german cooperation
DEUTSCHE ZUSAMMENARBEIT

implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

MTN

Environmental Management System Development

Guidelines for SME's in the E-Waste Sector

Published by:

Skills for Green Jobs (SFGJ) Programme
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH
Registered offices Bonn and Eschborn, Germany

GIZ Office Pretoria
P.O. Box 13732, Hatfield 0028
Hatfield Gardens, Block E, Third Floor,
333 Grosvenor Street
Pretoria
South Africa

Tel: +27 (0) 12 423 5900
E-mail: giz-suedafrika@giz.de
www.giz.de

Layout: Studio112
As at: December 2013
GIZ is responsible for the content of this publication.

Environmental Management System Development:
Guidelines for SME's in the e-waste Sector Towards a "Light"
Implementation Framework, Based on ISO 14001:2004

Prepared by:

JEFFARES & GREEN (PTY) LTD
PO Box 38561
Pinelands 7430
Tel: (021) 532 0940
Email: kasners@jgi.co.za

ENVIROSENSE
61 Peninsula Road
Zeekoevlei 7941
Tel: (021) 706 9829
Email: envirosense@xsinet.co.za

Table of Contents

Acknowledgements

The producers of this guidebook for Environmental Management System Development wish to gratefully acknowledge all the assistance, knowledge input and guidance we received compiling this guidebook from the key role-players in responsible South African e-waste management including (but not limited to):

GIZ: Glynis Harrison & Gavin Watson
MTN: Zakhiya Rehman (Group Sustainability Manager)
ITA-PEG: Ruben Janse van Rensburg (HP); Ulrike Vott (Nokia);
Jonathon Perry (DELL)- (Content Advisors)
IWMSA (Institute of Waste Management Southern Africa) –
Dr. Suzan Oelofse
(IWMSA Vice-President) (Content Advisor)

Further gratitude is expressed to other local key stakeholders who helped to shape this small business information booklet through their work including:
EWASA (e-waste Association of South Africa)
SAEWA (Southern Africa E-Waste Alliance)
RAG (Recovery Action Group)
WCRAG (Western Cape Recycling Action Group)

Sincere apology to any party or individual that was unintentionally omitted to get mentioned for his/her kind contribution.

Project Team

The content of this information guide was developed by "EnviroSense CC" and "Jeffares & Green (Pty) Ltd Engineering & Environmental Consulting" with layout by Studio 112 under instruction from and with financial support from the GIZ ("Deutsche Gesellschaft für Internationale Zusammenarbeit").

Disclaimer

No member of the writing and support team of this guide booklet assumes any personal liability or responsibility for the mismanagement of any portion of e-waste with regards to possible environmental or human health damages as a result of the information provided in this guidebook.

1. Introduction and Background

In South Africa, Small and Medium Enterprises (SMEs) have typically developed organically in response to market demand in the e-waste sector.

It is widely understood that SMEs are the drivers of economic growth and a healthy SME sector contributes prominently to the economy by creating employment opportunities, generating higher production volumes, increasing exports and introducing innovation and entrepreneurship. SMEs play a dynamic role in developing countries as the engines through which growth objectives can be achieved.

The White Paper on National Strategy for the Development and Promotion of Small Business in South Africa (1995) highlighted the fact that "small, medium and micro enterprises represent an important vehicle to address the challenges of job creation, economic growth and equity in our country". Some researchers have estimated the total economic output of SMEs in South Africa to be 50% of GDP and it is also estimated that they provide employment to about 60% of the labour force.

The Small Business Act (1996) and Amendment Act (2004) defines the small business sector. The Integrated Small Business Development Strategy (ISBDS), 2004 – 2014 has built upon this definition and embraces all micro-, small- and medium-sized enterprises. The ISBDS focuses on entrepreneurship by recognising the many entrepreneurs and entrepreneurial activities found across South Africa. It recognises that entrepreneurs are diverse, but share a common desire and attitude and display a willingness to work on their own or with others to create new economic opportunities and introduce their ideas, products and services to the market. Their efforts create new businesses or self-employment opportunities, but can also lead to the expansion of existing businesses (ISBDS, 2003).

However, despite their importance and contribution to economic growth, SMEs across the world, and particularly in South Africa, are faced with numerous challenges that inhibit their growth. These are often:

- a lack of management skills, often as a result of a lack of training and education
- difficulty accessing finance and obtaining credit
- access to markets and developing relationships with customers
- appropriate technology and low production capacity
- recognition by large companies
- government bureaucracy
- support for the role that they play in economic development
- inadequate compliance to legal and regulatory requirements.

These types of challenges often result in high rates of business failure and South Africa has one of the lowest SMEs survival rates in the world. This is the reality that has to be faced and is used as a departure point for the suggested way forward.

2. Purpose of the Guidebook

The purpose of this guidebook is to provide guidance to SMEs in the South African e-waste sector, assisting them to undertake the management and recovery of e-waste in an environmentally responsible manner.

3. What is the Reason for Promoting Environmentally Responsible E-Waste Management?

E-waste contains valuable ferrous (e.g. iron), non-ferrous (e.g. aluminum, copper) and precious (e.g. gold, palladium, silver, indium, gallium) metals that can be obtained from dismantling computer cases, frames, wires, cables and other components. It does, however, contain toxic substances such as lead, mercury, cadmium and brominated flame retardants. These materials are endocrine disruptors, bio-accumulative and highly toxic to humans and the environment. E-waste is known to be a growing environmental concern.

The accepted South African definition states that e-waste is any waste material that requires electricity to operate, (EWASA, 2008) and as e-waste generally contains both non-hazardous and hazardous waste, a precautionary approach has been implemented in South Africa to classify all e-waste as hazardous, (DEA, 2010).

There are growing volumes of e-waste being generated worldwide, and it can form a valuable resource, especially as scrap metal prices continue to increase, making recycling more economically viable and attractive. This will only be sustainable if collection, disassembly and processing for recovery takes place in an environmentally sound and responsible manner.

This guide aims to provide recommendations to ensure that these valuable resources are recovered without harmful impacts to the natural environment, working environment and human health.

4. EMS as a Tool for Environmentally Responsible E-Waste Management?

An Environmental Management System (EMS) is traditionally implemented with the aim of certification to the ISO14001 Standard. This can be a very costly exercise and out of the financial reach of smaller organisations. Most South African SMEs dealing with e-waste are also not directly concerned with the import or export of e-waste and it is therefore unlikely that they would see any merit in obtaining it unless they grow in size and expand their operational scope in future.

However, an EMS can offer many benefits in that it provides a structure and an operational guideline which can assist an SME in implementing operational procedures, ensuring legal compliance and reducing the risk of pollution and the environmental impacts of their activities. It can quite simply be seen as a good housekeeping tool that enhances efficiency and manages environmental impacts. Implementation of an EMS can be done in a cost effective manner. The bulk of the costs lies in the internal staff costs from allocating the human resources for implementation which should not be too onerous, even for SMEs, as the benefits will outweigh these costs.

As a stepping stone, this framework has been developed to guide SMEs in the right direction so that, as they grow in turnover and human resources, and the moment they attract international business, they can have the basic EMS in place that has the potential to be easily upgraded when and where required to allow formalisation and certification to the ISO 14001 Standard. As a “supplier of services” to the local corporate as well as the overseas market, this will be imperative.

5. What is an Environmental Management System (EMS)?

All organisations have an impact on the environment and an Environmental Management System (EMS) is a structured system designed to help an organisation reduce these impacts through targeted continual improvement in its environmental management, leading to improvements in environmental performance, while delivering bottom line benefits through reduced operating costs and reduced liability.

An EMS forms part of an organisation's overall management system which enables it to manage its environmental risks, achieve and control the expected level of environmental performance and provide a structured process for achievement of continual improvement, as well as identifying opportunities for reducing operating costs.

An EMS consists of the following elements:

1. Commitment & Policy
2. Planning & Implementation
3. Measurement & Evaluation
4. Review & Improvement

If the EMS is viewed as an organising framework that is continually monitored and periodically reviewed, the principle of continual improvement[1] is incorporated. An EMS should be integrated with existing procedures that are in place.

1 Recurring process of enhancing the Environmental Management System in order to achieve improvements in overall environmental performance consistent with the organisation's environmental policy.

6. The Functionalities of an EMS

An EMS is a systematic and due diligent approach to environmental management. By adopting an EMS, an organisation ensures that it has identified, and is managing its environmental risks in a systematic manner. The implementation of an EMS is done on a voluntary basis.

Companies with an EMS are able to reduce their business risk and demonstrate improved environmental performance. Other benefits can stem from the cost savings due to better planning, identification of deficiencies and the enhancement of awareness and skills among employees.

The Environmental Management System can be used as an aid to:

- identify and reduce the company's impact on the environment
- ensure sound (effective and efficient) environmental performance
- meeting legal and other environmental regulatory
- a due diligence approach to environmental management for the organisation and its staff
- introduce controlling routines or procedures
- establish tangible environmental goals for improvement
- introduce a programme in order to achieve environmental goals
- continually assess and evaluate environmental activities
- plan, manage and act using information gained from assessments and evaluations.

Environmental Management Systems are based on the Plan-Do-Check-Act cycle (Deming Cycle) and there are a number of certification bodies and standards to which an EMS can be certified. In South Africa, ISO14001 is the most widely recognised standard for certification.

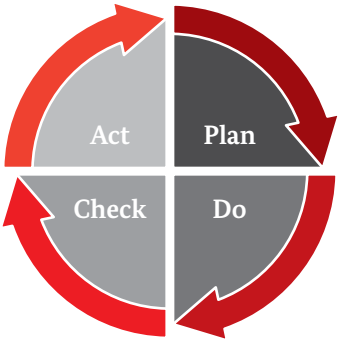

Figure 1: Deming Cycle on which an EMS is based

There is a lot of information available to assist with EMS implementation and the International Finance Corporation's website "SME Toolkit South Africa"[2] provides a useful online guide.

7. EMS Implementation Guideline

7.1 Initiation and Appointment of an EMS Champion

The first step for a company in the e-waste industry is to establish why they are pursuing the development of an EMS. The commitment of top management to the EMS is a critical precondition for a successful EMS. This is required to give the project importance within the organisation and allocate the necessary financial and human resources which make implementation possible in the first place. It is also important to realise that the system will be operated by the staff and therefore requires their commitment too.

2 http://southafrica.smetoolkit.org/sa/en/content/en/279/Creating-an-Environmental-Management-System EMS

Provision needs to be made to staff with the opportunity to provide input into how the system should be implemented.

The company needs to determine their objectives in implementing the EMS, and clarify and define the scope of their EMS.

It is recommended that a management representative to champion the EMS[3] is appointed (as indicated in Clause 4.1 of the ISO 14001:2004 Standard). This will ensure that the company takes ownership of the system from the start and that there is a dedicated resource. It will be the management's responsibility to drive the process on a day-to-day basis. External EMS training with an accredited training institution can be undertaken and is recommended if certification is to be pursued, in order to comply with Clause 4.3.2 of the Standard.

7.2 Initial Environmental Review Audit

Once the decision has been made to implement an EMS, the next step is an initial environmental review. The purpose of the initial environmental review is to establish the company's current position with regard to the environment. The aim is to consider all aspects[4] of the organisation as a basis for establishing the Environmental Management System.

This entails reviewing the current compliance and other programmes or systems in place and comparing these against the criteria for an EMS using the ISO 14001 clauses. Evaluation of the structure, procedures, policies, environmental impacts, training programmes and other current factors should also be investigated and an "Initial Environmental Review Report" drawn up as a record.

The initial review should provide a quick and easy approach to gaining greater understanding of the current level of environmental performance of the company and should cover the following key areas as a minimum:

3 See Section 4.5.1 regarding this position in SMEs.
4 An "aspect" is an element of an organisation's (i.e. the company) activities or products or services that can interact with the environment.

- Identification of activities or services that can interact with the environment
- Identification of legislation and other regulatory requirements which affect the company
- Assessment of the organisation's existing practices and procedures
- Evaluation of performance in terms of internal criteria, external standards, legislation etc
- Instances of non-compliances or incidents that have occurred
- Views of interested parties
- Consideration of full operating conditions as well as emergency situations

7.2.1 Eco-Mapping

A great way to systematically start the review process is "Eco-mapping". Eco-mapping is a step-by-step process to gather useful information and to immediately trigger environmental action. As 80% of environmental information is location-based, eco-maps of your shop floor are useful. They point to inadequate behaviour, problems with equipment, work-floor arrangement and lead to the identification of environmental impacts.

Eco-mapping is environmental management "light" as it is:

- an inventory of existing practices and problems
- a systematic method of conducting an on-site environmental review
- a collection of information which shows the current situation using visual language and a sketch of your workplace
- an adult learning and awareness-raising tool you can use as part of your staff awareness training
- the basis of environmental documentation for your organisation
- a tool with which everyone in your organisation can participate in the review without having to read heavy written procedures and instructions
- a method which allows your small organisation to define and prioritise problems.

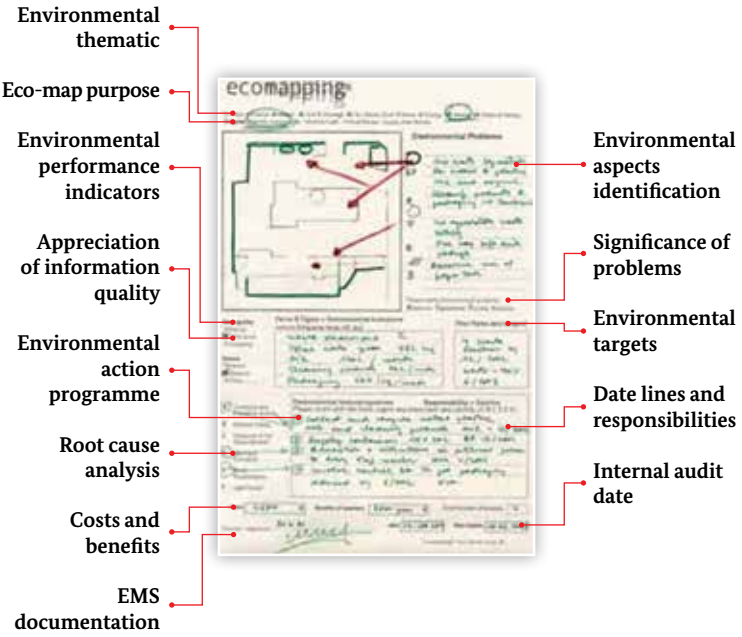

Figure 2: Example of an "Advanced Company Eco-Map" and all the components contained

For a step by step guide to eco-mapping please refer to the online EMAS toolkit instruction given under **http://ec.europa.eu/environment/emas/toolkit/toolkit_5_4_1.htm**

Based on the results of the initial review and eco-mapping exercise, a project plan and budget must be drawn up by the EMS champion. The plan must describe in detail the key actions required and who will be responsible for these, as well as the timeframes for achieving them. Resources required will also be identified during this process and timeframes set for when the activities are to be completed. This should then be reviewed, so that the budget and required resources are approved by top management.

7.3 Environmental Policy

The Environmental Policy is top management's declaration of its commitment to the environment and communicates the company's environmental vision. This is the foundation of the EMS and the cornerstone for implementation. The policy serves as a framework for setting environmental objectives and targets.

Defining the scope of the EMS will also direct the Environmental Policy and it therefore forms an integral part of the process of developing the Environmental Policy.

Top management and the EMS champion as well as any other key persons identified by management should be involved in establishing the Environmental Policy. The EMS Policy must be informed by the EMS standard requirements, EMS scope and company commitments or policies that may already exist. The policy will need to be communicated to the rest of the staff as well as to external parties identified by management (e.g. clients, contractors or sub-consultants and suppliers) to ensure that they are informed regarding the company's environmental commitment.

The Environmental Policy must include commitment to:

- continual improvement
- prevention of pollution
- compliance with applicable legal requirements and with other requirements to which the organisation subscribes which relate to its environmental aspects.

The policy must be documented, implemented and communicated to everyone in the organisation and must be available to the public.

The policy should be a simple, concise statement of the company's environmental objectives and strategy. The example below is taken from a US based e-waste recycler named "RENOVO"[5].

5 http://renovods.com/recycling/e-waste-recycling-environmental-quality-policy/

We are committed to reducing the impact of our activities on the environment. We also are committed to helping our customers do the same by encouraging them to use our recycling services.

To this end, our organisation has implemented an Environmental & Quality Management System to continuously improve our environmental performance and to ensure customer satisfaction.

To meet this commitment, RenovoData Services will pursue the following objectives:

- We will ensure compliance with all applicable environmental standards legislation and regulations.
- We will continue to strive to reduce emissions and consumption of natural resources, prevent pollution and minimize waste, noise and other environmental nuisances.
- We will ensure the security and secure destruction of our customers' sensitive data, when this is required.
- We will continuously assess our environmental performance and continually seek to improve our operations and the service we provide to our customers.
- We will make available the necessary resources to achieve these objectives.
- We will make our environmental information available to interested parties and seek to raise awareness of environmental matters within our workforce, our community, and our suppliers and customers.

Figure 3: Example of an Environmental Policy for an e-waste recycler

7.4 Planning

The purpose of the planning component is so that the company can compile a plan to fulfil its environmental policy and objectives.

7.4.1 Identifying Environmental Aspects

According to the Standard, an environmental aspect is defined as an "element of an organisation's activities, products or services that can interact with the environment". Identifying what these aspects are is the key to controlling the company's environmental impacts and identifying where they come from.

A procedure must be developed to identify and assess aspects that the organisation can control and over which it can have an influence. An environmental impact is defined as "any change to the environment, whether adverse or beneficial, wholly or partially, resulting from an organisation's activities, products, or services". The environmental aspects procedure requires the organisation to identify those environmental aspects "that it can control and those that it can influence."

Table 1: Examples of Aspects and Impacts Typical for e-waste Recycling Businesses:

Activity, product or service	Aspect	Impact
Handling hazardous waste	Potential for accidental spillage	• Contamination of stormwater or soil
Vehicle maintenance	Exhaust emissions	• Air pollution
Dismantling computers	Heavy metal dust emissions	• Air pollution • Impact on human health
Stockpiling of hazardous materials for collection	Potential for leakage/leaching	• Pollution of groundwater, soil or stormwater

The relationship between aspects and impacts is often one of cause and effect. Aspects may result from past activities e.g. spills. Significance of impacts will therefore be determined from the aspects. Aspects with more than one impact would be regarded as significant. The significant aspects need to be considered when establishing environmental objectives, defining operational controls and other actions that are required.

The Initial Environmental Review Report will also assist in the identification of aspects.

A document called an "Aspects and Impacts Register" is generated during this phase by the EMS champion. Included in this will be aspects that are regarded as significant which must be identified. ISO 14001 does not provide guidance as to what constitutes a "significant impact on the environment", leaving that determination to the organisation.

Potentially significant environmental impacts will become a focus of objectives and targets that are set by the company.

Table 2: Example of Things to Consider when Evaluating the Significance of Aspects and Impacts:
How much damage can it do to the environment?
• Scale of the impact
• Severity of the impact
• Probability of occurrence
• Duration of impact (or business concerns)
• Potential regulatory and legal requirements
• Concerns of interested parties
• Effect on public image

7.4.2 Legal and Other Requirements

A procedure must be established to identify and have access to the applicable legislation and other regulatory requirements and how these apply to the company's environmental aspects. It is suggested that the services of an environmental attorney are used to compile a legal register that keeps tab of any legislative changes and implications thereof.

What is of particular importance for the e-waste industry is taking the requirements of the National Environmental Management: Waste Act (No.59 of 2008) (NEM:WA) and its listed activities into account. It is important to be aware of the triggers that would require a waste management licence to be obtained. For more information on the latter, please also refer to Annexure A.

7.4.3 Establishing Objectives and Targets

Environmental objectives and targets help an organisation to translate its purpose into action and form the cornerstone of the planning phase to ensure the successful implementation of the system.

Through the Environmental Management Plan, the objectives and targets will translate how the goals and policy commitment will be taken further into concrete actions.

The objectives and targets of the EMS are based on the Environmental Policy as well as the significant aspects which have been identified. During the establishment of objectives and targets, the following will need to be considered:

- The environmental policy
- Significant environmental aspects
- Applicable legal and other requirements
- Measurability, where practicable
- Views of interested and affected parties
- Technological options
- Financial, operational and other organisational considerations

It is advisable to involve the relevant people in the various functional areas who, along with the EMS champion, establish the objectives and targets for the significant aspects and with this develop Environmental Management Programmes.

Top management will form an integral part of the process and the objectives must be communicated to the employees. It is the intention to establish objectives to improve current performance. During the review process, these can be revised to maintain levels of performance as part of the cycle of continual improvement.

Table 3: Example of Objectives and Related Targets:
Objective:
• Increase employee awareness of hazards around dismantling, e.g. dust potentially containing heavy metals.
Targets:
• Have regular training sessions with all staff to address the importance of wearing PPE;
• Monitor ventilation of working space.
Objective:
• Ensure adequate ventilation of working area.
Targets:
• Monitor ventilation of working space.

7.4.4 Environmental Management Programme

The Environmental Management Programme (EMP) is the plan that sets out how the targets will be met and ensures the effectiveness of the EMS. The EMP defines the responsibilities for achieving goals/targets, the means (resources) for achieving the goals and the time frame for achieving the goals. As far as possible the plan should build on existing plans and programmes already in place. It will also be guided by management and employees and must be clearly communicated to those parties who are affected.

The EMP should be a dynamic document that is reviewed regularly and updated to reflect changes in targets and objectives.

Table 4: Example of EMP Components:			
Goal/Target	**Responsibility**	**Resources**	**Time-frame**
Ensure new dust masks (PPE) are available on a daily basis	Health & Safety Manager	• Budget for PPE • Staff training	Ongoing
Reduce electricity consumption by 10%	Environmental Champion	• Availability of staff for training • Installation of energy saving lightbulbs • Spreadsheet for monitoring monthly usage	End of financial year

In the above examples, the training components of implementation can be linked in with existing programmes, such as regular health and safety training.

7.5 Implementation and Operation

Once all the planning has taken place, implementation of the EMS can start. Implementing and maintaining the EMS will involve all staff. It is therefore imperative that training is carried out at all levels, as every employee can have a potential impact on the environment. As mentioned previously, the appointed EMS champion will be crucial in the implementation and the success of the EMS as they will be the drivers of this process.

Responsibilities also need to be clearly defined and should be documented.

Top management will play a key role in providing the necessary resources, which includes allocating the necessary human resources for the EMS implementation.

7.5.1 Resources, Roles, Responsibility and Authority

The custodian of the EMS is the management representative (EMS champion) who will develop the EMS and support the ongoing implementation and continual improvement. Furthermore, identification of the capabilities required for the EMS is required along with what operational activities should be controlled, who is required to be involved in the implementation and how ownership of the EMS can be structured.

The EMS champion and top management will be responsible for defining these roles. The responsibilities and accountabilities must be outlined and documented as part of the EMS manual. These must also be communicated to all staff to ensure effective environmental management.

Table 5: Example of Responsibility List
Top Management Responsibility:
Direct top management involvement is the single most important factor in the successful implementation of an EMS. Top management has four specific responsibilities under the EMS and ISO 14001:
1. Defining the company's Environmental Policy
2. Defining roles, responsibilities, and authorities in order to facilitate effective environmental management
3. Providing human, financial, and technical resources and organisational infrastructure for establishing and maintaining the EMS
4. Reviewing the EMS at planned intervals to ensure its continuing suitability, adequacy, and effectiveness.

In the case of SMEs, it is often likely that top management may also fulfil the role of the EMS champion. This is not however a requirement and the best chance of success for the implementation of the EMS is if the person driving it has a passion for what they are doing.

7.5.2 Competence, Training and Awareness

It is important to build internal capabilities so that staff, who are performing tasks that have the potential to cause a significant impact, are competent. This will form an integral part of the success of the EMS. Training must involve all staff.

The EMS champion will be required to undertake the following key activities:

- Assess training needs and requirements
- Define training objectives
- Select suitable methods and materials and prepare a training plan
- Conduct training
- Track and document training (this can be as simple as an attendance register)
- Evaluate training effectiveness
- Improve the training programme

The EMS champion does not necessarily have to physically undertake all the above activities, but will need to ensure that they happen, this could be by means of:

- liaising with the correct people (e.g. HR manager)
- securing the services of an external consultant.

Table 6: Example of Record of Training Sessions – Environmental Awareness

Record of Training Sessions – Environmental Awareness					
Nr	**Date**	**Content**	**Attendees**	**Duration**	**Nr participants**
1	14/01/2012	Introductory seminar to EMS	All staff	½ day	12
2	17/02/2012	EMS planning	All staff	2 hours	12
3	26/03/2012	Workshop on objectives and targets identification	Managers	½ day	3
4	31/03/2012	The evaluation of significant environmental aspects	Managers	½ day	4
5	07/04/2012	Seminar on environmental permits and legislation	H&S officer	2 hours	1

Table 7: Example of Attendance Register to Record Training		
EMS Training Session:		
Trainer:		Date:
Name	Department & Designation	Signature
1.		
2.		
3.		

7.5.3 Communication

The establishment of internal and external communication procedures is required and is a very important component of the EMS. The company can decide and document the extent of external communication that will be undertaken. Internal communication can be undertaken using existing channels e.g. training, safety meetings or staff newsletters if these are already in place. Internal communication is vital to the success of the EMS.

It is important that the communications strategies and procedures that are established are effective.

Internal Communication:

The mechanisms that can be used for internal communications on environment-related matters include, but are not limited to:

a. meetings
b. emails
c. telephone calls
d. memoranda and letters
e. newsletters.

The effectiveness of the communication processes should be evaluated on an ongoing basis, through management review, employee surveys, environmental training programs, organisation audits and inspections, and informal discussions.

The main topics of internal communication should include, but are not limited to:

f. environmental policy, objectives, and targets
g. environmental management roles and responsibilities
h. organisational performance compared to environmental objectives and targets
i. environmental procedures
j. environmental compliance issues
k. emergency response procedures.

External Communication:

All enquiries and other communications received from external parties by mail, fax, telephone or in person, concerning the EMS or environmental performance including communication requests received from the media, public, and interested parties should be forwarded to the environmental champion. The champion then forwards these requests to the MD to determine the appropriate response.

Table 8: Template of External Communications Record	
External Environmental Communications Records	
Time:	Date:
Dealt By:	
Position:	
Third Party Name:	
Third Party Address and Contact Details:	
Telephone:	Email:
Details Of Third Party Communication:	

7.5.4 Documentation and Document Control

The EMS champion must establish and maintain information, in paper or electronic format, to describe the core elements of the management system and their interaction. This includes policies, procedures and a manual to ensure complete documentation of the system.

EMS Documentation

In terms of ISO 14001:2004 there are 14 mandatory procedures that will need to be established in an EMS. These are summarised below and include the following:

1. Environmental aspects of the company's activities, products or services
2. Identify and have access to legal and other requirements
3. Objectives, targets and programmes
4. Competence, training and awareness

5. Communication
    a. Internal communication between various levels and functions
    b. Receiving, documenting and responding to relevant communication from external interested parties
6. Documentation
7. Document control
8. Operational control
9. Emergency preparedness and response
10. Monitoring and measurement
11. Evaluation of compliance to legislation
12. Non-conformance, corrective action and preventive action
13. Control of records
14. Internal audits

The document control procedure will describe how the EMS is structured and ensure that everyone knows where the EMS documents can be located, that they are periodically reviewed, that current versions are available and obsolete documents are removed. This should be aligned with the company's existing policy for the control of other important documentation (e.g. financial requirements etc) so as not to be superfluous or onerous.

A few of the 14 mandatory ISO 14001 procedures are described further below, since they are equally relevant for any other "light" EMS version too.

7.5.5 Operational Control

The company is required to identify and plan the operations associated with its identified significant environmental aspects and legal requirements in order to establish documented operational control procedures. This will ensure consistency with the Environmental Policy and achieving objectives and targets.

The controls and compliance requirements that would be required should be discussed with the relevant staff and procedures must be formulated and implemented to ensure effectiveness.

Table 9: Example of an Operational Control Routine Response		
Significant Aspect	**Associated Operation**	**Operational Control**
Potential for oil spills	Use of hydraulic machinery	• Daily inspections for leaks
Heavy metal dust inhalation	Dismantling CRT monitors	• Inspections to ensure that all staff wear proper PPE • Adequate ventilation
Hazardous waste storage	On site storage of dismantled components prior to collection/ transportation	• Maintain a record of volumes/quantities and types so that there is readily available knowledge of volumes on site • Have a system to arrange for removal when a certain threshold is being approached • Undertake weekly visual inspections of storage area

7.5.6 Emergency Preparedness and Response

Minimising the impacts of uncontrolled events is one of the most important controls to have in place. A procedure must be compiled to address the following:

- Assessing the potential for accidents and emergencies
- Preventing incidents and associated impacts
- Plans for responding to incidents
- Mitigating impacts

This must be reviewed after an incident has occurred as part of the process of continual improvement.

Table 10: Example of Table to Rank Potential Emergency Situations				
Potential Accident or Emergency Event		Likelihood of Occurrence in One Year	Best Estimate of Economic Damages	Severity of Potential Environmental Impact
1	e.g. Spill or release of hazardous materials	Quite likely	High	High
2				
3				
4				
5				

For each potential accident or emergency situation identified, the following table can be used to identify any associated environmental impacts, determine what can be done to prevent the occurrence of the environmental impacts, and/or what can be done to mitigate the environmental impacts:

Ranked Potential Accident or Emergency Situation		Associated Environmental Impacts	Preventive Actions	Mitigative Actions
1	e.g. Spill or release of hazardous materials	Pollution of stormwater	Protect stormwater drains	Spill kit in workshop
2				
3				
4				
5				

7.5.7 Checking and Corrective Action

The measurement, analysis, assessment, and review of real data relating to the environmental performance of the organisation can support environmental reporting and communication (both internal and external).

Steps to developing a Corrective Action Program:

1. Management should review and record important information regarding the performance of the EMS. This should include: complaints from customers, agencies and third parties, monitoring deviations, raw materials costs reductions, accidents, emergencies, process improvement or changes resulting in waste reduction, pollution prevention or other environmental impacts.

2. Review and analyse the preventative action results and data.

3. This part of the system is the basis for tracking and recognising opportunities for continuous improvement for the EMS and for the environmental performance of the company. Many well-developed systems fail because they can't differentiate individual failure in procedures that are either not performed correctly or done well from procedures that, from a design perspective, do not accomplish the desired goal.

7.5.8 Monitoring and Measurement

The monitoring and measurement section of ISO14001 contains two requirements:

- Measurement and monitoring of environmental performance associated with operations that can have a significant impact on the environment
- Calibration and maintenance of equipment used for environmental monitoring and measurement

An effective EMS should consist of an effective monitoring and measurement process which measures ongoing performance against the objectives and targets which have been set.

This will enable the company to:

- Evaluate their environmental performance
- Analyse root causes of problems
- Assess compliance with legal requirements
- Identify areas requiring corrective action
- Improve performance and increase efficiency

Monitoring therefore helps to manage the company's activities better. The following key activities should be included in the monitoring procedure:

- Measuring progress of meeting objectives and targets
- Communicating performance
- Conducting internal audits

Calibration and Maintenance:

The requirement of having a calibration system is to ensure that measurements are reliable and accurate. A calibration system may be developed following these steps:

- Identification of measurements to be made
- Identification of equipment, instruments, hardware and software to be used
- Identification of the testing methods to be used
- Determination of the accuracy and precision required or desired
- Definition of calibration procedures
- Use of the system
- Establishment of records
- Taking corrective action if equipment is found to be out of calibration
- Improvement of the system as necessary

Example: If the e-waste collector uses a weighbridge or scale for items that are received, the weighbridge and scale are equipment that has been identified as requiring regular calibration. If they are found to be out of calibration, corrective action in terms of maintenance and repair will be required. The system can be improved by ensuring that there is a second scale available or installing a new and up to date weighbridge.

Monitoring

Example: Water consumption

Monthly water meter readings can be taken to establish the organisation's water consumption. This information can be used to monitor whether water saving measures and initiatives are effective and if water saving targets are being met. Excessive consumption will highlight that corrective action may be required, this could be as simple as identifying a leak or installation of low flow shower heads.

7.5.9 Evaluation of Compliance

A procedure should be compiled to include the:

- review of regulatory compliance and other requirements to which it subscribes
- review of legislative compliance.

7.5.10 Non-conformance and Corrective and Preventive Action

The facility should establish a procedure to define the responsibility and authority for handling and investigating non-conformances, taking action to mitigate any impacts caused and for initiating and completing corrective and preventive action.

7.5.11 Control of Records

The EMS requires that a procedure be established for the identification, maintenance and disposal of environmental records. Existing record control procedures should be reviewed and adapted or revised to meet the requirements of the EMS.

Example List of Records

1. Internal environmental communication documents i.e.: memos, newsletters
2. Responses to internal/external environmental communication documents
3. Proof of policy communication i.e. memo, training
4. Staff suggestions related to environmental issues e.g. meeting minutes
5. EMS document distribution, sign-off sheets
6. Emergency response communication record
7. Internal/external audit reports
8. Inspection and calibration information
9. Monitoring data, e.g. analysis of wastewater, smoke and air quality
10. Date for energy and water consumption, product usage
11. Training certificates and registers
12. Reports on non-conformances and follow-up

7.5.12 EMS Internal Audit

The EMS requires that a procedure and programme be established for periodic internal audits to be carried out to ensure whether the EMS conforms to the ISO standard and whether it has been properly implemented and maintained.

Audit results must be provided to management. An audit programme should be established as well as an audit procedure.

Table 12: Internal Audit Template & Example:

EMS Internal Audit Template			
Area/Location:		Auditor Name:	
Audit Date:		Auditee Name:	
ISO Clause/EMS Ref:	Requirement	Conformance Yes Or No?	Comments/ Observations (e.g. documents reviewed)
4.1	Has the organisations top management defined the environmental policy?		
	Is the policy documented, implemented and maintained?		
	Is the policy communicated to all persons working in the organisation?		
	Is the policy available to the public?		

7.6 Management Review

The management review provides a structured forum for reviewing the performance of the EMS and to ensure its continuing suitability, adequacy and effectiveness. The review should address, amongst other things, the company's commitment towards continual improvement, the environmental policy, the objectives and targets, the EMP, results of the EMS audit and changing circumstances.

If the certification route is to be followed, at least one management review will be required prior to the first certification audit.

8. Practicalities of Implementing an EMS

An EMS can be implemented to improve a company's environmental performance without the ultimate goal of certification.

- The EMS should be seen as a system that must be integrated into the company's existing operational procedures and practices (e.g Health and Safety) – it should not be onerous or seen as an add-on
- Should the SME grow and trigger the requirements for a waste licence, the existing EMS can form the basis of the required operational management plan
- The EMS provides a system for achieving continual improvement, as well as identifying opportunities for reducing operating costs
- Procedures can be combined, should not be lengthy and must be easy and practical to implement

- The EMS is a useful tool to ensure legislative compliance
- The monitoring and measuring requirements should be seen as best-practice and be undertaken regardless of the extent of implementation
- Reviews and audits can take place as part of existing review and audit procedures but must be documented.

Table 13: Checklist of Documents for Implementation of the EMS

	Procedure/Documentation	Check
1	Environmental policy	
2	Environmental aspects of the company's activities, products or services (ASPECTS & IMPACTS REGISTER)	
3	Legal and other requirements – LEGAL REGISTER	
4	Objectives, targets and programmes to reach these	
5	Competence, training and awareness procedure	
6	Communication	
6a	Internal communication between various levels and functions	
6b	Receiving, documenting and responding to relevant communication from external interested parties	
7	EMS manual	
8	Document control procedure	
9	Operational control procedure	
10	Emergency preparedness and response procedure	
11	Monitoring and measurement procedure	
12	Evaluation of compliance to legislation	
13	Non-conformance, corrective action and preventive actions procedure	

9. Annexure A: National Environmental Management: Waste Act Licence Requirements

The National Environmental Management: Waste Act (Waste Act; Act 59 of 2008) was promulgated and is in effect since July 2009. The Waste Act is the overarching legislation for waste management and sets parameters in terms of regulating the waste industry with regards to listing activities that require a waste management license. All activities that are listed require an application for a waste management license and the process is linked to the National Environmental Management Act (NEMA; Act 107 of 1998, as amended) in terms of the Environmental Impact Assessment (EIA) Regulations (R543, R544, R545 an R546).

What Do I Need to Know about the Waste Act?

The National Environmental Management: Waste Act (59 of 2008) (the Waste Act) combines all the regulations and control of waste management practices in one place. Among other things, its aim is to:

- protect human health and the environment
- provide for the licensing and control of waste management activities
- provide for national norms and standards for regulating the management of waste
- provide for a national waste information system.

The Waste Act makes any business or industry that creates waste responsible for the waste they generate. It also holds businesses involved in waste management and recycling accountable for the waste they manage. This helps minimise illegal dumping, pollution and with it, harmful effects on human health and the environment.

But I just want to start a small e-waste recycling initiative, what does this mean for me?

To make sure that waste is managed correctly and safely, the Waste Act regulates the licensing and control of waste management activities, some of which are 'listed'.

What are "listed activities"?

The Waste Act provides a list of waste (management) related activities that are required to have a waste management licence to be able to operate legally.

Listed activities include:

- storage of waste
- reuse, recycling and recovery of waste
- treatment of waste
- disposal of waste
- storage, treatment and processing of animal waste
- storage of hazardous waste
- the construction of facilities to undertake the above.

If I start a small recycling initiative, must I apply for a licence?

Not necessarily. The government understands that there are small scale initiatives that if managed correctly will not have a negative impact on human health or the environment. Initiatives that handle waste under certain limits or thresholds do not require a waste management licence.

If your operation manages waste in quantities or volumes above these limits you will need to apply for a waste management licence in order to continue operating and be legally compliant.

Threshold limits for the listed activities include:

- storage of waste
- the reuse, recycling and recovery of waste.

Licence Triggering Threshold Limits for the Storage of Waste by Volume

Licence triggering threshold limits are:

- temporary or permanent storage of general waste whose total volume is over 100m^3 in a facility at any one time (excluding the storage of waste in lagoons)
- temporary storage of hazardous waste at a facility that has the capacity to store in excess of 35m^3 (excluding the storage of waste in lagoons).

E-waste is classified as hazardous waste in terms of the Waste Act. Therefore, the threshold limits are different to that of general waste and if you have the capacity to store in excess of 35m^3 (i.e. more than one shipping container) of e-waste, then you will need to apply for a waste management license.

Licence Triggering Threshold Limits for the Storage of Waste by Weight

If you are sorting, shredding, grinding or baling waste at a facility that is capable of processing more than 1 ton per day you will need a waste management license.

TAKE NOTE! The listed activities work together. This means that even if you store less than 100m^3 of general waste by volume, you are still limited to the weight that you are allowed to sort, shred or bale, which is 1 ton per day.

What if my recycling initiative will be or is above these thresholds?

This will mean you need to apply for a waste management license. To apply for a waste management license, you first need to have an assessment done of your proposed facility to ensure that it does not negatively impact the environment. This environmental assessment can cost in excess of R80,000. You should approach a professional that can assist you with this.

How long will the waste management license process take?

This depends on the nature of the application in terms of the listed activities triggered and whether a Basic Assessment (BA) process or a Full Scoping and Environmental Impact Assessment (EIA) process is required. A BA process will take approximately 8 months and the Full Scoping and EIA process about 16 months to complete.

What will happen if I start operating before I have a waste management license?

If you operate over and above the threshold limits and do not have a waste management license, you are acting unlawfully and can be fined or imprisoned. The maximum fine for contravention of the Act is R10,000,000 and/or 10 years imprisonment.

References

Creating an Environmental Management System. International Finance Corporation. Online, Accessed on 13 February2013, Website Address: http://southafrica.smetoolkit. org/sa/en/content/en/279/Creating-an-Environmental-Management-System-EMS-.

Department of Environmental Affairs (2010) Question no. 355 for written reply: National Assembly, Online, Accessed on 14 November files/parliamentary updates/question355.pdf

Electronic Waste Association of South Africa (2008) ELECTRONIC WASTE ASSOCIATION OF SOUTH AFRICA WEBSITE, Online, Accessed on 14 September 2012, Website Address: http://www.ewasa.org/

SME Survey 2012 Report: Executive Summary. SME's on the Internet. Accessed on 13 February2013, Website Address: http://www.smesurvey.co.za/

ISO 14001:2004 Environmental Management Systems – Requirements with guidance for use (2004), 2nd Edition. International Organisation for Standardization.

Literature Review on Small and Medium Enterprises' Access to Credit and Support in South Africa (December 2011). Prepared for National Credit Regulator (NCR). Compiled by Underhill Corporate Solutions (UCS).

The Integrated Small Business Development Strategy in South Africa. 2004 – 2014. Department of Trade and Industry. October 2003

Notes

www.giz.de