

Terms of Reference for Inventorization of of e-Waste

I. OBJECTIVE

Electrical and electronics industry is one of the world's largest and fastest growing industry. The ever changing technology and the increased applications of the electrical and electronics in day to day life has led to increased growth of utilization as well as obsolescence and discarded products. As a result, the modern society has to face the menace of e-waste being generated and that is being discarded into the environment. E-waste has been defined as "Waste Electrical and Electronic Equipment (WEEE), whole or in part or rejects from their manufacturing and repair process, which are intended to be discarded". The e-waste consists of various heavy metals and halogenated plastics especially brominated, if the waste is not disposed properly, they will enter into the food chain and ecosystem impacting the health of living beings.

Ministry of Environment & Forests (MoEF) notified e-waste (Management and Handling) Rules, 2011, which came into force w.e.f. 1.5.2012. The major objective is to ensure environmentally sound management of e-waste, due to its exponential growth. These rules apply to every producer, consumer or bulk consumer involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or components as specified in Schedule-I, collection centre, dismantler and recycler of e-waste.

The main aim of the project is to conduct a detailed inventorisation with the objective to identify and quantify the Manufacture/production, sale, purchase and processing of electronic and electrical equipment in the specified locations of the state of Andhra Pradesh. Further, the WEEE generating consumer/bulk consumers, collection centers of e-Waste, dismantlers of electrical / electronic equipment, processors /recyclers of e-Waste.

The market supply chain in the study area has to be documented with full details. The top to bottom approach i.e cradle to grave (from production, consumer and

dismantling/recycling) shall need to be quantified with the list of facilities and methods that are being employed to collect, dismantle and recycling of the e-waste.

The data generated shall need to be authentic with necessary backup of records. The data generated shall be useful in understanding the spatial distribution of the pollution potential due to e-Waste in Andhra Pradesh. The advanced application of this project includes optimum routing of e-Waste, setting up of centralized processing and recycling facilities. This data will also be useful for effective decision making by the Government of AP and regulatory agencies.

II. TASKS

A. Manufacture/Producers, sale, purchase and processing inventory:

1. An inventory of the manufacturers/producers, sale, purchase and processing of Electrical and Electronic Equipment and related accessories manufactured as well as imported into the study area with GPS details.
 - a. List of Manufacturers in the state of Andhra Pradesh for Electrical and Electronic equipment and the handling of waste generated during the manufacturing.
 - b. Identifying the Carry & Forward agents, Dealer and stockists who are involved in trade of Electrical and Electronic equipment and accessories for assessing the annual sales including those imported.
 - c. List of assembling units and the associated market chain (purchase and sale) with the annual production and the waste handling mechanisms
2. An inventory of implementation of Extended Producer Responsibility by the manufacturers in compliance to the E-waste rules.
3. The E-waste factors (Plastics, metals, etc.,) for items given in schedule-I of E-waste rules 2011 has to be derived /gathered (authentic sources) for each

product of particular make and model. This inventory has to be made for all the popular brands available in the market.

4. The estimated average life /obsolescence rate of each electrical and Electronic equipment for items given in schedule-I of E-waste rules 2011
5. The statistics of the last five years of production, rejects, obsolete and any other related has also to be gathered for the preparation of trend and future projections.

B. Consumer/Bulk consumer inventory:

6. The data from the Bulk Consumers of Electrical and Electronic Equipment, such as Central and State Government Departments, Public Sector Undertakings, Banks, educational institutions, multinational organisations, international agencies and private companies (covering the IT, BPO and other allied service sectors) that are registered under the Factories Act, 1948 and companies Act, 1956.
 - a. An inventory of the Electrical and Electronic Equipment being used along with age, make and model by the bulk consumers as per schedule -I. The maintenance of the records as per E-waste Rules 2011 has to be documented.
 - b. Detailed information on the quantity of E waste generated, mode of disposal, reuse, refurbishing, recycling and average life span and other related information has to be collected.
 - c. Details of EPR being assured by the producer and the modus operandi has to be documented
 - d. Details of recycler/dismantler to whom the waste is being disposed and the quantities of waste disposed so far.

7. The data from the individual consumers need to be assessed by undertaking a sample (sample size to be backed with statistical tools) survey basing on different sources viz., census data, Dealers data, APSEB data, etc.,
 - a. The average life span of the equipment and the mode of disposal in general has to be assessed by a market survey in different economical groups in the study area
 - b. An inventory of the refurbishment/repairers and the waste handling mechanisms
 - c. The market chain and linkages has to be assessed and documented

C. Collection centre, dismantler and recycler of e-waste

8. An inventory of the systems, that are being followed by the authorized units in collection, dismantling, reuse and recycle has to be carried out along with the pollution control equipment that are in place.
9. An inventory of the unregistered units, organizations, or individuals has to be carried out in the study area. The quantities and type of waste handled by them has to be studied.
10. Detailed information on the processes adopted for collection of electronic waste, such as door-to-door informal collection, bulk purchase by registered entities, or voluntary donation to collection centers, etc.
11. Number of employees in each organization as well as Individuals that collect, purchase, process, reuse, resell, dismantle, refurbish, recycle, or otherwise handle used WEEE.
12. Study the market potential for different components of e-waste, recovery of plastic, metals and recycling of the e-Waste, including which components drive the greatest profits, which components cannot be recovered and present losses,

and who/where the primary buyers of recovered materials are, e.g. Indian IT manufacturers, foreign commodity markets, etc.

13. The consultant shall calculate the total quantity of e-Waste generated and processed, recycled in the study area. The consultant shall also identify the sources of these items, including if they come from other states or countries. If possible, items should be documented as having been purchased as new equipment or on the secondhand market; these original sources should also be documented.

D. Others

14. The geographical coordinates (latitude/longitude) of the units inventorised have to be collected in a mutually agreed proforma.
15. This data will initially be mapped on a GIS platform at 1:25,000 scale; further mapping at 1:10,000 scale can be taken up for priority sites identified after initial data collection.
16. The consultant shall also take up the mapping of e-Waste movement for different management models presently being followed from source to final disposal.
17. The consultant shall also provide estimates of future e-Waste generation in the State of Andhra Pradesh, based on a sound forecasting model.
18. The consultant shall formulate / prepare recommendations for effective e-Waste management in Andhra Pradesh, in short-term and in a sustainable long-term manner.
19. To impart hands on training while inventorising, compiling the data and report preparation and e-waste management to the staff of APPCB.

20. To study the existing business models/practices and to provide appropriate recommendations to support the endeavor of disposing the e-waste in a safe way

III. Study Area

- a. The entire state for the purpose of Task listed under A & D
- b. (i). For the Task listed under B & C major districts of Andhra Pradesh viz., Krishna, Visakhapatnam (Jurisdiction of VUDA) & Chittoor and three municipal corporations namely Kurnool, Rajahmundry and Nellore.
(ii). For the Task listed under B & C sample study for all the remaining ten districts and to extrapolate the data for entire state.

IV. DELIVERABLES

The entire assignment is expected to follow all guidelines of the World Bank and necessary approvals may be taken from APPCB whenever required. The assignment shall be for a period of 12 months and the delivery schedule shall be as follows :-

1. Inception report within one month from the date of work order
2. Preparation of formats and data base structure in consultation with APPCB to incorporate in the existing modules of APPCB for maintaining the data base.
3. Preliminary study report with list of units identified for field - within 2 months from the dt. of commencement
4. Report on Manufacture/Producers, sale, purchase and processing of electrical and electronic equipment within five months from the date of work order
5. Report on Consumer/Bulk consumers of e-waste within 7 months from the date of work order
6. Report on Collection center, dismantler and recycler of e-waste inventory within 9 months from the dt. of commencement
7. Draft final report - within 10 months from the date of commencement

8. Workshop on e-waste inventerisation, methodologies followed and outcome of the study in the 11th month
9. The inventory of the existing study to be uploaded in the software prepared by the consultant to maintain the database and train the staff of APPCB.
10. Final report after incorporating changes suggested by the Board – within 12 months from the date of commencement.

All deliverables shall be provided in colour hard copies (3 copies for draft version and 10 copies of final version) and also in electronic form.

The data collected shall be thoroughly verified and checked. It is suggested that they may compare the data collected with the standard inventories (conducted elsewhere) and also with manufacturers data like MAIT.

The consultant shall finalize the data in consultation with APPCB. Symbology shall be created in ArcGIS Desktop version as per the specification of APPCB – GIS.

V. DURATION OF THE PROJECT:

The duration for completion of the project is one year.

VI. QUALIFICATIONS AND EXPERIENCE:

- The team shall be headed by an experienced Environmental /Civil engineer/ Hazardous Waste expert / Metallurgical / process expert with experience in managing large data collection and collation projects with more than 15 years' experience and who is well versed in surveying with GPS system and GIS.
- The GIS Specialist shall co-ordinate with APPCB in thematic layer preparation and database development. The GIS specialist should preferably have prepared such data base and thematic layers in the past

- The team members should have one or two qualified Chemical/Metallurgical engineers well conversant with recovery processes of metals especially in e-waste.
- The team members should be knowledgeable in surveying and mapping and Inventorization of Industries and shall have experience in characterization of e-Waste and shall be well versed with the local conditions of the district/state. Firm should have sufficient numbers of qualified staff to undertake such assessment.