

ITA Industry Waste Management Plan

Draft V0.8

This version of the ITA Industry Waste Management Plan is a draft for public stakeholder consultation.

Its contents and subject matter remain under review and the contents may change and be expanded as part of the finalisation of the plan

IT Association of South Africa Producer Environmental Group
19 October 2011

Revisions

Date	Version	Changes	Person
19 Oct 11	0.8	For public stakeholder consultation	

A. General information

This Industry Waste Management Plan (IWMP) has been authored by the following companies under the umbrella of the IT Association of South Africa who, collectively, are considered to be significantly representative of the sector which produce and place Office, Information & Communication Technology Equipment on the South African Market and whom will be ultimately responsible for the management of e-Waste as a result of such products reaching end of life:

Dell, Hewlett Packard, IBM, Microsoft and Nokia

The plan is supported by the following member companies of the IT Association of South Africa:

Acer

The plan is also supported by the following companies who are not members of the IT Association of South Africa:

Cisco

While this plan has primary relevance to the Office, Information & Communication Technology Equipment industry sector, the content and structure of the plan are such that they could be relevant to other industry sectors and, potentially, to all categories of electronic waste including batteries used in ICT equipment.

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Definitions used

EEE	Electrical and Electronic Equipment e.g. computers, phones, TVs, radios, refrigerators, washing machines etc.
Covered EEE	ICT Electrical and Electronic Equipment is covered by this Industry Waste Management Plan
e-Waste	Discarded EEE that no longer can be re-used and needs to be recycled
Producer Collective Schemes	An organisation charged to coordinate and manage the collection and treatment of e-waste on behalf of producer members in accordance with producer obligations
Free rider / Free riding	A non-registered producer of EEE that is actively placing product on the market without being detected by the enforcement body
Local and Global Market	The recovered materials can be sent wherever there is market demand. In some cases the materials might need to be exported for material recovery
e-Waste Registry	A private independent body that provides the registration of all EEE producers, producer market share calculation and obligation determination, treatment centre auditing, Producer obligation auditing and fulfilment reporting.
Non-problematic fractions	Fractions where the income realised from selling the recovered fraction is greater than the cost of collection and recovery when treated optimally.
Problematic fractions	Fractions of negative value where treatment cost outweighs revenue through proper treatment. This can include the processing of hazardous items. Some materials will only be treated properly if they go to appropriate facilities.
Producer	The local manufacturer or importer of record of new and/or used EEE to be placed on the South African market at first invoice by sale.
OEM	The Original Equipment Manufacturer is the

	company that manufactures or assembles the original product under its own brand name. The OEM is also known as a Manufacturer.
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B. Executive summary

The ITA Producer Environmental Group is submitting an Industry Waste Management Plan on a voluntary basis under the umbrella of the IT Association of South Africa. The plan describes the waste related issues within the ICT industry sector and specifies how industry will address these issues, giving specific actions, targets and timeframes.

Key principles of the plan:

- The plan considers electronic-waste as an opportunity: to recover valuable materials, to create jobs, and to grow the recycling industry in South Africa.
- The plan takes care of the ICT e-waste stream including problematic hazardous materials and fractions (currently being burned or landfilled) as well as materials and fractions with value.
- Authors and supporters of the plan acknowledge their responsibility as producers to take care of their products at the end of their life-cycle, which includes a financial obligation.
- The plan seeks to harness existing recycling infrastructure and encourages industry growth and job creation through an effective and viable structure.
- The plan recommends a multi-stakeholder approach where all actors in the value chain have an important role to play.

Key benefits of the plan:

- The development of a green industry sector in South Africa creates opportunities for enterprise development, rural and youth skills development, unique home-grown technologies and IP for export to the rest of the African continent. Maximizing collection and the consolidation of specific E-Waste categories will secure much needed recycling technology investments.
- The development of a green industry sector in South Africa provides opportunities for job creation, for example in the recycling sector.
- The appropriate handling of e-waste can both prevent serious health and environmental damage and also recover valuable materials, especially metals.
- Sustainable recycling operations also considerably contribute to reducing greenhouse gas emissions. “Mining” of old phones or old

computers to recover the contained metals – if done in an environmentally sound or correct manner – needs only a fraction of energy compared to mining ores in nature.

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D. Introduction

The producer members of the IT Association of South Africa named in Section A (Acer, Dell, Hewlett Packard, IBM, Microsoft and Nokia) are submitting a plan on a voluntary basis under the umbrella of the IT Association of South Africa, recognising that Industry Waste Management Plans are the main co-regulatory instrument within the waste management system as detailed in the draft National Waste Management Strategy. The plan describes the waste related issues within our industry sector and specifies how industry will address these issues, giving specific actions, targets and timeframes.

We reiterate that while this plan has primary relevance to the Office, Information & Communication Equipment industry sector, the content and structure of the plan are such that they could be relevant to other industry sectors and, potentially, to all categories of electronic waste including batteries used in ICT equipment.

E. Background

What is e-waste?

E-waste is a term used to cover almost all types of electrical and electronic equipment that has or could enter the waste stream. Although e-waste is a general term, it can be often considered to cover TV's, computers, mobile phones, white goods (fridges, washing machines, dryers etc.), home entertainment and stereo systems, toys, toasters, kettles – almost any household or home business item with circuitry or electrical components with power or battery supply. Electrical waste contains materials that, if mishandled, can become hazardous to human health and the environment, but, most importantly, also materials that are valuable and scarce.

E-waste is growing exponentially simply because the market in which these products are produced is also growing rapidly as many parts of the world cross the so called 'digital divide'. Rapid product innovations and replacement, especially in ICT and office equipment, combined with the migration from analogue to digital technologies and to flat-screen TVs and monitors, for example, are fuelling the increase. Economies of scale have given way to lower prices for many electrical goods, which has increased global demand for many products that eventually end up as e-waste.

Because so much of the planet's e-waste is unaccounted for, it is difficult to know exactly how much e-waste there is. An estimated 40 million tons¹ of e-waste is generated worldwide on a yearly basis.

Proper treatment of e-waste avoids negative impacts and yields many benefits

If not properly treated, e-waste can have negative impacts, both on human health and on the environment. However, sustainable treatment of e-waste avoids these negative impacts.

The appropriate handling of e-waste can both prevent serious health and environmental damage and also recover valuable materials, especially for

¹ <http://www.step-initiative.org/initiative/what-is-e-waste.php>

metals. The recycling chain for e-waste is classified into three main subsequent steps:

- i. collection,
- ii. sorting/dismantling and pre-processing (including sorting, dismantling and mechanical treatment) and
- iii. end processing. All three steps should operate and interact in a holistic manner to achieve the overall recycling objectives.

The main objectives of sustainable e-waste recycling² are:

- Treat the hazardous fractions in an environmentally sound manner,
- Maximize the recovery of valuable materials,
- Create eco-efficient and sustainable business,
- Consider social impact and local context.

Sustainable e-waste recycling yields many benefits, for example:

- In its entirety electrical and electronic equipment is a major consumer of many precious and special metals and therefore an important contributor to the world's demand for metals. Recycling can significantly reduce the demand for virgin metals.
- Sustainable recycling operations also considerably contribute to reducing greenhouse gas emissions. Primary production, i.e. mining, concentrating, smelting and refining, especially of precious and special metals has a significant carbon dioxide (CO₂) impact due to the low concentration of these metals in the ores and often difficult mining conditions. "Mining" of old phones or old computers to recover the contained metals – if done in an environmentally sound or correct manner – needs only a fraction of energy compared to mining ores in nature.
- Recycling of ICT equipment reduces the amount of land that has to be set aside specifically as landfill zones which in turn can be used for far more productive and socially beneficial usages such as low income

² http://ewasteguide.info/files/UNEP_2009_eW2R.PDF

housing, more farming, or renewable energy power supplies. Recycling means that less money and energy has to be expended for the mining of the various minerals which are consumed during the manufacturing process for the production of ICT equipment.

- Essentially, the environmental footprint of a phone, a computer and other electronic devices could be significantly reduced if treated in environmentally sound managed recycling operations, which prevent hazardous emissions and ensure that a large part of the contained metals are finally recovered for a new life³.
- The building of a sustainable recycling infrastructure creates jobs, and contributes to capability building. The sustainable collection, sorting, manual dismantling and pre-processing of e-waste could create a significant number of jobs in South Africa.

Role of the industry in implementing the National Waste Management Strategy

The South Africa National Waste Management Strategy (NWMS), published as a first draft for public comment in March 2010, seeks to establish a common platform for action between stakeholders in order to systematically improve waste management in South Africa.

- The NWMS is a legislative requirement of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008). The Act requires that it is reviewed at least every five years, and the focus of the NWMS is therefore on the strategy's waste management measures and actions that need to be taken within the next five years.
- It is stated in section 5.1.5 of the NWMS that: "With respect to industry, the NWMS envisages an important role for industry within a co-regulatory approach to achieving the objectives of the Act. The primary instrument for achieving this vision is the Industry Waste Management Plan (IndWMP). Private sector representative bodies have an important role to play in ensuring that the provisions of the Act are understood, implemented, and complied with by business and industry. The uptake of

³ http://ewasteguide.info/files/UNEP_2009_eW2R.PDF

cleaner technology practices will also be a necessary step in the process of achieving waste minimisation.”

- The IndWMP from the ITA Producer Environmental Group describes the approach to achieving the objectives of the Act, and of the NWMS.

The IndWMP from the ITA Producer Environmental Group is a voluntary plan

- The ITA Producer Environmental Group has decided to proactively comply with the requirements of the NWMS. Therefore, the ITA Producer Environmental Group IndWMP is a voluntary plan.
- As required by the NWMS, the ITA Producer Environmental Group IndWMP includes metrics for monitoring and reporting of the plan, and also includes an annual review of the achievement of the IndWMP.

Scope of the ITA Producer Environmental Group

The ITA Producer Environmental Group IndWMP represents a key industry sector: the Information and Communication Technology (ICT) sector. Although it is estimated that the ICT sector accounts for only 8%⁴ of all e-waste generated worldwide, the ITA Producer Environmental Group has decided to proactively comply with the requirements of the NWMS, and submit a voluntary plan.

The companies who authored the plan for the ITA Producer Environmental Group are:

- Dell - Dell continually improves its business practices to better protect the environment while simplifying its customers' ability to manage their computer equipment responsibly. At the end of the financial year 2010 69.4 billion kilogrammes had been taken back through Dell's end of life programmes globally.
- HP - Since the 1980s, HP has been reducing the electronic waste stream by promoting more product reuse and recycling. Today, HP offers a range of product recovery services, including reuse and recycling

⁴ www.weee-forum.org – The WEEE Forum, European Association of Electrical and Electronic Waste Take Back Systems

programs in 53 countries or territories. In 2008, HP recovered 340 million pounds (154,000 tonnes) of hardware, including 75 million pounds (34,000 tonnes) for reuse and remarketing, and more than 265 million pounds (120,000 tonnes) of electronics and supplies for recycling.

- IBM - As part of its product end-of-life management (PELM) activities, IBM began offering product take-back programs in Europe in 1989 and has extended and enhanced them in many other countries. In 2009 IBM's PELM operations worldwide processed approximately 41,400 metric tons of end-of-life products and product waste and sent only 0.5% to landfills or to incineration facilities for treatment. This represents 61.5% of the estimated 67,000 metric tons of new IBM IT equipment manufactured and sold in 2009.
- Microsoft - Microsoft is committed to developing software and technology that helps people and organizations reduce their impact on the environment. Part of that responsibility includes advancing sustainability in our product design, packaging, and distribution — without sacrificing quality, customer safety or innovation. Between 2008 and 2010 Microsoft funded the recovery of more than 26 million kilograms of electronic materials from consumers across the globe.
- Nokia - Nokia is committed to connecting people to what matters to them by combining advanced mobile technology with personalized services. More than 1.3 billion people connect to one another with a Nokia, from our most affordable voice-optimized mobile phones to advanced Internet-connected smartphones sold in virtually every market in the world. In 2010, Dow Jones Indexes names Nokia as the world's most sustainable technology company for the second year running.

The companies who support the plan are:

- IT Association of South Africa www.ita.co.za
- Cisco

The ITA Producer Environmental Group IndWMP represents a key industry sector: the Information and Communication Technology (ICT) sector. However, the content and structure of the plan are such that they could be relevant to other industry sectors as well, and to potentially other categories

of electronic waste. Manufacturers of white goods, for example, could endorse this plan.

The plan includes the treatment/collection of batteries that arise from WEEE, unless they fall under the scope of the Battery IndWMP

F. Status Quo

EMPA conducted an E-Waste Assessment of South Africa in 2008⁵ that included projected calculations up 2012. The assessment considered three primary e-waste streams: white goods, consumer electronics, and information technology (ICT). By focusing on several tracer products in these categories – namely, fridges, washing machines, microwaves, TVs, PCs, printers, and mobile phones it outlined the current E-Waste situation in South Africa.

The Assessment identified the following key EEE (Electrical and Electronic Equipment) producer and importer stakeholders in South Africa:

Key new EEE producer stakeholders

Acer, Canon, Dell, Epson, Ericsson, Fujitsu, HP, IBM, Kelvinator, Lenovo, Lexmark, LG, Motorola, Mustek/Mecer, Nokia, Panasonic, Philips, Pinnacle Micro/Proline, Sahara, Samsung, Siemens, Sony, Tedelex and Telefunken

New consumer EEE is mostly sold through the following local retailers: Makro, Game, DionWired, Hi-fi Corp, Incredible Connection, Stax, Hirsch's, Pick n Pay, Hyperama House and Home, Bears, Morkels, Russells, and Bradlows.

Some new EEE is sold into B2C and or B2B markets. Some producers manufacture specific product for B2B such as high performance servers.

Key second hand EEE stakeholders

Key importers of second-hand PCs are Device Global, Xperien, and Bridgeport Technical Services. Pactel is considered the largest importer of second-hand mobile phones.

PC refurbishers currently import anything from 20,000-100,000 units a year into South Africa. Some 60,000 second-hand mobile phones (or 6% of the total) are said to be imported into the country each month. Currently the second-hand ICT market is relatively unregulated. For instance, the importation of new and second-hand PCs and mobile phones is not distinguished by SARS.

⁵ [E-waste assessment South Africa | ewasteguide.info](http://ewasteguide.info)

Amount of E-Waste generated

Key findings of the E-Waste Assessment outlined that:

- Between 1,129,000 and 2,108,000 tons of potential e-waste is estimated to be in South African households. This includes white goods, consumer electronics and ICT most of which is likely to enter the waste stream only in the next 5-10 years.
- The assessment through a household survey suggests that the total amount of e-waste (considering all product categories) generated by the top 10% of households by income is nearly 84,000 tons a year. This can be broken down into the following categories: White goods 64%, Consumer Electronics 17% and ICT 19%

New EEE information and regulations – Waste related⁶

The majority of EEE producer's product is designed and manufactured to meet global requirements. International Standards applicable to product marking and material regulations such as the European Union RoHS (Restriction of Hazardous Substances) Directive and the EU WEEE Directive already ensure the phasing out and restriction of hazardous materials. Product marking requirements assist in terms of awareness to avoid E-Waste from being dropped in garbage bins containing waste destined for disposal.

Additionally, the majority of producers also have information on disassembly instructions for recyclers that provide supplementary product end-of-life information for recycling and treatment facilities. Manufacturing product disassembly instructions address product reuse and treatment, and to identify components, materials and the locations of identified hazardous substances (if any).

E-Waste Collection

Informal Collection

According to the research of the South African E-Waste Assessment⁷ informally E-Waste is been sorted in an ad hoc way from mainstream waste for years (e.g. on the curb-side, and at landfills and Garden Sites or other municipal collection

⁶ Producer Product information – Dell, HP, IBM, Nokia

⁷ [e-Waste assessment South Africa | ewasteguide.info](http://ewasteguide.info)

points). While ferrous metals have been traded with the numerous scrap metal dealers found in urban areas, informal collection often involves basic recycling such as burning cables for their copper, and smashing CRT monitors and TVs to get at the same. Informal collectors are found at municipal collection points such as landfills, or comb the streets on waste disposal day with trolleys, sorting through domestic waste. They have become a permanent feature of the waste disposal landscape, and their informal entrepreneurship appears to offer a sustainable means of generating income.

Formal Collection and Voluntary Producer initiatives

Business to Business (B2B)

The majority of South Africa represented EEE Manufacturers have E-Waste Collection, Re-Use and Recycling Programmes in place for their business customers. Product that has been used in a B2B environment has more value than consumer product and is generally managed effectively through specific B2B recycling programmes so as not to add environmental impact.

Business to Consumer (B2C)⁸

A number of E-Waste consumer programmes/ drop-of points are available country wide whereby the consumer can dispose of E-Waste responsibly:

- Producer/Retailer E-Waste collection point initiatives i.e. Fujitsu- 13+ Makro stores country wide, 34+ Nokia service outlets etc.
- In excess of 10 Gauteng and Western Cape Municipal E-Waste drop off sites
- In excess of 25 Gauteng Pikitup Garden refuse sites
- Large number of country wide E-Waste Recycler collection points as well as on-going retailer collaboration buy-back promotions i.e. Incredible Connection, HiFi Corporation etc.
- Dedicated retailer E-Waste consumer drop-off points i.e. Pick and Pay, Builders Warehouse, Woolworths etc.
- Dedicated Academic institutions E-Waste Collection points i.e. UNISA, University of Stellenbosch and Cape Town etc.
- Online free consumer recycling programme provided by Dell for equipment replaced by new purchase or end of life Dell equipment.

⁸ [eWASA - Collection points](#), Producer information

Processing/ Recycling

The findings from the South African E-Waste assessment⁹ revealed that Recyclers processing non-ferrous and ferrous metals have been operating in South Africa for decades, as have specialized e-waste recyclers. There is also some degree of category specialization, with some E-Waste Recyclers specializing only in specific E-Waste categories. The recycling processes amongst the current operators are not uniform, and include manual dismantling and mechanised shredding. Manual dismantling is a value-add process that allows different markets to be found for the separated fraction.

E-Waste recyclers vary in size from the smaller ones processing as little as 5 tons to upwards in excess of 1000 tons per month.

As for final disposal/ landfilling the assessment reveals that much of the e-waste of value is likely to be formally and informally collected before it is landfilled. Few accurate statistics exist regarding how much e-waste ends up in municipal landfill, although figures of 5% of waste volumes being E-Waste have been quoted by Tshwane metro. The 2004 study by Widmer and Lombard also quotes a figure of 2.2 tons of e-waste a month at one landfill in Ekurhuleni (also in Gauteng). However the systematic monitoring of e-waste quantities is not happening, given that it is a relatively new waste stream.

Dependencies & challenges

Recycling technologies

According to the E-Waste of Assessment¹⁰, South Africa faces a number of recycling challenges when it comes to e-waste. These include dealing with hazardous fraction, such as Cathode Ray Tube (CRT) glass, and finding markets for flame-retardant plastics. Liquid Crystal Display (LCD) monitors are also likely to present a key challenge in the future, while the technology does not currently exist in the country for the environmentally friendly recycling of rechargeable batteries used in electronics and the recycling fridges. At the same time, basic environmental precautions are absent at some recyclers, and health and safety regulations are loosely enforced. Most refurbishers and

⁹ [E-waste assessment South Africa | ewasteguide.info](http://ewasteguide.info)

¹⁰ [E-waste assessment South Africa | ewasteguide.info](http://ewasteguide.info)

recyclers interviewed for this assessment did not hold or meet ISO Environmental Management System standards.

Maximizing collection and the consolidation of specific E-Waste categories will secure much needed recycling technology investments. Recycling technology investment is currently needed for E-Waste categories and fractions such as ABS plastics, Chargeable and Non Rechargeable batteries excluding lead acid type, large percentage of CRT tubes, CFC extraction and treatment of fridges and printer cartridges.

Regional cross boundary shipments of E-Waste can further improve E-Waste volumes required for local sustainable recycling solutions. By applying strict controls through country agreements and waste life cycle assessments as per the Basel Convention that South Africa is a signatory of, South Africa's economy could benefit greatly from providing the African continent with a regional E-Waste solution for specific E-Waste categories and fractions.

According to the latest global E-Waste studies manual dismantling deliver the highest quality secondary raw material yield, thereby it could create much needed job opportunities for the local economy.

Currently developed country economies such as Germany and the Netherlands are benefiting by accepting the importation of E-Waste in a controlled manner.

Employment

The South African E-Waste Assessment¹¹ revealed that there was a mix of formal and casual employment of workers at the recyclers and refurbishers visited for the study. Most employers claimed a better-than-minimum wage for employees that were formally employed. Benefits were not standardized, but included incentive bonuses, and a provident fund.

The assessment further suggested that E-Waste is unlikely to be a primary waste stream for informal collectors and recyclers, who will typically work with a range of recyclables (e.g. cardboard, glass, any kinds of scrap metal, as well as old electronics). The more formalized informal collection activities become,

¹¹ [E-waste assessment South Africa | ewasteguide.info](http://ewasteguide.info)

the more specialized informal collection is likely to become in terms of waste streams.

Of the 40,000 plus informal recyclers estimated to be working in South Africa, it is likely that most of them, at some time or another, have dealt with e-waste. While the informal sector in South Africa offers critical income generating opportunities for people, when it comes to e-waste, negative social impacts include:

- Open burning of plastics, both to extract value from metals such as copper, and for warmth
- Smashing of monitors to extract copper
- Exposure to hazardous substances generally
- A lack of basic safety equipment
- A lack of basic safety information about e-waste
- Vulnerability to e-waste traders (e.g. collectors do not have much leverage or bargaining power when negotiating with scrap metal merchants on prices)

Negative environmental impact

The assessment has revealed that a number of recyclers interviewed took some level of care regarding the environmental impact of their recycling processes. However, of 10 refurbishers and recyclers interviewed, only one was ISO 14001 compliant. Some environmentally problematic practices by the recyclers generally include:

- The mechanical shredding of monitors and white goods such as fridges (with the subsequent release of ozone-depleting and greenhouse gases)
- The stockpiling of hazardous fraction
- Passing hazardous fraction on to other recyclers, without proper knowledge of how it gets disposed
- Landfilling potentially harmful plastics for which no market can be found
- While one recycler insists that batteries are removed from ICT e-waste before recycling, it does not know what happens to the batteries that are removed
- Premises that are not properly contained to prevent run-off of contaminated water
- E-waste exposed to rain

- Many recyclers do not treat effluents/leaching or water, or test landfilled fraction for toxicity
- While no recyclers report using hazardous substances like chemicals in any of their recycling processes, the on-site incineration of e-scrap was reported

Awareness levels: Plastic federation

E-Waste awareness levels in South Africa are low compared to developed countries such as in Europe. E-Waste Awareness programmes have been undertaken by a number of organisations over the past two to three years – Plastic Federation, eWASA, WESSA and academic institutions such as University of Cape Town.

The South Africa E-Waste assessment recommend awareness-raising around the proper disposal of e-waste. Specifically at grassroots public education programme needs to be launched by government to educate informal collectors and recyclers and others as to the hazards of working with e-waste. This includes the implications of burning plastics, the smashing of monitors, and mercury in CFLs.

Correct E-waste handling, disposal and processing must be behaviour based. This type of practice is easily adopted if it becomes part of one's education earlier on in life. A behaviour based society will ensure that E-waste is collected, treated and processed in the correct manner. Therefore it is essential to ensure that E-waste education forms part of primary, secondary and tertiary schooling.

Eco-Schools¹²

- Implemented in South Africa by WESSA and WWF, Eco-Schools is an internationally recognised programme www.eco-schools.org, that accredits schools that make a commitment to continuously improve their school's environmental performance.
- The program started in South Africa in 2003. In 2010 nearly 1300 schools have registered.

¹² [Eco-Schools](http://www.eco-schools.org)

- Approximately 75% of schools participating in the program are under-resourced and often distressed schools, situated in a rural/ peri-urban setting. The program gives recognition to schools that can show how they have improved the quality of environmental learning and sustainable management in their schools and community.

G.Planning

This section of the document outlines the structure and planning needed in order to deliver a solution which meets the requirements of the National Waste Strategy and allows healthy competition. To make this happen it requires all responsible parties to engage and fulfil the necessary responsibilities.

All parties, (local and global producers, importer, retailer, distributor, operator, consumer, refurbisher, recycler, government etc.) should play their part in the establishment of a sustainable solution. This will help avoid 'free riders' and will result in long-term environmental and societal benefits.

A sustainable solution should ensure a level playing field between all actors in the value chain. There is a need to regulate the recycling activities but it should not create trader barriers, discriminate against organisations, companies or products.

Making producer responsibility work

Producers should take responsibility for the product placed on the market at end of life. For the purposes of explaining the two areas of material recovery and the management structure and the relationship between them known as producer responsibility they have been outlined as separate streams in Figure 1 below.

Definitions

Consumer – The owner and user of the product in a home or home office environment.

Collector/Collection Point – The party or location facilitating the collection of e-waste, it could be retailers, municipal or other.

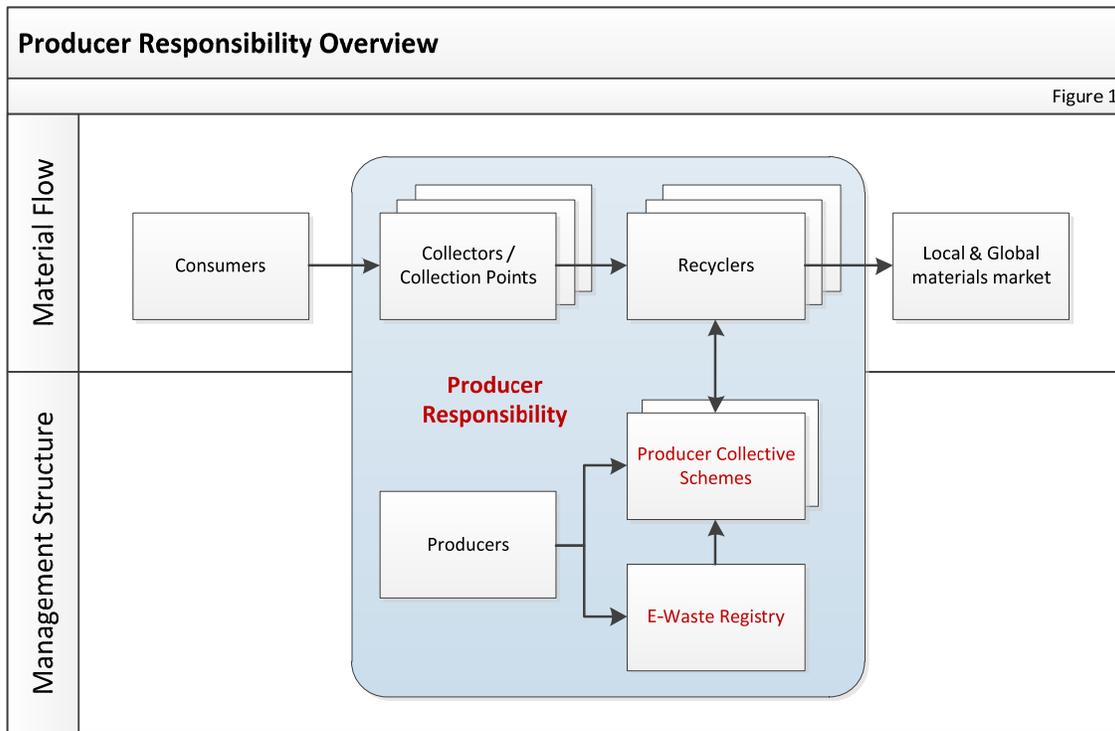
Recycler – The facility that disassembles and treats collected e-waste for material recovery or final disposition.

Global raw materials market – Where material is recycled into raw material

Producer – The local manufacturer or importer of record of new and/or used EEE to be placed on the South African market at first invoice by sale.

E-Waste Registry – An independent body for managing producer market share obligation and the development of relevant standards.

Producer Collective Scheme – The organisation charged to coordinate and manage the collection and treatment of e-waste in line with producers obligations.



Producer Responsibility

The highlighted area of producer responsibility shows the extent of the flow covered and the structure required to ensure producers take the necessary responsibility for the recycling of end of life product. Within the area of producer responsibility are two new elements (in red) namely the E-Waste Registry and the Producer Collective Scheme that need to be established to ensure the successful implementation of the Industry Waste Management Plan in an equitable and non-monopolistic way.

The Material Stream

The focus for this stream is to ensure that as much material as possible is properly collected, treated and recycled finding its way back into the supply chain as a raw material.

A key principle of producer responsibility is to ensure that the consumer can return end of life electrical and electronic products at no cost for recycling. The consumer should be able to return product to retailers at or after point of sale, a municipal collection point or to a specialist e-waste collector where the items/material would be consolidated. This material should then be collected by a specialist recycler who would then treat the product to specific standards ensuring that all material is properly treated. The material can then enter the

local and global materials market where it will be recycled into raw material ready for use in new products.

The Management Structure stream

The focus for this stream is to ensure that producers who placed the product on the market take responsibility for the treatment of the product at the end of its useful life.

Given that producers do not own their own recycling plants they need to leverage the existing infrastructure in a way that allows them to take responsibility for the recycling of e-waste. To do this producers can register the products they place on the market with an E-Waste Registry. The E-Waste Registry will use this data to calculate the current market share of the producer and will pass this information to the producer collective scheme. The producers need to join a collective scheme which will take on the responsibility for organising the collection and recycling of e-waste. The producer will be charged for its share of the collected and treated e-waste on current market share calculations.

Roles and Responsibilities

The success of this plan relies on each stakeholder fulfilling its own responsibility. The plan would not be balanced if any stakeholder was to take on the responsibilities of another stakeholder in addition to their own.

Producers

The Waste management strategy requires industry to put forward a plan to manage e-waste in a responsible way and it is essential that the producers be central to that plan as they will fund the management and treatment of e-waste. Key functions and requirements include:

- The definition of producer is the local manufacturer or importer of record of new and/or used EEE to be placed on the South African market at first invoice by sale.
- They must join a Producer Collective Scheme
- Must register with E-Waste Registry and declare of which scheme they are a member
- They must declare the weight and category of EEE placed on the consumer market to the E-Waste Registry

- Declare any product collected and treated through the producers own take back or recycling programmes to the Collective Scheme and to the Registry
- Pay the Collective Scheme based on the producer's current market share and as per Scheme invoices
- Records should be kept in line with local legislation.
- Information, education & awareness
 - Mark all product placed on the market with a crossed out wheeled bin logo (as per Cenelec standard)
 - Make information available to recyclers on how to dismantle their product and the location of any hazardous substances or items within the product
 - Provide information to end users on how to handle product at the end of its useful life
- Manufacturers or OEMs who are not defined as producers may on agreement with the producer (importer of record) take over the responsibilities of the producer and assign a local representative to manage the obligations for all its products.

E-Waste Registry

The key role of the Registry is to enable producers to register with a single independent, not for profit body, which has no commercial intent and will keep sensitive market share data confidential. The Registry would act as a 'black box' and enable Producers to take responsibility for the treatment of e-waste. A single Registry would need to be set up and funded by producers.

Key functions and requirements include:

- A not for profit organisation
- Organise a Board consisting of Producer members (retired or active in producer industry), the Registry operator, DEA or other departments or ministries.
- Tenders for operation of the software and registry – This would most likely appeal to companies with financial and operational auditing expertise.
- Oversee the setting up of electronic registration and reporting systems
- Producer registration
- Delivery of registration number to producers – for inclusion on import documentation and invoices

- Collective scheme and Recycler approval and registration
- Receive reports of product placed on the consumer market from producers by category and weight
- Receive reports of collected and treated product from recyclers by category and weight
- Calculate Producers current market share obligation based on reports from Producers and Recyclers by category and weight
- Determines compliance obligation for Producer members of Schemes
- Reports to the DEA the total amount of waste collected and treated by category, quarterly reporting of output by material state (re-use, recycle), type (product, metal, plastic, other) and destination (smelter, incinerator, producer, landfill).
- To audit Collective Schemes including reviewing the Schemes audits of its members
- Set collection, transport, processing and recycling standards for e-waste services in line using current law as a baseline. See Appendix 1 for detail on standards.
- Responsible for developing key messages for educating consumers
- Establish and manage an Enterprise development program. Key objectives of the program will be to support and enable KPI's of the IndWMP in respect to:
 - Discouragement of dumping/ burning of materials
 - ICT E-Waste industry growth
 - ICT E-Waste recycling technology
 - Maximise collection
- Records should be kept in line with local legislation.

Producer Collective Scheme

A Collective Scheme could be set up as a commercial or not for profit organisation that will ensure the current market share obligations set out by the E-Waste Registry are met. More than one Collective Scheme can operate in the market and would attract members based on their unique selling points and ability to efficiently organise the collection and treatment of e-waste.

Key functions and requirements include:

- Establish a three year operational plan to include: scheme constitution, scheme membership rules, planned collection and recycling network, expected volumes, Re-use of suitable appliances, expected members,

financial structure and plans.

The plan must clearly define how it is to achieve the objective of obtaining enough e-waste to treat in order to meet the obligations of its members.

- Organise collection of e-waste from Collection Points for treatment by Recyclers
- Organise prioritisation of the re-use of appliances where suitable
- Maximise the collection of all e-waste including hazardous materials such as CRT
- Report the collected material category and weight to the E-Waste Registry
- Invoice members for compliance operation costs based on current market share by collected category and weight
- Consumer awareness of the need for proper recycling through advertising and education
- Audit members companies to verify compliance with scheme and registry mandated requirements.
- Records should be kept in line with local legislation.

Recyclers

It is hoped that existing recyclers which meet the necessary standards will be contracted to work for collective schemes and recycle the collected e-waste. Standards of treatment and recovery efficiency are essential when it comes to recycling e-waste, if the efficiency is low then the value return on the materials will be low also. It is hoped that this will be an area of the programme that will provide additional jobs for South Africans.

Key functions and requirements include:

- Work with Collective Schemes through contract to the required standards. See Appendix 1 for detail on standards
- Report inbound and processed weights at the required detail to E-Waste Registry and Collective Scheme
- Recyclers can select items for repair and re-use if fully documented, failed items are recycled and re-use weight is reported by category to E-Waste Registry
- Treat to Best Available Treatment (global standards) or export for further treatment to a facility with the same or higher standards

- All facilities for further treatment must meet same or higher standards (Best Available Treatment) as set out by the E-Waste Registry.
- Records should be kept in line with local legislation.

Collection points and Collectors

Collection points and Collectors would have agreements with specific schemes to provide materials for the recyclers to collect and treat. The collection method could be either from a drop off point such as retail stores, a municipal site, service/repair centre or items could be collected directly from consumers. It is hoped that this will be an area of the programme that will provide additional jobs for South Africans.

Key functions and requirements include:

- Can be operated by formal or informal collectors
- Must meet minimum Health, Safety and Environmental standards for collection and sorting of e-waste
- Must work with a Collective Scheme through formal agreement or contract and be able to provide evidence of participation if and when challenged by a consumer.
- Collect e-waste and make 100% of collected e-waste available for collection by the Scheme appointed Recyclers for treatment.
- Must not selectively remove materials of value from the collection point.
- Report collected e-waste to recycler and e-waste registry by weight and category
- Collection points could be local authority sites, retailer sites or other formal or informal collection site or method.
- Collection points must be secure to prevent theft of waste.
- Records should be kept in line with local legislation.

Consumer

The Consumer is the source of the e-waste and will need to be encouraged to take their items to an appropriate Collection Point for recycling. Education could be in the form of targeted advertising through media or municipal authorities.

Key functions and requirements include:

- Make all e-waste available for recycling
- Use approved drop off or collection points/collectors

Government

The participation of the government is key to making this whole plan work. Lack of enforcement will result in parts of the industry taking on more responsibility and burden than others.

Key responsibilities are:

- To endorse and enforce this plan
- Mandate all ICT EEE producers to subscribe to this plan by registering with E-Waste Registry and joining a Collective Scheme through additional legislation if required
- Ensure legislation does not limit growth for recycling sector through restrictive laws for treatment or transportation.
- Increase consumer awareness to the environmental benefits for recycling
- Ensure participation of councils in providing municipal collection points.

Re-use and refurbishment of used EEE or e-waste

In order to meet the 3 R's of sustainability (Reduce, Re-use, Recycle), product that is suitable for re-use should be prioritised as appropriate.

Key functions and requirements include:

- Where the re-use of end of life product is appropriate either in whole or part, industry best practice should be promoted and adopted.
- All material that is successfully re-used must be reported to the Registry by weight and category
- All material that was selected for re-use but is later deemed to be unfit for purpose must be recycled by a scheme approved recycler and the weight and category reported to the Registry
- Records should be kept in line with local legislation.

Type and categories of covered EEE

The type of equipment covered in this plan is ICT equipment which consists of but is not limited to the following item category descriptions of ICT equipment:

- Centralised data processing: Mainframes, Minicomputers, Printer Units.
- Personal Computing: Personal computers, Laptop computers, Notebook computers, notepad computers, printers, copying equipment, electrical and electronic typewriters, pocket and desk calculators, accessories and other products and equipment for the collection, storage, processing, presentation or communication of information by electronic means.

- User terminal and systems: Facsimile, Telex, Telephones, Pay telephones, Cordless telephones, Cellular telephones, Answering systems and other products or equipment of transmitting sound, images or other information by telecommunications.

This definition is aligned with the EU WEEE Directive (2002/96/EC)

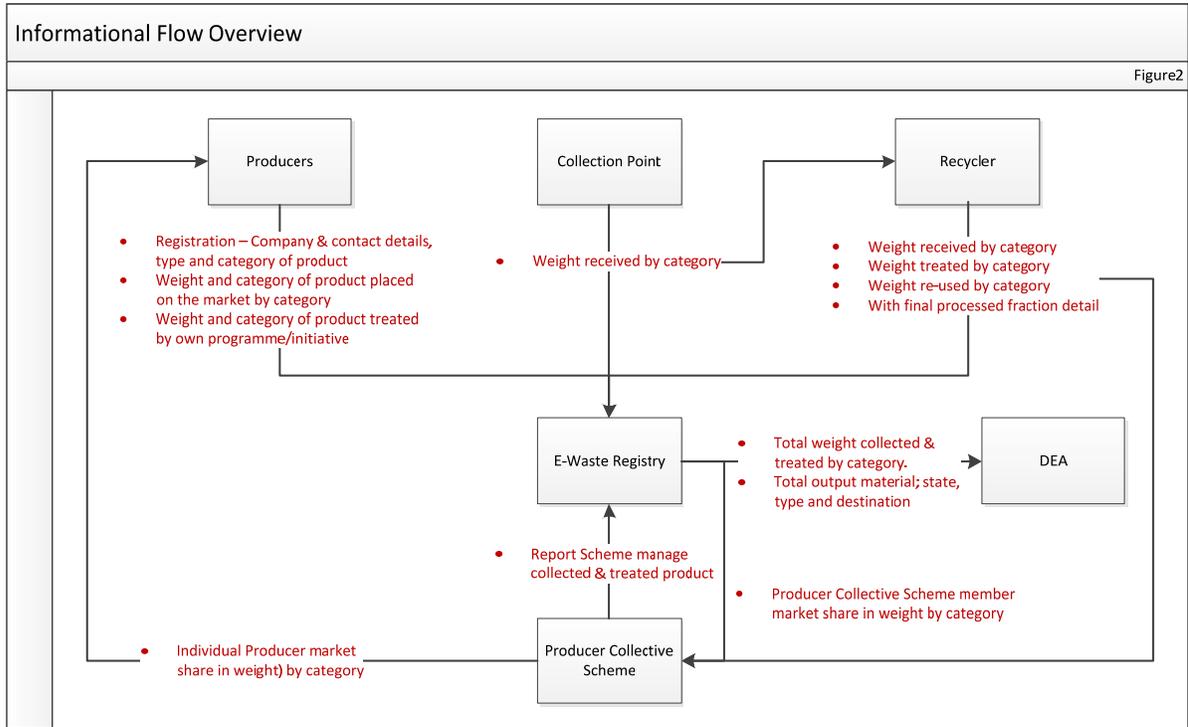
E-Waste consumables i.e. paper, inks, toner and batteries.

Only in the case where collecting WEEE that contains consumables would those consumables be treated as part of the e-waste IndWMP treatment.

Consumables are not e-waste in their own right and as such are not included in the definitions above.

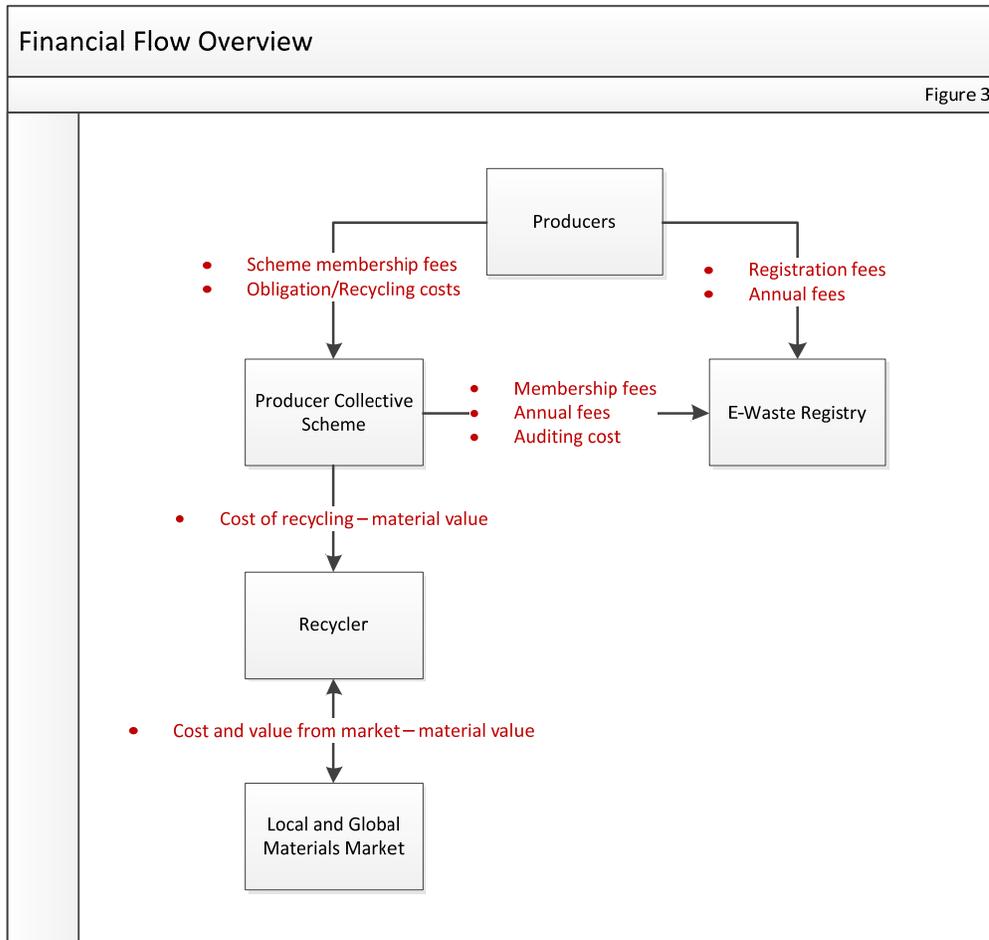
Information process and flow

Figure 2 provides a more detailed overview of the exchange of information between parties to ensure accuracy and integrity of data.



Financial process and flow

Figure 3 provides further information on the financial process flow indicating the type of transactions that are conducted.



Timeline to implement

- See the Implementation section for full timeline. The projected timeline is 18 months from the approval of the IndWMP.

Key Performance Indicators

It is necessary to define key performance indicators (KPIs) to ensure the success of the programme. Some critical KPIs are:

- Number/percentage of producers(importers) registered with and reporting products placed on the market with E-Waste Registry
- Number of official e-waste collection point and recyclers participating with producer collective schemes
- Amount of waste collected and treated by category. Quarterly reporting of output by material state (re-use, recycle), type (product, metal, plastic, other) and destination (smelter, incinerator, producer, landfill).This should also include metrics on the potential indication of diversion of the material from landfill
- The South African Standards Model is to be used for scoring the below KPIs
 - Number of jobs created for sector growth
 - B-BBEE requirements

H. Implementation

This section focuses on the action required from the point that the plan is finalised and approved by the Minister for the Department of Environmental Affairs.

The high level outline is presented in a table format which outlines the Major targets, milestones, participating actors and proposed timeframes as covered in the Planning chapter.

Key Implementation Milestones

Target	Milestones	Actor	Timeline
Approval of IWMP	<ul style="list-style-type: none"> Final IWMP submitted to Government Approval of IWMP IWMP specific Law 	ITA PEG DEA DEA	T
Establish e-Waste Registry	<ul style="list-style-type: none"> Establishment of E-waste registry board Tender applications to run registry Appointment of registry operator Set up registration and reporting mechanisms Register producers 	ITA PEG ITA PEG ITA PEG e-Waste Registry e-Waste Registry	T+6 months
Establish Producer Collective Schemes	<ul style="list-style-type: none"> Submit interest to e-waste registry with operational plan Approval of schemes Register Producer members Establish adequate collection network for large cities and urban areas 	Potential Producer Collective Schemes e-Waste Registry Producer Collective Schemes Producer Collective Schemes	T+9 months
Commence take back operations	<ul style="list-style-type: none"> Producers report placed on the market data E-Waste collected by collection network Producer Collective schemes manage logistics and recycling Recyclers treat e-waste Reporting of required e-waste data to E-waste registry 	Producers Collectors Producer Collective Schemes Recyclers Collectors, Recyclers, Producer Collective schemes	T+18 months

	<ul style="list-style-type: none"> • Calculation of Producer Market share 	E-Waste Registry	
Expand take back operations	<ul style="list-style-type: none"> • Expand collection network into smaller cities and rural areas 	Producer Collection Schemes, Collectors	T+30 months

Requirements for implementation

Participation

All actors are required to fulfil their implementation and operational responsibilities within the time period to ensure the successful implementation of the programme.

I. Monitoring, review and reporting

Implementation

Implementation of the plan will be managed by the ITA PEG according to the Implementation Section of the IndWMP. Key monitoring, review and reporting activities will include:

- Appointment of external contracting body to act as an Implementation Partner
- Implementation Project Plan (IPM)
- Scheduled reviews of IPM deliverables
- Scheduled IPM reporting to DEA and prospective members of the Management Structure

IndWMP Management Structure monitoring, review and reporting

Registry

As an independent not for profit legal entity the constitution of the Registry will make provision for the appointment of an accredited external auditor. External auditing requirements will also include the core operational responsibilities of the Registry:

- Registration of all South African producers and importers of ICT EEE
- Market share obligation calculations
- Invoicing of all members
- Collective Schemes evaluation, approval, auditing/ monitoring process
- Enterprise Development mechanism/ program
- ICT E-Waste Education and Awareness mechanism/ program
- KPI's as per Registry board resolution

Overall Scheduled Management Structure Reporting to DEA and members related to defined targets/ metrics:

- Number/percentage of producers (importers) registered
- Details of official e-waste collection points and recyclers participating with producer collective schemes
- Amount of waste collected and treated, quarterly reporting of output by material state (re-use, recycle), type (product, metal, plastic, other) and destination (smelter, incinerator, producer, landfill)
- Local vs. global market material processing percentage
- Landfill diversion rate

- Standards Model evaluation and improvement status for all collective scheme operators
- Collective Schemes member auditing results
- Enterprise development program status
- Education and Awareness programs status

Collective Scheme

As a commercial or not for profit legal entity the constitution of the Collective Compliance scheme will make provision for the appointment of an accredited external auditor. External auditing requirements will also include the core operational responsibilities of the Collective Scheme:

- Recycler evaluation, approval, auditing, contracting and monitoring process as per the IndWMP standards model (The external auditor may appoint an additional independent industry standards auditing body i.e. ISO 9001, ISO 14001, Recycling specific)
- Collection points and collectors evaluation, approval, auditing, contracting and monitoring process as per the IndWMP standards model (This activity may managed as part of the Recycler operations)
- Scheduled ICT E-Waste reporting into the Registry
 - Collected material category and weight
 - Members invoicing as per current market share by category and weight
 - Consumer awareness and education programs
 - Audit results of members
 - Scheduled Collective Scheme KPI's reporting i.e. Maximise collection and hazardous fractions treatment rate
- ICT E-Waste Education and Awareness mechanism/ program

J. Conclusion

The Implementation of the recommendations of this plan will provide both environmental and economic benefits to South Africa.

It will provide greater levels of environmental protection and help reduce risks to public health through safe handling and processing practices.

The building of a sustainable recycling infrastructure will create jobs and contribute to building capacity as the informal sector becomes more formally established.

K. Appendices

1. Collection, Transport, Treatment centre and Recycler Standards Model and Audit Score Card System
2. Stakeholder consultation results

Appendix 1

Collection, Transport, Treatment centre and Recycler Standards Model and Audit Score Card System

The Standards Model defines the minimum requirements for specific functions within the IndWMP. In addition to the minimum requirements a score card system will be used to drive improvement of operating and processing practices in line with global best available treatment (BAT)

E-Waste Scheme elements:

- Physical Collection (10 Points)
- Drop off/ collection points (30 Points)
- Transport (20 Points)
- Re-use (40 Points)
- Recycling (260 Points)
- Education/ Awareness (40 Points)

The following evaluation criteria will be applied to the respective IndWMP Elements:

- **Critical Criteria in Red:** South African legal and IndWMP specific (Non-Negotiable Compliance is required)
- South African business specific criteria
- Globally accepted e-waste business practices/ standards

1. Collection

Criteria	Description	Measurement	Result Comment
Legal	Legally compliant collection activities	<ul style="list-style-type: none">• Operational Legal Register (Approved by qualified legal firm)• Special attention to be given to legally required Environmental Health and Safety practices i.e. Personal Protective Equipment (PPE) training and correct	Compliant – Non-Negotiable

		usage.	
ICT E-Waste fractions collected	All ICT E-Waste fractions needs to be accepted for collection	Part of Standard operating procedure/ to be monitored/ checked	Compliant – Non-Negotiable
Informal Sector Involvement/ opportunity	Making use of the informal sector	<ul style="list-style-type: none"> • Informal sector collections only – 5 points • Informal Sector involvement that include E-Waste Health and Safety training – 10 	
Maximum Evaluation Score			10 Points

2. Drop off/ collection point

Criteria	Description	Measurement	Result Comment
Legal	Point needs to be part of a legal operation or public service	<ul style="list-style-type: none"> • Operational Legal Register (Approved by qualified legal firm) • Special attention to be given to legally required Environmental Health and Safety practices i.e. Personal Protective Equipment (PPE) training and correct usage. 	Compliant Non-Negotiable
ICT E-Waste fractions collected	All ICT E-Waste fractions needs to be accepted for collection	Part of Standard operating procedure/ to be monitored/ checked	Compliant – Non-Negotiable
ICT E-Waste Accepted- Size	All sizes of ICT equipment taken back	<ul style="list-style-type: none"> • All sizes – 10 Points • Partial – 5 Points 	
Ease of access	Ease of access by means of transport	<ul style="list-style-type: none"> • Accessible by road infrastructure and general public transport – 10 points • Limited transport options – 5 	
Safety & Security	General security of	<ul style="list-style-type: none"> • Facility in an area where 	

	drop off/collection point	<p>normal business activity is taking place during business hours (08:00 to 17:00) – 5 Points</p> <ul style="list-style-type: none"> • Adequate security to prevent theft in and out of working hours – 5 Points 	
Maximum Evaluation Score			30 Points

3. Transport

Criteria	Description	Measurement	Result Comment
Legal	Required licenses/ permits for transportation i.e. solid, hazardous waste transportation	Operational Legal Register (Approved by qualified legal firm)	Compliant Non-Negotiable
Security	Security during transport	<ul style="list-style-type: none"> • Open trucks/ pickups – 0 • Close body trucks – 5 Points • Satellite Tracking – 5 Points 	
Fleet Maintenance	Fleet reliability	<ul style="list-style-type: none"> • Maintenance Program – 10 Points 	
Maximum Evaluation Score			20 Points

4. Re-Use

Criteria	Description	Measurement	Result Comment
Legal	Required licenses/ permits for operations i.e. secondhand goods Acts etc.	<ul style="list-style-type: none"> • Operational Legal Register (Approved by qualified legal firm) • Special attention to be given to legally required Environmental Health and Safety practices i.e. Personal Protective Equipment (PPE) training and correct usage. 	Compliant Non-Negotiable

Quality Management	Business quality standards	<ul style="list-style-type: none"> • ISO 9001 – 10 Points • OHSAS 18001 – 10 Points • ISO 14001 – 10 Points • Quality, Environment, Health and Safety System (Not certified) – 2 points for each discipline documented and operationally applied • Re-use specific: Secure data destruction/ security and refurbishment specifications – 10 Points 	
Maximum Evaluation Score			40 Points

5. Recycling

Criteria	Description	Measurement	Result Comment
Legal	Required licenses/ permits for operations i.e. waste storage license section 20 NEMA, material export licenses (Basel etc)	<ul style="list-style-type: none"> • Operational Legal Register (Approved by qualified legal firm) • Special attention to be given to legally required Environmental Health and Safety practices i.e. Personal Protective Equipment (PPE) training and correct usage. 	Compliant Non-Negotiable
Recycling Operations - Processing	To determine the extent of recycling related to the generation of secondary raw material	<ul style="list-style-type: none"> • Material fraction Separation – 2 Points/ material fraction purity of >80% • Material fraction pre-processing – 2 Points per Material fraction pre-processing • Material fraction secondary raw material 	Maximum of 10 fractions allowed for evaluation purposes

		processing (materials that can be used in new manufacturing) – 10 Points/ fraction	
Downstream Vendors	To determine the control of downstream vendors	<ul style="list-style-type: none"> Downstream vendor selection and audit program that include material visibility up to secondary raw material status – 30 Points 	
Recycling Standards	Business and Recycling specific standards and best practice	<ul style="list-style-type: none"> Recycling Standard i.e. E-Stewards, R2 – 10 Points 	
Quality Management	Business quality standards	<ul style="list-style-type: none"> ISO 9001 – 10 Points OHSAS 18001 – 10 Points ISO 14001 – 10 Points Quality, Environment, Health and Safety System (Not certified) – 2 points for each discipline documented and operationally applied 	
Broad Based Black Economic Empowerment		<p>B-BBEE Scorecard compliant to legislation</p> <ul style="list-style-type: none"> Level 1- 50 Points Level 2- 40 Points Level 3- 30 Points Level 4- 25 Points Level 5- 20 Points Level 6- 15 Points Level 7- 10 Points Level 8- 5 Points Exemption – 50 Points 	
Maximum Evaluation Score			260 Points

6. Education and Awareness

Criteria	Description	Measurement	Result Comment
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E-Waste Training/ Awareness	Programs/ initiatives to perform E-Waste training and awareness	<ul style="list-style-type: none"> • Public Programs i.e. Schooling, events – 10 Points per program to a maximum of 2 • SETA Accredited Training – 10 Points per training module to a maximum of 2 • Training of employees in handling and hazards awareness 	
Maximum Evaluation Score			40 Points

Minimum Scheme Qualification Criteria for Service providers:

- 1.) Compliance to critical non-negotiable criteria
- 2.) An initial minimum evaluation score in the following respective elements if applicable: 6 elements
 - a. Physical Collection – 2 points
 - b. Drop off/ collection points – 6 points
 - c. Transport – 4 points
 - d. Re-use – 8 points
 - e. Recycling – 52 points
 - f. Education/ Awareness – 8 points

Continuous Corrective Action plan criteria to improve evaluation score:

- a. Corrective Action plan in support of a maximum evaluation score over a three year period.

Appendix 2

Stakeholder consultation results

To be added following consultation

End.