



CAPACITY BUILDING OPPORTUNITIES AND END OF LIFE MANAGEMENT CRITERIA FOR A VOLUNTARY CONSENSUS STANDARD

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A joint collaboration between
Centre for Responsible Business
and the
Green Electronics Council

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SECTION 1: CRB & GEC PARTNERSHIP

1.1 About Centre for Responsible Business:

Centre for Responsible Business (CRB, www.c4rb.org) is an independent centre of excellence, working with business and stakeholders to promote responsible business strategies, policies and practices across sectors. It has subsequently evolved into an independent organisation, working in four programmatic verticals i.e. Action and Policy Research, Training and Capacity Building, Customised Advisory Services and Technical Assistance, Fora. Over the years CRB has facilitated multi-stakeholder led discourses on sustainable business in these sectors (Agro-business, Textiles, Apparel, Electronics, Mining, etc.).

CRB's activities and interest is showcased each year at its annual conference 'India & Sustainability Standards' – a multi-stakeholder event covering a number of sectors and thematic areas. This conference (www.sustainabilitystandards.in) brings together Indian and international policy-makers, standard setters, businesses and other concerned practitioners to dialogue on sustainability challenges, using a result-based approach.

1.2 About Green Electronics Council

The Green Electronics Council (GEC, www.greenelectronicscouncil.org), is a not for profit organisation, headquartered in Portland, Oregon, US, that leverages institutional purchasing power to achieve a world in which only sustainable information technology (IT) products are designed, manufactured and purchased. GEC is known for managing EPEAT, the leading global IT sector ecolabel which is based on balanced voluntary consensus standards.

The EPEAT program provides independent verification of IT manufacturers' product claims and all products that meet the EPEAT criteria can be found on the online EPEAT Registry. Private and public sector purchasers from around the world use EPEAT as part of their sustainable procurement decisions. Currently, EPEAT covers over 4000+ products from more than 65+ manufacturers and is used by purchasers in 43 countries. The Green Electronics Council is committed to the use of voluntary consensus standards to increase sustainability globally.

1.3 Introduction to CRB & GEC Partnership:

In India, e-waste is primarily managed by the informal sector and there is high dependency on informal sector to manage IT/electronics products at end of life. GEC and CRB have formed an institutional partnership with the aim of bridging the gap between the state of policy and current end of life practices by exploring capacity building opportunities for end-of-life management of IT/electronics equipment.

One possible path to capacity building of informal sector is using the power of purchasers and engaging the producers in the creation of end-of-life requirements, or criteria, in an *India IT Product Sustainability Standard* that would leverage the resources of IT manufacturers. These voluntary consensus criteria would link to the Sustainable Development Goals (SDGs).

IT product sustainability standards exist globally and have been shown to move the industry sectors towards more sustainable practices. However, the existing IT product sustainability standards were developed to reflect the end-of-life management infrastructure and workforce challenges faced by countries such as the United States and Members of the European Union. An IT product sustainability standard for India could include capacity building criteria for end-of-life management that take into consideration the unique situation and challenges in the country, as explained in the earlier chapters.

1.4 Introduction to the ‘White Paper’

CRB has initiated a project in partnership with Green Electronic Council (GEC, USA) on ‘IT Products Sustainability Standard in India’. One of the objective is to design a White Paper on End-of-Life Capacity Building Criteria for IT Products in India to be developed based on interactions and inputs received on the issue from key multiple stakeholders including government representatives, industry association representatives, businesses (IT and electronics producers), recyclers including agencies, sector experts, NGOs working on the issue. The research explored ways to promote workable solutions (good practices) for producers/industry actors so that such ‘knowledge’ is available for other industry actors to emulate.

This white paper provides necessary ‘background information’ to facilitate the development of voluntary consensus standard (starting with a set of criteria) that producers must meet, reflecting the priorities and challenges within India for responsibly managing end of life IT products. The criteria will focus on building the capacity of supply chain actors including the

informal sector, linking to SDGs and can be incorporated into an India specific IT product sustainability standard (drawing elements and experiences from the EPEAT standard developed and implemented by GEC). However, to meet the overall goal, following short term objectives were set:

- To identify the gaps and challenges pertaining to end of life management of e-waste in India
- To identify possible topics for end of life capacity building criteria for IT products in India
- To assess if/how each possible capacity building topic area supports the SDGs (8, 12)

CRB and GEC are especially grateful for the efforts of Richa Prasad (CRB), Pamela Brody-Heine (GEC) and Priyanka Porwal (Project Consultant) for the development of this report.

SECTION 2: BACKGROUND

2.1 Background

Rapid economic growth, along with urbanisation and growing demand for consumer goods, has increased both the production and consumption of electrical and electronics equipment (EEE) in our society. Currently the production of electrical and electronic equipment is one of the fastest growing manufacturing activities globally. This remarkable increase in use of EEE and consumer behavior has led to exponential increase in volume of *e-waste*. Rapid technology change, low initial cost, high obsolescence rate has resulted in this fast growing problem around the globe. It is a crisis not only of quantity alone but also one that emanates toxic ingredients, posing threat to occupational health of workers as well as the environment.

E-waste broadly contains two types of materials. One is of hazardous nature, due to the presence of heavy metals and toxic substances such as lead, arsenic, selenium, cadmium, mercury, PCBs (polychlorinated biphenyls) etc. Secondly it contains a variety of valuable materials (precious and strategic metals) such as gold, silver, platinum and copper. Both these attributes make it essential that this waste stream is handled in an appropriate manner. Scientific recovery and extraction of these toxics as well as valuable items becomes critical, especially to avoid environmental and health hazards on one hand and to ensure effective recovery of valuable resources (materials).

India ranks fifth in terms of e-waste generation across the world; discarding 1.7 million tonnes of EEE in 2014 as per UN report. Global e-waste generation reached 41.8 million MT in the same year. In a 2016 study it was estimated that e-waste generated in India was nearly 1.85 million MT which could increase at a compounded annual rate of 30% till 2020. With innovation in technology leading to lower obsolescence rate for many electronic products, e-waste generation is likely to keep mounting every year.

Existing management practices related to e-waste in India are reasonably poor and are proving to be a challenge. Though the regulatory framework was put in place few years back to improve the system, lack of proper implementation remains a reality. Currently more than 90% of this hazardous waste stream is handled and processed by the informal sector, increasing the risk of occupation health and of other local environmental impacts. The current practices of e-waste management in India suffer from a number of challenges and drawbacks.

2.2 E-Waste in India: Current Scenario and Concerns

Since 2011 India has had a legal framework to manage and handle its e-waste. Prior to this, e-waste was handled and processed mostly by the informal sector in the country, mainly located in and around urban centres. These workers are dominated by urban poor (many migrants) with very low literacy and awareness regarding hazards related with unsafe handling of e-waste. Among the urban poor, there is a large number of women and children engaged with electronic waste collection and handling. These workers are mainly migrants, who live unsafe work conditions and handle hazardous materials with little or no information about their ill effects and/or personal protection.

The Central Government notified an amendment to the E-waste (Management) Rules, in March 2016 which came into force October 2016. Extended Producer Responsibility (EPR) is one of the critical and important components in the framework introduced by this new legislation, which stipulates that the Producers of EEE set up a system to collect and manage the end-of-life electronic products (e-waste). The rules also stipulate that e-waste needs to be processed in environmentally safe manner by licensed units. The amendment widened the coverage of the e-waste handling responsibility to all players in the value chain from producers of equipment, components, consumables, and spare parts, to dismantlers and introduced financial schemes /economic instruments for encouraging implementation of the rules.

The regulatory amendment was expected to change many things on the ground. Establishment of extensive collection network to world class recycling facility- the new e-waste regime was aimed to bring in larger fractions of this new age e-waste to a clean channel, thereby preventing environment damage, human exploitation and ensuring efficient resource recovery.

Disappointingly, majority of e-waste generated in the country still flows into the informal sector, being recycled in conditions which are detrimental to both human health and environment. Though the licensed recycling infrastructure saw a big upturn in terms of numbers after the rules, with the facilities licensed to process e-waste currently standing at more than 150, most of the facilities are far from being world class. The existing facilities have also failed to divert waste from the informal sector and run below capacities. One big reason has been existence of very few collection networks set up by the producers. Though

some producers have *Take-Back Systems* and collection points, they are grossly inadequate to serve the large population of users today.

2.3 Existing System of Informal Sector

In India, recycling is largely undertaken by the informal sector. A certain community of people is often seen to be engaged with this work. In the current system, they are also engaged by formal waste management agencies. They are the backbone of the waste management system in India and play a critical role in making recycling of e-waste possible and business-worthy.

In a study conducted by MAIT and GIZ it was reported that 94% of the manufacturers did not have an IT/electronics disposal policy in place and most of them disposed their e-waste through scrap dealers, who in turn sell their waste to recyclers in the informal sector. Essentially, recycling in informal sector involves a list of steps such as (manual) dismantling and sometimes extracting precious metals for metal recovery. The e-waste trade chain in India comprises of aggregators who purchase scrap from households and businesses, followed by segregators who dismantle the components manually and sell off to recyclers who process the waste further for extraction of precious metals. The waste aggregators and segregators form an integral and important part of the e-waste trade chain as far as the channelization and collection of e-waste are concerned.

There are highly networked and skilled workers engaged in sale/purchase and dismantling. The aggregators and segregators also have skills to extend the product's life cycle by reusing certain components. By extending the life of old electronics, they prevent pollution by saving the amount of energy required to make new products, reduce carbon footprints and enhance the penetration of IT and consumer durables among the economically disadvantaged people. Further, the informal sector plays an extremely important role in ensuring material security (reclaiming valuable metals), and thereby contributing towards circularity in the Indian electronics/IT sector.

2.4 E-Waste Management Rules, 2016

The e-waste management and handling rules of 2011 was the first attempt to try and move towards managing e-waste problem for India by introducing a public regulatory regime. This led to a spurt in the number of authorized recyclers in the country in the private sector. However, over a period of 5 years the private sector realized that they were competing against the informal sector which was formidable in nature owing to its presence across the country as well as a formidable collection network.

The cornerstone to the amended E-Waste Management Rules, 2016 is introduction of the concept of EPRs for producers to ensure e-waste is collected from disposers and sent across to authorized recyclers. As per this new regulation, producers are supposed to meet the EPR targets, set up proper infrastructure and spread awareness amongst key stakeholders to ensure proper collection and disposal of e-waste. For manufacturers to meet their recycling targets, they will need to engage with the informal sector collectors. In order to integrate informal sector into e-waste supply chain, producers need to ensure that informal sector get access to material and are willing to shift to clean recycling technologies, thereby reducing overall environmental and health hazards caused by handling of e-waste.

This is however, a major challenge for producers considering that they do not have the experience of working with the informal sector who are a champion at collection of e-waste across the country. The producers also understand that it is a livelihood of the informal sector and hence if one has to meet targets then one has to ensure that they are able to work with the informal sector. The relationship thus developed will be based on economic considerations which can also lead to financial drain for the producers.

The amended E-Waste Management rules, 2016 have augmented the level of accountability for producers. As it can be seen from the following flow chart, the revised rules takes into consideration the role of all the actors in the supply chain of e-waste, viz. manufacturers, dealers, refurbishers and producer responsible organisations (PRO).



Source:<http://www.sustainabilityoutlook.in/content/e-waste-management-india-new-rules-old-problems-756361>

SECTION 3: METHODOLOGY & STAKEHOLDERS

In order to achieve the overall aim it was important to understand the views of relevant stakeholders in the e-waste supply chain. Relevant stakeholders were identified and interacted with, to gather their inputs/perspectives in the course of developing this white paper.

3.1 Process & Methodology

In order to meet the objectives, it was important to establish the WEEE value chain linking different stakeholders (SH) to understand the current scenario of e-waste management in the country, status of implementation of the rules, need of capacity building and required instruments for setting up capacity building criteria for end of life of IT products.

The methodology adopted for the study is presented below in figure 1:

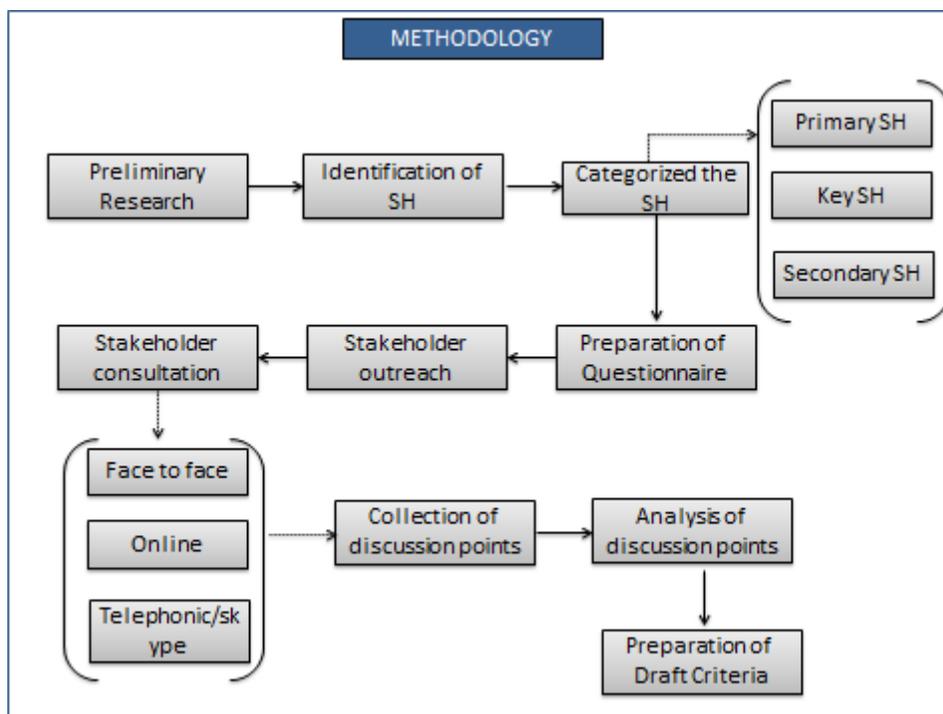


Figure 1: Methodology of the study

The study was based on stakeholder consultation in the form of face-to-face interviews with key stakeholders. In order to understand the gaps that existed in proper implementation of the rules all such stakeholders were identified who were directly affected by the rules and need to comply with the guidelines. The stakeholders were identified in 2 separate buckets which consisted of one who need to meet compliance within the rules and the other who were to implement the same. A 3rd set of stakeholders were those who not directly covered within the rules but interested in its implementation and compliance. Producers, Bulk Consumers, recyclers and Industry Associations were identified along with key resource persons at the Central Pollution Control Board (CPCB) and some State Pollution Control Boards (SPCBs) for valuable inputs. The three category of stakeholders approached are as follows-

- *Key stakeholders*- The actors, who are able to use their skill, knowledge and position of power and significantly influence the project
- *Primary stakeholders*- Primary stakeholders is applied to those who are directly affected by the project
- *Secondary stakeholders*- The involvement of this set of stakeholders in the project is indirect or temporary

The study started with the understanding of the E-waste (Management) rules, 2016 and its implications towards stakeholders in the value chain. Discussion guides and questionnaires were developed to guide the process to interviews with resource persons. **Figure 1** illustrates the schematic diagram of approach & methodology adopted for the study. The following fields of action were taken in order to develop white paper for end of life management of IT products in India -

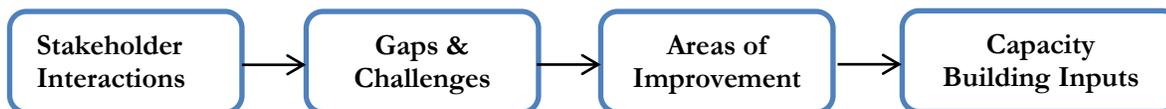
- Secondary research on best practices for capacity building
- Understand the current regulatory framework
- Regulatory compliance for all stakeholders in the value chain
- Required tools for EPR compliance
- Need of informal sector to meet the collection target
- Linkage between all stakeholders to meet the e-waste collection target for producers
- Study of existing e-waste management system in the country
- Feedback from different stakeholders in the value chain
- Assessment of technology and infrastructure in the country

Some of the key stakeholders contacted under the study includes:

1. MeitY
2. GIZ
3. CPCB
4. SPCB, Bhubneswar
5. Dept. of Environment, Govt. of Delhi
6. MAIT
7. CEAMA
8. Civil Society/NGO: NIUA, Chintan Research & Action Group
9. Strategos Advisory Pvt. Ltd
10. Sofies Group
11. E-Waste Recyclers: E-Parisara
12. Producers: HP(E), Acer, Ricoh India Pvt. Ltd.
13. Key Bulk Consumers such as LIC of India, NIELIT etc.

3.2 Methodology followed for building capacity criteria

To achieve capacity building criteria the following approach was followed in the study. Through stakeholder interactions the key issues in e-waste sector were identified and relevant areas of improvement were suggested. These were further used as inputs in designing the capacity building criteria. The criteria developed in accordance to all actors of e-waste supply chain.



While designing the capacity building criteria following approach was used-

For designing each criterion, a linkage between the gaps and challenges, areas of improvement and respective criteria was established. This linkage was crucial as it could provide more clarity on respective criteria.



SECTION 4: CAPACITY BUILDING NEEDS OF STAKEHOLDERS

Discussion with the stakeholders revealed some key challenges or gaps in end of life management of electronics, which have been presented here below. Also, suggested areas of improvement that were also suggested by the stakeholders have been provided.

The three broad categories of gaps were:

- Policy and implementation gaps
- Infrastructure gaps
- Knowledge and capacity gaps

The areas of improvement suggested by the stakeholders can be segregated into:

- Policy and implementation level
- Market based instruments

This provides key inputs about capacity building needs of different stakeholders, from an end of life management of electronics in India. This has been presented here below.

4.1 Capacity Building Needs and Tools for Stakeholders

Bulk Consumers:

- *Linkage between manufacturers and bulk consumers:* This will need producers and bulk consumers to develop procurement contracts which will enable that once the electronic item reaches end of life (e-waste) then there is a take back mechanism which will ensure that the material can be channelized for environmentally safe recycling. Furthermore, the producer can replace electronic items which have been discarded as e-waste from the bulk consumers as per the rates which can be negotiated. The new products can incorporate a DRS which will enable and ensure that the bulk consumers will give back the material to the producers as well as receive some money in such transactions as well.
- *Awareness and capacity building in bulk consumers:* Introduction of EPR, responsibility of bulk consumer, Take- Back mechanism, procurement procedure which should reflect the disposal mechanism in the organisation: Recyclers should also be brought in at this stage whereby their process could be audited by a bulk consumers in case they so wish to. This will also be reflective in form 2 which will be

filled in by the Bulk consumer at the time of disposal of e-waste and hence pass on the knowledge to the SPCB/CPCB where these forms are submitted.

- Safe storage with the precaution of breakage, segregation, separate storage (e.g., for intact fluorescent and other mercury containing lamps): Best practices should be developed such that capacities can be developed for the bulk consumers as well as the informal sector. This could also help in providing job opportunities to the informal sector which has been dealing with e-waste for quite a few years.
- Maintenance of record of e-waste generation in Form-2: How to fill in the forms? How to map the material which is being discarded and will become e-waste? How to ensure that procurement guidelines can be embedded with clauses which will ensure producer responsibility to deal with the e-waste generated?
- File annual return in Form- 3 to State Pollution Control Boards (SPCBs)
- Checklist for selection of authorised recycler: How to audit a recycler? What are the key points to be verified in the value chain for recycling in e-waste
- Monitoring mechanism while handing over the e-waste to the recyclers: Monitoring framework, How does one collect data? How does one analyze data? How does the feedback action loop work?
- The capacity building criteria can also be used to train officials in the SPCBs and PCCs on how they should be evaluating e-waste across stakeholders in the value chain.

Tools:

- ✓ Workshop and awareness session: A ToT kit which can be the basic content for the trainers in the workshop who can assimilate the same and then train others
- ✓ Hands on training on record keeping, tendering procedure for safe disposal: A one time draft which can be vetted by the DGS&D for all sort of electronic item procurement by PSEs.
- ✓ Case Studies and best practices

Recyclers:

- Linkage between manufacturers and Recyclers: Form 3 and Form 2 which will enable to understand the quantum of material which flows from the manufacturers to the recyclers. Furthermore, under EPR whatever has been collected by the PRO or other

agencies which have authorisation from the manufacturers and then pass on to authorised recyclers.

- Capacity building for record mapping of the SPCBs and the PCCs so that they are able to get an account of what has moved in the value chain to be recycled and how it fits into the EPR plans that have been vetted and approved for the manufacturers by the CPCB.
- Checklist for selection of authorised recycler: Protocols that can be established in terms of key elements of the process which are with the recycler. In case there are technologies which are not available then the same will move to other actors in the value chain which needs to be studied such that environmentally sound recycling takes place.
- Monitoring mechanism while handing over the e-waste to the recyclers
- Set the protocol for the contract mechanisms
- Minimum quantity of the material for recycling
- Agreement on the set rates for e-waste recycling
- Monitoring mechanism of e-waste recycling
- Standards for e-waste recycling for ex: environment compliance, data destruction etc.
- Certification on recycling (e.g. using the R2 recycling standard, etc.)
- Business relationship
- It is also important to understand the business models of recyclers to understand the volume of e-waste that will make them cover the costs of running the business. Furthermore, random checks are important to ensure that the material is being recycled proper as per the standards that have been agreed to at the initiation of the contract. In most cases technology for some aspect of e-waste recycling is not available with the recycler. It is therefore important that the recycler has tie-ups with other recyclers who are authorised and have the technology to recycle such elements in e-waste.

Tools:

- ✓ Workshop and awareness session
- ✓ Hands on training on record keeping, tendering procedure for safe disposal, Occupation Health and Safety while handling e-waste
- ✓ Case Studies and best practices

Individual Consumers:

- Right strategy to ensure effective implementation of EPR and e-waste collection with individual consumers
- Introduction of EPR and take-back mechanism
- Capacity development and training of target audience for ex: Schools, youth, RWA to target the individual consumer
- Right approach to reach out to the community
- Leverage the awareness programme of MeitY, participate for maximum reach out to the audience
- Linkage with collection centre/ recycler/ formalized informal sector (authorized by producer for e-waste collection)

Tools:

- ✓ Awareness campaign through youth engagement, use the tools like creative art, dance, wall painting, theatre and role play etc.
- ✓ Promotional audio/video/ add film at cinema halls, TV channels and Radio
- ✓ Street play in public place
- ✓ Connect for e-waste disposal: provide details of nearest collection centre/ collection points

Informal Sector:

What?

- Overview of e-waste, Current status of e-waste generation in India
- Formal Recycler, mechanism of recycling, legal aspects, Infrastructure etc.
- E-waste Management Rules, 2016
- Environmental and Occupational Health & Safety Issues

- Requirement of formalisation
- Collection of e-waste- Act as collection agent/ collection points on behalf of Authorised recycler or Producer/s
- Soft skill training programme
- Setting up Business plan for informal sector
- Monitoring and evaluation

How?

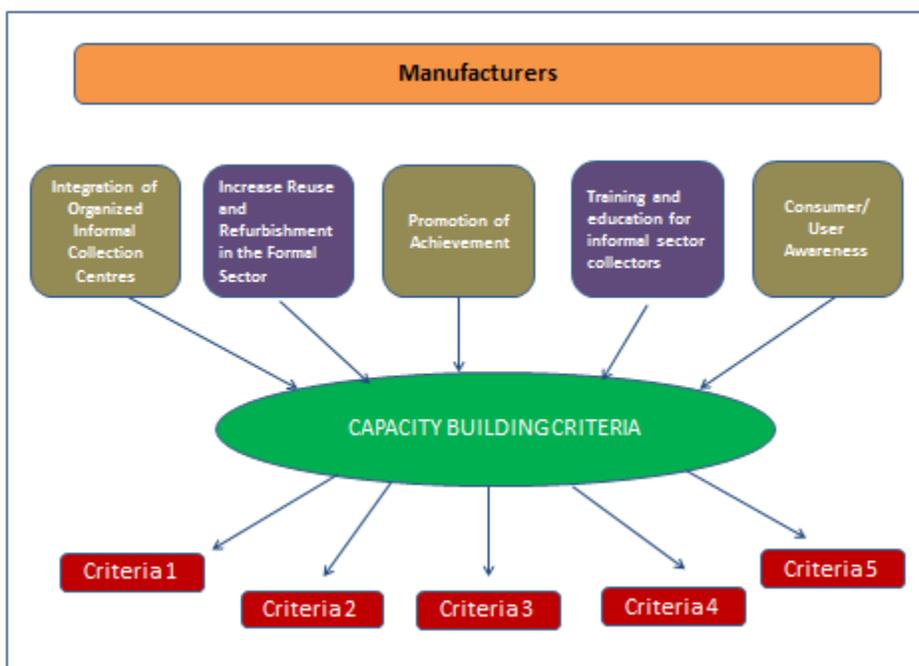
- **Interactive Lecture/ Pictorial presentations:** Detailed explanations with questions from informal sector.
- **Class Discussion:** Conversation with questions posed to elicit thoughtful responses from learners.
- **Small Group Exercises:** 4-6 people answering questions or solving problems together.
- **Two & Three-Person Exercises:** Smaller groups designed for more intense discussion and problem solving.
- **Case Studies:** Learners analyze a written account of a realistic situation and how it was solved.
- **Role-playing:** Realistic situation played out by learners.
- **Simulations:** Lengthy scenarios similar to problems in a job-related environment.
- **Games:** Competitive activity that allows learners to test their knowledge of and skill in a subject.
- **Surveys, Quizzes, and Short Writing Exercises:** Answer questions or write one or two paragraphs.
- **Business Model:** Documentation, case study and economics and to encourage them to switch to formal sector
- **Observations and Hands-on Work in Field:** Students watching others accomplish a job-related task or practice skills they learned in training.

SECTION 5: CAPACITY BUILDING OPPORTUNITIES AND PROPOSED END OF LIFE MANAGEMENT CRITERIA FOR A VOLUNTARY CONSENSUS STANDARD

Green Electronics Council (GEC), in partnership with CRB and in consultation with stakeholders, has explored capacity building opportunities for end-of-life management of IT equipment. Thus, an IT product sustainability standard for India would include capacity building criteria for end-of-life management that take into consideration the unique situation and challenges facing the country.

The proposed capacity building criteria presented below aim to reflect the priorities and challenges within India for responsibly managing electronics at end-of-life while incorporating the existing informal sector. These draft criteria can be incorporated into an India-specific IT products sustainability voluntary consensus standard, can be a set of voluntary India-specific criteria to add on to the EPEAT standards, or a separate set of criteria for purchaser use. These criteria will be fully vetted in a multi-stakeholder consensus process, and after completion used as a purchasing tool by government and institutional purchasers in specifying IT products.

The five potential capacity building opportunities and associated draft criteria for consideration and discussion are given below. They were developed following a series of in-depth interviews with key stakeholders. The findings of the stakeholder interviews and are summarized above. The following schematic diagram explains the respective challenges which led to development of five criteria.



Challenge 1: Integration of Organized Informal Collection Centres

It is estimated that in India over 90% of e-waste is collected by the informal sector. In order for manufacturers to meet their recycling targets under India’s 2016 E-Waste Rules, they will almost certainly need to engage with the informal sector collectors. There are several barriers to successful linkage between the manufacturer’s EPR programs and the informal collection sector. The 2016 version of the E-Waste Rules do not cover collection centers run by NGOs, or formalized informal sector organization or associations, and does not include a mechanism for authorization of the informal sector. The 2016 Rules also do not provide guidance for working with informal sector workers that may choose not to formally organize themselves. The informal sector also does not have the wherewithal to approach the manufacturers and seek authorization for collection on their behalf.

Furthermore, as PROs are in the process of being developed (with only a few launched), the informal sector has been finding it very hard to go about forging alliances and partnerships with producer/manufacturers for collecting on their behalf under EPR programs. At this time, new ideas are being tested on the ground to work with the informal sector and to find mechanisms for tracking collected material to ensure that it is safely recycled. As PROs and NGO-led collectives gain more experience working with informal collectors and dismantlers

and direct material to safe end of life processing, various models for engaging the informal sector may be available for manufacturers to support and leverage.

Additionally, the informal sector recyclers can currently offer higher prices to the informal collectors, creating a disincentive for the informal collectors to work with the formal recyclers. As such, on the ground initiatives are currently trying to find new ways to engage informal collectors and dismantlers, building on pilot lessons from previous years supported by government, NGO and international donor agencies. A criterion that requires manufacturers to work, directly or indirectly, with informal sector collectors could help overcome these barriers.

Proposed Criterion 1: *Manufacturer's Extended Producer Responsibility (EPR) program shall collect a minimum of x% of their annual recycling of e-waste target from initiatives that engage the informal sector. Such initiatives can include PRO-led efforts, collection centers run by NGOs and/or formalized informal organizations or associations either directly or through authorized recyclers.*

Any initiatives, either third party or manufacturer-led, that work with informal collectors and dismantlers, shall include traceability when obtaining material from informal collectors and, where applicable, evidence that dismantlers are adhering to E-Waste Guidelines. The collected e-waste shall be processed using authorized recyclers following the E-Waste Rules (2016).

SDG Linkage (Goal 8, Target 8.2) - Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high value added and labor-intensive sectors.

Challenge 2: Increase Reuse and Refurbishment in the Formal Sector

Recycling contracts in India between formal recyclers and bulk consumers often do not allow for reuse or refurbishment of used electronics. This not only limits formal recyclers' ability to generate more revenue from managing used electronics, furthering the economic divide between the formal and informal sectors, but also is a missed environmental opportunity with regard to the highest use of the e-waste.

A criterion that requires a manufacturer to assist in educating bulk customers, as well as requiring the EPR program to incorporate the hierarchy of waste management could assist in addressing this issue.

Proposed Criterion 2: *The manufacturer's EPR program shall incorporate the hierarchy of management of e-waste which prioritizes reuse and refurbishment, then materials recovery, followed by energy recovery and lastly disposal. The manufacturer shall also provide information to their bulk customers on the environmental benefits of reuse and refurbishment of e-waste.*

SDG Linkage (Goal 12, Target 12.5) - By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

Challenge 3: Promotion of Achievement

Implementation and enforcement of the 2016 E-Waste Rules is dependent on the Central Pollution Control Board (CPCB) and the State Pollution Control Boards (SPCBs) limited resources. Increased transparency and reporting by manufacturers on their collection and recycling achievements would assist the CPCB and SPCBs. In addition, providing this information to the public would showcase manufacturers that are in compliance, would promote progress and support education of consumers.

Proposed Criterion 3: *Manufacturers shall make the following information publicly available on their website or on a website of a public reporting initiative:*

- *Summaries of their submitted (approved?) EPR plans*
- *Total annual amount of e-waste collected through the EPR program*
- *Annual achievement towards E-Waste Rule (2016) threshold*
- *Percentage of e-waste 1) reused/refurbished; 2) recycled; 3) disposed & used for energy recovery*

SDG Linkage (Goal 12, Target 12.6) - Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

Challenge 4: Training and education for informal sector collectors

Background: In addition to some of the items highlighted above, the informal sector collector has other barriers including lack of training in regulations, environmental and occupational health and safety as well as experience developing partnerships and interacting with manufacturers. This sector of e-waste would benefit from training and education on topics including, but not limited to:

- Overview of e-waste and current status of e-waste generation in India

- E-waste Management Rules, 2016, and impact on informal workers
- Environmental and occupational health and safety
- Collection of e-waste, act as collection agent/collection points on behalf of authorized recycler or producer
- Soft skill training program
- Business plan development for informal sector
- Monitoring and evaluation

Proposed Criterion 4: *The manufacturers shall either directly, through a PRO, authorized recyclers or another third party, provide or training and education to partner collection centers run by NGOs and/or formalized informal organizations or associations. The training and education shall include topics such as the E-Waste Management Rules (2016), environmental and occupational health & safety issues, requirement of formalization, requirements for collector of e-waste, soft skills (e.g. communication), business plan development as well as monitoring and evaluation.*

The manufacturer can choose to work with, and support, a third-party entity such as a PRO or NGO collection entity that is already providing such training. The training and education may be provided in person or virtually.

SDG Linkage (Goal 8, Target 8.8) - Protect labor rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.

Challenge 5: Consumer/ User Awareness

In India, consumers anticipate that their end-of-life electronics have value and expect compensation. This expectation to receive payment from collectors puts pressure on the collectors to favor selling to downstream informal recyclers who can typically offer a higher price than the formal recyclers. Education on responsible management of e-waste and behavior change campaigns are needed to shift consumer perspective and transition consumers expectation to getting paid less, or not at all, for end-of-life electronics.

Additionally, many consumers, both individual and bulk consumers, are not aware of manufacturer's EPR programs, and how to utilize the program. By providing this information, manufacturers can drive collection of e-waste to their partner informal sector collectors and into their EPR programs.

Proposed criterion 5: *Manufacturer shall inform customers of their Extended Producer Responsibility (EPR) program and how utilize the program to recycle the product at end of life. The information shall include options for utilizing partner collection programs (e.g. collection centers run by NGOs and/or formalized informal organizations or associations). The information shall be provided with the product at point of sale, as well on the manufacturer's public website.*

Manufacturer shall also develop and implement, either independently or as part of a consortium, public education campaign covering topics including but not limited to EPR programs, responsible management of end-of-life electronics, and environment and human health impacts of e-waste.

SDG Linkage (Goal 12, Target 12.8) - By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

APPENDIX: STAKEHOLDER DISCUSSION INPUTS

A. Gaps & Challenges

(i) Policy & Implementation Gaps:

- 30% of collection target under EPR has been set by regulators for producers/manufacturers to comply with while they are still figuring out mechanisms for implementation of the same. The 30% target has now been reduced to 10% for producers.
- Limited capacities on working with the informal sector who are the key to collection of e-waste
- Inadequate capacities and resources within SPCBs and PCCs to firmly implement the e-waste rules, 2016 and monitor the same as per guidelines
- Although, there exist policies like take back policy for the producers, but none of them is executing it in proper manner. The policies also a failure in our country. Since they provide no incentives it becomes difficult to convince consumers to return their waste for free.
- Lack of verification and monitoring mechanism in SPCBs
- The percentage wise target for producers is not favourable to implementation of the rules, while the adequate infrastructure for recycling of end of life products does not exist in the country.
- After commencement of the revised EWM rules 2016, under the EPR producers are supposed to maintain records of their historical waste, which is becoming difficult from the producers end. Since the regulations came five years back, but the clause of maintaining historical records came last year.
- In case of BIS, BEE, the producers are meeting the compliances, as it has got a labelling scheme inbuilt. But in case of EWM rules, there is no labelling scheme, so to capture, check, maintain and to enforce. This is a major problem to map the e-waste generated. If a labelling scheme, stating that the product is EPR authorised and if producers are also aware about it, then in that case it can become convenient to capture e-waste generated.

- The EMW rules came into existence in 2011, under which the bulk consumers were under the ambit of rules. Our existing market share comprises of 30-40% of bulk consumers, wherein 20-25% roughly is occupied by government offices and remaining 8-10% share is occupied by PSUs and others. Thus, the government offices were noted to contribute maximum percentage share in this category of bulk consumers. There is lack of enforcement of regulations, in these government offices itself. Thus, if the producers wish to reach out to these bulk consumers (i.e. purchase e-waste from them), still it will not help in meeting the targets.
- The MoEFCC, in its recent regulations on electronics waste i.e. EWM rules, 2016 have not given any recognition to the informal sector. Unlike, the Solid Waste Management Rules, 2016, which clearly mentioned the role of informal sector in managing waste stream. There it has given its role as a key stakeholder who is responsible in door to door collection and guidelines for the municipality to work with them and formalize. However, there is no specific guideline for the informal sector in e-waste rules, 2016. Furthermore, producers/manufacturers have very limited scope to work with the informal sector since the financial implications of the same are prohibitive in nature. This makes it important to implement the rules in spirit by the agencies and monitoring the implementation of the rules as well to ensure that unsafe environmental and health practices can be prohibited in the informal sector. Incentives for the informal sector will also go a long way in ensuring that they formalize. Infrastructure and access to technology could be the initiating factors which can play a huge role in this process.

(ii) Infrastructure Gaps:

- Inadequate infrastructure for recycling of e-waste in the country which is the key cause of an ever-burgeoning informal sector which works unscathed in the spaces available. For example the recycling capacity of e-waste in the country is 4 lakh tones per annum (according to CPCB data), and according to ASSOCHAM report India is generating 17 lakhs tons per annum. This amounts to cater just 25% of institutional capacity of total generation of e-waste in the country.
- The rules do not cover the collection centres run by NGOs, formalized informal sector organization or associations which were already established and working, which may create a partnership for decentralized collection centres. The institution of working with the producer/manufacturers in terms of seeking authorization to set up such collection centers has hindered many of these stakeholders who had access to

Government agencies for setting up collection centers but do not have access to producer/manufacture organisations.

- Mapping of e-waste: There is no labelling mechanism to track e-waste in India. Since there is an extensive informal market for repair and refurbished products, it is difficult to track material in its complete form as produced by the producer/manufacture.
- The bulk consumers who can give away their e-waste to producers are actually doing e-bidding. However, the recyclers on the other hand are again selling away their waste or material which they cannot recycle, again back to informal sector. Thus, the waste rather than getting eliminated and recycled from the supply stream, is getting accumulated and transferred on to other actors of supply chain.

(iii) Knowledge & Capacity Gaps:

- The rules prescribe the development of Producer Responsibility Organisation (PRO) which can serve as a mechanism for producers to implement EPR and meet targets prescribed to them for collection of e-waste. However, it is early days and the companies are trying to find their way into the best possible mechanism to set up PROs in the country. There is lack of understanding about PRO in our country and we need to build capacities regarding how to develop Collective Producer Responsibility models, such as those in Europe, Japan and Latin America.
- Lack of knowledge about e-waste regulation within the stakeholders- There are serious gaps which are recognized when stakeholders are interviewed which hover around areas like fixing responsibility, data collection, monitoring, data submission, infrastructure requirement and criteria for relationship between stakeholders involved in e-waste management
- Insufficient knowledge on monitoring mechanism within the state pollution control Boards
- Lack of understanding on technology acquisition. There are technological options available but very little clarity on how to acquire them.
- Lack of awareness and capacity of all stakeholders in the value chain on aspects related to collection, environmental and health hazards of handling e-waste, management of data, reporting and tactical and strategic planning.
- Lack of understanding of participation of all stakeholders in the value chain for e-waste management
- Awareness and knowledge gap on take-back mechanism so that the products can be reached to the authorised recyclers after its end of life of for proper recycling

- Lack of financial mechanism with informal sector- At present, there is no proper financial mechanism available to engage with informal sector. Since most of the e-waste is handled by the informal sector, a low cost option for producers might be to source the material from the informal sector. However, there are serious quality control issues which can crop up. Hence innovative contract mechanisms need to be thought through which will enable the informal sector to have a sustainable livelihood while also ensuring that material is channelized to formal recyclers once it has been collected by them.
- There is limited knowledge about the SDGs and it was discussed that if government has made such initiatives, they must disseminate this knowledge to all, so that people can inculcate and move in same direction.

B. Areas of Improvement

(i) Policy and Implementation Level:

- Urban Local Body/ State Govt. should provide support to manufacturers and recyclers in providing the infrastructure for collection of e-waste. A case in point of the Government of Goa which is trying to ride on the collection infrastructure set up for Municipal Solid Waste, to collect-waste as well and then transport the same to the nearest recycler. Money earned from the recycler will help to cover collection costs of the state. The Producers/Manufacturers can also provide funds for these activities as it helps them achieve their EPR targets as set under the guidelines to the rules.
- A guideline to implementation of the rules is a must for all sets of stakeholders. Further there should be regular capacity development initiatives which will ensure that all stakeholders are on board as far as implementation of the rules is concerned. With the ever changing dynamics and environment, it is important that a monitoring and evaluation framework is developed supplemented by a feedback action loop which will ensure that learnings are put into constructive action elements through incorporation in implementation guidelines.
- It is also important that data gathering, whether it is for inventorisation, production or recycling, takes place across the country, especially from bulk consumers and producers so that there is enough evidence to build and model future capacities to tackle the quantum of e-waste that will be generated in the country.

- It is important to note that the key areas related to the rules which include mechanisms for EPR as well as linking key stakeholders involved in environmentally sound recycling of e-waste needs to be specified in greater detail. Recyclers and Producer/Manufacturers should be provided with guidelines for collection, management of data, recycling of e-waste and channelization of materials in the value chain. Identification of stakeholders and partnership agreements which will ensure transparency in dealings is important so that monitoring by state lead agencies can be smoothened.

(ii) Market Instruments:

- DRS: Introduction of an economic instrument in the form of a Deposit Refund System (DRS). The implementation of a DRS would involve collecting a deposit from a consumer that is refundable when consumer deposits the e-waste for safe recycling. The implementation of this scheme would be difficult for the products that have long life span because it would be difficult to claim the buyer slip till the duration of the claim. Secondly product may be reselling or passing to the third party to extend the life of the product then it would not be possible for original owner to claim Deposit. DRS would also require to be monitored by regulatory authorities in this case consumers would bear the financial burden of implementing this scheme and unscrupulous actors have the potential to gain significantly from subverting such a system. It would also be difficult to guard against orphan products in a large country like India. While the rules have fixed responsibility of orphan products on the municipality, the consumer of such products will always have the incentive to sell the same to the informal sector for a marginal profit. This could help him reap rewards despite there being no DRS mechanism for the product.
- E-waste Exchange: An innovative instrument, introduced as part of the new rules, is the 'e-waste exchange'. The exchange is an independent market instrument offering services for sale and purchase of e-waste generated from end-of-life electrical and electronic equipment between agencies or organisations authorised under these rules. However, it is only available for large players. The scope of the e-waste exchange could be enhanced to include individual consumers as well as micro and small-scale enterprises (including those in the informal sector) that handle significant amount of e-waste. This is especially crucial because these actors might be most reluctant to deal with extensive paperwork required for compliance with the Rules. The e-waste exchange has the potential to use IT enabled services for effective implementation of the rules.

- Industry Associations or PRO needs to make platform for take back mechanism where dealer should also play role for logistics and data management of returned products.
- Legal establishments may be done in informal sector through formalisation: cooperatives or Associations may be successful in India. These cooperatives/ Associations may work as collection agents for manufacturers.

(iii) Others:

- A tool should develop to track the collected e-waste and financial incentives
- Capacity building for equal participation of other stakeholders: Awareness on take back policy, maintenance of inventory and monitoring mechanism for Bulk consumers
- Inter organisational roles and understanding of the rules and its implementation
- Inter- ministerial coordination for awareness programme
- Capacity Building of SPCBs in technology development, infrastructure for collection & recycling and monitoring mechanism.