WASTE MANAGEMENT SUPPORT SYSTEMS FOR SMMEs

Training Manual

environmental affairs
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Environmental Affairs
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LIST OF ABBREVIATIONS

BBSDP	Business Supplier Development Programme
CIS	Co-operative Incentive Scheme
DEA	Department of Environmental Affairs
DBSA	Development Bank of Southern Africa
GDP	Gross Domestic Product
EPWP	Extended Public Works Programme
ISP	Incubation Support Programme
ISWA	International Solid Waste Association
LFG	Landfill gas
MRFs	Materials Recovery Facilities
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NOWCS	National Waste Composting Strategy
NWMS	National Waste Management Strategy
SMEDP	Small Medium Enterprise Development Programme
SEMA	Specific Environmental Management Acts
SMEs	Small and Medium Enterprises
SMMEs	Small, Medium and Micro Enterprises
SPII	Support Programme for Industrial Innovation
STP	Seda Technology Programme
the dti	Department of Trade and Industry
THRIP	Technology and Human Resources for Industry Programme (THRIP)
UNEP	United Nations Environment Programme
WtE	Waste to Energy (WtE)

1 INTRODUCTION

As the leading authority for environmental protection in the country, the Department of Environmental Affairs (DEA) has made tremendous strides towards the development of legislation aimed at protecting the environment. Amongst these is the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (the Waste Act) – though this was fairly recently promulgated. In its move towards achieving the objectives of the Waste Act, DEA had developed and published the National Waste Management Strategy (NWMS) in 2011. The purpose of the NWMS is to implement the Waste Act and thus providing a plan to address numerous waste management challenges that the country is facing.

In relation to waste management, landfilling still remains the most commonly practiced and perhaps the cheapest method for managing waste, relatively. However, various attempts are being put in place to move away from this approach – in pursuance of other effective and efficient methods of waste management – as per the waste management hierarchy provided for in the NWMS. As it stands now, landfills will continue to play a significant role in waste management for a while and the proper management thereof is of paramount importance.

The NWMS advocates waste management hierarchy as a necessary approach towards achieving effective waste management and contributing to sustainable development. One of the goals set in the NWMS is to achieve a target of 25% diversion of recyclables from landfills for re-use, recycling and recovery. This creates a platform for the waste sector to grow and play a meaningful role in its contribution to the green economy by creating an opportunity for SMEs and cooperatives to participate in the waste service delivery and recycling.

However, many aspirant SMEs and cooperatives are not aware of the existence of these opportunities and how they could take advantage of these and meaningfully participate in this sector. It is upon this reason that DEA – through the Chemicals and Waste Management Branch – is coming up with this programme or training to bring to the awareness of SMEs the available opportunities for participating in the waste sector and help grow the green economy.

The purpose of this training is to expose SMEs on the available opportunities for participating in the waste sector; the government support schemes for the sector; and the legislative framework governing the waste sector.

2 LEGISLATIVE FRAMEWORK

Waste management is impacted upon and governed by a series of regulations and legislation pitched from the national level and cascaded down to the local government level, passing through the provincial level. This section provides a brief review of these legislation and or regulations governing the waste sector.

2.1 The Constitution of the Republic of South Africa, 108 (Act 108 of 1996)

The Constitution of the Republic of South Africa, 1996 (the Constitution) – as the source of all legislature in the country – makes specific references to the prevention of pollution and ecological degradation. The right to environmental protection and to live in an environment that is not harmful to health or well-being is set out in the Bill of Rights (section 24 of Chapter 2).

In fulfilling these rights, the State, through the organs of state responsible for implementing this Act, must put in place uniform measures that seek to reduce the amount of waste that is generated and, where waste is generated, to ensure that waste is re-used, recycled and recovered in an environmentally sound manner before being safely treated and disposed of.

2.2 National Environmental Management Act, 1998 (Act 107 of 1998)

The National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) sets out guiding principles governing decision making on matters affecting the environment. Prominent amongst these principles are the Polluter Pays Principles, Producer Responsibility and the Precautionary Principles. In Chapter 5 of the Act, provisions are made with regard to Integrated Waste Management as well as placing the duty of care on any persons that may cause environmental pollution, and thus requiring them to introduce measures directed towards preventing the pollution from further occurring or to minimise the pollution.

In addition to the afore-mentioned principles, with regard to waste management, NEMA emphasizes and promotes the following:

- A stronger statement on the waste management hierarchy that establishes avoidance of waste as the basic objective of waste management;
- A requirement for planning to anticipate and therefore prevent, minimize, and remedy negative impacts on the environment and human health;
- A life cycle approach to waste management, encompassing the extended producer responsibility.

NEMA emphasizes on cooperative governance and in so doing sets out procedures for establishing institutions that will promote cooperative governance, as well as setting up procedures for coordinating environmental functions exercised by organs of state.

2.3 The National Environmental Management: Waste Act, 2008 (Act 59 of 2008)

The Waste Act primarily brings about an improvement in the law governing waste management in the country and introduces a coherent and integrated approach that addresses all the steps in the waste management hierarchy. The Waste Act advocates a systematic and hierarchical approach in waste management – covering aspects of waste avoidance, reduction, re-use, recycling, recovery and safe disposal as a last resort. In cases where uniformity is required with regard to dealing with certain aspects or provisions of the Waste Act, the development of norms and standards becomes the foundation of the regulatory system. Under the Waste Act, provinces and local municipalities are also given powers to develop their own standards, provided that such standards are not in conflict with the national standards.

In order to effectively and efficiently implement the Waste Act, the Department developed the National Waste Management Strategy (NWMS) in 2011. The important factors driving the application of the Waste Act are emphasised in the NWMS and are structured around the waste management hierarchy that sets the tone that directs proper and effective waste management in the country. The waste management hierarchy consists of options for waste management during the lifecycle of waste, arranged in descending order of priority, as shown in Figure 2.1 below. The NWMS requires all waste producers and users to follow the waste management hierarchy when making waste management decisions.

The first step or the most preferred step in the waste management hierarchy involves waste avoidance and reduction. This is aimed at encouraging manufacturers of goods or products to manufacture or produce their products or goods in such a manner that the generation of waste is minimised. Also important in this approach is the reduction of the quantity and toxicity of waste generated during the production process.

The second step in the waste management hierarchy is the re-use of waste, which involves removing an article from waste stream and using it in a similar or different purpose without changing its form.

The third stage is waste recycling, which involves separating articles from the waste stream and processing them as products or raw materials.

Figure 2.1: Waste management hierarchy

The fourth stage is recovery and involves reclaiming useful components or material from the waste or using the waste for generating energy.

The final and least preferred step in waste management is waste disposal. The emphasis in this stage is that waste should be treated/ and or disposed of as a last resort. The approach in the disposal route is that the safest methods of disposal must be followed.

These first four stages of the waste management hierarchy are the foundation of cradle-to-cradle waste management. This approach seeks to re-use or recycle a product when it reaches the end of its life cycle whereby it becomes inputs for new products and materials. The cycle repeats itself until a small portion of the original product eventually enters the next level of the waste management hierarchy, which is recovery.

Where the quantity of waste cannot be reduced during production, the purpose of implementing the waste management hierarchy is to use waste as a resource and divert these potential resources from landfill. The Act provides a mechanism whereby activities that have, or are likely to have, a detrimental effect on the environment are licenced. Although landfill is widely considered the most affordable way to manage waste, this view does not take into account factors such as the environmental impacts of landfills; the costs of developing and maintaining additional landfill capacity to accommodate the increasing rate of waste disposal; and the cost of closing and remediating the landfill.

Landfills are also known to be sources of air pollution and as a result their operations are impacted upon by the provisions of the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) (AQA), which is the SEMA promulgated to specifically deal with air quality issues in the country.

2.3.1 The National Waste Management Strategy (NWMS)

The overall purpose of the NWMS is to give effect to the objectives of the Waste Act– which are to protect health, well-being and the environment through sound waste management and the application of the waste management hierarchy. The strategy provides a plan to give practical effect to the Waste Act, and as such it seeks to ensure that responsibility for waste management is properly apportioned. Eight goals have been outlined in the strategy, as means to giving effect to the objects of the Waste Act.

These goals are as follows:

- Promote waste minimisation, re-use, recycling and recovery of waste.
- Ensure the effective and efficient delivery of waste services.
- Grow the contribution of the waste sector to the green economy
- Ensure that people are aware of the impact of waste on their health, well-being and the environment.
- Achieve integrated waste management planning.
- Ensure sound budgeting and financial management for waste services.
- Provide measures to remediate contaminated land.
- Establish effective compliance with and enforcement of the Waste Act.

2.3.2 Waste Act Regulatory Instruments

A number of instruments have been developed to operationalise the Waste Act and its amended version. These include, amongst others: National Policy in Thermal Treatment of General and Hazardous Waste (GN 32439, 24 July 2011); National Policy for the Provision of Basic Refuse Removal Services to Indigent Household (GN 34385, 22 June 2011); List of Waste Management Activities that have, or are likely to have a detrimental effect on the environment (GN 37083, 29 November 2013); National Waste Information Regulations (GN 35583, 13 August 2012); Waste Classification Regulations (GN 36784, 23 August 2013); National Domestic Waste Collection Standards (GN 33935, 21 January 2011); National Norms and Standards for Disposal of Waste to Landfill (GN 36784, 23 August 2013); National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN 36784, 23 August 2013); National Norms and Standards for the Extraction, Flaring and Recovery of Landfill Gas (GN 37086, 29 November 2013); National Norms and Standards for the Scrapping or Recovery of Motor Vehicles (GN 37087, 29 November 2013); and the National Norms and Standards for the Storage of Waste (GN 37088, 29 November 2013).

2.4 The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)

The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)'s main objective is to protect the environment by providing reasonable measures for the protection and enhancement of air quality and the prevention of air pollution and ecological degradation. The Act provides a framework for setting of national norms and standards with regard to: air quality management planning; monitoring and reporting; ambient air quality standards; setting of emission standards from point and non-point sources; provision for geographical hotspots; air quality information management; mechanisms, systems and procedures to attain compliance with ambient air quality standards.

The relevance of this Act with regard to waste management is that poor waste management practices may present the risk of dust and contaminant pollution through wind action. Hazardous air pollutants may be dispersed from waste management facilities as dust or in gas form. Furthermore, certain waste streams such as organic waste are biodegradable and may generate offensive airborne emissions in the process.

2.5 Other legislation

Apart from the above mentioned legislation, other pieces of legislation such as the Local Government: Municipal Structures Act, 1998 (Act 117 or 1998); the National Water Act, 1998 (Act 36 of 1998); and the Environmental Conservation Act, 1989 (Act 73 of 1989) make provisions for responsible waste management. The Local Government: Municipal Structures Act, 1998 (Act 117 of 1998) places responsibility to the District Municipalities to make provisions for the development of a strategy and sites for waste disposal.

The National Water Act recognises poor management of waste as posing threat to water resources and specifies measures for the prevention of such pollutions from happening, as well as making provisions for the remediation of such pollutions.

The Environmental Conservation Act, 1989 (Act 73 of 1989) makes provisions for the control of environmental pollution and the control of activities that negatively impact on the environment, as well as emphasising the need for waste disposal facilities for effective waste disposal.

3 GREEN ECONOMY

The term green economy was first introduced in a report prepared in 1989 for the United Kingdom Government by a group of well-known environmental economists. This report was entitled "Blueprint for a Green Economy" (ISWA, 2013). It is reported that there is currently no internationally agreed definition of green economy. However, the definition that is widely used is the one proposed by the United Nations Environmental Programme (UNEP) – which defines green economy as "an economy that results in improved human well-being and reduced inequalities over the long term, while not exposing future generations to significant environmental risks and ecological scarcities".

The term was again brought to the spotlight in 2008 by the United Nations Environment Programme (UNEP) in connection with policy discussions amidst concerns of a global recession. UNEP developed the idea of "green stimulus packages" through which a number of identified focused areas was brought forward to kick-start the green economy where much attention was placed on large-scale public investment programmes. This ideas inspired several government entities around the globe to implement significant 'green stimulus' packages as part of their economic recovery efforts (ISWA, 2013).

The main principle of green economy is to create a low carbon economy and dissociate resource depletion and waste generation from economic growth. Thus, the approach towards achieving green economy is focused towards encouraging investment in ways that reduce carbon emissions, reduce the generation of waste, optimize resource use, and prevent loss of biodiversity and ecosystem services. Amongst many sectors that may contribute directly or indirectly to the green economy are renewable energy, green buildings, clean transportation, water management, waste management and land management (ISWA, 2013).

In essence green economy plays a significant role in the drive to achieving the objectives of sustainable development. Broadly speaking, sustainable development or sustainability encompasses environmental sustainability, social sustainability and economic sustainability.

3.1 Economic sustainability

According to the Businessdictionary.com (2013), economic sustainability refers to the use of various strategies for employing existing resources optimally so that a responsible and beneficial balance can be achieved over the longer term. Within a business context, economic sustainability involves using the assorted assets of the company efficiently to allow it to continue functioning profitability over time.

3.2 Environmental sustainability

According to UNEP (2013) environmental sustainability relates to making decisions and taking actions that are geared towards protecting the natural world – with specific emphasis on conserving the capability of the environment to be able to support human life. The environmental aspect of the green economy needs to be considered from a sectoral approach, as well as from an operational level. The waste sector as a whole needs to have an all-inclusive aim of resource efficiency and should follow the waste hierarchy principles in order to effectively contribute to the green economy.

3.3 Social sustainability

Social sustainability is referred to as the ability of a community to develop practices and structures which enable it to meet the needs of its current generation while it also supports the ability of future generations to maintain a healthy community. The relevance of the waste sector in relation to social sustainability lies on the sector's ability to meet the minimum social conditions such as safe working conditions and maintaining healthy and safety level of communities. Therefore, in addition to meeting occupational health and safety requirements, employment in the green economy needs to be concerned with other social factors as well, such as the aspects of child labour, social protection and freedom of association (ISWA, 2013).

Figure 3.1 below provides a schematic representation of the interlink between the environmental, social and economic capitals.

Figure 3.1: Interconnection between the Environment, Social and Economy (Source: The Chicago Community Trust 2013)

In summary, the waste sector has the potential to contribute in numerous ways to a green economy. Nevertheless, there is a need for the players in the sector to endorse and meet minimum social, environmental and economic standards and practices. Without the endorsement of sustainable waste management practices, the waste sector could have devastating negative influences on the natural, social and economic capitals, as shown in Figure 3.2 below:

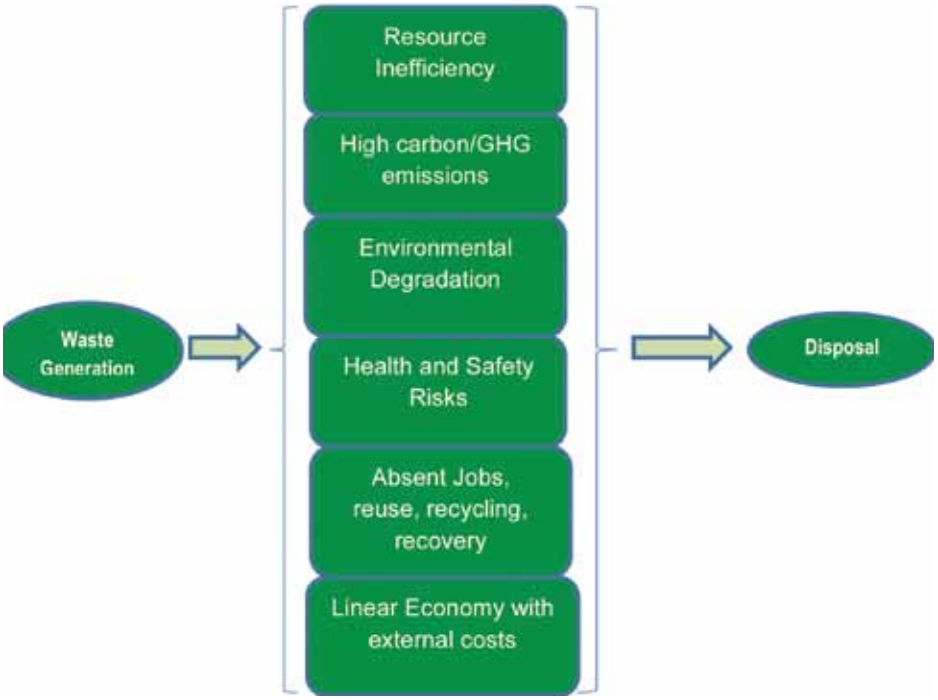

Figure 3.2 Unsustainable waste management practices (Source: ISWA, 2013)

The ultimate result of unsustainable waste management practices are undesirable consequences of environmental degradation, unhealthy societies, joblessness and many other negative effects. This is a total opposite of sustainable development and leads to poor contribution to the green economy. The fundamentals of green economy are based on the five capitals model of sustainable development and the principles of ecological economics. The five capitals model covers the natural capital, the human capital, the social capital, the manufactured capital and the financial capital.

3.4 The five capitals model

Although this document is not aimed at discussing at length the five capital models, it is important to provide a brief description of these capitals, since these underpin any progress in relation to the green economy. These are the capitals from which goods and services needed to improve the quality of life are derived.

3.4.1 The Natural Capital

The Natural Capital relates to the stock of natural ecosystems that provides a flow of valuable ecosystem goods and services into the future (Encyclopaedia of Earth, 2013). Typical examples include stock of forest, rivers, land, minerals and oceans, as well as the natural processes and functions that underpin their operation (Department for Environment, Food and Rural Affairs, 2013).

3.4.2 The Human Capital

The Human capital broadly refers to any stock of knowledge and characteristics that a worker possesses that contribute to his or her productivity (London School of Economics, N.d).

3.4.3 The Social Capital

The Social capital, according to Goodwin (2003) refers to the stock of trust, mutual understanding, shared values, and socially held knowledge that is important for the facilitation of economic activities. A company can enhance its social capital through supporting the development of communities in which it operates; providing safe, supportive living and working conditions such as developing and implementing family friendly policies; amongst other things (Forum for the Future, 2013).

3.4.3 Manufactured capital

The Manufactured capital relates to the material goods and infrastructure owned or leased by an organisation, which contribute to the production or provision of services, but they themselves are not part of the output (Forum for the Future, 2013).

3.4.4 Financial Capital

The financial capital is known to play a crucial role in the economy and enables the other four capitals to be owned and traded through bonds, banknotes or shares (University of Cambridge, 2013). A company can enhance and maintain its financial capital by, amongst others: internalising environmental and social costs and assigning an economic value to them; ensuring a fair distribution of the wealth created; improving access to financial capital by demonstrating a positive stance on the management of sustainability issues (Forum for the Future, 2013).

3.5 The contribution of the waste sector in the green economy

The waste sector is one of the sectors that have been shown to have a potential to play a significant role in achieving the objectives of the green economy. Sustainable waste management contributes significantly to the green economy concept, particularly the consideration of the significant role that the sector plays in creating a low carbon economy, whereby the generation of waste and detrimental substances is minimized.

The waste sector has been shown to advocate the maximisation of materials re-use, recycling or recovered, while minimising waste disposal – a concept called waste management hierarchy in many countries – including South Africa. This concept is adopted to avoid or reduce potential damage to the environment and human health (ISWA, 2013). Figure 3.4 below provides a schematic representation of waste management in the green economy.

As it can be seen from the diagram below, the approach is cyclic in nature and advocates efficient approach to material utilisation and adopts a concept of re-utilisation of materials, with minimal waste generation. Though not included in the diagram, human behavior and attitude is key in driving this circular economy.

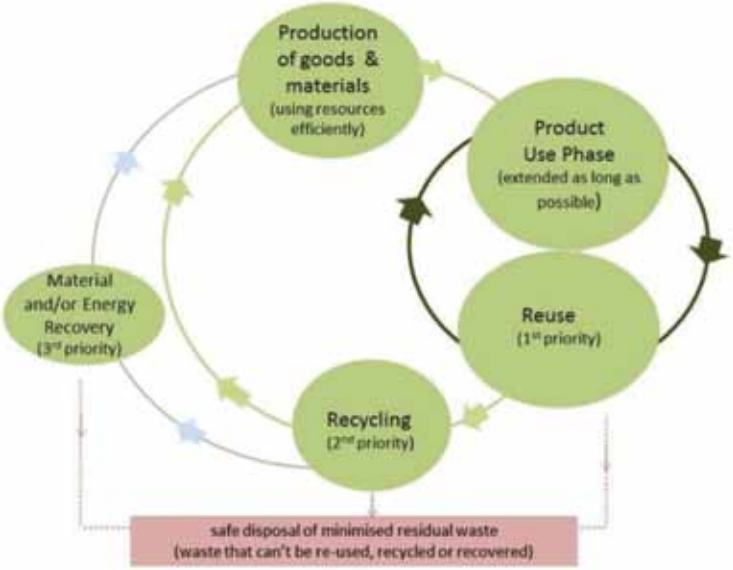

Figure 3.4: Waste Management in a circular economy (Source: The Guardian, 2014)

The Waste Sector will continue to play a significant role in the green economy for economic, environmental and social benefits. Various approaches of the significance of this sector in the green economy include: Providing a platform for saving natural resource and energy; establishment of new businesses and job creation; contribution to the agricultural sector through organic waste composting; generation of energy from waste; reducing greenhouse gases emissions; and contributions to equity and poverty alleviation(UNEP, 2011).

Change in the consumer demand is also a major determinant underlining the potential "greening" of the waste sector. With increased environmental awareness, more and more consumers have started demanding recycled products and waste-derived products (UNEP, 2011). The waste sector can fulfil its responsibility to provide a wide range of high quality secondary materials cost effectively. This can be achieved by supporting the dissociation of resource consumption from economic growth and waste generation – a concept also known as decoupling. The waste sector can enhance the growth of the green economy through the provision of waste treatment operations for reuse, recycling and recovery that are cost effective, so that materials are increasingly recycled and recovered, above being disposed. Furthermore, secondary materials and substances can be competitively priced relative to raw materials. One of the ways to achieve this is through channeling funds and investment towards the development of appropriate practices, infrastructure, equipment and services (ISWA, 2013).

For the waste sector to continue to play a meaningful role in the green economy and thus contributing to sustainable development, it is recommended that entities in the waste sector need to work in collaboration with the production & manufacturing sectors to promote the production of goods and materials with minimal hazardous contents, resulting in low quantities of waste being generated. This is achievable through maximising the use, reuse and recycling potential of products. At the operation level, the technologies and practices applied need to ensure that there is no or minimised adverse impact on the environment. This could be achieved through, for example, putting in place effective measures to protect against pollution to land, water resources or air and capture of greenhouse gases and through following the material resource efficiency principles (ISWA, 2013).

Other approaches that could be followed to increase the contribution of the waste sector in the green economy – while minimizing potential negative impacts on the environment – include efficient harnessing of energy for fuel or electricity generation in thermal treatment plants. This would replace the need for fossil fuels and lead to a net contribution to a low carbon economy. However, it is important to note that in the framework of sustainable development and the green economy waste treatment operations must not compete with material reuse and recycling, so that materials are not unnecessarily lost from the system (ISWA, 2013).

3.6 Waste management job opportunities

The major contribution of the waste sector in the green economy can be attributed to recycling. Recycling forms one of the bases for the green economy and plays a great role in the creation of employment opportunities in the sector. According to UNEP (2011) recycling in all its forms employs over 12 million people in countries like Brazil, China and United States.

The waste sector has been shown to create opportunities for people that would otherwise be excluded from participating in the economy. Business opportunities such as collection, processing and redistribution of recyclables are usually done by workers with limited skills. However, it is important to note that regardless of the potential and significant contribution of the waste sector to employment creation, not all of the recycling and waste management related jobs can be considered green jobs. Some of the criteria that need to be met for a job to be qualified as green job include matching the requirements of decent work, avoiding child labour, meeting occupational health and safety standards, social protection and freedom of association (UNEP, 2011).

It is has commonly been noticed that poorly managed waste practices can adversely impact human health and the safety of both waste workers/pickers and the general public, in many ways. This could result from coming into direct contact with certain hazardous waste and healthcare risk waste, or exposure to harmful substances that get released from certain operations or processes into the environment (ISWA, 2013).

The above challenge could be overcome by addressing the health and safety aspect of waste management, which could lead to improvements in public health, safety and minimisation of the associated cost burden. What needs to be done is to meet the upstream effects, such as reducing the hazardous substances in products; minimising the health and safety risks involved with waste management and treatment operations; including addressing the long term impact and cumulative effects of the pollutants into the environment (ISWA, 2013).

Though the contribution of the waste sector in the green economy is clearly recognized, as mentioned before, there are certain challenges that still need to be addressed, particularly in developing countries. These include poor work conditions, child labour, risky health and safety conditions, and discrimination by waste traders or buy-back centres. Waste picking is mainly associated with poor societies that are vulnerable to exploitation. If managed properly, the waste sector has huge potentials and can play a significant role in poverty alleviant and in job creation (ISWA, 2013).

The establishment of reuse and recycling industry is recognized as a good pathway leading toward substantial job creation and employment opportunities. Certain developing countries such as Brazil and China have made tremendous strides in creating waste management related job opportunities (ISWA, 2013). South Africa can take advance of its close economic ties with these nations and learn from them to advance is green job agenda.

According to media reports South Africa is facing an enormous challenge in the form of an excessively high rate of unemployment, which is stated to be currently above 25%. There had been a number of efforts that have been indicated to be under way to increase labour absorption in the various economic sectors, with the green economy receiving particular attention.

The green economy is diverse, relatively new and fast evolving in many of its segments, particularly in developing countries such as South Africa. One of the key developmental areas, which is an area with a lot of opportunities, now and in the near future, is in the development and commercialization of green economy related technologies. Certain waste management programmes such as recycling, energy from waste, landfill gas projects, composting and material recycling facilities have a huge contribution on the development of the green economy (Maia at al, 2011).

3.6.1 Recycling

The huge volumes of general waste generated in the country serve as an indication of the economic potential of the waste management sector. This is estimated to the total tune of R10 billion expenditure per year. If the sector is well utilised and supported, waste collection and the recycling industry can make a significant contribution to job creation and on the GDP. One example of the contribution of the sector on the creation of job opportunities is a pilot project in Mafikeng, which services 30 000 households. The project has managed to create 75 job opportunities and five small businesses. The small businesses now own their own waste collection trucks (DBSA, 2011).

Other job opportunities in this sector are from the upper level of the recycling value chain, such as the beneficiation of waste streams, including creating infrastructure for materials recovery facilities; outsourcing waste services to stimulate enterprise development; and waste-to-energy initiatives (Maia at al 2011).

There is already a basis for a recycling industry in the country-though the rate of recycling is taking place at a slow pace. This can be attributed to the existing recycling figures, which show that approximately 1.5 billion tonnes of packaging and paper waste is being recycled per year (DBSA, 2011). While this is still slightly behind statistics for developed countries and behind some developing countries, it provides an established base upon which to build and set targets for the recycling industry.

3.6.2 Waste to energy

Recovering energy and other useful by-products from waste has been made possible by considerable technological breakthroughs. These have resulted in the implementation of Waste to Energy (WtE) projects. In most cases, energy-recovery projects provide opportunities for generation and distribution of power on a decentralised basis where the electricity grid may not be available. Typical sources of the input materials in the generation of energy from waste include landfill gasses, as well as the use of waste with high calorific value such as tyres as sources of energy in cement kilns (Maia at al 2011).

There is currently a move and a desire in many countries to move away for landfilling as the only method for waste management. Municipalities are increasingly under pressure to reduce the amount of waste that needs to be land filled. The waste currently being dumped in landfills has the potential to be converted into forms of energy such as electricity and gas (UNEP, 2009).

The usage of waste for the production of energy will play a significant role in addressing the challenge of the limited availability of landfill airspace while also contribute towards addressing the country's energy challenges and minimising the detrimental impact of waste deposits on the environment. Some of the methods for extracting energy from waste include the following: Mechanical Biological Treatment; Aerobic/ anaerobic digestion; Incineration; Gasification; Pyrolysis; and Plasma Arc (UNEP, 2009).

3.6.3 Landfill Gas projects

Landfill Gas (LFG) is the gas released from landfills as a result of decomposition of waste. The major component of LFG is methane (CH_4), which consists at most 60% of LFG, with Carbon dioxide(CO_2) largely constituting the remainder. The methane gas from landfills presents a valuable energy resource that can be harvested and used in various ways. The reduction of methane gas in the atmosphere presents other important benefits on the environmental and in the economy (EEA, 2014).

The system of extracting LFG involves a series of wells and pumps that channel the collected gas towards a particular point for processing purposes. The gas can subsequently be flared, utilised for the generation of electricity, improved to natural gas form or used as an alternative fuel for vehicles (EEA, 2014). In South Africa, due to the so many benefits associated with landfill gas extraction, the Government has reduced the regulatory burden on landfill gas projects by exempting such projects from requiring a Waste Management Licence. Such activities are regulated through norms and standards.

3.6.4 Composting

The diversion of organic waste from landfill and its utilisation in the production of compost or soil conditioner brings economic benefits to small-scale farmers and reduces nutrient run-off and nitrogen leaching. Organic waste composting could also increase carbon management properties of the soil and enhance the crop yield (UNEP, 2012). In its drive to achieving the objectives of the National Waste Management Strategy for diverting waste from landfills, DEA has developed the National Organic Waste Composting Strategy (NOWCS). NOWCS is aimed at promoting composting as one method to beneficiate organic waste. Furthermore, the regulatory requirement for managing organic waste composting is controlled though norms and standards (DEA, 2013).

3.6.5 Material recovery

Reclamation of materials at many landfill sites around the country is an indication of the high value of the materials being disposed of at landfills. However, the best practice and most profitable way is for reclamation of re-usable and recyclable waste to happen before the waste reaches the landfill sites. Generally, two approaches can be followed in the recovery of valuable waste materials. These involve sorting of valuable recyclable and reusable materials from mixed waste at dirty Material Recovery Facility; and separation of valuable materials at source combined with further sorting at “clean” MRFs. Apart from offering “clean” recyclables which fetch higher prices, clean MRFs also provide more humane working conditions for those involved in reclamation activities and thus adding to their dignity (CSIR, 2014).

Depending on the type of method used in each reclamation activity, the volumes and types of waste sorted at these facilities will dictate the level of sophistication required in the machinery used. Conveyer belt systems are well suited to dirty MRFs while less costly table-top sorting systems can be employed at clean MRFs. Technologies are likely to be more complex at dirty MRFs due to the need for cleaning and more advanced sorting. The type of plant influences the quality of the recyclables as it may be difficult to find markets for contaminated recyclables (CSIR, 2014).

4 FINANCIAL SUPPORT SYSTEMS

One of the resources that is important in the functioning and survival of any business is the availability of sufficient financial resources. Financial management is at the core of putting systems in place to effectively manage this resource. In addition to this, the securing of this resource is equality important. This Chapter focuses on the Government's available financial support systems for financing small, medium and micro-enterprises. It does not cover aspects relating to the management of finances. The purpose is mainly to bring awareness on the available financial schemes that the Government has put in place to support the development of SMMEs.

The development and advancement of Small, Medium and Micro-sized Enterprises (SMMEs) is amongst the Government's focus areas that are targeted to be used as vehicles for accelerating the objectives of achieving economic development and economic growth (Department of Trade and Industry, 2014). With the assistance of other government departments and institutions, the Department of Trade and Industry (the dti) takes the lead in implementing SMME-related policies, to ensure that adequate financial and non-financial assistance is provided to the sector, for its long-term prosperity and that of the country as a whole. In the future the function for promoting economic growth and development through SMEs programmes will be shifted from the control of the dti to the recently formed Department of Small Business Development.

Many other government departments contribute in one way or another to the development of SMMEs –though not necessarily through the provision of financial incentives, but through programmes that include creating job opportunities and skills acquisition. For example, the Department of Public Works, through its Extended Public Works Programme (EPWP) creates job opportunities for the unemployed as well as providing training and enterprises development support (Department of Public Works, 2014).

The Department of Trade and Industry is one of the shining examples of the government departments that continue to play a role in promoting economic development and economic growth in the country. In living up its vision for, a dynamic industrial, globally competitive South African economy, characterised by inclusive growth and development, decent employment and equity, built on the full potential of all citizens, this Department has done a lot in promoting the development of SMMEs in the country through the establishment of numerous support systems. One of these support systems is the incentive schemes.

In fulfilling its vision, the Department of Trade and Industry derives its mandate from these five key strategic objectives:

- Facilitating the transformation of the economy to promote industrial development, investment, competitiveness and employment creation;
- Building mutually beneficial regional and global relations to advance South Africa´s trade, industrial policy and economic development objectives;
- Facilitating broad-based economic participation through targeted interventions to achieve more inclusive growth;
- Creating a fair regulatory environment that enables investment, trade and enterprise development in an equitable and socially responsible manner; and
- Promoting a professional, ethical, dynamic, competitive and customer-focused working environment that ensures effective and efficient service delivery (Department of Trade and Industry, 2014)

The Department of Trade and Industry's incentive schemes for SMMEs include the following: Black Business Supplier Development Programme (BBSDP); Co-operative Incentive Scheme (CIS); Incubation Support Programme (ISP); Seda Technology Programme (STP); Small and Medium Enterprise Development Programme (SMEDP); Support Programme for Industrial Innovation (SPII); and Technology and Human Resources for Industry Programme (THRIP). The section below will provide a brief description on some of the incentive schemes. Detailed information on each of these can be found on the dti website –www.thedti.gov.za.

4.1 Black Business Supplier Development Programme (BBSDP)

The Black Business Supplier Development Programme (BBSDP) is a grant and is aimed at fast-tracking existing SMMEs that meet the required criteria into the mainstream economy; and complementing current affirmative action procurement and outsourcing initiatives of public and public sector enterprises, amongst other objectives. The incentive is offered to enterprises that are owned by black people (Africans; Coloureds; Indians and Chinese people who arrived in South Africa before 1994). This is a cost-sharing grant aimed at assisting qualifying people to improve their competiveness and make their enterprices sustainable and enable them to create employment opportunities and become part of the mainstream economy. The incentive is in a form of grant not exceeding R1 000 000, which is broken down into the following:

- R800 000 for tools, machinery and equipment on a 50:50 cost-sharing basis; and
- R200 000 for business development and training interventions per eligible enterprise to improve their corporate governance, management, marketing, productivity and use of modern technology on a 80:20 cost-sharing basis (Department of Trade and Industry, 2014).

In order to qualify for this incentive scheme or programme, potential entrepreneurs need to meet the following criteria:

- Fifty-one per cent black majority shareholding;
- R250 000 to R35 million turnover per year;
- One year in operation and trading as a business;
- Fifty per cent management positions held by black people (historically disadvantaged individuals);
- Enterprises formally registered for VAT;
- Eligible to obtain funding to a maximum of R1 million, which is broken down as indicated above.
- Be operating and trading for at least one financial year – at the sole discretion of the Department of Trade and Industry. An enterprise that has been operational or registered for less than a year may be considered for this incentive, provided that the enterprise can supply sufficient evidence to service a tender/contract.

4.2 Co-operative Incentive Scheme (CIS)

The Co-operative Incentive Scheme (CIS) is a 100% grant for registered primary co-operatives. A primary co-operative consists of five or more members. The primary objective of the CIS is to assisting co-operatives to acquire their startup capital and to improve the viability and competitiveness of co-operative enterprises by lowering their cost of doing business through an incentive that supports Broad-Based Black Economic Empowerment. The qualifying business activities that are eligible to be supported through this scheme includes: Business development services such as feasibility studies and production efficiency; technological improvements; acquisition of machinery, equipment and tools, commercial vehicles, project linked infrastructure; and working capital.

Eligible enterprises must meet the following criteria:

- be incorporated and registered in South Africa in terms of the Co-operatives Act of 2005;
- be emerging co-operatives with a majority black ownership;
- have projects in any of the different economic sectors;
- adhere to co-operative principles;
- be owned by historically disadvantaged individuals (HDIs); and
- be biased towards women, youth and people with disabilities (Department of Trade and Industry, 2014).

4.3 Incubation Support Programme (ISP)

The Incubation Support Programme is a grant support aimed at ensuring that small, micro and medium enterprises (SMMEs) graduate into the mainstream economy through the support provided by the incubators. Therefore, the ISP is one of the support measures to encourage partnerships in which big business assists SMMEs with skills transfer, enterprise development, supplier development and marketing opportunities. The main objective of the ISP is to encourage private sector partnerships with Government to support incubators in order to develop SMMEs and nurture them into sustainable enterprises that can provide employment and contribute to economic growth.

The incubation support is made available on a cost-sharing basis between the Government and private sector partner(s). It is available for infrastructure and business development services necessary to mentor and grow enterprises to ensure that within a period of 2 to 3 years the enterprises will grow to a level where they are able to sustain themselves by providing products and services to the market.

The grant approval criteria will be based on some of the following:

- The grant approval will be based on projections for the first year at application stage whereas the approval for subsequent year(s) will be dependent on the review of actual performance of the preceding year against agreed milestones.
- All payments will be made directly to the incubator's primary account.
- The grant approval is capped at a maximum of R10 million (VAT inclusive) per financial year over a three (3) year period and is subject to the availability of funds.
- The ISP offers a cost-sharing support of 50:50 for large businesses and a cost-sharing of 40:60 for SMMEs.
- After the three year period, applicants may apply for assistance for an additional three years and must comply with the guidelines of the ISP.

The ISP is intended to support costs that would cover the following:

- Business development services (e.g. business advisory services, coaching and mentoring, training, facilitation of funding, production efficiency and improvement, quality and standards acquisition)
- Market access
- Machinery, equipment and tools
- Infrastructure linked to incubator (buildings, furniture)
- Feasibility studies for establishing and expanding incubators
- Product or service development
- Information and Communication Technology (ICT)
- Operational costs

Eligible businesses must meet the following criteria

- The business or the applicant must be: a registered legal entity in South Africa in terms of the Companies Act, 1973 (as amended) or the Companies Act, 2008 (as amended); the Close Corporations Act, 1984 (as amended) or the Co-operatives Act, 2005 (as amended); or a registered higher or further education institution; or a licensed and/or registered science council.
- The programme is available to applicants that want to establish new incubators or wish to grow and expand existing ones.
- The supported incubator may either offer physical and/or virtual incubation support services.
- The incubator to be supported may be a corporate incubator; a private investor's incubator; an academic or research institution incubator in partnership with industry, and must be focused on establishing and/or growing enterprises that will graduate to sustainable enterprises.

4.4 Seda Technology Programme (STP)

The Seda Technology Programme (STP) is a division of Seda (Small Enterprise Development Agency) and focuses on technology business incubation, quality & standards and technology transfer services, as well as support to small enterprises. The programme is aimed at stimulating economic growth and development through facilitating technological innovation, increasing accessibility to, and utilisation of technology and technical support for small enterprises. At the same time the programme seeks to improve sustainability and international competitiveness of small enterprises. The programme is responsible for the provision of both financial and non-financial technology transfer, business incubation and quality support services for small enterprises.

The Technology Transfer Unit of the programme seeks to provide a range of services that assist small enterprises, particularly enterprises in the 2nd economy, to access and acquire technology. "2nd economy''– as defined by the STP – broadly refers to small enterprises (registered or not registered) that are marginalised with respect to all or most of the following: Access to funds; Access to markets; Limited business skills; Limited technical know-how; and Access to appropriate technology.

The Unit's main objectives are: to provide technology transfer services to small enterprises; and to provide specific technology support to women-owned enterprises. These objectives are aimed at providing funding for small enterprises to acquire the necessary technology and technical support for effective technology transfer transactions. The STP offers financial assistance in the form of a non-repayable grant up to a maximum of R600 000 per project. In relation to providing specific technology support to women-owned enterprises, the scheme's objective focuses on the provision of technology transfer services and support to women-owned enterprises (>50% woman ownership),

The following are the categories that are eligible to qualify for Technology Transfer Fund (TTF):

- Design, formulation, materials and methods transfer, including design improvement and optimisation;
- Know-how, knowledge, skills and expertise transfer, including training and mentoring related to the technology being transferred;
- Designs, equipment, systems, machinery and tooling directly related to the product and process technology being transferred;
- The know-how, knowledge, skills and expertise required to operate and maintain the equipment, systems and machinery, including training and mentoring related to the technology being transferred;
- Expert labour costs regarding the technology, where such costs do not exceed 20% of the total approved TTF funding provided by STP;
- Intellectual Property payments (e.g. Licensing Agreements) and expertise transfer payments to enable the TTF transaction.
- Travelling and subsistence claims relating to the technology transfer transactions, subject to Adjudication Panel's prior approval;
- Legal and expert resource expenses regarding the negotiations, agreement and transfer of the technology;
- Business training, development and mentoring; and
- General business services, e.g. equipment, machines, facilities or processes that are utilised to provide repairs, examinations, overhauls, support or assistance in some form or other, as well as specialised equipment, machines or processes that are utilised to provide support for manufacturing, mining, agro-processing or service enterprises.

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