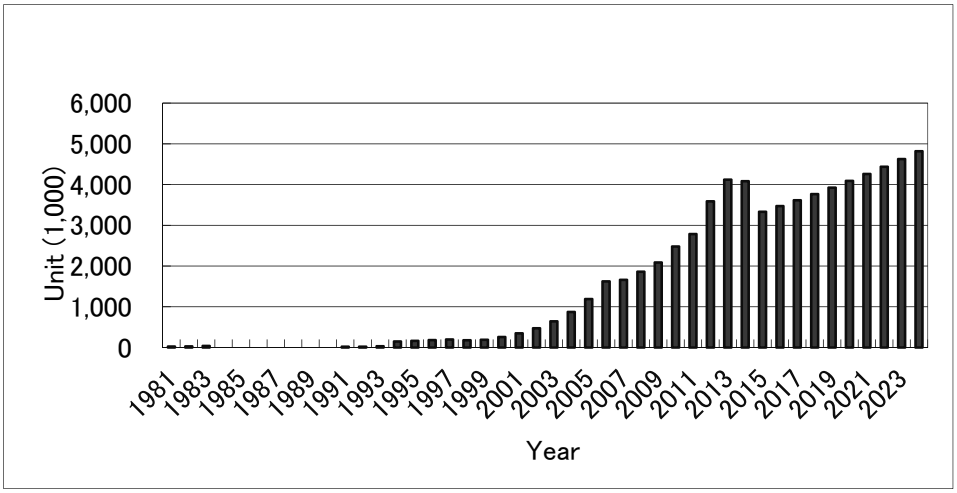


Figure 3: Current and Future domestic sales of PC

(4) Refrigerator

Table 4: Estimated Domestic Sales of Refrigerator (Unit: 1,000)

Calendar Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Domestic Sales	150	155	146	198	189	212	254	272	280	285

Calendar Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Domestic Sales	293	383	345	267	300	316	333	333	448	465

Calendar Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Domestic Sales	480	495	510	470	446	457	473	480	500	505

Calendar Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Domestic Sales	515	515	515	515	515	515	515	515	515	515

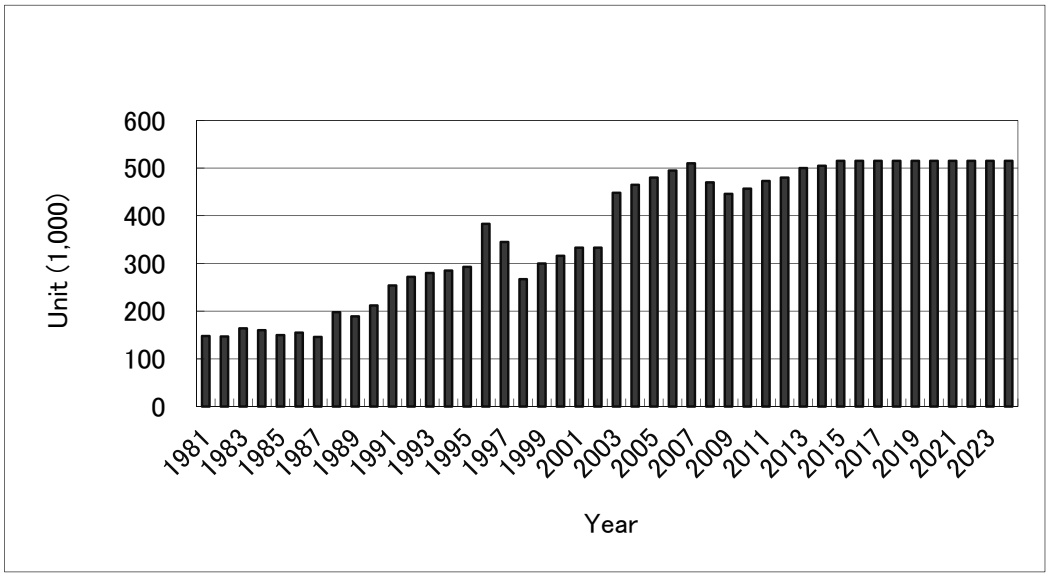


Figure 4: Current and Future domestic sales of Refrigerator

(5) Washing Machine

Table 5: Estimated Domestic Sales of Washing Machine

Calendar Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Domestic Sales			30	50	80	110	140	170	190	211

Calendar Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Domestic Sales	235	255	245	230	215	230	320	330	340	364

Calendar Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Domestic Sales	370	381	439	428	455	465	485	535	555	589

Calendar Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Domestic Sales	625	625	625	625	625	625	625	625	625	625

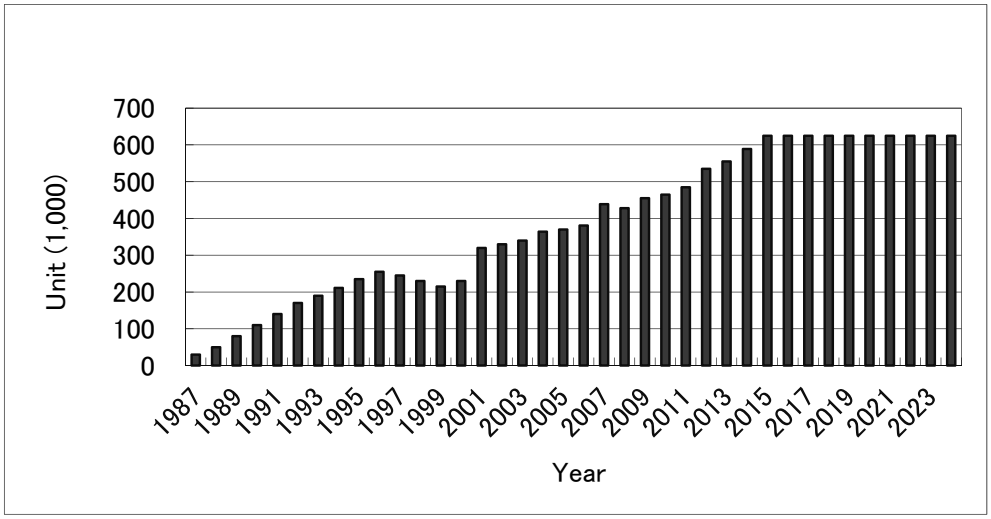


Figure 5: Current and Future domestic sales of Washing Machine

(6) Mobile Phone

Table 6: Estimated Domestic Sales of Mobile Phone

Calendar Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Domestic Sales			30	50	80	110	243	282	327	380

Calendar Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Domestic Sales	456	410	347	311	948	3,440	3,353	3,274	4,171	5,873

Calendar Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Domestic Sales	8,691	7,000	7,342	7,657	7,135	9,062	11,267	13,568	15,826	18,254

Calendar Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Domestic Sales	17,117	17,117	17,117	17,117	17,117	17,117	17,117	17,117	17,117	17,117

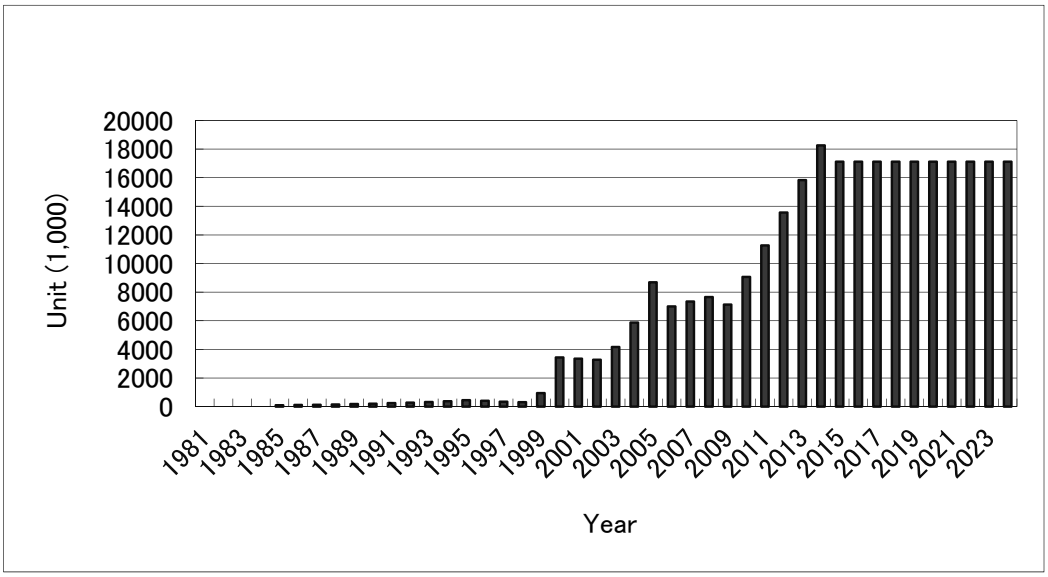


Figure 6: Current and Future domestic sales of Mobile Phone

2. Identifying the annual disposal curve of regulated E-appliances by each of 6 items

Based on the number of years used for each regulated E-appliance, that were collected from interview surveys to the users and past trend of E-waste generation in Malaysia, the annual disposal curve of regulated E-appliances was identified by applying the so-called Weibull Regression Model. These annual disposal curves identified for each regulated E-appliance item estimates disposal percentage of each item every consecutive year after its purchase and start utilization. The following figures represents the annual trend of the percentage of purchased E-appliance that are still in use for each regulated item (usually called as "survival rate").

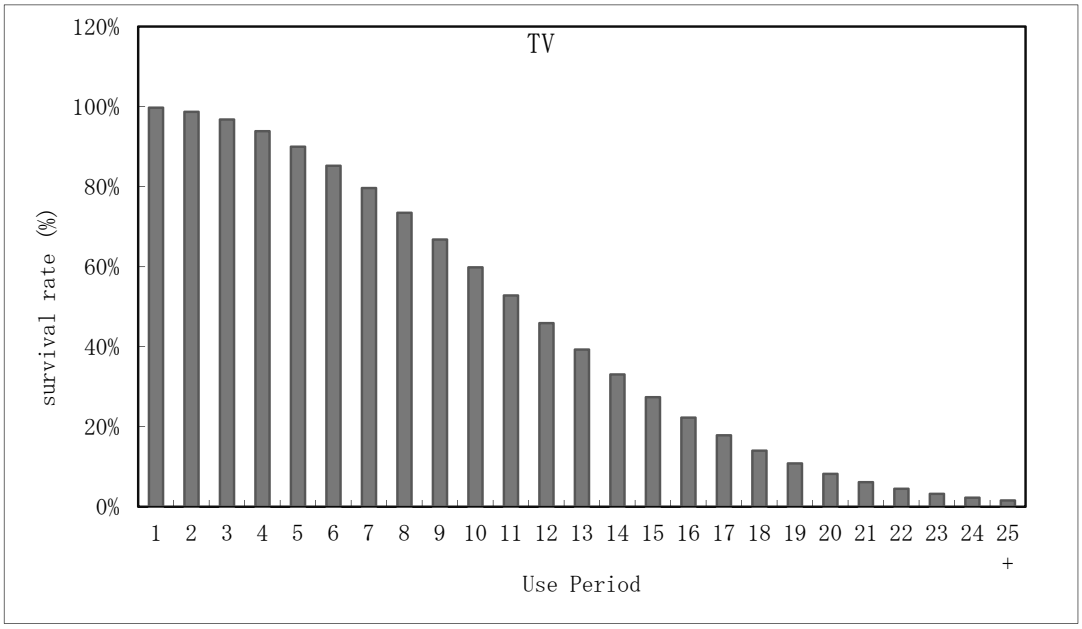


Figure 7: Estimated Annual trend of survival rate (TV)

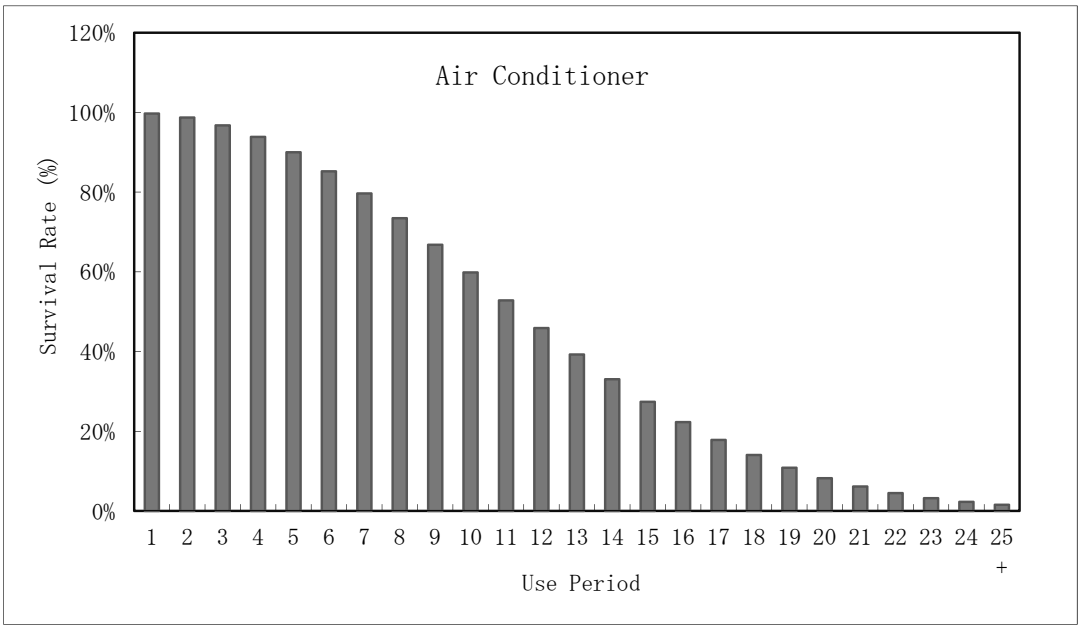


Figure 8: Estimated Annual trend of survival rate (Air Conditioner)

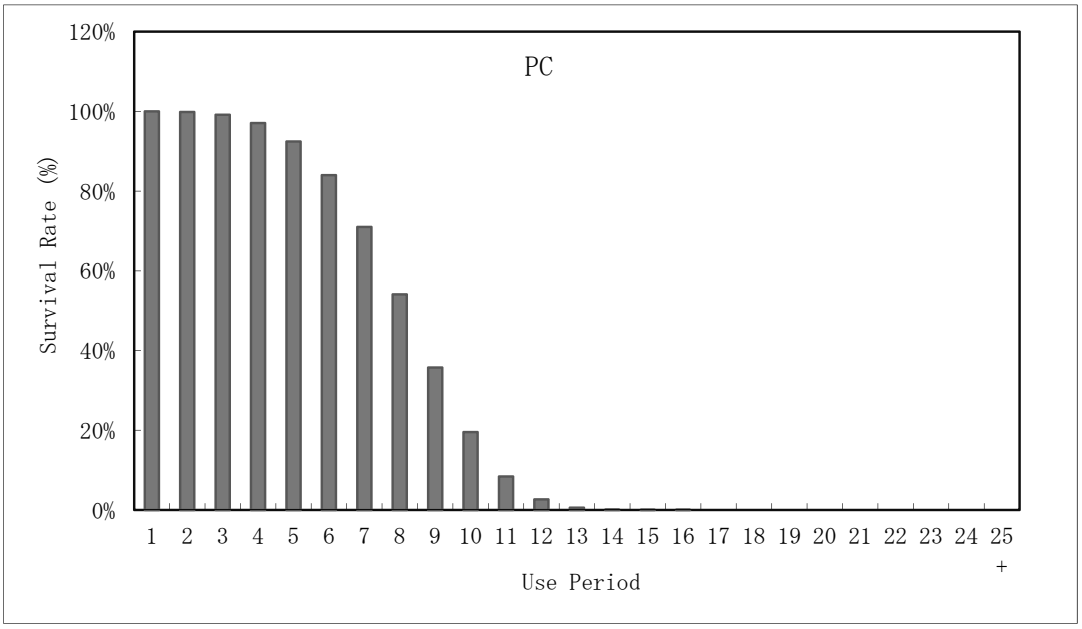


Figure 9: Estimated Annual trend of survival rate (PC)

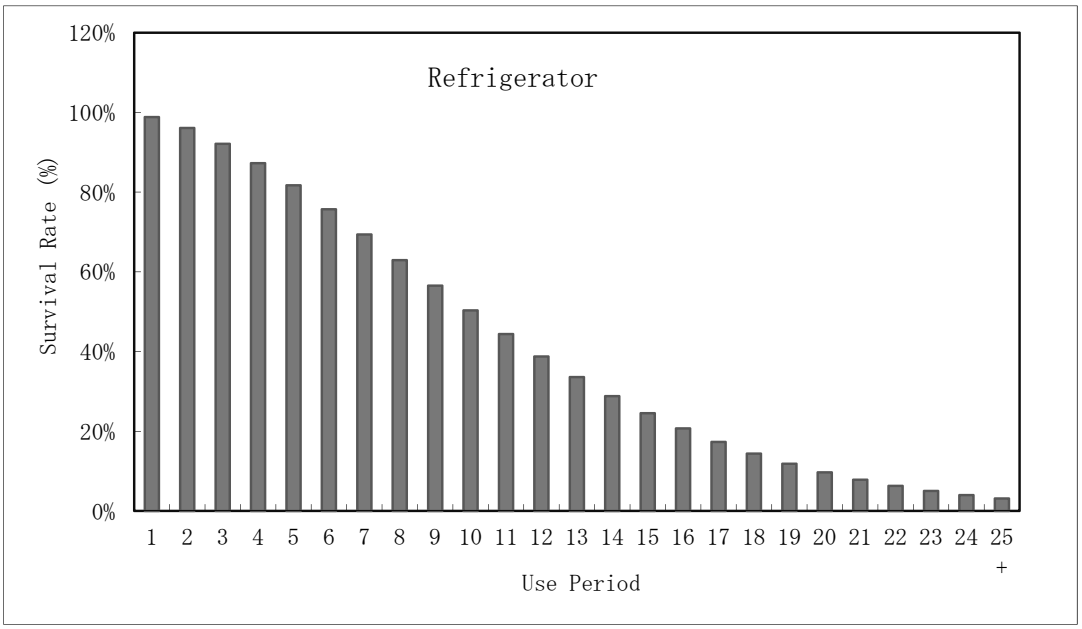


Figure 10: Estimated Annual trend of survival rate (Refrigerator)

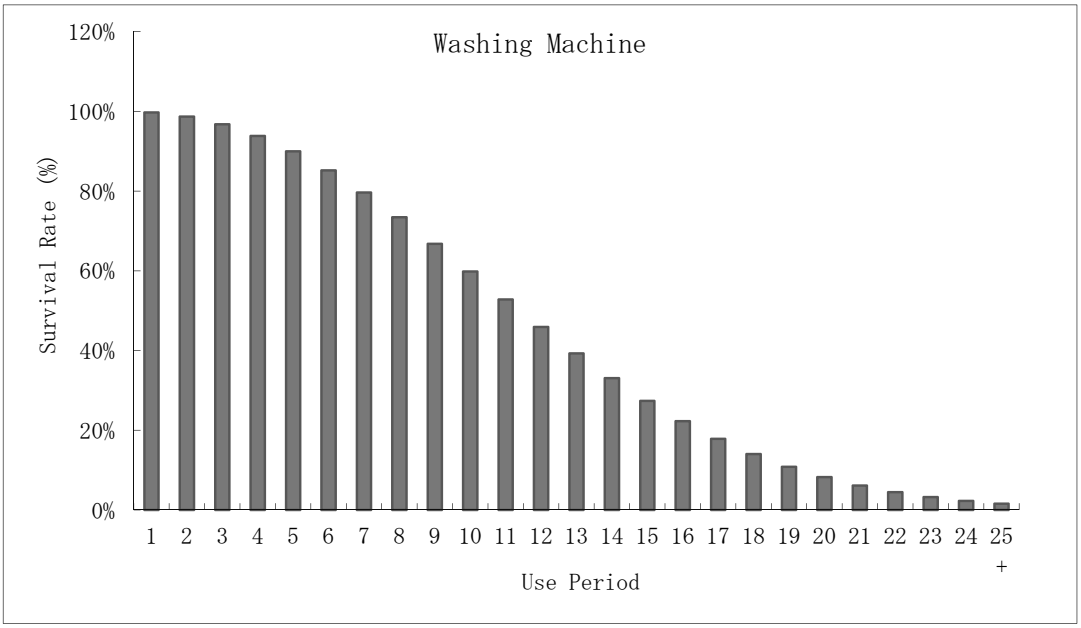


Figure 11: Estimated Annual trend of survival rate (Washing Machine)

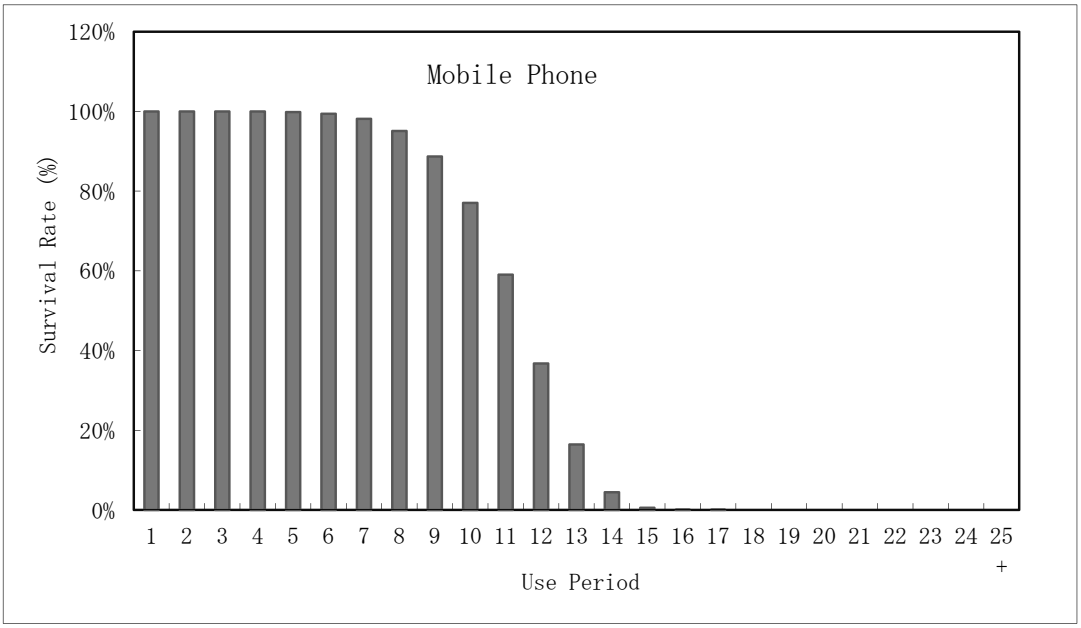


Figure 12: Estimated Annual trend of survival rate (Mobile Phone)

3. Estimation on the current and future generation of E-waste by each of 6 items

Based on the estimated domestic sales of regulated E-appliances and identified disposal curves for each E-appliance, the current and future generation of E-waste were estimated as shown in the following tables and figures.

Table 7: Estimated Generation of TV (Unit: 1,000)

Calendar Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Waste Generation	317	348	378	407	433	458	480	501	521	541

Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Waste Generation	565	594	629	674	727	791	864	946	1,035	1,128

Calendar Year	2021	2022	2023	2024	2025
Waste Generation	1,224	1,320	1,413	1,503	1,587

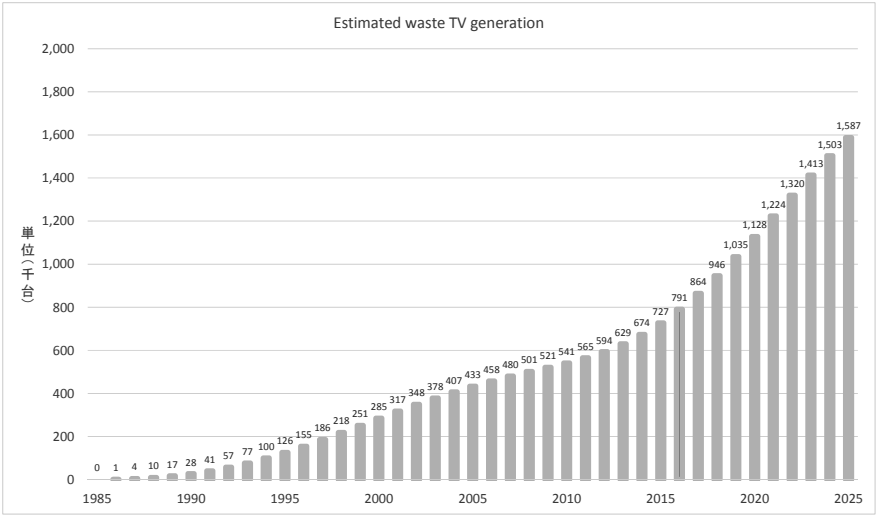


Figure 13: Estimated Generation (TV)

Table 8: Estimated Generation of Air Conditioner (Unit: 1,000)

Calendar Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Waste Generation	133	143	153	164	176	188	201	212	225	252

Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Waste Generation	298	312	314	342	380	441	505	568	636	677

Calendar Year	2021	2022	2023	2024	2025
Waste Generation	685	697	733	765	789

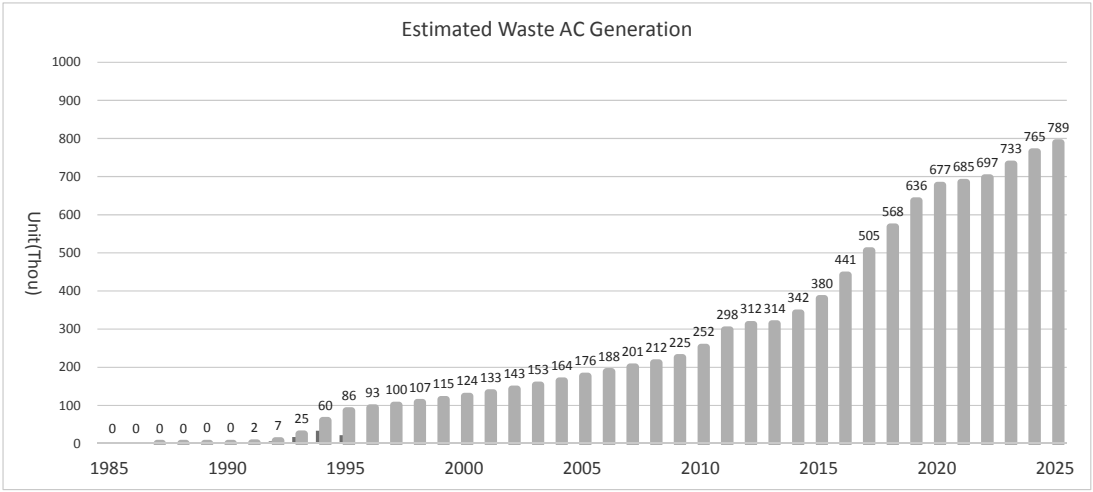


Figure 14: Estimated Generation (Air Conditioner)

Table 9: Estimated Generation of PC (Unit: 1,000)

Calendar Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Waste Generation	74	104	135	163	189	217	258	323	419	553

Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Waste Generation	726	933	1,165	1,412	1,668	1,935	2,224	2,542	2,878	3,196

Calendar Year	2021	2022	2023	2024	2025
Waste Generation	3,452	3,611	3,678	3,696	3,725

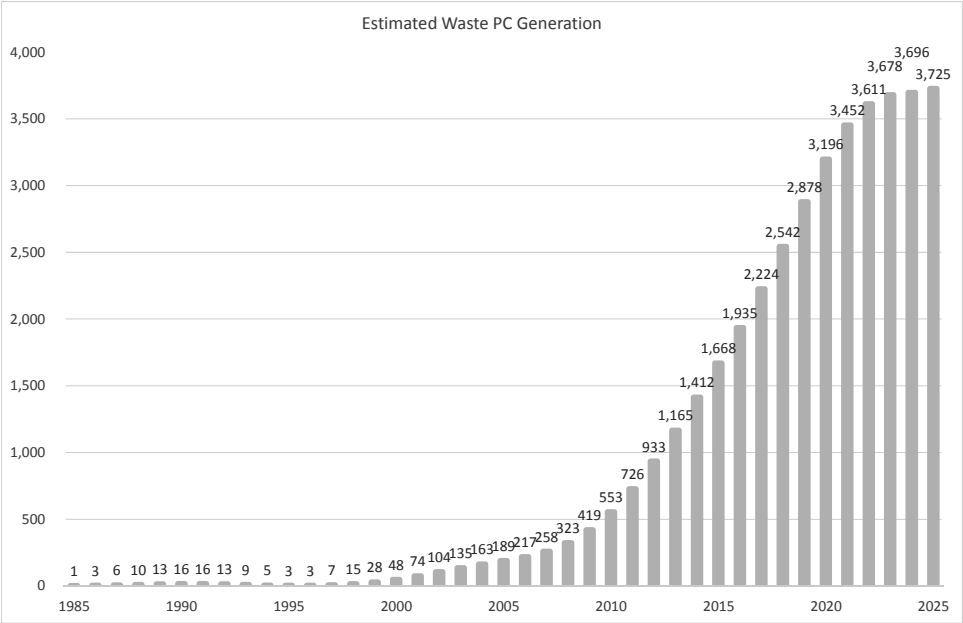


Figure 15: Estimated Generation (PC)

Table 10: Estimated Generation of Refrigerator (Unit: 1,000)

Calendar Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Waste Generation	223	235	246	259	272	287	303	319	335	349

Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Waste Generation	363	375	388	399	411	421	431	441	450	458

Calendar Year	2021	2022	2023	2024	2025
Waste Generation	465	472	478	483	488

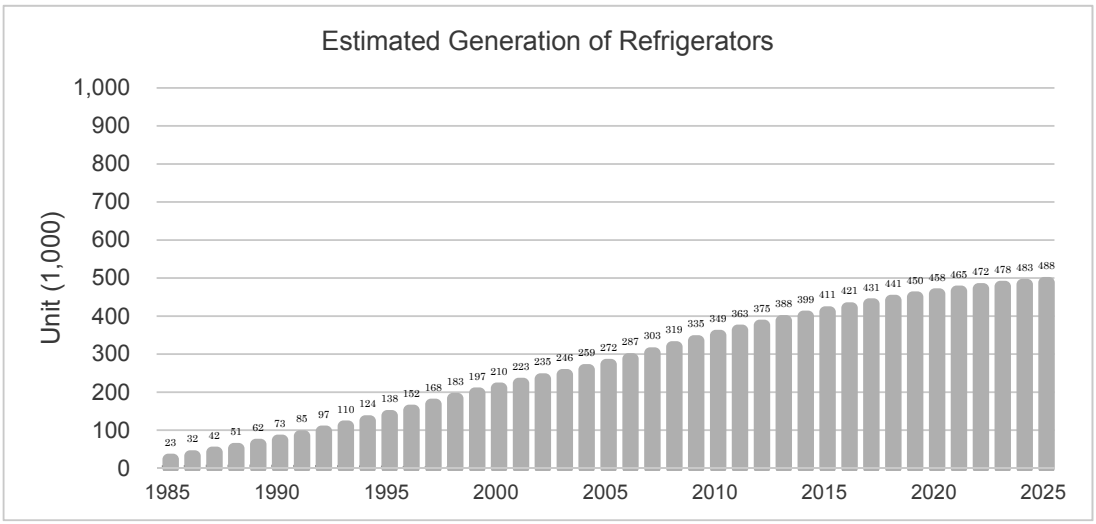


Figure 16: Estimated Generation (Refrigerator)

Table 11: Estimated Generation of Washing Machine (Unit: 1,000)

Calendar Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Waste Generation	12	20	32	49	69	93	118	144	167	189

Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Waste Generation	207	222	234	244	253	264	279	299	322	345

Calendar Year	2021	2022	2023	2024	2025
Waste Generation	366	386	405	424	445

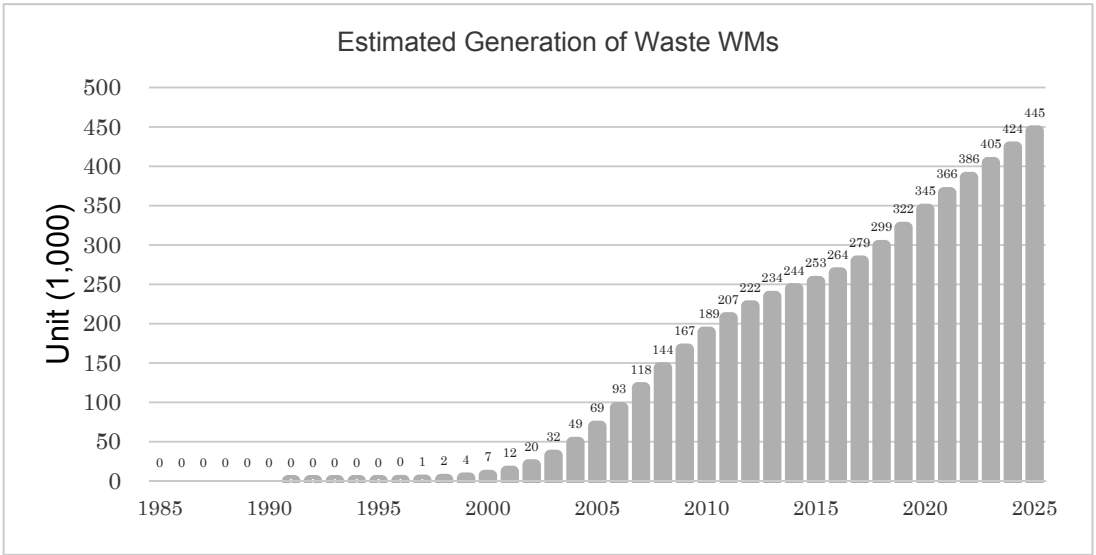


Figure 17: Estimated Generation (Washing Machine)

Table 12: Estimated Generation of Mobile Phone (Unit: 1,000)

Calendar Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Waste Generation	209	242	278	318	363	419	503	658	953	1,459

Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Waste Generation	2,181	3,014	3,820	4,597	5,464	6,386	7,137	7,589	7,932	8,510

Calendar Year	2021	2022	2023	2024	2025
Waste Generation	9,516	10,972	12,737	14,492	15,915

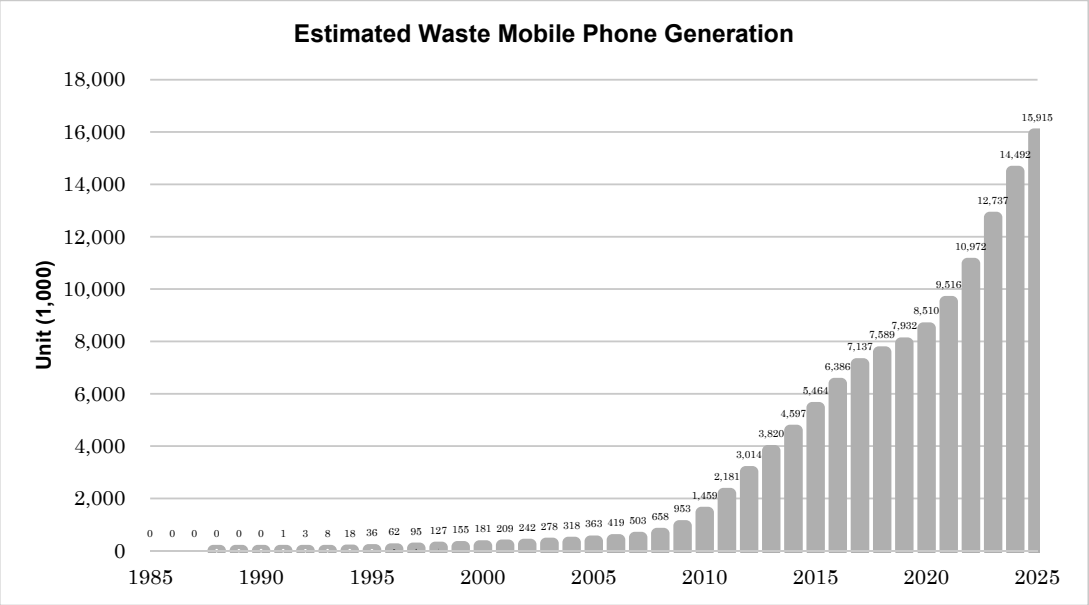
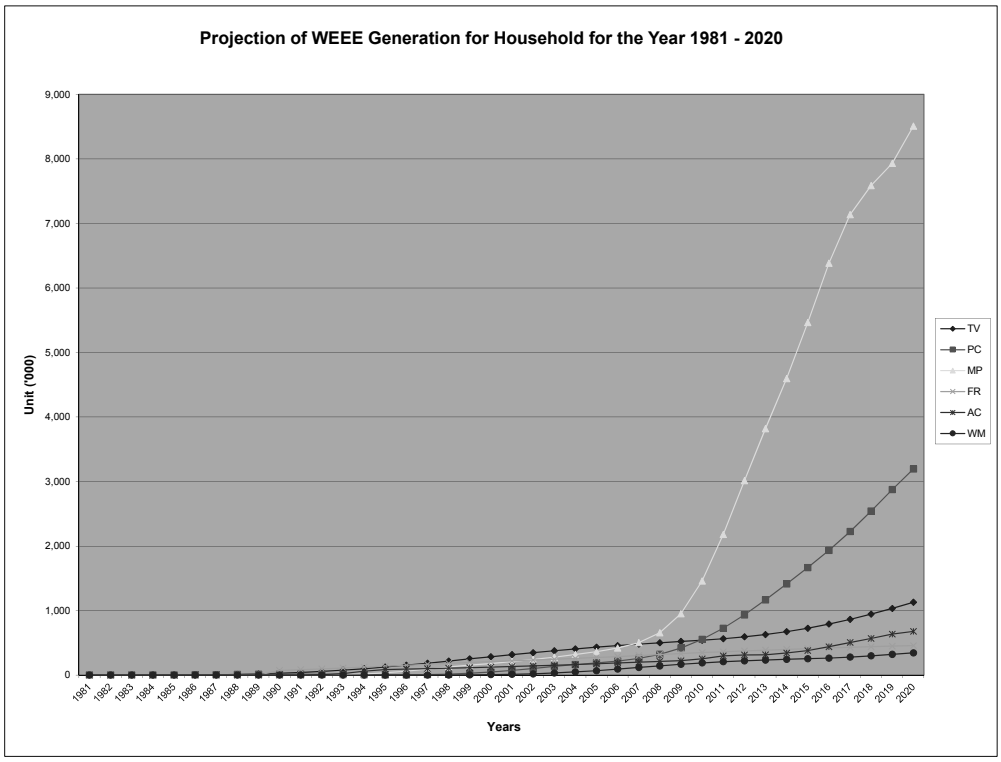


Figure 18: Estimated Generation (Mobile Phone)

4. Estimated Total E-waste Generation

Year	TV	PC	MP	FR	AC	WM
2001	317	74	209	223	133	12
2002	348	104	242	235	143	20
2003	378	135	278	246	153	32
2004	407	163	318	259	164	49
2005	433	189	363	272	176	69
2006	458	217	419	287	188	93
2007	480	258	503	303	201	118
2008	501	323	658	319	212	144
2009	521	419	953	335	225	167
2010	541	553	1,459	349	252	189
2011	565	726	2,181	363	298	207
2012	594	933	3,014	375	312	222
2013	629	1,165	3,820	388	314	234
2014	674	1,412	4,597	399	342	244
2015	727	1,668	5,464	411	380	253
2016	791	1,935	6,386	421	441	264
2017	864	2,224	7,137	431	505	279
2018	946	2,542	7,589	441	568	299
2019	1,035	2,878	7,932	450	636	322
2020	1,128	3,196	8,510	458	677	345
2021	1,224	3,452	9,516	465	685	366
2022	1,320	3,611	10,972	472	697	386
2023	1,413	3,678	12,737	478	733	405
2024	1,503	3,696	14,492	483	765	424
2025	1,587	3,725	15,915	488	789	445
Total	**20,940**	**39,472**	**126,351**	**10,887**	**10,711**	**5,604**



Annex 2

Collection Guideline for Household E-waste

GUIDELINE

Collection, Storage, Handling and Transportation of Scheduled E-waste in Malaysia




Published by:

Department of Environment (DOE) Malaysia

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Japan International Cooperation Agency (JICA)

TABLE OF CONTENTS

Guideline

Collection, Storage, Handling and Transportation of Scheduled E-waste in Malaysia

1.0 INTRODUCTION

Electrical and electronic waste (commonly known as E-waste), is growing exponentially worldwide because of tremendous growth of demands on the use of electrical and electronic equipment. The disposal of E-waste is of big concern discussed at international arena, because of the nature of hazardousness of the waste and drastically increased volume of disposal in a globalized world.

Note:

"E-waste" referred to SW110 as stipulated in the First Schedule of EQ (Scheduled Waste) Regulations 2005.

"Electrical and electronic equipment "means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields falling under the categories set out in First Schedule of the regulations;

Improper handling of E-waste poses high risk of pollution, health impacts and causes incidents of illegal disposal. The lack of proper environmental precaution measures in E-waste management could cause enormous environmental issues such as release of chlorofluorocarbon (CFC) gases that cause ozone depletion, global warming and contaminations from other hazardous/toxic substances.

In Malaysia, E-waste is generally divided into two main types by generation sources, i.e. E-waste generated from the industrial sectors, and E-waste generated from the non-industrial sectors, mainly households, commercial and institutional entities.

E-waste from industrial sector is categorized as Scheduled Wastes under the Code SW110, First Schedule of the Environmental Quality (Scheduled Wastes) Regulations 2005. The categories of E-waste defined under this coding are only covering E-waste generated from the industrial sectors, including electrical and electronic industries, as well as other industrial generators.

The management of E-waste generated from non-industrial sectors, especially household and other entities such as commercial and institutional is now regulated under a newly enacted regulation known as the Environmental

Quality (Scheduled E-Waste) Regulations 20XX, which defines scheduled E-wastes under Code HSW, including HSW100, which is specifically for targeted categories of scheduled E-waste.

Note:

"Scheduled electrical and electronic equipment waste" or "Scheduled E-waste" means discarded electrical and electronic equipment falling within the categories of waste in the first schedule, which are generated from household, commercial, industrial, institutional entities, and any other sources;

Scheduled E-waste requires a different management system as compared to the E-waste generated from the industrial sector, particularly from the financial perspective where significant costs are required for collection and transportation of the Scheduled E-waste, as well as to comply with the proper environmental precaution standards. Therefore, Scheduled E-waste shall only be processed or treated by specific scheduled E-waste recycling facilities, which are licensed by the DOE.

This Guideline shall be read together with the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulations 20XX.

2.0 ABOUT THE GUIDELINE

Under the framework of the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulations 20XX, it is emphasized that all the scheduled E-waste shall be channeled, collected and delivered through a formal or authorized flow of stakeholders to the final destination of proper treatment, and recycling with environmentally sound system. Each respective stakeholder has their roles and responsibilities, and the costs involved for the entire system shall be shared among all the stakeholders.

This Guideline provides a list of requirements for the users, who are directly involved in specific activities dealing with Scheduled E-waste, particularly on the activities of storage, handling, collection and transportation of Scheduled E-waste. It is aimed to provide guidance to the stakeholders for effective compliance of the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulations 20XX.

The main categories of Scheduled E-waste covered under this Guideline are the list of E-waste under the First Schedule of the Environmental Quality (Scheduled E-Waste) Regulations 20XX including (a) cloth washing / drying machine, (b) refrigerator / freezer / chiller, (c) air-conditioner, (d) computer, (e) television and (f) mobile phone / tablet PC. In a long run, it also includes other Scheduled E-wastes such as E-waste of small appliances (e.g. CD players, hair dryers, microwave ovens, etc.)

The users of this Guideline shall always refer to the Environmental Quality (Scheduled E-Waste) Regulations 20XX as the main document of this Guideline to ensure complete understanding of the entire requirements under the regulations, as well as the clauses of the Environmental Quality Act (1974) as the main Act.

Detailed elaborations on the types of activities that are subject to this Guideline are explained in Section 2.1, while Section 2.2 elaborates the definitions and categories of stakeholders subject to the requirements stipulated in this Guideline.

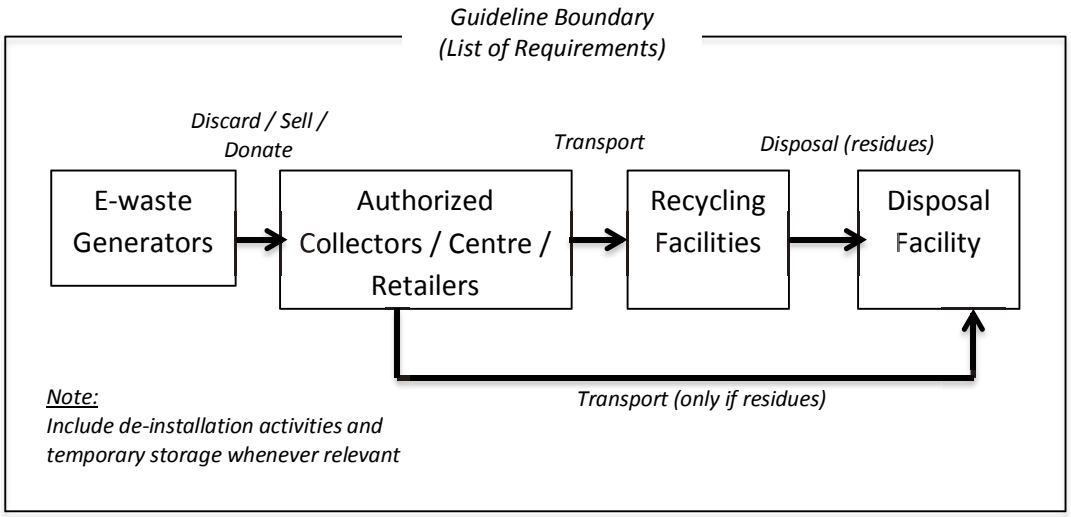
2.1 Scopes of the Guideline

This Guideline shall apply to all stakeholders of activities as described below, whether it is an individual person, company, organization or any other entities:

Activities	Descriptions
Collecting / donating / buying / selling	• Donating / giving away, discarding and selling Scheduled E-waste by any generators from households, commercial, institutional and any other sources to another party who receives, buys or collects for specific purposes. • Buying Scheduled E-waste from any generators from households, commercial and institutional sources at prices agreed upon both the buyer and generator/seller. • Receiving / collecting Scheduled E-waste from any generators from households, commercial and institutional sources for free without any payment involved. • Selling Scheduled E-waste received / collected / purchased from any generators from households, commercial and institutional sources, to another buyers for specific purposes.
Temporary storage	• Temporary storage of Scheduled E-waste generated / received / collected / purchased from any generators from households, commercial, institutional or any other sources.
Handling activities	• Any handling activity on Scheduled E-waste generated / received / collected / purchased from any generators before the subsequent activities or destinations, such as segregation, dismantling or cleaning etc. • Activities of de-installation of Scheduled E-waste particularly air-conditioners that contain refrigerants and refrigerant oils.

	• Handling activity excludes repairing processes by repair shops of electrical and electronic appliances received from the customers. Nevertheless, Scheduled E-waste generated from any repair shop shall be subject to the requirements of this Guideline.
Transportation / transfer	• Transporting or transferring of E-waste generated / received / collected / purchased from any generators to the next destinations, such as another buyer or receiving point, recycling or disposal facilities.

In general, the scope of the Guideline cover the entire activity flow of the Scheduled E-waste from generation points (including de-installation activity if relevant), via collection and transportation (including temporary storage if relevant) till the boundary of the final receiving points whether it is a recycling or disposal facility. The scope falling within the boundary of the Guideline are illustrated as shown below:



Scopes of the Guideline

2.2 Descriptions of Stakeholders

The users of this Guideline are expected to be all relevant stakeholders who are involved in the activities elaborated within the Guideline scope boundary, generally the authorized collection centers, collectors, retailers, scheduled E-waste recycling facilities, as well as some other stakeholders who are authorized and carrying out the same activities.

Descriptions of different categories of stakeholders who are commonly involved in the activities subject to this Guideline are listed but not limited to the following:

Stakeholders		Descriptions
Authorized Collection Centers / Collectors	*Concessionaire companies*	Waste management companies awarded concessionaires by the National Solid Waste Management Department (JPSPN) or sub-contractors, for collection of household solid waste, including Scheduled E-waste collection on specific schedule at selected States in the country.
	Local Authorities / other government agencies	Local governments, any other government agencies and their sub-contractors who possibly operate collection centers to collect recyclable materials, including Scheduled E-waste, as well as collection campaigns organized on *ad hoc* basis.
	Institutions / universities / colleges / schools	Universities, colleges, schools, hospitals and any other public or private institutions that carry out collection of Scheduled E-waste.
	Private companies (contractors, recyclable buyers, traders, middlemen etc.)	Private recyclers or buyers who are buying recyclable materials including Scheduled E-waste from any sellers. The activities are market-driven, profit-oriented and it could involve several levels of transactions from smaller to larger scale stakeholders.
	Non-Governmental Organizations (NGO)	Registered organizations that operate collection centers to collect recyclable materials, including Scheduled E-waste, as well as carry out collection campaigns on *ad hoc* basis normally at community levels, for fund raising or charity purpose.
	Charity Organizations / Non-profit Organizations (NPO)	
	Charity Organizations	
Authorized Retailers	*Retailers*	Any retailer whether individual shop, franchise companies, brand dealers / distributors or department stores in malls that are selling new electrical and electronic appliances to the consumers, and collect Scheduled E-waste from the consumer premises, or brought in to the retailer premises.
	Brand dealers / distributors	
	Hypermarkets / malls	

Repair / Secondhand Shops	*Repair shops*	Shops that are carrying out business to repair or refurbish damaged electrical and electronic appliances. Appliances that are non-repairable and becomes Scheduled E-waste are subject to the requirements of the Guideline.
	Secondhand shops	Shops that are playing same roles as retailers but selling used electrical and electronic appliances for the consumers.
Authorized Recycling Facility	*Scheduled E-Waste Recycling Facility*	Facilities that are licensed by the DOE to specifically receive Scheduled E-waste from authorized sources, and carry out recycling process of Scheduled E-waste.
Others	*Installer / de-installer*	Individuals or companies that are offering services to maintain, service, install and de-install of electrical and electronic appliances. De-installation is commonly applicable for air-conditioner in particular.
	Maintenance / service companies	

2.3 Categories of Targeted Scheduled E-waste

The target categories of Scheduled E-waste subject to this Guideline are basically the 6 main categories of E-waste specified in the First Schedule of the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulations XXXX, excluding the small appliances, fluorescent lamps and rechargeable batteries. The 6 main categories of Scheduled E-waste are listed as follows with the sub-categories:

No	Categories	Sub-categories
1	Televisions	CRT Televisions  
		Flat Televisions (Plasma, LCD, LED)  
2	Air-conditioners	Window Units  
		Split units  Ceiling Unit 
		Mobile units   

3	Computers	LCD Desktop CRT Desktop 
		Laptop 
4	Refrigerators	Refrigerators 
		Freezers 
		Chillers 

5	Washing / Dryer machines	Washing machines 
		Cloth Dryers 
6	Mobile phones and Tablet PCs	Mobile phones 
		Tablet PCs 

3.0 THE LEGAL FRAMEWORKS OF SCHEDULE E-WASTE MANAGEMENT

Scheduled E-waste management is regulated under the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulations XXXX, which emphasizes the concept of "shared responsibilities" among the stakeholders, with implementation of the principle of Extended Producer's Responsibility (EPR).

The principle of EPR is the main feature of E-waste management framework in Malaysia, wherein the producers of electrical and electronic appliances have the responsibility to ensure proper management of the E-waste after the 'end of life' of the products. Under the EPR, producers are also entrusted with the responsibility to finance and organize a system to meet the costs involved in overall management of the E-waste in an environmentally sound manner.

In general, the entire legal framework of the Scheduled E-waste management is confined to 3 main flows, which are summarized below:

E-waste Flow	Determines the right channel of Scheduled E-waste is collected from generation points to authorized collection centers, collectors, retailers, and finally the Scheduled E-waste recycling facilities or final disposal. Proper E-waste flow prohibits the Scheduled E-waste to enter into informal sectors, by authorizing only the formal collection channels within the formal system boundary.
Fee Flow	Determines how the recycling fee (known as contribution under the EQA) is collected and channeled to a fund management entity (known as Recycling Contribution Management Body - RCMB), for various purposes of disbursements to ensure functionality of the entire system. Proper fee flow ensures the overall costs required for proper management of Scheduled E-waste is secured and shared among the stakeholders.
Reporting Flow	Determines the information / data flow through proper reporting by relevant stakeholders, with the use of manifest forms. Proper reporting flow avoids leaking of E-waste into the informal sectors, and ensures that proper data is captured for determination of total recycling fee to be received by relevant stakeholders. Proper data management is also crucial for future planning and improvement of the system in a long run.

Detailed elaborations of the regulatory framework of Scheduled E-waste management by each of the 3 main flows are described in the following sections.

3.1 Scheduled E-waste Flow

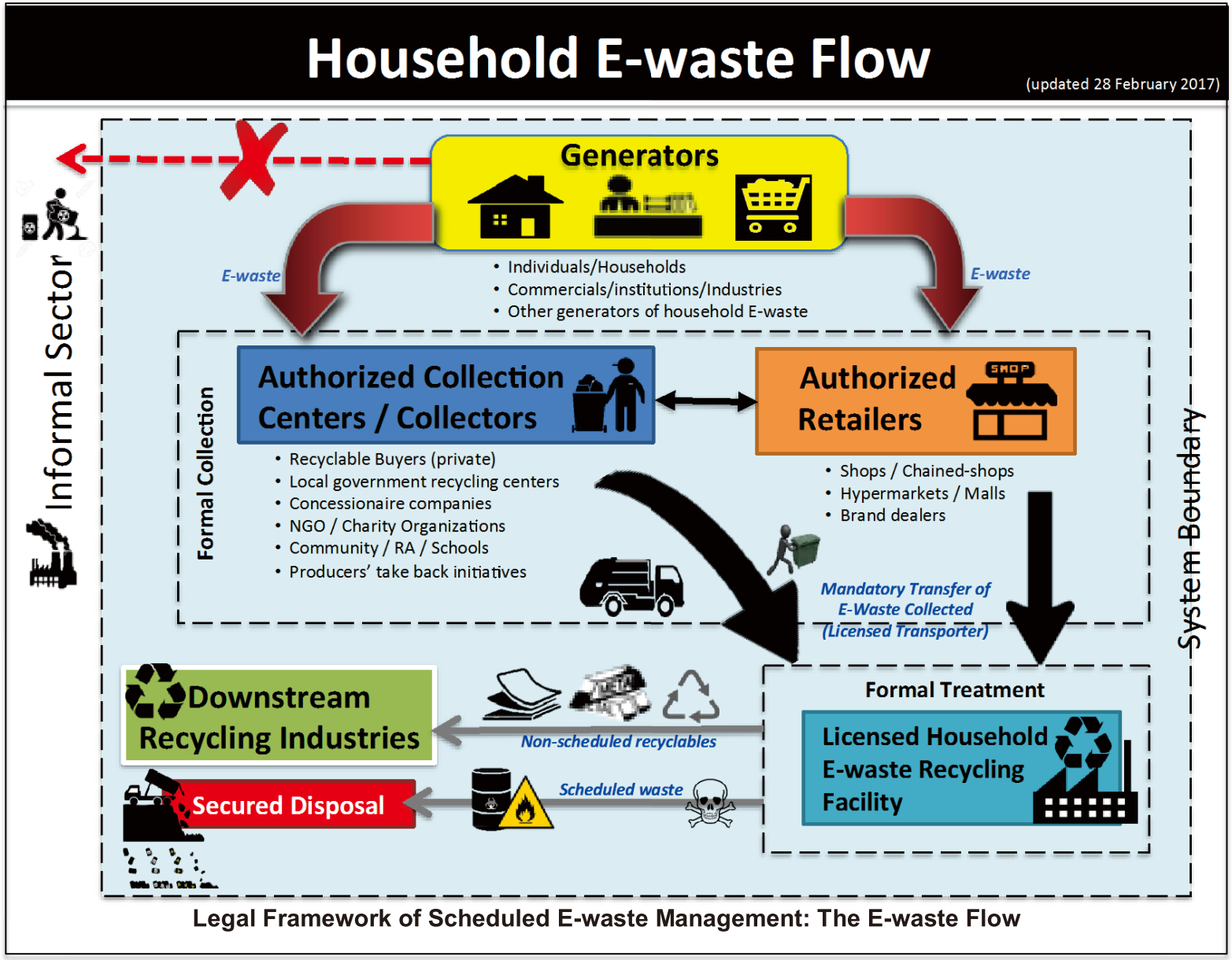
The generators for Scheduled E-waste cover not only limited to households, but also any other entities such as commercial, institutions and industries that use the same categories of electrical and electronic appliances. Examples of non-household generators include offices, commercial shops, malls, universities, schools, industries and any other generation sources, as long as the categories of targeted Scheduled E-waste specified in Section 2.3 are generated.

Under the new framework of the regulations, all generators of Scheduled E-waste are required to discharge their Scheduled E-waste to the authorized receiving points by the DOE as formal collection channels, which could be a retailer shop, recycling center, NGO or charity collection, concessionaire company or local government collection, or any other authorized premises. The Scheduled E-waste can be sold, donated, given or discarded with or without monetary incentives subject to the market demands. Any flow of Scheduled E-waste from generators to un-authorized receiving points is illegal and prohibited.

The collected Scheduled E-waste by the authorized collection points will be channeled to Scheduled E-waste recycling facility licensed by the DOE, to ensure proper treatment and recycling of the Scheduled E-waste in an environmentally sound manner. In case where the authorized collection points are not able to channel the collected Scheduled E-waste directly to the licensed facility due to logistic or any other factors such as small retailers, the collected Scheduled E-waste shall be delivered to another authorized collection point that has capability to channel the E-waste in a larger quantity.

The licensed Scheduled E-waste recycling facility is strictly prohibited from receiving Scheduled E-waste from any unauthorized sources. These licensed facilities shall fulfill the technical and legal requirements set by the DOE to efficiently process the Scheduled E-waste received (Refer to Recycling Guideline), in which the recyclable materials be sold to downstream recyclers, precious materials be recovered and residue waste be disposed off to licensed scheduled waste disposal facility either for secure landfill or other treatment.

Under the regulatory framework, the Scheduled E-waste is expected to flow from the generation points into proper recycling system within the system boundary. The generators shall understand and be responsible for the entire flow of the Scheduled E-waste that they have generated, to ensure that the Scheduled E-waste is collected or purchased or received by only authorized collection points including retailers, and channeled to license facility for proper recycling. Any outflow of Scheduled E-waste from the regulated system boundary to informal sectors will be considered illegal and should be strictly prohibited.



Legal Framework of Scheduled E-waste Management: The E-waste Flow

3.2 Fees Flow

It is important to understand that recycling of Scheduled E-waste does not always yield revenues but it involves significant costs particularly when taken into consideration the logistic costs and environmental protection costs such as destruction of chlorofluorocarbon (CFC) gases, various pollution control measures, as well as treatment and disposal of hazardous substances. The overall costs required to ensure that the Scheduled E-waste is properly channeled and processed in an environmentally sound manner shall be shared among the stakeholders, including the manufacturers and importers of electrical and electronic appliances, generators (consumers / users), retailers, authorized collection points, as well as end receiving points, i.e. the licensed E-waste recycling facility.

Under the new regulatory framework, the concept of “Shared Responsibility” is applied. The manufacturers and importers are obliged to pay recycling fee upon introduction of their products into the markets. The recycling fee collected will be channeled to the Recycling Contribution Management Body (RCMB) directly.

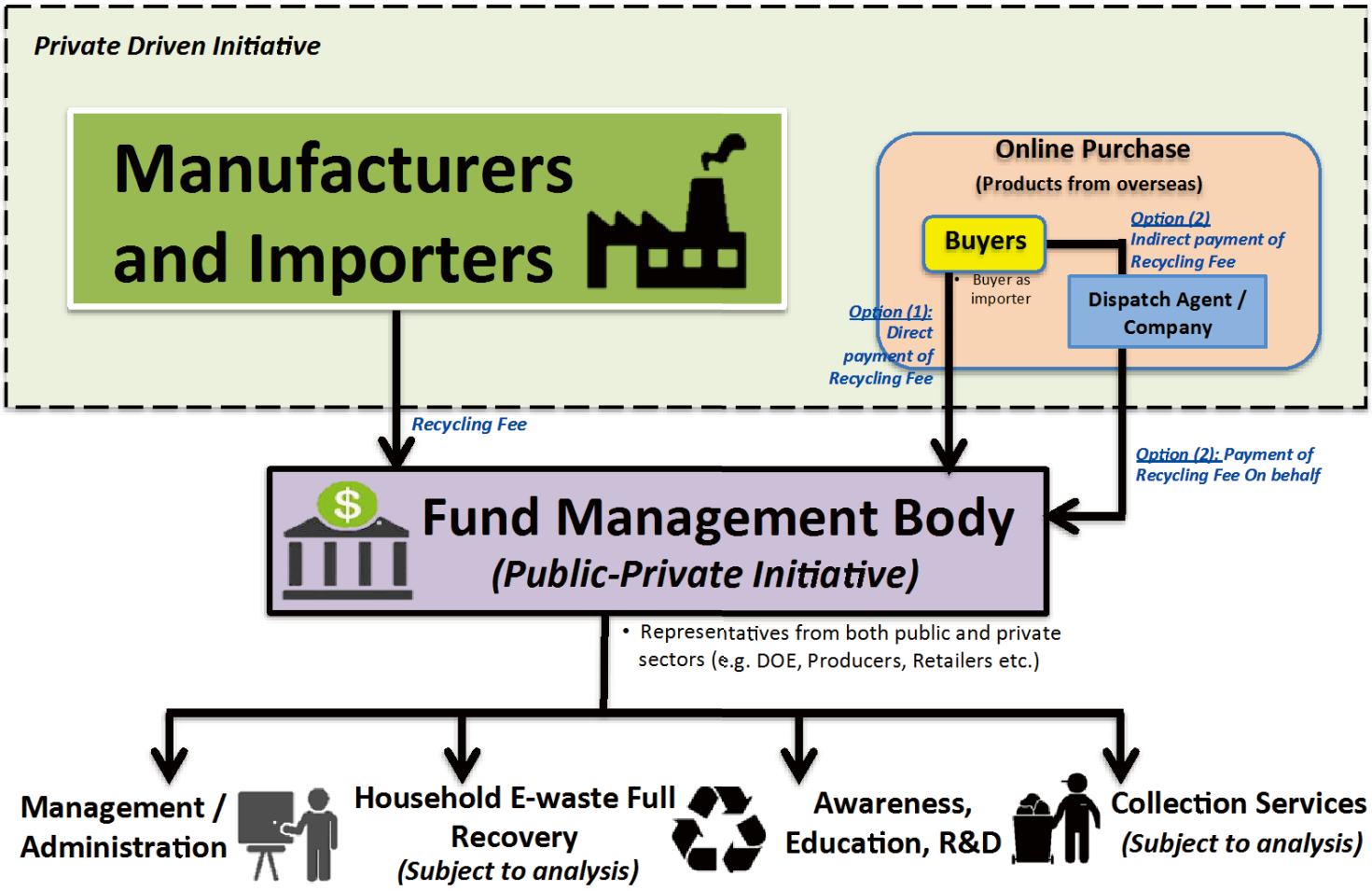
In case of online or internet purchase of the regulated products by the buyers / consumers without any direct involvement of manufacturer or importer, the buyers / consumers are obliged to pay the recycling fees.

The recycling fees paid by the manufacturers, importers or the consumers for the case of online purchase will be the main source of fund, which will be used to subsidize necessary activities of the licensed Scheduled E-waste recycling facilities, authorized collection centers, authorized retailers and other possible stakeholders involved, which will be determined by the FMB. In general, the recycling fee collected will be used to cover not only possible subsidies for activities of collection and recycling facilities, but also administration of the FMB as well as necessary awareness and education events.

The recycling fee for different items of targeted Scheduled E-waste will be different subject to various factors involved in collection and recycling of the items. Details of fee structures to be paid by the manufacturers and importers by each category of targeted Scheduled E-waste are described in Recycling Fee Guideline.

Recycling Fee Flow

(updated 28 February 2017)



Legal Framework of Scheduled E-waste Management: The Recycling Fee Flow

3.3 Reporting Flow

Proper reporting system is an essential tool to monitor and ensure proper Scheduled E-waste flow and recycling fee flow as elaborated in Section 3.1 and 3.2 above.

In order to determine the recycling fee to be paid by the manufacturers, importers, as well as consumer for the case of online purchase, the following reporting needs to be carried out:

a) Manufacturers and Importers – to report the quantity of the regulated electrical and electronic appliances introduced into the Malaysia market, whether it is locally manufactured, assembled, or imported.
b) Custom Department – to provide data on the importation of regulated electrical and electronic appliances directly by the consumers.

Information reported by the manufacturers, importers and Custom Department will be the fundamental for the FMB to determine the amount of recycling fees to be collected.

On the other hand, in order to ensure proper flow of the Scheduled E-waste within the system boundary from generation points to the final receiving points, reporting by relevant stakeholders by manifest system is required. The manifest system comprises 6-ply of consignment notes, which shall be filled out and kept by respective stakeholders following the methods as detailed in Reporting Guideline. Some brief explanations on the reporting flow under the new regulatory framework are shown below:

a) The authorized collection centers and retailers shall report each collected Scheduled E-waste by using the manifest form, to ensure each Scheduled E-waste is delivered to the right destination, i.e. the licensed Scheduled E-waste recycling facilities.

b) In case a licensed transporter is used, the authorized collection centers and retailers shall make sure that the manifest forms flow along with the transportation to the licensed facilities.

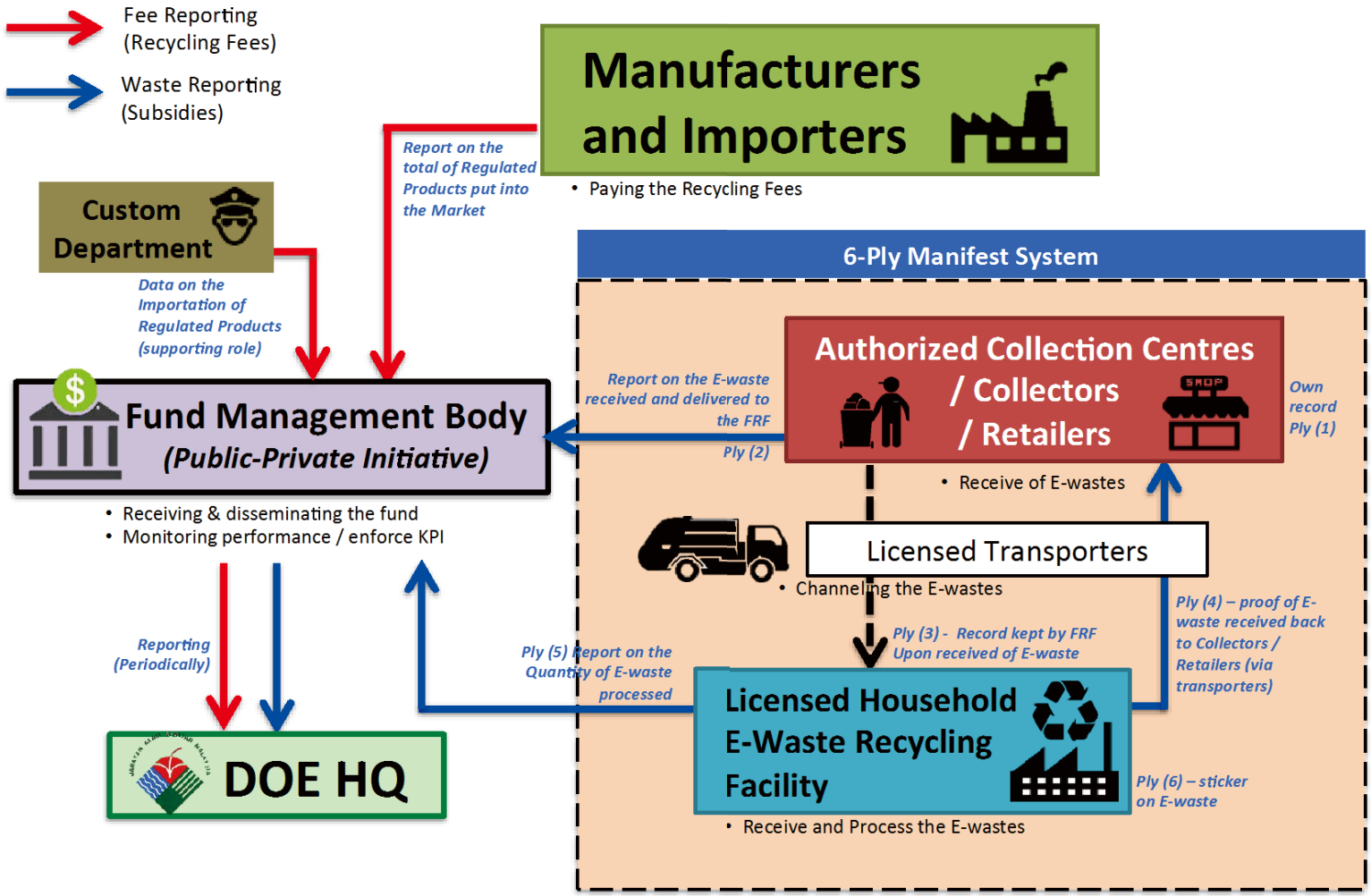
c) The licensed Scheduled E-waste recycling facilities shall only receive Scheduled E-waste from authorized sources, with clear manifest forms attached.

d) The authorized collection centers, retailers and licensed Scheduled E-waste recycling facilities shall report the number of Scheduled E-waste collected or received to the FMB in order to justify if any subsidy is required.

In general, the manifest system ensures all the collected Scheduled E-wastes are channeled to the right destination for proper recycling. Proper reporting flow serves as monitoring tool to ensure effective implementation of the entire system within the regulated boundary.

Reporting Flow

(updated 28 February 2017)



Legal Framework of Scheduled E-waste Management: The Reporting Flow

4.0 REQUIREMENTS FOR COLLECTION, STORAGE, HANDLING AND TRANSPORTATION

In general, the Environmental Quality (Scheduled E-Waste) Regulations 20XX outlines the responsibilities of different stakeholders throughout the entire flow of Scheduled E-waste management from generation to final destinations whether it is a disposal site or a recycling facility. Any person who contravenes the regulations shall be guilty of an offence and shall be liable to a fine or to a term of imprisonment for a period as stipulated in the Regulations.

This Guideline focuses particularly on the stakeholders involved in activities from the generation points to the authorized receivers who are possibly a collection center, collector, and retailer in terms of Scheduled E-waste handling, storage, collection and transportation. It is to ensure that the Scheduled E-waste is managed in a manner that is not creating nuisance, leakage and effectively channeled to the final destinations.

4.1 Purchase, Receive and Collect

Any individual person, company, organization or any other entities that receive, purchase, collect Scheduled E-waste shall take note of the following:

a) The Scheduled E-waste generators [as defined in the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulations 20XX are legally allowed to give away, donate, discard, sell the Scheduled E-waste to only collection centers, collectors, retailers, who are authorized by the DOE.

b) The Scheduled E-waste generators shall give away, donate, discard, sell the Scheduled E-waste in a complete set or incomplete set (Refer to Section 2.3), with the following requirements:

Television	Complete set - no dismantling of any part is allowed.
Air-conditioner	Complete set - no dismantling of any part is allowed, release of refrigerants is strictly prohibited.
Cloth Washing Machine / Dryer	Complete set - no dismantling of any part is allowed.
Refrigerator / freezer / chiller	Complete set - no dismantling of any part is allowed, release of refrigerant are strictly prohibited.
Computer	Complete or incomplete set - Small extent of dismantling may happen such as removal of the hard disk or CD-ROM. Further dismantling is not allowed.
Mobile phone / tablet PCs	Complete set - no dismantling of any part is allowed.

c) Any stakeholders who are involved in the activities of Scheduled E-waste collection, whether to purchase, to collect or receive for free shall obtain written authorization from the DOE. Application for authorization shall be done by filling out the specific form.

d) The authorized stakeholders are responsible to notify the public that they are authorized by DOE on Scheduled E-waste collection, and inform about the service provided with regard to Scheduled E-waste (such as receive of Scheduled E-waste, provide collection service of Scheduled E-waste upon request etc.)

e) The authorized stakeholders are obliged to receive, purchase, collect Scheduled E-waste irrespective of any brand, when and where the original item brought for disposal was originally produced.

f) The authorized stakeholders are obliged to receive / collect Scheduled E-waste in a complete set or incomplete set as listed in 4.1(c). Any deviation from the list could also be collected / received but it shall be clearly reported following the Reporting Guideline.

g) The Scheduled E-waste generators have the right to know the destination of the E-waste that they have given away, discarded, donated or sold, to ensure that the Scheduled E-waste ends up at dedicated destinations for proper recycling or disposal.

h) For de-installation of air-conditioner in particular, the generators shall use capable de-installer or company with certified technicians to ensure proper de-installation processes to avoid leaking or release of the refrigerants into the environment [Refer to the Environmental Quality (Refrigerant Management) Regulations, 1999].

4.2 On-site Storage / Handling

As a general guide, proper storage and handling of Scheduled E-waste generated includes the following important measures to be taken into considerations:

a) Proper segregation of Scheduled E-waste, particularly important to avoid mixing the Scheduled E-waste with any other categories of waste such as scheduled waste or residual solid waste;

b) Selection of appropriate and durable Scheduled E-waste storage container types with right capacities for different categories of Scheduled E-waste generated;

c) Appropriate selection of Scheduled E-waste storage areas, whether to be in a container or directly on the ground. The storage areas shall be shaded from direct sunlight and avoid exposure to rainfall to prevent possible fire risk of lithium batteries contained in the Scheduled E-waste.

d) Proper usage of the storage container, to avoid overloading, spillage and improper storage of the container.

Examples of Proper Storage Containers for Segregated Scheduled E-waste

e) Proper labeling of the storage areas, subject to the labeling specification and requirements.

f) In case if lithium batteries are removed from the Scheduled E-waste, all lithium batteries shall be placed into a separate plastic or wooden container, and handled with care to avoid potential fire risk during transportation. Do not store lithium batteries in any metal containers.

Special Note: for Lithium Batteries Storage

- ✓ *All lithium batteries are subject to the EQA (Scheduled Waste) Regulations 2005, under code SW103.*
- ✓ *Special care shall be taken to ensure lithium batteries are not exposed to any flammable environment / wet condition.*
- ✓ *Lithium batteries can release toxic material if crushed or broken or opened, large quantities shall be stored in an isolated area.*
- ✓ *Lithium batteries shall be stored in a secure, cool, well-ventilated, dry environment, without direct sunlight.*
- ✓ *Temperature shall be kept below 25^{o}C at all time.*
- ✓ *Seal both the terminal (+) and (-) of the lithium batteries with tapes before storage.*
- ✓ *The storage area shall have access to a fire extinguisher or other extinguisher designed for metallic fires.*

- ✓ *Storage areas shall be clearly identified as a Lithium Battery storage area.*
- ✓ *Do not load or transport the lithium batteries if the package or container is found damaged.*

← Example of Label

g) Further dismantling of the Scheduled E-waste other than the requirements as specified in Section 4.1(c) is strictly prohibited at any stage of handling and storage, which is subject to occupational safety and health concerns.

Dismantling Activity of Scheduled E-waste is Prohibited

Special Notes for Repair Shops:

- ✓ *Dismantling of Scheduled appliances shall be carried out in accordance to the general code of practice, without creating any pollution and nuisance to the surrounding environment.*
- ✓ *Dismantled parts of E-waste that needs to be disposed shall comply with the EQA (Scheduled Waste) Regulations 2015, including the lithium batteries / button batteries which are listed in the First Schedule as SW103.*
- ✓ *Appliances that cannot be repaired and need to be disposed in a complete set shall comply with the EQA (Scheduled E-Waste) Regulations 20XX.*

h) The Scheduled E-waste shall be stored in a way to ensure it does not hold water in order to prevent the potential for mosquito breeding.

i) In order to carry out all the above effectively, sufficient information / education shall be made available to relevant workers / staff / officers on site, who are directly dealing with the Scheduled E-waste (Refer to Section 4.5 on Other Requirements).

In addition to the above, some specific requirements by each category of Scheduled E-waste targeted in this Guideline are elaborated as follows:

No	Categories	Precautions
1	Television	✓ Televisions shall be handled with care because the CRT glass is fragile and contains lead, which is highly hazardous to human health and the environment. ✓ When stacking the televisions together during storage, separate flat screen televisions and CRT television for easy storage and saving of space. ✓ Separate the televisions by types and sizes will also ease the works of documentation especially in reporting using the manifest forms (Refer to Reporting Guideline).
2	Refrigerator / Freezer / chiller	✓ Refrigerant in the refrigerator / freezer shall not be released into the air at all time. ✓ Used refrigerant shall be pumped and stored in a refrigerant gas cylinder. ✓ The compressor of the refrigerator / freezer shall be intact without any dismantling, and carefully handled to avoid leaking of refrigerant and lubricant oil. ✓ The insulation foam of the refrigerator / freezer contains CFC and shall not be dismantled at all time. ✓ The plastic compartments / shelves in the refrigerator / freezer may be taken out by the generator, which is acceptable but no further dismantling activity is allowed. ✓ Separate the refrigerators / freezers / chiller by types and sizes will also ease the works of documentation especially in reporting using the manifest forms (Refer to Reporting Guideline).
3	Cloth Washing / Dryer Machine	✓ Some cloth dryer or washing machine may contain glass, which is fragile and shall be handled with care to avoid possible occupational hazards to the workers. ✓ Separate the washing machine / cloth dryer by types and sizes will also ease the works of documentation especially in reporting using the manifest forms (Refer to Reporting Guideline).

4	Air-conditioner	✓ Air-conditioner shall be de-installed with special care by certified persons to ensure that the refrigerant contained in the air-conditioner is not released into the atmosphere. ✓ Used refrigerant shall be pumped and stored in a refrigerant gas cylinder. ✓ The handling and treatment of used refrigerants shall be in compliance with the relevant regulations. ✓ Separate the air-conditioner by types and sizes will also ease the works of documentation especially in reporting using the manifest forms (Refer to Reporting Guideline).
5	Computer	✓ Computers contain lithium battery and/or button battery that shall be handled with care. ✓ Computer monitors shall be handled with care because the CRT glass is fragile and contains lead, which is highly hazardous to human health and the environment. ✓ When stacking the computer monitors together during storage, separate flat screen and CRT screen for easy storage and saving of space. ✓ Complete or incomplete set of computer refers to mainly the monitor and the CPU unit, excluding other peripherals such as keyboard, speaker, mouse and charger. ✓ Some parts of the computer may be taken out by the generators such as hard disks and ram, which is acceptable but no further dismantling of computer CPU is allowed. ✓ Separate the computers by types and sizes will also ease the works of documentation especially in reporting using the manifest forms (Refer to Reporting Guideline).
6	Mobile phone / Tablet PC	✓ Complete set of mobile phone and tablet PC includes or without the lithium battery, excluding the charger and other peripherals. ✓ Mobile phones contain lithium battery that shall be handled with care. ✓ All the mobile phones and tablet PC collected can be mixed and placed together in a plastic or wooden container.

Mobile Phone Battery

Power Bank

Lithium and Button Batteries Shall be Handled with Care

4.3 Transportation / Transfer

Transportation or transfer of Scheduled E-waste is generally carried out either by commercial and non-commercial stakeholders. Commercial stakeholders include recyclers, concessionaire companies, retailers, industries and any other private commercial entities; non-commercial stakeholders include the local authorities, NGO, community based organizations, institutions such as schools and universities, as well as individual.

Transportation of Scheduled E-waste by any stakeholder shall obtain prior authorization by the DOE, through application by using the Form as enclosed in the Appendix (Refer to Section 5.0). Some stakeholders may apply for exemption of registration to the Director-General of DOE, subject to deviation details and conditions.

Prior to transportation of any Scheduled E-waste, it is a basic requirement that each item of the Scheduled E-waste shall be properly recorded / documented by using the manifest form of the DOE as part of the reporting requirements (refer to Section 4.4 on Reporting Responsibility).

The following requirements shall be applied for all transportation / transfer activities of Scheduled E-waste:

a) Individual generators are allowed to use own vehicle to transport only own Scheduled E-waste to any authorized collection center / collector / retailer / recycling facility.

b) Proper label to be placed at the back of the vehicle during transportation, which is visible and readable by the road users at the distance of 30m away, with the following wordings (except for personal vehicle of individual generators; and collection vehicles of the Concessionaire companies which are subject to labeling requirements of the JPSPN):

> Please report in case of emergency to:
> Department of Environment HQ: 1-800-88-2727 (24 jam)
> Department of Environment XX State: XXXXXXXXX

c) The Scheduled E-waste shall be placed on the vehicle in an appropriate manner. Avoid overloading at all time and the transported Scheduled E-waste loads shall be fully covered (such as using canvas or plastic sheets) to avoid falling off of the Scheduled E-waste from the vehicle during transportation.

d) The flow or destination of Scheduled E-waste is strictly controlled and shall be transported only to authorized/licensed destinations, including any authorized collection centers, collectors, retailers or any licensed recycling facilities.

e) Any dismantling activity of the Scheduled E-waste is strictly prohibited by the transporter workers.

f) Temporary storage of the Scheduled E-waste is strictly prohibited by the transporter. The transported Scheduled E-waste shall be delivered to the destinations as soon as possible.

g) In the case of falling off of Scheduled E-waste from the vehicle during transportation routes, the transporter company or authorized company / organization shall take immediate action to carry out any necessary clean-up activities under their own costs. A report of the incident shall be made to the DOE immediately.

In addition to the above, the transportation / transfer of Scheduled E-waste is generally also subject to reporting requirements, which is further elaborated in Section 4.4 of the Guideline.

4.4 Reporting Responsibility

The authorized collectors, collection centers, retailers, transporters, recycling facilities and any other relevant stakeholders who are involved in the activities specified in Section 2.1 of the Guideline are also subject to do reporting, following the reporting requirements as stipulated in the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulations 20XX.

Detailed requirements of reporting responsibilities by different stakeholders shall refer to the Guideline on Reporting Requirements.

4.5 Other Requirements

In addition to the above, some additional requirements from other aspects of the handling of Scheduled E-waste are summarized as follows:

(a) Training of Workers (Subject to DOE decision whether to delete)

The authorized collectors, collection centers, retailers, transporters, recycling facilities and any other relevant stakeholders who are involved in the activities specified in Section 2.1 and 2.2 of the Guideline, shall ensure that all the workers are well trained by a competent personnel in performing the jobs. The competent person shall attend training courses provided by the DOE or endorsed training providers by the DOE on relevant topics from time to time.

(b) Health and Safety

The authorized collectors, collection centers, retailers, transporters, recycling facilities and any other relevant stakeholders who are involved in the activities specified in Section 2.1 and 2.2 of the Guideline, shall ensure that all necessary health and safety measures are taken into consideration in conducting the activities, such as using the personal protective and safety equipment (safety cone, jacket and signboard etc.). All activities carried out shall be in accordance to the requirements, following the Regulations under the Occupational Safety and Health Act 1994 (Act 514).

(c) Emergency Response Plan

The authorized collectors, collection centers, retailers, transporters, Scheduled E-waste recycling facilities and any other relevant stakeholders who are involved in the activities specified in Section 2.1 and 2.2 of the Guideline, shall prepare an Emergency Response Plan (ERP), for the activities carried out. The ERP shall be updated from time to time and made available for inspection by the DOE whenever required.

5.0 AUTHORIZATION / REGISTRATION PROCEDURES (THIS CHAPTER WILL BE SUBJECT TO DOE DECISION ON HOW TO DO THE AUTHORIZATION)

Under the legal framework of the Environmental Quality (Scheduled E-Waste) Regulations 20XX, only authorized stakeholders are legally allowed to deal with Scheduled E-waste, throughout the entire process from generation to final destination whether a recycling facility or disposal site.

5.1 Eligibility

The applicant for authorization or registration is only applicable to company (with registration of ROC), association or society (with registration of ROS) as well as any government agencies (Local, State or Central).

Any individual or sole proprietor, who is interested or involved in the activities of collection, storage, handling and transportation of Scheduled E-waste, shall engage any registered or authorized stakeholders for carrying out the activities.

5.2 Application Procedures

The application for authorization or registration shall undergo the following official procedures:

a) Submit the application Form as attached in the Appendix, addressed to:

   Director-General
   Department of Environment (DOE)
   Level 1, Podium 2 Wisma Sumber Asli,
   Persiaran Perdana, Precint 4,
   62574 Putrajaya

b) Submit supporting documents (refer to Section 5.3) and receipt of processing fee, within 14 days from the submission date of the application form.

c) Submit any additional documents requested by the DOE (if applicable).

d) Pay processing fee as specify in Section 5.4.

e) The applicant shall be notified on the status of application within 14 days from the date of submission of all required documents.

f) Each applicant shall renew the registration / authorization on annual basis, with update of the information if relevant, by using the Form as attached in the Appendix.

5.3 Supporting Documents

The applicant shall submit two copies each of the supporting documents required include:

i. Bank statement for latest 3 months, showing account balance of not less than RM30,000.00, or any proof of "kemudahan kredit" or combination of both not less than RM30,000.00.

ii. Existing contract / agreement or any other documents (e.g. memorandum of understanding (MOU) with licensed facilities receiving Scheduled E-waste (if relevant).

iii. Description of operational plan for storage, handling, collection and transportation of Scheduled E-waste.

iv. Any other permits, licenses, approvals by other relevant authorities such as the permit by the Royal Police of Malaysia (PDRM); licensed by the National Solid Waste Management Department (JPSPN) and Solid Waste and Public Cleansing Management Corporation (SWCorp); approval by the Local Authorities etc.

v. Any additional supporting documents as requested by the DOE (e.g. the proof of the storage capability).

5.4 Fees (Refer to EQA – legal binding)

Each application shall pay processing fee of RM100 (One hundred Ringgit Malaysia) to the DOE.

Each successful applicant registered / authorized by the DOE shall pay RM100 (One hundred Ringgit Malaysia) annual fee, to be renewed on yearly basis.

Both the processing and annual fees are not refundable.

5.5 Deviation of Requirements

All players involved in any activity in dealing with the Scheduled E-waste shall be registered and authorized by the Director-General of the DOE. In case if any deviation of requirements as specified in this Guidelines is applicable, written application shall be made to the Director-General of the DOE for special exemption of approval for deviation of requirements.

6.0 SUMMARY OF THE GUIDELINE

This Guideline focuses particularly all the activities involved in handling, storage, collection and transportation of Scheduled E-waste management from the generation points to the authorized receivers. It is to ensure that the Scheduled E-waste is handled in a manner that is not creating nuisance, leakage and pollution to the environment, and effectively channeled to the licensed facilities for recycling and disposal in an environmentally sound manner.

The roles and responsibilities of all relevant stakeholders are stipulated in this Guideline, which is summarized in the Table as follows:

No	Stakeholders	Summary of Responsibilities
1	Generators	✓ Give / donate / sell / discard complete set or incomplete set of Scheduled E-waste only to authorized collectors or collectors or retailers. ✓ No further dismantling of Scheduled E-waste is allowed. ✓ Be responsible on the Scheduled E-waste generated; make sure it ends up at licensed facilities for proper recycling. ✓ Strictly no channeling of Scheduled E-waste to the informal sectors.
2	Collectors / Collection Centers	✓ Obliged to be registered / authorized by DOE on the collection of Scheduled E-waste. ✓ Notify the public that they are “Authorized” by the DOE. ✓ Inform the public what kind of services offered with regards to Scheduled E-waste collection. ✓ Receive Scheduled E-waste only in complete set or partially complete set (as shown in Section 4.1). ✓ Further dismantling of the Scheduled E-waste is not allowed. ✓ Proper storage of Scheduled E-waste under shade, no exposure to direct sunlight and rainfall. ✓ Separation of lithium batteries and button batteries from the Scheduled E-waste is allowed (if applicable), store the lithium batteries and button batteries separately in containers, at dry cool place; subject to requirements of SW103 under the EQA (Scheduled Waste) Regulations 2005.
3	Retailers	

		✓ Proper labeling at collection / storage areas. ✓ Beware of creating mosquito breeding ground in E-waste storage area. ✓ Deliver the collected Scheduled E-waste only to other authorized premises or licensed recycling facilities / only use authorized transporter. ✓ Fulfill reporting requirement (refer to the requirements in Reporting Guideline). ✓ Fulfill other requirements such as workers competencies (refer to Section 4.5).
4	Transporters	✓ Obliged to be registered / authorized by DOE on the transportation of Scheduled E-waste. ✓ Transport of collected Scheduled E-waste following all the SPAD requirements. ✓ Avoid overload; make sure Scheduled E-waste transported is fully covered. ✓ Temporary storage not allowed. ✓ Further dismantling of the Scheduled E-waste is not allowed. ✓ Proper labeling at the transport vehicle. ✓ Deliver the Scheduled E-waste only to authorized premises or licensed recycling facilities. ✓ Fulfill reporting requirement (refer to the requirements in Reporting Guideline). ✓ Fulfill other requirements such as workers competencies (refer to Section 4.5).
5	Repair shops	✓ Conduct the dismantling activities following general code of practices. ✓ Ensure no release of refrigerants into the atmosphere from the appliances (if applicable). ✓ Collected refrigerant shall be handled in accordance to the EQA (Refrigerant Management) Regulations. ✓ All separated lithium batteries and button batteries shall be stored in containers, at dry cool place; subject to requirements of SW103 under the EQA (Scheduled Waste) Regulations 2005. ✓ Comply with EQA (Scheduled Waste) Regulations 2005 for dismantled parts of E-waste.

		✓ Comply with EQA (Scheduled E-Waste) Regulations 20XX for complete set of Scheduled E-waste. ✓ Proper storage of Scheduled E-waste under shade, no exposure to direct sunlight and rainfall ✓ Beware of creating mosquito breeding ground in E-waste storage area. ✓ Proper labeling at storage areas. ✓ Fulfill reporting requirement (refer to the requirements in Reporting Guideline). ✓ Fulfill other requirements such as workers competencies (refer to Section 4.5).
6	De-installers (Air-cond)	✓ Ensure de-installation of air-conditioner is carried out with no release of refrigerants into the atmosphere. ✓ Collected refrigerant shall be handled in accordance to the EQA (Refrigerant Management) Regulations. ✓ Dismantling of the Scheduled E-waste is not allowed. ✓ Fulfill reporting requirement (refer to the requirements in Reporting Guideline). ✓ Fulfill other requirements such as workers competencies (refer to Section 4.5).
7	Licensed Recycling Facility	✓ Receive Scheduled E-waste only from authorized collection centers / collectors / retailers. ✓ Trading of Scheduled E-waste among different licensed recycling facilities is allowed. ✓ Fulfill reporting requirement (refer to the requirements in Reporting Guideline). ✓ Carry out recycling and disposal of Scheduled E-waste in an environmentally sound manner (refer to the requirements in Recycling Guideline). ✓ Fulfill other requirements such as workers competencies (refer to Section 4.5).

With respective roles and responsibilities played by different stakeholders, this Guideline aims to:

- Avoid improper handling and management of Scheduled E-waste by the informal sectors.
- Prevent adverse impacts to the environmental and human health caused by improper dismantling activities.
  - No release of harmful refrigerants into the atmosphere
  - No inhale of harmful gasses from illegal burning
  - No leakage of contaminants / wastewater
  - No illegal dumping of unwanted residues
  - No injury of workers due to improper dismantling
  - No chronic health impacts to the workers
- Ensure effective resource recovery of Scheduled E-waste by competent / qualified stakeholders.
  - Effective recycling of recyclable materials such as plastics, irons, coppers, zinc etc.
  - Effective recovery of precious metals such as gold, platinum, silver etc.
- Ensure efficient pollution control and proper waste disposal
  - Proper disposal of residues to licensed facilities

Recycle your E-waste Responsibly!!

APPENDICES

APPENDIX A

Form XX – Application for Registration / Authorization for Scheduled E-waste Collection and Transportation

General Information

Applicant name: ____David Lim Ah Beng_____ contact number: __012-3456789____

Company name: ____E-waste Transport Sdn Bhd_____ Co. Reg. No. __1234567-W___

Address: _____No. 123, Jalan Satu Dua Tiga, Taman Empat Lima Enam,_____

_____Taman ABC, 44500 Shah Alam, Selangor _____

Contact: ___03-4567890_ (Tel) __03-4567891_ (Fax) _ewastetransport@gmail.com_ (Email)

Category of business:
- ☐ Retailers / dealers ☐ Collectors / Collection Centers
- ☐ Local government / other government agencies
- ■ Transport / Logistic Company
- ☐ Others (Pls specify: _____)

Application Details:

a) Information on the vehicle to be registered / authorized:

No	Vehicle Type	Capacity (tonnes)	Plate Number
1	Nissan XXX loader	1-tonne	ABC 1234
2	Toyota XXX truck	2-tonne	WEE 2345
3	Tata XXX lorry	5-tonne	WAA 6789
4			
5			

Note: Submit in separate sheet of paper if not sufficient

b) Types of Scheduled E-waste to be collected and transported (Tick more than one if applicable):

No	Types	Tick
1	Washing machine / Dryer	X
2	Television	X
3	Air-conditioner	

No	Types	Tick
4	Refrigerator	X
5	Computer	X
6	Mobile phone	

Note: Only the above 6 categories of Scheduled E-waste are subjected to the Regulations

c) Contract with licensed Scheduled E-waste recycling facility (if available):

No.	Name of Facility	Contract Validity
1	Jaring Metals Industry Sdn Bhd (Shah Alam)	June 2015 – June 2018
2	Meriahtek Sdn Bhd (Melaka)	May 2015 – May 2020
3		

Note: Only the facilities licensed by the DOE are allowed to receive collected Scheduled E-waste

Payment Details:

a) Registration fee: RMXXX.00 per company (First time only)

b) Authorization for vehicle registered: RMXX.00 per vehicle per year

No	Fee types	Total (RM)
1	Company registration	XXX.00
2	Vehicle number - ____3_____ x RMXX.00 per vehicle per year	XX.00
Total Amount Payable (RM)		XXX.00

Remarks:
Please make payment by cheque under the name of "RECYCLING CONTRIBUTION MANAGEMENT BODY" or transfer into the bank account: MAYBANK, 1234-5678-9000 (Please provide transfer reference number for tracking)

Note:

Please provide photocopy (one copy each) of the following documents along with the submission of the Application Form:

- ✓ *Identity Card of the Applicant*
- ✓ *Company Registration Certificate and Form 49*
- ✓ *Vehicles' registration cards*
- ✓ *Contract with the Licensed Scheduled E-waste recycling facility*
- ✓ *Other supporting document (if relevant)*

I, the undersigned, hereby acknowledge that all the information provided above is true, and XXXXXXXXXXX XXXXXXXXXXXXXXXX XXXXXXXXXXXX.

Signature:

_____
Name: David Lim Ah Beng
Position: Managing Director
Company name: E-waste Transport Sdn Bhd (Co. Reg. 1234567-W)

Date: 28th April 2016

APPENDIX B

Form – Application for Renewal of Registration / Authorization for Scheduled E-waste Collection and Transportation

General Information

Applicant name: ____David Lim Ah Beng_____ contact number: __012-3456789____

Company name: ____E-waste Transport Sdn Bhd_____ Company ID. __HHEW001___

Address: _____No. 123, Jalan Satu Dua Tiga, Taman Empat Lima Enam,_____

_____Taman ABC, 44500 Shah Alam, Selangor _____

Contact: ___03-4567890_ (Tel) __03-4567891_ (Fax) _ewastetransport@gmail.com_ (Email)

Category of business:
- ☐ Retailers / dealers ☐ Collectors / Collection Centers
- ☐ Local government / other government agencies
- ■ Transport / Logistic Company
- ☐ Others (Pls specify: _____)

Any registered information to be changed / updated?

☐ YES (Please update below) ■ NO (Proceed to payment details)

Update of Information:

a) Information on the vehicle to be registered / authorized:

No	Vehicle Type	Capacity (tonnes)	Plate Number
1			
2			
3			
4			
5			

Note: Submit in separate sheet of paper if not sufficient

b) Types of Scheduled E-waste to be collected and transported (Tick more than one if applicable):

No	Types	Tick
1	Washing machine / Dryer	
2	Television	
3	Air-conditioner	

No	Types	Tick
4	Refrigerator	
5	Computer	
6	Mobile phone	

Note: Only the above 6 categories of Scheduled E-waste are subjected to the Regulations

c) Contract with licensed Scheduled E-waste recycling facility (if available):

No.	Name of Facility	Contract Validity
1		
2		
3		

Note: Only the facilities licensed by the DOE are allowed to receive collected Scheduled E-waste

Payment Details:

a) Authorization for vehicle registered: RMXX.00 per vehicle per year

No	Fee types	Total (RM)
1	Vehicle number - ____3_____ x RMXX.00 per vehicle per year	XX.00
Total Amount Payable (RM)		XXX.00

Remarks:
Please make payment by cheque under the name of "RECYCLING CONTRIBUTION MANAGEMENT BODY" or transfer into the bank account: MAYBANK, 1234-5678-9000 (Please provide transfer reference number for tracking)

I, the undersigned, hereby acknowledge that all the information provided above is true, and XXXXXXXXXXX XXXXXXXXXXXXXXXX XXXXXXXXXXXX.

Signature:

_____
Name: David Lim Ah Beng
Position: Managing Director
Company name: E-waste Transport Sdn Bhd (ID: HHEW-001)

Date: 28th April 2016

APPENDIX C

Form – Application for Deviation of Requirements for Scheduled E-waste Collection and Transportation

General Information

Applicant name: ____David Lim Ah Beng_____ contact number: __012-3456789____

Company name: ____E-waste Transport Sdn Bhd_____ Company ID. __HHEW001___

Address: _____No. 123, Jalan Satu Dua Tiga, Taman Empat Lima Enam,_____

_____Taman ABC, 44500 Shah Alam, Selangor _____

Contact: ___03-4567890_ (Tel) __03-4567891_ (Fax) _ewastetransport@gmail.com_ (Email)

Category of business:
- ☐ Retailers / dealers ☐ Collectors / Collection Centers
- ☐ Local government / other government agencies
- ■ Transport / Logistic Company
- ☐ Others (Pls specify: _____)

Application Details:

Please elaborate types of deviation needed, justifications and countermeasures to be taken:

No	Deviations	Justifications	Countermeasures
1	Need to carry out dismantling of televisions and computer monitors	Because XXXXXXXXXXXXX	All dismantled parts will be handled in accordance to EQA (Scheduled waste) Regulations. XXXXXXXXXXXXX
2			

3			
4			

Note: Submit in separate sheet of paper if not sufficient

Note:

No deviation of requirement is allowed until written approval is obtained from the Department of Environment (DOE) with specific terns and conditions given, subject to the types of deviations applied.

I, the undersigned, hereby acknowledge that all the information provided above is true, and XXXXXXXXXXX XXXXXXXXXXXXXXXX XXXXXXXXXXXX.

Signature:

_____

Name: David Lim Ah Beng
Position: Managing Director
Company name: E-waste Transport Sdn Bhd (ID: HHEW-001)

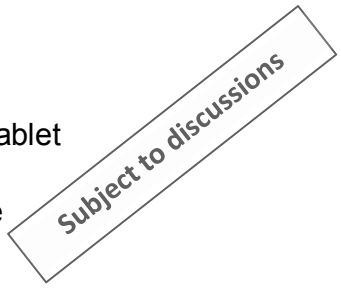
Date: 28th April 2016

APPENDIX D

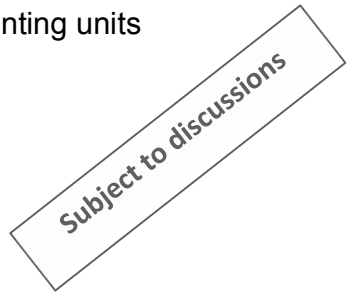
List of Scheduled E-Waste in the First Schedule of the Environmental Quality Act (Scheduled E-Waste) Regulations, 20XX

First Schedule

HSW_100	Electronic and Electrical Equipment *Definitions*
HSW_101	Air-Conditioner *Definitions*
HSW_102	Washing Machine / Cloth Dryer *Definitions*
HSW_103	Refrigerator / Freezer *Definitions*
HSW_104	Television *Definitions*
HSW_105	Computer / Tablet *Definitions*
HSW_106	Mobile Phone *Definitions*

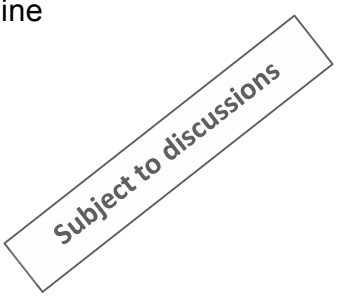


HSW_200	Small Electrical and Electronic Appliances *Definitions*
HSW_201	Printers and other printing units *Definitions*
HSW_202	Vacuum Cleaner *Definitions*
HSW_203	Hair Dryer *Definitions*
HSW_204	Scanners *Definitions*
HSW_205	Video Camera / Digital Camera / Recorder *Definitions*
HSW_206	DVD Player *Definitions*
HSW_207	Portable Music Player *Definitions*
HSW_208	Game Machine



Definitions

HSW_209	Telephone / Fax Machine *Definitions*
HSW_210	Car Navigator / GPS *Definitions*
HSW_211	Radio / Audio players *Definitions*
HSW_212	Rice Cooker *Definitions*
HSW_213	Microwave Oven / other ovens *Definitions*
HSW_214	More to add on *Definitions*



HSW_300	More to be added in the Future *Definitions*
HSW_400	More to be added in the Future *Definitions*
HSW_500	More to be added in the Future *Definitions*

APPENDIX E

List of Authorized Collectors / Transporters / Retailers / Other Collection Points

APPENDIX F

List of Licensed E-waste Full Recovery Facilities Under the Existing EQA (Scheduled Waste) Regulations

1	**CENTURY SURF SDN BHD (PLOT 157A)**	**FACILITI**:
	PLOT 157A, LORONG PERINDUSTRIAN BUKIT MINYAK 7, BUKIT MERTAJAM , PULAU PINANG	Kemudahan Pemerolehan Penuh Luar Tapak
	State: PULAU PINANG	
	Phone:012 4111 882	
	Fax:04 626 6002	
2	**DD WORLD CORPORATION SDN BHD (FOMERLY KNOWN AS QUANTUM REFIN**	**FACILITI**:
	PLOT 75, JALAN PERINDUSTRIAN BUKIT MINYAK TAMAN PERINDUSTRIAN BUKIT MINYAK , BUKIT MERTAJAM , PULAU PINANG	Kemudahan Pemerolehan Penuh Luar Tapak
	State: PULAU PINANG	
	Phone:04-5015577	
	Fax:04-5015575	
3	**EGA RECYCLING SDN. BHD. (FULL RECOVERY) (NSU)**	**FACILITI**:
	LOT 29, JALAN PERMATA 1/1,ARAB MALAYSIAN INDUSTRIAL PARK , NILAI , NEGERI SEMBILAN	Kemudahan Pemerolehan Penuh Luar Tapak
	State: NEGERI SEMBILAN	
	Phone:06-7998229	
	Fax:06-7646425	
4	**KRUBONG RECOVERY SDN. BHD.**	**FACILITI**:
	(2625 & 2630) PT.1671 & PT 1676,KAWASAN PERINDUSTRIAN KRUBONG , MELAKA , MELAKA	Kemudahan Pemerolehan Penuh Luar Tapak
	State: MELAKA	
	Phone:06-3352519	
	Fax:06-3352520	
5	**MERIAHTEK (M) SDN. BHD.**	**FACILITI**:
	NO 1, JALAN TTC 30, LOT 4827, 4828, 4831 & 4832, TAMAN TEKNOLOGI CHENG,MUKIM CHENG , MELAKA , MELAKA	Kemudahan Pemerolehan Penuh Luar Tapak
	State: MELAKA	
	Phone:06 - 3365211	
	Fax:06 - 3365201	
6	**ALH INDUSTRIES SDN BHD (SW110)**	**FACILITI**:
	LOT 7832, 7833, 7834, 7835, JALAN BATU TIGA, BUKIT CHERAKAH , SHAH ALAM , SELANGOR	Pemerolehan Kembali Luar Tapak
	State: SELANGOR	
	Phone:03-78469967	
	Fax:03-78464967	

7	**BENCHMARK VISTA SDN. BHD.(LOT NO. 6,SOLOK SULTAN HISHAMUDDIN**	**FACILITI**:
	LOT NO. 6, SOLOK SULTAN HISHAMUDDIN 7, BANDAR SULTAN SULAIMAN, SELAT KLANG UTARA, , PELABUHAN KELANG , SELANGOR	Pemerolehan Kembali Luar Tapak
	State: SELANGOR	
	Phone:03-31766357	
	Fax:03-31767357	
8	**CHEMALAYA SDN BHD**	**FACILITI**:
	Plo 128 Jalan Rimba 3 Tanjung Langsat Industri Complex , PASIR GUDANG , JOHOR	Pemerolehan Kembali Luar Tapak
	State: JOHOR	
	Phone:07-6522064	
	Fax:07-6522070	
9	**CYCLE TREND INDUSTRIES SDN. BHD. (BUKIT MINYAK)**	**FACILITI**:
	NO. 1001, PLOT 209b, JALAN PERINDUSTRIAN BUKIT MINYAK KAWASAN PERINDUSTRIAN BUKIT MINYAK, , BUKIT MERTAJAM , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-507 8089	
	Fax:04-508 0861	
10	**DNS WASTE MANAGEMENT SDN.BHD.**	**FACILITI**:
	LOT 880, BLOCK 237 KNLD, KOTA SENTOSA INDUSTRIAL PARK, JALAN BATU KITANG 93250 KUCHING , KUCHING , SARAWAK	Pemerolehan Kembali Luar Tapak
	State: SARAWAK	
	Phone:016-8639991	
	Fax:082-687252	
11	**ESTALCO SDN BHD**	**FACILITI**:
	PLO 616 JALAN MIEL 1, JALAN KELULI 9, KAWASAN PERINDUSTRIAN MEIL 4 , PASIR GUDANG , JOHOR	Pemerolehan Kembali Luar Tapak
	State:JOHOR	
	Phone:07-2552888	
	Fax:07-2552333	
12	**HI-TECH FULL RECOVERY (M) SDN BHD**	**FACILITI**:
	Lot 4169, No 14, Lorong Perusahaan 3, Kaw Ind. Padang Meha, Kedah , ALOR SETAR , KEDAH	Pemerolehan Kembali Luar Tapak
	State:KEDAH	
	Phone:	
	Fax:04-4853032	

13	**HYDRO METAL (M) SDN BHD**	**FACILITI**:
	PLO 59, JALAN PERAK 1, KAWASAN PERINDUSTRIAN PASIR GUDANG, 81700, PASIR GUDANG , PASIR GUDANG , JOHOR	Pemerolehan Kembali Luar Tapak
	State:JOHOR	
	Phone:07-2521896	
	Fax:07-2529882	
14	**Infinity Recovery Sdn. Bhd.**	**FACILITI**:
	NO. 2, JALAN CENDERAI 24,TAMAN PERINDUSTRIAN KOTA PUTERI, MASAI, JOHOR	Pemerolehan Kembali Luar Tapak
	State:JOHOR	
	Phone:07-3866080	
	Fax:	
15	**JARING METAL INDUSTRI SB**	**FACILITI**:
	NO 10 JALAN IKS JURU JAYA 14100 SIMPANG AMPAT, SIMPANG AMPAT(P) , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:	
	Fax:	
16	**JARING METAL INDUSTRIES SDN BHD (NO.7, SHAH ALAM SELATAN 2)**	**FACILITI**:
	NO.7, JALAN SUNGAI KAYU ARA 32/37 TAMAN BERJAYA, SEKSYEN 32 , SHAH ALAM , SELANGOR	Pemerolehan Kembali Luar Tapak
	State: SELANGOR	
	Phone:	
	Fax:	
17	**KHT RECYCLE SDN BHD**	**FACILITI**:
	PTD 34286 JALAN WAWASAN 8 KAW. PER. SRI GADING , SERI GADING , JOHOR	Pemerolehan Kembali Luar Tapak
	State:JOHOR	
	Phone:	
	Fax:	
18	**KUALITI KITAR ALAM SDN. BHD.**	**FACILITI**:
	LOT H.S. (D) 20487 P.T. 3292 LDG TANAH MERAH A3 DIVISION MK JIMAH , PORT DICKSON , NEGERI SEMBILAN	Pemerolehan Kembali Luar Tapak
	State: NEGERI SEMBILAN	
	Phone: 066662000	
	Fax: 066662010	
19	**LIMA JAYA PAPER TRADING SDN. BHD.**	**FACILITI**:
	NO. 643, JALAN IDAMAN 3/9, TAMAN DESA IDAMAN, , SENAI , JOHOR	Pemerolehan Kembali Luar Tapak
	State:JOHOR	
	Phone:	
	Fax:	

20	**MATSUDA SANGYO (MALAYSIA) SDN. BHD.**	**FACILITI**:
	PT 511, LOT 62773 (PLOT B), PERSIARAN HULU SELANGOR, SEKSYEN 26, SHAH ALAM , SELANGOR	Pemerolehan Kembali Luar Tapak
	State: SELANGOR	
	Phone:03-81910162	
21	**METAHUB INDUSTRIES SDN.BHD.**	**FACILITI**:
	LOT 2247 & 2248, JLN SEELONG JAYA 8, SEELONG JAYA, SENAI , JOHOR	Pemerolehan Kembali Luar Tapak
	State: JOHOR	
	Phone:	
	Fax:	
22	**METAL RECOVERY INDUSTRIES SDN BHD (KLANG UTARA)**	**FACILITI**:
	LOT 6251-B, BATU 5 1/2, JALAN KAPAR, KLANG , SELANGOR	Pemerolehan Kembali Luar Tapak
	State: SELANGOR	
	Phone: 03-32906988	
	Fax: 03-32906922	
23	**MING ENGINEERING PLASTIC SDN BHD**	**FACILITI**:
	PLOT 71, LORONG PERINDUSTRIAN BUKIT MINYAK 14, BUKIT MERTAJAM, P. PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone: 04-508 4557	
	Fax: 04-508 6557	
24	**PETROMINE (M) SDN BHD (LOT 25)**	**FACILITI**:
	LOT 300735, NO 25, KAWASAN PERINDUSTRIAN GOPENG, FASA 3, 31600 GOPENG, IPOH, PERAK	Pemerolehan Kembali Luar Tapak
	State: PERAK	
	Phone:	
25	**PREFERENCE MEGACYCLE SDN. BHD. (PLOT 80A)**	**FACILITI**:
	PLOT 80A, LORONG PERINDUSTRIAN BUKIT MINYAK 16 KAWASAN PERINDUSTRIAN BUKIT MINYAK, BUKIT MERTAJAM , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-5086027	
	Fax:04-5076027	
26	**RECLAIMTEK (M) SDN. BHD.**	**FACILITI**:
	PLOT 88A, JALAN PERINDUSTRIAN BUKIT MINYAK KAWASAN PERINDUSTRIAN BUKIT MINYAK , BUKIT MERTAJAM , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-5088571	
	Fax:04-5088577	

27	**SHAN POORNAM METALS SDN. BHD.**	**FACILITI**:
	PLOT 34 (NO. 1479), LORONG PERUSAHAAN MAJU 6 KAWASAN PERUSAHAAN PERAI, FASA 4, PERAI , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-5084841	
	Fax:04-5084843	
28	**SMC TECHNOLOGY SDN BHD**	**FACILITI**:
	PLO 31, JLN PERINDUSTRIAN PONTIAN, PONTIAN, JOHOR	Pemerolehan Kembali Luar Tapak
	State: JOHOR	
	Phone:07-6862088	
	Fax:07-6862066	
29	**SUN SOON YIK RECYCLE PLASTIC & METAL SDN. BHD.**	**FACILITI**:
	LOT 137249 & 137250 HALAL PERUSAHAAN MENGLEMBU 16, IPOH, PERAK	Pemerolehan Kembali Luar Tapak
	State: PERAK	
	Phone:05-2829321	
	Fax:	
30	**SYP RECOVERY & RECYCLING SDN. BHD.**	**FACILITI**:
	LOT 2833-2834, KAWASAN PERINDUSTRIAN BUKIT RAMBAI, MUKIM TANJUNG MINYAK, MELAKA, MELAKA, MELAKA	Pemerolehan Kembali Luar Tapak
	State: MELAKA	
	Phone:06 - 351471	
	Fax:06 - 3515199	
31	**TES-AMM (MALAYSIA) SDN. BHD.**	**FACILITI**:
	NO 2005, TINGKAT PERUSAHAAN 1 KAWASAN PERUSAHAAN PERAI, PERAI , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-3991896	
	Fax:04-3993221	
32	**TWINKLE METAL (M) SDN. BHD.**	**FACILITI**:
	No 1449, Lorong Perusahaan Maju 8, Plot 96, kawasan Perusahaan Prai 4, PERAI, P.PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-5084557	
	Fax:04-5086557	
33	**VICTORY RECOVERY SDN. BHD.**	**FACILITI**:
	LOT 2211, 2212, 2213 & 2214, 2215,2216 JALAN PK 11 KAWASAN PERINDUSTRIAN KRUBONG, KERUBONG , MELAKA	Pemerolehan Kembali Luar Tapak
	State: MELAKA	
	Phone:06 - 3345336	
	Fax:06 - 3344589	

34	**VITA RECYCLE SDN BHD**	**FACILITI**:
	LOT 1227, BLOK 8, DEMAK LAUT INDUSTRIAL PARK, PHASE 11 A, JALAN BAKO, 93050 KUCHING SARAWAK , KUCHING , SARAWAK	Pemerolehan Kembali Luar Tapak
	State: SARAWAK	
	Phone:082-450031	
	Fax:082-573136	
35	**XANTARA SDN BHD (PYDT BT)**	**FACILITI**:
	LOT NO. 3992 & 3993, NO. 21 & 22 LORONG 3/1 KAWASAN PERINDUSTRIAN SENAWANG , SENAWANG , NEGERI SEMBILAN	Pemerolehan Kembali Luar Tapak
	State: NEGERI SEMBILAN	
	Phone:06-6751548	
	Fax:06-6794931	

APPENDIX G

List of Other Partners (E-waste Alam Alliance Partners) (Updated XXXXX)

State	No	Company Name	Address	Contact
PERLIS	1	Iyan Trading Sdn Bhd	Lot 5, Kawasan Perindustrian Mukim Jejawi, 02600 Arau, Perlis.	012-4750210
	2	Senheng Electric (KL) Sdn Bhd	No. 1A, Persiaran Jubli Emas, 01000 Kangar, Perlis.	012 – 611 2440
	3	Suria Jerai Electrical Sdn Bhd	No. 45, 47,49 Jalan Jubli Perak, 01000 Kangar, Perlis.	014 – 629 6747
KEDAH	1	Pen Green Global Trading	Sungai Petani, Kedah Darul Aman	019 – 458 1595
	2	Senheng Electric (KL) Sdn Bhd	2&2A, 3&3A, Pekan Simpang Kuala off Lebuh Raya Sultan Abdul Halim, 05400 Alor Setar, Kedah	012 – 658 1695
	3	Senheng Electric (KL) Sdn Bhd	34, Pekan Jitra 3, 06000 Jitra, Kedah	012 – 404 1044
	4	Senheng Electric (KL) Sdn Bhd	207 & 208, Jalan Legenda 7, Legenda Heights, 08000 Sungai Petani, Kedah	012 – 658 1784
	5	Senheng Electric (KL) Sdn Bhd	Lot No. F10 & F11, First Floor, Tesco Sungai Petani Mutiara No. 368, Jalan Bakar Arang, 08000 Sungai Petani, Kedah	012 – 657 9365
	6	Senheng Electric (KL) Sdn Bhd	Lot No. F1, First Floor, Tesco Mergong, No. 1 Lebuhraya Sultanah Bahiyah, 05100 Alor Setar, Kedah	012 – 493 1404
PENANG	1	MSV Metal (M) Sdn Bhd	No. 3675, Jalan Permatang Pauh, 13400 Butterworth, Penang.	04 – 323 4306
	2	ICT Komtar (Venice Gateway Sdn Bhd)	Unit No. 1B & 1D, 1.01-4.01, Komtar, Jalan Penang, 10000 Penang	04 – 250 8662
	3	Northern Electronics Services	Blok A-G-08, Lebuh Nangka 1, Taman Desa Damai, 14000 Bukit Mertajam, Penang	019 – 412 3392
	4	Ex Tech Enterprise	146, 4th Floor, Bukit Jambul Complex, Jalan Rumbia 11900 Bayan Lepas, Penang	04 – 643 5312
	5	Yayasan Humanistik	No. 58, Lorong Tambun Indah 10, Taman Tambun Indah, 14100 Simpang Ampat, Penang.	016 – 543 6077
	6	Senheng Electric (KL) Sdn Bhd (SenQ)	S23 Second Floor, Sunway Carnival Mall, 3068, Jalan Todak, Pusat Bandar, 13700 Seberang Jaya, Penang	04 – 390 0040
	7	Senheng Electric (KL) Sdn Bhd	No. 112, 114, 116 Jalan Raja Uda, Pusat Perniagaan Raja Uda, 12300 Butterworth, Penang.	04 – 323 5040

PENANG	8	Senheng Electric (KL) Sdn Bhd	Tesco Bukit Mertajam Jalan Rozhan, Pusat Perniagaan Seri Impian, Bukit Mertajam, Penang.	012 – 658 1596
	9	Senheng Electric (KL) Sdn Bhd	Fortune Court, 288 B-1-10 & 11 Ground Floor, Jalan Thean Teik, Farlim, 11500 Penang.	04 – 829 4140
	10	Senheng Electric (KL) Sdn Bhd (SenQ)	Gurney Plaza, 170-07-08, Plaza Gurney, Persiaran Gurney, 10250 Penang.	04 – 229 4040
	11	Senheng Electric (KL) Sdn Bhd (SenQ)	Queensbay Mall 2F-07, second Floor, Queensbay Mall 100, Persiaran Bayan Indah, Sungai Nibong, 11900 Bayan Lepas, Penang.	04 – 641 1052
	12	Senheng Electric (KL) Sdn Bhd	Tesco Tg Pinang Lot No. F4, F5 & F6, 1st Floor, Kawasan Tebusguna Bandar Tg Pinang, Jalan Tg Tokong, Jalan Seri Tg Pinang, Daerah Timur Laut, 10470 Penang.	04 – 890 4370
	13	Senheng Electric (KL) Sdn Bhd	Bukit Jambul No. 12J, 12K & 12L, Jalan Tun Dr. Awang G27, Bukit Jambul, 11900 Penang.	04 – 646 3040
	14	Pusat Pengumpulan Kitar Semula	No. 7, Tingkat Binjai 20, Taman sri Rambai, 14000 Bukit Mertajam	012-4857789
PERAK	1	Enviro Metal Sdn Bhd	No. 85, Pt 38902, Hala Perusahaan Menglembu 15, Kawasan Perindustrian Menglembu, 31450 Ipoh, Perak	05 – 282 6003
	2	Senheng Electric (KL) Sdn Bhd	No. 9 & 9A, 11 & 11A, 13 & 13A, Jalan Pengkalan Utama 1, Taman Pengkalan Utama 31650 Ipoh, Perak	012 – 484 9440
	3	Senheng Electric (KL) Sdn Bhd	431 & 432, Jalan Silibin, Taman Seri Tahan, 30100 Ipoh, Perak	012 – 658 1482
	4	Senheng Electric (KL) Sdn Bhd	No. 505 – 507, Jalan Pasir Puteh, Pasir Puteh, 31650 Ipoh, Perak	012 – 657 9034
	5	Senheng Electric (KL) Sdn Bhd	40 – 42, Lebuh Medan Ipoh, Bandar Baru Medan Ipoh, 31400 Ipoh, Perak	012 – 658 1649
	6	Senheng Electric (KL) Sdn Bhd	No. 1-3, Jalan Medan Taiping, Medan Taiping, 34000 Perak	012 – 658 1624
	7	Senheng Electric (KL) Sdn Bhd	No. 13,15,17,19 Ground Floor, Jalan Kamunting, 34600 Taiping, Perak	012 – 658 8635
	8	Senheng Electric (KL) Sdn Bhd	No. 11A, 15, Jalan Keli, Taman Damai, 34200 Parit Buntar, Perak	012 – 657 9602
SELANGOR	1	Shan Poornam Metals (Selangor) Sdn Bhd	No. 1, Jalan Pendamar 27/90, Seksyen 27, Shaha Alam, 40400 Shah Alam, Selangor	012 – 483 9211
	2	Tan Boon Ming Sdn Bhd	Shah Alam No. 37 & 39, Jalan Mewah 25/63, Taman Sri Muda, 40400 Shah Alam, Selangor	03 – 5121 4122

	3	Senheng Electric (KL) Sdn Bhd	Sri Kembangan No.7, Jalan 7/3A, Kawasan Perindustrian Seri Kembangan, 43000 Serdang, Selangor	012 – 658 2654
	4	Senheng Electric (KL) Sdn Bhd	Shah Alam No. 2A-Jalan 31/54, Kota Kemuning, 40460 Shah Alam	012 – 658 2749
	5	Senheng Electric (KL) Sdn Bhd	Batu Caves No. 10, Jalan Industri Batu Caves 1/1, Taman Perindustrian Batu Caves, 68100 Batu Caves	012 – 703 1440
	6	Senheng Electric (KL) Sdn Bhd	No. 105, Jalan Pelabur B 23/B, Section 23, 40300 Shah Alam, Selangor	012 – 658 0697
	7	Senheng Electric (KL) Sdn Bhd	21, Jalan USJ 10/1F, 47620 UEP Subang Jaya,Selangor	012 – 658 1450
	8	Senheng Electric (KL) Sdn Bhd	1012 & 1014, Jalan Meru, 41050 Klang, Selangor	012 – 658 0957
	9	Senheng Electric (KL) Sdn Bhd	No. 39-G, 39-I, 40-G & 40-I, Jalan Nautika U20/A, Sekyen U20, Pusat Komersil TSB, 40160 Shah Alam, Selangor	012 – 695 4840
	10	Senheng Electric (KL) Sdn Bhd	127, 129 Jalan Sultan Abdul Samad, 42700 Banting, Selangor	012 – 658 0961
	11	Senheng Electric (KL) Sdn Bhd	No. 9 & 11, Jalan SBBC 3, Sungai Besar, Business Centre, 45300 Sungai Besar, Selangor	012 – 337 3440
	12	Senheng Electric (KL) Sdn Bhd	Lot No. F36, F37, F38 & F39, Giant Hypermarket Bandar Kinrara Lot 449, Jalan BK 5A/1, Bandar Kinrara, 47100 Puchong, Selangor	012 – 268 1040
	13	Senheng Electric (KL) Sdn Bhd	Lot F.08, 1st Floor Selayang Mall Shopping Centre, Jalan S U 9, Taman Selayang Utama, 68100 Batu Caves, Selangor	03 – 9285 4544
	14	Senheng Electric (KL) Sdn Bhd	Lot No LG 25A, Lower Ground Floor, Alamanda Putrajaya Shopping Centre, Jalan Alamanda, Precinct 1, 62000 Putrajaya	012 – 657 9745
SELANGOR	15	Senheng Electric (KL) Sdn Bhd	No. 53, 55 & 57, Jalan Bandar Rawang 2, 48000 Rawang, Selangor Darul Ehsan	012 – 658 1264
	16	Senheng Electric (KL) Sdn Bhd	7G & 8G, Plaza Citra, Jalan Citra, Kajang, 43000 Kajang	012 – 657 9721
	17	Senheng Electric (KL) Sdn Bhd	Lot 465 & 493, Mukim of Cheras, Jalan Balokong, 43200 Batu 11 Cheras, Selangor	03 – 9285 4555
	18	Senheng Electric (KL) Sdn Bhd	35 & 36G, Jalan Medan PB4, Seksyen 9 Pusat Bandar Baru Bangi, 43650 Selangor	012 – 631 1040
	19	Senheng Electric (KL) Sdn Bhd	F14 & F15 Giant Hypermarket, Kelana Jaya Jalan SS6/12, 47301 Petaling Jaya.	012 – 658 0854
	20	Senheng Electric (KL) Sdn Bhd	Lot 3F-18A, 3F-23A and F-25, 3rd Floor SACC Mall, Precint 1.1 & Precint 1.2, Jalan Perbadanan 14/9, Seksyen 14, 40000 Shah Alam.	012 – 658 1094

	21	Senheng Electric (KL) Sdn Bhd	Lot F23-23A, IOI Mall, Batu 9, Jalan Puchong, Bandar Puchong Jaya, 47100 Selangor	012 – 658 0715
	22	Senheng Electric (KL) Sdn Bhd	No 29C, 29D, 29E, Jalan Dinar G U3/G, Taman Subang Perdana, Seksyen U3, 41050 Shah Alam, Selangor	012 – 694 2440
KL	1	Tan Boon Ming Sdn Bhd	Jalan Klang Lama PS-1, Taman Evergreen,Batu 4, Jalan Klang Lama,58100 Kuala Lumpur	03 – 7983 2020
	2	Tan Boon Ming Sdn Bhd	Bangsar Village Unit No. LG-6, Lower Ground Floor, Jalan Telawi Satu, Bangsar Baru, 59100 Kuala Lumpur	03 – 2287 4818 /4819
	3	Tan Boon Ming Sdn Bhd	Cheras Furniture City Lot No. 51449, Block A1 & A2, Batu 5/12, Jalan Cheras, 56100 Kuala Lumpur	03 – 9132 1975
	4	Tan Boon Ming Sdn Bhd	KL Festival City Lot No. F-27, First Floor, Jalan Taman Ibu Kota, Taman Danau Kota, Setapak , 53300 K. Lumpur	03 – 4131 6263
	5	Senheng Electric (KL) Sdn Bhd	Lot L2-7, Level 2, Cheras Leisure Mall, Jalan Manis 6, Taman Segar Cheras, 56100 Kuala Lumpur	012 – 658 0734
	6	Senheng Electric (KL) Sdn Bhd	Lot No. F1, F2, F3, First Floor, Hartamas Shopping Centre 60, Jalan Sri Hartamas 1, Sri Hartamas, 50480 Kuala Lumpur	012 – 657 9350
	7	Senheng Electric (KL) Sdn Bhd	40 & 40-1, 42&42-1, Block C, Vista Magna, Batu 7, Jln Kepong, Kepong, 52100 Kuala Lumpur	012 – 658 0794
KL	8	Senheng Electric (KL) Sdn Bhd	LG 8, Parkson Grand, The Mall, 100 Putra Place, Jalan Putra, 50350 Kuala Lumpur	012 – 658 0287
	9	Senheng Electric (KL) Sdn Bhd	36-38, Jalan Pandan 2/1, Pandan Jaya, 55100 Cheras, Kuala Lumpur	012 – 658 0197
	10	Senheng Electric (KL) Sdn Bhd	171 & 173, Jalan Sarjana, Taman Connaught, off Jalan Cheras, 56000 Kuala Lumpur	012 – 658 0276
	11	Senheng Electric (KL) Sdn Bhd	Lot F49 & F50, First Floor, AEON AU2 Shopping Centre No.6, Jalan Taman Setiawan (Jln 37/56), AU2 Taman Keramat, 54200 Kuala Lumpur	012 – 618 5440
	12	Senheng Electric (KL) Sdn Bhd	Diamond Square No. 15 & 17, Jalan 2/50, Jalan Gombak, BT 3 1/2 Setapak, 53000 Kuala Lumpur	012 – 658 0542
	13	Senheng Electric (KL) Sdn Bhd	55 & 57, Jalan Radin Bagus, Sri Petaling, 57000 Kuala Lumpur	012 – 658 1462
	14	Senheng Electric (KL) Sdn Bhd	61-63, Jalan 46A/26, Rampai Town Centre, 53300 K. Lumpur	012 – 658 0571
	15	Senheng Electric (KL) Sdn Bhd	No. 15-0 & 13A-0 (Ground Floor), Platinum Walk, No. 2, Jalan Langkawi, Setapak, 53000 Lake City, KL	012 – 659 4404

MELAKA	1	Senheng Electric (KL) Sdn Bhd	NO 105-107 Jalan PM2, Taman Perindustrian Merdeka, Batu Berendam 75350 Melaka	012 – 658 3251
	2	Senheng Electric (KL) Sdn Bhd	16-18, Jalan Seri Mangga 1/2, Taman Seri Mangga, 75250 Melaka	012 – 657 9457
	3	Senheng Electric (KL) Sdn Bhd	No. 43, 43-1 & 43-2, Jalan BBP 1, Taman Bt Berendam Putra, 75350 Melaka	012 – 657 9465
	4	Senheng Electric (KL) Sdn Bhd	No. G-3 & 1-3, (PT7711, 7712 & 7713), Mukim Cheng, Jalan Cheng Perdana 1/1, Taman Desa Cheng Perdana 1, Cheng, 75250 Melaka	012 – 657 9325
JOHOR	1	Shan Poornam Metals (Johor) Sdn Bhd	No. 39, Jalan Murni 4, Taman Perindustrian Murni Senai, 81400 Senai, Johor	07 – 590 9863
	2	Green Future Enterprise	No.6, Jalan Keembong 27, Taman Johor Jaya, 81100 Johor Bahru	
	3	DST Solution Sdn Bhd	L3-35, 36, 37, Level 3 Danga City Mall , Jalan Tun Razak, 80000 Johor Bahru	07-221 0976
	4	Senheng Electric (KL) Sdn Bhd	LOT AT09, Giant Hypermarket, Jalan Masai Lama, Plentong, 81750 Johor Baru, Johor	017-7978977
	5	Senheng Electric (KL) Sdn Bhd	L2-036 Sutera Mall, No. 1 Jalan Sutera Tanjung 8/4, Taman Sutera Utama, 81300 Skudai, Johor Bahru.	012 – 728 8404
JOHOR	6	Senheng Electric (KL) Sdn Bhd	No. 63, 64, 65, Jalan Sejambak 14, Taman Bukit Dahlia, 81750 Pasir Gudang, Johor	012 – 524 0409
	7	Senheng Electric (KL) Sdn Bhd	No. 1, Jalan Sultan, 86000 Kluang, Johor	012 – 657 9654
	8	Senheng Electric (KL) Sdn Bhd	No. 16, 16A, 18,18A, 20, 20A, Jalan Setia 7/18, Taman Setia Indah, 81100 Johor Bahru	012 – 658 8171
	9	Senheng Electric (KL) Sdn Bhd	Lot No. M21 & M22, Tesco Kulai, No. 52 Taman Desamas, Batu 22½ Jalan Kulai – Air Hitam, 81000 Kulai, Johor	012 – 740 2440
	10	Senheng Electric (KL) Sdn Bhd	No. 12 (Ground Floor) & No. 13 (Ground & First Floor), Jalan Susur 2/1 Taman Utama, Bandar Baru, 85000 Segamat, Johor	012 – 681 6040
	11	Senheng Electric (KL) Sdn Bhd	Lot F01, First Floor, Jusco Tebrau City Shopping Centre, No. 1, Jalan desa Tebrau, Taman Desa Tebrau, 81100 Johor Bahru	012 – 657 9415
	12	Senheng Electric (KL) Sdn Bhd	Lot No. 1.61, First Floor, 303B, Jalan Kluang, 83000 Batu Pahat, Johor	012 – 658 3462
PAHANG	1	Senheng Electric (KL) Sdn Bhd	No. 90, 91 & 92, Jalan Tengku Ismail, 28000 Temerloh, Pahang	012 – 658 2415
	2	Senheng Electric (KL) Sdn Bhd	S-19, S-20 & S-21 (Tgkt Bawah), & C-21 (Tgkt Atas), Jalan Benom, Bandar Baru, Jerantut, Pahang.	012 – 658 2495

	3	Senheng Electric (KL) Sdn Bhd	B102, B104, B106, B108, Jalan Tun Ismail, Sri Dagangan Kuantan, 25000 Kuanatan	012 – 658 2395
	4	Senheng Electric (KL) Sdn Bhd	Ground Floor B897, 899, 901, Jalan Bukit Ubi, 25000 Kuantan	012 – 981 0443
	5	Senheng Electric (KL) Sdn Bhd	No. 34, Jalan 1M 3/3, Mahkota Industrial Park, Bandar Baru Indera Mahkota, 25200 Kuantan	012 – 658 3076
NEGERI SEMBILAN	1	Senheng Electric (KL) Sdn Bhd	1F-29-30, 1st Floor Seremban Palm Mall, Jalan Toman 1, Kemayan Square, 70200 Seremban, Negeri Sembilan	06 – 765 6322
	2	Senheng Electric (KL) Sdn Bhd	F21 &F22, Tesco Seremban 2, PT2374, Pekan Bukit Kepayang, Daerah Seremban, 70300 Negeri Sembilan	012 – 657 7885
	3	Senheng Electric (KL) Sdn Bhd	1st Floor 31, Jusco Seremban 2 Shopping Centre, 112 Persiaran S2 B1 Seremban 2, 70300 Seremban	012 – 657 9516
	4	Senheng Electric (KL) Sdn Bhd	Lot 12176 & 12177, Jalan BBN 1/1F, Putra Point, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan	012 – 658 2591
TERENGGANU	1	Senheng Electric (KL) Sdn Bhd	1049-I, G/Floor, Wisma Ladang, Jalan Sultan Sulaiman, 20000 Kuala Terengganu	012 – 658 2534
	2	Senheng Electric (KL) Sdn Bhd	Lot-9941/9942 Sura Gat, Business Centre, Jalan Yahaya Ahmad, 23000 Dungun, Terengganu	012 – 658 2514
	3	Senheng Electric (KL) Sdn Bhd	PT 11268 (G), Tingkat 1129 (G), Tingkat 1 & 2, Taman Cukai Utama, Jalan Kubang Kurus, 24000 Kemaman, Terengganu	012 – 658 2436
KELANTAN	1	Senheng Electric (KL) Sdn Bhd	1857-8, Paya Bemban, Jalan Hospital, 15400 Kota Bahru, Kelantan	012 – 981 2440
	2	Senheng Electric (KL) Sdn Bhd	Lot 678, Jalan Kampung Teluk Panji, 16100 Kota Bahru, Kelantan	012 – 981 2440
	3	Senheng Electric (KL) Sdn Bhd	L/341, T/B Kedai Jalan Padang Garong, Bnagunan MBSB, 15000 Kota Bahru, Kelantan	
	4	Senheng Electric (KL) Sdn Bhd	Lot 243, Jalan Hospital, 17500 Tanah Merah, Kelantan	012 – 658 0291
	5	Senheng Electric (KL) Sdn Bhd	PT1607 & PT 1608 (Ground Floor), Jalan KK 6, Bandar Baru Kubang Kerian, 16150 Kota Bharu, Kelantan	012 – 985 7440
	6	Senheng Electric (KL) Sdn Bhd	Lot 41A & 1.61A, 1st Floor, 1-888 KB Mall Jalan Hamzah, 15050 Kota Bharu, Kelantan	012 – 658 2584

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Annex 3

Reporting Guideline for Household E-waste

GUIDELINE

Reporting for Management of Scheduled E-wastes in Malaysia

Published by:

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Guideline

Reporting for Management of Scheduled E-wastes in Malaysia

1.0 INTRODUCTION

Electrical and electronic waste (commonly known as E-waste), is growing exponentially worldwide because of tremendous growth of demands on the use of electrical and electronic equipment. The disposal of E-waste is of big concern discussed at international arena, because of the nature of hazardousness of the waste and drastically increased volume of disposal in a globalized world.

Note:

"E-waste" referred to SW110 as stipulated in the First Schedule of EQ (Scheduled Waste) Regulations 2005.

"Electrical and electronic equipment "means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields falling under the categories set out in First Schedule of the regulations;

Improper handling of E-waste poses high risk of pollution, health impacts and causes incidents of illegal disposal. The lack of proper environmental precaution measures in E-waste management could cause enormous environmental issues such as release of chlorofluorocarbon (CFC) gases that cause ozone depletion, global warming and contaminations from other hazardous/toxic substances.

In Malaysia, E-waste is generally divided into two main types by generation sources, i.e. E-waste generated from the industrial sectors, and E-waste generated from the non-industrial sectors, mainly households, commercial and institutional entities.

E-waste from industrial sector is categorized as Scheduled Wastes under the Code SW110, First Schedule of the Environmental Quality (Scheduled Wastes) Regulations 2005. The categories of E-waste defined under this coding are only covering E-waste generated from the industrial sectors, including electrical and electronic industries, as well as other industrial generators.

The management of E-waste generated from non-industrial sectors, especially household and other entities such as commercial and institutional is now regulated under a newly enacted regulation known as the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulation 20XX, which defines scheduled E-wastes under Code HSW, including HSW100, which is specifically for targeted categories of scheduled E-waste.

Note:

"Scheduled electrical and electronic equipment waste" or "Scheduled E-waste" means discarded electrical and electronic equipment falling within the categories of waste in the first schedule, which are generated from household, commercial, industrial, institutional entities, and any other sources;

Scheduled E-waste requires a different management system as compared to the E-waste generated from the industrial sector, particularly from the financial perspective where significant costs are required for collection and transportation of the Scheduled E-waste, as well as to comply with the proper environmental precaution standards. Therefore, Scheduled E-waste shall only be processed or treated by specific scheduled E-waste recycling facilities, which are licensed by the DOE.

This Guideline shall be read together with the Environmental Quality (Scheduled E-Waste) Regulations 20XX.

2.0 ABOUT THE GUIDELINE

Under the framework of the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulations 20XX, it is emphasized that all the scheduled E-waste shall be channeled, collected and delivered through a formal or authorized flow of stakeholders to the final destination of proper treatment, and recycling with environmentally sound system. Each respective stakeholder has their roles and responsibilities, and the costs involved for the entire system shall be shared among all the stakeholders.

This Guideline provide list of reporting requirements for the users, who are directly involved in specific activities dealing with electrical and electronic equipment and the Scheduled E-waste. It is aimed to provide guidance to the players for effective compliance of the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulations 20XX.

The main categories of Scheduled E-waste covered under this Guideline are the list of E-waste under the First Schedule of the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulations 20XX include (a) cloth washing / drying machine, (b) refrigerator / freezer / chiller, (c) air-conditioner, (d) computer, (e) television and (f) mobile phone / tablet PC. In

a long run, it also includes other Scheduled E-wastes such as E-waste of small appliances (e.g. CD players, hair dryers, microwave ovens, etc.)

The users of this guideline shall always refer to the Environmental Quality (Scheduled Electrical and Electronic Equipment Waste) Regulations 20XX as the main document of this Guideline to ensure complete understanding of the entire requirements under the regulations, as well as the clauses of the Environmental Quality Act (1974) as the Mother Act.

Detailed elaborations on the types of activities that are subject to this Guideline are explained in Section 2.1 below, while Section 2.2 elaborates the definitions and categories of respective players subject to the requirements stipulated in this Guideline.

2.1 Scope of the Guideline

This Guideline shall apply to all players of activities as described below, whether it is an individual person, company, organization or any other entities:

Activities	Descriptions
Manufacturing / Importing of EEEs	• Manufacturing of Electric and Electronic Equipment (EEE), which falls within 2.3 Categories of Targeted Scheduled E-wastes at the end of its life. • Importing of EEE, which falls within 2.3 Categories of Targeted Scheduled E-wastes at the end of its life, also includes Internet sales and on-line business from oversea.
Putting on the market of EEEs	• Putting on the market of new EEE, which falls within 2.3 Categories of Targeted Scheduled E-wastes at the end of its life.
Collecting / donating / buying / selling	• Donating / giving away, discarding and selling Scheduled E-waste by any generators from households, commercial, institutional and any other sources to another party who receives, buys or collects for specific purposes. • Buying Scheduled E-waste from any generators from households, commercial and institutional sources at prices agreed upon both the buyer and generator/seller. • Receiving / collecting Scheduled E-waste from any generators from households, commercial and institutional sources for free without any payment involved. • Selling Scheduled E-waste received / collected / purchased from any generators from households, commercial and institutional sources, to another

	buyers for specific purposes.
Temporary storage	• Temporary storage of Scheduled E-waste generated / received / collected / purchased from any generators from households, commercial, institutional or any other sources.
Handling activities	• Any handling activity on Scheduled E-waste generated / received / collected / purchased from any generators before the subsequent activities or destinations, such as segregation, dismantling or cleaning etc. • Activities of de-installation of Scheduled E-waste particularly air-conditioners that contain refrigerants and refrigerant oils. • Handling activity excludes repairing processes by repair shops of electrical and electronic appliances received from the customers. Nevertheless, Scheduled E-waste generated from any repair shop shall be subject to the requirements of this Guideline.
Transportation / transfer	• Transporting or transferring of E-waste generated / received / collected / purchased from any generators to the next destinations, such as another buyer or receiving point, recycling or disposal facilities.
Recycling of Scheduled E-wastes	• Sorting, segregation and dismantling according to the Environment Quality (Scheduled E-wastes) Regulations. • Recovery facility shall treat hazardous materials in environmentally sound manner.
Final disposal	• Final disposal of residues generated from recycling process.

In general, the scope of this Guideline cover the entire activity flow of the Scheduled E-waste from collection and transportation till recycling or disposal activities. In addition, the scope of this Guideline also covers manufacturing and sales activities of Electric and Electronic Equipment for fee reporting purpose.

2.2 Descriptions of Stakeholders

The users of this Guideline are expected to be all relevant stakeholders who are involved in the activities elaborated within the Guidelines scope boundary, generally the approved collectors, scheduled E-waste recycling facilities, as well as manufacturers/importers who reports the Put-on-market volume of Electric and Electronic Equipment for the fee reporting.

Descriptions of different categories of stakeholders who are commonly involved in the activities subject to this Guideline are listed but not limited to the following:

Player Categories		**Descriptions**
Manufacturers		Manufacturers of targeted Electric and Electronic Equipment, who pay Recycling Fee to the Fund management Body.
Importers		Importers of targeted Electric and Electronic Equipment, who pay Recycling Fee to the Fund management Body.
Approved Collectors	*Concessionaire companies*	Waste management companies awarded concessionaires by the National Solid Waste Management Department (JPSPN) or sub-contractors, for collection of household solid waste, including Scheduled E-waste collection on specific schedule at selected States in the country.
	Local Authorities / other government agencies	Local governments, any other government agencies and their sub-contractors who possibly operate collection centers to collect recyclable materials, including Scheduled E-waste, as well as collection campaigns organized on *ad hoc* basis.
	Institutions / universities / collages / schools	Universities, colleges, schools, hospitals and any other public or private institutions that carry out collection of Scheduled E-waste.
	Private companies (contractors, recyclable buyers, traders, middlemen etc.)	Private recyclers or buyers who are buying recyclable materials including Scheduled E-waste from any sellers. The activities are market-driven, profit-oriented and it could involve several levels of transactions from smaller to larger scale stakeholders.
	Non-Governmental Organizations (NGO)	Registered organizations that operate collection centers to collect recyclable materials, including Scheduled E-waste, as well as carry out collection campaigns on *ad hoc* basis normally at community levels, for fund raising or charity purpose.
	Charity Organizations / Non-profit Organizations (NPO)	
	Charity Organizations	

Authorized Retailers	*Retailers*	Any retailer whether individual shop, franchise companies, brand dealers / distributors or department stores in malls that are selling new electrical and electronic appliances to the consumers, and collect Scheduled E-waste from the consumer premises, or brought in to the retailer premises.
	Brand dealers / distributors	
	Hypermarkets / malls	
Repair / Secondhand Shops	*Repair shops*	Shops that are carrying out business to repair or refurbish damaged electrical and electronic appliances. Appliances that are non-repairable and becomes Scheduled E-waste are subject to the requirements of the Guideline.
	Secondhand shops	Shops that are playing same roles as retailers but selling used electrical and electronic appliances for the consumers.
Licensed Recycling Facility	*Scheduled E-waste Recycling Facility*	Facilities that are licensed by the DOE to specifically receive Scheduled E-waste from authorized sources, and carry out recycling process of Scheduled E-waste.
Others	*Installer / de-installer*	Individuals or companies that are offering services to maintain, service, install and de-install of electrical and electronic appliances. De-installation is commonly applicable for air-conditioner in particular.
	Maintenance / service companies	

2.3 Categories of Targeted Scheduled E-waste

The target categories of Scheduled E-waste subject to this Guideline are basically the 6 main categories of E-waste specified in the First Schedule of the Environmental Quality (Scheduled E-Waste) Regulations 20XX, excluding the small appliances, fluorescent lamps and rechargeable batteries. The 6 main categories of Scheduled E-waste are listed as follows with the sub-categories:

No	Categories	Sub-categories
1	Televisions	CRT Televisions 
		Flat Televisions (Plasma, LCD, LED) 
2	Air-conditioners	Window Units 
		Split units Ceiling Unit 
		Mobile units 

3	Computers	LCD Desktop CRT Desktop 
		Laptop 
4	Refrigerators	Refrigerators 
		Freezers 
		Chillers 

5	Washing / Dryer machines	Washing machines 
		Cloth Dryers 
6	Mobile phones and Tablet PCs	Mobile phones 
		Tablet PCs 

3.0 THE LEGAL FRAMEWORKS OF SCHEDULE E-WASTE MANAGEMENT

Scheduled E-waste management is regulated under the Environmental Quality (Scheduled E-Waste) Regulations 20XX, which emphasizes the concept of "shared responsibilities" among the stakeholders, with implementation of the principle of Extended Producer's Responsibility (EPR).

The principle of EPR is the main feature of E-waste management framework in Malaysia, wherein the producers of electrical and electronic appliances have the responsibility to ensure proper management of the E-waste after the 'end of life' of the products. Under the EPR, producers are also entrusted with the responsibility to finance and organize a system to meet the costs involved in overall management of the E-waste in an environmentally sound manner.

In general, the entire legal framework of the Scheduled E-waste management is confined to 3 main flows, which are summarized below:

E-waste Flow	Determines the right channel of Scheduled E-waste is collected from generation points to authorized collection centers, collectors, retailers, and finally the Scheduled E-waste recycling facilities or final disposal. Proper E-waste flow prohibits the Scheduled E-waste to enter into informal sectors, by authorizing only the formal collection channels within the formal system boundary.
Fee Flow	Determines how the recycling fee (known as contribution under the EQA) is collected and channeled to a fund management entity (known as Recycling Contribution Management Body - RCMB), for various purposes of disbursements to ensure functionality of the entire system. Proper fee flow ensures the overall costs required for proper management of Scheduled E-waste is secured and shared among the stakeholders.
Reporting Flow	Determines the information / data flow through proper reporting by relevant stakeholders, with the use of manifest forms. Proper reporting flow avoids leaking of E-waste into the informal sectors, and ensures that proper data is captured for determination of total recycling fee to be received by relevant stakeholders. Proper data management is also crucial for future planning and improvement of the system in a long run.

Detailed elaborations of the regulatory framework of Scheduled E-waste management by each of the 3 main flows are described in the following sections.

3.1 Scheduled E-waste Flow

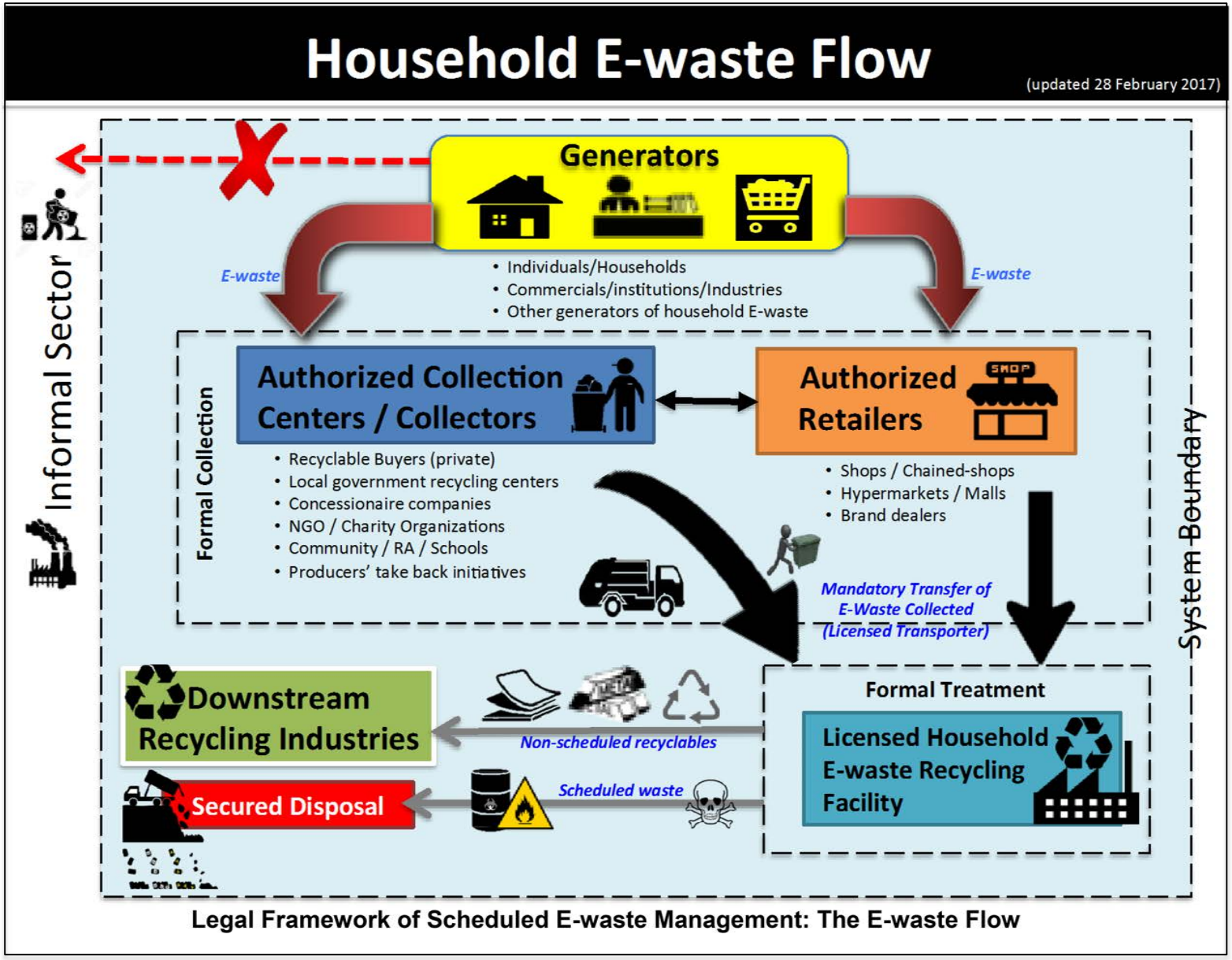
The generators for Scheduled E-waste cover not only limited to households, but also any other entities such as commercial, institutions and industries that use the same categories of electrical and electronic appliances. Examples of non-household generators include offices, commercial shops, malls, universities, schools, industries and any other generation sources, as long as the categories of targeted Scheduled E-waste specified in Section 2.3 are generated.

Under the new framework of the regulations, all generators of Scheduled E-waste are required to discharge their Scheduled E-waste to the authorized receiving points by the DOE as formal collection channels, which could be a retailer shop, recycling center, NGO or charity collection, concessionaire company or local government collection, or any other authorized premises. The Scheduled E-waste can be sold, donated, given or discarded with or without monetary incentives subject to the market demands. Any flow of Scheduled E-waste from generators to un-authorized receiving points is illegal and prohibited.

The collected Scheduled E-waste by the authorized collection points will be channeled to Scheduled E-waste recycling facility licensed by the DOE, to ensure proper treatment and recycling of the Scheduled E-waste in an environmentally sound manner. In case where the authorized collection points are not able to channel the collected Scheduled E-waste directly to the licensed facility due to logistic or any other factors such as small retailers, the collected Scheduled E-waste shall be delivered to another authorized collection point that has capability to channel the E-waste in a larger quantity.

The licensed Scheduled E-waste recycling facility is strictly prohibited from receiving Scheduled E-waste from any unauthorized sources. These licensed facilities shall fulfill the technical and legal requirements set by the DOE to efficiently process the Scheduled E-waste received (Refer to Recycling Guideline), in which the recyclable materials be sold to downstream recyclers, precious materials be recovered and residue waste be disposed of to licensed scheduled waste disposal facility either for secure landfill or other treatment.

Under the regulatory framework, the Scheduled E-waste is expected to flow from the generation points into proper recycling system within the system boundary. The generators shall understand and be responsible for the entire flow of the Scheduled E-waste that they have generated, to ensure that the Scheduled E-waste is collected or purchased or received by only authorized collection points including retailers, and channeled to license facility for proper recycling. Any outflow of Scheduled E-waste from the regulated system boundary to informal sectors will be considered illegal and should be strictly prohibited.



Legal Framework of Scheduled E-waste Management: The E-waste Flow

3.2 Fees Flow

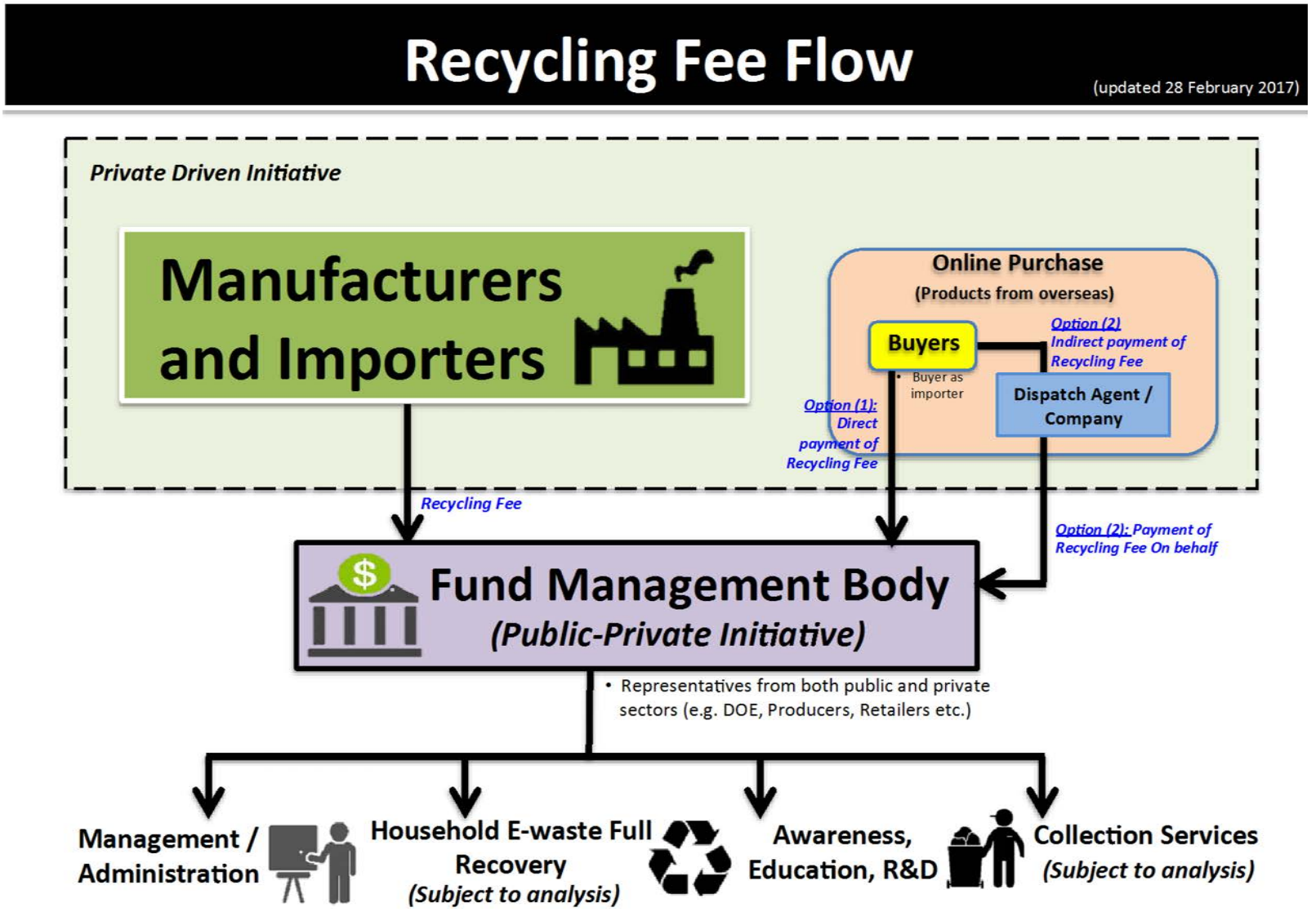
It is important to understand that recycling of Scheduled E-waste does not always yield revenues but it involves significant costs particularly when taken into consideration the logistic costs and environmental protection costs such as destruction of chlorofluorocarbon (CFC) gases, various pollution control measures, as well as treatment and disposal of hazardous substances. The overall costs required to ensure that the Scheduled E-waste is properly channeled and processed in an environmentally sound manner shall be shared among the stakeholders, including the manufacturers and importers of electrical and electronic appliances, generators (consumers / users), retailers, authorized collection points, as well as end receiving points, i.e. the licensed E-waste recycling facility.

Under the new regulatory framework, the concept of “Shared Responsibility” is applied. The manufacturers and importers are obliged to pay recycling fee upon introduction of their products into the markets. The recycling fee collected will be channeled to the Recycling Contribution Management Body (RCMB) directly.

In case of online or internet purchase of the regulated products by the buyers / consumers without any direct involvement of manufacturer or importer, the buyers / consumers are obliged to pay the recycling fees.

The recycling fees paid by the manufacturers, importers or the consumers for the case of online purchase will be the main source of fund, which will be used to subsidize necessary activities of the licensed Scheduled E-waste recycling facilities, authorized collection centers, authorized retailers and other possible stakeholders involved, which will be determined by the FMB. In general, the recycling fee collected will be used to cover not only possible subsidies for activities of collection and recycling facilities, but also administration of the FMB as well as necessary awareness and education events.

The recycling fee for different items of targeted Scheduled E-waste will be different subject to various factors involved in collection and recycling of the items. Details of fee structures to be paid by the manufacturers and importers by each category of targeted Scheduled E-waste are described in Recycling Fee Guideline.



Legal Framework of Scheduled E-waste Management: The Recycling Fee Flow

3.3 Reporting Flow

Proper reporting system is an essential tool to monitor and ensure proper Scheduled E-waste flow and recycling fee flow as elaborated in Section 3.1 and 3.2 above.

In order to determine the recycling fee to be paid by the manufacturers, importers, as well as consumer for the case of online purchase, the following reporting needs to be carried out:

a) Manufacturers and Importers – to report the quantity of the regulated electrical and electronic appliances introduced into the Malaysia market, whether it is locally manufactured, assembled, or imported.
b) Custom Department – to provide data on the importation of regulated electrical and electronic appliances directly by the consumers.

Information reported by the manufacturers, importers and Custom Department will be the fundamental for the FMB to determine the amount of recycling fees to be collected.

On the other hand, in order to ensure proper flow of the Scheduled E-waste within the system boundary from generation points to the final receiving points, reporting by relevant stakeholders by manifest system is required. The manifest system comprises 6-ply of consignment notes, which shall be filled out and kept by respective stakeholders following the methods as detailed in this Guideline. Some brief explanations on the reporting flow under the new regulatory framework are shown below:

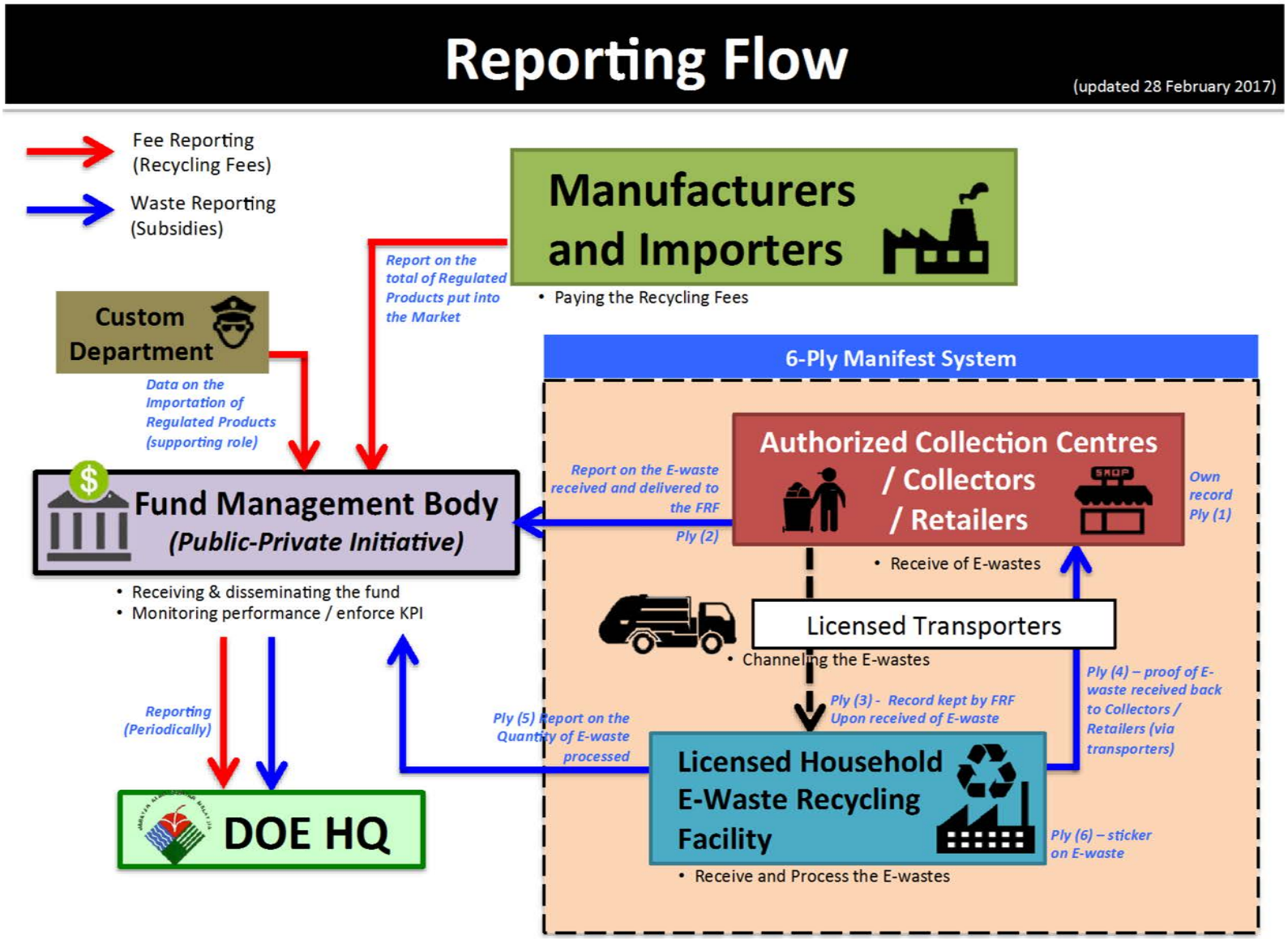
a) The authorized collection centers and retailers shall report each collected Scheduled E-waste by using the manifest form, to ensure each Scheduled E-waste is delivered to the right destination, i.e. the licensed Scheduled E-waste recycling facilities.

b) In case a licensed transporter is used, the authorized collection centers and retailers shall make sure that the manifest forms flow along with the transportation to the licensed facilities.

c) The licensed Scheduled E-waste recycling facilities shall only receive Scheduled E-waste from authorized sources, with clear manifest forms attached.

d) The authorized collection centers, retailers and licensed Scheduled E-waste recycling facilities shall report the number of Scheduled E-waste collected or received to the FMB in order to justify if any subsidy is required.

In general, the manifest system ensures all the collected Scheduled E-wastes are channeled to the right destination for proper recycling. Proper reporting flow serves as monitoring tool to ensure effective implementation of the entire system within the regulated boundary.



Legal Framework of Scheduled E-waste Management: The Reporting Flow

4.0 REPORTING BY THE STAKEHOLDERS

The stakeholders under the Environmental Quality (Scheduled E-Waste) Regulations 20XX have responsibility to report relative information. Required information for each stakeholder is described in details below.

4.1 Reporting by Collectors, Transporters and Recycling facilities using Manifest system

The proper movement of Scheduled E-wastes are managed by the manifest, which collectors, transporters and recycling facilities pass from one to another along with the Scheduled E-wastes.

Items on the Manifest are shown in the table below; collectors, transporters and recycling facilities need to fill them out for each unit of Scheduled E-waste, except for mobile phones and tablet PCs.

Items	Explanation	Filled out by
Manifest ID Number	Unique numbering	Printed from the beginning
Scheduled E-waste type	e.g. Washing machine / flat screen television	Collectors
Brand name	Manufacturer's name	Collectors
Size	e.g. 20kg capacity / 40 inches screen	Collectors
Status of the Scheduled E-waste	Whether any parts are missing at the time of reception.	Collectors Transporters Recycling Facilities
Transferring Date	Date of transferring E-waste	Collectors
Collector's Company Name/ID		Collectors
Collector's signature		Collectors
Transferring Date	Date of transferring E-waste	Collectors
Transporter's Company Name / ID	e.g. ABC Transport Enterprise (ID: XXXXX)	Collectors
Transporter's signature		Transporters
Recycling Facility Name / ID	e.g. XYZ Recycling Facility (ID: YYYYY)	Collectors or transporters
RF's signature		Recycling Facilities
RF's receiving Date	Date of receiving E-waste	Recycling Facilities

See the form of manifest in the Appendix A (Form 01).

4.1.1 Reporting Procedure with manifest

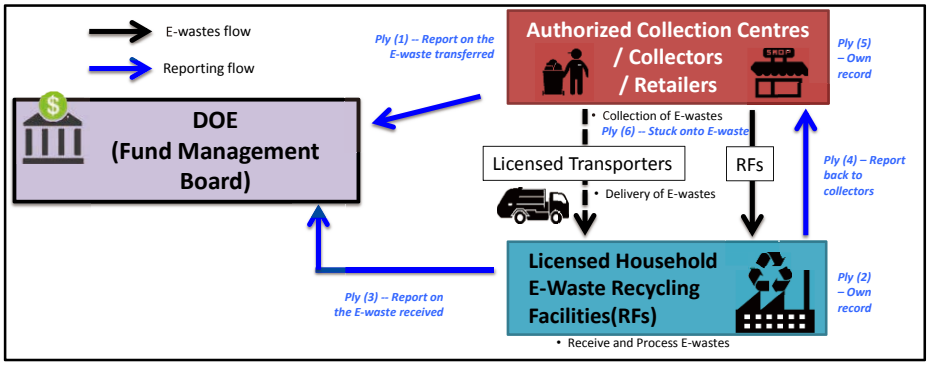
One manifest comprises 6 sheets of carbon copies, and will be assigned to one item of E-waste, except for mobile phones and tablet PCs. When collectors, transporters and recycling facilities receive E-waste, they keep one copy of manifest each. When transferring process has been completed, a

copy of manifest will be sent to Fund Management Body (FMB) to verify proper conduct at each step.

a) Collectors fill out a manifest, keep one carbon copy of the manifest, send one copy to FMB (frequency will be later determined), and then attach the remaining manifest to a Scheduled E-waste. When Collectors attach the manifest, check the status of the Scheduled E-waste whether any part is missing. If the Scheduled E-waste is missing some part, fill in the status on the Manifest. When the Scheduled E-waste is transported, collectors fill in transferring date and transporter or Recycling Facility name (or ID), and hand over the Scheduled E-waste to transporters or Recycling Facility if transports directly to the recycling facility.

b) If transporters are used, transporters shall check the status of the Scheduled E-waste whether any part is missing at the time of reception. If the Scheduled E-waste is missing some part, fill in the status on the Manifest. Transporters also need to fill in Recycling Facility name (or ID) on the manifest. Transporters keep one carbon copy, and then transport E-waste to a recycling facility.

c) When Recycling Facilities receive Scheduled E-wastes, recycling facilities shall check the status of the Scheduled E-waste whether any part is missing at the time of reception. If the Scheduled E-waste is missing some part, fill in the status on the Manifest. Recycling facilities keep one carbon copy for own records, send one carbon copy to FMB to confirm the reception of the Scheduled E-waste (frequency will be later determined).



Flow of Manifest Form

4.1.2 Filing copies of the Manifest

Each sheet of Manifest will be filed and kept by appropriate entities in the system. Below is the summary of manifest filing.

Ply no.	Movement	Filed and kept by
1	White paper: from collector to FMB	FMB
2	Blue paper: recycling facility own copy	Recycling Facilities
3	Green paper: from recycling facility to FMB	FMB
4	Pink paper: from recycling facility to collector	Collector
5	Yellow paper: collector own copy	Collector
6	White sticker: stick on to the E-waste by collector	Recycling Facilities

4.1.3 Periodical Verification by FMB

FMB will periodically verify the movement of Scheduled E-wastes by cross-checking Manifest numbers. FMB will compare the sheet number 1 and 3 to verify proper transportation of Scheduled E-wastes that will be the basis for paying collection subsidy to collectors.

4.2 Reporting by the Manufacturers / Importers

Manufacturers and Importers mainly have two types of reporting responsibilities. The first type of reporting is providing information on hazardous contents of EEEs for proper treatment; the second type is providing information on sales volume in order to determine the recycling fee.

a) As Environmental Quality (Scheduled E-Waste) Regulation 20XX states: “Every manufacturer or importer shall provide information to the Director General on the method of dismantling of their electrical and electronic equipment and the components that contain hazardous substances in their electrical and electronic equipment,” Manufacturers and Importers of EEEs have responsibility to report information of hazardous substances or items in their product to DOE in order for recycling facilities to properly and safely treat these products. The list of hazardous substances or items within EEEs can be found as focused materials in the Recycling Guideline. Manufacturers and importers may choose to use their own reporting formats; however, they must keep in mind that their report is useful to those who recycle their products. The list of information needed to report is below:

Items	Explanations
Type of EEEs	6 targeted categories of EEEs
EEEs product information	Information, such as product model, product number or production period, to identify targeted EEEs.
Information of hazardous substances or items within EEEs	Manufacturers / Importers shall show components which contains hazardous substance.
Recommended method to remove components which contains hazardous substances	Manufacturers should show how to safely disassemble EEEs in order to remove components which contains hazardous substances.

Manufacturers and Importers shall provide this information in the following ways:

For the products manufactured or imported in the past, manufacturers and importers may report this information in a summarized manner, not necessary to report each product individually. Manufacturers and importers also may report in collective way, meaning that a representative of several manufacturers may report for their members. If manufacturers or importers choose to do so, they must clearly present the information provided is for which manufacturers' which specific product.

For the newly manufactured or imported products, manufacturers and importers report to DOE whenever they manufacture or import a product that contains hazardous substances or items in a way unlike those similar products in the past. This information will be used to update the list of focused materials in the future.

b) Manufacturers and Importers of EEEs also have responsibility to report their put-on-market volume of the targeted items for the payment of Recycling fee to FMB. The list of information needed to report is below:

Items	Explanations
Reporting frequency	Twice a year (Subject to discussion)
Reporting moment	Record information at the time of shipment from the factories.
Type of EEEs	6 targeted categories of EEEs, as well as the sub-categories and sizes (Subject to discussion)
Quantity of EEEs	Quantity of targeted items of EEEs that have been introduced to the Malaysian market in one reporting period. Also, quantity of items that have been returned.

The form of manufacturers / importers put-on-market reporting is shown in Appendix B (Form 02).

4.3 Reporting by the Retailers

Retailers have one type of reporting responsibilities that is providing information on collection of E-wastes.

a) Retailers of EEEs have responsibility to report information of received Scheduled E-waste to FMB as collectors. The report should be filed in

the form of a manifest in order for all the stakeholders to keep track of every Scheduled E-waste from collection points to final receiving points. The reporting requirements of retailers of EEEs as collectors are described in the Section 4.1 of this Guideline.

4.4 Reporting by the Collectors

Collectors of Scheduled E-waste have responsibility to report information of received Scheduled E-waste to FMB. The report should be filed in the form of a manifest in order for all the stakeholders to keep track of every Scheduled E-waste from collection points to final receiving points. The reporting requirements of collectors are described in the Section 4.1 of this Guideline.

4.5 Reporting by the Scheduled E-waste Recycling Facilities

Recycling Facilities mainly have three types of reporting responsibilities. The first type of reporting is providing information on reception of Scheduled E-waste; the second type is providing information on recycling; the third type is providing information on residual wastes generated from processing received Scheduled E-waste.

a) Recycling Facilities of Scheduled E-waste have responsibility to report information of received Scheduled E-waste to FMB. The report should be filed in the form of a manifest in order for all the stakeholders to keep track of every Scheduled E-waste from collection points to final receiving points. The reporting requirements of Recycling Facilities are described in the Section 4.1 of this Guideline. Recycling Facilities of Scheduled E-waste also have responsibility to report daily reception of Scheduled E-waste to FMB. The list of information needed to report is below:

Items	Explanations
Reporting frequency	Every month
Reporting moment	Record information at the time of receiving E-waste from collectors or transporters.
Types of Scheduled E-waste	6 targeted categories of Scheduled E-waste
Quantity Scheduled E-waste received	Quantity of targeted items of Scheduled E-waste that have been received with each truck.
Transporter's information	License plate number of the truck and transporting company name

The form of Recycling Facilities' reception of E-waste report is shown in Appendix C (Form 03).

b) Recycling Facilities of Scheduled E-waste also have responsibility to report information of recovered materials from processing Scheduled E-wastes to FMB. This reporting is necessary to ensure proper material balance of E-waste recycling. The list of information needed to report is below:

Items	Explanations
Reporting frequency	Every month
Reporting moment	Record information at the time of shipping recovered materials from the processing lines.
Time and date	Time and date of shipping out recovered materials.
Type of recovered materials	Materials recovered from E-wastes, such as iron, copper, aluminum, glass, plastics, and etc.
Quantity of recovered materials	Quantity of materials that is loaded in a truck
Destination of the recovered materials	Enterprises, where the recovered materials are sent to.
Transporter's information	License plate number of the truck and transporting company name.

The forms of Recycling Facilities' report on recovered materials are shown in Appendix C (Form 04 and 05).

c) Recycling Facilities of Scheduled E-waste also have responsibility to report information of residual wastes generated from processing Scheduled E-wastes to FMB. This reporting is necessary to ensure proper final disposal of Scheduled E-waste. Any generation of scheduled waste should be reported to DOE by eSWIS. The list of information needed to report is below:

Items	Explanations
Reporting frequency	Every month
Reporting moment	Record information at the time of shipping residual wastes from the processing lines.
Time and date	Date of shipping out residual wastes.
Description of waste	Names of the residual wastes, such as fluorescent powder, lead-containing glass, and etc.
Quantities of wastes	Quantities of residual wastes from processing of Scheduled E-waste.
Destination of the residual waste	Authorized final disposal facilities, where the residual wastes are sent to.
Transporter's information	License plate number of the truck and transporting company name

The forms of Recycling Facilities' report on residual wastes are shown in Appendix C (Form 06, 07 and 08).

d) Recycling Facilities of Scheduled E-waste also have responsibility to report information of processing of received Scheduled E-waste to FMB in order to claim for the recycling subsidy. The list of information needed to report is below:

Items	Explanations
Reporting frequency	Every month
Reporting moment	Record information at the time of receiving, processing and shipping Scheduled E-waste, recovered materials or residual wastes.
Type of Scheduled E-waste	6 targeted categories of Scheduled E-waste, as well as the sub-categories (Subject to discussion).
Quantity of processed Scheduled E-waste	Quantity of targeted items of Scheduled E-waste that have been received in one reporting period.
Quantities of recovered materials	Quantities of recovered materials from Scheduled E-waste, such as plastics, irons, ferocious metals, glass, and etc.
Quantities of wastes generated	Quantities of wastes generated from processing Scheduled E-waste.

The form of Recycling Facilities' recycling report is shown in Appendix C (Form 09, 10 and 11).

APPENDICES

APPENDIX A

Form 01 – Manifest of Received Scheduled E-waste

XXXXX

1. Type of Scheduled E-waste					
Mobile Phone & Tablet PC	***Television & PC monitor***	***Refrigerator***	***Clothes Washing Machine & Dryer***	***Air-Conditioner***	***Personal Computer***
☐ Mobile Phone ☐ Tablet PC _____pcs	☐ CRT TV/monitor ☐ Flat (Plasma / LED / LCD) TV/monitor	☐ Refrigerator ☐ Freezer ☐ Chiller	☐ Washing machine ☐ Dryer	☐ Window type ☐ Split unit type ☐ Ceiling type ☐ Mobile type	☐ Desktop tower ☐ Laptop
2. Size of Scheduled E-waste					
	☐ less than 24 inches ☐ 24 inches & more	☐ less than 250 L ☐ 250 L & more	☐ less than 20 kg ☐ 20 kg & more	☐ Less than 1.5 HP ☐ 1.5 HP & more (HP: Horse Power)	☐ less than 24 inches ☐ 24 inches & more
3. Brand Name	(e.g. ELECTROLUX, HAIER, LG, PENSONIC, TOSHIBA)				☐ Unknown

4. Records of Transportation				
	COLLECTOR	***TRANSPORTER 1***	***TRANSPORTER 2***	***RECYCLING FACILITY***
Date Received				
Company ID				
Status of the E-waste	☐ Good ☐ Missing part : _____	☐ Good ☐ Missing part : _____	☐ Good ☐ Missing part : _____	☐ Good ☐ Missing part : _____
Recipient Name & Signature				

APPENDIX B

Form 02 – Reporting Form of EEEs Introduced to the Malaysian Market by Manufacturers and Importers

Reporting Period (From MM/YY to MM/YY):							
Name of Manufacturer or Importer							
Address							
Phone number							
E mail address							
Contact person							
Amount of EEEs introduced to the market							
Item	Subcategories	Amount produced in Malaysia (pieces) (a)	Amount imported (pieces) (b)	Amount exported (pieces) (c)	Amount returned (pieces) (d)	Amount introduced to the market (pieces) (a+b−c−d)	Remarks (Referring Document number)
Air Conditioner							
Washing Machine / Cloth Dryer							
Refrigerator / Freezer							
Television							
Computer							
Mobile Phone /Tablet PC							
Person in Charge(Signature): Date(DD/MM/YY):							

APPENDIX C

Form 03 – Reporting Form of Recycling by Recycling Facilities (Daily Recording Table for Receiving Scheduled E-waste)

Name of the RF	XYZ Recycling Bhd.						
Date(DD/MM/YY)	DD/MM/YY						
Time of Entrance	Description of E-waste	Truck's license place No.	Truck's company name	Weight at entrance (kg) (1)	Weight at exit (kg) (2)	Net Weight(kg) (3)=(1) – (2)	Remarks

Person in Charge(Signature):
Date(DD/MM/YY):

Form 04 – Reporting Form of Recycling by Recycling Facilities (Daily Recording Table for Shipping Recovered Materials from Recycling Facilities)

Name of the RF	XYZ Recycling Bhd.				
Date(DD/MM/YY)	DD/MM/YY				
Time of Exiting	Description of Recovered Materials	Weight(kg)	Destination	Truck's license place No.	Truck's company name
Person in Charge(Signature): Date(DD/MM/YY):					

Form 05 – Reporting Form of Recycling by Recycling Facilities (Recording Table for Monthly Movement of Materials)

Name of the RF	XYZ Recycling Bhd.						
Date(DD/MM/YY)	DD/MM/YY						
Type of Recovered Materials	From previous month (1)	Amount generated this month (2)	outgoing amount (3)	Amount at the end of month (4)	Verification (5) = ((1)+(2)-(3))	Difference (6) = (5) − (4)	Remarks
Person in Charge(Signature): Date(DD/MM/YY):							

Form 06 – Reporting Form of Recycling by Recycling Facilities (Daily Recording Table for Shipping Waste from Recycling Facilities)

Name of the RF	XYZ Recycling Bhd.				
Date(DD/MM/YY)	DD/MM/YY				
Time of Exiting	Description of waste	Weight(kg)	Destination	Truck's license place No.	Truck's company name
Person in Charge(Signature): Date(DD/MM/YY):					

Form 07 – Reporting Form of Recycling by Recycling Facilities (Recording Table for Monthly Movement of Wastes)

Name of the RF	XYZ Recycling Bhd.							
Date(DD/MM/YY)	DD/MM/YY							
Type of Waste	Description of waste	From previous month (1)	Amount generated this month (2)	Outgoing amount (3)	Amount at the end of month (4)	Verification (5) = ((1)+(2) - (3))	Difference (6) = (5) - (4)	Remarks
Person in Charge(Signature): Date(DD/MM/YY):								

Form 08 – Reporting Form of Recycling by Recycling Facilities (Recording Table for Monthly Recovery of Focused Materials)

Name of the RF	XYZ Recycling Bhd.			
Reporting Period	From 01/MM/YY to DD/MM/YY			
Items	Focused Materials	Weight recovered (kg)	Method of Treatment/Disposal	Destination(Full Recovery Facilities or Oversea)
TV(CRT)	CRT monitor			
	Printed circuit board			
	Capacitor (old type)			
	Plasma display			
TV(Flat Screen)	Printed circuit board			
	Florescent tube			
	Liquid crystal display			
	Plasma display			
Refrigerator	Refrigerant (in compressor)			
	Foaming agent for heat insulating material			
	Printed circuit board			
Air Conditioner	Refrigerant			
	Printed circuit board			
	Capacitor (old type)			
Washing Machine/Dryer	Refrigerant (heat pump type dehumidifier or dryer)			
	Printed circuit board			
	Capacitor (old type)			
Personal Computer(PC) CRT	Printed circuit board			
	CRT monitor			
Personal Computer(PC) Flat Screen monitor	Printed circuit board			
	Florescent tube			
	Liquid crystal display			
	Plasma display monitor			
Personal Computer(PC) Tower Unit	Printed circuit board			
	Rechargeable battery			
	Button batteries			
Personal Computer(PC) Notebook	Printed circuit board			
	Florescent tube			
	Liquid crystal display			
	Rechargeable battery			
	Button batteries			
Mobile Phone/Tablet PC	Printed circuit board			
	Rechargeable battery			
	Button batteries			
	Florescent tube			
	Liquid crystal display			
Person in Charge(Signature): Date(DD/MM/YY):				

Form 09 – Reporting Form of Recycling by Recycling Facilities (Monthly Recording Table for WEEE Recycling)

Name of the RF	XYZ Recycling Bhd.			
Reporting Period	From 01/MM/YY to DD/MM/YY			
Items	Amount received (pieces)	Weight received (kg)	Amount processed (pieces)	Weight processed (kg)
TV(CRT)				
TV(Flat Screen)				
Refrigerator				
Air Conditioner				
Washing Machine/Dryer				
Personal Computer(PC) CRT monitor				
Personal Computer(PC) Flat Screen monitor				
Personal Computer(PC) Tower Unit				
Personal Computer(PC) Notebook				
Mobile Phone/Tablet PC				
Person in Charge(Signature): Date(DD/MM/YY):				

Form 10 – Reporting form of Recycling by Recycling Facilities (Recording Table for Monthly Material Balance)

Reporting Period	From 01/MM/YY to DD/MM/YY			
Name of RF	XYZ Recycling Bhd.			
Address of RF				
Phone number				
Contact person				
Amount of WEEEs processed				
Item	Subcategories	Amount processed (piece)	Amount processed (kg)	Remarks
TV				
Refrigerator				
Washing Machine				
Air Conditioner				
PC				
Mobile Phone				
	Total			
Amount of recovered materials (kg)				
	Total			
Amount of waste generated (kg)				
	Total			
Person in Charge(Signature): Date(DD/MM/YY):				

Form 11 – Reporting form of Recycling by Recycling Facilities (Recording Table to Calculate Monthly Recycling Rate)

Reporting Period	From 01/MM/YY to DD/MM/YY			
Name of RF	XYZ Recycling Bhd.			
Item	Subcategories	Weight (kg)	Destinations	Recycling Rate(%)
TV(CRT)	Metals	(a)		(a+b+c) / (a+b+c+d) x100=
	Plastics	(b)		
	Other recyclable materials	(c)		
	Residues	(d)		
TV(Flat Screen)	Metals	(a)		(a+b+c) / (a+b+c+d) x100=
	Plastics	(b)		
	Other recyclable materials	(c)		
	Residues	(d)		
Refrigerator	Metals	(a)		(a+b+c) / (a+b+c+d) x100=
	Plastics	(b)		
	Other recyclable materials	(c)		
	Residues	(d)		
Air Conditioner	Metals	(a)		(a+b+c) / (a+b+c+d) x100=
	Plastics	(b)		
	Other recyclable materials	(c)		
	Residues	(d)		
Washing Machine/Dryer	Metals	(a)		(a+b+c) / (a+b+c+d) x100=
	Plastics	(b)		
	Other recyclable materials	(c)		
	Residues	(d)		
Personal Computer(PC) CRT monitor	Metals	(a)		(a+b+c) / (a+b+c+d) x100=
	Plastics	(b)		
	Other recyclable materials	(c)		
	Residues	(d)		
Personal Computer(PC) Flat Screen monitor	Metals	(a)		(a+b+c) / (a+b+c+d) x100=
	Plastics	(b)		
	Other recyclable materials	(c)		
	Residues	(d)		
Personal Computer(PC) Tower Unit	Metals	(a)		(a+b+c) / (a+b+c+d) x100=
	Plastics	(b)		
	Other recyclable materials	(c)		
	Residues	(d)		
Personal Computer(PC) Notebook	Metals	(a)		(a+b+c) / (a+b+c+d) x100=
	Plastics	(b)		
	Other recyclable materials	(c)		
	Residues	(d)		
Mobile Phone/Tablet PC	Metals	(a)		(a+b+c) / (a+b+c+d) x100=
	Plastics	(b)		
	Other recyclable materials	(c)		
	Residues	(d)		
Person in Charge(Signature): Date(DD/MM/YY):				

APPENDIX D

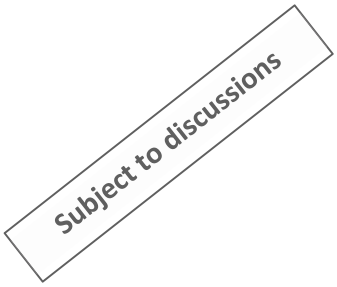
List of Scheduled E-waste in the First Schedule of the Environmental Quality Act (Scheduled Electrical and Electronic Equipment Waste) Regulations, XXXX

First Schedule

HSW_100	Electronic and Electrical Equipment Waste *Definitions*
HSW_101	Air-Conditioner *Definitions*
HSW_102	Washing Machine / Cloth Dryer *Definitions*
HSW_103	Refrigerator / Freezer *Definitions*
HSW_104	Television *Definitions*
HSW_105	Computer / Tablet *Definitions*
HSW_106	Mobile Phone *Definitions*
HSW_200	Small Electrical and Electronic Appliances Waste *Definitions*
HSW_201	Printers and other printing units *Definitions*
HSW_202	Vacuum Cleaner *Definitions*
HSW_203	Hair Dryer *Definitions*
HSW_204	Scanners *Definitions*
HSW_205	Video Camera / Digital Camera / Recorder *Definitions*
HSW_206	DVD Player *Definitions*
HSW_207	Portable Music Player *Definitions*
HSW_208	Game Machine *Definitions*
HSW_209	Telephone / Fax Machine

Definitions

HSW_210	Car Navigator / GPS *Definitions*
HSW_211	Radio / Audio players *Definitions*
HSW_212	Rice Cooker *Definitions*
HSW_213	Microwave Oven / other ovens *Definitions*
HSW_214	More to add on *Definitions*



HSW_300	More to be added in the Future *Definitions*
HSW_400	More to be added in the Future *Definitions*
HSW_500	More to be added in the Future *Definitions*

APPENDIX E

List of Authorized Collectors / Transporters / Retailers / Other Collection Points

APPENDIX F

List of Licensed E-waste Full Recovery Facilities Under the Existing EQA (Scheduled Waste) Regulations

1	**CENTURY SURF SDN BHD (PLOT 157A)**	**FACILITI**:
	PLOT 157A, LORONG PERINDUSTRIAN BUKIT MINYAK 7, BUKIT MERTAJAM , PULAU PINANG	Kemudahan Pemerolehan Penuh Luar Tapak
	State: PULAU PINANG	
	Phone:012 4111 882	
	Fax:04 626 6002	
2	**DD WORLD CORPORATION SDN BHD (FOMERLY KNOWN AS QUANTUM REFIN**	**FACILITI**:
	PLOT 75, JALAN PERINDUSTRIAN BUKIT MINYAK TAMAN PERINDUSTRIAN BUKIT MINYAK , BUKIT MERTAJAM , PULAU PINANG	Kemudahan Pemerolehan Penuh Luar Tapak
	State: PULAU PINANG	
	Phone:04-5015577	
	Fax:04-5015575	
3	**EGA RECYCLING SDN. BHD. (FULL RECOVERY) (NSU)**	**FACILITI**:
	LOT 29, JALAN PERMATA 1/1,ARAB MALAYSIAN INDUSTRIAL PARK , NILAI , NEGERI SEMBILAN	Kemudahan Pemerolehan Penuh Luar Tapak
	State: NEGERI SEMBILAN	
	Phone:06-7998229	
	Fax:06-7646425	
4	**KRUBONG RECOVERY SDN. BHD.**	**FACILITI**:
	(2625 & 2630) PT.1671 & PT 1676,KAWASAN PERINDUSTRIAN KRUBONG , MELAKA , MELAKA	Kemudahan Pemerolehan Penuh Luar Tapak
	State: MELAKA	
	Phone:06-3352519	
	Fax:06-3352520	
5	**MERIAHTEK (M) SDN. BHD.**	**FACILITI**:
	NO 1, JALAN TTC 30, LOT 4827, 4828, 4831 & 4832, TAMAN TEKNOLOGI CHENG,MUKIM CHENG , MELAKA , MELAKA	Kemudahan Pemerolehan Penuh Luar Tapak
	State: MELAKA	
	Phone:06 - 3365211	
	Fax:06 - 3365201	
6	**ALH INDUSTRIES SDN BHD (SW110)**	**FACILITI**:
	LOT 7832, 7833, 7834, 7835, JALAN BATU TIGA, BUKIT CHERAKAH , SHAH ALAM , SELANGOR	Pemerolehan Kembali Luar Tapak
	State: SELANGOR	
	Phone:03-78469967	
	Fax:03-78464967	

7	**BENCHMARK VISTA SDN. BHD.(LOT NO. 6,SOLOK SULTAN HISHAMUDDIN**	**FACILITI**:
	LOT NO. 6, SOLOK SULTAN HISHAMUDDIN 7, BANDAR SULTAN SULAIMAN, SELAT KLANG UTARA, , PELABUHAN KELANG , SELANGOR	Pemerolehan Kembali Luar Tapak
	State: SELANGOR	
	Phone:03-31766357	
	Fax:03-31767357	
8	**CHEMALAYA SDN BHD**	**FACILITI**:
	Plo 128 Jalan Rimba 3 Tanjung Langsat Industri Complex , PASIR GUDANG , JOHOR	Pemerolehan Kembali Luar Tapak
	State: JOHOR	
	Phone:07-6522064	
	Fax:07-6522070	
9	**CYCLE TREND INDUSTRIES SDN. BHD. (BUKIT MINYAK)**	**FACILITI**:
	NO. 1001, PLOT 209b, JALAN PERINDUSTRIAN BUKIT MINYAK KAWASAN PERINDUSTRIAN BUKIT MINYAK, , BUKIT MERTAJAM , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-507 8089	
	Fax:04-508 0861	
10	**DNS WASTE MANAGEMENT SDN.BHD.**	**FACILITI**:
	LOT 880, BLOCK 237 KNLD, KOTA SENTOSA INDUSTRIAL PARK, JALAN BATU KITANG 93250 KUCHING , KUCHING , SARAWAK	Pemerolehan Kembali Luar Tapak
	State: SARAWAK	
	Phone:016-8639991	
	Fax:082-687252	
11	**ESTALCO SDN BHD**	**FACILITI**:
	PLO 616 JALAN MIEL 1, JALAN KELULI 9, KAWASAN PERINDUSTRIAN MEIL 4 , PASIR GUDANG , JOHOR	Pemerolehan Kembali Luar Tapak
	State:JOHOR	
	Phone:07-2552888	
	Fax:07-2552333	
12	**HI-TECH FULL RECOVERY (M) SDN BHD**	**FACILITI**:
	Lot 4169, No 14, Lorong Perusahaan 3, Kaw Ind. Padang Meha, Kedah , ALOR SETAR , KEDAH	Pemerolehan Kembali Luar Tapak
	State:KEDAH	
	Phone:	
	Fax:04-4853032	

13	**HYDRO METAL (M) SDN BHD**	**FACILITI**:
	PLO 59, JALAN PERAK 1, KAWASAN PERINDUSTRIAN PASIR GUDANG, 81700, PASIR GUDANG , PASIR GUDANG , JOHOR	Pemerolehan Kembali Luar Tapak
	State:JOHOR	
	Phone:07-2521896	
	Fax:07-2529882	
14	**Infinity Recovery Sdn. Bhd.**	**FACILITI**:
	NO. 2, JALAN CENDERAI 24,TAMAN PERINDUSTRIAN KOTA PUTERI, MASAI, JOHOR	Pemerolehan Kembali Luar Tapak
	State:JOHOR	
	Phone:07-3866080	
	Fax:	
15	**JARING METAL INDUSTRI SB**	**FACILITI**:
	NO 10 JALAN IKS JURU JAYA 14100 SIMPANG AMPAT, SIMPANG AMPAT(P) , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State:PULAU PINANG	
	Phone:	
	Fax:	
16	**JARING METAL INDUSTRIES SDN BHD (NO.7, SHAH ALAM SELATAN 2)**	**FACILITI**:
	NO.7, JALAN SUNGAI KAYU ARA 32/37 TAMAN BERJAYA, SEKSYEN 32 , SHAH ALAM , SELANGOR	Pemerolehan Kembali Luar Tapak
	State:SELANGOR	
	Phone:	
	Fax:	
17	**KHT RECYCLE SDN BHD**	**FACILITI**:
	PTD 34286 JALAN WAWASAN 8 KAW. PER. SRI GADING , SERI GADING , JOHOR	Pemerolehan Kembali Luar Tapak
	State:JOHOR	
	Phone:	
	Fax:	
18	**KUALITI KITAR ALAM SDN. BHD.**	**FACILITI**:
	LOT H.S. (D) 20487 P.T. 3292 LDG TANAH MERAH A3 DIVISION MK JIMAH , PORT DICKSON , NEGERI SEMBILAN	Pemerolehan Kembali Luar Tapak
	State:NEGERI SEMBILAN	
	Phone: 066662000	
	Fax: 066662010	
19	**LIMA JAYA PAPER TRADING SDN. BHD.**	**FACILITI**:
	NO. 643, JALAN IDAMAN 3/9, TAMAN DESA IDAMAN, , SENAI , JOHOR	Pemerolehan Kembali Luar Tapak
	State:JOHOR	
	Phone:	
	Fax:	

20	**MATSUDA SANGYO (MALAYSIA) SDN. BHD.**	**FACILITI**:
	PT 511, LOT 62773 (PLOT B), PERSIARAN HULU SELANGOR, SEKSYEN 26, SHAH ALAM , SELANGOR	Pemerolehan Kembali Luar Tapak
	State: SELANGOR	
	Phone:03-81910162	
21	**METAHUB INDUSTRIES SDN.BHD.**	**FACILITI**:
	LOT 2247 & 2248, JLN SEELONG JAYA 8, SEELONG JAYA, SENAI , JOHOR	Pemerolehan Kembali Luar Tapak
	State: JOHOR	
	Phone:	
	Fax:	
22	**METAL RECOVERY INDUSTRIES SDN BHD (KLANG UTARA)**	**FACILITI**:
	LOT 6251-B, BATU 5 1/2, JALAN KAPAR, KLANG , SELANGOR	Pemerolehan Kembali Luar Tapak
	State: SELANGOR	
	Phone: 03-32906988	
	Fax: 03-32906922	
23	**MING ENGINEERING PLASTIC SDN BHD**	**FACILITI**:
	PLOT 71, LORONG PERINDUSTRIAN BUKIT MINYAK 14, BUKIT MERTAJAM, P. PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone: 04-508 4557	
	Fax: 04-508 6557	
24	**PETROMINE (M) SDN BHD (LOT 25)**	**FACILITI**:
	LOT 300735, NO 25, KAWASAN PERINDUSTRIAN GOPENG, FASA 3, 31600 GOPENG, IPOH, PERAK	Pemerolehan Kembali Luar Tapak
	State: PERAK	
	Phone:	
25	**PREFERENCE MEGACYCLE SDN. BHD. (PLOT 80A)**	**FACILITI**:
	PLOT 80A, LORONG PERINDUSTRIAN BUKIT MINYAK 16 KAWASAN PERINDUSTRIAN BUKIT MINYAK, BUKIT MERTAJAM , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-5086027	
	Fax:04-5076027	
26	**RECLAIMTEK (M) SDN. BHD.**	**FACILITI**:
	PLOT 88A, JALAN PERINDUSTRIAN BUKIT MINYAK KAWASAN PERINDUSTRIAN BUKIT MINYAK , BUKIT MERTAJAM , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-5088571	
	Fax:04-5088577	

27	**SHAN POORNAM METALS SDN. BHD.**	**FACILITI**:
	PLOT 34 (NO. 1479), LORONG PERUSAHAAN MAJU 6 KAWASAN PERUSAHAAN PERAI, FASA 4, PERAI , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-5084841	
	Fax:04-5084843	
28	**SMC TECHNOLOGY SDN BHD**	**FACILITI**:
	PLO 31, JLN PERINDUSTRIAN PONTIAN, PONTIAN, JOHOR	Pemerolehan Kembali Luar Tapak
	State: JOHOR	
	Phone:07-6862088	
	Fax:07-6862066	
29	**SUN SOON YIK RECYCLE PLASTIC & METAL SDN. BHD.**	**FACILITI**:
	LOT 137249 & 137250 HALAL PERUSAHAAN MENGLEMBU 16, IPOH, PERAK	Pemerolehan Kembali Luar Tapak
	State: PERAK	
	Phone:05-2829321	
	Fax:	
30	**SYP RECOVERY & RECYCLING SDN. BHD.**	**FACILITI**:
	LOT 2833-2834, KAWASAN PERINDUSTRIAN BUKIT RAMBAI, MUKIM TANJUNG MINYAK, MELAKA, MELAKA, MELAKA	Pemerolehan Kembali Luar Tapak
	State: MELAKA	
	Phone:06 - 351471	
	Fax:06 - 3515199	
31	**TES-AMM (MALAYSIA) SDN. BHD.**	**FACILITI**:
	NO 2005, TINGKAT PERUSAHAAN 1 KAWASAN PERUSAHAAN PERAI, PERAI , PULAU PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-3991896	
	Fax:04-3993221	
32	**TWINKLE METAL (M) SDN. BHD.**	**FACILITI**:
	No 1449, Lorong Perusahaan Maju 8, Plot 96, kawasan Perusahaan Prai 4, PERAI, P.PINANG	Pemerolehan Kembali Luar Tapak
	State: PULAU PINANG	
	Phone:04-5084557	
	Fax:04-5086557	
33	**VICTORY RECOVERY SDN. BHD.**	**FACILITI**:
	LOT 2211, 2212, 2213 & 2214, 2215,2216 JALAN PK 11 KAWASAN PERINDUSTRIAN KRUBONG, KERUBONG , MELAKA	Pemerolehan Kembali Luar Tapak
	State: MELAKA	
	Phone:06 - 3345336	
	Fax:06 - 3344589	

34	**VITA RECYCLE SDN BHD**	**FACILITI**:
	LOT 1227, BLOK 8, DEMAK LAUT INDUSTRIAL PARK, PHASE 11 A, JALAN BAKO, 93050 KUCHING SARAWAK , KUCHING , SARAWAK	Pemerolehan Kembali Luar Tapak
	State:SARAWAK	
	Phone:082-450031	
	Fax:082-573136	
35	**XANTARA SDN BHD (PYDT BT)**	**FACILITI**:
	LOT NO. 3992 & 3993, NO. 21 & 22 LORONG 3/1 KAWASAN PERINDUSTRIAN SENAWANG , SENAWANG , NEGERI SEMBILAN	Pemerolehan Kembali Luar Tapak
	State:NEGERI SEMBILAN	
	Phone:06-6751548	
	Fax:06-6794931	

APPENDIX G

List of Other Partners (E-waste Alam Alliance Partners)

State	No	Company Name	Address	Contact
PERLIS	1	Iyan Trading Sdn Bhd	Lot 5, Kawasan Perindustrian Mukim Jejawi, 02600 Arau, Perlis.	012-4750210
	2	Senheng Electric (KL) Sdn Bhd	No. 1A, Persiaran Jubli Emas, 01000 Kangar, Perlis.	012 – 611 2440
	3	Suria Jerai Electrical Sdn Bhd	No. 45, 47,49 Jalan Jubli Perak, 01000 Kangar, Perlis.	014 – 629 6747
KEDAH	1	Pen Green Global Trading	Sungai Petani, Kedah Darul Aman	019 – 458 1595
	2	Senheng Electric (KL) Sdn Bhd	2&2A, 3&3A, Pekan Simpang Kuala off Lebuh Raya Sultan Abdul Halim, 05400 Alor Setar, Kedah	012 – 658 1695
	3	Senheng Electric (KL) Sdn Bhd	34, Pekan Jitra 3, 06000 Jitra, Kedah	012 – 404 1044
	4	Senheng Electric (KL) Sdn Bhd	207 & 208, Jalan Legenda 7, Legenda Heights, 08000 Sungai Petani, Kedah	012 – 658 1784
	5	Senheng Electric (KL) Sdn Bhd	Lot No. F10 & F11, First Floor, Tesco Sungai Petani Mutiara No. 368, Jalan Bakar Arang, 08000 Sungai Petani, Kedah	012 – 657 9365
	6	Senheng Electric (KL) Sdn Bhd	Lot No. F1, First Floor, Tesco Mergong, No. 1 Lebuhraya Sultanah Bahiyah, 05100 Alor Setar, Kedah	012 – 493 1404
PENANG	1	MSV Metal (M) Sdn Bhd	No. 3675, Jalan Permatang Pauh, 13400 Butterworth, Penang.	04 – 323 4306
	2	ICT Komtar (Venice Gateway Sdn Bhd)	Unit No. 1B & 1D, 1.01-4.01, Komtar, Jalan Penang, 10000 Penang	04 – 250 8662
	3	Northern Electronics Services	Blok A-G-08, Lebuh Nangka 1, Taman Desa Damai, 14000 Bukit Mertajam, Penang	019 – 412 3392
	4	Ex Tech Enterprise	146, 4th Floor, Bukit Jambul Complex, Jalan Rumbia 11900 Bayan Lepas, Penang	04 – 643 5312
	5	Yayasan Humanistik	No. 58, Lorong Tambun Indah 10, Taman Tambun Indah, 14100 Simpang Ampat, Penang.	016 – 543 6077
	6	Senheng Electric (KL) Sdn Bhd (SenQ)	S23 Second Floor, Sunway Carnival Mall, 3068, Jalan Todak, Pusat Bandar, 13700 Seberang Jaya, Penang	04 – 390 0040
	7	Senheng Electric (KL) Sdn Bhd	No. 112, 114, 116 Jalan Raja Uda, Pusat Perniagaan Raja Uda, 12300 Butterworth, Penang.	04 – 323 5040

PENANG	8	Senheng Electric (KL) Sdn Bhd	Tesco Bukit Mertajam Jalan Rozhan, Pusat Perniagaan Seri Impian, Bukit Mertajam, Penang.	012 – 658 1596
	9	Senheng Electric (KL) Sdn Bhd	Fortune Court, 288 B-1-10 & 11 Ground Floor, Jalan Thean Teik, Farlim, 11500 Penang.	04 – 829 4140
	10	Senheng Electric (KL) Sdn Bhd (SenQ)	Gurney Plaza, 170-07-08, Plaza Gurney, Persiaran Gurney, 10250 Penang.	04 – 229 4040
	11	Senheng Electric (KL) Sdn Bhd (SenQ)	Queensbay Mall 2F-07, second Floor, Queensbay Mall 100, Persiaran Bayan Indah, Sungai Nibong, 11900 Bayan Lepas, Penang.	04 – 641 1052
	12	Senheng Electric (KL) Sdn Bhd	Tesco Tg Pinang Lot No. F4, F5 & F6, 1st Floor, Kawasan Tebusguna Bandar Tg Pinang, Jalan Tg Tokong, Jalan Seri Tg Pinang, Daerah Timur Laut, 10470 Penang.	04 – 890 4370
	13	Senheng Electric (KL) Sdn Bhd	Bukit Jambul No. 12J, 12K & 12L, Jalan Tun Dr. Awang G27, Bukit Jambul, 11900 Penang.	04 – 646 3040
	14	Pusat Pengumpulan Kitar Semula	No. 7, Tingkat Binjai 20, Taman sri Rambai, 14000 Bukit Mertajam	012-4857789
PERAK	1	Enviro Metal Sdn Bhd	No. 85, Pt 38902, Hala Perusahaan Menglembu 15, Kawasan Perindustrian Menglembu, 31450 Ipoh, Perak	05 – 282 6003
	2	Senheng Electric (KL) Sdn Bhd	No. 9 & 9A, 11 & 11A, 13 & 13A, Jalan Pengkalan Utama 1, Taman Pengkalan Utama 31650 Ipoh, Perak	012 – 484 9440
	3	Senheng Electric (KL) Sdn Bhd	431 & 432, Jalan Silibin, Taman Seri Tahan, 30100 Ipoh, Perak	012 – 658 1482
	4	Senheng Electric (KL) Sdn Bhd	No. 505 – 507, Jalan Pasir Puteh, Pasir Puteh, 31650 Ipoh, Perak	012 – 657 9034
	5	Senheng Electric (KL) Sdn Bhd	40 – 42, Lebuh Medan Ipoh, Bandar Baru Medan Ipoh, 31400 Ipoh, Perak	012 – 658 1649
	6	Senheng Electric (KL) Sdn Bhd	No. 1-3, Jalan Medan Taiping, Medan Taiping, 34000 Perak	012 – 658 1624
	7	Senheng Electric (KL) Sdn Bhd	No. 13,15,17,19 Ground Floor, Jalan Kamunting, 34600 Taiping, Perak	012 – 658 8635
	8	Senheng Electric (KL) Sdn Bhd	No. 11A, 15, Jalan Keli, Taman Damai, 34200 Parit Buntar, Perak	012 – 657 9602
SELANGOR	1	Shan Poornam Metals (Selangor) Sdn Bhd	No. 1, Jalan Pendamar 27/90, Seksyen 27, Shaha Alam, 40400 Shah Alam, Selangor	012 – 483 9211
	2	Tan Boon Ming Sdn Bhd	Shah Alam No. 37 & 39, Jalan Mewah 25/63, Taman Sri Muda, 40400 Shah Alam, Selangor	03 – 5121 4122

	3	Senheng Electric (KL) Sdn Bhd	Sri Kembangan No.7, Jalan 7/3A, Kawasan Perindustrian Seri Kembangan, 43000 Serdang, Selangor	012 – 658 2654
	4	Senheng Electric (KL) Sdn Bhd	Shah Alam No. 2A-Jalan 31/54, Kota Kemuning, 40460 Shah Alam	012 – 658 2749
	5	Senheng Electric (KL) Sdn Bhd	Batu Caves No. 10, Jalan Industri Batu Caves 1/1, Taman Perindustrian Batu Caves, 68100 Batu Caves	012 – 703 1440
	6	Senheng Electric (KL) Sdn Bhd	No. 105, Jalan Pelabur B 23/B, Section 23, 40300 Shah Alam, Selangor	012 – 658 0697
	7	Senheng Electric (KL) Sdn Bhd	21, Jalan USJ 10/1F, 47620 UEP Subang Jaya,Selangor	012 – 658 1450
	8	Senheng Electric (KL) Sdn Bhd	1012 & 1014, Jalan Meru, 41050 Klang, Selangor	012 – 658 0957
	9	Senheng Electric (KL) Sdn Bhd	No. 39-G, 39-I, 40-G & 40-I, Jalan Nautika U20/A, Sekyen U20, Pusat Komersil TSB, 40160 Shah Alam, Selangor	012 – 695 4840
	10	Senheng Electric (KL) Sdn Bhd	127, 129 Jalan Sultan Abdul Samad, 42700 Banting, Selangor	012 – 658 0961
	11	Senheng Electric (KL) Sdn Bhd	No. 9 & 11, Jalan SBBC 3, Sungai Besar, Business Centre, 45300 Sungai Besar, Selangor	012 – 337 3440
	12	Senheng Electric (KL) Sdn Bhd	Lot No. F36, F37, F38 & F39, Giant Hypermarket Bandar Kinrara Lot 449, Jalan BK 5A/1, Bandar Kinrara, 47100 Puchong, Selangor	012 – 268 1040
	13	Senheng Electric (KL) Sdn Bhd	Lot F.08, 1st Floor Selayang Mall Shopping Centre, Jalan S U 9, Taman Selayang Utama, 68100 Batu Caves, Selangor	03 – 9285 4544
	14	Senheng Electric (KL) Sdn Bhd	Lot No LG 25A, Lower Ground Floor, Alamanda Putrajaya Shopping Centre, Jalan Alamanda, Precinct 1, 62000 Putrajaya	012 – 657 9745
SELANGOR	15	Senheng Electric (KL) Sdn Bhd	No. 53, 55 & 57, Jalan Bandar Rawang 2, 48000 Rawang, Selangor Darul Ehsan	012 – 658 1264
	16	Senheng Electric (KL) Sdn Bhd	7G & 8G, Plaza Citra, Jalan Citra, Kajang, 43000 Kajang	012 – 657 9721
	17	Senheng Electric (KL) Sdn Bhd	Lot 465 & 493, Mukim of Cheras, Jalan Balokong, 43200 Batu 11 Cheras, Selangor	03 – 9285 4555
	18	Senheng Electric (KL) Sdn Bhd	35 & 36G, Jalan Medan PB4, Seksyen 9 Pusat Bandar Baru Bangi, 43650 Selangor	012 – 631 1040
	19	Senheng Electric (KL) Sdn Bhd	F14 & F15 Giant Hypermarket, Kelana Jaya Jalan SS6/12, 47301 Petaling Jaya.	012 – 658 0854
	20	Senheng Electric (KL) Sdn Bhd	Lot 3F-18A, 3F-23A and F-25, 3rd Floor SACC Mall, Precint 1.1 & Precint 1.2, Jalan Perbadanan 14/9, Seksyen 14, 40000 Shah Alam.	012 – 658 1094

	21	Senheng Electric (KL) Sdn Bhd	Lot F23-23A, IOI Mall, Batu 9, Jalan Puchong, Bandar Puchong Jaya, 47100 Selangor	012 – 658 0715
	22	Senheng Electric (KL) Sdn Bhd	No 29C, 29D, 29E, Jalan Dinar G U3/G, Taman Subang Perdana, Seksyen U3, 41050 Shah Alam, Selangor	012 – 694 2440
KL	1	Tan Boon Ming Sdn Bhd	Jalan Klang Lama PS-1, Taman Evergreen,Batu 4, Jalan Klang Lama,58100 Kuala Lumpur	03 – 7983 2020
	2	Tan Boon Ming Sdn Bhd	Bangsar Village Unit No. LG-6, Lower Ground Floor, Jalan Telawi Satu, Bangsar Baru, 59100 Kuala Lumpur	03 – 2287 4818 /4819
	3	Tan Boon Ming Sdn Bhd	Cheras Furniture City Lot No. 51449, Block A1 & A2, Batu 5/12, Jalan Cheras, 56100 Kuala Lumpur	03 – 9132 1975
	4	Tan Boon Ming Sdn Bhd	KL Festival City Lot No. F-27, First Floor, Jalan Taman Ibu Kota, Taman Danau Kota, Setapak , 53300 K. Lumpur	03 – 4131 6263
	5	Senheng Electric (KL) Sdn Bhd	Lot L2-7, Level 2, Cheras Leisure Mall, Jalan Manis 6, Taman Segar Cheras, 56100 Kuala Lumpur	012 – 658 0734
	6	Senheng Electric (KL) Sdn Bhd	Lot No. F1, F2, F3, First Floor, Hartamas Shopping Centre 60, Jalan Sri Hartamas 1, Sri Hartamas, 50480 Kuala Lumpur	012 – 657 9350
	7	Senheng Electric (KL) Sdn Bhd	40 & 40-1, 42&42-1, Block C, Vista Magna, Batu 7, Jln Kepong, Kepong, 52100 Kuala Lumpur	012 – 658 0794
KL	8	Senheng Electric (KL) Sdn Bhd	LG 8, Parkson Grand, The Mall, 100 Putra Place, Jalan Putra, 50350 Kuala Lumpur	012 – 658 0287
	9	Senheng Electric (KL) Sdn Bhd	36-38, Jalan Pandan 2/1, Pandan Jaya, 55100 Cheras, Kuala Lumpur	012 – 658 0197
	10	Senheng Electric (KL) Sdn Bhd	171 & 173, Jalan Sarjana, Taman Connaught, off Jalan Cheras, 56000 Kuala Lumpur	012 – 658 0276
	11	Senheng Electric (KL) Sdn Bhd	Lot F49 & F50, First Floor, AEON AU2 Shopping Centre No.6, Jalan Taman Setiawan (Jln 37/56), AU2 Taman Keramat, 54200 Kuala Lumpur	012 – 618 5440
	12	Senheng Electric (KL) Sdn Bhd	Diamond Square No. 15 & 17, Jalan 2/50, Jalan Gombak, BT 3 1/2 Setapak, 53000 Kuala Lumpur	012 – 658 0542
	13	Senheng Electric (KL) Sdn Bhd	55 & 57, Jalan Radin Bagus, Sri Petaling, 57000 Kuala Lumpur	012 – 658 1462
	14	Senheng Electric (KL) Sdn Bhd	61-63, Jalan 46A/26, Rampai Town Centre, 53300 K. Lumpur	012 – 658 0571
	15	Senheng Electric (KL) Sdn Bhd	No. 15-0 & 13A-0 (Ground Floor), Platinum Walk, No. 2, Jalan Langkawi, Setapak, 53000 Lake City, KL	012 – 659 4404

MELAKA	1	Senheng Electric (KL) Sdn Bhd	NO 105-107 Jalan PM2, Taman Perindustrian Merdeka, Batu Berendam 75350 Melaka	012 – 658 3251
	2	Senheng Electric (KL) Sdn Bhd	16-18, Jalan Seri Mangga 1/2, Taman Seri Mangga, 75250 Melaka	012 – 657 9457
	3	Senheng Electric (KL) Sdn Bhd	No. 43, 43-1 & 43-2, Jalan BBP 1, Taman Bt Berendam Putra, 75350 Melaka	012 – 657 9465
	4	Senheng Electric (KL) Sdn Bhd	No. G-3 & 1-3, (PT7711, 7712 & 7713), Mukim Cheng, Jalan Cheng Perdana 1/1, Taman Desa Cheng Perdana 1, Cheng, 75250 Melaka	012 – 657 9325
JOHOR	1	Shan Poornam Metals (Johor) Sdn Bhd	No. 39, Jalan Murni 4, Taman Perindustrian Murni Senai, 81400 Senai, Johor	07 – 590 9863
	2	Green Future Enterprise	No.6, Jalan Keembong 27, Taman Johor Jaya, 81100 Johor Bahru	
	3	DST Solution Sdn Bhd	L3-35, 36, 37, Level 3 Danga City Mall , Jalan Tun Razak, 80000 Johor Bahru	07-221 0976
	4	Senheng Electric (KL) Sdn Bhd	LOT AT09, Giant Hypermarket, Jalan Masai Lama, Plentong, 81750 Johor Baru, Johor	017-7978977
	5	Senheng Electric (KL) Sdn Bhd	L2-036 Sutera Mall, No. 1 Jalan Sutera Tanjung 8/4, Taman Sutera Utama, 81300 Skudai, Johor Bahru.	012 – 728 8404
JOHOR	6	Senheng Electric (KL) Sdn Bhd	No. 63, 64, 65, Jalan Sejambak 14, Taman Bukit Dahlia, 81750 Pasir Gudang, Johor	012 – 524 0409
	7	Senheng Electric (KL) Sdn Bhd	No. 1, Jalan Sultan, 86000 Kluang, Johor	012 – 657 9654
	8	Senheng Electric (KL) Sdn Bhd	No. 16, 16A, 18,18A, 20, 20A, Jalan Setia 7/18, Taman Setia Indah, 81100 Johor Bahru	012 – 658 8171
	9	Senheng Electric (KL) Sdn Bhd	Lot No. M21 & M22, Tesco Kulai, No. 52 Taman Desamas, Batu 22½ Jalan Kulai – Air Hitam, 81000 Kulai, Johor	012 – 740 2440
	10	Senheng Electric (KL) Sdn Bhd	No. 12 (Ground Floor) & No. 13 (Ground & First Floor), Jalan Susur 2/1 Taman Utama, Bandar Baru, 85000 Segamat, Johor	012 – 681 6040
	11	Senheng Electric (KL) Sdn Bhd	Lot F01, First Floor, Jusco Tebrau City Shopping Centre, No. 1, Jalan desa Tebrau, Taman Desa Tebrau, 81100 Johor Bahru	012 – 657 9415
	12	Senheng Electric (KL) Sdn Bhd	Lot No. 1.61, First Floor, 303B, Jalan Kluang, 83000 Batu Pahat, Johor	012 – 658 3462
PAHANG	1	Senheng Electric (KL) Sdn Bhd	No. 90, 91 & 92, Jalan Tengku Ismail, 28000 Temerloh, Pahang	012 – 658 2415
	2	Senheng Electric (KL) Sdn Bhd	S-19, S-20 & S-21 (Tgkt Bawah), & C-21 (Tgkt Atas), Jalan Benom, Bandar Baru, Jerantut, Pahang.	012 – 658 2495

	3	Senheng Electric (KL) Sdn Bhd	B102, B104, B106, B108, Jalan Tun Ismail, Sri Dagangan Kuantan, 25000 Kuanatan	012 – 658 2395
	4	Senheng Electric (KL) Sdn Bhd	Ground Floor B897, 899, 901, Jalan Bukit Ubi, 25000 Kuantan	012 – 981 0443
	5	Senheng Electric (KL) Sdn Bhd	No. 34, Jalan 1M 3/3, Mahkota Industrial Park, Bandar Baru Indera Mahkota, 25200 Kuantan	012 – 658 3076
NEGERI SEMBILAN	1	Senheng Electric (KL) Sdn Bhd	1F-29-30, 1st Floor Seremban Palm Mall, Jalan Toman 1, Kemayan Square, 70200 Seremban, Negeri Sembilan	06 – 765 6322
	2	Senheng Electric (KL) Sdn Bhd	F21 &F22, Tesco Seremban 2, PT2374, Pekan Bukit Kepayang, Daerah Seremban, 70300 Negeri Sembilan	012 – 657 7885
	3	Senheng Electric (KL) Sdn Bhd	1st Floor 31, Jusco Seremban 2 Shopping Centre, 112 Persiaran S2 B1 Seremban 2, 70300 Seremban	012 – 657 9516
	4	Senheng Electric (KL) Sdn Bhd	Lot 12176 & 12177, Jalan BBN 1/1F, Putra Point, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan	012 – 658 2591
TERENGGANU	1	Senheng Electric (KL) Sdn Bhd	1049-I, G/Floor, Wisma Ladang, Jalan Sultan Sulaiman, 20000 Kuala Terengganu	012 – 658 2534
	2	Senheng Electric (KL) Sdn Bhd	Lot-9941/9942 Sura Gat, Business Centre, Jalan Yahaya Ahmad, 23000 Dungun, Terengganu	012 – 658 2514
	3	Senheng Electric (KL) Sdn Bhd	PT 11268 (G), Tingkat 1129 (G), Tingkat 1 & 2, Taman Cukai Utama, Jalan Kubang Kurus, 24000 Kemaman, Terengganu	012 – 658 2436
KELANTAN	1	Senheng Electric (KL) Sdn Bhd	1857-8, Paya Bemban, Jalan Hospital, 15400 Kota Bahru, Kelantan	012 – 981 2440
	2	Senheng Electric (KL) Sdn Bhd	Lot 678, Jalan Kampung Teluk Panji, 16100 Kota Bahru, Kelantan	012 – 981 2440
	3	Senheng Electric (KL) Sdn Bhd	L/341, T/B Kedai Jalan Padang Garong, Bnagunan MBSB, 15000 Kota Bahru, Kelantan	
	4	Senheng Electric (KL) Sdn Bhd	Lot 243, Jalan Hospital, 17500 Tanah Merah, Kelantan	012 – 658 0291
	5	Senheng Electric (KL) Sdn Bhd	PT1607 & PT 1608 (Ground Floor), Jalan KK 6, Bandar Baru Kubang Kerian, 16150 Kota Bharu, Kelantan	012 – 985 7440
	6	Senheng Electric (KL) Sdn Bhd	Lot 41A & 1.61A, 1st Floor, 1-888 KB Mall Jalan Hamzah, 15050 Kota Bharu, Kelantan	012 – 658 2584

HAZARDOUS SUBSTANCES DIVISION
DEPARTMENT OF ENVIRONMENT
MINISTRY OF NATURAL RESOURCE AND ENVIRONMENT
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Annex 4

Recycling Guideline for Household E-waste

GUIDELINE

Recycling of Scheduled E-waste in Malaysia

Department of Environment (DOE) Malaysia

Japan International Cooperation Agency (JICA)

1

TABLE OF CONTENTS

Guideline on Recycling of Scheduled E-waste in Malaysia

1.0 PREAMBLE

Electrical and electronic waste (commonly known as E-waste), is growing exponentially worldwide because of tremendous growth of the demand on the use of electrical and electronic equipment. The disposal of E-waste is of big concern discussed at international arena, because of the nature of hazardousness of the waste and drastically increased volume of its disposal in a globalized world.

Note:

"E-waste" referred to SW110 as stipulated in the First Schedule of Environment Quality (Scheduled Waste) Regulations 2005.

"Electrical and electronic equipment "means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields falling under the categories set out in First Schedule of the regulations;

Improper handling of E-waste poses high risk of pollution, health impacts and causes incidents of illegal disposal. The lack of proper environmental precaution measures in E-waste management could cause enormous environmental issues such as release of chlorofluorocarbon (CFC) gases that cause ozone depletion, global warming and contaminations from other hazardous/toxic substances.

In Malaysia, E-waste is generally divided by two main types of generation sources, i.e. E-waste generated from the industrial sectors, and E-waste generated from the non-industrial sectors, mainly households, commercial and institutional entities.

E-waste from industrial sector is categorized as Scheduled Wastes under the Code SW110, First Schedule of the Environmental Quality (Scheduled Wastes) Regulations 2005. The categories of E-waste defined under this coding are only covering E-waste generated from the industrial sectors, including electrical and electronic industries, as well as other industrial generators.

The management of E-waste generated from non-industrial sectors, especially household and other entities such as commercial and institutional entities is now regulated under a newly enacted regulation known as the Environmental Quality (Scheduled E-Waste) Regulation 20XX, which defines scheduled E-waste in which the six targeted categories of E-waste are designated.

Scheduled E-waste requires a different management system as compared to the E-waste generated from the industrial sector, particularly from the financial perspective where significant costs are required for collection and transportation, as well as to comply with the proper environmental precaution standards. Therefore, scheduled E-waste shall only be processed or treated by scheduled E-waste recyclers, which are licensed by the DOE.

This Guideline shall be read together with the Environmental Quality (Scheduled E-waste) Regulations 20XX.

2.0 ABOUT THE GUIDELINE

Under the framework of the Environmental Quality (Scheduled E-Waste) Regulations 20XX, it is emphasized that all the scheduled E-wastes shall be channeled, collected and delivered through a formal/authorized flow of stakeholders to the final destination of proper treatment, recycling and recovery in an environmentally sound system. Each respective player has their own roles and responsibilities, and the cost involved in the entire system shall be shared among all the stakeholders.

This Guideline provides a list of requirements for the users, who are directly involved in specific activities dealing with scheduled E-waste, particularly on the activities of recycling. It provides practical guidance to the recyclers how to comply with the Environmental Quality (Scheduled E-waste) Regulations 20XX.

The categories of E-waste covered under this Guideline are the list of Scheduled E-waste under the First Schedule of the Environmental Quality (Scheduled E-waste) Regulations 20XX including:

(a) Televisions;
(b) Air Conditioners;
(c) Computers;
(d) Refrigerators;
(e) Washing Machines/Cloth Dryers; and
(f) Mobile phones and tablet PCs.

The users of this Guideline shall always refer to the Environmental Quality (Scheduled E-Waste) Regulations 20XX as the main text to ensure complete understanding of the entire requirements under the regulations, as well as the clauses of the Environmental Quality Act (1974) as the Mother Act.

2.1 Scope of the Guideline

This guideline shall apply to all those who are engaged in recycling of the scheduled E-waste, regardless of whether they are individual persons, companies, organizations, or any other entities. The term “Recycling” is defined, in this Guideline, as follows:

For the purpose of this Guideline **“Recycling of scheduled E-waste”** means the following acts:

i. The act of separating and/or dismantling components and/or materials from electric and electronic appliances which have become waste and using them as components or raw materials for products; and
ii. The act of separating and/or dismantling components and/or materials from electric and electronic appliances that have become waste and converting them into a state in which they may be transferred with or without charge to a person who uses them as components or raw materials for products.

In the definition of “Recycling” above, “Thermal Recycling” is excluded. “Thermal Recycling” is defined as:

i. The act of producing heat from components and/or materials separated from the scheduled E-waste, or
ii. The act of converting components and/or materials separated from the scheduled E-waste into a state in which they may be transferred with or without charge to a person who produces heat from them.

The acts of “Reuse” and “Repair”, as defined below respectively, are not subject to control under this Guideline.

For the purpose of this Guideline, **“Reuse”** means the act of using again the second-hand electric and electronic appliances for its original purpose (conventional reuse) or for a different function without any separation and/or dismantling of components and/or materials.

For the purpose of this Guidelines, **“Repair”** means the act of fixing or mending a broken, damaged, or non-working electric and electronic appliances to an acceptable operating, working, or usable condition or state.

2.2 Description of Stakeholders

The users of this Guideline are expected to be all relevant stakeholders who are involved in recycling of the scheduled E-waste as listed in the section 2.0 above.

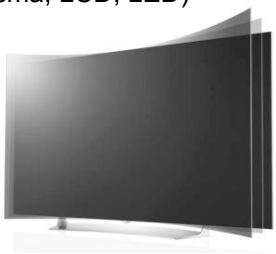
The table below clarifies the relevance of the existing stakeholders that may be partially or fully engaged in recycling of scheduled E-waste in terms of the compliance with this Guideline.

Types of Stakeholders	Relevance to the Recycling Guideline
Collectors	▪ Any activities of separation or dismantling of the components and/or materials from the E-waste are subject to control under this Guideline.
Repair shop	▪ In case the shop cannot repair the received electric and electronic appliances and keep them in the shop, they will be regarded as E-waste. Therefore, any activities of separation or dismantling of the components and/or materials from them are subject to control under this Guideline. ▪ In case the shop repaired a still working or broken electric or electronic appliance and return it to the customer or resale it, such activities are not subject to the control under this Guideline. ▪ When the shop replaces some parts or components of the electric and electronic appliances for the purpose of repair, such activity is not subject to control under this Guideline. However, the remaining parts and/or components after dismantling the reusable ones may be regarded as E-waste to be properly handled in accordance with this Guideline and the Environmental Quality (Scheduled E-waste) Regulations 20XX, depending on their types. ▪ Any separation and/or dismantling of components and/or materials not for repair/reconditioning purpose is subject to the control under this Guideline.
Secondhand shop	▪ Resale of the used electric and electronic appliances is not subject to the control under this Guideline. ▪ Any activities of repair/reconditioning of the used electric and electronic appliances before resale is not subject to the control under this Guideline. ▪ The remaining parts and/or components after dismantling the reusable ones may be regarded as E-waste to be properly handled in accordance with this

Types of Stakeholders	Relevance to the Recycling Guideline
	Guideline and the Environmental Quality (Scheduled E-waste) Regulations 20XX, depending on their types. ▪ Any separation and/or dismantling of components and/or materials not for repair/reconditioning purpose is subject to the control under this Guideline.
Partial/Full recovery facility	▪ As far as the scheduled E-waste defined in the Environmental Quality (Scheduled E-waste) Regulation 20XX is concerned, both partial and full recovery facilities currently authorized by DOE are required to follow this Guideline.

2.3 Categories of Scheduled E-waste

The target categories of scheduled E-waste subject to this Guideline are basically the 6 main categories specified in the First Schedule of the Environmental Quality (Scheduled E-waste) Regulations 20XX, excluding the small appliances, fluorescent lamps and rechargeable batteries. The 6 main categories of scheduled E-waste are listed as follows with their sub-categories:

No	Categories	Sub-categories
1	Televisions	CRT Televisions  
		Flat Televisions (Plasma, LCD, LED)  
2	Air-conditioners	Window Units  

No	Categories	Sub-categories
		Split units Ceiling Unit 
		Mobile units 
3	Computers	LCD Desktop CRT Desktop 
		Laptop 
4	Refrigerators	Refrigerators 

No	Categories	Sub-categories
		Freezers 
		Chillers 
5	Washing Machines/ Cloth Dryers	Washing machines 
		Cloth Dryers 
6	Mobile phones and Tablet PCs	Mobile phones 

No	Categories	Sub-categories
		Tablet PCs 

2.4 Principal Framework of Scheduled E-waste Management

Scheduled E-waste management is regulated under the Environmental Quality (Scheduled E-waste) Regulations 20XX, which emphasizes the concept of "shared responsibilities" among the players, with implementation of the principle of Extended Producer's Responsibility (EPR).

Under the framework of scheduled E-waste management, the manufacturers and importers of electrical and electronic appliances have the financial obligation to pay the "Recycling Fee (contribution)" which is to be determined by the Department of Environment (DOE) in accordance with the mandate provided in EQA. The "Recycling Contribution" shall be channeled to the "Environment Fund" which is established under EQA and utilized to cover the cost of scheduled E-waste collection, transportation, recycling, or any other purposes in accordance with the requirement to be determined by the Director General of DOE.

The Department of Environment (DOE) shall have the primary responsibility for environmentally sound and sustainable management of scheduled E-waste under their authority of controlling all the relevant stakeholders.

All the households and business entities, who generate scheduled E-waste defined in the Environmental Quality (Scheduled E-waste) Regulations 20XX, have the responsibility to make sure they hand over their E-waste to the authorized collectors.

The legal framework of scheduled E-waste management consists of 3 (three) key flows, namely "E-waste", "Fee (Money)", and "Information (Reporting)", as summarized below.

E-waste Flow	Determines the right channel of scheduled E-waste that starts with collection from generation points to authorized collection centers, collectors, retailers, and ends with the licensed scheduled E-waste recycling facilities or final disposal. The regulation requires all the collectors of scheduled E-waste to register with DOE while all the recyclers to apply for the licenses to manage scheduled E-waste.
Fee (Money) Flow	Determines how the recycling fee (contribution) is collected and channeled to the "Environmental Fund" for various purposes of disbursements to ensure environmentally sound and sustainable management of scheduled E-waste.
Information (Reporting) Flow	Determines the information / data flow through proper reporting by relevant players (manufacturers/importers, collectors, transporters, and recyclers) The scheduled E-waste manifest system is introduced for actual flow tracking of E-waste from collectors to the recyclers. The reporting and manifest system integrally avoid leaking of E-waste into the informal sectors, and ensure that proper data is captured for determination of total recycling fees to be collected and proper amount of subsidy to be provided.

Detailed description of the 3 (three) key flow is respectively given below.

2.4.1 Scheduled E-waste Flow

The sources of scheduled E-waste include households, commercial, industrial, and institutional entities, and any other sources that generate the same categories of scheduled E-waste, listed in Section 2.3 of this guideline.

Under the framework of scheduled E-waste management, all generators are required to discard their scheduled E-waste to the collectors authorized by DOE, which could be a retailer shops, recycling centers, NGOs, municipal waste collection concessionaire companies, local government, or any other authorized persons. Any flow of scheduled E-waste from generators to unauthorized collectors is prohibited.

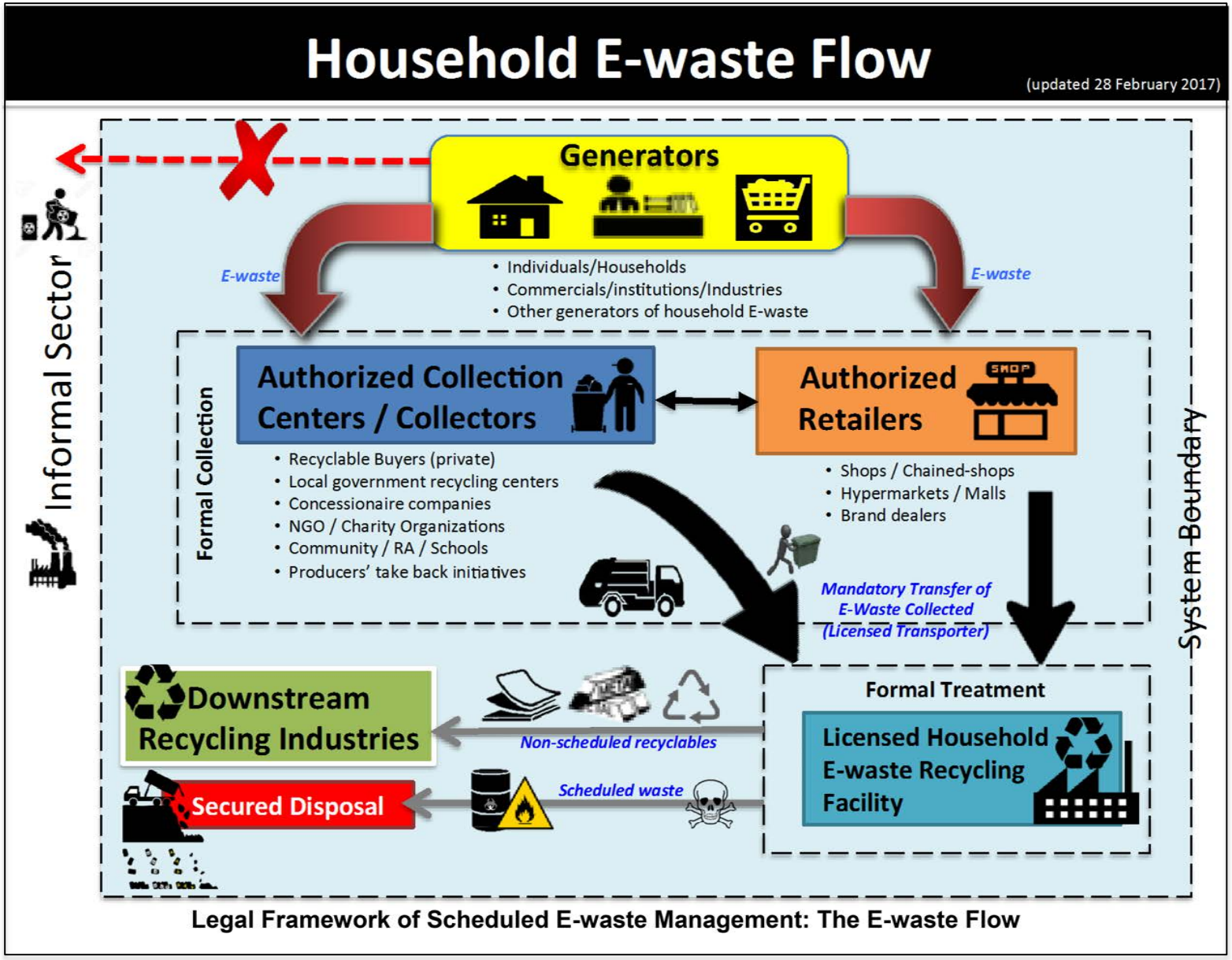
The collected scheduled E-waste by the authorized collectors must be channeled to the scheduled E-waste recyclers licensed by the DOE, to ensure proper treatment and recycling of scheduled E-waste in an environmentally sound manner. In case where the authorized collectors are not able to channel the collected scheduled E-waste directly to the licensed recyclers due to logistic or any other factors such as small retailers, the collected scheduled E-waste shall be delivered to another authorized collectors that have capability to channel the E-waste in larger volume to the licensed scheduled E-waste recyclers.

The licensed scheduled E-waste recyclers shall fulfill the requirements set in this Recycling Guideline in their recycling operation. The first requirement of the Recycling Guideline is to ensure proper management of “Focused Materials” for each scheduled E-waste item. Focused Materials are the specific components or parts of or substances contained in scheduled E-waste items that are defined as potentially hazardous to human health and/or environment if they are improperly handled. Examples of such materials include funnel glass of cathode-ray tube (CRT) TV, printed circuit board, refrigerant used in air conditioners and refrigerators, lithium ion batteries, and so forth. The Recycling Guideline provides handling methods of focused materials in recycling process of each scheduled E-waste.

Another requirement set in the Recycling Guideline is the minimum recycling rate to be fulfilled by the licensed scheduled E-waste recyclers. For each type of scheduled E-waste, the Guideline set different minimum weight-based recycling rate target that each licensed recycler must comply in its recycling operation.

Under the scheduled E-waste management mechanism, the scheduled E-waste is expected to flow from the generation points into proper recycling system run by the authorized collectors and licensed recyclers. Any outflow of household E-waste from the new mechanism will be considered illegal and subject to legal punishment.

The chart on next page illustrates the E-waste flow under the new scheduled E-waste management mechanism.



Legal Framework of Scheduled E-waste Management: The E-waste Flow

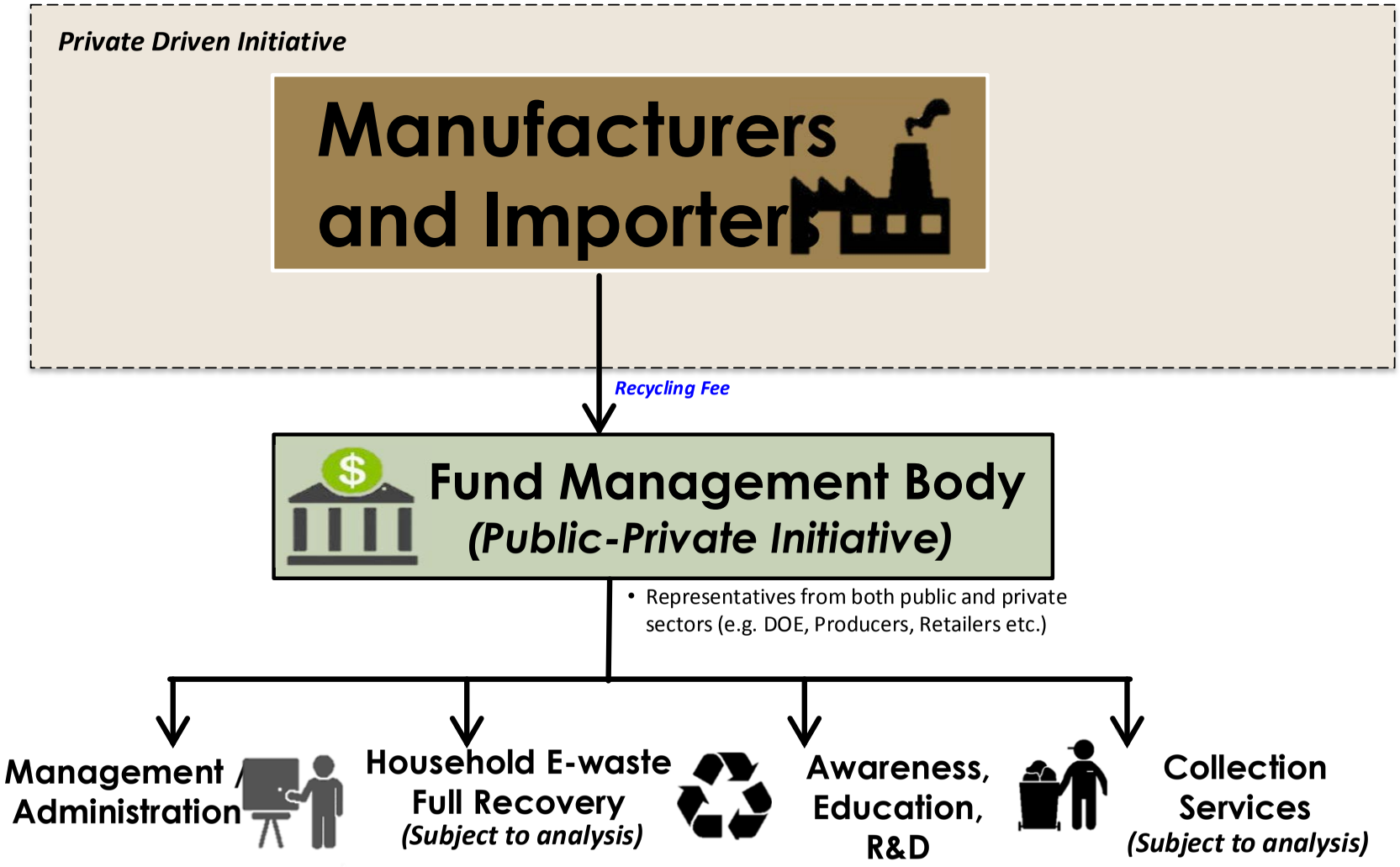
2.4.2 Fee Flow

It is important to understand that recycling of scheduled E-waste does not always yield revenues but it involves significant costs particularly when taking into consideration the logistic cost and environmental protection cost such as destruction of chlorofluorocarbon (CFC) gases, various pollution control measures, as well as treatment and disposal of hazardous substances. The overall cost required to ensure that the scheduled E-waste is properly channeled and processed in an environmentally sound manner shall be shared among all those who receive benefits from the relevant E-appliances.

Under the new scheduled E-waste management mechanism, the manufacturers and importers or any other individuals and entities who put the designated E-appliances into the Malaysian market shall pay the "Recycling Fee (Contribution)" to represent all the stakeholders to be benefited from proper management of the scheduled E-waste. The Recycling Fee (Contribution) will be collected by the so-called "Recycling Contribution Management Body (RCMB)", which is established as the independent organization to finance overall mechanism of scheduled E-waste management in Malaysia including provision of subsidy to the necessary activities of the licensed scheduled E-waste recyclers, authorized collectors, and other possible stakeholders of the new scheduled E-waste management mechanism, which will be determined by RCMB.

In accordance with the principle of "Shared Responsibilities", the required cost for proper management of scheduled E-waste should be shared among all the relevant stakeholders who receive benefits from the relevant E-appliances, including manufacturers, importers, wholesalers, retailers, and consumers. In this scheduled E-waste management mechanism, the manufacturers and importers temporarily shoulder this cost by paying the recycling fees. Therefore, it is given to the individual decisions of manufacturers and importers whether and how they would share this financial responsibilities with other stakeholders.

The recycling fee (contribution) determined for each item of scheduled E-waste will be different, reflecting various cost factors involved in their collection and recycling. Details of fee structures to be paid by the manufacturers and importers by each scheduled E-waste are described in Recycling Fee Guideline.



Legal Framework of Scheduled E-waste Management: The Recycling Fee Flow

2.4.3 Reporting Flow

Proper reporting system is an essential tool to monitor and ensure proper scheduled E-waste flow and recycling fee flow as elaborated in Section 2.4.1 and 2.4.2 above.

The new scheduled E-waste management mechanism mainly consists of two types of reporting system. i.e. reporting by the manufacturers and importers of the designated E-appliances and reporting by the stakeholders involved in collection and recycling of scheduled E-waste.

The purpose of reporting by the manufacturers and importers is to identify the volume and amount of the designated E-appliances put into the Malaysian market. The manufacturers and importers have the obligation to periodically report to the RCMB on the volume of designated E-appliances put on the Malaysian market by each item. This data will be the baseline for forecasting the present and future generation of E-waste in the long run while it will be also used as an important factor in determining the recycling fee to be paid by the manufacturers and importers (Detail formula of determining the recycling fee is provided in the "Recycling Fee Guideline".)

On the other hand, the reporting by the collectors and recyclers aims at ensuring proper flow of the scheduled E-waste from generation sources to their final destinations. The new scheduled E-waste management mechanism introduced the so-called "E-waste manifest system" to trace the flow of each E-waste item from collection points to their final destinations. The manifest system comprises 6-ply of manifest forms, which shall be filled out and kept by respective stakeholders following the methods as detailed in "E-waste Reporting Guideline". Reporting mechanism under the manifest system is summarized as below:

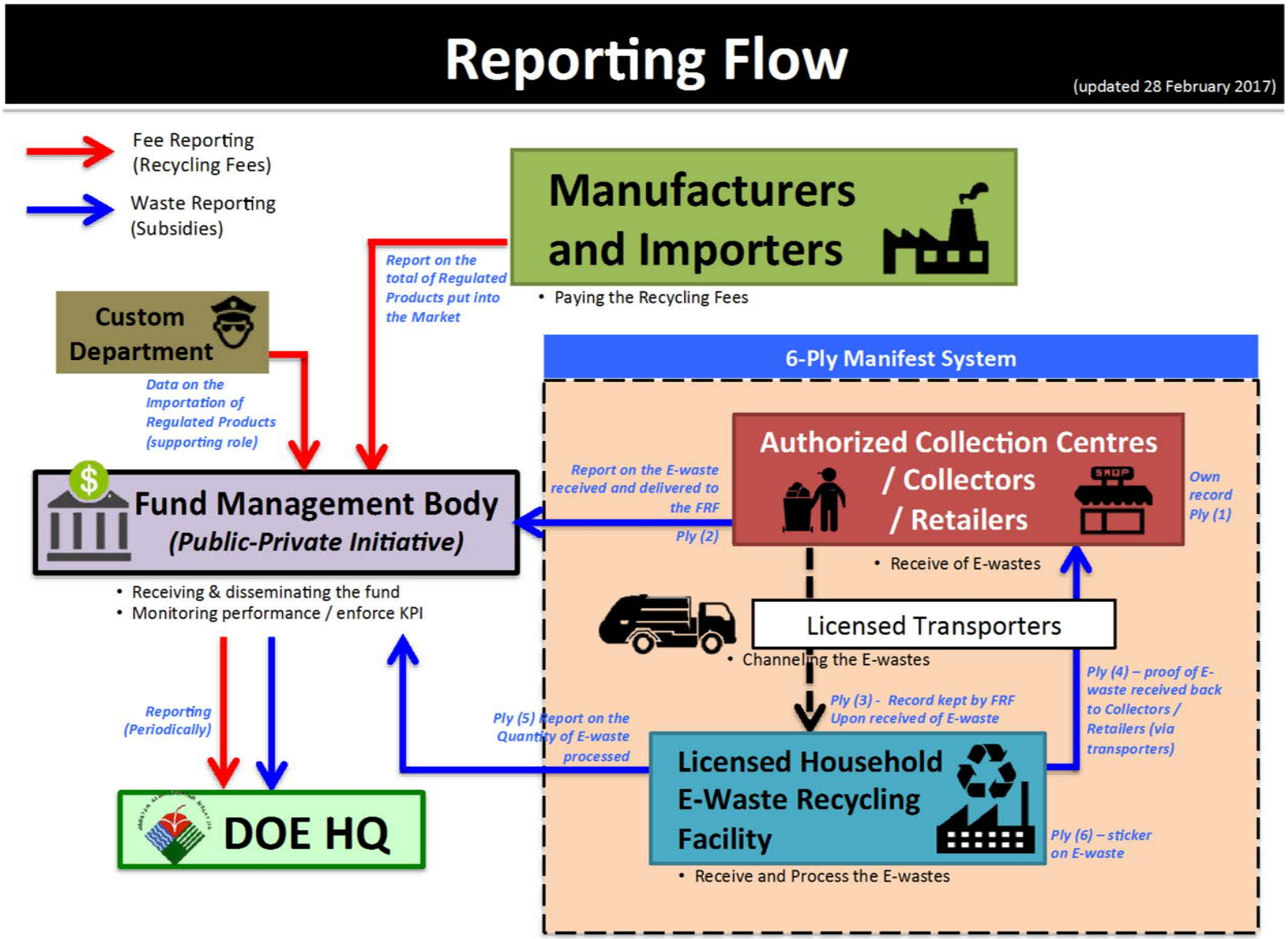
a) The authorized collectors shall fill out one manifest form for each of E-waste item collected. At the time of handing it over to the authorized transporters or licensed recyclers, they return 1-ply of manifest to the RFMB while keeping one copy and attaching the remaining copies to each E-waste item to be handed over.

b) When the authorized transporters receive E-waste with manifest form attached, they shall fill out the necessary parts of the manifest form. At the time of sending out the received E-waste to the licensed recyclers, they shall return 1-ply of manifest to RFMB while keeping one copy and attaching the remaining copies to each E-waste item they sent out.

c) When the licensed scheduled E-waste recyclers receive scheduled E-waste from authorized collectors or transporters with their manifest forms attached to each E-waste item, they shall fill out the necessary parts of the manifest forms. After completing all the recycling and treatment process, the licensed recyclers shall return to RFMB 1-ply of manifest form of each E-waste item they recycled while keeping 1 copy under their hand for each E-waste item.

d) RFMB shall cross-examine the manifest forms returned by collectors, transporters and recyclers to ensure proper flow of each scheduled E-waste from primary collectors to the recyclers. After confirmation on completion of the overall flow, RFMB will make disbursement of the fund (subsidy) to the relevant stakeholders above.

The manifest system directly links with subsidy disbursement mechanism run by RFMB. RFMB shall make disbursement of the subsidy only upon reception of all manifest forms from relevant stakeholders. Manifest form is utilized as the written evidence of proper recycling of each E-waste.



Legal Framework of Scheduled E-waste Management: The Reporting Flow

3.0 REQUIREMENT FOR SCHEDULED E-WASTE RECYCLERS

In general, the Environmental Quality (Scheduled E-waste) Regulations 20XX outlines the responsibilities of different stakeholders throughout the entire flow of scheduled E-waste management from generation to final destinations. Any person who contravenes the regulation shall be guilty of an offence and shall be liable to a fine or to a term of imprisonment for a period as stipulated in the Regulations.

This Guideline focuses particularly on the stakeholders involved in recycling of the scheduled E-waste. It is to ensure that the scheduled E-waste is recycled in an environmentally sound and sustainable manner and in maximizing the use of recyclable resources in each E-waste.

Any individual or entity involved in recycling of the scheduled E-waste is defined in this Guidelines as "Scheduled E-waste Recycler".

3.1 Requirement for obtaining the License of Scheduled E-waste Recycler

Any individual or entity intending to carry out recycling of the scheduled e-waste defined in "Scheduled E-waste Regulations 20XX" must obtain the license of scheduled E-waste recycler from the Department of Environment (DOE) before starting its recycling operation.

In accordance with the "Scheduled Waste Regulation 2005", the scheduled E-waste recycler must hold the license of dealing with the schedule waste categorized as SW 110 in the Regulation above.

3.1.1 Licensing Procedure

(1) Submission of license application form

Any applicant of scheduled E-waste recycler must submit to DOE the prescribed application form for the review and decision by DOE on issuance of the license. The applicant must clearly describe how to comply with the Recycling Guideline by filling out the application form in accordance with the requirement and guidance in the form (See Appendix A of this Guideline).

(2) Review and evaluation of the application by DOE

Every application form shall be reviewed and evaluated by DOE to make decisions regarding issuance of the license. DOE may conduct interview to the applicant as well as on-site inspection of the recycling facilities in this review and evaluation process. In case the submitted applications does not satisfy the requirement to be scheduled E-waste recyclers, DOE may request applicants revision of the applications and shall not issue the license until such request is met by the applicants.

(3) Issuance of license

If DOE decides that the applicant has sufficient capacity and capability to recycle scheduled E-waste, it will officially issue the written license to the applicant. At the time of issuing the license, license fee will be charged to the applicant to cover the cost of document processing and control.

The above license shall be granted by each E-waste item. Therefore, the applicant can apply for obtaining the license by each item discretely or collectively.

3.1.2 Duration and renewal of licenses

The license of scheduled E-waste recycler is valid for 1 (one) year from the date of its issuance and may be renewed every year upon request of the license holder and review of the recycling performance by DOE.

3.2 Requirement regarding Focused Materials management

The licensed scheduled E-waste recyclers must follow the requirement regarding the handling and management of so-called focused materials defined in this Guideline for each E-waste item. Any violation of this requirement shall result in no disbursement of recycling subsidy from RFMB and even legal punishment depending upon its severity in accordance with the relevant laws and regulations.

3.2.1 Focused Materials (FMs) in Scheduled E-waste

FMs are the specific components or parts of or substances contained in scheduled E-waste items that are defined as potentially hazardous to human health and/or environment if they are improperly handled. The Guideline provides the rules of handling these focused materials in each targeted E-waste item. The table below provides the types of focused materials with the potentially hazardous substances contained in each E-waste item.

E-waste Items	Focused Materials	Hazardous Substances
Television	CRT monitor	▪ Lead (Pb)
	Printed circuit board	▪ Lead (Pb), Cadmium (Cd), etc.
	Capacitor (old type)	▪ Polychlorinated biphenyl (PCB)
	Florescent tube (flat TV)	▪ Mercury (Hg)
	Liquid-crystal display	▪ Antimony (Sn), Arsenic (As)
	Plasma display	▪ Lead (Pb)
Refrigerator	Refrigerant (in compressor)	▪ Fluorocarbon
	Foaming agent for heat insulating material	▪ Fluorocarbon
	Printed circuit board	▪ Lead (Pb), Cadmium (Cd), etc.
Air conditioner	Refrigerant	▪ Fluorocarbon
	Printed circuit board	▪ Lead (Pb), Cadmium (Cd), etc.
	Capacitor (old type)	▪ Polychlorinated biphenyl (PCB)
Washing machine/dryer	Refrigerant (heat pump type dehumidifier or dryer)	▪ Fluorocarbon
	Printed circuit board	▪ Lead (Pb), Cadmium (Cd), etc.
	Capacitor (old type)	▪ Polychlorinated biphenyl (PCB)
Personal computer	Printed circuit board	▪ Lead (Pb), Cadmium (Cd), etc.
	CRT monitor	▪ Lead (Pb)
	Florescent tube (flat TV)	▪ Mercury (Hg)
	Liquid-crystal display	▪ Antimony (Sn), Arsenic (As)
	Plasma display monitor	▪ Lead (Pb)
	Rechargeable battery	▪ Cadmium (Cd), Lead (Pb)
	Button batteries	▪ Mercury (Hg)
Mobile Phone	Printed circuit board	▪ Lead (Pb), Cadmium (Cd), etc.
	Rechargeable battery	▪ Cadmium (Cd), Lead (Pb)
	Florescent tube	▪ Mercury (Hg)
	Liquid-crystal display	▪ Antimony (Sn), Arsenic (As)

3.2.2 Handling and Management Rules of Focused Materials

(1) CRT Monitor (TV, PC monitor)

① **Prohibition of recycling funnel part of CRT glass**

As the funnel glass of CRT monitor contains lead, it must be sent to the licensed schedule waste treatment/disposal facilities. Other parts of CRT monitor, such as panel glass of CRT monitor and plastic casing can be recycled as long as the recycler can properly separate (such as by cutting) it from lead-containing funnel glass. In case the recycler cannot completely separate funnel part of CRT glass, it must send all the CRT glass or monitor to the licensed schedule waste treatment/disposal facilities.

② **Reuse of Cathode Ray Tube (CRT)**

If the recycler transfer Cathode Ray Tube without any physical change or treatment to those who properly reuse it as the rebuilt or refurbished CRT monitor or TV, it shall be regarded as recycled.

(2) Printed Circuit Board (All 6 items)

① **Obligation of dismantling printed circuit boards**

The printed circuit boards embedded in E-waste must be properly dismantled and handled as the scheduled waste in accordance with the Scheduled Waste Regulations 2005.

② **Removal of button batteries**

Button-type batteries are sometimes embedded in printed circuit boards. In such a case, the recycler must dismantle them before entering into further recycling process or sending out the printed circuit boards to other recyclers and/or treatment facilities.

③ **Obligation of proper handling of hazardous substances in further separation process of recyclable materials from dismantled printed circuit boards**

If the recycler further separates recyclable materials from dismantled printed circuit boards with any processes (manual/physical, mechanical, chemical, etc.), it must take proper measures to control emissions of hazardous substances in accordance with the relevant laws and regulations. Printed circuit boards may contain potentially hazardous heavy metals such as lead, tin, antimony, chromium, beryllium, cadmium, and so forth. Plastic components in the print circuit boards may contain brominated flame retardants of which some types such as PBDE (Polybrominated Diphenyl Ether) are designated as Persistent Organic Pollutants (POPs) under Stockholm Convention.

Especially in applying mechanical shredding process or chemical process for further separation of recyclable materials from printed circuit boards, proper pollution control and occupational health and safety measures must be taken to avoid exposure of these hazardous substances to the workers as well as to the environment.

④ **Transfer of dismantled printed circuit boards to the other licensed Recyclers**

In case the recycler transfer the dismantled printed circuit boards to the other licensed recyclers for further processing of separating recyclables, that printed circuit boards are regarded as recycled.

(3) Capacitor (TV, Air Conditioner, Washing Machine)

The recycler must properly dismantle the PCB-containing capacitors from the E-waste and transfer them to the licensed scheduled waste treatment/disposal facilities. Any recycling or processing of the PCB-containing capacitors is strictly prohibited. However, since PCB is utilized mainly in old-type capacitors, the recycler does not have to send them to the licensed scheduled waste treatment/disposal facilities if it can prove with clear documented evidence that no PCB is utilized in the specific capacitors.

(4) Florescent Tube (Flat TV, PC monitor, Tablet PC)

① **Handling rule of mercury-containing backlights of LCD-display panel**

Mercury-containing fluorescent tubes are utilized as the backlights in Liquid-Chrystal Displays of TVs, PC monitors and Tablet PCs. The recycler must properly dismantle these florescent tubes with no crack or break of glass and send them to the licensed scheduled waste treatment/disposal facilities unless it has proper technologies or processes of separating mercury from them. To avoid leakage of mercury due to crack or break of fluorescent tubes during dismantling process, the recycler must have equipment of suction and mercury adsorption equipment. If no such equipment is available, the recycler is not allowed to dismantle the LCD display from the TVs, PC monitors or tablet PCs, but must send it to the licensed scheduled waste treatment/disposal facilities.

② **Reuse of Flat TV, PC monitor**

If the recycler transfers the LCD monitor without any physical change or treatment to those who properly reuse it as the rebuilt or refurbished LCD monitor or TV, it shall be regarded as recycled.

(5) Liquid-Chrystal Display (TV, PC monitor, Tablet PC)

As the LCD display glass contains arsenic and antimon, the recycler must send LCD glass to the licensed scheduled waste treatment/disposal facilities unless it has proper technologies and processes to properly remove and treat them. Crashing and/or shredding of LCD display glass is strictly prohibited without such technologies and processes.

(6) Plasma Display (TV, PC monitor)

As the panel of plasma display contains hazardous substances in its sealing glass, the recycler must send it to the licensed scheduled waste treatment/disposal facilities unless it has proper technologies and processes to properly remove and treat them. Crashing and/or shredding of display panel glass is strictly prohibited without such technologies and processes.

(7) Rechargeable Batteries (PC, Mobile Phone, Tablet PC)

In personal computers, mobile phones, and tablet PCs, rechargeable batteries are installed as the power source. Depending upon types, they include nickel, cadmium, cobalt, and lead, that are precious/rare metals while are sometimes hazardous when exposed to the environment.

① **Dismantling and handling rules of rechargeable batteries**

The recycler must properly dismantle rechargeable batteries when conducting any process of recycling PCs, mobile phones, and tablet PCs. The dismantled rechargeable batteries must be separately stored depending upon types. It is also required to prevent exposure to excessive heat, water, or any crushing or physical

damage during handling, sorting, and storage so as not to bring any fire, rupture, or overheating of the batteries.

(8) Refrigerant (Refrigerator, Air Conditioner, Heat-pump Type Dehumidifier/Dryer)

① Obligation of refrigerant collection

The recycler must properly collect refrigerant from refrigerators, air conditioners and heat-pump type dehumidifiers/dryers in its dismantling and/or recycling process with no leakage of refrigerant to the environment. The types of refrigerant controlled under this Guideline with obligation of its collection are as follows:

Type	Refrigerant name
CFC	R11, R12, R113, R114, R502
HCFC	R22, R123, R141b, R142b, R225
HFC	R134a, R152a, R32, R125, R404A, R410A, R407C
Non-fluorocarbon	R600a

In collecting the remaining refrigerant from the compressors installed in refrigerators, air-conditioners and heat-pump type dehumidifiers/dryers, the recycler must utilize proper vacuum aspiration device/equipment in order to avoid any leakage of refrigerant during the collection process. As the remaining refrigerant machine oil also absorbs refrigerant gas, the recycler must collect it as well to avoid its spillage to the environment. The collected refrigerant oil can be reused as fuel.

② Storage of refrigerant by types

In case the refrigerant is collected for the purpose of reuse, it must be separately collected/vacuumed by types and stored in different cylinders. Mixed collection, storage and transfer of refrigerant by the recyclers is prohibited unless it is transferred to the licensed treatment facilities for its destruction.

③ Exceptional handling of flammable refrigerants (R134a and Isobutane)

Flammable refrigerants such as R134a and R600a (containing isobutane) must be separately collected, stored and handled with proper care as flammables regardless of whether they are recycled or destroyed.

(9) Foaming Agent for Heat Insulation Material (Refrigerator)

As CFC or HCFC gas is used as foaming agent for heat insulation urethane of refrigerators, the recycler must properly collect them with the dedicated device and equipment to avoid its leakage into the environment. Any recycling of refrigerators without proper collection and leakage prevention of CFC and HCFC from the heat insulation urethane is strictly prohibited.

(10) Prohibition on the reuse of compressors

Dismantling and reuse of the compressors installed in refrigerators, air conditioners、and heat-pump type dehumidifier/dryers is prohibited.

3.2.3 Standard Recycling Process by Regulated Items

As a reference to the potential recyclers, this section describes the standard recycling process of scheduled E-waste by each item.

(1) CRT-TV

Recycling of CRT-TV usually start with manual dismantling, sorting, and separation of its major components such as printed circuit boards, cabinet, and cathode-ray tube. The dismantled printed circuit boards may be further mechanically shredded and separated into valuable materials (metal scraps and plastics) unless the recycler sell and transfer them to other downstream recyclers without any further treatment. TV cabinet may be sold as plastic materials with or without shredding.

The dismantled cathode-ray tube is usually mechanically separated into two parts, i.e. panel and funnel glass with special device/equipment. Panel glass can be recycled while funnel glass must be transferred to the scheduled waste management facilities as it contains lead. The figure below illustrates the standard recycling process of CRT TV.

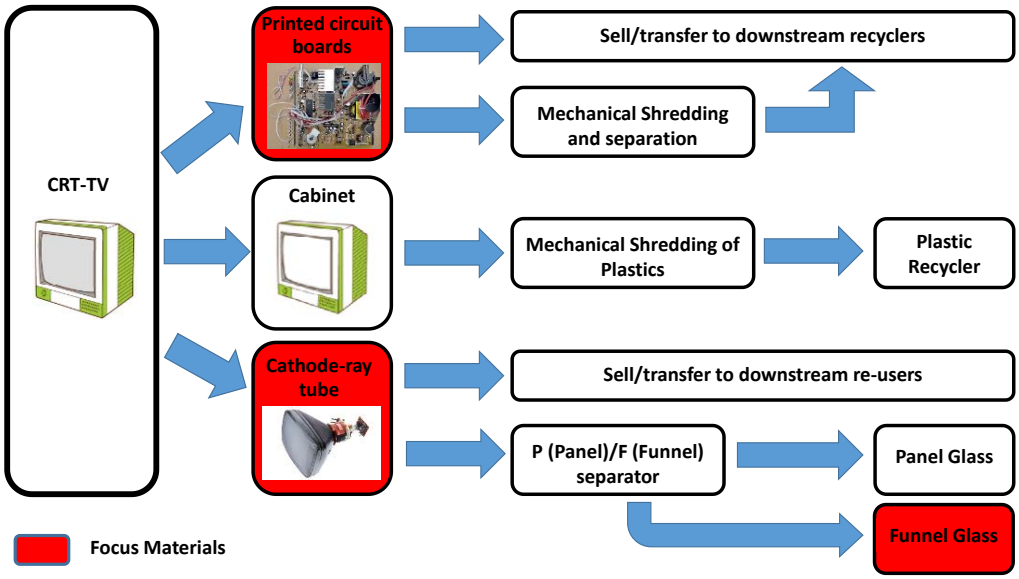


Figure 1: Standard recycling process of CRT-TV

(2) LCD/Plasma TV

Recycling of LCD/Plasma TV begins with dismantling of the cabinet. The dismantled cabinet may be further shredded for volume reduction and transfer as plastic materials. The remaining components after dismantling the cabinet consists of printed circuit boards, TV panel, florescent tubes (in the case of LCD-TV), and chassis. Printed circuit boards can be dismantled for recycling in the same way as CRT TVs. The dismantled chassis can be recycled as iron scrap. Special handling is required for the panel and florescent tubes installed as backlight. Florescent tubes installed in the panel must be carefully dismantled and separated and sent to the licensed scheduled waste treatment/disposal facilities.

The TV panel can be further dismantled and separated into panel glass and other valuable materials such as acrylic resin (PMMA) and some precious metals. The remaining panel glass must be sent to the licensed scheduled waste treatment/disposal facilities. The figure below illustrates the typical flow of recycling LCD/Plasma TV.

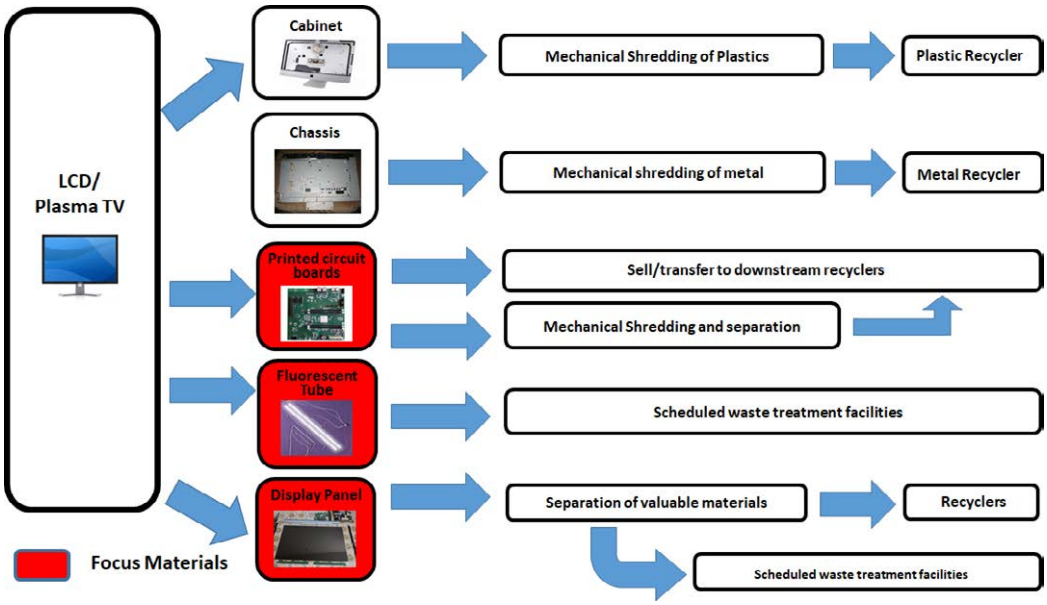


Figure 2: Standard recycling process of LCD/Plasma TV

(3) Refrigerator/Freezer

Before dismantling the refrigerators/freezers, door packing and plastic cases inside them shall be removed as recyclable materials. Subsequently, refrigerant in the compressor must be collected by making use of special vacuuming device/equipment to avoid its leakage to the environment. The collected refrigerant may be recycled or destroyed by the licensed recyclers or treatment facilities. In case the collected refrigerant is sold or transferred for recycling, the recycler must separately store refrigerant in cylinders by types.

As the refrigerant is also absorbed into the refrigerant oil in the compressors, the recycler must collect the refrigerant oil before recycling the compressor. After that, the compressor can be recycled with or without further separation of scrap metals.

The cabinet of refrigerators/freezers are not allowed to be shredded or dismantled unless the recycler has proper device or equipment to collect fluorocarbon contained in heat insulating urethanes installed in the cabinet.

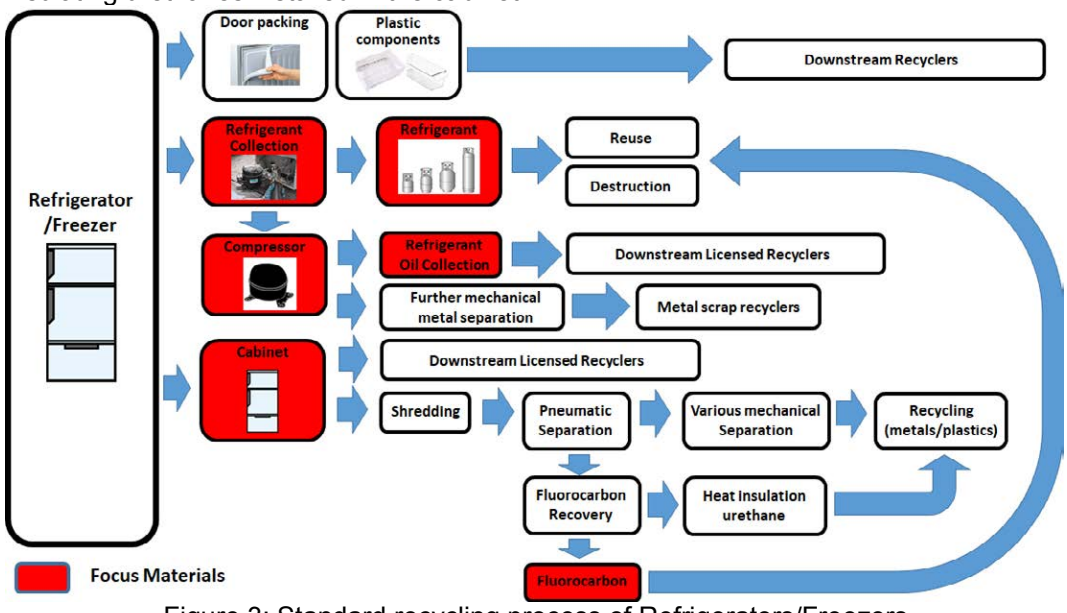


Figure 3: Standard recycling process of Refrigerators/Freezers

(4) Air Conditioner

A complete set of air conditioner usually consists of indoor and outdoor units except for window-type units. As the compressor installed in the outdoor unit includes refrigerant it must be properly collected with no leakage to the environment before dismantling. In the same manner as refrigerant in the compressor of refrigerators, the collected refrigerant may be recycled or destroyed by the licensed recyclers or treatment facilities. Likewise, in case the collected refrigerant is sold or transferred for recycling, the recycler must separately store refrigerant in cylinders by types.

Also, as the refrigerant is also absorbed into the refrigerant oil in the compressors, the recycler must collect the refrigerant oil before recycling the compressor. After that, the compressor can be recycled with or without further separation of scrap metals.

The heat exchangers and remaining cabinets of outdoor/indoor units of air conditioners may be manually as well as mechanically separated for recycling of ferrous/non-ferrous metals and plastics.

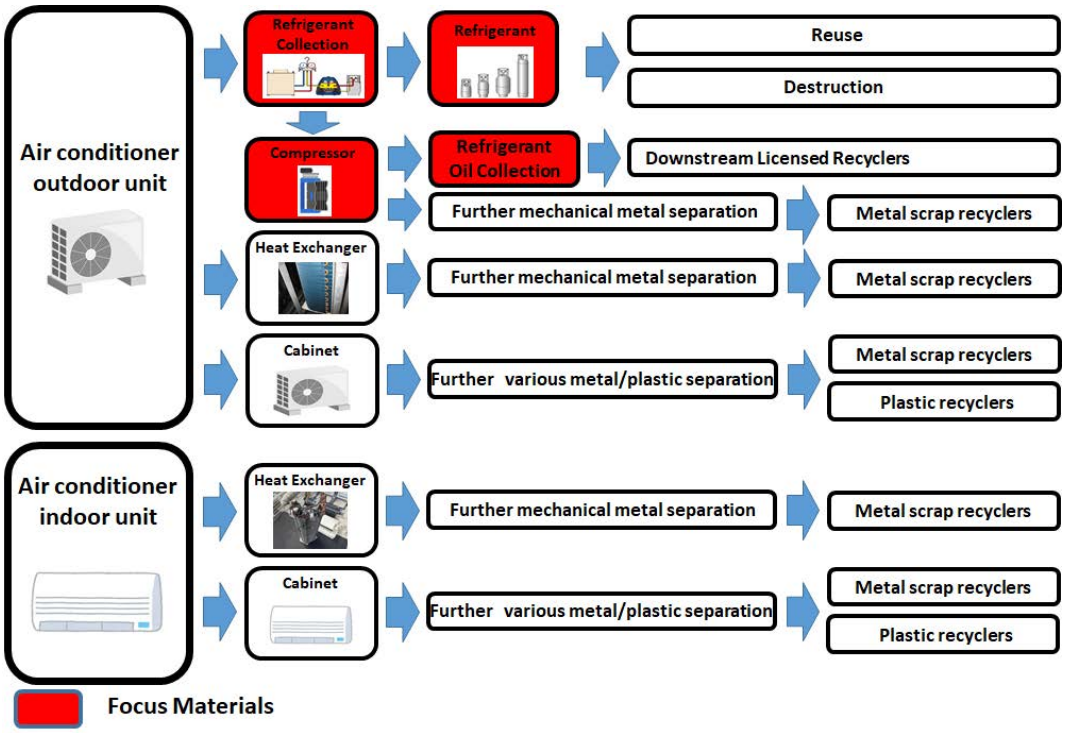


Figure 4: Standard recycling process of Air Conditioners

(5) Washing Machine/Dryers

Printed circuit boards are usually installed for controlling washing/drying modes of washing machines and dryers. The recycler must dismantle the printed circuit boards and may further mechanically shred and separate them into valuable materials (metal scraps and plastics) unless the recycler sell and transfer them to other downstream recyclers without any further treatment. Subsequently, motor and stainless tank maybe manually dismantled and further processed for recycling.

Remaining cabinet may be shredded and mechanically separated for collection of recyclable metals and plastics unless the recycler transfer it to other licensed recyclers. In case the recycler applies shredding and mechanical separation process in recycling the remaining cabinet, it is recommended to take out saltwater included in the ring element at the top of the washing tank lest the shredding machines and recycled metals be rusted.

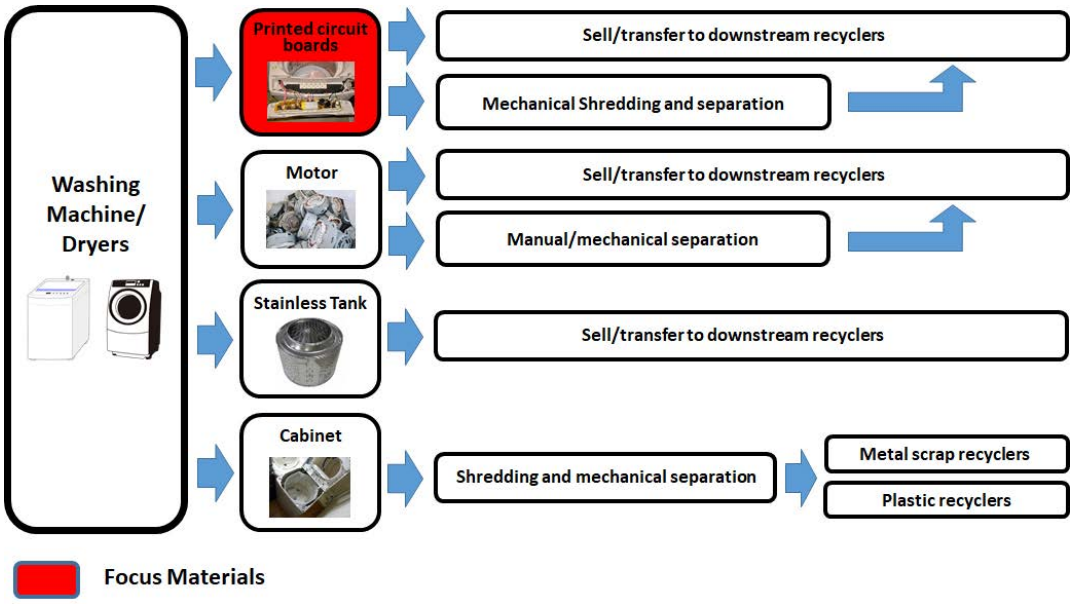


Figure 5: Standard recycling process of Washing Machines/Dryers

In the case of recycling the washing machine/dryers with heat pump installation, the recycler must collect refrigerant from the compressor in addition to the recycling process above.

(6) Personal Computers (Desktop/Laptop)

The standard recycling process of personal computers is different between desktop and laptop types.

① Desktop computers

A complete set of desktop computers usually consists of a display monitor, tower unit, and keyboard. Display monitors are further categorized into CRT and LCD types. The standard recycling process of CRT and LCD monitors are similar with CRT and LCD TVs respectively although printed circuit boards are generally not installed in display monitors.

Regarding the printed circuit boards installed in tower units of desktop computers, the recycler must remove button batteries before proceeding to next recycling process such as mechanical shredding and separation. The removed button batteries must be sent to the licensed scheduled waste treatment/disposal facilities after insulating the electrodes with insulating materials such as plastic tapes in order to avoid accidental energization and ignition. Button batteries are usually installed in motherboards of tower units as so-called CMOS (Complementary Metal Oxide Semiconductor) batteries. The remaining printed circuit boards shall be sold/transferred to the licensed recyclers with or without further mechanical shredding and/or separation of recyclable materials.

Housing, keyboard, and other components of inside tower units shall also be sold/transferred to the licensed recyclers with or without further mechanical shredding and/or separation of recyclable materials.

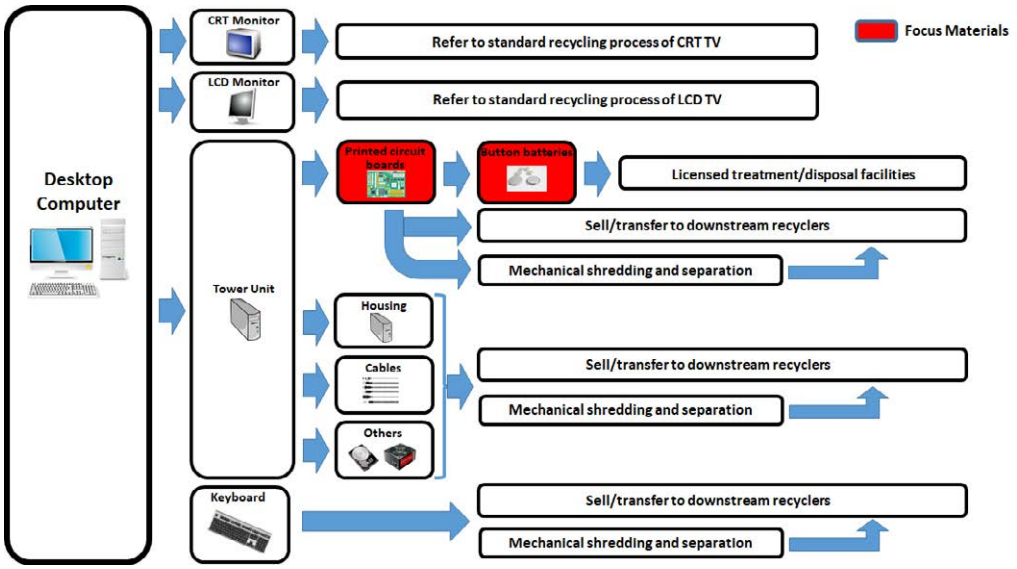


Figure 6: Standard recycling process of Desktop Computers

② Laptop computers

Recycling of laptop computers starts with removing the installed rechargeable battery. It must be sent to the licensed scheduled waste treatment/disposal facilities without any further dismantling or recycling unless the recycler has the license to do so. In their transportation, the recycler must properly store them with proper insulation of electrodes to avoid possible energization and ignition.

As to the printed circuit boards, the standard recycling process is same as the case of desktop computers. The recycler may also dismantle housing, chassis, and other components of laptop computers for recycling in the same manner as desktop computers.

Regarding LCD panel, the recycler must carefully dismantle, without any breakage, fluorescent tubes installed at the back side of the panel and send it to the licensed scheduled waste treatment/disposal facilities. The remaining panel shall be handled in the same fashion as regulated LCD TVs and monitors.

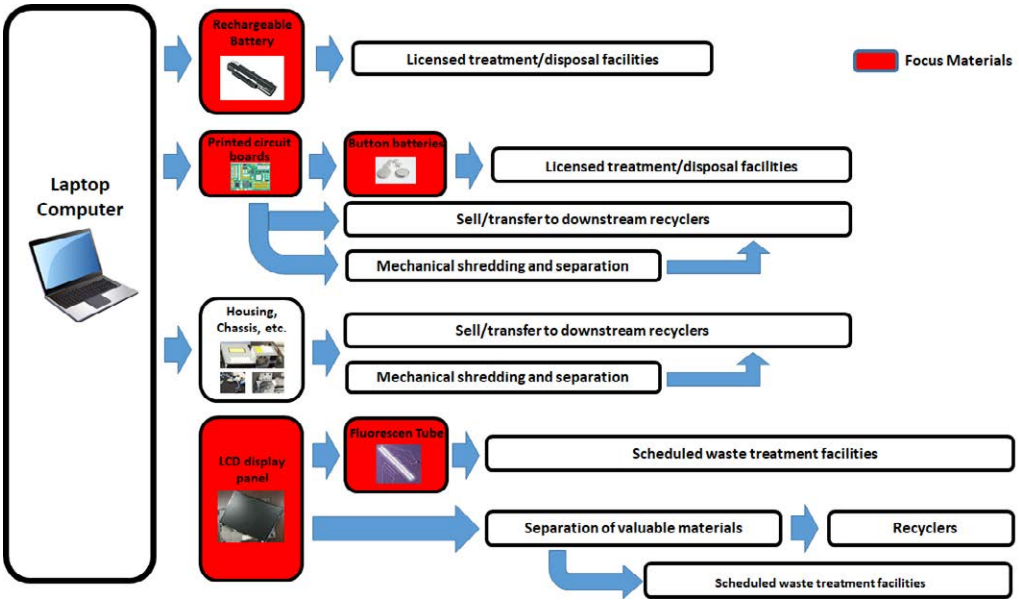


Figure 7: Standard recycling process of Laptop Computers

(7) Mobile Phones/Tablet PCs

In a similar way as laptop computers, rechargeable batteries installed in the mobile phones and table PCs must be first removed before starting any other process of recycling. The removed batteries must be sent/transferred to the licensed scheduled waste treatment/disposal facilities with proper insulation of batteries.

Housing, chassis, and other components of mobile phones and tablet PCs can be dismantled and separated as recyclable materials.

If LCD display panel is utilized in mobile phones and/or tablet PCs, the recycler must confirm whether fluorescent tubes are embedded at the back side of the panels as backlight. The recycler must carefully dismantle fluorescent tubes and send them to the licensed scheduled waste treatment/disposal facilities unless the recycler has the license to do so.

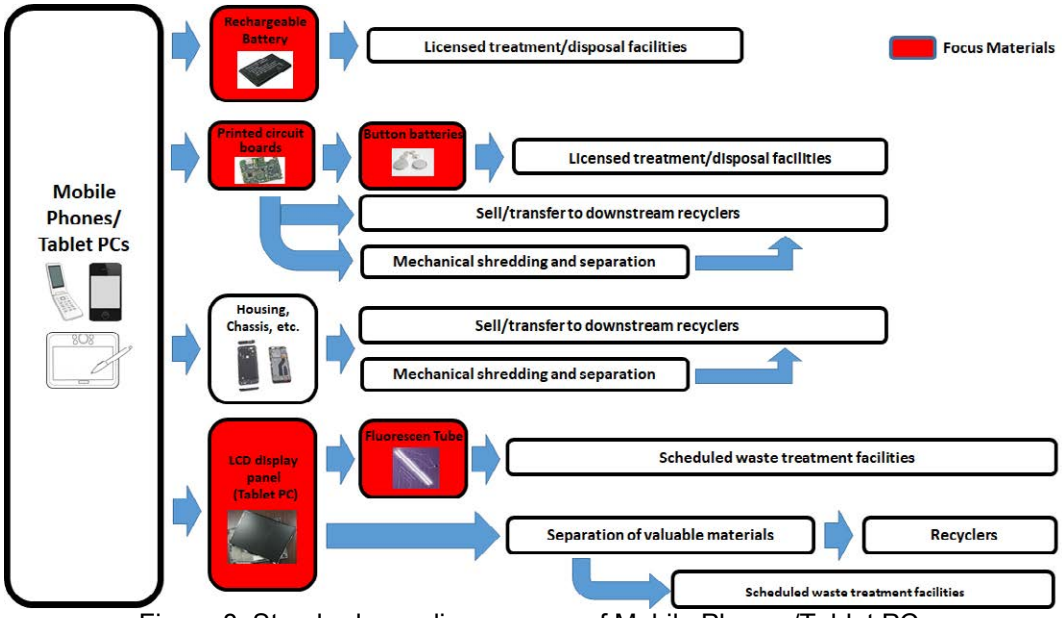


Figure 8: Standard recycling process of Mobile Phones/Tablet PCs

3.3 Minimum Recycling Rate Targets by Each Item

To promote recycling of as many recyclable fractions in the scheduled E-waste as possible, the recycling guideline set the “Minimum Recycling Rate Targets” by each regulated item to be complied by the licensed scheduled E-waste recyclers. Non-compliance with the minimum recycling rate targets may result in no provision of subsidy with legal caution, admonition, and even disqualification of the license depending upon its seriousness in accordance with the relevant laws and regulations.

3.3.1 Definition of Recycling Rate Targets

Recycling rate, in this guideline, is defined as the weight-based fraction (percentage) of recycled components/materials from each regulated E-waste item. The minimum recycling rate targets are set by each item in view of their components structure, composition of materials, development levels of dismantling, separation and recycling technologies, existing conditions of downstream recycling market, and so forth.

In determining the minimum recycling rate targets, the Government, in cooperation with the local recyclers, conducted a series of so-called "Recycling test", in which all 6 types of regulated E-waste items are dismantled and separated into recyclable and non-recyclable materials on the premises of selected scheduled waste recyclers. Each of the separated materials are weighed and recorded by each E-waste item to identify the fraction of potentially recyclable components and materials. The detailed analysis of components and materials for each regulated E-waste is given in Annex XX to this guideline.

3.3.2 Calculation Method of Recycling rate

All the licensed recyclers are required to comply with the minimum recycling rate targets set by each regulated item so that they can be qualified to be subsidized by the Recycling Fund Management Body. Recycling rate is calculated in accordance with the equation below.

$$RR(x) = \frac{WR(x)}{TW(x)} * 100$$

Where:

RR(x):	Recycling rate of E-waste type x (%)
WR (x):	Total weight of materials recycled from E-waste type x (tons)
TW (x):	Total weight of E-waste x received (tons)

To demonstrate its compliance with the recycling rate above, every licensed recycler must measure and periodically report the total weight of E-waste received and materials recycled for each type of regulated E-waste with the actual recycling rate in its recycling operations calculated in accordance with the equation above. Detailed reporting requirement in relation to this requirement is shown in the Annex B to this guideline.

3.3.3 Review of the minimum recycling rate targets

The minimum recycling rate targets set for each regulated E-waste item shall be annually reviewed by the Recycling Rate and Fee Review Committee (RFRC) to be organized as the advisory committee to RFMB. RFRC shall be organized by Government agencies (DOE, MITI, MOF and KPDNKK), industry representatives (manufacturers/importers, retailers, recyclers), environmental NGOs, consumer associations and experts in hazardous waste management sector. RFRC shall review and make recommendations regarding the revision of the minimum recycling rate targets in consideration of the annual performance of household E-waste collection and recycling under the mechanism, trend of development and applications of recycling technologies, market conditions of recyclable components and materials, change in components and materials utilized in the E-appliances, and so forth.

3.4 Reporting Requirement for Scheduled E-waste Recyclers

To be eligible for disbursement of subsidy by RFMB, the licensed recyclers must demonstrate themselves by reporting that they have recycled the scheduled E-waste in compliance with the requirement in this guideline. To do this, they must clearly document their recycling operations with the data and information by each scheduled E-waste item as indicated below.

3.4.1 Data and information to be provided in the report

(1) Total volume of E-waste items recycled

The recycler must report the total volume of E-waste items recycled at their own premises. The volume is to be given in weight as well as number of units for each regulated E-waste. As the minimum recycling rate targets are separately set for PC monitors and tower units in the case of desktop computers, their volumes must be distinctly reported as well. To comply with this requirement, the recycler must measure and record the weight of each E-waste received before entering into recycling process in their premises. However, at the time of reporting the total volume of E-waste items recycled, the recycler is not allowed to include the volume of E-waste items that are received but not yet finished all the process of recycling (The E-waste received and temporarily stored for recycling is not allowed to be included in this total volume.). The volume or number of E-waste items received but transferred for reuse with no processing is strictly prohibited to be included in this total volume of E-waste items recycled. It is also required for the licensed household E-waste recyclers to report the volume and number of units transferred for reuse by each regulated item.

(2) Total volume of focused materials collected and their methods of treatment and disposal

For each regulated E-waste item, the recycler is required to measure and record the weight of focus materials separated/collected with their methods of treatment and disposal by each type of materials. In case the recycler contracts out treatment and disposal of focused materials to other licensed scheduled waste treatment/disposal facilities, it must clearly states the receivers of those focus materials with the documented evidence of sending out the focused materials to them.

(3) Total volume of materials collected for recycling and remaining non-recyclable residues with their destinations.

After completing the recycling process in its premise, the recycler must measure the weight of materials to be recycled by types for each regulated E-waste item. As to the recyclable materials, the recycler must clearly identify their destinations and/or their final use.

Likewise, the recycler is also required to measure the weight of remaining non-recyclable residues from its recycling process while clearly stating their final destinations for further treatment and/or disposal.

(4) Recycling rate achieved

Based on the result of measurement conducted in (3) above, the recycler shall calculate and record the recycling rate achieved for each regulated E-waste item.

3.4.2 Frequency of reporting by the licensed recyclers

Reporting shall be made monthly by the licensed recyclers to RFMB. RFMB shall assess and verify the report to make decisions on disbursement of the subsidy from the fund.

HAZARDOUS SUBSTANCES DIVISION
DEPARTMENT OF ENVIRONMENT
MINISTRY OF NATURAL RESOURCE AND ENVIRONMENT
Level 1-4, Podium 2 & 3, Wisma Sumber Asli
No. 25, Persiaran Perdana
Precint 4 Putrajaya
62574 PUTRAJAYA

www.doe.gov.my/household-ewaste
Tel: +603-88712000 / 2200; Fax: +603-88886120 / 9987
Email: ewaste_hh@doe.gov.my

FORM

APPLICATION FOR LICENSING AS SCHEDULED E-WASTE RECYCLER UNDER SECTION OF ENVIRONMENTAL QUALITY (SCHEDULED ELECTRICAL AND ELECTRONIC EQUIPMENT WASTE) REGULATIONS 20xx

A.	PENGENALAN / IDENTIFICATION

1. Nama Pemohon : _____
   Name of Applicant
2. Alamat Pemohon : _____
   Address of Applicant
3. No. Telefon : _____ No. Faks : _____
   Telephone No. Fax No
4. Warganegara : _____
   Nationality
5. Nama Premis : _____
   Name of Premises
6. Alamat Premis : _____
   Address of Premisses

   _____

7. Nyatakan tarikh kelulusan yang diberikan oleh JAS ke atas laporan EIA untuk cadangan kemudahan pemerolehan kembali. (sila sertakan salinan surat kelulusan).
   Indicate the date of approval of the EIA report for the proposed household E-waste recycling facility given by the DOE. (Please attach a copy of the approval letter)
8. Describe your license information as SW110 Recovery Facility that already obtained from DOE

9. Describe the previous experience for recycling E-waste by your entity(name of the E-waste, its origin,quantity, processed outputs, etc)
   Name of E-waste ( )
   Origin/source( )
   Quantity per annum( )
   Treating process( )
   Processed outputs( )
   Output products mainly sold to( )

B. **MAKLUMAT OPERASI**
OPERATIONAL INFORMATION

8. Cadangan tarikh menduduki atau mengguna premis :
Proposed date for starting the operation at premises :

_____

9. Jadual Operasi/ Schedule of Operation :

(i) Bilangan syif sehari : Purata _____
Number of shift per day : Average
Maksimum _____
Maximum

(ii) Jam operasi : Purata : _____ Maksimum : _____
Hours of operation Average Maximum

(iii) Bilangan hari operasi : Seminggu
Number of operating days Per week _____
Sebulan
Per month _____
Setahun
Per year _____

(iv) Jadual bermusim : Daripada Hingga
Seasonal schedule From _____ To _____

10. In this form, we are applying for a license for treating the following E-waste.

Name of E-wastes	Code	Select if applying for a license
TV(CRT)		
TV(LCD)		
Washing machine		
Refrigerator		
Air Conditioner		
Laptop PC		
Desktop PC		

10. List down the plan for E-waste to be treated by your facility per month and per annum.

Name of E-wastes	Quantity to be treated(units)
	/month
	/year
	/month
	/year
	/month
	/year
	/month
	/year
	/month
	/year
	/month
	/year
	/month
	/year
	/month
	/year

11. Describe the detail recycling flow diagram of the all E-wastes to be processed by type at your facility (Attach all detailed engineering design plans of the facility in the A1 size drawing with Professional Engineer Signatory Certification).

Recycling flow 1 (Name of the E-waste to be processed by this flow:)
Recycling flow 2 (Name of the E-waste to be processed by this flow:)
Recycling flow 3 (Name of the E-waste to be processed by this flow:)

* Untuk pemerolehan kembali atau kitar semula bekas bahan buangan, sila nyatakan jenis, saiz dan kandungan sisa kimia. (Lampirkan carta alir bagi setiap proses yang digunakan). For recycling of waste containers, please indicate their type, size and chemical residue contained. (Attach a flow sheet of each process applied).

12. List of emission/ discharges to be generated from the process mentioned in para 12 as well as its pollution controlling measures. Describe the measures for possible spillage of the refrigerant machine oil used

(i) Proses Process	Jenis keluaran/pelepasan(gas, cecair, separa pepejal, pepejal) Types of emission/discharges (gaseous,liquid,semisolid,solid)	Kuantiti Sebulan Quantity/Month	Pollution control measures(name of equipment)

(ii) Jelaskan kualiti keluaran atau pelepasan (dalam mg/nm 3 atau mg/l atau melainkan sekiranya dikhususkan)

Parameter Parameters	Unit Units

* Sila kemukakan produk catalog bagi setiap peralatan yang akan digunakan di dalam proses.
Please attached all the product catalog intended to be used in the process.

14. Jelaskan program kecemasan yang menggariskan langkah tebatan untuk mengawal pelepasan/tumpahan yang tidak sengaja daripada tapak.
Describe the emergency program outlining mitigative measures to control discharges/accidental spillages from the site.

15. Jelaskan program kecemasan yang menggariskan langkah tebatan untuk mengawal pelepasan/tumpahan yang tidak sengaja daripada tapak.
Describe the emergency program outlining mitigative measures to control discharges/accidental spillages from the site.

16. Jelaskan pelan penutupan yang memperincikan langkah- langkah yang perlu untuk menutup premis sama ada sementara atau menamatkan operasi.
Describe the closure plan which details the step necessary to close the premises temporarily or to cease operation.

C.	MAKLUMAT PENSTORAN BUANGAN TERJADUAL E-WASTE STORAGE INFORMATION

20. Nyatakan kategori dan kuantiti buangan yang akan distor.
Specify category (ies) and quantities of E-wastes to be stored

Kod buangan Waste code	Nama buangan Name of E-waste	Kuantiti/Bulan Quantity/units of waste

21. Senaraikan semua bekas, pembungkusan dan kemudahan penstoran seperti format di bawah.
List all containers, packaging and storage facilities to be made available as outlined in the format below

Jenis Bekas/Pembungkusan/ Kemudahan Penstoran Type of Container/Packaging/ Storage Facility	Kategori Buangan Distor Dikendalikan Category of Waste Stored/Handled	Kapasiti (M)3 Capacity (M)3

21. Describe how to store the Fluorocarbon gas collected from the process and preventive measures for possible leakage of the gas

	Storage method	Preventive measure
Refrigerant gas		
Gas from the system(insulation)		

24. Lampirkan kaedah penstoran, keluasan kawasan penstoran dan pelan kejuruteraan terperinci mengenai rekabentuk kemudahan penstoran.
Attach method of storage, size of storage area and detailed engineering design plans of the storage facility

D.

FOCUSED MATERIALS MANAGEMENT

13. Describe the plan for handling, treating, and disposing (including usage as recyclable materials) of Focused Materials(FM)

FM	Handling process	Treating process	Disposing/selling to where
1			
2			
3			
4			
5			
6			
7			

E.

RECYCLING RATE ACHEIVEMENT PLAN

13. Describe the plan how to achieve the recycling rates of each item to be processed at the facility. Quantitative evidence such as the result data of recycling test for calculation of recycling rate needs to be submitted. Annex of *Guidelines on recycling of household E-waste in Malaysia* can be referred for recycling rate calculation procedure.

TV(CRT)

COMPONENTS	FRACTION	WEIGHT,kg (D)	RECYCLING (R) for recyclable fractions *Mark "R"	WASTE(W) for disposing fractions *Mark "W"	TOTAL OF RECYCLABLE FRACTIONS (F=1+2) (count only (R))	
Glass			R			
			R			
			R			
				W		
Plastic			R			
				W		
				W		
Metal				W		
			R			
			R			
			R			
Other				W		
				W		
				W		
				W		
	SubTOTAL(A)	***0.00***	**-**	**-**	#DIV/0!	1
	(After further process of CRT)					
	Panel and funnel separation					
Glass			R			
				W		
				W		
Metal			R			
			R			
			R			
Other				W		
				W		
	SubTOTAL(B)	***0.00***	**-**	**-**	#DIV/0!	2
	WHOLE WEIGHT TOTAL(C=A+B)	**0.00**			#DIV/0!	F
	ORPHAN / RESIDUE ((1)-(C))	0.00				
	INPUT WEIGHT(1)	0.00				
					RECYCLING RATE ,% (F/C x 100)	

TV(LCD)

COMPONENTS	FRACTION	WEIGHT,kg (D)	RECYCLING (R) for recyclable fractions *Mark "R"	WASTE(W) for disposing fractions *Mark "W"	TOTAL OF RECYCLABLE FRACTIONS (F) (count only (R))
Glass			R		
			R		
			R		
				W	
Plastic			R		
				W	
				W	
Metal				W	
			R		
			R		
			R		
Other				W	
				W	
				W	
				W	
WHOLE WEIGHT TOTAL(C=A+B)		**0.00**			#REF!
ORPHAN / RESIDUE ((1)-(C))		0.00			
INPUT WEIGHT(1)		0.00			
					RECYCLING RATE ,% (F/C x 100)

Washing Machine

COMPONENTS	FRACTION	WEIGHT,kg (D)	RECYCLING (R) for recyclable fractions *Mark "R"	WASTE(W) for disposing fractions *Mark "W"	TOTAL OF RECYCLABLE FRACTIONS (F) (count only (R))
Glass			R		
			R		
			R		
				W	
Plastic			R		
				W	
				W	
Metal				W	
			R		
			R		
			R		
Other				W	
				W	
				W	
				W	
WHOLE WEIGHT TOTAL(C=A+B)		**0.00**			#REF!
ORPHAN / RESIDUE ((1)-(C))		0.00			
INPUT WEIGHT(1)		0.00			
					RECYCLING RATE ,% (F/C x 100)

Refrigerator

COMPONENTS	FRACTION	WEIGHT,kg (D)	RECYCLING (R) for recyclable fractions *Mark "R"	WASTE(W) for disposing fractions *Mark "W"	TOTAL OF RECYCLABLE FRACTIONS (F) (count only (R))
Glass			R		
			R		
			R		
				W	
Plastic			R		
				W	
				W	
Metal				W	
			R		
			R		
			R		
Other				W	
				W	
				W	
				W	
WHOLE WEIGHT TOTAL(C=A+B)		**0.00**			#REF!
ORPHAN / RESIDUE ((1)-(C))		0.00			
INPUT WEIGHT(1)		0.00			
					RECYCLING RATE ,% (F/C x 100)

Air Conditioner

COMPONENTS	FRACTION	WEIGHT,kg (D)	RECYCLING (R) for recyclable fractions *Mark "R"	WASTE(W) for disposing fractions *Mark "W"	TOTAL OF RECYCLABLE FRACTIONS (F) (count only (R))
Glass			R		
			R		
			R		
				W	
Plastic			R		
				W	
				W	
Metal				W	
			R		
			R		
			R		
Other				W	
				W	
				W	
				W	
WHOLE WEIGHT TOTAL(C=A+B)		**0.00**			#REF!
ORPHAN / RESIDUE ((1)-(C))		0.00			
INPUT WEIGHT(1)		0.00			
					RECYCLING RATE ,% (F/C x 100)

Notebook PC

COMPONENTS	FRACTION	WEIGHT,kg (D)	RECYCLING (R) for recyclable fractions *Mark "R"	WASTE(W) for disposing fractions *Mark "W"	TOTAL OF RECYCLABLE FRACTIONS (F) (count only (R))
Glass			R		
			R		
			R		
				W	
Plastic			R		
				W	
				W	
Metal				W	
			R		
			R		
			R		
Other				W	
				W	
				W	
				W	
WHOLE WEIGHT TOTAL(C=A+B)		**0.00**			#REF!
ORPHAN / RESIDUE ((1)-(C))		0.00			
INPUT WEIGHT(1)		0.00			
					RECYCLING RATE ,% (F/C x 100)

Desktop PC

COMPONENTS	FRACTION	WEIGHT,kg (D)	RECYCLING (R) for recyclable fractions *Mark "R"	WASTE(W) for disposing fractions *Mark "W"	TOTAL OF RECYCLABLE FRACTIONS (F) (count only (R))
Glass			R		
			R		
			R		
				W	
Plastic			R		
				W	
				W	
Metal				W	
			R		
			R		
			R		
Other				W	
				W	
				W	
				W	
WHOLE WEIGHT TOTAL(C=A+B)		**0.00**			#REF!
ORPHAN / RESIDUE ((1)-(C))		0.00			
INPUT WEIGHT(1)		0.00			
					RECYCLING RATE ,% (F/C x 100)

C.

DOWNSTREAM CHANNEL INFORMATION

20. Describe the downstream channel of each fraction that to be recycled at your facility

Fraction	Information of facility that recieves the fraction(name, location)	Operation of the facility(recovery, disposal, recyclable raw material use)	Quantity/Month	Provide license information such as DOE license number

F.

E-WASTE COLLECTION INFORMATION

20. Describe the E-waste collection channel of each type and the quantity that planned to be procured

Information of collector/channel that your facility procure from(name, location)	Type of E-waste	Quantity/Month
1		
2		
3		
4		
5		

11. Describe the method of transporting the waste from the generator to your factory. (contractor/own transport).

Saya sahkan bahawa maklumat yang diberikan adalah benar dan betul sepanjang pengetahuan saya.
I certify that all information provided is true and correct to the best of my knowledge.

Tandatangan Pegawai Pelapor
Signature of Reporting Officer
Nama :
Name
Nombor K/P :
I/C No
Jawatan :
Designation
Organisasi/Syarikat :
Organisation/Company
Tarikh :
Date

Nota: Sila gunakan lampiran tambahan jika perlu.
Note: Please use additional sheets if necessary

SENARAI SEMAK PERMOHONAN CHECKLIST OF APPLICATION				
Bil.. No.	Perkara Subject	Ada Yes		Tiada No
		Lengkap Complete	Tidak Lengkap Incomplete	
1.	The location plan (scale 1:2500) and layout plan (scale 1:500) size A1 drawing are attached			
2.	A copy of the approval letter given by DOE on the EIA report of the proposed recovery facility is attached			
3.	A flow diagram of the all E-wastes to be processed by type at your facility (Attach all detailed engineering design plans of the facility in the A1 size drawing with Professional Engineer Signatory Certification).			
4.	All detailed engineering design plans of the facility and storage indicated in the drawing are attached			
5.	Please attached all the product catalog intended to be used in the process.			
6.	Processing Fee for Written Permission Section 19, Environmental Quality Act 1974 payable to Director General Environmental Quality of Malaysia			

ANNEX 3
Proposed Target Recycling Rate
(by each of 6 items)

Summary Recycling Rate

Item		Recycling rate	Recycling rate (without panel glass)	Recycling rate (without plastic)	Recommendable Recycling rate (80%)
Television (TV)	CRT	79.7%	46.9%	33.8%	**27%**
	Flat Screen	76.6%	-	52.3%	**42%**
Washing machine (currently top/front loading type combined)		81.4%	-	52.8%	**42%**
Air-conditioning		98.9%	-	85.1%	**68%**
Refrigerator		92.6%	-	76.5%	**61%**
Personal Computer (PC)					
Desktop PC	CPU + monitor (CRT monitor & flat screen)	85.8%	71.9%	57.2%	**46%**
	CPU	88.0%	-	81.7%	**65%**
	CRT monitor	79.7%	50.2%	36.3%	**29%**
	Flat screen	75.9%	-	46.4%	**37%**
Notebook PC		64.3%	-	43.6%	**35%**
Mobile phone	smart phone	59.6%	-	38.3%	**31%**
	old type	66.6%	-	39.7%	**32%**

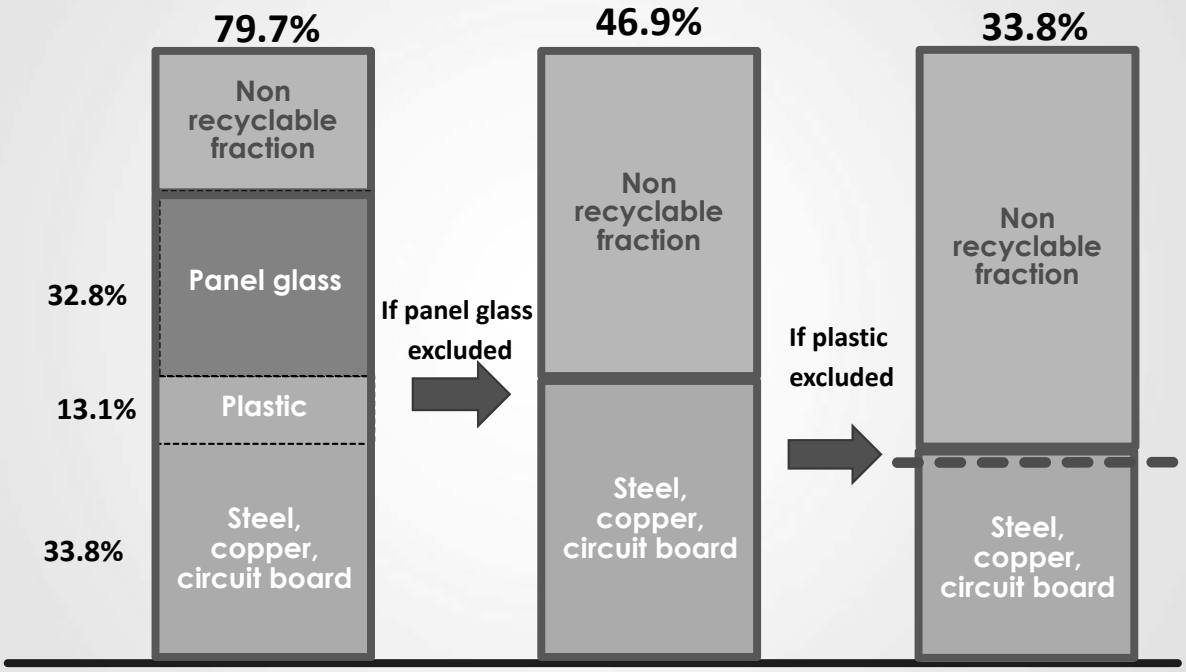
Summary Comparison of Recycling Rate with Other Country

Item		Japan (%)	Hong Kong (%)	Taiwan (%)	EU (%)	Recommendable Recycling rate (80%)
Television (TV)	CRT					**27%**
	Flat Screen					**42%**
Washing machine (currently top/front loading type combined)						**42%**
Air-conditioning						**68%**
Refrigerator						**61%**
Personal Computer (PC)						
Desktop PC	CPU + monitor (CRT monitor & flat screen)	85.8%	71.9%	57.2%		**46%**
	CPU	88.0%	-	81.7%		**65%**
	CRT monitor	79.7%	50.2%	36.3%		**29%**
	Flat screen	75.9%	-	46.4%		**37%**
Notebook PC		64.3%	-	43.6%		**35%**
Mobile phone	smart phone	59.6%	-	38.3%		**31%**
	old type	66.6%	-	39.7%		**32%**

TV-CRT

Total input weight: 2,760kg/ 110pcs

Recommendable Recycling rate = 27% (33.8*0.8)

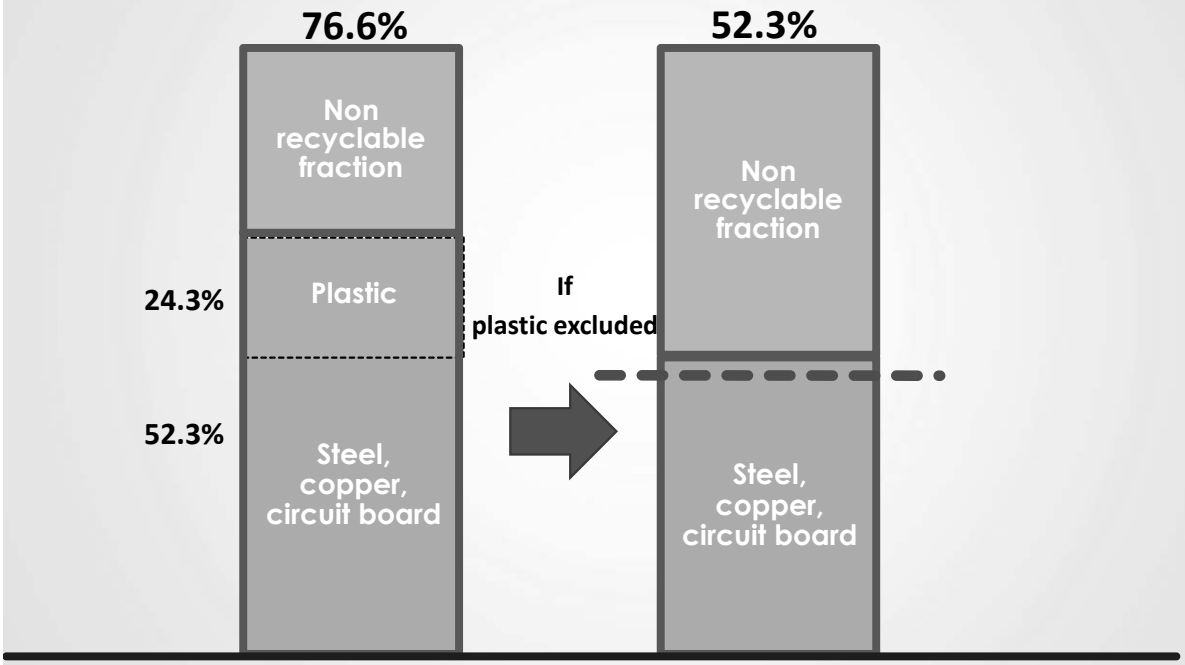


- **CRT glass should be separated from CRT monitor and disposed separately.**
- **Plastic recycling market is only limitedly available for PP and TV plastic is excluded.**

Flat TV

Total input weight: 959kg/ 90pcs

Recommendable Recycling rate = 42% (52.3*0.8)



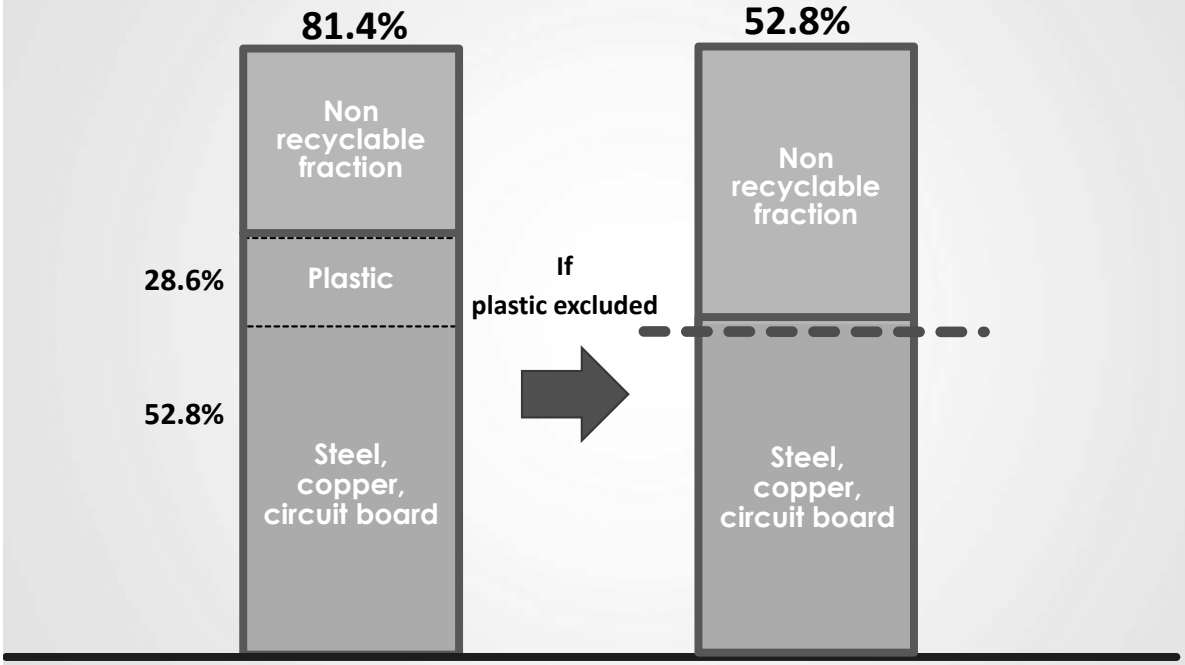
- Plastic recycling market is only limitedly available for PP and TV plastic is excluded.
- LCD panel recycling is not widely possible.

5

Washing machine

Total input weight: 1,259kg/ 31pcs

Recommendable Recycling rate = 42% (52.8*0.8)



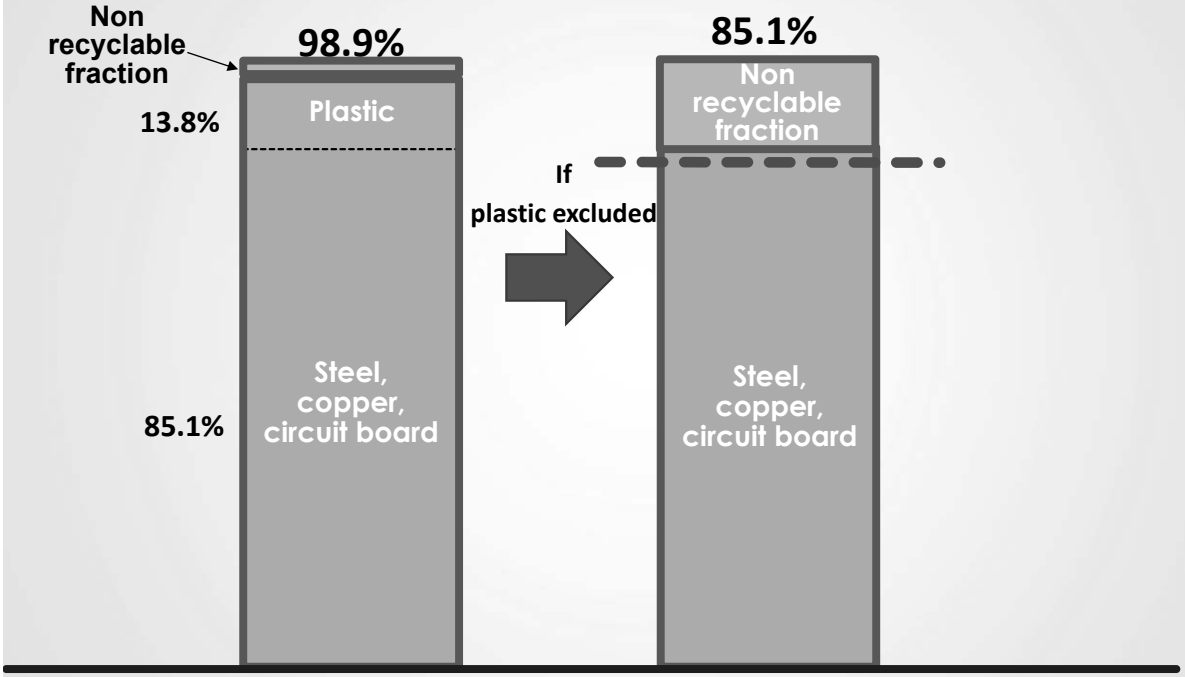
- Plastic recycling is only available for PP in Malaysia and market is small yet. Some WM originating PP can be recycled.
- Segregating efficiency can be increased.

6

Air conditioner

Total input weight: 1,258kg/ 25pcs

Recommendable Recycling rate = 68% (85.1*0.8)



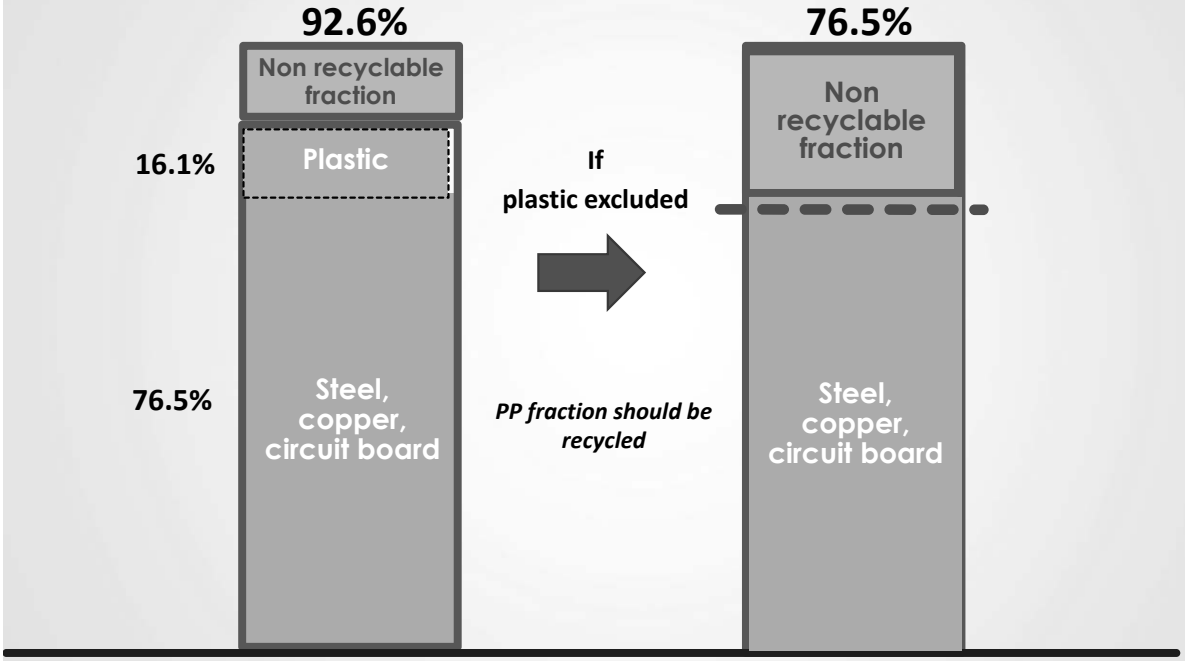
- **Plastic recycling market is only limitedly available for PP and air conditioner plastic is excluded.**

7

Refrigerator

Total input weight: 3,563kg/ 60pcs =59kg

Recommendable Recycling rate= 61% (76.5*0.8)



- **Plastic recycling market is only limitedly available for PP and thus PP fraction among mixed plastic should be segregated and recycled.**

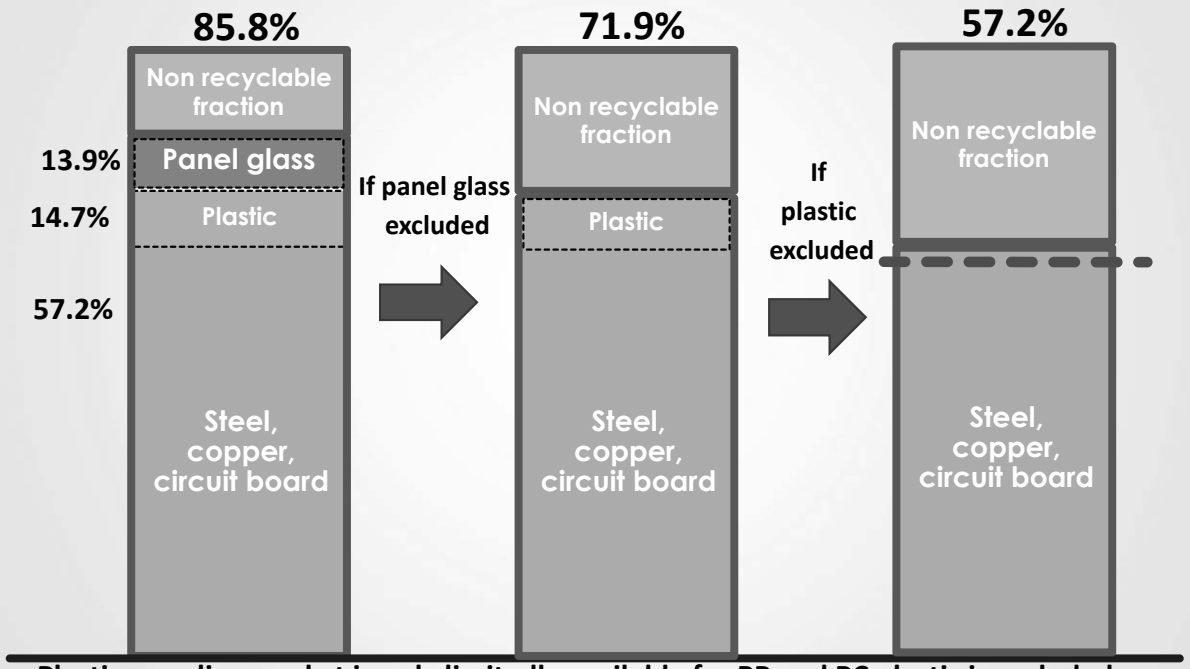
8

Desktop PC (CPU + monitor)

Total input weight: 1377kg/ 118pcs

(Monitor accompanied with CPU = 50% is CRT and 50% is flat screen)

Recommendable Recycling rate = 46% (57.2*0.8)

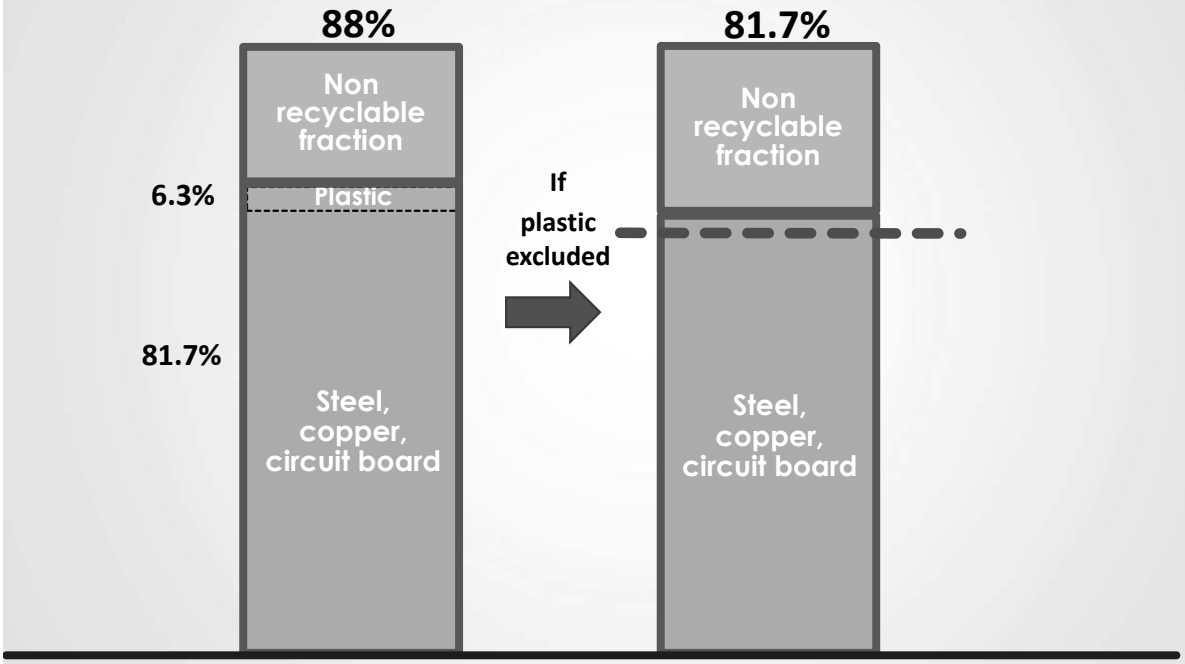


- **Plastic recycling market is only limitedly available for PP and PC plastic is excluded.**
- **Panel glass should be separated from CRT monitor and disposed separately and LCD panel recycling is not widely possible.**

Desktop PC (CPU)

Total input weight: 1377kg/ 118pcs

Recommendable Recycling rate = 65% (81.7*0.8)

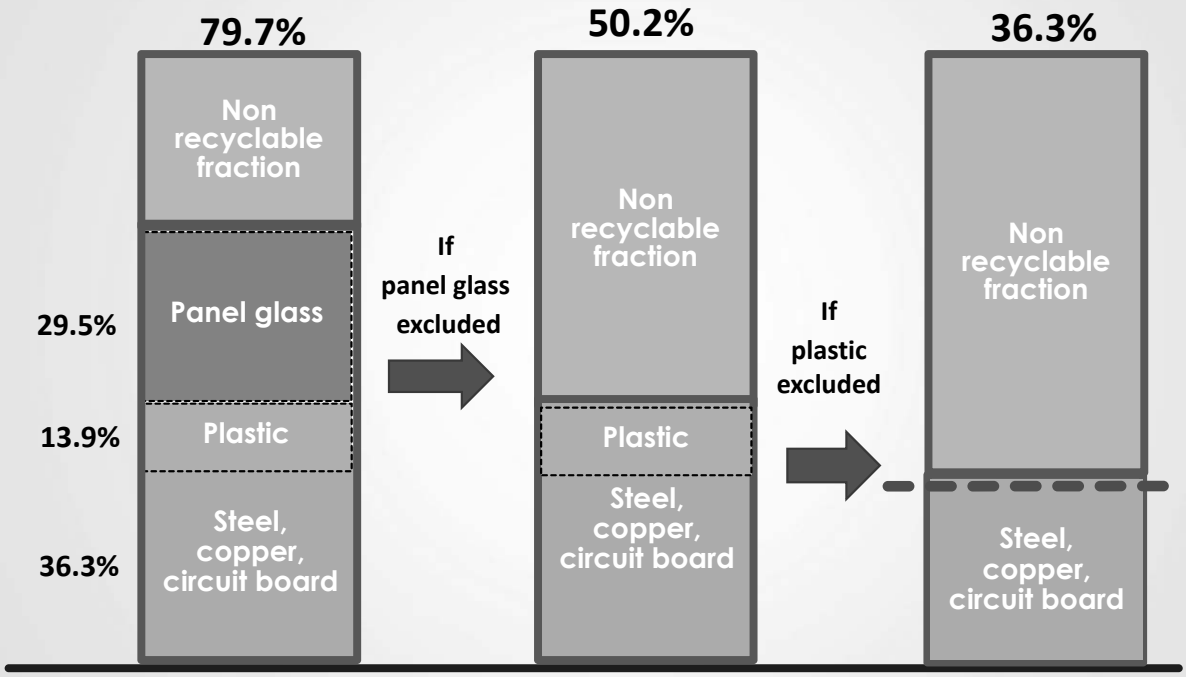


- **Plastic recycling market is only limitedly available for PP and PC plastic is excluded.**

Desktop PC CRT monitor

Total input weight: 1,706kg/ 120pcs

Recommendable Recycling rate = 29% (36.3*0.8)



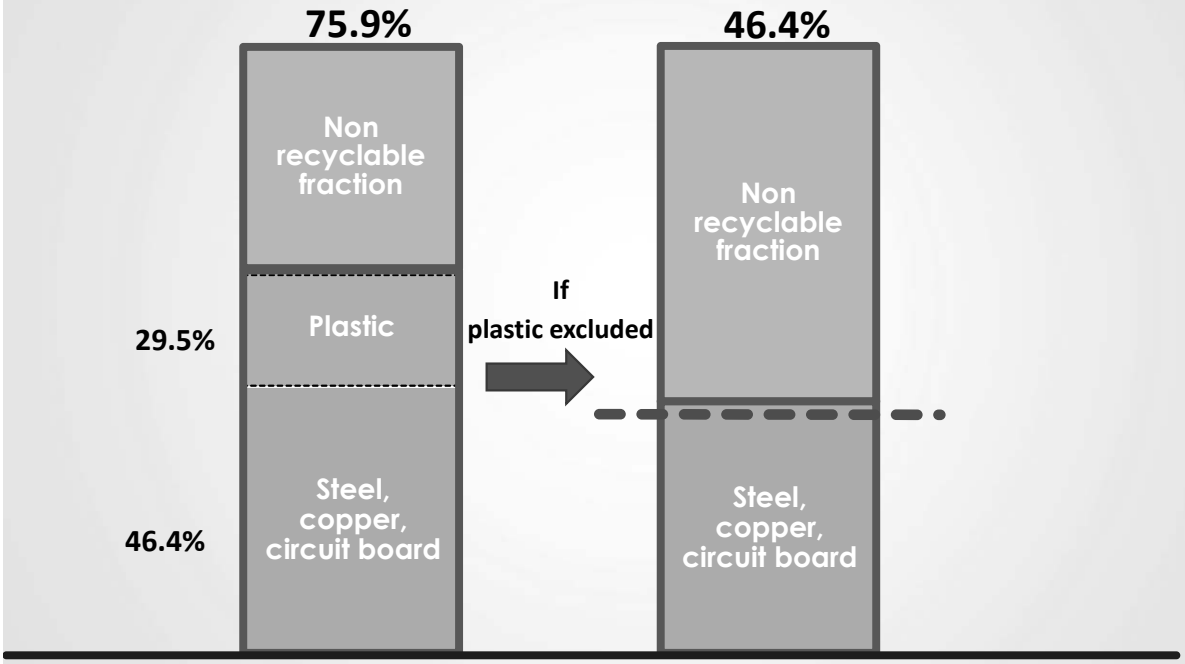
- Panel glass should be separated from CRT monitor and disposed separately.
- Plastic recycling market is only limitedly available for PP and PC plastic is excluded.

11

Desktop PC Flat monitor

Total input weight: 712kg/ 132pcs

Recommendable Recycling rate = 37% (46.4*0.8)



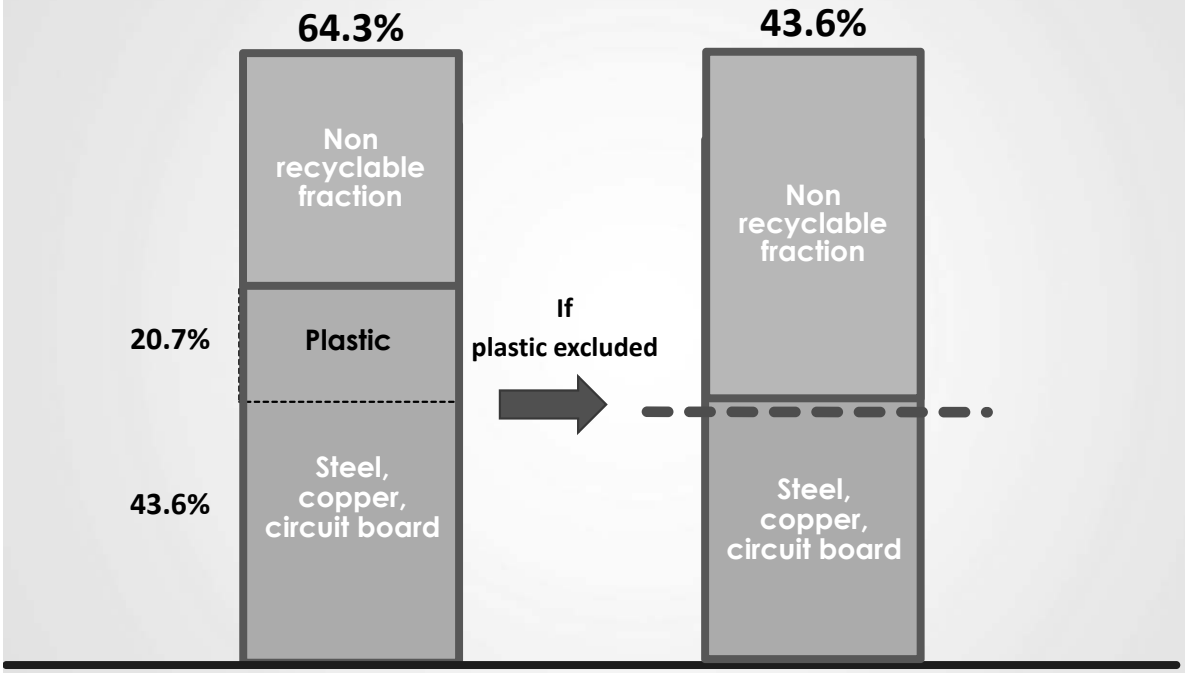
- Plastic recycling market is only limitedly available for PP and PC plastic is excluded.
- LCD panel recycling is not widely possible.

12

Notebook PC

Total input weight: 313kg/ 137pcs

Recommendable Recycling rate = 35% (43.6*0.8)

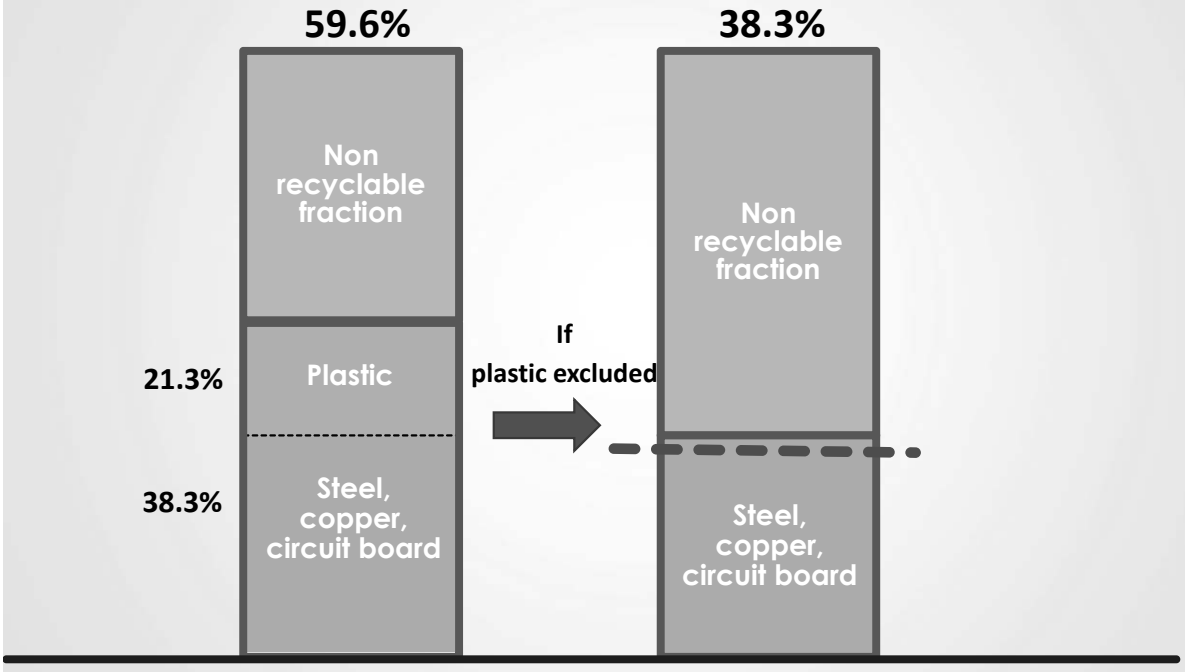


- Plastic recycling is only available for PP in Malaysia and market is small yet.

Mobile phone (smartphone)

Total input weight: 15.18kg/ 115pcs

Recommendable Recycling rate = 31% (38.3*0.8)

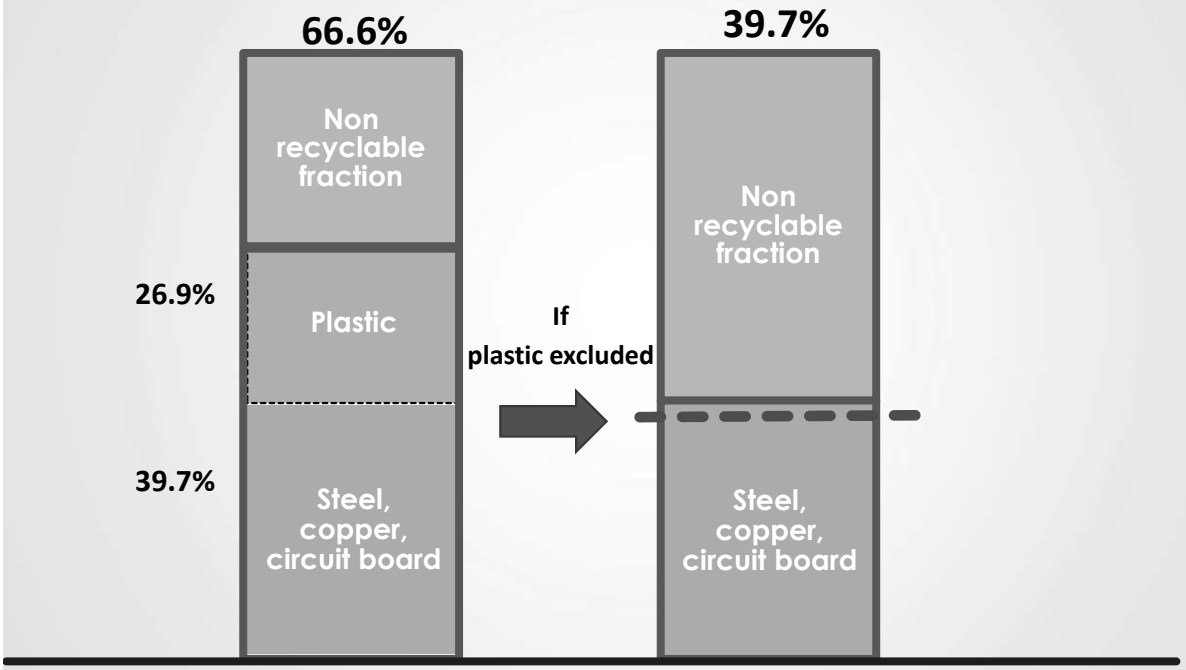


- Plastic recycling is only available for PP in Malaysia and market is small yet.

Mobile phone (old type)

Total input weight: 8.48kg/ 85pcs

Recommendable Recycling rate = 32% (39.7*0.8)



- **Plastic recycling is only available for PP in Malaysia and market is small yet.**

15

Annex 5

Fee Guideline for Household E-waste

GUIDELINE

Fee and Subsidy for Scheduled E-waste Management in Malaysia

Published by:

Department of Environment (DOE) Malaysia

Supported by:

Japan International Cooperation Agency (JICA)

TABLE OF CONTENTS

1.0 PREAMBLE

Electrical and electronic waste (commonly known as E-waste), is growing exponentially worldwide because of tremendous growth of the demand on the use of electrical and electronic equipment. The disposal of E-waste is of big concern discussed at international arena, because of the nature of hazardousness of the waste and drastically increased volume of its disposal in a globalized world.

Note:

"E-waste" referred to SW110 as stipulated in the First Schedule of EQ (Scheduled Waste) Regulations 2005.

"Electrical and electronic equipment "means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields falling under the categories set out in First Schedule of the regulations;

Improper handling of E-waste poses high risk of pollution, health impacts and causes incidents of illegal disposal. The lack of proper environmental precaution measures in household E-waste management could cause enormous environmental issues such as release of chlorofluorocarbon (CFC) gases that cause ozone depletion, global warming and contaminations from other hazardous/toxic substances.

In Malaysia, E-waste is generally divided by two main types of generation sources, i.e. E-waste generated from the industrial sectors, and E-waste generated from the non-industrial sectors, mainly households, commercial and institutional entities.

E-waste from industrial sector is categorized as Scheduled Wastes under the Code SW110, First Schedule of the Environmental Quality (Scheduled Wastes) Regulations 2005. The categories of E-waste defined under this coding are only covering E-waste generated from the industrial sectors, including electrical and electronic industries, as well as other industrial generators.

The management of E-waste generated from non-industrial sectors, especially household and other entities such as commercial and institutional entities is now regulated under a newly enacted regulation known as the Environmental Quality (Scheduled E-Waste) Regulations 20XX, which defines scheduled E-waste in which the six targeted categories of E-waste are designated.

Scheduled E-waste requires a different management system as compared to the E-waste generated from the industrial sector, particularly from the financial perspective where significant costs are required for collection and transportation of household E-waste, as well as to comply with the proper environmental precaution standards. Therefore, household E-waste shall only be processed or treated by household scheduled waste recycling facilities, which are licensed by the DOE.

This Guideline shall be read together with the Environmental Quality (Scheduled E-waste) Regulations 20XX.

2.0 ABOUT THE GUIDELINE

Under the framework of the Environmental Quality (Scheduled E-Waste) Regulations 20XX, it is emphasized that all the scheduled E-wastes shall be channeled, collected and delivered through a formal/authorized flow of stakeholders to the final destination of proper

treatment, recycling and recovery in an environmentally sound system. Each respective player has their own roles and responsibilities, and the cost involved in the entire system shall be shared among all the stakeholders.

This Guideline provides the overall financial mechanism of scheduled E-waste, which mainly consists of Recycling fee collection and recycling subsidy provision mechanism to be run by the Recycling Contribution Management Body (RCMB). It also specifies the methodology of making calculation/computation of recycling fee rate and subsidy rate respectively for each scheduled E-waste item.

The main categories of scheduled E-waste covered under this Guideline are the list of E-waste under the First Schedule of the Environmental Quality (Scheduled E-Waste) Regulations 20XX including:

(a) Television;
(b) Air conditioner;
(c) Personal Computer (Desktop and laptop including monitor); and
(d) Refrigerator/freezer, chiller;
(e) Cloth washing/drying machine;
(f) Mobile phone (Old type and smartphone)/tablet PC.

The users of this Guideline shall always refer to the Environmental Quality (Scheduled E-Waste) Regulations 20XX as the main text of this Guideline to ensure complete understanding of the entire requirements under the regulations, as well as the clauses of the Environmental Quality Act (1974) as the Mother Act.

2.1 Scope of the Guideline

This guideline provides the details of overall financial mechanism of the scheduled E-waste management comprising of:

(1) Overall financial mechanism of the scheduled E-waste management,
(2) Mechanism of scheduled E-waste recycling fee (contribution) collection,
(3) Mechanism of scheduled E-waste recycling subsidy, and
(4) Methodology of making calculation/computation of recycling fee (contribution) and subsidy rates.

The stakeholders to be involved in and relevant to this guideline are all those who take their own roles and responsibilities in the entire mechanism of scheduled E-waste management in Malaysia. The table below specifies their respective roles and responsibilities related to implementation of this guideline

Types of Stakeholders	Relevance to the Fee Guideline
Manufacturers and importers of E-appliances	▪ Manufacturers, importers, and any other persons who put their E-appliances that are regulated in the Environmental Quality (Scheduled E-Waste) Regulations 20XX to the Malaysian market shall be subject to payment of the recycling fee based on the volume/amount of the regulated E-appliances.
Generators (consumers of E-appliance)	▪ Although the recycling fee is not collected from each consumer of E-appliance directly, it shall shoulder its own financial responsibility of environmentally sound scheduled E-waste management at the time of purchasing new E-appliances.
Authorized household E-waste collectors	▪ Authorized scheduled E-waste collectors are entitled as the receivers of subsidy in accordance with the volume/amount of scheduled E-waste that are collected in compliance with the collection guideline.
Licensed household E-waste recyclers	▪ Licensed scheduled E-waste recyclers are entitled as the receivers of subsidy in accordance with the volume/amount of scheduled E-waste that are recycled in compliance with the recycling guideline.
Recycling Contribution Management Body (RCMB)	▪ RCMB is responsible for the entire financial mechanism of scheduled E-waste management including collection of scheduled E-waste recycling fee (contribution), provision of scheduled E-waste subsidy, management and operation of the fund raised from the collected recycling fee.

2.2 Categories of Scheduled E-waste

The target categories of scheduled E-waste subject to this Guideline are basically the 6 main categories specified in the First Schedule of the Environmental Quality (Scheduled E-waste) Regulations 20XX, excluding the small appliances, fluorescent lamps and rechargeable batteries. The 6 main categories of scheduled E-waste are listed as follows with their sub-categories:

No	Categories	Sub-categories
1	Televisions and Monitors	CRT Televisions 
		Flat Televisions (Plasma, LCD, LED) 
2	Air-conditioners	Window Units 
		Split units Ceiling Unit 
		Mobile units 

No	Categories	Sub-categories
3	Computers	LCD Desktop CRT Desktop 
		Laptop 
4	Refrigerators	Refrigerators 
		Freezers 
		Chillers 

No	Categories	Sub-categories
5	Washing / Dryer machines	Washing machines 
		Cloth Dryers 
6	Mobile phones and Tablet PCs	Mobile phones 
		Tablet PCs 

2.3 Principal Framework of Scheduled E-waste Management

Scheduled E-waste management is regulated under the Environmental Quality (Scheduled E-Waste) Regulations XXXX, which emphasizes the concept of "shared responsibilities" among the players, with implementation of the principle of Extended Producer's Responsibility (EPR).

Under the framework of scheduled E-waste management, the manufacturers and importers of electrical and electronic appliances have the financial obligation to pay the "Recycling Fee (contribution)" which is to be determined by the Department of Environment (DOE) in accordance with the mandate provided in EQA. The "Recycling Fee (contribution)" shall be channeled to the "Environment Fund" which is established under EQA and utilized to cover scheduled E-waste collection, transportation, recycling, or any other purposes in accordance with the requirement to be determined by the Director General of DOE.

The Department of Environment (DOE) shall have the primary responsibility for environmentally sound and sustainable management of scheduled E-waste under their authority of controlling all the relevant stakeholders.

All the households and business entities, who generate scheduled E-waste defined in the Environmental Quality (Scheduled E-Waste) Regulations 20XX, have the responsibility to make sure they hand over their E-waste to the authorized collectors.

The legal framework of household E-waste management consists of 3 (three) key flows, namely "E-waste", "Fee (Money)", and "Information (Reporting)", as summarized below.

E-waste Flow	Determines the right channel of scheduled E-waste that starts with collection from generation points to authorized collection centers, collectors, retailers, and ends with the licensed scheduled E-waste recycling facilities or final disposal. The regulation requires all the collectors of scheduled E-waste to register with DOE while all the recyclers to apply for the licenses to manage scheduled E-waste.
Fee (Money) Flow	Determines how the recycling fee is collected and channeled to the "Environmental Fund" for various purposes of disbursements to ensure environmentally sound and sustainable management of scheduled E-waste.
Information (Reporting) Flow	Determines the information / data flow through proper reporting by relevant players (manufacturers/importers, collectors, transporters, and recyclers) The scheduled E-waste manifest system is introduced for actual flow tracking of E-waste from collectors to the recyclers. The reporting and manifest system integrally avoid leaking of E-waste into the informal sectors, and ensure that proper data is captured for determination of total recycling fees to be collected and proper amount of subsidy to be provided.

Detailed description of the 3 (three) key flow is respectively given below.

2.3.1 Scheduled E-waste Flow

The sources of scheduled E-waste include households, commercial, industrial, and institutional entities, and any other sources that generate the same categories of scheduled E-waste, listed in Section 2.3 of this guideline.

Under the framework of scheduled E-waste management, all generators are required to discard their scheduled E-waste to the collectors authorized by DOE, which could be a retailer shops, recycling centers, NGOs, municipal waste collection concessionaire companies, local government, or any other authorized persons. Any flow of scheduled E-waste from generators to unauthorized collectors is prohibited.

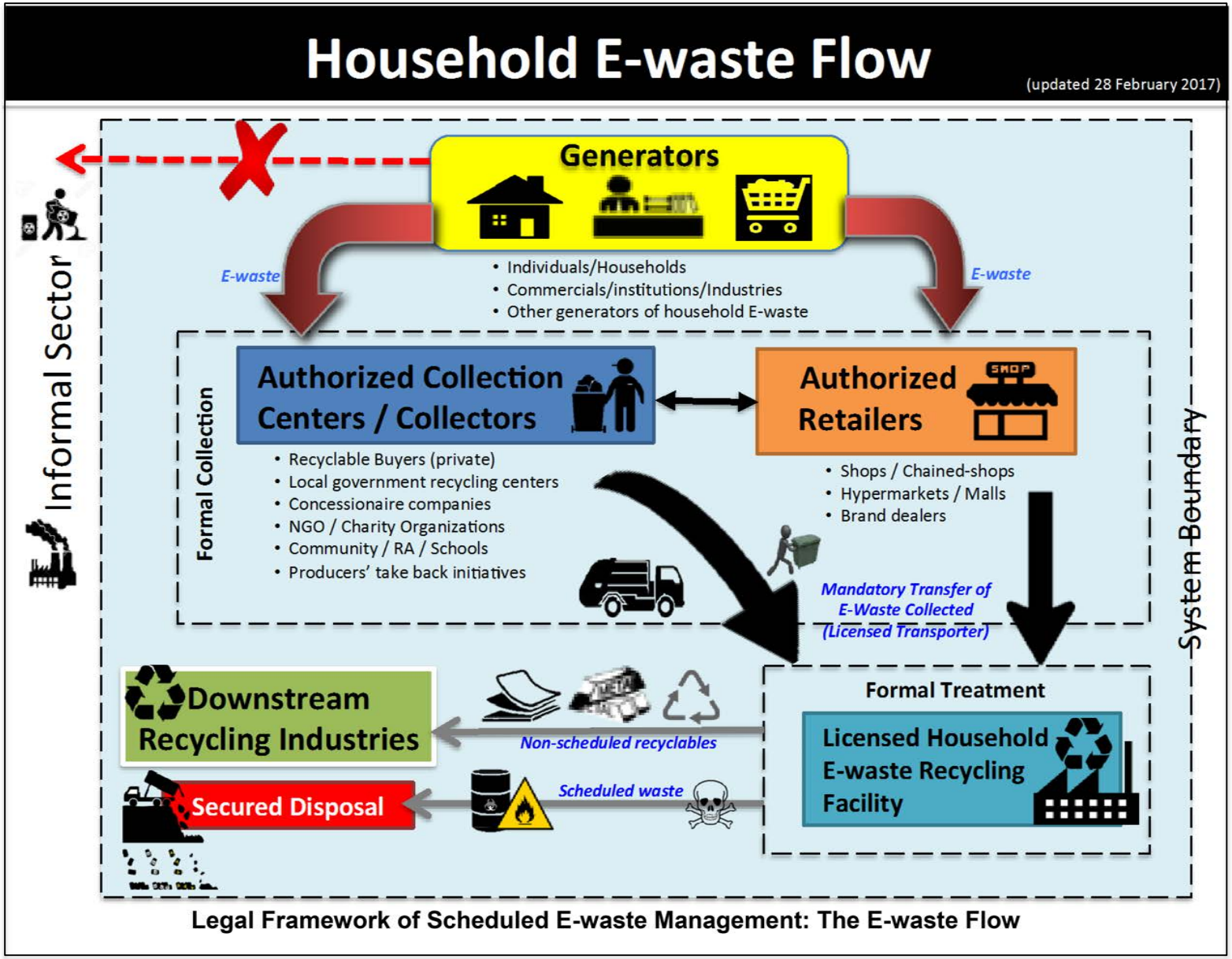
The collected scheduled E-waste by the authorized collectors must be channeled to the scheduled E-waste recyclers licensed by the DOE, to ensure proper treatment and recycling of scheduled E-waste in an environmentally sound manner. In case where the authorized collectors are not able to channel the collected scheduled E-waste directly to the licensed recyclers due to logistic or any other factors such as small retailers, the collected scheduled E-waste shall be delivered to another authorized collectors that have capability to channel the E-waste in larger volume to the licensed scheduled E-waste recyclers.

The licensed scheduled E-waste recyclers shall fulfill the requirements set in this Recycling Guideline in their recycling operation. The first requirement of the Recycling Guideline is to ensure proper management of “Focused Materials” for each scheduled E-waste item. Focused Materials are the specific components or parts of or substances contained in scheduled E-waste items that are defined as potentially hazardous to human health and/or environment if they are improperly handled. Examples of such materials include funnel glass of cathode-ray tube (CRT) TV, printed circuit board, refrigerant used in air conditioners and refrigerators, lithium ion batteries, and so forth. The Recycling Guideline provides handling methods of focused materials in recycling process of each scheduled E-waste.

Another requirement set in the Recycling Guideline is the minimum recycling rate to be fulfilled by the licensed scheduled E-waste recyclers. For each type of scheduled E-waste, the Guideline set different minimum weight-based recycling rate target that each licensed recycler must comply in its recycling operation.

Under the scheduled E-waste management mechanism, the scheduled E-waste is expected to flow from the generation points into proper recycling system run by the authorized collectors and licensed recyclers. Any outflow of household E-waste from the new mechanism will be considered illegal and subject to legal punishment.

The chart on next page illustrates the E-waste flow under the new scheduled E-waste management mechanism.



Legal Framework of Scheduled E-waste Management: The E-waste Flow

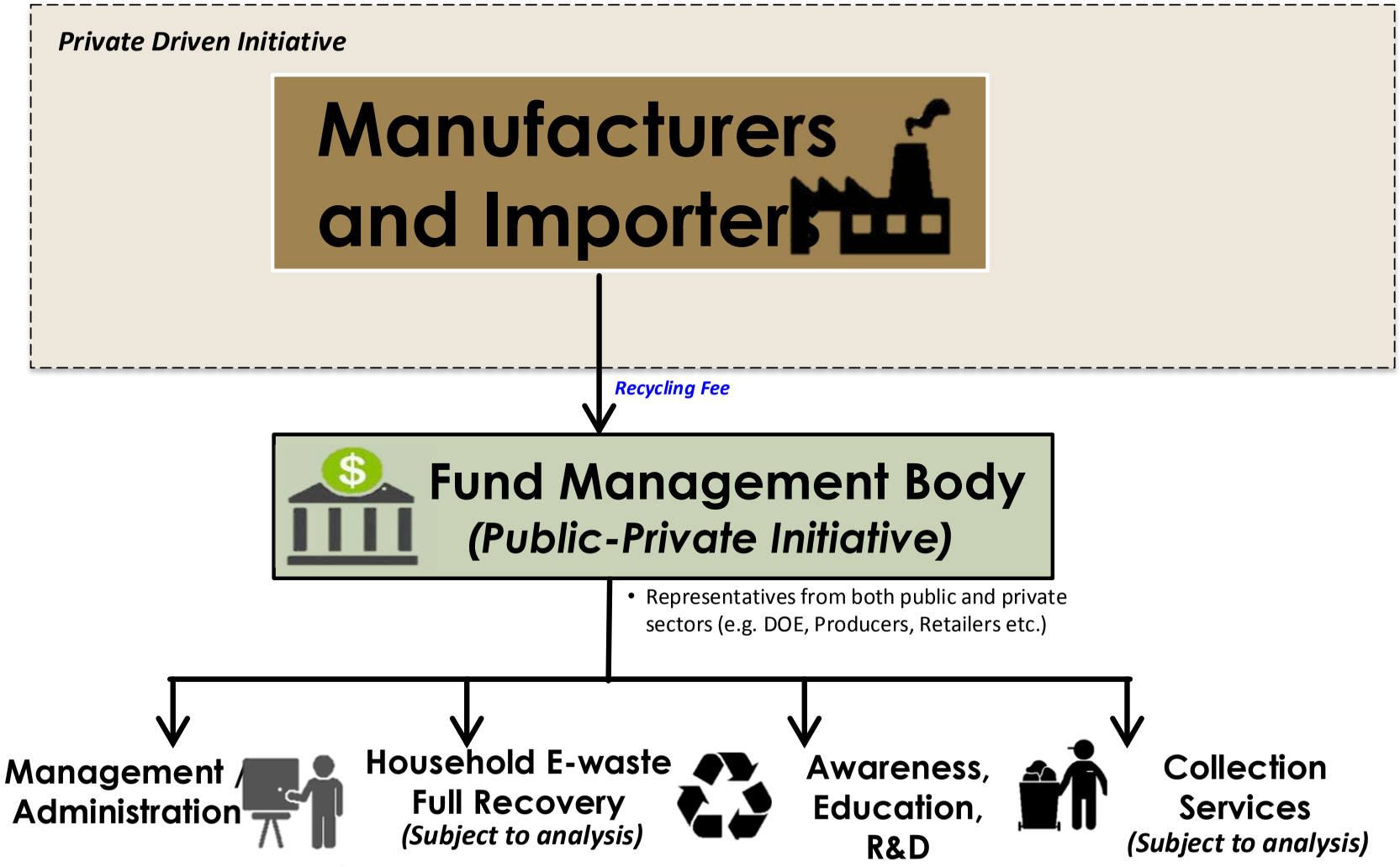
2.3.2 Fee Flow

It is important to understand that recycling of scheduled E-waste does not always yield revenues but it involves significant costs particularly when taking into consideration the logistic cost and environmental protection cost such as destruction of chlorofluorocarbon (CFC) gases, various pollution control measures, as well as treatment and disposal of hazardous substances. The overall cost required to ensure that the scheduled E-waste is properly channeled and processed in an environmentally sound manner shall be shared among all those who receive benefits from the relevant E-appliances.

Under the new scheduled E-waste management mechanism, the manufacturers and importers or any other individuals and entities who put the designated E-appliances into the Malaysian market shall pay the "Recycling Fee (Contribution)" to represent all the stakeholders to be benefited from proper management of the scheduled E-waste. The Recycling Fee (Contribution) will be collected by the so-called "Recycling Contribution Management Body (RCMB)", which is established as the independent organization to finance overall mechanism of scheduled E-waste management in Malaysia including provision of subsidy to the necessary activities of the licensed scheduled E-waste recyclers, authorized collectors, and other possible stakeholders of the new scheduled E-waste management mechanism, which will be determined by RCMB.

In accordance with the principle of "Shared Responsibilities", the required cost for proper management of scheduled E-waste should be shared among all the relevant stakeholders who receive benefits from the relevant E-appliances, including manufacturers, importers, wholesalers, retailers, and consumers. In this scheduled E-waste management mechanism, the manufacturers and importers temporarily shoulder this cost by paying the recycling fees. Therefore, it is given to the individual decisions of manufacturers and importers whether and how they would share this financial responsibilities with other stakeholders.

The recycling fee (contribution) determined for each item of scheduled E-waste will be different, reflecting various cost factors involved in their collection and recycling. Details of fee structures to be paid by the manufacturers and importers by each scheduled E-waste are described in Recycling Fee Guideline.



Legal Framework of Scheduled E-waste Management: The Recycling Fee Flow

2.3.3 Reporting Flow

Proper reporting system is an essential tool to monitor and ensure proper scheduled E-waste flow and recycling fee flow as elaborated in Section 2.4.1 and 2.4.2 above.

The new scheduled E-waste management mechanism mainly consists of two types of reporting system. i.e. reporting by the manufacturers and importers of the designated E-appliances and reporting by the stakeholders involved in collection and recycling of scheduled E-waste.

The purpose of reporting by the manufacturers and importers is to identify the volume and amount of the designated E-appliances put into the Malaysian market. The manufacturers and importers have the obligation to periodically report to the RCMB on the volume of designated E-appliances put on the Malaysian market by each item. This data will be the baseline for forecasting the present and future generation of E-waste in the long run while it will be also used as an important factor in determining the recycling fee to be paid by the manufacturers and importers (Detail formula of determining the recycling fee is provided in the "Recycling Fee Guideline".)

On the other hand, the reporting by the collectors and recyclers aims at ensuring proper flow of the scheduled E-waste from generation sources to their final destinations. The new scheduled E-waste management mechanism introduced the so-called "E-waste manifest system" to trace the flow of each E-waste item from collection points to their final destinations. The manifest system comprises 6-ply of manifest forms, which shall be filled out and kept by respective stakeholders following the methods as detailed in "E-waste Reporting Guideline". Reporting mechanism under the manifest system is summarized as below:

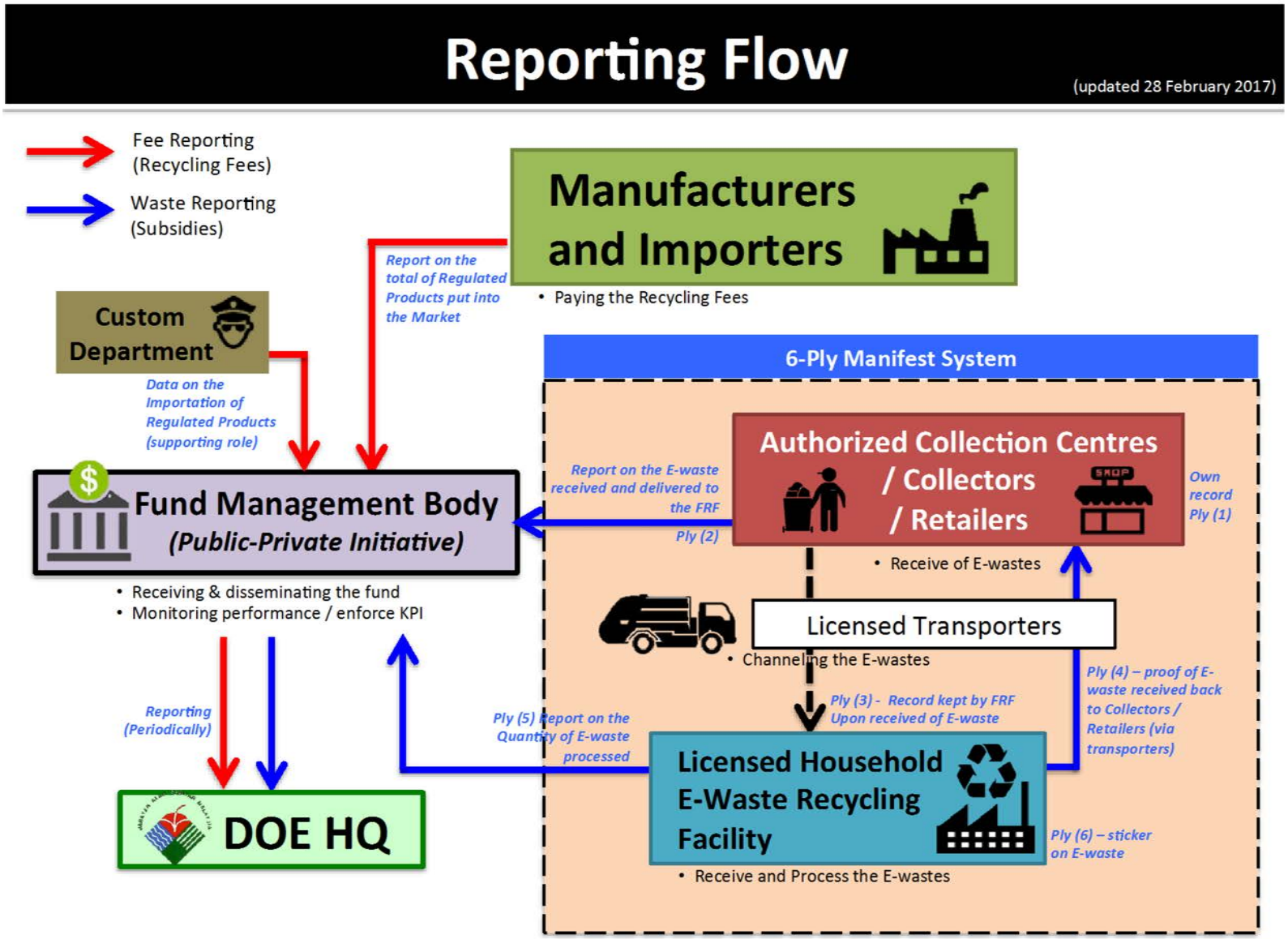
a) The authorized collectors shall fill out one manifest form for each of E-waste item collected. At the time of handing it over to the authorized transporters or licensed recyclers, they return 1-ply of manifest to the RFMB while keeping one copy and attaching the remaining copies to each E-waste item to be handed over.

b) When the authorized transporters receive E-waste with manifest form attached, they shall fill out the necessary parts of the manifest form. At the time of sending out the received E-waste to the licensed recyclers, they shall return 1-ply of manifest to RFMB while keeping one copy and attaching the remaining copies to each E-waste item they sent out.

c) When the licensed scheduled E-waste recyclers receive scheduled E-waste from authorized collectors or transporters with their manifest forms attached to each E-waste item, they shall fill out the necessary parts of the manifest forms. After completing all the recycling and treatment process, the licensed recyclers shall return to RFMB 1-ply of manifest form of each E-waste item they recycled while keeping 1 copy under their hand for each E-waste item.

d) RFMB shall cross-examine the manifest forms returned by collectors, transporters and recyclers to ensure proper flow of each scheduled E-waste from primary collectors to the recyclers. After confirmation on completion of the overall flow, RFMB will make disbursement of the fund (subsidy) to the relevant stakeholders above.

The manifest system directly links with subsidy disbursement mechanism run by RFMB. RFMB shall make disbursement of the subsidy only upon reception of all manifest forms from relevant stakeholders. Manifest form is utilized as the written evidence of proper recycling of each E-waste.



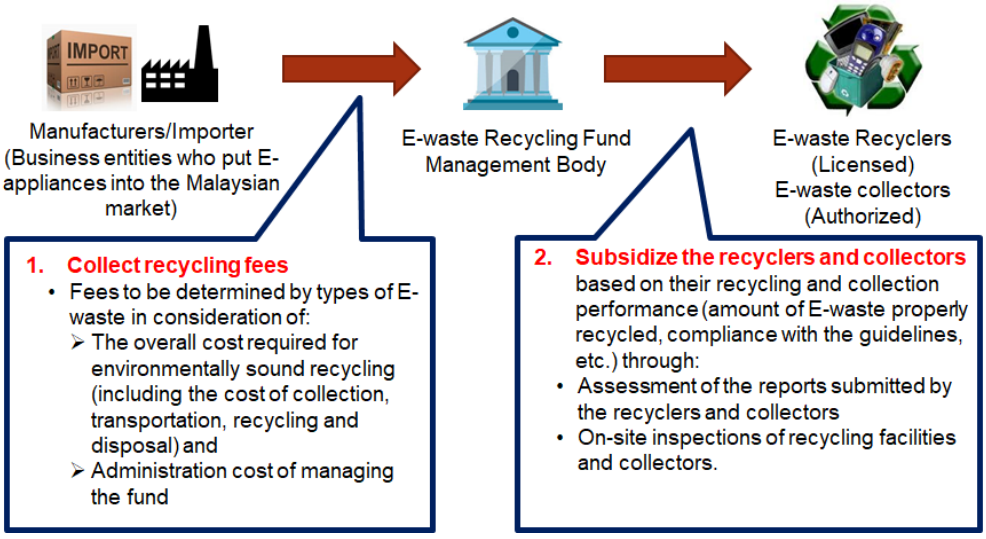
Legal Framework of Scheduled E-waste Management: The Reporting Flow

3.0 FINANCIAL MECHANISM OF SCHEDULED E-WASTE MANAGEMENT

3.1 Recycling Contribution Fund Management Body

Recycling Contribution Management Body (RFMB) is the public entity responsible for the entire mechanism of scheduled E-waste management in accordance with the Environmental Quality (Scheduled E-Waste) Regulations 20XX. The details of the roles and responsibilities of RCMB is provided in the schedule of RCMB attached to the Environmental Quality (Scheduled E-Waste) Regulations 20XX.

Regarding the implementation of this guideline, the main roles and responsibilities of RCMB is as shown in the figure below.



The operation of RCMB shall be supervised by the third-party organizations, i.e. Recycling Rate & Fee Review Committee (RFRC) and Auditing and Verification Committee (AVC), organized by the representatives of pubic as well as private stakeholders involved in the entire household E-waste management mechanism. The members of RFRC and AVC are provided in the schedule of RCMB.

3.2 Recycling Fee (Contribution) Collection Mechanism

3.2.1 Basic Structure of Recycling Fee (Contribution)

The purpose of collecting recycling fee is to cover the cost required for entire implementation of scheduled E-waste management mechanism, including:

- Total logistic cost required for proper collection and transportation from generators to the licensed recyclers by the authorized collectors,
- Total recycling cost required for environmentally sound recycling, treatment, and disposal cost by the licensed recyclers, and
- Total cost of RCMB required for the operation of the entire household E-waste management mechanism.

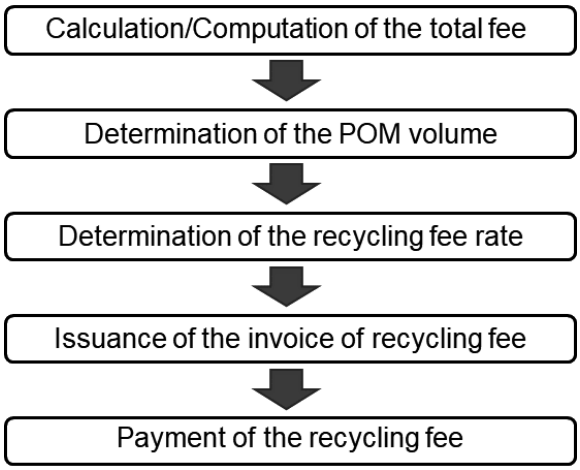
Therefore, the total amount of recycling fee collected has to be enough to cover the above costs as illustrated in the formula below.

(The total amount of fee collected)
= (Total logistic cost required) + (Total recycling cost required) + (RFMB cost)

Considering the difference in cost of collection and recycling depending upon types of regulated items, the total amount of fee collected shall be determined by each type of E-waste items. Detailed methodology of making calculation/computation of recycling fee is given in Section 3.4 of this guideline.

3.2.2 Recycling Fee collection Procedure

The basic procedure for collection of recycling fee is as shown in the chart below.



(1) Calculation/Computation of the total fee

In accordance with the formula shown in Section 3.2.1 above, The total amount of recycling fee required to cover the sum of the total logistics cost, recycling cost, and RCMB cost is to be calculated by each regulated E-waste item. The detailed methodology of making computation of each cost above is specified in Section 3.4 of this guideline.

(2) Determination of the put on market (POM) volume

So called "Put-On-Market (POM)" volume of each regulated E-appliance in the previous year is to be determined based on the reporting of POM volume by each manufacturer, importer and all those who put their own regulated E-appliances on the Malaysian market. To do this, they are required to be registered at RCMB as manufactures and/or importers of the regulated E-appliances. The POM volume shall be reported in total number of units as well as total tonnage for each regulated E-appliance. In reporting the total POM volume, the volume manufactured or imported for export may be excluded. POM is, in principle, equal to yearly shipment (sell-in) volume to the Malaysian market for sale in Malaysia.

The reported POM volume shall be cross-examined with the relevant information and data from other sources such as Custom Department, Statistic Agency, and so forth. False or no registration as well as reporting shall be subject to penalties in accordance with the relevant laws and regulations.

(3) Determination of the recycling fee rate

Based on the total fee calculated in (1) above and POM determined in (2) above, the recycling fee rate shall be determined for each regulated E-appliance by applying the equation below.

Recycling Fee Rate (RM/per unit)

= Total amount of recycling fee (RM/year) / POM volume (units/year)

RCMB shall be responsible for conducting all the procedures above (from (1) to (3)) to come out with the draft recycling fee rate for each regulated E-appliance. Once the draft recycling fee rate is determined, the Recycling Rate & Fee Review Committee (RFRC) shall review the entire procedure to finalize the recommended recycling fee rate for submission to the Chairman of RCMB. The chairman of RCMB shall make the final decision and official announcement of the recycling fee rate in the form of the schedule of recycling fee rate as a part of the Environmental Quality (Scheduled E-Waste) Regulations 20XX.

(4) Issuance of the invoice of recycling fee

In accordance with the final decision of recycling fee rates by the Chairman of RCMB, Invoices of recycling fee shall be issued for each of manufacturers, importers, and all those who put their own regulated E-appliances on the Malaysian market. RCMB shall be responsible for all this procedure. The invoice shall detail out the breakdown of the fee, manner of payment, and due date for payment. The invoice shall be sent once a year to manufacturers, importers, and all those who put their own regulated E-appliances on the Malaysian market.

(5) Payment of the recycling fee

Upon receiving the invoice form RCMB, the manufacturers, importers, and all those who put their own regulated E-appliances on the Malaysian market shall make their payment to RCMB in accordance with the manner and term of payment stated in the invoice. The delay or non-payment of the fee as well as shortage of the payment amount may be subject to penalties in accordance with the relevant laws and regulations.

3.3 Recycling subsidy disbursement mechanism

3.3.1 Basic structure of recycling subsidy

The recycling subsidy is to be provided for the purpose of covering the logistic and recycling cost required for proper collection and recycling of the regulated E-waste in accordance with the Environmental Quality (Scheduled E-Wastes Regulations 20XX and the attached guidelines. In principle, the authorized collectors and licensed recyclers of the regulated E-waste are entitled to receive the recycling subsidy. The amount of subsidy to be provided to authorized collectors and licensed recyclers will be determined by applying the equation below.

The amount of subsidy (RM)

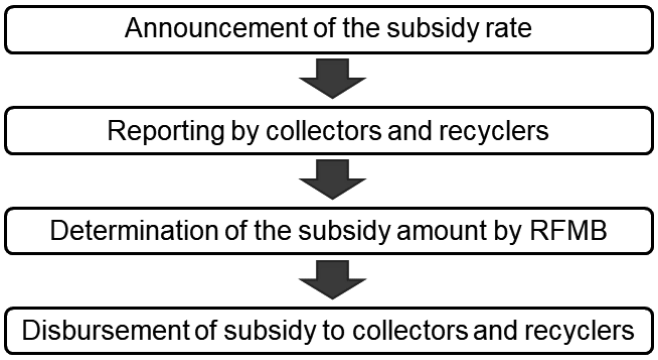
= Subsidy rate (RM/unit) ∗ Number of units collected or recycled (Units)

The subsidy rate shall be separately determined for each regulated E-waste item in accordance with the calculation of per unit logistic and recycling cost required. Detailed methodology of making calculation/computation of recycling subsidy rate is given in Section 3.4 of this guideline.

Number of units collected or recycled shall be determined based on the reporting by the authorized collectors and recyclers in accordance with the collection, recycling, and reporting guidelines. Non-compliance with these guidelines may result in no or discounted provision of subsidy. False reporting may be subject to penalties in accordance with the laws and regulations depending upon its seriousness.

3.3.2 Subsidy disbursement procedure

The basic procedure for disbursement of subsidy is as shown in the chart below.



(1) Announcement of subsidy rate

Based on estimation of the total logistic and recycling cost in the process of making calculation/computation of recycling fee rate mentioned above, RCMB shall determine the draft subsidy rate to authorized collectors and recyclers respectively for each regulated E-waste item. The draft subsidy rate shall be entirely reviewed of its estimation procedure by the Recycling Rate & Fee Review Committee (RFRC) for final recommendation to the Chairman of RCMB. Once the RCMB Chairman make his final decision, subsidy rate to be applied in the relevant year(s) shall be officially announced in the form of the schedule of recycling subsidy rate as a part of the Environmental Quality (Scheduled E-Waste) Regulation 20XX.

(2) Reporting by collectors and recyclers

To be entitled as the receivers of this subsidy, the authorized collectors and licensed recyclers must submit their report (monthly or quarterly) of the volume collected and/or recycled to RCMB. The volume shall be reported in number of units and tonnage. The reporting must be made with the reporting forms for collectors and recyclers in accordance with the relevant guidelines (Collection, recycling, and reporting guidelines). The authorized collectors and licensed recyclers may submit their report to be attached with their own copy of manifest form as a proof of their collection and recycling performance.

(3) Determination of the subsidy amount by RCMB

Upon receiving the reports from authorized collectors and licensed recyclers, RCMB shall make their entire review to decide subsidy amount to respective collectors and recyclers.

RCMB shall first cross-check the volume claimed in the report with the actual copies of manifest sent. If there is an inconsistency between them, RCMB shall notify them revision and resubmission of the report until the volume is matched. False reporting may be subject to disbursement of no or discounted subsidy or even subject to penalties depending upon its seriousness in accordance with the

Regarding the authorized collectors, collection and transportation of incomplete sets of regulated E-waste items may be subject to discount of subsidy amount to avoid leakage of E-waste outside this mechanism that may result in incidental environmental pollution. Non-compliance with the collection guideline may also be subject to payment of no or discounted subsidy or even penalties depending upon its seriousness such as dismantling of valuable materials and selling them to non-licensed recyclers.

As to the licensed recyclers, non-compliance with the recycling guideline may result in disbursement of no or discounted subsidy as well as be subject to penalties depending

upon its seriousness such as illegal handling of focused materials, overstatement of recycling rate, and so forth.

(4) Disbursement of subsidy to collectors and recyclers

Upon determination of the subsidy amount, RCMB shall notify it in a written form to authorized collectors and recyclers. On reception of the notification, they may issue invoices for disbursement of subsidy by RCMB. Depending upon frequency of reporting and request by authorized collectors and licensed recyclers, the subsidy shall be paid monthly or quarterly.

3.4 Methodology of making calculation/computation of recycling fee and subsidy rates

3.4.1 Recycling fee rate calculation/computation

The basic formula of recycling fee rate calculation/computation is as shown below.

Recycling Fee rate (RM/unit) × Put on market volume (units/year) = Total logistic cost (RM/year) + Total recycling cost (RM/year) + RFMB cost (RM/year) ± Adjustment of fund management surplus (RM/year)

The methodology for each factor described in the formula above is as specified respectively below.

(1) Recycling fee rate

The recycling fee rate shall be determined in the form of RM/unit by each regulated E-waste item. The unit utilized shall be per complete unit or per ton of each E-waste item.

(2) Put-On-Market (POV) Volume

Put-On-Market (POM) volume of each regulated E-appliance shall be determined based on the reporting of POM volume by each manufacturer, importer and all those who put their own regulated E-appliances on the Malaysian market in the previous year.

The POM volume shall be reported in total number of units as well as total tonnage for each regulated E-appliance. In reporting the total POM volume, the volume manufactured or imported for export may be excluded. POM is, in principle, equal to yearly shipment (sell-in) volume to the Malaysian market for sale in Malaysia.

The reported POM volume shall be cross-examined with the relevant information and data from other sources such as Custom Department, Statistic Agency, and so forth.

(3) Total logistic cost

The total logistic cost is defined as the cost for entire collection and transportation of regulated E-waste items from their generation sources to final destinations, i.e. licensed recyclers. The total logistic cost shall be estimated for each regulated E-waste item. The basic formula of estimating the total logistic cost is as shown below.

The total logistic cost (RM/year)
= Unit cost of collection and transportation (RM/ton· km) ∗Total distance of collection and transportation (ton· km/year)

(a) Unit cost of collection and transportation
Unit cost of collection and transportation shall be determined by types of transportation mode as well as standard loading capacity of each transportation mode. In the case of Malaysia, road transportation by trucks (including container trucks) shall be assumed as the main mode of transportation for Peninsular Malaysia while combination of land and sea transportation shall be assumed for the region of Sabah and Sarawak in estimating the unit cost of collection and transportation.

(b) Total distance of collection and transportation
The total distance of collection and transportation shall be calculated by applying the following equation.

Total distance of collection and transportation (ton· km)
= Average distance of collection and transportation by mode of transportation per trip (ton · km/trip) ∗ Number of trips per year

The estimation above shall be made for each type of transportation mode as well as by levels of loading capacity of transport means (e.g. types and scale of trucks and cargo ships).

More detailed procedure for estimating the total logistic cost is given in Annex1 of this guideline as an example.

(4) Total recycling cost

The total recycling cost shall be estimated for each type of regulated E-waste item by applying the following equation.

Total recycling cost (RM/year)
= Recycling cost per unit (RM/unit) ∗ Number of units recycled (units/year)

The unit to be applied in the equation above shall be tonnage as well as per E-waste item (e.g. per TV set, refrigerator, etc.).

(a) Recycling cost per unit
Recycling cost per unit shall be estimated by so-called capacity cost accounting (RM/unit). On the other hand, as the recycler shall obtain revenue from selling recyclable materials, it shall be subtracted from the gross recycling cost to obtain the net recycling cost. Thus, the standard equation of recycling cost estimation shall be as follows:

The total recycling cost (RM/unit)
= Capital cost (RM/unit) + Operation cost (RM/unit) – Revenue (RM/unit)

i. Setting the standard E-waste recycling operation
To estimate the recycling cost in accordance with the equation above, the standard e-waste recycling operation shall be set for each type of regulated E-waste items. It shall also be designed to comply with the handling rules of focused materials and the minimum recycling rate targets determined in the household E-waste recycling guideline.

ii. Capital cost
Capital cost shall include the cost of machinery and equipment to be required for recycling of regulated E-waste items in accordance with the household E-waste recycling guideline. It shall mainly consist of the machinery and equipment cost for proper separation and handling of focused materials and compliance with the minimum recycling rate targets.

iii. Operation cost

Operation cost shall include the cost of manpower, utility, consumables and other miscellaneous cost required for recycling operations. It shall also include the cost of treatment and disposal of focused materials in accordance with the household E-waste recycling guideline.

iv. Revenue

To obtain the net cost of recycling, the revenue from selling the recyclable materials processed from recycling operation shall be estimated.

(b) Number of units recycled

Number of units recycled shall be estimated for each regulated E-waste item taking into account the past trend of domestic sales of relevant E-appliances and their durable years to project their annual generation as E-waste and assumption on the collection ratio of E-waste by the authorized collectors.

More detailed procedure for estimating the total recycling cost is given in Annex 2 of this guideline as an example.

(5) RCMB cost

The RCMB cost shall include the capital and operation cost of RCMB in accordance with the schedule of RCMB attached to the Environmental Quality (Scheduled E-Waste) Regulation 20XX. It shall include the capital cost of basic equipment such as the computers for controlling manifest system, database for controlling all the information of stakeholders and their reports and operation cost including manpower, utility, consumables, and other miscellaneous expenses. More detailed estimation of RCMB cost is given in Annex 3 of this guideline.

(6) Adjustment of fund management surplus

In the entire financial operation of RCMB, there may be surplus of the fund on annual basis because of the discrepancy between the amount of recycling fee collected and the amount of subsidy disbursement. RCMB shall adjust this surplus in determining the fee rate for the subsequent year. This adjustment shall be made in annual review of fee and subsidy rate by RFRC.

3.4.2 Subsidy rate calculation/computation

Subsidy rate shall be annually determined in the process of making calculation /computation of recycling fee rate discussed in Section 3.4.1 above. There shall be two types of subsidies, i.e. E-waste collection subsidy and E-waste recycling subsidy. For both types of subsidies, subsidy rate shall be set for each type of regulated E-waste.

(1) E-waste collection subsidy

E-waste collection subsidy shall be provided to the authorized household E-waste collectors for the purpose of covering the collection and transportation cost of household E-waste. The authorized collectors shall be entitled as the receivers of subsidy by reporting the collection amount of regulated household E-waste items in accordance with the reporting guideline. The subsidy rate for E-waste collection shall be determined by applying the equation below.

Subsidy rate (RM/unit)

= Collection/transportation cost (RM/unit) ∗ Adjustment Factor (%)

(a) Collection/transportation cost

The collection/transportation cost per unit shall be converted from the total logistic cost determined in the process of making calculation/computation of recycling fee rate in Section 3.4.1 above. The cost shall be separately estimated for Peninsular Malaysia and the region of Sabah and Sarawak, taking into consideration of the transport distance and the use of different transportation mode.

(b) Adjustment factor

To encourage authorized collectors to collect more regulated E-waste items in complete set with no missing of valuable components and parts, different subsidy rate shall be set for complete and incomplete set of E-waste items by making use of adjustment factor. For incomplete sets of collected E-waste items, this adjustment factor shall be applied to discount its subsidy rate. The adjustment rate shall be determined for each of regulated E-waste item considering the types of components and parts that can potentially be missing and their market values.

(2) E-waste recycling subsidy

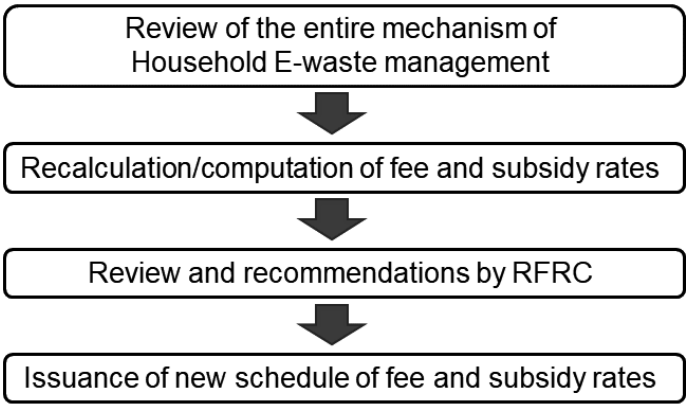
E-waste recycling subsidy shall be provided to the licensed scheduled E-waste recyclers for the purpose of covering recycling cost of scheduled E-waste. The licensed recyclers shall be entitled as the receivers of subsidy by reporting the recycled amount of regulated scheduled E-waste items in accordance with the reporting guideline. The subsidy rate for E-waste recycling shall be determined by applying the equation below.

Subsidy rate (RM/unit) = Recycling cost (RM/unit)

The recycling cost per unit shall be converted from the total recycling cost determined in the process of making calculation/computation of recycling fee rate in Section 3.4.1 above. The cost shall be separately estimated for each regulated E-waste item.

3.5 Review mechanism of recycling fee rate and subsidy rate

RCMB shall, on annual basis, conduct a comprehensive review of the entire mechanism of household E-waste management to determine the fee and subsidy rates for subsequent years. The standard procedure for this review shall be as shown in the chart below.



(1) Review of the entire mechanism of scheduled E-waste management

As the first step of the annual review process, RCMB shall compile all information and data on relevant stakeholders' performance into an annual report. The report shall also include financial statements of RCMB to clarify its revenue and expenditure.

(2) Recalculation/computation of fee and subsidy rates

As a part of the annual report or in another document, RCMB shall provide the results of recalculated/computed fee and subsidy rates based on the previous year's performance of scheduled E-waste management. RCMB also provide information and data on the market trend of recyclable materials, the trend of technology development in E-waste recycling, variation in components, parts, and materials used in regulated E-appliances, and so forth to be considered in this recalculation/computation process.

(3) Review and recommendations by RFRC

Upon submission of the recalculated/computed fee and subsidy rates by RCMB, RFRC shall review all the process with submitted information and data to make recommendations to the Chairman of RCMB on the fee and subsidy rate for the subsequent year.

(4) Issuance of new schedule of fee and subsidy rates

Receiving recommendations from RFRC, the Chairman of RCMB shall make final decision on the fee and subsidy rate for the subsequent year and issue the new schedule of fee and subsidy rates.

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ANNEX:

Proforma Calculation of the Total Cost (logistic, recycling and RCMB Cost), Fee and Subsidy

Cost calculation procedure

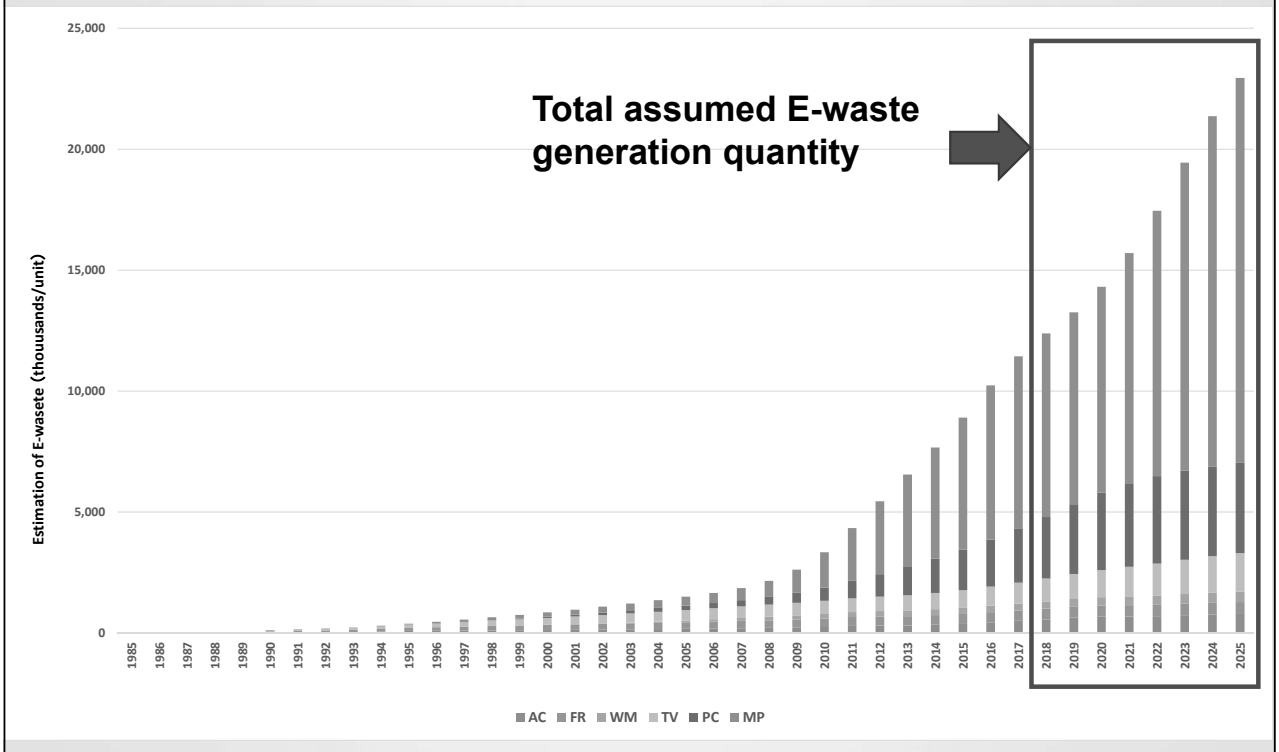
-Total logistic cost (RM/year)-

5. How to estimate the collection cost by item

(Determining collection rate)

- Collection volume is assumed to determine the scale of recycling facility as well as the E-waste to be collected and transported.
- Assumption is made based on the Household E-waste Inventory conducted in 2016 to estimate the potential household E-waste generation in Malaysia.
- It is assumed the collection rate out of the generation volume becomes 10%, 20%, 40%, 60% at first year, second year, 5th year, 10th year respectively.
- It is expected the collection amount is different from the POM amount. FMB considers the disparity and determines the recycling fee amount to be collected in coming years.

(Assuming future generation and collection amount of E-waste)



(Logistical cost: Factors to be considered in the estimation)

- Depending upon the difference in the distance between the locations of generators and recyclers due to its geographical distribution (such as the case of Sabah and Sarawak) current market mechanism may discourage collection and transportation, leading to lower collection rate from such areas.
- Also, the bulky E-waste with low market value of materials (e.g. refrigerators and washing machine) may also discourage the collectors and recyclers to collect and handle.
- Therefore, logistical cost needs to be taken into account when setting the recycling fee.

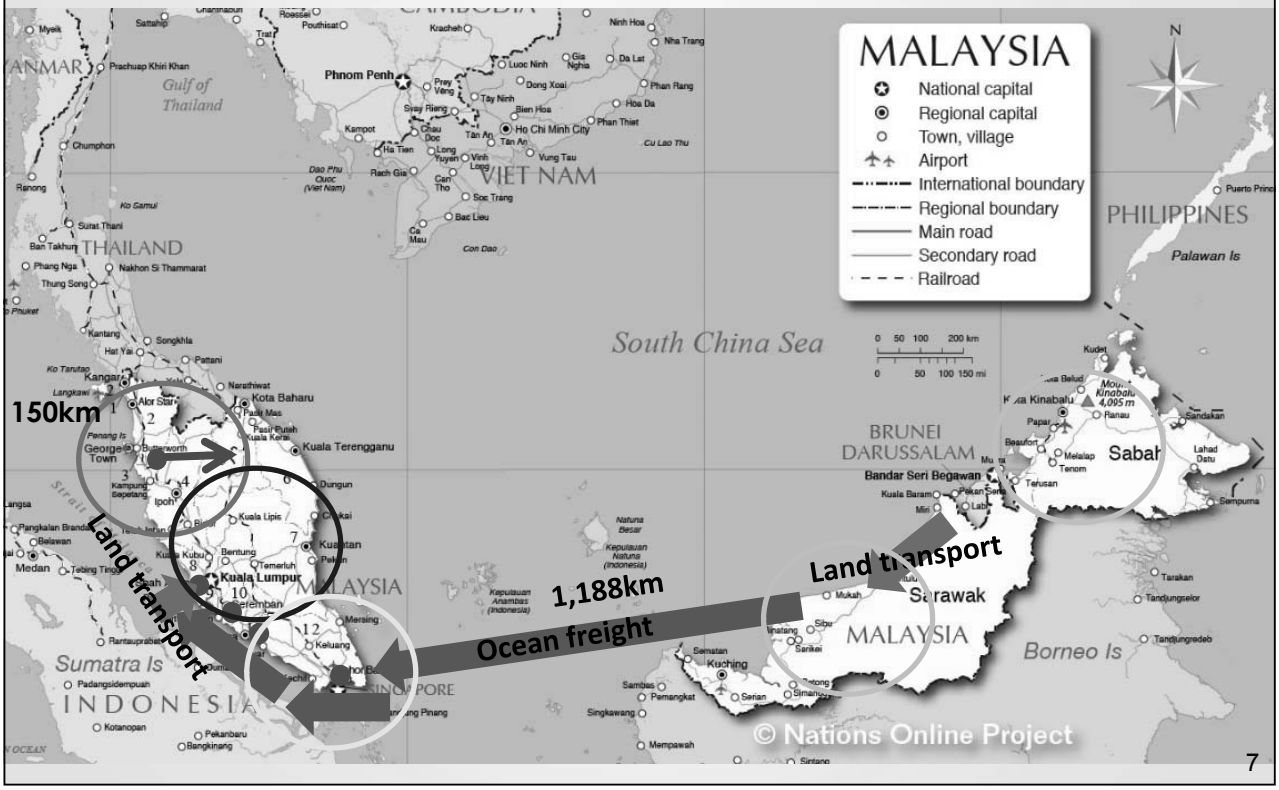
(Logistical cost)

- Assumed collection volume is divided regionally to know the state wise volume. By knowing the state wise volume, logistical cost is calculated.
- Basically E-waste transported and treated at recycling facilities in major regions(Penang, Klang Valley, N Sembilan, Melaka, and Johor) except East Malaysia. Initially all generated E-wastes shipped to Peninsular Malaysia.
- E-wastes generated in other regions are assumed to be transported and treated also at the recycling facilities.

Total assumed E-waste collection volume **X** **Region wise population**

Region wide population	2010 Census Population	
Region	mil	Ratio
Penang	1.9	6.8%
Klang Valley	7.2	26.0%
(KL)	(1.6)	(5.7%)
Melaka	0.82	3.0%
N Sembilan	1.02	3.6%
Johor	3.6	12.7%
Sabah/Sarawak	5.6	20.0%

Household E-waste logistical plan



(State wise assumed collection volume in 2024)

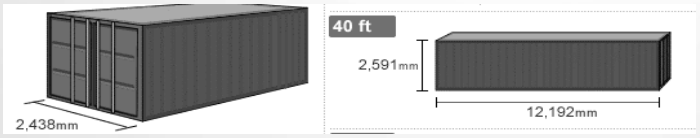
(Unit)

	CRT TV	Flat TV	WM	AC	FR	PC (Desktop)	PC (Note)	MP
Penang	20,441	20,441	11,533	20,808	13,138	55,292	45,239	394,182
Klang Valley (KL+ Selangor)	78,156	78,156	44,096	79,560	50,232	211,411	172,973	1,507,168
N Sembilan	10,822	10,822	6,106	11,016	6,955	29,272	23,950	208,685
Melaka	9,018	9,018	5,088	9,180	5,796	24,394	19,958	173,904
Johor	38,176	38,176	21,539	38,862	24,536	103,266	84,491	736,194
Other states	83,867	83,867	47,318	85,374	53,903	226,860	185,613	1,617,307
Sub TOTAL	**240,480**	**240,480**	**135,680**	**244,800**	**154,560**	**650,495**	**532,224**	**4,637,440**
Sabah & Sarawak	60,120	60,120	33,920	61,200	38,640	162,624	133,056	1,159,360
TOTAL	**300,600**	**300,600**	**169,600**	**306,000**	**193,200**	**813,119**	**665,280**	**5,796,800**

- West Malaysia
  - Logistical cost: RM 500/ 1day(5 ton truck, 8 hour land transportation fee) (Source: Standard transport rates)

Assumed loadable amount on truck

- East Malaysia
  - Logistical cost: RM 12,611/trip (40 ft container sea freight fee) (Source: Average sea freight fare)



Assumed loadable amount in container

- Assumed 5 ton truck can make 300km trip/day(8 hours) and calculated loadable amounts for each item by that size of truck.

Loadable E-waste amount

Item	Average weight (kg/unit)	Loadable amount (unit/truck)
CRT TV	25	50
Flat TV	10	100
WM	40	20
AC	46 (Outdoor 36kg, indoor 10kg)	30
Fridge	58*1	13
PC*2 (desktop)	21.7	20
Laptop	2.3	120
MP	0.1	4,000

***1: Used the average weight obtained in the pilot project on recycling except fridge as most of received fridge lacking compressor. Instead used the average weight from Japan home appliance recycling data**

***2: For desktop PC, CPU weight is 12kg, CRT type monitor is 14kg and flat type is 5.4kg. Thus used average weight of CPU + average weight of both CRT and flat type monitors**

- Assumed 40 ft container from East Malaysia to Peninsular can accommodate following amount per trip
- Included land transportation in East Malaysia and Peninsular after and before the sea freight

Loadable E-waste amount

Item	Average size(cm)	Loadable amount (unit/container)
CRTTV	55 x 80 x 55	240
Flat TV	50 x 90 x 5	2,000
WM	1040 x 58 x 70	120
AC	80 x 80 x 30	360
Fridge	150 x 66 x 66	100
PC(desktop)*1	38 x 53 x 38 38 x 39 x 38	860
Laptop	4 x 28 x 21	29,000
MP	120 x 90 x 90*2	210,600

***1: For desktop PC, CPU and monitor combined size considered. For monitor, CRT and flat type ration is 1:1. Upper and lower figure shows CPU+CRT and CPU and flat monitor respectively**

***2: For mobile phone, jumbo bag is used and 8,100 pcs accommodated per bag and 26 bags assumed to be loaded per container**

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(Logistical cost: formula)

- Logistical cost is for the collection and transportation of Household E-waste. It covers the cost from the generators to recycling facility.
- Logistical cost is calculated by following parameters
  - RM/ton, km: carryable quantity by truck or container
  - Collection and transportation ton, km: regional assumed collection quantity by population distribution ratio
- Basic formula is
  - Logistical cost= RM/ton,km x collection and transportation ton,km.
- This is the source for subsidizing registered collectors.
- Logistical cost is to be set by considering the transaction activity in the market.

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(Unit cost)

- Considered all the parameters and conditions, unit cost for carrying **1 ton for 1 km so-called ton kilo unit cost** for both land and sea freight transportation are calculated
- Ton kilo cost for Peninsular is 1.47(500/1.25=440/300) x weight and average transporting distance per trip
- Total collection cost is RM 19,846K as shown below

Assumed logistical cost for Peninsular

				(0)	(1)	(2)	(3)	(0)x(1)x(2)x(3)
	Logistics rate(RM)	Carry amount(unit)	Distance (km)	ton km(RM)	Collection amount(unit)	Weight (t)	Average distance(km)	Total collection cost(RM)
CRTTV	550	50	300	1.47	240,480	0.025	150	1,322,640
Flat TV	550	100	300	1.83	240,480	0.01	150	661,320
WM	550	20	300	2.29	135,680	0.04	150	1,865,600
AC	550	30	300	1.33	244,800	0.046	150	2,244,000
Fridge	550	13	300	2.43	154,560	0.058	150	3,269,538
PC(desktop)	550	20	300	4.17	650,495	0.022	150	8,944,306
Laptop	550	120	300	6.64	532,224	0.0023	150	1,219,680
MP	550	4,000	300	4.58	4,637,440	0.0001	150	318,824
					6,836,159	0.2034		**19,845,909**

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- For East Malaysia, inland transportation before and after sea freight transportation are calculated by using the parameters
- Ton kilo cost for East Malaysia is 1.77(12,611/6=2,101/1,198) x weight and average transporting distance per trip
- For inland transportation, same unit cost is used
- Total collection cost is RM 101,462K as shown below

Assumed logistical cost for East Malaysia

							(0)	(1)	(2)	(3)	(0)x(1)x(2)x(3)
	Logistics rate(RM)	Carry amount(unit)	Distance (km)	Sea freight	Land(A)	Land(B)	ton km(RM)	Collection amount(unit)	Weight (t)	Average distance (km)	Total collection cost(RM)
CRTTV	12,611	240	1,188	1.77	1.47	1.47	4.7	60,120	0.025	1,338	9,456,901
Flat TV	12,611	2000	1,188	0.53	1.83	1.83	4.2	60,120	0.01	1,338	3,376,438
WM	12,611	120	1,188	2.21	2.29	2.29	6.8	33,920	0.04	1,338	12,335,375
AC	12,611	360	1,188	0.64	1.33	1.33	3.3	61,200	0.046	1,338	12,422,801
Fridge	12,611	100	1,188	3.03	2.43	2.43	7.9	38,640	0.035	1,338	14,287,723
PC(desktop)	12,611	860	1,188	0.56	4.17	4.17	8.9	162,624	0.022	1,338	42,577,478
Laptop	12,611	29,000	1,188	0.16	6.64	6.64	13.4	133,056	0.0023	1,338	5,504,939
MP	12,611	210,600	1,188	0.504	4.58	4.58	9.67	1,159,360	0.0001	1,338	1,500,145
								1,709,040	0.18		**101,461,799**

(Total collection cost)

- Following is the total collection cost required both for Peninsular and East Malaysia

Total collection cost

	Total collection cost(RM)	per unit(RM)	per ton(RM)	Total collection cost(RM)	per unit(RM)	per ton(RM)
CRTTV	1,322,640	5.5	220.0	9,456,901	157.3	6,292
Flat TV	661,320	2.75	275.0	3,376,438	56.2	5,616
WM	1,865,600	13.75	343.8	12,335,375	363.7	9,092
AC	2,244,000	9.17	199.3	12,422,801	203.0	4,413
Fridge	3,269,538	21.15	364.7	14,287,723	369.8	10,565
PC(desktop)	8,944,306	13.75	625.0	42,577,478	261.8	11,901
Laptop	1,219,680	2.29	996.4	5,504,939	41.4	17,988
MP	318,824	0.07	687.5	1,500,145	1.3	12,939
	19,845,909	2.90	396.4	101,461,799	59.37	8,725

Assumed logistical cost for Peninsular

Assumed logistical cost for East Malaysia

Cost calculation procedure

-Total Recycling cost (RM/year)-

6. How to estimate recycling cost by item

(Recycling cost formula)

- Recycling cost covers the followings;
  - Cost for proper dismantling and segregation of hazardous substances in E-waste(a)
  - Cost for proper treatment and disposal for hazardous substances(b)
  - Cost for dismantling and segregation of recyclables in E-waste(c)
  - Cost for proper disposal of the residual materials(d)
- Revenue to be obtained by selling recyclable fractions will be deducted to have net cost of recycling which becomes the source of the subsidy for licensed E-waste recycling facility.
- Basic formula is Recycling cost = (a)+(b)+(c)-(d)
- Recycling cost is to be determined as RM/unit and also converted to RM/ton by using the standard weight of the E-waste, obtained in the pilot recycling test.

(Setting recycling facility scale)

- Considering the E-waste collection amount, scale of the facility is assumed to treat each item hourly, daily and yearly
- Treating volume data is based on the pilot project on recycling conducted in July 2017
- Assumed recycling facility basically operates 8 hours/day, 20 days /month, 240 days /year

Scale of E-waste quantity recycled

Item	Hourly treating units	Daily treating units	Yearly treating units
CRT TV	20	160	38,400
Flat TV	20	160	38,400
WS	50	400	96,000
AC	15	120	28,800
Fridge	50	400	96,000
PC(desktop)	60	480	115,200
PC(Laptop)	60	480	115,200
Mobile phone	90	720	172,800

(Setting standard recycling process)

- Standard recycling process is set for each item to fulfill recycling rate and to ensure environmentally sound management for Focused Materials

Item	Recycling process
CRT TV	•CRT monitor panel funnel part separation—(A) •CRT brushing, roller conveyer, air screwdriver •Phosphor vacuum cleaner
Flat TV	•Back light mercury dust collecting chamber—(B) •Roller conveyer, air screwdriver
WM	•Roller conveyer, air screwdriver, tool for washing tub •Shredder –(C) •Salt water collection equipment—(D)
AC	•Refrigerant fluorocarbon gas and oil capturing devise—(E) •Fluorocarbon gas pipe severance •Roller conveyer, air screwdriver •Shredder for heat exchanger shredding and segregation
Fridge	•Refrigerant fluorocarbon gas and oil capturing devise—(F) •Fluorocarbon gas pipe severance •Roller conveyer, air screwdriver •Shredder (G) +fluorocarbon gas capturing equipment—(H)
PC (desktop)	•Roller conveyer, air screwdriver •Monitor processing equipment
Laptop	•Roller conveyer, air screwdriver, manual dismantling—(I)
MP	•Dismantling table •Roller conveyer, air screwdriver •Shredder—(J)

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(Setting standard recycling process)


(A)RT PF cutting


(B)Back light separation


(C)Shredder


(D)Salt water collection


(E)Fluorocarbon gas sucking


(F)Refrigerant fluorocarbon gas collection


(G)Fridge shredder


(H)Fluorocarbon insulation capturing


(I)Manual dismantling


(J)Shredder

(Setting standard recycling process cost estimation)

- Estimation is made by collecting cost data from existing E-waste recyclers in Malaysia and overseas and quotations from suppliers according to the set standard recycling process
- Process cost covers the equipment and rely both manual and mechanical process. Does not cover the asset property cost such as land, building, shed, etc

Equipment cost

Item	Equipment cost (RM)	Converted JPY (,000yen)
CRTTV	115,000	3,100
Flat TV	97,800	2,640
WM	2,564,520	69,240
AC	3,650,000	98,550
Fridge	13,770,000	371,800
PC(desktop)	105,600	2,850
Laptop	105,600	2,850
MP	210,000	5,670

(Recycling process and number of workers estimation)

Item	#of workers	Requiring number for each process
CRT TV	7	3: PF separation, 4: Dismantling casing, monitor, wire, PCB=total 7
Flat TV	12	10: Back cover, LCD monitor, PCB, cable, monitor separation, 2: Back light separation=total 12
WM	10	8: Top cover, washing tub, cable separation, 2: Washing tub dismantling and collecting salt water from balancer=total 10
AC	17	4: Capturing refrigerant fluorocarbon gas and oil from outdoor unit 10: outdoor unit dismantling(main body, heat exchanger, PCB, compressor and remaining oil capture, Indoor unit segregation (main body fan, motor, PCB, harness cable) =total 17
Fridge	10	1: Type segregation(fluorocarbon or hydro carbon type) prior to process, 4: Capturing refrigerant fluorocarbon gas and oil and dismantling compressor, 4: Segregating main body(plastic, gasket, PCB, cable, 1: Monitoring shredding process =total 1
PC (desktop)	15	8: Segregating main body(casing, PCB, HD, optical disk, harness) 5: CRT monitor PF separation, LCD monitor separation(monitor and back light separation)=total 15
Laptop	15	8: Segregating main body(casing, PCB, HD, optical disk, harness) 5: PF separation, 4: LCD monitor separation(monitor and back light separation), lithium ion battery separation and sealing=total 15
MP	20	15: Segregating main body(casing, PCB, screen, memory, harness), 3: PF separation, 5:lithium ion battery separation and sealing=total 20

(Operational cost estimation for the recycling process)

- Operational cost covers workers cost and utilities
- Workers cost is RM9/hour by considering the workers monthly pay at existing recyclers
- For maintenance and spare parts, 10% of the equipment cost is included

Total workers cost

Item	Workers cost（RM）
CRT TV	120,960
Flat TV	207,360
WM	120,960
AC	293,760
Fridge	207,360
PC(desktop)	259,200
Laptop	259,200
MP	345,600

Utility cost

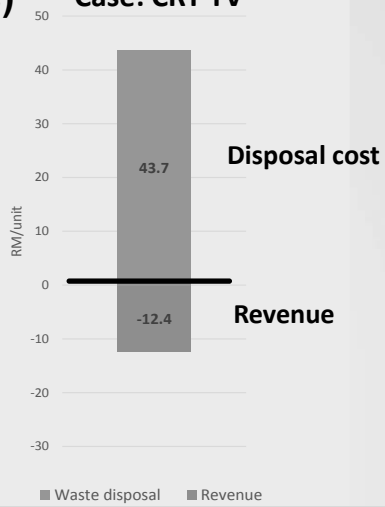
	Unit cost	Source	Usage
Electricity	0.334 MYR/KWh	Tenaga Nasional Berhad 「Tariff Rates」	For powering overall equipment
Fuel	2.18 MYR/liter	Diesel oil price as of April, 2018	For lifting devise in process
Water	2.28 MYR/m3	Suruhanjaya Perkhidmatan Air Negara 「Water Tariff」	For generating steam for activated carbon to capture insulation fluorocarbon

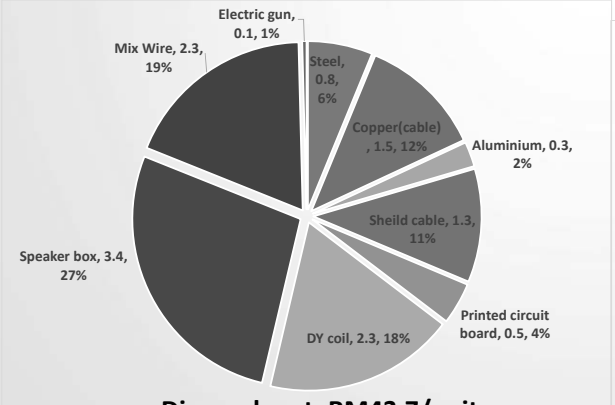
(Cost and revenue for segregated fractions)

Cost and revenue for processed fractions

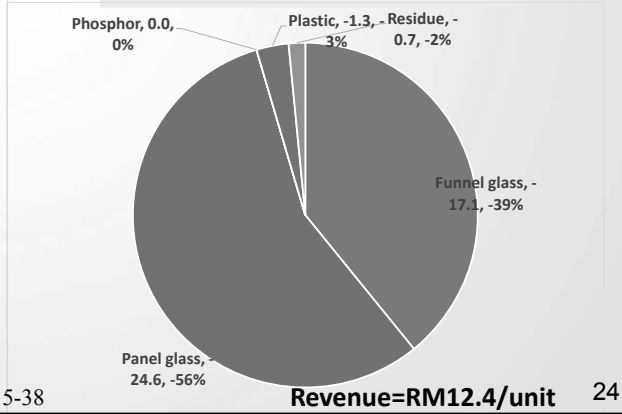
Item	Disposal cost (RM/unit)	Revenue (RM/unit)
CRT TV	43.7	12.4
Flat TV	9	5.4
WM	37	31
AC	11.3	65.3
Fridge	20	39
PC (desktop)	34	19.2
Laptop	2.7	3
MP	0.13	0.03

Case: CRT TV





Disposal cost=RM43.7/unit



Revenue=RM12.4/unit

(Cost and revenue for segregated fractions and general expense)

- Cost for fractions treated at the recycling process is also estimated
- Disposal cost for non recyclable fractions is identified and revenue to be obtained by selling recyclable fraction such as metal and non-ferrous metal are deducted to estimate net recycling cost
- Composition of the fractions in each items is based on the pilot project on recycling
- General expense is also estimated to be used for bags, boxes and containers for proper segregation and storage, insurance and managing material balance data including downstream channel facilities

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(Total recycling cost estimation)

- Following is the total recycling cost required for Malaysia
- There is no difference between Peninsular and East Malaysia in the recycling cost

Total recycling cost

Item	Total recycling cost(RM)
CRT TV	1,555,966
Flat TV	475,857
WM	1,528,085
AC	1,019,245
Fridge	9,059,420
PC (desktop)	6,130,807
Laptop	2,408,045
MP	613,152

(Estimated Recycling cost per item)

- Recycling cost (Equipment cost + operational cost + disposal cost + general expense – revenue) is converted to the unit cost
- For CRT TV case, 10 recycling facilities treating the set quantity are to be deployed. Meaning the total recycling cost is RM 15,560K.
- Unit recycling cost of CRT TV is RM 41/unit (15,560K/384K) and likewise other items are estimated

Recycling cost per unit

Item	Recycling cost per unit (RM/unit)
CRT TV	41
Flat TV	12
WM	16
AC	5
Fridge	49
PC (desktop)	8
Laptop	3
MP	3

7. RFMB cost

(RFMB cost: administration cost of fund management body)

- Recycling Fund Management Board (RFMB) cost as shown below is to be used for proper household E-waste management and operation of the entire mechanism including license application evaluation on behalf of DOE and E-waste recyclers auditing
- POM Information obtained from manufacturers and importers is to be used for determining the fee rate after RFMB cross-examines the accuracy
- RFMB cost is converted to the unit cost by considering the ratio of the item in the estimated total collection volume

Total RFMB cost

Item	Budget (MYR/Yr)
Human resource	9,946,500
Office facilities	3,388,000
Audit expenses	7,051,340
Report, awareness raising	1,150,000
Fee and rate review committee related	48,400
Legal fee	109,000
General admin expenses	3,525,540
TOTAL	25,218,780

8. Providing the subsidy

- Recycling Fee is a source of the subsidy to be provided to the licensed recycling facility and collectors.
- Discount rate factors are applied when providing the subsidy to the collectors and recyclers. 100% of the Recycling Fee will not be provided. Because some collectors sell E-waste to recyclers especially for the E-waste in good conditions with the functionality.
- Discount rate also applies to collectors who bring E-waste missing valuable parts. This is to prevent so called “Cherry picking” activity.
- Different subsidy applies to the E-waste collection from East Malaysia where currently no E-waste recyclers. In future it is ideal to pursue the possibility for local recycling and even pretreatment before shipping entire units for the sake of reducing the cost.
- Subsidy is to be provided every month. RFMB receives the collected, received and treated quantity report from the licensed recyclers and collectors by the end of a month and verifies the accuracy of the data. Afterwards, the payment is done by the end of the next month.

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9. How to charge the Recycling Fee

- Recycling fee is to be charged to the manufacturers and importers of E-products by product types based on their POM amount.
- Manufacturers and importers of E-products are requested to report the POM amount of the previous year(January through December) by the end of January.
- POM amount report can be done either by unit or volume. Conversion figure is to be determined.

(POM estimation)

- Put On Market quantity is estimated with available estimation sources. Figures are used to calculate the unit recycling fee

POM quantity estimation

Item	POM assumed (,000 units)	Source
CRT TV	850	Reed Electronics Research assumed generation as of 2015(CRT and LCD is 1:1)
Flat TV	850	Reed Electronics Research assumed generation as of 2015(CRT and LCD is 1:1)
WM	555	JEMA(Japan Electrical Manufacturers' Association) assumed White goods demand as of 2013
AC	790	JARAC(Japan Association of Refrigeration and Air-Conditioning Contractors) assumed A/C demand as of 2015
Fridge	500	JEMA(Japan Electrical Manufacturers' Association) assumed White goods demand as of 2013
PC (desktop)	552	BMI Research assumed generation as of 2018
Laptop	1,849	BMI Research assumed generation as of 2018
MP	10,770	BMI Research assumed generation as of 2015
TOTAL	16,716	-

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10. Recycling fee

- For setting the recycling fee, total collection cost + total recycling cost + RFMB cost / POM (Put On Market)
- Total collection cost for Peninsular and East Malaysia is converted to the unit cost through weight average calculation considering the population ratio in the region

Unit collection cost

	Total collection cost(RM)	per unit(RM)	per unit(RM)
CRT TV	1,322,640	5.5	157.3
Flat TV	661,320	2.75	56.2
WM	1,865,600	13.75	363.7
AC	2,244,000	9.17	203.0
Fridge	3,269,538	21.15	369.8
PC(desktop)	8,944,306	13.75	261.8
Laptop	1,219,680	2.29	41.4
MP	318,824	0.07	1.3
	19,845,909	2.90	59.37

Population ratio 80% : 20%

Logistical cost		
West Malaysia	East Malaysia	Entire Malaysia average
5.5	108.2	26
2.8	31.6	9
13.8	241.0	59
9.2	121	32
21.2	255.9	68
13.8	139.2	39
2.3	20.9	6
0.1	0.7	0.2

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10. Recycling fee

- Recycling fees to be imposed on manufacturers and importers are shown in the following table

Recycling fee (RM/ unit)

	(1)	(2)	(3)	((1)+(2))*(3)=(4)		(5)	(4)+(5)=(6)	(7)	(6)/(7)
Item	**Collection cost(RM)**	**Recycling cost(RM)**	**Collection amount(unit)**	**Sub TOTAL**	**FMB Total cost (RM)**	**Allocated FMB cost**	**TOTAL(RM)**	**POM(unit)**	**Recycling Fee(RM/unit)**
CRTTV	36	41	300,600	23,146,200	25,218,780	2,277,820	25,424,020	850,000	**29.9**
Flat TV	13	12	300,600	7,515,000	25,218,780	2,277,820	9,792,820	850,000	**11.5**
WM	84	16	169,600	16,960,000	25,218,780	1,285,157	18,245,157	555,000	**32.9**
AC	48	5	306,000	16,218,000	25,218,780	2,318,739	18,536,739	790,000	**23.5**
Fridge	91	49	193,200	27,048,000	25,218,780	1,463,988	28,511,988	500,000	**57.0**
PC(desktop)	63	8	813,119	57,731,449	25,218,780	6,161,473	63,892,922	552,000	**115.7**
Laptop	10	3	665,280	8,648,640	25,218,780	5,041,211	13,689,851	1,849,000	**7.4**
MP	0.3	3	5,796,800	19,129,440	25,218,780	4,392,571	23,522,011	10,770,000	**2.2**
			8,545,199					**16,716,000**	

11. Adjustment of fund management surplus

- Recycling fee is collected based on the POM amount by each manufacturers and importers. Quantity of household E-waste to be recycled at household recycling facilities is not equal to the POM because of various factors such as deadstock and leakage of E-waste.
  - Recycling fee to be charged
    - Collection amount for the fee to be determined considering the assumed collection volume, Instead of 100% of POM equivalent fully charged
- Therefore, there might be the surplus of the fee collected and this needs to be taken into consideration for setting the recycling fee.
- When setting the recycling fee, the cost eventually needed in the future, considering the life span of the E-appliances need also to be taken into consideration.

12. Fee review mechanism

- Recycling Fee rate is to be reviewed periodically
- Fee review is conducted, considering the market trend of recyclable materials, relevant technology development, change in the components and materials used in the designated E-appliances and other factors.
- In the initial stage E-waste amount to be collected and recycled may not be large enough to expect scale of economy. When more amount collected and recycling facility has become more experienced and efficient, cost for recycling is supposed to be reduced. Additionally, when it becomes more efficient, it leads creating more market and producing more revenue for some fraction which may not exist without enough volume. Therefore, it is important for RFMB to monitor the cost and revise it on regular basis.
- RFMB also closely monitors how the fee collected is utilized to ensure for avoiding over charge and false reporting and improper spending.

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