Waste Economy
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2017
Market Intelligence Report
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GreenCape

GreenCape

GreenCape is a non-profit organisation that drives the widespread adoption of economically viable green economy solutions from the Western Cape. Our vision is for South Africa to be the green economic hub of Africa.

We work with businesses, investors, academia and government to help unlock the investment and employment potential of green technologies and services, and to support a transition to a resilient green economy.

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Image courtesy of: Averda - Materials Recovery Facility
Caption: Cardboard being baled and prepped for the market

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18 Roeland Street, Cape Town, 8001, South Africa

Editorial and review:	Internal: Lauren Basson, Salomé Bronkhorst, Mike Mulcahy, Sarah O'Carroll and Cathy Pineo External: DEA&DP (Eddie Hannekom), PETCO (Cheri Scholtz, Oscar Baruffa and Alistair Schorn) and DST (Linda Godfrey)
Images:	GreenCape
Layout and design:	Deep Agency

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AD	Anaerobic Digestion
AWT	Alternative Waste Treatment
C&DW	Construction and demolition waste
C&I	Commercial and industrial
CCT	City of Cape Town
CCA	Customs-controlled area
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DEDAT	Department of Economic Development and Tourism
DoE	Department of Energy
DST	Department of Science and Technology
dti	Department of trade and industry
EIA	Environmental impact assessment
eWASA	e-Waste Association of South Africa
e-waste	Electronic waste (also known as waste electrical and electronic equipment)
EPR	Extended producer responsibility
ETI	Employment tax incentive
GDP	Gross domestic product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Society for International Cooperation)
GRI	Gestamp Renewable Industry
GW	Gigawatt
IDC	Industrial Development Corporation
IT	Information technology
ITAC	International Trade Administration Commission of South Africa
IPP	Independent power producer
IndWMP	Industry waste management plan
IWM	Integrated Waste Management
IWMP	Integrated Waste Management Plan
KFW	Kreditanstalt für Wiederaufbau Development Bank (Credit Institution for Reconstruction Development Bank)
kWh	Kilowatt hour(s)
MIG	Municipal Infrastructure Grant
MIR	Market Intelligence Report
MRF	Material recovery facility
MSA	Municipal Systems Act, No. 32 of 2000
MSW	Municipal solid waste

MW	Megawatt(s)
NEMA	National Environmental Management Act, No. 107 of 1998
NEM:WA	National Environmental Management: Waste Act, No. 59 of 2008
NPSWM	National Pricing Strategy for Waste Management
NWIB	National Waste Information Baseline
NWMS	National Waste Management Strategy
PE-HD	High-density polyethylene
PE-LD	Low-density polyethylene
PE-LLD	Linear low-density polyethylene
PET	Polyethylene terephthalate
PETCO	PET Recycling Company of South Africa
POLYCO	Polyolefin Recycling Company
PP	Polypropylene
PPP	Public-private partnership
PRASA	Paper Recycling Association of South Africa
PRO	Producer responsibility organisation
PS	Polystyrene
PS-E	Polystyrene expanded
PSPC	Polystyrene Packaging Council
PVC	Polyvinyl chloride
R&D	Research and development
REDISA	Recycling and Economic Development Initiative of South Africa
REEEP	Renewable Energy and Energy Efficiency Partnership
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SABIA	Southern African Biogas Industry Association
SAEWA	South African e-Waste Alliance
SALGA	South African Local Government Association
SAVA	Southern African Vinyls Association
SEZ	Special economic zone
StEP	Solving the e-waste problem
TA	Transactional Advisor
TGRC	The Glass Recycling Company
UNIDO	United Nations Industrial Development Organization
VAT	Value-added tax
WCPS	West Coast Power Solutions
WISP	Western Cape Industrial Symbiosis Programme
WMB	Waste Management Bureau
WtE	Waste to energy
WWTW	Waste water treatment works

Image: Cape Advanced Engineering - Biogas plant at Uilenkraal Farm

Executive summary

The country and the Western Cape's waste management landscape is changing. Rather than a sudden change, there is a steady incremental change each year as South Africa moves towards a more sustainable waste management model.

This will be driven largely by enabling legislation, municipalities gearing to partner with the private sector and the demand for secondary material.

The waste industry in South Africa consists primarily of waste collection and landfilling, with a limited amount (10%) of recycling (DEA 2012). Household waste is managed by municipalities and/or their service providers. Commercial and industrial waste is typically managed by the private sector (in larger municipalities), although some waste may still be disposed of at municipal landfills.

The current waste economy results in an industry that is estimated to be worth R15 billion in revenue and provides 29 833 people with employment. However, R17 billion worth of resources could be unlocked if 100% of the identified 13 waste streams could be recycled. However, achieving the goal of the Roadmap by 2022 (Scenario 3) would only unlock R9.2 billion resource value into the economy (DST 2014).

By 2019, South Africa is aiming to reach the target of 20% waste division (by weight) (DEA&DP 2015). For the Western Cape this means diverting 1.5 million tonnes per annum, of which 800 000 tonnes are municipal solid waste (MSW) (DEDAT 2016). This will not be easily done, as the implementation of alternative waste management is relatively expensive (initial capital costs that usually stem from the need for new infrastructure) and will be a financial constraint based on current budget allocation.

The DEA&DP estimates that the cost of compliance (just meeting service delivery goals for disposal) is in excess of R1 billion for Western Cape municipalities. Coupled with this, municipalities would need to invest another R1 billion in implementing Alternative Waste Treatment (AWT) infrastructure to achieve a 20% diversion rate by 2019.

Municipalities will have to look into innovative and alternative ways of funding these support functions. This includes partnerships with the private sector, where provincial and national government play a role in the implementation of extended producer responsibility (EPR) and allow for the levies charged to assist with some of the infrastructural and operational demands. Unlocking post-consumer waste and increase feedstock requirements for large-scale alternative waste treatment facilities (such as waste to energy) will require partnerships between private industry and municipalities.

Within the challenges lies opportunity. Legislation has been passed to help unlock the potential R17 billion of material currently being landfilled that could be recycled (DST 2014). Coupled with this, Western Cape municipalities are gearing up to implement PPP that will potentially attract a further R1.3 billion and create approximately 1 600 jobs in the next five years.

We see current opportunities for businesses and investors in the waste sector in the Western Cape that are primarily focused on recyclables (plastics), organics, e-waste, and construction and demolition waste (C&DW).

1 – Introduction and purpose

GreenCape's Waste Economy Market Intelligence Report provides insight for investors and businesses that are currently active in, or interested in, providing alternative waste treatment solutions in South Africa, specifically in the Western Cape.

This report outlines how the waste management landscape is changing and the opportunities it presents for businesses and investors in an expanded waste management sector. There are opportunities across the value chain in the collection, sorting, processing and treatment of waste, provided that there is:

- access to waste;
- at least one market for recovered materials; and
- a viable business case for the recovery of materials.

In what follows, we provide an overview of the waste industry in the South African context, focusing on the Western Cape, and provides information on waste data (Section 2), legislative updates (Section 3), opportunities across the value chain (Section 4), available finance and incentives (Section 5). Section 6 outlines the Western Cape's advantages and position as Africa's green technology hub, and Section 7 focuses on GreenCape's work in supporting the growth of the green economy in South Africa.

For questions or queries, or to access GreenCape's services, contact our Waste Sector Desk: waste@green-cape.co.za

2 – Industry overview

This section focuses on the South African and Western Cape waste sector. It provides an overview of the macro-economic trends, key players, and drivers of green/alternative waste treatment (AWT) technology and practices in the waste economy.

The waste industry in South Africa primarily consists of waste collection and landfilling, with a limited amount (10%) of recycling (DEA 2012). Household waste is managed by municipalities and/or their service providers. Commercial and industrial waste is typically managed by the private sector (in larger municipalities), although some waste may still be disposed of at municipal landfills.

The waste management landscape is changing with increased diversion of waste from landfill towards recycling and recovery. This is mainly due to increasing pressures on municipalities (e.g. limited landfill airspace); extensive investment and activity by voluntary material organisations and producer responsibility organisations; an increase in awareness of sustainability imperatives by business and industry, and, to some extent policy and regulatory reform. Furthermore, the government is increasingly focusing on the waste economy as a job creator through various green economy policies and strategies.

By 2019 South Africa is aiming to reach the target of 20% waste division (by weight). For the Western Cape, this means diverting 1.5 million tonnes per annum, of which 800 000 tonnes are municipal solid waste.

2.1. Industry structure

Under the South African Constitution, local municipalities are mandated to collect household waste. Municipalities can either provide the collection services directly or appoint private contractors. These contracts are generally for three years. The commercial and industrial (C&I) sectors are responsible for the safe disposal of their own waste, which includes both general and hazardous waste fractions, and generally appoint waste service providers to manage their waste.

In terms of the Constitution and as elaborated on in the Municipal Systems Act (No. 32 of 2000) (MSA), municipalities are responsible for ensuring that adequate waste collection and disposal facilities are available to meet the need within their boundaries. Alternative waste treatment, such as recycling or waste to energy (WtE), is not explicitly mentioned in the definition of municipal functions in the MSA. It is, however, considered to be a municipal support activity[1] in terms of the MSA (National Treasury 2008).

Furthermore, the National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA) and the National Waste Management Strategy (NWMS) (2011) mandate municipalities to implement alternative waste management to divert waste from landfill and minimise environmental degradation.

[1] These are municipal activities that are reasonably necessary for, or incidental to, the effective performance of a municipality's functions and exercising of its powers.

Based on current waste management costs and limited resource capacity, the implementation of alternative waste management practices (such as recycling) is perceived to be more costly than landfill. This perception has been partially responsible for the slow uptake of alternative waste management measures, despite national laws.

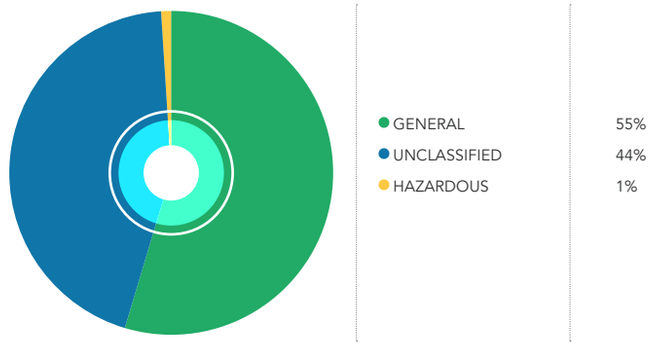
The demand for basic services, coupled with the demand for alternative waste treatment (which is usually accompanied by the need for new infrastructure), will be a financial constraint based on current budgeting. The Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) estimates that the cost of compliance (just meeting service delivery goals for disposal) is more than R1 billion for Western Cape municipalities. In addition, municipalities would need to invest another R1 billion in implementing Alternative Waste Treatment (AWT) infrastructure[2] (DEA&DP 2016) to achieve a 20% diversion rate by 2019.

Consequently, municipalities have to look into innovative and alternative ways of funding these support functions. This includes partnerships with the private sector, where provincial and national government play a role in the implementation of extended producer responsibility (EPR)[3] and allow for the EPR fees or relevant taxes charged to assist with some of the infrastructural and operational demands[4].

2.2. Market size for South Africa

According to the National Waste Information Baseline (NWIB), South Africa generated approximately 108 million tonnes of waste in 2011, consisting of 59 million tonnes of general waste; 48 million tonnes of unclassified waste[5]; and 1 million tonnes of hazardous waste (see Figure 1 for the split in terms of percentage of total waste) (DEA 2012).

Figure 1: Classification of total waste generated in South Africa in 2011



[2] R300 million to collectively meet the diversion target of 20% by 2019 and another R 700 million for infrastructure up to 2030.
[3] EPR refers to measures that extend a producer's financial and/or physical responsibility for a product to the post-consumer stage of the product.
[4] The White Paper on Local Government recommends that municipalities look for innovative ways of providing and accelerating the delivery of municipal services (SALGA, 1998).
[5] These are wastes that are listed under both general and hazardous waste and will require further classification in terms of the Waste Classification and Management Regulations (GNR 634: 2013).

© Image courtesy of City of Cape Town - Kraaifontein Integrated Waste Management Facility
Image: A City of Cape Town rotary compaction truck empties waste onto the apron.

The 'business as usual' approach to waste management (approximately 90% going to landfill) generates an industry that is estimated to be worth R15 billion[6] in revenue and provides 29 833[7] people with employment, primarily in the recycling/reclamation sector (Department of Science and Technology ((DST) 2014). Capital investment from the public sector is primarily in collection infrastructure (transport) and landfilling, while considerable private sector investment has been made in landfilling and AWT (DST, 2014).

It is estimated that 65% of the waste (around 38 million tonnes) is recyclable and could theoretically be diverted from landfill and recovered to be reprocessed/repurposed (DEA 2012). Based on global trends, by diverting waste away from landfill, South Africa could increase the revenue from this sector. In 2014, the DST estimated that an additional R17 billion/year worth of resources could be unlocked if 100% of the identified 13 waste streams could be recycled. However, achieving the goal of the Roadmap by 2022 (Scenario 3) would only unlock R9.2 billion resource value into the economy.

To tap into this opportunity, the South African government has recognised the role that waste can play in creating jobs and socio-economic opportunities. Thus we expect growth in this sector.

2.3. Market size for the Western Cape

Based on the available data, the NWIB study estimated that the Western Cape accounted for 20% (21.6 million tonnes) of the waste generated in South Africa in 2011, of which 55% (11.8 million tonnes) was general waste (DEA 2012).

This is significantly higher than the 2016 Western Cape Government estimates of 4 million tonnes MSW in 2015 (DEA&DP 2016). In an update to the GreenCape Western Cape Waste-to-Energy Position Paper (2014), which was based on the National Waste Information Baseline Report (DEA 2012), the DEDAT Draft Waste Business Case put this estimate at 7.7 million tonnes, including waste coming from commerce and industry (C&I) (DEDAT 2016).

The DEA&DP has identified that waste data varies greatly. It is currently collecting information with a view to acquiring more accurate and disaggregated data.

Table 1 illustrates waste generation figures per municipality for both MSW and C&I waste (DEDAT 2016). Refer to Annexure A for a more detailed breakdown of the waste composition.

Table 1: Total waste tonnages per District Municipality

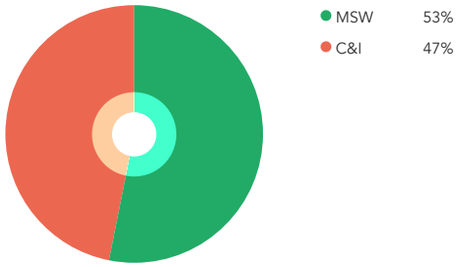
Municipality	Tonnages		
	Municipal	Commercial & industrial	Total
City of Cape Town	2 762 100	951 600	3 713 700
Cape Winelands	559 200	453 300	1 012 500
Eden	332 500	606 100	938 600
West Coast	204 700	938 600	1 185 500
Overberg	180 700	587 300	768 000
Central Karoo	40 900	43 080	83 980
Total for the Western Cape	**4 080 100**	**3 622 180**	**7 702 280**

[6] This is approximately 0.51% of South Africa's gross domestic product (GDP).
[7] Also providing 60 000 – 90 000 people with livelihoods (income) in the informal sector.

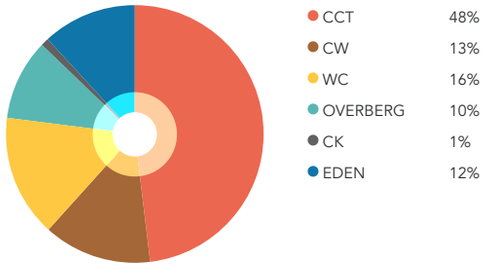
Figure 2 (a-d) illustrates an interesting phenomenon. The Western Cape's waste character reflects a nearly 50-50 split between MSW (53%) and waste generated in the private sector, i.e. C&I waste (47%). As can be expected, the CCT dominates in terms of the location of the waste, generating just under 70% of the MSW and nearly half (48%) of the total waste. This is understandable as over 65% of the Western Cape's population is located within the CCT district (Stats SA 2014).

Figure 2: Western Cape waste characterisation (2016)

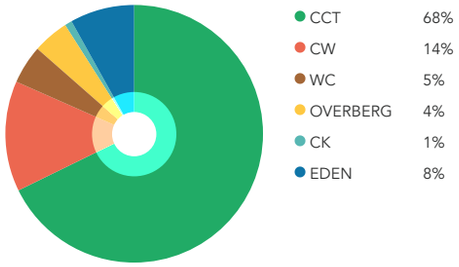
A) WC-MSW vs C&I (total)



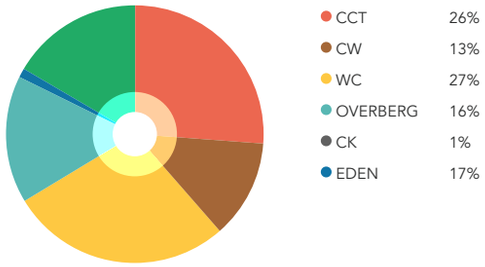
B) WC - Total waste per municipality



C) WC-MSW generated per municipality



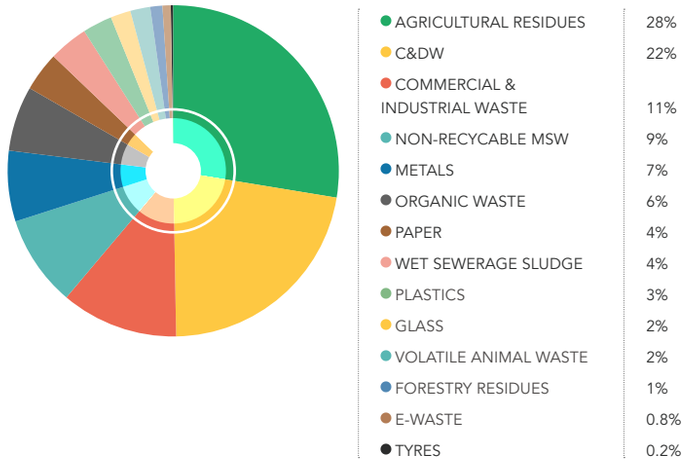
D) WC-C&I generated per municipality



Surprisingly, although Cape Town is the central hub for commerce and industry in the province and provides more than 73% of its GDP (Western Cape Provincial Treasury 2013), the CCT does not dominate the generation of C&I waste, with only a 26% share of the total. This can largely be accredited to the fact that the primary agricultural sector is located outside the CCT district, and that the CCT derives a large portion of its GDP from tertiary sectors (e.g. banking and IT). Refer to Annexure A and Figure 3 for a detailed breakdown of the waste composition (DEDAT 2016).

Agricultural residues account for 28% (2 million tonnes) of the waste generated in the Western Cape. However, these estimates are based on the size of the industry and the expected wastes generated. Agricultural residues include materials such as manure and green fodder that may already be reused on farms (e.g. left on the land for soil enhancement, fertilizer or repurposed for animal feed).

Figure 3: Western Cape waste characterisation – total waste splits (2016)



2.3.1. Municipal overview

Municipalities generate and manage over half (53%) of the waste in the Western Cape, with an approximate budget of R1.7 to R2 billion per annum. Refer to Table 2 for the breakdown of the municipal waste budgets per district (information derived from municipal audited financial statements).

The CCT's budget comprises 63% of the total municipal budgets in the Western Cape. It is estimated that about 25 to 30% of its operational expenditure goes to private companies acting as service providers and/or contractors (waste collection, waste diversion facility operations, etc.) (DEDT 2014). This illustrates that there is a possible R340 million already utilised by private industry in providing services to the CCT. However, it is important to understand the requirements and challenges of working with municipalities.

© Averda – Materials Recovery Facility
Image: Materials being sorted during the recycling process.

Working with municipalities

The Municipal Systems Act governs municipalities when they improve, extend or upgrade a municipal service or establish a new municipal service where there are financial implications, among other things.

The following steps are required before a municipality can partner with a private entity[8]:

- Section 76 describes the types of mechanisms that can be used (internal and external);
- Section 77 stipulates when the service delivery must be reviewed (significant upgrade, new service, etc.);
- Section 78 evaluates the different service delivery mechanisms:
  - Section 78(1) assesses the different internal service delivery mechanisms, as well as the municipality's capacity for implementing the different mechanisms.
  - Section 78(2) stipulates that a municipality may decide on an internal mechanism (based on the outcome of the Section 78(1)), but may also explore the possibility of providing the service via an external mechanism.
  - Section 78(3) dictates the processes that must be followed in assessing the provision of the service via an external mechanism.
  - Section 78(4) stipulates that a municipality may decide on an appropriate internal or external service delivery mechanism, based on the results of the section 78(3) study.
  - Section 78(5) stipulates that the application of the Section 78 process must be aligned with other legislation.

Figure 4 on the following page provides a summary of the process.

[8] These are the steps for modification of a municipal service/function. The end result may or may not be the appointment of a private partner.

Table 2: Municipal Budgets (2016)

Municipality (District)	MSW (Tonnes)	Budget 2015/2016 (ZAR)	Budget 2016/2017 (ZAR)
City of Cape Town	2 762 100	1 097 205 400	1 232 929 000
Cape Winelands	559 200	241 628 318	265 857 364
Eden	332 500	199 021 745	208 243 000
West Coast	204 700	100 041 000	109 372 000
Overberg	180 700	102 253 000	109 293 000
Central Karoo	40 900	30 387 000	40 061 000
Western Cape (total)	**4 080 100**	**1 770 536 463**	**1 965 755 364**

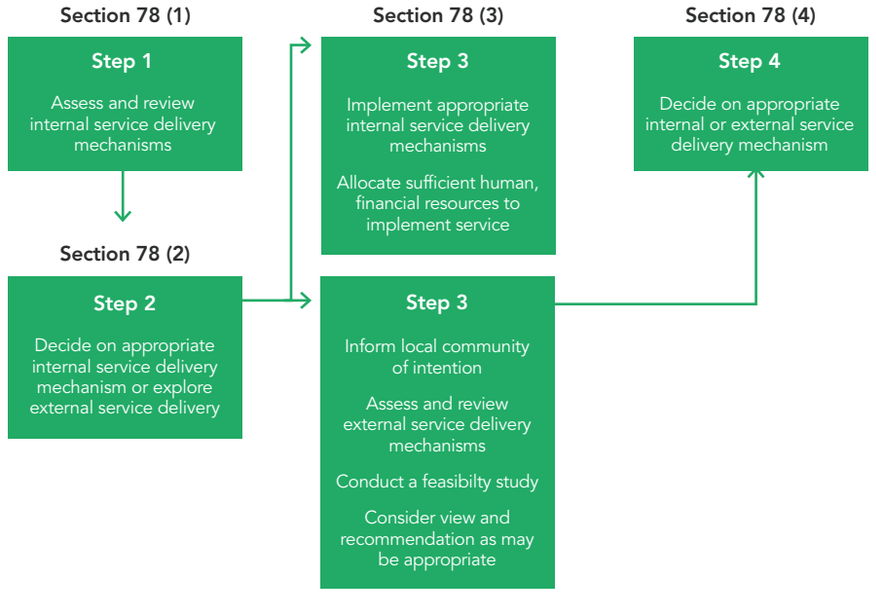


Figure 4: Section 78 process

Western Cape municipalities with public-private partnership arrangements

Western Cape municipalities have begun engaging the private sector through public-private partnerships (PPPs) to implement alternative waste management solutions. The process provides opportunities for traditional waste management companies (i.e. collect and disposal), as well as opportunities to provide services to enable and support the development of alternative waste management, e.g. local manufacturing of piping and instrumentation for digesters, and servicing of engines for electricity generation.

Drakenstein Municipality (within the Cape Winelands District Municipality) has completed its Section 78 process, and the municipal council has approved the provision of waste management services via an external delivery mechanism in the form of a PPP. The PPP agreement has been signed with Interwaste and MBH Energy, with Black & Veatch to provide technical support. The partnership is proposing the establishment of an integrated waste facility with a capacity of ~500t/d. The facility will have three functions and four components: recycling (a dirty materials recovery facility), organics beneficiation (a MSW pressing plant), and waste-to-energy (using an anaerobic digester and a direct combustion facility) (RMS Environmental 2016).

Waste will be processed via the materials recovery facility (MRF). It is expected that 10% of the waste will be recovered for recycling, with the remainder processed via the organics press. The organic fraction will then be sent to the anaerobic digester (AD) plant to be combined with other organic material, for example sludge from wastewater treatment works. The resulting digestate from the AD, and the dry fraction from the press will be further processed/treated in the direct combustion facility. Refer to Table 3 for information on the process flows (RMS Environmental 2016).

Table 3: Drakenstein Municipality AWT PPP proposal

Facility	Input	Output	Material	Tonnages (per day)
Dirty materials recovery	•		Mixed waste (MSW)	421
		•	Mixed waste	379
		•	Recyclables	42
Organics press	•		Mixed waste (from dirty materials recovery facility)	379
		•	Organics (sludge)	197
		•	Refuse derived fuel	182
Anaerobic Digestion 2.9 MW energy generation	•		Organics (from press)	197
	•		Other organics (WWTW sludge, agri residues etc.)	200
		•	Digestate	118
Direct Combustion 10 MW energy generation	•		Refuse derived fuel (from press)	182
	•		Digestate (from AD)	118
		•	Ash	45

© Image courtesy of City of Cape Town - Kraaifontein Integrated Waste Management Facility
Image: Sorted cardboard at the City of Cape Town's Kraaifontein Integrated Waste Management Facility.

At the time of writing (November 2016), **Saldanha Bay Municipality** is investigating the possibility to provide West Coast Power Solutions (WCPS) with a feedstock agreement for ten years. The agreement is for the processing of wet organic residential and business waste by means of anaerobic digestion – thus diverting waste from landfill. WCPS has obtained a Waste Management License to establish a biogas plant. The plant will be located at, and provide gas to, ArcelorMittal, with the capacity to process 2 000 tonnes of waste per month. It will produce approximately 2 500 tonnes of methane per month (WC-DEA&DP 2014).

The **CCT** has appointed a Transaction Advisor (TA) (Akhile Management and Consulting) to perform various feasibility assessments, to provide transaction advice, and to assist the municipality with the procurement of partnerships relating to alternative waste treatment and disposal.

The TA's appointment will be for six years. By the end of the appointment term, key projects would need to be commissioned and institutionalised.
Current opportunities include an initial feasibility assessment followed by clustered projects. Refer to Table 4 for a description of upcoming projects and the imminent opportunities (CCT (2016)).

The feasibility assessments are primarily targeted at the panel of consultants,[9] and the cluster project would consist of engineering, procurement and construction (management) (EPC (m)) projects.

Table 4: CCT imminent opportunities

Focus area	Description of projects	Opportunity target
Feasibility Projects		
Waste characterisation study	▪ Determine the high level categorisation of solid waste being received at specific city transfer stations, and drop-off and landfill sites ▪ Compare available results from recent studies and report on findings	Panel of professional consultants
Resource economy study (greater cape town)	▪ Assessing the potential impacts of developing/enabling/enhancing economic opportunities in the city related to waste diversion	Panel of professional consultants
Investigate status of all licences, permits and authorities	▪ Develop an understanding of the current position to determine possible future work and impact	Panel of professional consultants
Waste systems cost model update	▪ Produce updated unit costs for different services/activities to further develop an Integrated Waste Management Plan (IWMP) to enable the waste economy	Panel of professional consultants
Assessment of current systems used in solid waste	▪ Develop an understanding of current Waste Systems that must provide for the collection of separated waste as required by the Waste Act No. 59 of 2008	Panel of professional consultants
Contract Management Office (CMO)	▪ Determine the opportunities to enhance, implement and optimise CMO functionalities, processes, procedures, technologies and systems	Panel of professional consultants
Coordinating and management entity (carbon management and trading)	▪ A Clean Development Mechanism Programme of Activities for the mitigation of landfill gas emissions has been registered by CCT. ▪ The objective is to appoint an external service provider with the requisite knowledge, expertise and extensive contemporary exposure to the protocols of various carbon registries and platforms, to coordinate and manage the emission reductions achieved by CCT carbon mitigation projects. ▪ The landfill gas extraction and utilisation programme of activities is aimed at producing tradable Carbon Emission Reduction certificates (CERs) in terms of the Kyoto Protocol ▪ The sale of CERs is intended as an additional revenue stream to add to the viability of developing such projects to meet climate change objectives	Management and consulting contract
Example Of Cluster Projects – To Be Advertised		
Landfill gas	▪ Beneficial use of landfill gas for power generation	Technology and operational contract
ARTS Extension (Athlone Refuse Transfer Station)	▪ ARTS and MRF expansion as well as WtE/MBT project	Feasibility study and procurement Design, construction, technology and operational contract
Green fuel / bio-gas or power generation	▪ The comparison of end-use of bio-gas as a green fuel for city buses versus on-site electricity generation for own use at WWTW	Feasibility study and procurement Design, construction, technology and operational contract

[9] This is approximately 0.51% of South Africa's gross domestic product (GDP).

Working with the private sector

The C&I sector (retail, manufacturing, institutions, etc.) generates approximately 47% (3.6 million tonnes) of the waste in the Western Cape. The private sector is responsible for the safe disposal of their own waste, which includes both general and hazardous waste fractions. They generally appoint waste service providers to manage their wastes.

There are more than 200 waste service providers operating in the Western Cape across the full value chain, i.e. collection, transportation, disposal, recycling, sorting, storage and cleaning. Working with the private sector and their service providers allows easier access to waste compared to partnering with municipalities. This is largely due to fewer legal requirements to develop partnerships with the private sector.

There are more than 200 waste service providers operating in the Western Cape across the full value chain

The linear value chain (collection, transportation and disposal) is dominated by the larger waste management companies such as Averda, Enviroserv, Interwaste and WasteMart. Avderda and Enviroserv are the only waste management companies that jointly own a landfill site located in Cape Town. There are five other privately owned landfills, owned by PetroSA[10] (in Mossel Bay), PPC[11] (in De Hoek and Riebeek West), Exxaro[12] (in Vredenburg) and ArcelorMittal[13] (in Saldanha Bay) but neither of these companies' core business is waste management.

The market for secondary materials is largely driven by the national economy and to some extent the global market for recyclables. There are at least 50 companies that provide alternatives to landfilling services in the Western Cape, with all the mainline recyclables (paper, glass, plastics and metal) and e-Waste being covered.

Recycling – Industry Association

Although recycling is legislated in South Africa, recycling activities are driven by industry through the establishment of industry associations. There are various industry associations in South Africa, all contributing to the promotion of the recovery and recycling of recyclable materials – at different points all the value chain. The industry bodies broadly fall within the following categories:

- Producer responsibility organisations (PRO) – generally non-profit organisations, with a national footprint and primarily funded by producers (manufacturers and brand owners) of the product.
- Material specific organisations – meet all the requirements of a PRO but receive voluntary funding from the product producers.
- Recycling organisations – primarily funded by recycling companies for the support of collection and processing of secondary material.

Currently there is no clear distinction, or agreed upon definition, between the industry associations. In terms of their respective roles and purpose, it can create confusion among broader industry players. However, all mainstream recyclables (paper, glass, plastics and metal), tyres and electronic waste (e-waste) have a specific industry association responsible for diverting the waste from landfill. These associations provide financial and infrastructure support to all industries along the waste/recovery/recycling value chain. Table 5 shows a list of active industry associations and the tonnages generated and diverted for South Africa (data waste collated from the most recent annual reports form the industry associations and have been included in the reference list).

[10] PetroSA is South Africa's National Oil Company.
[11] Pretoria Portland Cement is a cement company.
[12] Exxaro is a coal and heavy mineral mining company.
[13] ArcelorMittal is a steal production company.

Table 5: Industry Association and recyclables processed / available – 2016

Name of Industry association	Material	Tonnes (000s)				Percentage recycled (SA)
		Generated	Diverted from landfill	Available for recycling		
				SA	WC	
Paper Recycling Association of South Africa (PRASA)	Paper	1 793	1 215	557	95	68%
Plastics SA PET Recycling Company (PETCO) Polyolefin Recycling Company (POLYCO) Southern African Vinyls Association (SAVA) Polystyrene Packaging Council (PSPC) Polystyrene Packaging Council	Plastics	1 490	310	1 179	176	21%
The Glass Recycling Company (TGRC)	Glass	1 000	410	590	96	41%
Metal Recyclers' Association of South Africa Collect-A-Can	Metal	3 121	2 497	624	106	80%
South African e-Waste Alliance (SAEWA) e-Waste Association of South Africa (eWASA)	e-Waste	322	38	280	74	12%
REDISA	Tyres	270	109	160		43%

Currently, in most cases, membership of and financial contributions to the industry associations are voluntary. However, for the management of waste tyres, all tyre producers/importers are required by law to be members of REDISA (the tyre management PRO) and pay a tax on all tyres sold in South Africa. This tax is then paid to REDISA for the management of the tyres. Thus, to access/benefit from this tax it is necessary to consult REDISA.

Although it is not mandatory to engage with the other relevant industry associations when dealing with the respective wastes (plastics, paper, etc.), it would be beneficial as they provide support and information. A list of industry association contact details is available in Annexure B.

In 2016, four projects in the province attracted investments of R1.1 billion, leading to the creation of 148 jobs in the waste sector.

Current investment by the private sector

In 2016, four projects have attracted investments of R1.1 billion, created 148 jobs and advanced the technical capacity of the sector, i.e. increased local market demand for recyclable material.

- Opening of the second recycled PET bottle- to-bottle plant. The Mpact Polymers plant entailed a total investment of more than R350 million and provides 40 direct jobs.
- The start of construction of the first MSW biogas plant. The New Horizons Energy plant is worth R400 million and will create 75 jobs.
- The operation of the first landfill constructed to comply with the new Waste Classification and Management Regulations. The Averda landfill is worth R250 million and created 30 direct jobs
- The commissioning of the pilot plastics to oil pyrolysis plant. This CCT/CFN pyrolysis plant is worth R41 million and has created 8 operational jobs.

© Image courtesy of Atlantic Plastics
Image: Plastic washed and flaked for recycling

3 – Policy and regulation

This section provides a brief introduction to the regulatory framework for waste management, including a focus on updates made in the past year.

The updates below are expected to affect investment decisions made by potential investors and businesses in the waste sector.

3.1. Waste management policy and legislation in South Africa

Historically, waste management in South Africa focused primarily on end-of-pipe technologies such as landfilling (for general and hazardous waste) and incineration (for medical waste). With the promulgation of the National Environmental Management Act (No. 107 of 1998) (NEMA), which aims to give effect to Section 24 of the Constitution – 'to secure an environment that is not harmful to the health and well-being of the people of South Africa' – and the National Environment Management: Waste Act (No. 59 of 2008) (NEM:WA), which aims to, amongst others, implement the principles of the waste hierarchy– waste management in South Africa has evolved to include additional requirements such as waste minimisation and recycling.

The NEMA and the NEM:WA are guided by integrated environmental management principles that aim to ensure negative environmental impacts are prevented, mitigated and regulated. They provide a range of tools and measures to monitor and manage activities that generate environmental impacts.

With the promulgation of the NEM:WA in 2008, all organs of state within South Africa were bound to achieve the objectives of the waste management hierarchy.

Among other things, the NEM:WA sets out to achieve the following objectives:

- minimise the consumption of natural resources;
- avoid and minimise the generation of waste;
- reduce, re-use, recycle and recover waste;
- treat and safely dispose of waste, as a last resort.

To achieve the objectives of the Act, the South African Government was obligated to develop a National Waste Management Strategy in 2011. The objective was to promote the waste management hierarchy and ensure effective service delivery, whilst growing the waste economy by improving job creation and business development.

To ensure that the NEM:WA objectives are achieved without causing a negative impact on the environment, Government Notice No. 718 of 2009, recently amended by No. 921 of 2013, was promulgated. This government notice provides a list of waste management activities that may have a detrimental effect on the environment and which require a waste management licence to be issued prior to undertaking the activity.

3.2. Recent legislative changes

Most notable in 2016 were:

- The National Pricing Strategy for Waste Management (NPSWM) was published.
- Notice was given to the paper and packaging, electrical and electronic and lighting industries in terms of the Waste Act to prepare and submit an industry waste management plan (IndWMP) for approval.
- The National Norms and Standards for the Disposal of Waste to Landfill and the landfill ban for all types of light bulbs came into effect.

3.2.1. National Pricing Strategy for Waste Management

The NPSWM has been published under the NEM:WA as the framework within which waste management charges will be set in South Africa. The NPSWM recognises that there is currently an under-pricing of waste services. This does not encourage waste generators and holders to reduce waste generation or to re-use, recycle or recover waste, but rather perpetuates the use of landfill which is perceived as the cheapest method of waste disposal.

The NPSWM contains a methodology and approach for waste management charges to be applied in South Africa. It outlines possible waste management charges or economic instruments that may be applied in accordance with the overall fiscal and taxation policy of South Africa.

There is still uncertainty within industry if the strategy would have a positive effect, as under the current voluntary levy system material specific organisations receive their operational budget directly from industry. The NPSWM makes provision for both for a taxed-based levy that would pay directly into the fiscus, and a direct payment to the PRO option.

Industry has concerns that if the taxed-based levy is implemented the funds would be not be used for waste management, as National Treasury is clear that it does not ring-fence funds. Furthermore, concerns have been raised with regards to the administrative costs associated with the newly formed Waste Management Bureau that is tasked to disburse the fees collected (to PROs) and implement, monitor and evaluate the effects of IndWMPs.

© Image courtesy of City of Cape Town - Gordon's Bay Drop-off
Image: Garden waste site with chipped material and material waiting to be chipped. In the background, the closed and rehabilitated landfill.

3.2.2. Industry waste management plans

The notice to the paper and packaging, electrical and electronic and lighting industries has been published in terms of the NEM:WA, requesting them to prepare and submit industry waste management plans (IndWMP) for approval. Since the initial draft notice was published in 2015, the timeframes for registration with the Minister and preparation and submission of IndWMPs for approval to the Minister have been reduced significantly. The Notice considered all entities within the value chain, virgin or secondary, as "producers" and required them to register with the Minister within 30 days of commencement of the Notice.

Furthermore, all producers, recyclers, collectors, processors, reclaimers, recycling advocacy associations or entrepreneurs "in relation to a waste stream" would need to prepare and submit an IndWMP to the Minster for approval within three months from the publication of the Notice or subscribe formally to a submitted IndWMP.

There has been significant outcry from industry in terms of the implementation, lack of definitions, severe penalties, lack of information on how plans were to be evaluated, and their timeframes. This resulted in the withdrawal of the Notice and the publication of a new draft Notice to industry for comment. The new draft Notice amends the timeframes for industry to register and prepare and submit the IndWMPS. The timeframes have been extended to 12 months for registration and 12 months for submission.

3.2.3. National norms and standards for the disposal of waste to landfill

The assessment of waste destined to landfill and the associated landfill classification has come into effect on 23 August 2016. The legislation makes limited provision for 'unlined' landfills. Only uncontaminated construction and demolition waste (C&DW) and excavated earth will be allowed to be disposed without an engineered plastic line at a Class D landfill. All other waste would need to be disposed of at either Class A[14] (hazardous), or Class B or C (general waste)[15] landfills. These standards are in line with the international standards of a sanitary landfill. The obvious challenge is that disposal at the appropriate compliant landfill sites is not possible for all industries and municipalities, due to logistics, distance and the cost of construction. Alternative solutions are therefore required, which will result in significant cost impacts for the sector.

3.2.4. Landfill bans

On 23 August 2016 the landfill ban on all types of light bulbs came into effect. This is a concern and an opportunity, as there are only two service providers in South Africa that provide an effective alternative solution. This opportunity will be further discussed in Section 4.

[14] H:H/H:h in terms of the Minimum Requirements for Waste Disposal at Landfill (2nd edition, Department of Water Affairs and Forestry, 1998).
[15] G:L:B+ in terms of the Minimum Requirements for Waste Disposal at Landfill (2nd edition, Department of Water Affairs and Forestry, 1998).

4 – Opportunities

This section highlights the opportunities for businesses and investors in the waste sector in the Western Cape, primarily focusing on recyclables, organics, e-Waste, and construction and demolition waste (C&DW).

Section 2 stipulates that four projects implemented nationally in 2016 attracted at least R1.1 billion in investment and created 148 jobs in the waste sector. Furthermore, Western Cape municipalities are in the process of implementing PPPs that will potentially attract R1.3 billion and create approximately 1 600 jobs in the next five years. In addition, legislation has been passed to help unlock the potential R17 billion (minimum) of resource value that could be recycled (the 90% that is currently being landfilled) (CSIR 2012). Although the NPSWM and the call for IndWMPs may be considered controversial, both laws are critical to unlock the opportunities in the sector.

The above illustrates the potential of South Africa's growing waste economy. Table 6 provides the current and potential market size and the opportunities that if offers[16].

4.1. Recyclables

The economics of recycling are simple: if the cost of collecting and processing recyclate to produce a new 'raw material' cheaper than the virgin material (either directly or with support from incentives or disincentives), then it is generally recycled - i.e. a viable market exists.

South Africa's recycling market is well established and primarily focuses on the recycling of packaging waste. Over half (1.9 million tonnes) of the packaging waste consumed in 2015 was collected for recycling (Packaging SA 2016). This is largely due to the initiatives implemented by the private-sector supported industry associations (in creating demand), and a very active informal waste sector (supply).

Although collectively the recycling of packaging is comparable with global benchmarks, a closer look at the specific materials (not just packaging) illustrates further areas of opportunity. Refer to Figure 5 (Packaging SA 2016).

4.1.1.Metals

Metals are largely recycled (80%) and are driven by a global market worth R12 billion per year (Steyn 2016).

Legislation requires 30% of all metal to be resold to the South African market. The International Trade Administration Commission of South Africa (Itac) is attempting to develop the local market by proposing amendments to the price preference system, forcing the market to keep more of the material within the country. However, to date these amendments have been rather ineffectual (Steyn 2016).

It is unlikely that this will be resolved in the short term as there is a technology gap between South Africa and the global market, which can offer higher prices for scrap material and process it at a cheaper rate.

[16] The resource value is estimated, based on the DST's (2014) commodity prices against the current industry and DEDAT (2016) reported tonnages.

Table 6: Waste economy market size and potential (2016)

Sector	Current Market Size (ZAR)	Opportunities	Potential Material Value (ZAR)	Jobs Potential
Paper	900 million (SA) 120 – 180 million (WC)	▪ EPR Schemes – Development of IndWMPs ▪ Improvement of quality of recyclate ▪ Waste to Energy	400 million (SA) 150 million (WC)	1 100 (SA) 190 (WC)
Plastics	960 million (SA) R00 – 160 million (WC)		3.6 billion (SA) 550 million (WC)	7 860 (SA) 1 150 (WC)
Glass	200 million (SA) 20 – 40 million (WC)	▪ EPR Schemes – Development of IndWMPs ▪ Technology interventions ▪ Requires new markets for material	290 million (SA) 47 million (WC)	118 (SA) 19 (WC)
Metal	12 billion (SA – global prices) 5.6 billion (SA – local prices) 960 million (WC)	▪ Well recycled material but 70% of the material is exported ▪ Legislative intervention would be required	1.4 billion (SA) 241 million (WC)	1 800 (SA) 308 (WC)
e-Waste	38 million (SA) 7 million (WC)	▪ Significant growth can occur here ▪ Dismantling businesses are low cost with high employment ▪ Favourable legislative changes.	280 million (SA) 54 million (WC)	8 700 (SA) 1 690 (WC)
Construction & Demolition Waste	61 million (WC)	▪ Valuable material for the construction sector ▪ High employment ▪ High waste diversion potential	88 million (WC)	500 (WC)

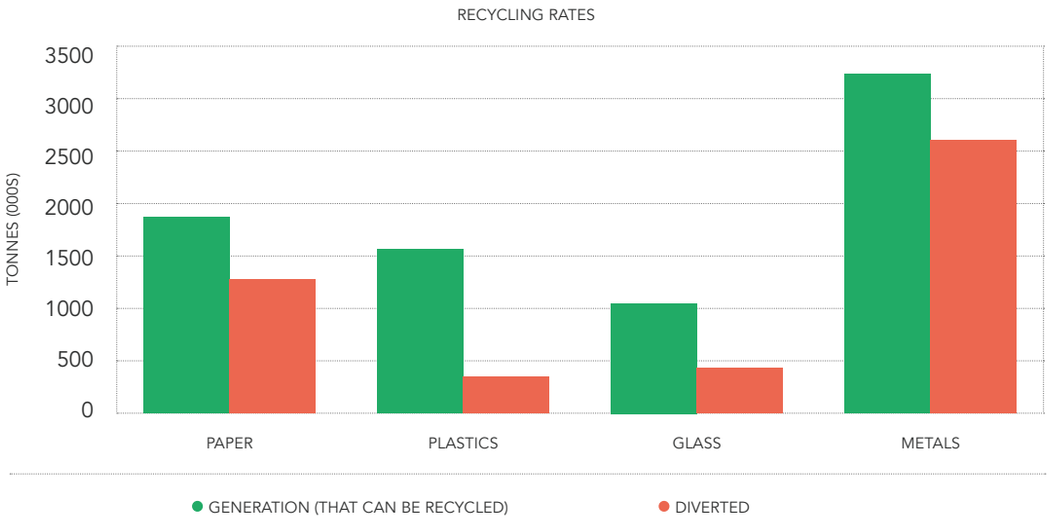


Figure 5: Mainline Recyclables – recycling rates (2016)

4.1.2. Paper, glass and plastic

In terms of paper, glass and plastics, the opportunity in the recycling market will be largely driven by mechanical recycling. Mechanical recycling is only economically viable in large volumes, requiring large capital investment. Growth in this sector would largely be driven by the PROs, material converters such as Mpact, Amcor, Nampack, Consol, and Golden Era, and producers such as Consol, ArcelorMittal, and SASOL etc. with support from national and local government.

The publishing of the NPSWM and the call to IndWMPs intend to increase available funds to enhance the current recycling activities. This will be achieved primarily by mandating EPR schemes and placing a mandatory[17] levy (fee/tax) on products put onto the market. The development of sector-specific IndWMPs – such as for packaging, lighting and e-waste – would potentially build on the initiatives already established in the industry.

This combined effort should result in opportunities across the value chain if market demand for recyclables is increased.

- Product developers would need to find products that are suitable for recycled content.
- Material converters should commit to a certain percentage of recyclate in their raw material consumption (design for recycling/environment is one of the intentions of EPR, but to date design has been driven by product cost, rather than EPR).
- Converters should stipulate their recyclate requirements to the recycling industry.
- To adequately meet this, recyclers would have to invest in improved quality measurement.

[17] Currently packaging producers pay a voluntary levy to PROs.

© Image courtesy of GREENLITE
Image: Polystyrene after being processed for inclusion into building products.

Materials that cannot re-enter the recycling stream would require alternative solutions, such as waste-to-energy (WtE). Some of these materials are highlighted below:

- The growth in the use of **tissue paper** suggests that there is some potential for this to be used in alternative waste treatment (AD or higher temperature WtE projects), provided it can be separated adequately and economically, e.g. collected with the organic fraction for anaerobic digestion, separated at source or managed with residual waste.
- Plastic SA estimates that 30% of the **plastic** produced could go to WtE projects, as these problematic materials are not currently recycled in South Africa and/or are, e.g. as a result of contamination, multi-layer and low value.

4.2. Organics

Approximately 2.9 million tonnes of organic waste are generated in the Western Cape per annum. National legislation changes and the potential provincial goal to ban the landfill of organics (by 2026) are supporting the growth of organic waste beneficiation.

In 2016, legislation came into effect (see Section 3.2.3) that resulted in a significant increase in the cost of landfilling. DEA&DP (2016) estimates that landfilling compliance will cost Western Cape municipalities approximately R1 billion in total. For this reason, DEA&DP is proposing to ban all organics from landfill within 10 years, initially aiming to reduce organics to landfill by 50% over the next 5 years. DEA&DP are recommending that if the organic fraction (the leachable / methane producing fraction) can be diverted, there would be no need for such a strict requirement for landfill construction.

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The Western Cape generates 2.9 million tonnes of organic waste per year. The provincial government is planning to ban all organics from landfill within ten years, with a reduction of 50% over the next five years.

This presents several opportunities: it would (a) save municipalities money; (b) make organic waste available for beneficiation; and (c) target the separation of organics from the waste stream. This will result in the remaining waste largely being dry recyclable waste with less risk of contamination.

However, the ban cannot be implemented unless the correct technology can be implemented at competitive cost - i.e. the cost of landfilling needs to increase. This is where the private sector will have to play its part. Private investors are increasingly seeking access to organic material for beneficiation. The potential demand appears to be sufficient. However, the question is whether they would have the capacity to upscale their activities to accommodate 50% of the organics within five years.

In 2016 we engaged with some of the larger/ active organic solution providers, in the Western Cape. Table 7 provides industries' current tonnages. Based on our 5-year projection, industry's capacity is set to increase by more than 200%. This is more than 50% of the organics fraction of MSW, but potentially less than 20% of all organics. Thus there is still further need for investment in this sector.

The organics sector could be developed if the companies operating in this space were supported by policies/subsidies. Easy wins would be to target garden waste and agricultural waste still going to landfill, with milestones set to focus on the organics in MSW.

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Based on the potential ban of organics in the next 10 years, industry will be able to achieve a 50% diversion of organics from MSW in the next five years. Considerable investment is still needed, as this is, in total, only 20% of all organics waste (which include, MSW, commercial and industrial organic wastes).

Table 7: A sample of organic waste solutions in WC and potential 5 year projections (2016)

Waste hierarchy	Family	Current tonnes/year	Tonnes/year projected	Input	Output
Reuse	Waste to food	720	7 200	Pre-Consumer Obsolete Stock	Recyclables
Recycle	Waste to feed	36 000	126 000	Pre-Consumer Post-Consumer	Protein Feed Oil Compost
	Waste to soil	145 000	145 000	Green Waste	Compost
		14 400	36 000	Pre-Consumer Post-Consumer	Compost
		720	720	Animals Pre-Consumer Post-Consumer	Non Sellable Compost
		3 600	12 600	Pre-Consumer Post-Consumer	Compost Vermicast
	Waste to energy	108 000	108 000	Pre-Consumer Post-Consumer Abattoir	CO2 Methane Sludge Waste Water
		0	108 000	Manure Pre-Consumer Post-Consumer	Biogas Sludge Waste Water
		36 000	41 400	Pre-Consumer Post-Consumer Abattoir	Biogas Sludge Waste Water
Total		**344 440**	**584 920**		

4.3. e-Waste

According to eWASA, South Africa produces approximately 322 000 tonnes of electronic waste (e-waste) per annum. Table 8 provides the tonnages of total waste as classified by eWASA.

In 2009, there were two large e-waste recyclers in South Africa – Universal Recycling Company and Desco – processing approximately 9 000 tonnes per annum. Both companies provide dismantling and processing services (extraction of metals) (ewasteguide 2009). Now in 2016 there are more than 20 companies located nationally providing a variety of services, from refurbishment to metal extraction. Collectively they process 45 000 tonnes, which account for only 12% of the waste (Dataweek 2015).

Table 8: e-Waste classification

e-Waste classification	Tonnes	Percentage recycled
Large appliances (stoves, fridges)	125 000	39%
Consumer equipment	78 000	24%
Information technology (IT) equipment	77 000	24%
Small household appliances (toasters, kettles, etc.)	40 000	13%

Based on industry's presentation at WasteCon 2016, the draft IndWMP aims to increase the recycling of e-waste to 20% in the next five years (eWasa 2016). We see this as a good opportunity for SMMEs development. The barriers to establishing an e-waste dismantling business are lower than that of dry recyclables, with a higher job factor (30 jobs created for every 1 000 tonnes diverted) (Maia, et al. 2011). This is a sector that can generate significant growth, as an 8% increase in e-waste diversion can result in a market potential of R22 million and create 650 local jobs.

4.4. Construction and demolition waste

Builders' rubble[18] is largely landfilled in South Africa, in spite of its potential for re-use and the high financial and societal costs of landfilling. One of the biggest opportunities in the recovery, processing and application of builders' rubble lies in the uptake of material into new applications, e.g. roads. This holds prospects on the supply side for the crushing industry and on the demand side in road material for both the public and private sectors.

The economy in builders' rubble must be considered at a regional scale due to the low value of the material relative to logistics costs. Economic viability is dependent on local sourcing and processing of materials, such that the transport and processing costs do not exceed the economic value of the resources.

Within the CCT, about 43 000 cubic metres (m^3) of builders' rubble is dumped at landfill every month. An estimated 20 to 30% of that material is suitable for sub-base material in roads, such that there is an estimated R1.1 to R1.4 million worth of sub-base material going to landfill every month.

The current crushing capacity in the CCT is in excess of 17 000 m^3 per month. With extra capacity and further investment, it is expected that a further 38 000 m^3 per month will be available in the next couple of years.

There are currently few externally imposed drivers on the economy, such as policy and legislation dictating diversion from landfill, or industry body oversight governing the handling, treatment and disposal of builders' rubble.

Current drivers of the C&DW economy include:

- rising virgin material prices
- regulation of waste flows, meaning that the costs of waste handling are increasing
- limited landfill space.

[18] The mineral component of C&DW consists of concrete, bricks – both clay and concrete blocks – and stone.

Due to the scarcity of landfill space, incentives to divert wastes and disincentives to dispose of wastes may very well be implemented at local municipal level in the next five years, if the current practice of disposing of large volumes continues.

Opportunities for the crushing sector include tenders for crushing contractors at the CCT and Stellenbosch landfills.

- To access this opportunity in the CCT, crushing companies will have to be accredited through the Solid Waste Management Department as a waste management service provider.

- To capitalise on the opportunity, strict quality control for verified quality products is required to satisfy the demand side in foundations for structures, and especially for inclusion in roads. The quality control process must start at the point of waste generation – separation at source is the primary factor that determines material quality.

Work in developing the builders' rubble economy is focusing on best practice guidelines for the crushing industry, to produce high-quality products that will meet demand-side requirements in association with industry stakeholders. In the longer term, material specifications for aggregates that are inclusive of material recovered from builders' rubble will be developed.

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Up to R1.4 million of potential sub-base material for roads is being landfilled very month in the City of Cape Town.

4.5. Untapped opportunities

The Western Cape Industrial Symbiosis Programme (WISP) has identified 13 opportunities. The waste that has been identified is typically not taken up by large companies. This creates a diversion and recycling opportunity for smaller entrepreneurs. The business opportunities are:

- Textile processing;
- Cardboard core processing;
- Cardboard core containers;
- Pallet recycling;
- Wood chipping;
- On- and off- site paper pulp / effluent tech;
- Contaminated bentonite processing;
- Foundry sand value add; and
- Paper recycler/dehydration of waste streams.

Table 9 provides the availed tonnages and the potential opportunities to develop businesses (not limited).

4.6. Opportunity – conclusion

The country and Western Cape Province's waste management landscape is changing. However, rather than a sudden change, there is a steady incremental change each year as South Africa moves towards a more sustainable waste management model. This can be greatly accelerated, with the support of legislation – adequate implementation of EPR/IndWMPs (in the next 1-2 years) and further partnerships with municipalities and the private sector.

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An 8% increase in e-waste diversion can result in a market potential of R22 million and create 650 local jobs.

© Image courtesy of GREENLITE
Image: Recycled polystyrene mixed with concrete being pumped into molds.

Table 9: Untapped WISP opportunities

Material opportunity	Tonnes available (t/annum)	Potential business opportunity	Potential material Value (ZAR/ annum)
Textile processing	198	An operation that separates textile thread from industrial strength cores and processes textile offcuts from industries in Atlantis. They could either be stockpiled or shredded for sale to a locally based textile recycler.	790 000
Cardboard core processing	103	Establishes an operation that processes the industrial strength cores (from which textile thread is wrapped). Once shredded they could be sold to fibre recyclers based in Atlantis, or sent to Piketberg to PPC.	40 500
Cardboard core containers		Uses the cores to manufacture containers for storage. The cores are interesting looking, funky and great for containers.	
Pallet recycling	278	Establishes a pallet collection, processing and recycling / refurbishing facility in Atlantis to serve Atlantis, Cape Town, Saldanha and surrounding companies.	109 800
Wood chipping	530	A chipping operation to use wood material (offcuts from a wood company, pallets and alien veg) to feed a biomass boiler or firewood in Atlantis. Ash from boilers could be used by a brick manufacturer.	209 350
On- and off- site paper pulp / effluent tech	43 600	Pyrolysis / Gasification tech to process both their paper pulp (including plastic/ fibre) and also effluent water from a paper manufacturer.	17 253 600
		An egg box manufacturer also produces similar waste to the paper manufacturers in the area, but not in viable quantities to justify setting up a pyrolysis plant on site. A company could transport the egg box manufacturer's waste to the pyrolysis plant. This would require a waste license.	
Contaminated bentonite processing	360	An operation to process PET contaminated bentonite from a non-woven geotextile manufacturer to a quality product for either resale back to the geotextile manufacturer, a nearby foundry, or other offtakers.	142 200
Foundry sand value add	72 000	Value-add operation to process contaminated foundry sand to a value-add product such as bricks or reusable material.	37 728 000
Paper recycler/ Dehydration of waste streams	2 979	Paper recycler dewatering operation to reduce volume (and subsequent landfill gate fees) and to downgrade waste from a hazardous category, making it easier to divert to a solution.	1 176 700

5 – Funding and incentives

A range of funding solutions are either focused on or available to green technology manufacturers and service companies, as well as those who use such services. It applies to Development Finance Institutions (DFI), local public and private sector financiers and investors, and a considerable range of tax incentives.

According to the KPMG Green Tax Index (GTI), South Africa ranks 13th out of 21 countries to use tax as an incentive to drive the green growth agenda (ahead of Australia, Singapore and Finland). Investors and suppliers can benefit from understanding the various incentive and funding options available to them, as well as from understanding those available to their customers or clients. It can influence the viability and attractiveness of their products and projects.

The table below demonstrates a wide variety of such funding solutions. It is not exhaustive, is indicative of more green-focused funds or incentives available, and provides potential leads or starting points to explore various options. Further to those below, the full range of government investment incentives can be found at www.investmentincentives.co.za.

Note: The links below are clickable in the electronic version of this MIR, which is available on our website. For further funding and incentives, please download the SA Business Funding Directory for 2016 / 2017 on the GreenCape website under the green finance link.

Table 10: List of funding solutions and incentives – Waste-specific

Entity Name	Opportunity overview		Website
PET Plastic Recycling Company (PETCO)	Cat A: Dependent on PETCO requirements; no large projects needed until 2018. Small innovative projects considered. Private projects and private-public partnerships. R30m-R40m per annum. Cat B: Currently partnering with industries, but training and awareness requests are considered on an ongoing basis. See Criteria for more info; Apply as per Criteria document. Private projects and private-public partnerships; R4m per annum.	Subsidy	www.petco.co.za
Polyolefin Recycling Company (Polyco)	Invitation to recycling companies to submit proposals for funding that would be used to grow recycling production volumes and have a direct impact on the sustainable growth of the polyolefin plastics recycling industry.	Loan	www.polyco.co.za

Table 11: List of funding solutions and incentives

Entity Name	Opportunity overview	Product	Website
Commercial Bank			
GroFin	Financing and supporting small and growing businesses across Africa and the Middle East.	Loan	https://goo.gl/liynqq
Investec	Power & Infrastructure Finance: Arranger and underwriter of debt for projects. Selectively develops and take equity in projects.	Loan Equity	https://goo.gl/CC4JJa
Old Mutual	IDEAS fund: Invests in commercially viable developmental projects in SADC.	Equity	https://goo.gl/UUl6nh
Nedbank	Responsible lending that rejects transactions that do not meet the required- sustainability standards, and includes guidance to enable compliance.	Loan	www.nedbank.co.za
Nedbank / WWF	The Green Trust supports programmes with a strong community-based conservation focus in multiple areas, including climate change.	Grant	https://goo.gl/DMSiHA
SCF Capital Solutions	Unsecured working capital based on invoice or supply contracts. R250k - R5m is offered with interest rates of 2-3% per month.	Loan	www.scfcap.com
Development Finance Institutions			
German Investment Corporation	Amount ranging R4m-R30m for a duration of 4 years.	Loan Equity	www.deginvest.de
Development Bank of South Africa	For green initiatives related to the green economy.	Loan Equity Grant	www.sagreenfund.org.za
European Investment Bank	Direct and intermediated loans, minority investments in specialist private equity funds focussing on renewable energy and energy efficiency projects in emerging markets.	Loan	www.eib.org
GEF Special Climate Change Fund	Worth, ~USD350m, the fund is designed to finance activities, programs and measures under the following four financing windows: Adaptation to climate change (top priority), technology transfer, mitigation in selected sectors including: energy, transport, industry, agriculture, forestry and waste management, and economic diversification.	Grant	https://goo.gl/lQNu2i
German Bank for Reconstruction & Development (KfW)	For public entities focussing on energy and climate change	Loan	https://goo.gl/RALjfZ

Entity Name	Opportunity overview	Product	Website
Global Environmental Facility	The Small Grants programme (SGP) invests in communities affected by environmental degradation.	Grant	https://goo.gl/qwA6Ed
International Finance Corporation	Funds private sector development projects. May fund smaller businesses through financial intermediaries that on-lend.	Loan Equity	https://goo.gl/k4Br3Z
Overseas Private Investment Corporation	Private project development focussed on renewable resources (and less on technology, health care, food and people). Involvement of a US company preferred.	Loan Guarantee	www.opic.gov
The African Development Bank	Development projects in the public and private sectors.	Loan	https://goo.gl/QnTCz4
Global Innovation Fund	Invests in social innovations that aim to improve the lives and opportunities of millions of people in the developing world.	Grant Equity Loan	www.globalinnovation.fund/
World Bank	World Bank Green Bonds are an opportunity to invest in climate solutions through a high-quality credit fixed income product.	Loan	https://goo.gl/RBZMGS
Government Department			
Department of Higher Education and Training	National Skills Fund: Finances costs directly related to the delivery of learning – not infrastructure and/or ongoing operational costs of SETAs.	Grant	www.dhet.gov.za/
Department of Science and Technology	11D Tax Incentive: Undertaking R&D in South Africa qualifies for a 150% tax deduction of operational R&D expenditure.	Rebate	www.dst.gov.za/r-d
dti	Industrial Financing Loan Facilities encourage manufacturers to upgrade production facilities.	Loan	www.thedti.gov.za
dti	12I Tax Allowance Incentive supports capital investment and training. Application deadline: 31 December 2017	Rebate	www.thedti.gov.za/
IDC	Industrial financing loan facilities (the Working Capital Component) to promote competitiveness in manufacturing while ensuring job retention in the sector	Loan	https://goo.gl/FySmGc
Department of Small Business Development	The Black Business Supplier Development Programme (BBSDP) is offered to small black-owned enterprises to improve their competitiveness and sustainability.	Grant	http://bbsdpgrants.co.za
dti	Black Industrialist Scheme: Unlocks industrial potential through targeted and financial and non-financial interventions, described in the IPAP and other government policies.	Grant	www.thedti.gov.za
dti	Strategic Partnership Programme (SPP) supports manufacturing and services supply capacity of suppliers with linkages to strategic partner's supply chains, industries or sectors	Grant	www.thedti.gov.za
dti	The Capital Projects Feasibility Programme (CPFP) contributes to feasibility studies that lead to projects increasing local exports	Grant	www.thedti.gov.za

Entity Name	Opportunity overview	Product	Website
dti	Critical Infrastructure Grant (CIG): A cost sharing grant for projects to improve critical infrastructure.	Grant	http://www.thedti.gov.za
Department of Small Business Development	Co-operative incentive Scheme (CIS): A 100% grant for registered primary co-operatives.	Grant	http://bbsdpgrants.co.za
Department of Small Business Development	The Shared Economic Infrastructure Facility (SEIF) provides an enabling environment to crowd in investment, mostly in townships, rural areas and the inner city.	Grant	http://bbsdpgrants.co.za
dti	Sector Specific Assistance Scheme (SSAS): A reimbursable 80:20 cost-sharing grant offering financial support to for-profit export councils, joint action groups and industry associations.	Grant	http://www.thedti.gov.za
dti	Export Marketing & Investment Assistance Scheme: Develops export markets for local goods and services, and recruits new foreign direct investment.	Other	http://www.thedti.gov.za
National Research Foundation	Research/study funding for public tertiary institutions.	Grant	http://www.nrf.ac.za
dti	The Technology and Human Resources for Industry Programme (THRIP) is a research and development programme.	Grant	http://www.thedti.gov.za
Small Enterprise Development Agency	Seda Technology Programme (STP) is responsible for the provision of technology transfer, business incubation and quality support services for small enterprise. Excludes R&D.	Grant	www.seda.org.za/
Small Enterprise Development Agency	Direct Lending where individuals apply directly to sefa. Direct Lending: R50k - R5m with tenors of 1-5yrs.	Loan	www.seda.org.za/
Small Enterprise Development Agency	Wholesale Lending where financial intermediaries (Joint ventures, funds, RFI, MFI) are used. R20m-R100m with tenors of 1-5yrs.	Loan	www.seda.org.za/
South African Revenue Services	37B and 37C: Deductions regarding environmental expenditure and environmental maintenance.	Rebate	https://goo.gl/sC5Wos
South African Revenue Services	12K Clean Development Mechanisms (CDM) Tax Incentive (2009): South African businesses receiving CDM benefits are exempt from tax derived from such benefits, in Income Tax or Capital Gains Tax.	Rebate	www.sars.gov.za
Western Cape Government - DEDAT	Cape Capital Fund: Grows small businesses in agri-processing and oil and gas sectors: supports purchase or new equipment and and improvement of business processes.	Grants	https://goo.gl/OUHkJm
Technology Innovation Agency	Financial support to proposals based on merit. Includes R&D funding.	Grants Loans Equity	http://www.tia.org.za/

Entity Name	Opportunity overview	Product	Website
Private Equity			
Atlantic Asset Management	Focus: Intermediaries or businesses creating new jobs with a record less than 5 years. Investment range of R15m-R60m with a duration of 3-5yrs.	Loan	www.atlanticam.com/
Business Partners	For: Businesses which actively develop, manufacture and provide goods and services by implementing measures and/or technology which reduce their adverse impact on the environment. Investment range: R500k-R30m.	Equity Loan	www.businesspartners.co.za/
Adlevo Capital	Investments available to the public and private sector with technology-enabled business models.	Equity	www.adlevocapital.com
Treacle Private Equity	Equity capital to mid-market private and small cap listed companies in Southern Africa.	Equity	www.treacle.co.za/
Sovereign Funds			
Entrepreneurial Development Bank of Netherlands (FMO)	Supports private sector entrepreneurship in developing countries: energy, agribusiness, food and water.	Loan	www.fmo.nl/home
French Agency for Development (AFD)	Development projects in energy, water, municipal sector support and biodiversity.	Loan Guarantee Grant	https://goo.gl/7QuiyH
German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)	International Climate Initiative (IKI), supports climate and biodiversity projects in developing countries. Fund size: EUR 120m, annually.	Grant	https://goo.gl/9qJEEb
Ireland Development Cooperation	Projects across various sectors involving an Irish Partner company.	Grant	www.idaireland.com
Japan Bank for International Cooperation	Focus areas: Energy & Natural Resources, Infrastructure & Environment and industry finance. Accessed through a Japanese business partner.	Loan Equity	www.jbic.go.jp/en/finance
Japan International Cooperation Agency	Intergovernmental work regarding technical cooperation.	Loan Grant	www.jica.go.jp/english
PROPARCO	Private sector development projects (energy, infrastructure, agriculture, etc.).	Equity Loan	https://goo.gl/XQ7lOb
United Kingdom: Prosperity Fund Programme	Fund to tackle climate change, strengthen energy security and promote an open global economy in emerging economies.	Grant	https://goo.gl/Rn4jLX
Embassy of Finland	Local Co-operation Fund: Supports initiatives in export and investment promotion, businesses and other groups.	Grant	https://goo.gl/AmNv2P

Entity Name	Opportunity overview	Product	Website
Venture Capital			
4Di Capital	An independent seed- and early-stage technology venture capital firm based in Cape Town.	Equity	www.4dicapital.com/
AngelHub Ventures	Angel seed fund investing into lean start-ups with disruptive business models and technologies. Investment range: R500k-R5m	Grant	www.angelhub.co.za/
Edge Growth	Edge Growth has 2 funds to fund Green projects. Investment range: R1m-R20m. For: SMEs that have limited equity or don't qualify for credit from a bank.	Loan Equity	www.edgegrowth.com
Hasso Plattner Ventures Africa	Invests solely in fast-growing and IT-driven companies in seed stage or growth stage.	Equity	www.hp-ventures.co.za/
Other			
Anglo-American Zimele Green Fund	Targets opportunities that mitigate carbon, reduce energy and water consumption, and improve waste and emissions management in the Anglo-American value chain. The Fund provides funding of up to R10 million per project or business.	Grant	https://goo.gl/wr4cPF

6 – The Western Cape: Africa's green economy hub

The Western Cape is a world-class investment destination.

The province provides businesses and investors with prime locations, modern infrastructure, a skilled workforce, low operational costs and an abundance of natural resources. It is also a sought-after place to live, with unrivalled natural beauty, vibrant culture, excellent schools and universities, and an outstanding quality of life. Cape Town has been ranked among the top 21 global investment destinations by Foreign Direct Investment (fDi) Intelligence, a division of the Financial Times.

A great place for green business

There are compelling reasons why the Western Cape Province is viewed by many as Africa's green economic hub. Coupled with a strong and rapidly growing market for green technology and services in South Africa and beyond, the Western Cape offers:

- Africa's renewable energy and cleantech hub, with a critical mass of leading companies present.
- Local presence of major professional services and financiers.
- Significant market opportunities for businesses and investors in agriculture, energy services, utility scale solar and wind, waste, water, bioeconomy and resource efficiency.
- A supportive government that has made ease of doing business and the green economy key priorities.
- Five universities with comprehensive R&D capabilities and dedicated green economy skills programmes.
- A range of investment incentives in proposed Atlantis Greentech Special Economic Zone (SEZ).

Supporting businesses and investors

The province also offers dedicated support for businesses and investors focusing on green tech and services, including:

GreenCape: Provides dedicated support and market intelligence to green economy sectors

Wesgro: The official investment and trade promotion agency for the Western Cape

SAREBI: A business incubator providing non-financial support to green entrepreneurs

SARETEC: Offers specialised industry-related and accredited training for the wind and solar industries

Businesses and investors will soon be able to make use of a convenient one-stop-shop for investment support, offered by the Department of Trade and Industry (dti), the WCG and the City of Cape Town. Called the Cape Investor Centre, it will house various institutions with a permanent or semi-permanent presence at the centre.

Market opportunities in the province and South Africa

Some of the major market opportunity areas in the province and South Africa in the next five years are outlined in the graphic on the next page (see individual MIRs and the GreenCape website for more information).

Major market opportunities: Western Cape and South Africa

Agriculture

Solar irrigation
R2.9 bn market (SA)

Sustainable agriculture
Tools, data analysis, machinery rentals, local manufacturing, financing

Conservation agriculture
R114 m market, ~R1 bn potential market (SA)

Solar energy for packhouses
R1 bn potential market (WC)

Controlled environment agriculture
R600 m potential market; 15% growth p.a. (WC)

Precision agriculture
Tech & services to improve water & energy efficiency

Energy services (SA-wide)

Solar PV systems & components
500 MWp installed capacity & R2 bn investments predicted (2016-2019)

Local manufacturing & assembly
Solar PV systems and components – systems require compliance with local content regulations

Energy efficiency retrofitting
100 000+ public buildings require retrofitting

Utility scale renewable energy (SA-wide)

Independent power production
Ministerial determination for 6.3 GWp more RE generation capacity: 1.1 GW (670 MW wind; 450 MW solar) p.a.

Rest of Africa
RE deployment in the rest of Africa, some programmes mirroring REIPPPP

Local manufacturing
Through REIPPPP local content requirements

Waste

Municipal PPP
Public-private partnership projects of R1.3 bn (WC)

Secondary materials
Robust & growing market for plastics, metals, e-waste, etc.

Construction & demolition waste
Growing reuse & recycling market

Water

Industrial water reuse
Recycling & resource recovery; R600 m market: (WC)

Water & energy
Opportunities for efficiency & use of renewables

Local resource development
Brackish water desalination, ground, storm & grey water

Bioeconomy & resource efficiency

Food value retention
R600 m value through improved cold chain management & waste reduction (WC)

Solar thermal
>R100 m industrial-scale installations, R3.7 bn potential market for agri-processing (SA)

Biogas
For LPG replacement, heating & electricity generation: >R450 m market, R18 bn potential market, 395 MW potential generation (WC)

R&D capabilities and skills

The region's five universities – University of Cape Town, Stellenbosch University, University of the Western Cape, the Cape Peninsula University of Technology and the George campus of the Nelson Mandela Metropolitan University – underpin all of this with comprehensive research and development (R&D) capabilities and dedicated green economy skills programmes.

Atlantis Greentech Special Economic Zone (SEZ): Investment incentives

The City of Cape Town established a greentech manufacturing hub in Atlantis in 2011 in response to the government's focus on localisation of manufacturing as part of the Department of Energy's Renewable Energy Independent Power Producer Programme (REIPPPP).

The City has made tracts of land available at low cost for purchase or lease by greentech companies through an accelerated land disposal process. A number of other financial and non-financial incentives are also on offer, including discounted electricity and rapid turnaround on development applications.

An application has now been submitted by the Western Cape Provincial Government for the Atlantis Industrial area to be declared a Greentech SEZ, a decision on which is expected in 2017. GreenCape's Atlantis SEZ team can assist with information, and facilitate access to permits, licenses, planning and development approvals, incentives and finance.

© Image courtesy of GREENLITE
Image: Cross-section of polystyrene building block, created using recycled polystyrene and concrete.

7 – GreenCape's support to businesses and investors

GreenCape is a non-profit organisation that drives the widespread adoption of economically viable green economy solutions from the Western Cape. Our vision is for South Africa to be the green economic hub of Africa.

We work with businesses, investors, academia and government to help unlock the investment and employment potential of green tech and services, and to support a transition to a resilient green economy.

We assist businesses by removing barriers to their establishment and growth and provide our members with:

- free, credible and impartial market information and insights
- access to networks of key players in government, industry, finance and academia
- an advocacy platform to help create an enabling policy and regulatory environment for green business

We assist local, provincial and national government to build a resilient green economy by providing:

- support on the development of standards, regulations, tools and policies
- expert technical knowledge on key sectors in the green economy
- access to networks of key players across business, academia, and internationally

Since inception in 2010, GreenCape has grown to a multi-disciplinary team of over 40 staff members, representing backgrounds in finance, engineering, environmental science and economics.

We have facilitated and supported R17bn of investments in renewable energy projects and manufacturing. From these investments, more than 10 000 jobs have been created. Through our WISP (Industrial symbiosis) programme, by connecting businesses with waste / under-used resources, we have to date diverted over 4360 tonnes of waste from landfill.

Our Market Intelligence Reports form part of a working body of information generated by sector desks and projects within GreenCape's three main programmes – energy, waste and resources.

Figure 7 below shows the different focus areas within each of our programmes.

Benefits of becoming a GreenCape member

We currently have over 800 members, and offer free membership. Becoming a member of GreenCape will give you access to the latest information regarding developments in the various sectors; access to tools, reports, and project information; and offer you the opportunity – through our networking events – to meet and interact with various stakeholders in the green economy.

1 Renewable Energy

Utility-scale projects, small-scale embedded generation, and localisation of component manufacture.

2 Energy Services

Commercial, industrial and agricultural energy efficiency and embedded generation; incentives and financing options.

3 Alternative Waste Treatment

Municipal decision-making and policy and legislative tools on alternative waste treatment options; small-scale biogas, recycling and reuse (dry recyclables, construction and demolition waste).

4 Western Cape Industrial Symbiosis Programme (WISP)

The team matches businesses to share unused resources, cut costs and create value.

5 Water

Water provision and economic development; greentech opportunities for water use efficiency, treatment and reuse.

6 Agriculture and Bio-Based Value Chains

Sustainable agriculture, valorisation of wastes to high value bio-products, including bio-energy.

Figure 7: GreenCape's focus areas

Cross-border matchmaking through the International Cleantech Network

GreenCape's membership of the International Cleantech Network (ICN) gives our members access to international business opportunities in countries where other cleantech clusters are based (mainly Europe and North America).

For investors looking for opportunities in South Africa, GreenCape's Cross-border Matchmaking Facility offers a business matchmaking facility for green firms and entrepreneurs.

The matchmaking team helps international inbound firms and entrepreneurs looking for South African partners in the green economy. The team assists with contacts, introductions and matches to South African businesses. They also offer matchmaking activities for trade offices, missions and other inbound interests. These services can be accessed via the ICN passport or directly with GreenCape.

To become a member or to get your ICN passport, please contact GreenCape or visit our website: www.greencape.co.za

7.1. More about GreenCape's work in the waste sector

GreenCape's Waste Programme was established in 2010. We encourage the use of waste as a resource, supporting the development of a thriving, legally compliant and labour absorptive secondary materials industry in the Western Cape.

Over time, our ambition is to move towards closed loop recycling, unlocking the high value opportunities in manufacturing, industry and agriculture, and transitioning from a waste economy to a materials management economy.

In 2016, our work focused on:

Broad sector support

GreenCape's Waste Sector Desk aims to be a hub of information to help industry understand and foresee challenges and opportunities within the waste economy, which in turn facilitates informed decision making. The desk also hosts a range of events to disseminate information and promote discussion around particular challenges facing the sector, to help identify interventions that can address these challenges.

Our specific projects include:

- **Developing and demonstrating decision support tools to enable integrated municipal waste management**
  - In 2016 we continued and complete the development of our integrated waste management (IWM) decision support tool, which assists municipalities in their planning and investment decision-making. Contact us to use the tool.
- **Developing value chains to support use of secondary materials in commercial and industrial wastes**
  - In 2015 we prioritised further research on the C&DW economy. C&DW constitutes a large portion of waste disposed at landfill (up to 40%) and offer significant opportunity for re-use as secondary materials, as well as job creation.
  - We are currently working with the CCT, Provincial Roads, SANRAL, Stellenbosch University, Aggregate and Sand Producers Association of Southern Africa, BVi Consulting Engineers, Martin & East and the Concrete Institute to develop a guideline for the inclusion of builder's rubble into roads.
  - We are also further exploring new markets for secondary material, using material flow analysis and gross value add.

Industrial symbiosis

Industrial symbiosis is a resource efficiency approach where one company's unused or residual resources are used by another, for mutual business benefit, leading to a more resource efficient and lower carbon economy. The Western Cape Industrial Symbiosis Programme (WISP) is a free facilitation service that networks companies wishing to trade their under-utilised resources, including materials, energy, assets, logistics and expertise. Since its inception in 2013, WISP has developed a database of diverse businesses and resources and already enabled significant cost savings to its members and created new business opportunities and jobs.

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9 – Annex A – Western Cape Tonnages

Waste streams	Western Cape	CCT	CW	Eden	WC	Over-berg	CK
Municipal Solid Waste SW	4 080 100	2 762 100	59 200	332 500	204 700	180 700	40 900
• *Organic Waste*	*489 300*	*342 500*	*58 700*	*24 500*	*19 600*	*4 900*	*39,100*
• *C&DW*	*1 704 500*	*1 091 000*	*272 700*	*153 400*	*85 200*	*85 200*	*17,000*
• *Non-recyclable MSW*	*685 500*	*479 800*	*82 300*	*34 300*	*27 400*	*6 900*	*54,800*
• *Mainline Recyclables*	*1 200 800*	*848 800*	*145 500*	*85 200*	*60 700*	*48 500*	*12,100*
• *Paper*	*295 200*	*206 600*	*35 400*	*23 600*	*14 800*	*11 800*	*3,000*
• *Plastics*	*222 600*	*155 900*	*26 700*	*17 800*	*11 100*	*8 900*	*2,200*
• *Glass*	*151 600*	*114 400*	*19 600*	*1 300*	*8 200*	*6 500*	*1,600*
• *Metals*	*531 400*	*371 900*	*63 800*	*42 500*	*26 600*	*21 300*	*5,300*
Tyres	18 080	12 700	2 200	1 400	900	700	180
Wet sewerage sludge	294 900	191 000	39 800	28 400	19 500	12 700	3 500
Commercial and industrial waste	881 000	637 400	99 000	70 300	39 500	30 500	4 300
Agricultural residues	2 125 100	46 600	277 700	392 400	885 100	507 500	15 800
Volatile animal waste	149 700	11 200	22 500	44 900	28 100	24 300	18 700
Forestry residues	91 100	9 100	4 600	63 700	4 600	9 100	-
e-Waste	62 300	43 600	7 500	5 000	3 100	2 500	600
Total	**7 702 280**	**3 713 700**	**1 012 500**	**938 600**	**1 185 500**	**768 000**	**83 980**

10 – Annex B – Producer Responsibility Organisations

Name	Recycling Related Function	Tel. No.	Website And E-Mail
Plastics SA	Umbrella body for the plastics industry; promotes recovery of plastics for recycling	+27 11 314 4021	www.plasticsinfo.co.za enquiries@plasfed.co.za
The Glass Recycling Company	Promotes the recovery and recycling of used glass containers	+27 11 803 0767	www.theglassrecyclingcompany.co.za info@theglassrecyclingcompany.co.za
PETCO	Promote recycling of post-consumer Polyethylene Terephthalate (PET) products	+27 86 013 7738	www.petco.co.za info@petco.co.za
Collect-a-Can	Recovery of steel beverage and other cans for recycling	+27 11 466 2939	www.collectacan.co.za info@collectacan.co.za
e-Waste Association of SA	Platform for recycling of electrical and electronic waste in South Africa	+27 31 575 8119	www.ewasa.org info@ewasa.org
National Oil Recycling Association of South Africa (NORA-SA)	Co-ordinates and facilitates the environmentally responsible recovery, collection, transportation, storage, processing and use of used lubrication oils	+27 21 448 7492	www.norasa.co.za usedoil@iafrica.com
Packaging SA	Umbrella body for the packaging industry	+27 12 001 1914	www.packagingsa.co.za Charles@packagingsa.co.za
Polystyrene Packaging Council	Collection and recycling of polystyrene packaging		www.polystyrenepackaging.co.za adri@polystyrenepackaging.co.za
POLYCO	Collection and recycling of polystyrene packaging	+27 21 531 0647	www.polyco.co.za mandy@polyco.co.za
Paper Recycling Agency of South Africa (PRASA)	Represents processors and manufacturers of recycled paper fibre		www.pamsa.co.za ursula.henneberry@pamsa.co.za
ROSE Foundation	Collection, storage and recycling of used lubricating oil	+27 21 448 7492	www.rosefoundation.org.za usedoil@iafrica.com


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