



Market Intelligence Report

Waste

2014

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Acknowledgements	3
List of figures	4
List of tables	4
List of acronyms	5
Executive summary	6
1. Overview of the waste economy in South Africa	7
2. Historical and regulatory framework of waste management in South Africa	8
3. Waste economy regulatory update	9
3.1 Regulatory changes	9
3.2 National waste road map	11
3.3 Waste tyres	11
3.4 Recycling industry	12
3.5 Waste-to-energy	13
4. Western Cape context	14
4.1 Western Cape Industrial Symbiosis Programme (WISP)	15
4.2 Overview of waste related by-laws	16
4.3 Overview of waste-related projects in municipalities	16
4.3.1 City of Cape Town	16
4.3.2 Drakenstein Municipality	17
4.3.3 George Municipality and Eden District Municipality	17
4.3.4 Stellenbosch Municipality	17
5. Waste economy: challenges for industry	18
5.1 Securing your feedstock agreements	18
5.2 Recovery rates and separation at source	19
5.3 Electricity and gas usage agreements and tariffs	19
5.4 Legal authorisation backlog	19
6. Future outlook for the waste market	20
Appendix 1: Steps to follow for a waste-to-energy project	21
Appendix 2: List of upcoming waste-to-energy projects in the Western Cape	22
Appendix 3: Integrated waste management by-laws in the Western Cape	23
Appendix 4: Waste Economy players	24
7. References	26
List of figures	
Figure 1: Overview of the waste sector regulatory framework in South Africa (<i>Godfrey et al., 2012</i>)	10
Figure 2: Average recycling rates in South Africa (<i>PACSA, 2012</i>)	12
Figure 3: Overview of legal authorisation process required to develop a biogas project (<i>adapted from Thomas and Feldner, 2013</i>)	21
List of tables	
Table 1: List of by-laws in the Western Cape	22
Table 2: List of industry associations in the waste sector	23
Table 3: Academic Institutions in the Waste Economy Research field	24

List of acronyms

AD	anaerobic digestion
AQA	Air Quality Act, Act 39 of 2004
B-BBEE	Broad-Based Black Economic Empowerment
CDM	Clean Development Mechanism
CFL	compact fluorescent lamp
CoCT	City of Cape Town
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DED&T	Department of Economic Development and Tourism
DoE	Department of Energy
DoP	Department of the Premier
DST	Department of Science and Technology
E&PSE	Environmental & Process Systems Engineering
ECA	Environmental Conservation Act, Act 73 of 1989
EIA	environmental impact assessment
eWASA	e-Waste Association of South Africa
GDP	gross domestic product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HA	Health Act, Act 63 of 1977
HAS	Hazardous Substances Act, Act 5 of 1973
IP&WM	Integrated Pollution and Waste Management
IWMP	Industrial Waste Management Plans
JPCE	Jan Palm Consulting Engineers
Kg	kilogram
Kwh	kilowatt hour
LCA	life-cycle analyses
MFMA	Municipal Finance Management Act, Act 56 of 2003
MPRD	Minerals and Petroleum Resources Development Act, Act 28 of 2003
MSA	Municipal Structures Act, Act 117 of 1998
MSyA	Municipal Systems Act, Act 32 of 2000
MW	megawatt
NEM:WA	National Environmental Management: Waste Act, Act 59 of 2008
NEMA	National Environmental Act, Act 107 of 1998
NERSA	National Energy Regulator of South Africa
NWA	National Water Act, Act 36 of 1998
NWMS	National Waste Management Strategy
OSA	Occupational and Safety Act, Act 85 of 1993
PACSA	Packaging Council of South Africa
PET	polyethylene terephthalate
PoA	programme of activities
PPP	public-private partnership
PRASA	Paper Recycling Association of South Africa
RAG	Western Cape Recycling Action Group
RE	renewable energy
REDISA	Recycling Development Initiative of Southern Africa
REIPP	Renewable Energy Independent Power Producers
RFP	request for proposals
RIA	regulatory impact assessment
SAIBA	South African Biogas Industry Association
SALGA	South African Local Government Association
SAPRO	South African Plastic Recyclers Association
SMEs	small and medium enterprises
SOP	Standards Offer Programme
TA	transactional advisor
TDL	tyre-derived fuel
TIA	Technology Innovation Agency
TIWMP	Tyre Industry Waste Management Plan
UCT	University of Cape Town
WISP	Western Cape Industrial Symbiosis Programme
WMRIG	Waste Minimisation Interest Group

15.3
Billion

The value
of the
South
African
waste
economy

Executive summary

This report explores the regulatory environment that influences the waste sector, and its impact on the ambitious targets set out by the National Waste Management Strategy (NWMS) for job creation and enterprise development.

The report provides an overview of the state of the South African tyre recycling, recycling and waste-to-energy industries at a national, provincial and municipal level.

Valued at R15.3 billion, or ~0.51% of South Africa's GDP, the waste sector has grown over the last decade. Various changes in legislation have affected the sector, stimulating growth in some areas. At the same time, the matrix of legislation and regulatory processes has hampered development in other areas. Delays in more complex procurement processes have been seen to affect investor confidence.

For operators, key challenges include security of waste material supply to sustain long-term contracts with municipalities; and extended licensing processes.

Municipal by-laws and waste management plans also have an impact on waste sector operators, with different requirements for different areas. In parallel, limited landfill airspace plus high transport, infrastructure and logistics costs affect the ability of municipalities to effectively implement their waste management plans.

1. Overview of the waste economy in South Africa

According to a survey conducted by the Council for Scientific and Industrial Research (CSIR) (Godfrey *et al.* 2012), the waste economy in South Africa – including both the public and private sectors – is estimated at R15.3 billion, equating to ~0.51% of GDP. The waste industry is dominated by large players whose main activities revolve around offering consulting services and end-of-pipe waste management services and products such as collection, sorting, recycling, and disposal.

Over the last decade, the number of companies in the waste sector has increased significantly. This increase can be attributed to the changes implemented by the National Department of Environmental Affairs (DEA) reflected in the National Environmental Management: Waste Act (NEM:WA), Act 59 of 2008. The NEM:WA shifts the focus from end-of-pipe to cradle-to-cradle solutions to include waste minimisation through recycling and recovery of valuable material from the waste streams.

The National Waste Management Strategy (NWMS), published in 2011, has set ambitious waste economy targets to establish 2 600 small and medium enterprises (SMEs) and create 69 000 jobs in the South African waste sector by 2016.

Historical and regulatory framework of waste management in South Africa

The waste sector in South Africa has been guided by the White Paper on Integrated Pollution and Waste Management (IP&WM) published in 2000, the NEM:WA and the NWMS. Other legal requirements for the private sector are triggered depending on the waste project being developed. Figure 1 provides more detail.

In addition, the Municipal Structures Act (MSA), Act 117 of 1998, Municipal Systems Act (MSyA), Act 32 of 2000, and Municipal Finance Management Act (MFMA), Act 56 of 2003, which govern the municipal procurement processes in South Africa, are also triggered for projects on which the municipality is a stakeholder.

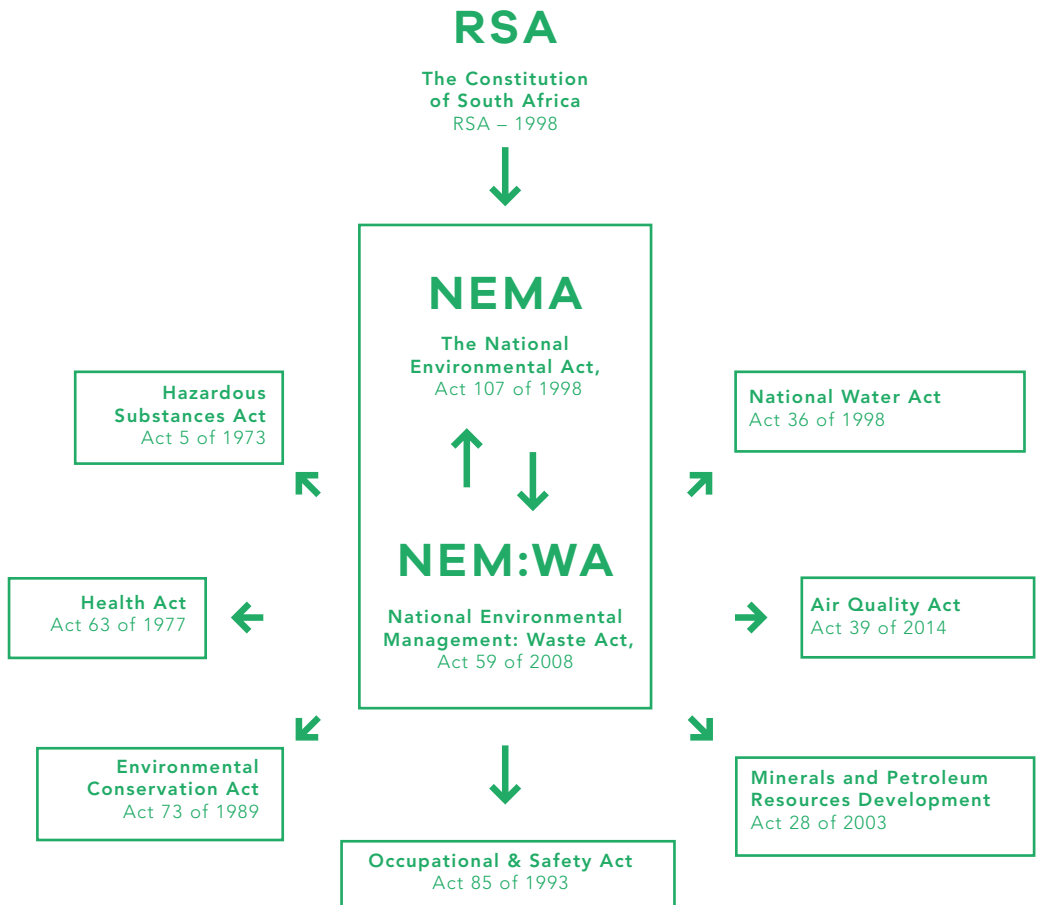


Figure 1:
Overview of the waste sector regulatory framework in South Africa(Godfrey et al., 2012)

It is worth noting that there are a number of other by-laws applicable across most municipalities in South Africa.

The only municipalities that have not introduced any by-laws in the Western Cape to date are:

Stellenbosch,
 Prince Albert,
 Oudtshoorn,

Witzenberg,
 George,
 Swellendam

Laingsburg,
 Kannaland,
 Swartland.

Please refer to Page 11 for more details about waste management by-laws in the Western Cape.

3. Waste economy regulatory update

For more information, refer to: Waste Information Today, the online journal run by the national Department of Environmental Affairs (DEA), <http://sawic.environment.gov.za/>. Registration is online and free of charge.

This section presents the key projects and changes implemented in South African waste legislation since June 2012.

3.1 Regulatory changes

The NEM:WA Bill was published in July 2013 and introduced to Parliament in August 2013.

The proposed amendments to NEM:WA seek to:

Change the definition (Section 38 in NEM:WA) and classification of waste where 'any portion of waste, once re-used, recycled [and] or recovered, ceases to be waste'. This is a positive shift towards attributing value to waste.

The amendments might eliminate the need to obtain a waste license, depending on the waste thresholds. The amendments also mean that applicants need only qualify for a basic assessment rather than a full environmental impact assessment (EIA)

Include the disposal of animal carcasses, which was previously excluded

Require industry sectors to develop waste management plans with the supervision of provincial departments.

Additional changes included in the regulatory framework in the waste sector are the development of:

Listed activities under the NEM:WA (Gazette No 921 of 2013, November 2013)

National norms and standards for storage of waste (November 2013)

Draft norms and standards for the assessment of waste disposal in landfills (August 2012)

Draft norms and standards for the extraction, flaring and recovery of landfill gas (Gazette No 34416-Notice 434, promulgated in November 2013). However, further clarity is required to understand the exact implications for the existing companies handling waste, and how these amendments will be applied in the Western Cape. More clarity is expected before the financial year end, which is March 2014.v

3.2 National waste road map

The Department of Science and Technology (DST) is developing a National Waste Research, Development and Innovation Road Map for South Africa with the CSIR. The project is scheduled to last for 10 years, and will be implemented in three main phases.

More background on the project can be found on the DST's website at:

www.wasteroadmap.co.za/index.php

These are:

- | | |
|---|--|
| 1 | Developing the first baseline of the South African waste economy. |
| 2 | Identifying specific instruments – financial, policy, institutional, among others – to boost the waste economy and required skills |
| 3 | Implementing the strategies identified in phases one and two. |

It is expected that resources to implement the road map will be channelled directly through the DST and its agencies, such as the Technology Innovation Agency (TIA), to foster growth and innovation in and the sector in South Africa.

3.3 Waste tyres

The Tyre Industry Waste Management Plan (TIWMP) – developed by the Recycling Development Initiative of Southern Africa (REDIS) – was approved earlier this year. Currently, 10 million tyres are sent to landfill every year in South Africa. The plan aims to collect a R2,30/kg levy from tyre manufacturers, importers and dealers which will be used to create and subsidise a sustainable tyre recycling industry in South Africa (<http://www.redisa.org.za/faq/>). All tyre recyclers are required to register with REDISA between July 2013 and April 2014.

For more information, contact REDISA directly through Vish Gianpersad at:

vish.gianpersad@redisa.org.za

The key criteria are a 51% Broad-Based Black Economic Empowerment (B-BBEE) shareholding and being able to promote job creation and environmental welfare. Based on REDISA's briefing presentation to recyclers in November 2013, it appears that the bulk of opportunities will be for tyre-derived fuels (TDFs) in Gauteng, Northern and Eastern Cape. The existing facilities in the Western Cape are able to provide enough capacity to deal with the tyres in the province.

3.4 Recycling industry

The average recycling rate in South Africa is 19.6%, compared to a global average of 23.3% (McKenzie, 2012). With more than 180 recyclers across the country, the recycling industry is well established in South Africa, and has existed for over 20 years. The main materials recycled are packaging wastes, including metals, paper, glass and plastics, as illustrated in Figure 3 below.

There are seven main groups of polymers. Of these, three or four are most frequently recycled to meet higher market demand.

These are:

Polyethene Terephthalate (PET), labelled number 1;

Digh Density Polyethylene (number 2);

Polypropylene (number 3); and

Low-Density Polyethylene (number 4).

About 80% of recyclers use materials recovered directly from landfills, which is supplied mostly from waste pickers nationwide and sold to either a depot, buy-back centre or large-scale collector (*Pretorius, personal communication, 2013*). The remainder of the waste stream is generally sent to landfill since options such as energy and chemical recovery are not widely used at present.

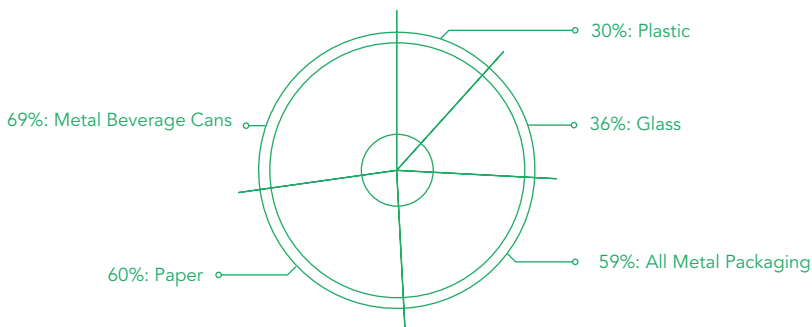


Figure 2: Average recycling rates in South Africa (PACSA, 2012)

More information on the recycling industry is available through the National Recycling Forum (<http://www.recycling.co.za/index.html>), and the respective industry associations (see Appendix 4)

It is expected that the ambitious waste minimisation targets and the job creation targets in the NWMS will act as an additional incentive to increase the volumes of waste recovered, and also to create added-value products from recycled materials. For example, the South African Plastic Recyclers Association (SAPRO) plans to achieve a 40% recycling rate by 2014 (*PACSA, 2011*).

3.5 Waste-to-energy

The Department of Energy (DoE) has increased tariffs and quota allocations for the Renewable Energy Independent Power Producers (REIPPs).

The increases for biogas, landfill gas and biomass are from:

R0,60 / kwh — to — R0,90 / kwh

R0,80 / kwh — to — R0,94 / kwh

R1,07 / kwh — to — R1,40 / kwh

More information is available on the DoE's REIPP website www.ipprenewables.co.za/

In September 2013, the DoE also issued a request for proposals (RFP) for small projects between 1-5 MW. The preferred bidders will be selected after a four-stage bidding process.

A total capacity of 200 MW for all renewable energy technologies has been allocated over two cycles, which includes waste-to-energy. The bidding documents are available at a nominal fee of R5 000. The first bid closed on 30 October 2013, and the second bid submission date will be on 10 February 2014.

The DEA plans to develop a National Waste-to-Energy Strategy to investigate the potential for mitigating greenhouse gases in South Africa, in line with the country's commitments to the Kyoto Protocol (*Letete, 2013*). The project is currently at conception stage.

In the Western Cape, the Department of Environmental Affairs and Development Planning (DEA&DP) has processed over a dozen waste licence applications for small-scale waste-to-energy projects, especially biogas for farms, and abattoir wastes.

The growth of small-scale biogas projects in South Africa results from a combination of stricter environmental disposal legislation and increasing landfill fees, coupled with the premium tariffs offered by Eskom (R1,20/kwh) as part of the Standard Offer Programme (SOP) in 2012.

Unfortunately, Eskom terminated the SOP earlier this year until further notice as it was oversubscribed. Appendix 2 presents a list of waste-to-energy projects planned in the province.

4. Western Cape context

On average, 80% of the Western Cape's waste is generated between the City of Cape Town, Stellenbosch and Drakenstein (IWMPs, DEA&DP, 2012). Across the province, municipal managers are facing increasing pressure from limited remaining landfill airspace. The average estimated lifespan of existing landfills is eight years, with less than three years left for Stellenbosch Municipality.

Municipalities, and their respective waste management facilities, are widely spread, resulting in high transport costs. Consequently, while large-scale centralised technology or projects located close to the metro could be feasible, given the scale and quantities of waste available in those areas, a decentralised approach might be more suited for some districts or municipalities.

The Western Cape Green Economy Strategic Framework was published in 2013. One of its main objectives is to achieve resource efficiency by minimising the amount of waste generated in agricultural and industrial processes, as well as creating economic opportunities from our current waste streams

In addition, the Department of Economic Development and Tourism (DED&T) and the Department of the Premier (DoP) are conducting a regulatory impact assessment (RIA), and mapping the waste economy. This work is designed to benchmark and understand the size of the industry in the province, and identify targeted policy interventions required to support businesses.

It is important to note that the Waste Licensing Unit within the DEA&DP has worked relentlessly to simplify the process of securing environmental authorisations for industry. The unit has committed itself to helping industry develop a waste economy in the province.

For more information, contact Charline Mouton from DED&T Charline.Mouton@westerncape.gov.za and Taryn van der Rheede from DoP taryn.vanderheede@westerncape.gov.za

For any enquiries, contact the DEA&DP directly through Eddie Hanekom (eddie.hanekom@westerncape.gov.za) or Lance McBain-Charles (Lance.McBain-Charles@westerncape.gov.za).

4.1 Western Cape Industrial Symbiosis Programme (WISP)

In 2013, the Western Cape Green Economy Steering Committee, under the DoP, set up the Western Cape Industrial Symbiosis Programme (WISP).

WISP aims to develop mutually profitable links between all industrial sectors to enable companies to recover, reprocess and reuse underused resources such as energy and water and materials left by other companies.

The programme is based on the highly successful national programme in the UK, which demonstrated that industrial symbiosis has the potential to significantly reduce industrial and commercial waste and comprehensively reduce the adverse environmental impacts of business.

The WISP team hosted a number of successful workshops during the 2013 financial year, where companies involved identified opportunities to save costs and resources.

For more information on forthcoming workshops and the programme, visit the WISP website: <http://www.westerncape.gov.za/110green/initiatives/list/western-cape-industrial-symbiosis-programme> and/or contact the WISP facilitators at GreenCape (joshua@green-cape.co.za , sarah@green-cape.co.za).

4.2 Overview of waste related by-laws

The purpose and content of by-laws varies across different municipalities. For example, the City of Cape Town's (CoCT) by-laws require more compliance compared to other municipalities. The section below presents an overview of the impact of by-laws implemented across the province that are mostly relevant to the waste industry.

These are:

- A waste generator must use the City's waste removal services or its accredited service providers

- Industrial waste generators must contract with an accredited service provider for collection and disposal for a licensed facility. The CoCT requires industrial waste generators to submit integrated waste management plans, and to comply with rules set for waste generation, minimisation, storage, recycling, collection and disposal

- All companies transporting, handling, processing, treating and disposing of waste maybe required, at the request of the municipality, to submit monthly reports to the municipality

- Anyone collecting or removing waste must have a contract signed with the waste authority for its collection and removal

- Organisations generating commercial, industrial, business, events and building waste across CoCT are required to register with the City and provide an integrated waste management plan – unless they are granted an exemption from the solid waste director

- Disposers or owners of building rubble waste shall provide a monthly report of the quantities disposed.

4.3 Overview of waste-related projects in municipalities

4.3.1 City of Cape Town

The CoCT has opened a tender/call for proposals to appoint a transactional advisor (TA), whose main role will be to advise and develop alternative waste management projects across the metro. The call for proposal closes in January 2014. The TA appointment forms part of the City's longer-term vision to upgrade its integrated waste management in future.

A feasibility study was completed as part of the Section 78 assessment in 2010-11. The report shows there are currently eight sites, and 11 potential alternative waste management projects the City will develop in the future, such as anaerobic digestion (AD) and landfill gas extraction.

The CoCT has also completed the registration of its landfill gas project under the Clean Development Mechanism (CDMs) Programme of Activities (PoA) before the window closed for South Africa in 2012.

It is important to note that project boundaries are not limited to the CoCT; they extend across South Africa. This offers a potential opportunity for other landfill gas projects across the country to register under the CoCT's scheme – provided the project meets the technical specifications.

4.3.2 Drakenstein Municipality

Drakenstein Municipality is keen to introduce waste-to-energy into its integrated solid waste management plan and aims to develop an integrated zero-waste park, using a combination of increased recycling rates, AD and thermal treatment.

The Solid Waste Department at Drakenstein Municipality has appointed Interwaste as its service provider and is awaiting the council's approval for a waste-to-energy facility in the area. The service provider will be responsible for running the municipal recycling and managing its landfill site, as well as implementing the waste-to-energy plant. Jan Palm Consulting Engineers (JPCE) was appointed as the TA and has been acting as the technical and legal advisor to Drakenstein Municipality.

The main challenge will be securing enough waste to run both an AD and thermal facility, unless additional waste is imported from neighbouring municipalities. The contractual agreements between the municipality and the appointed service provider have been structured so that the private party bears the bulk of the responsibility for securing enough feedstock. Interwaste was appointed to conduct the feasibility study, and National Treasury has worked closely with the municipality to guide it through the required procurement processes.

4.3.3 George Municipality and Eden District Municipality

George Municipality conducted a feasibility study to investigate the biogas potential from its sewage waste. The project, which was sponsored by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the South African Local Government Association (SALGA), formed part of a national programme to understand the biogas potential at four other municipalities. SLR Consulting was appointed as the service provider, and the project ended in November 2013.

The Eden District Municipality is also conducting a feasibility study to look at the potential for a centralised waste-to-energy facility, and the opportunity to regionalise integrated waste management facilities at district level. The project is in its conception phase and is expected to be completed in the near future.

4.3.4 Stellenbosch Municipality

Stellenbosch is currently under tremendous pressure to divert waste from its landfills, which are estimated to have less than three years' worth of airspace (interview with Saliem Haider, Solid Waste Manager, Stellenbosch Municipality).

The Stellenbosch Municipality has completed the first two sections of the feasibility study required by the Section 78 of the MSyA (No. 32 of 2000). The municipality will be opening a call for proposals for treatment of organic wastes and waste minimisation at its Klappmuts landfill site in Q1 2014 (Haider, 2013). However, a regional approach between the CoCT and Drakenstein Municipality might be more financially feasible for all three municipalities.

5. Waste economy: Challenges for industry

This section is a reflection of the conversations held with industry over the 2012-13 financial year relating to the main challenges the waste industry is currently experiencing. The information was collated through Waste-to-Energy Working Group meetings chaired by DED&T; individual meetings held with recyclers; and attendance at the Western Cape Recycling Action Group (RAG) and Waste Minimisation Interest Group (WMRIG) meetings.

5.1 Securing your feedstock agreements

Industrial waste generators must contract with Access to municipal solid waste remains a stumbling block for project developers due to constraints in the procurement regulations such as the MSyA and the MFMA. If the private sector is involved, section 78 (1-3) of the MSyA requires municipalities to conduct a feasibility study to determine the costs and impact on the municipal revenue, benefits to the municipality and future budget projections. These processes can typically extend over a number of years. For example, it took the CoCT two years to complete their Section 78 (3) process, and it is expected to take another two years once the TA is appointed before the City is ready to advertise calls for proposal and project opportunities for waste developers.

If municipal land or any other municipal assets are to be used for longer than three to five years, the procurement process to be followed will either require public private partnerships (PPPs) to be structured and/or longer-term contracts as unsolicited bids. However, municipalities are discouraged from issuing long-term contracts – that is, longer than three to five years – without going through a public participation process. These agreements or contracts can take a number of years to be developed into structured and legal documents, despite the fact that the MFMA allows municipalities to apply for concessions to extend contractual agreements for longer than three years.

Most alternative treatment and waste management projects have a payback period of between 10 and 15 years, and require security of waste supply for that period. The inability to secure supply limits the projects' ability to attract investment and funding. This scenario acts as a disincentive for investors in municipal projects. After all, it is discouraging that willing investors must wait for two to three years for a tender to be issued, with no security of return for their investments. There needs to be a balance between promoting fair and transparent business practices at local level, and creating a suitable environment to attract investors by, for example, providing faster internal processes under set conditions.

Refer to Figure 3, which shows the main steps of legal authorisations required for biogas projects on page xx

5.2 Electricity and gas usage agreements and tariffs

Industrial waste generators must contract with

The challenges experienced by project developers are directly linked to the complexity of the process required to secure a generator's licence and power purchase agreements, as well as the lower tariffs that are available to developers.

The waste-to-energy industry is still in its infancy compared with the relatively more established solar and wind developers. For example, under the Gas Act, Act No. 48 of 2001, every biogas project is now required to register and obtain a gas user license. In addition, electricity generated from waste is currently produced at least R0,15-0,20/kwh higher than the bulk electricity price from Eskom.

For that reason, project developers are not able to sell directly to municipalities at a premium price for renewable energy unless permission is obtained from the National Energy Regulator of South Africa (NERSA).

5.3 Legal authorisation backlog

Industrial waste generators must contract with

Typically, It takes nine to 24 months to obtain a waste license in line with NEM:WA and an EIA, depending on the type of EIA process followed. In addition, waste projects might trigger a list of other legislation requirements, such as water, land use and air quality, among others. All this can easily lengthen the project development stage by up to five years. Therefore, it is crucial to appoint an adequate environmental assessment practitioner (EAP) with previous experience in the waste sector, and who is aware of recent changes in the legislation.

The lack of coordination between the different Government departments including DEA, Department of Water, NERSA and municipalities, as well as delays experienced during the project development phase can result in significant additional unplanned costs.

6. Future outlook for the waste market

The NWMS has set ambitious targets to establish 2 600 small and medium enterprises (SMEs) and create 69 000 new jobs from the waste sector by 2016. There are significant opportunities to increase waste recovery, and divert waste from landfills. This would require innovative project funding models and would present an opportunity to increase the contribution of both the informal and private sectors.

Based on the current challenges arising from complex municipal procurement processes, it appears that small-scale and decentralised projects with direct supply from a private party will keep growing as they require shorter project development processes. The number of applications for waste licenses is testament to the faster growth already happening in the private sector.

Appendix 1: Steps to follow for a waste-to-energy project

This section presents a summary of the steps followed by Bio2Watt, a South African biogas project developer reached financial close to develop the first the first 3 MW biogas project in Bronkhorstspuit, South Africa.

The project falls outside the DoE's REIPPP and will sell electricity directly to a private user at a premium price. The project took five years to develop, required 56 iterations to the financial model and the Industrial Development Corporation (IDC) provided the bulk of the funding.

The total project cost is R135 million, and the project development fees were ~R6 million.

Project Feasibility Study

- **Find a site and negotiate purchase or lease land.**
The MFMA and MSA would be triggered if it is municipal land

- **Conduct an Environmental Impact Assessment (EIA);**
This process can take between 6–18 months

- **Negotiate your feedstock supply agreements.**
Access to municipal waste would trigger MFMA and MSA

- **Negotiate and finalise power purchase agreements.**
This can take up to 2 years

- **Negotiate interconnection agreements with Eskom and the (?)**

- **Secure Investors.**
This includes operations and maintenance (O&M) and engineering procurement contracts (EPC), term sheets and loan agreements.

Figure 3: Overview of legal authorisation process required to develop a biogas project (adapted from Thomas and Feldner; 2013)

GreenCape congratulates Sean Thomas, the Managing Director of Bio2Watt, for his project and wishes to express its gratitude for sharing the valuable lessons learnt during this long journey for biogas and waste-to-energy project developers.

Appendix 2: List of upcoming waste-to-energy projects in the Western Cape

Below is a list of waste-to-energy projects that have either been granted a waste licence or have applied for one:

Projects with approved waste licences

AD generation of electricity: piggery,	Klipheuwel
AD generation of electricity: fruit waste farm,	Grabouw
AD generation of electricity: bovine manure farm,	Darling
AD generation of electricity: bovine manure farm,	Bonnievale
Waste Management License (WML) application for a basic assessment (BA) for proposed construction of animal manure storage facility,	Graafwater, Voorpaardeberg
Tyre pyrolysis plant,	Atlantis
Cape Dairy biogas plant on Portion 3 of Farm No. 589 (Morgenster),	Malmesbury
Proposed biogas development,	Saldanha Phase 1

Projects waiting for approval of waste licences

Biomass fuel combustion - poultry litter, farm	Romance
Biomass fuel combustion - poultry litter, farm	Doornekraal
Biomass fuel combustion - poultry litter, farm	Blomvlei
Bio digestion facility - organic waste,	Athlone Industria

Appendix 3: Integrated waste management by-laws in the Western Cape

Table 1: List of by-laws in the Western Cape

Name of municipality	Name of Act
City of Cape Town	City of Cape Town integrated waste management by-law (2009 as amended in 2010)
Overberg District	
Langeberg	Integrated waste management by-law (2013)
Breede Valley	Breede Valley Municipality solid waste disposal by-law (2008)
Drakenstein	Drakenstein Municipality integrated waste management by-law (2013)
Central Karoo District	
Beaufort West	Municipality of Beaufort-West Notice 146/2005 by-law relating to refuse removal (2005)
Eden District	
Bitou	Solid waste disposal by-law (2002)
Hessequa	Hessequa Municipality solid waste disposal by-law (2008)
Kannaland	No by-law available
Knysna	Knysna Municipality by-law relating to control over refuse removal and disposal sites (19109/2006)
Mossel Bay	Mossel Bay Municipality by-law relating to refuse removal (2010)
Overberg District	
Cape Agulhas	Cape Agulhas Municipality refuse removal by-law (2005)
Overstrand	Overstrand Municipality integrated waste management by-law (2013)
Theewaterskloof	Theewaterskloof Municipality by-law relating to refuse removal (2005)
West Coast District	
Bergrivier	Bergrivier Municipality: solid waste disposal by-law (2009)
Cederberg	By-law relating to the control of disposal sites (7/2004)
	By-law relating to refuse removal (20/2004)
Matzikama	Matzikama Municipality solid waste disposal by-law (2010)
Saldanha Bay	Saldanha Bay Municipality solid waste disposal by-law (2002)

Appendix 4: Waste Economy players

Table 1 and 2 present the main industry associations and academic institutions based in the Western Cape operating in the waste sector

Organisation	Role of the organisation	Contacts
Plastics SA	Representing various industries in plastic sector in South Africa. Section 21 Organisation.	http://www.plasticsinfo.co.za/ Anton Hanekom anton.hanekom@plasticssa.co.za
South African Plastic Recycling Organisation (SAPRO)	The SA Plastics Recycling Organisation (SAPRO) is the official representative body of plastic recyclers and re-processors. As an NPO, SAPRO is funded by its members	http://www.sapro.biz/ Annabe Pretorius E-mail: annabe@absamail.co.za
PETCO	PETCO was established in December 2004 as a private limited company specifically to promote and improve the waste management and recycling of post-consumer PET products on behalf of all stakeholders in the PET industry in South Africa.	Website: http://www.petco.co.za/flash.html Cheryl Scholtz e-mail: cheri.scholtz@petco.co.za
Packaging Council of South Africa (PACSA)	PACSA is closely associated with the Institute of Packaging South Africa (IPSA), which is a voluntary industry body. Its membership contains three broad categories: converters, associates and affiliates. It also deals with major raw material suppliers. Its affiliates are also customers and major recyclers.	http://www.pacsa.co.za/
Paper Recycling Association of South Africa (PRASA)	PRASA's mission is to reduce the amount of recoverable paper that goes to landfill by progressively increasing the paper recovery rate. It does this by promoting the concept of reuse, reduce, recycle and recover by intensifying education and awareness campaigns to households, businesses and schools.	http://www.prasa.co.za/ Ursula Henneberry ursula.henneberry@pamsa.co.za
South African Biogas Industry Association (SABIA)	SABIA was created to support the growth of the industry. It has approached the DoE with the intention of forming a National Biogas Steering Committee. The two-day conference being hosted in October 2013, discussed the industry challenges directly with the DoE and DEA to determine the roles of this national committee.	http://biogasassociation.co.za/ Mark Tiepelt (Acting chairman) mark@biogassa.co.za

Appendix 4: Waste Economy players

Table 1 and 2 present the main industry associations and academic institutions based in the Western Cape operating in the waste sector

Table 2: List of industry associations in the waste sector

Organisation	Role of the organisation	Contacts
South African Biogas Industry Association (SABIA)	SABIA was created to support the growth of the industry. It has approached the DoE with the intention of forming a National Biogas Steering Committee. The two-day conference being hosted in October 2013, discussed the industry challenges directly with the DoE and DEA to determine the roles of this national committee.	http://biogasassociation.co.za/ Mark Tiepelt (Acting chairman) mark@biogassa.co.za
e-Waste Alliance (eWA)	eWA is a non-profit organisation which helps to coordinate responsible management of the entire electronic waste (e-waste) stream in a one-stop shop format. It is made up of independent business units that are able to handle all parts of the e-waste waste streams. The e-Waste Association of South Africa (e-WASA) is a non-profit organisation which works closely with manufactures, vendors and distributors of electronic and electrical goods, including e-waste handlers. Recently, e-WASA has gone into joint partnership with Mintek and has concluded a five-year memorandum of understanding.	http://www.ewastealliance.co.za/ Suzanne Dittke envirosense@xsinet.co.za
e-Waste Association of South Africa (eWASA)	eWASA is a non-for-profit organisation established in 2008 to establish a sustainable, environmentally sound e-waste management system for the country. e-WASA works with manufacturers, vendors and distributors of electronic and electrical goods and e-waste handlers (including refurbishers, dismantlers and recyclers) to manage e-waste effectively.	http://www.ewasa.org/

7. References

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4. Packaging Council of South Africa. (2012). *Links to major Recyclers available: http://www.pacsa.co.za/index.php?option=com_content&view=article&id=12&Itemid=24 . Last accessed 08th January 2013.*
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