

## INDUSTRY BRIEF:

# Food and organic waste management: simple solutions that could benefit your business

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### Introduction

This industry brief is written for businesses that generate food and other organic wastes. It aims to help you manage your organic waste generated by providing simple solutions and access to solution providers that may benefit your business.

It highlights:

- potential benefits to your business
- available solutions (i.e. alternatives to sending organic waste to landfill)
- important waste regulations to be aware of
- on-site best practices to enable organic waste to be diverted from landfill, and
- opportunities in the Western Cape to add value to organic waste.

If, after reading this brief, you have questions or need advice on solutions, please contact GreenCape's Waste Sector Desk: [waste@greencape.co.za](mailto:waste@greencape.co.za)

### Benefits to your business

Diverting organic waste to one of these solutions could assist with **meeting in-house sustainability goals** and **integrated reporting requirements**. This can also, in some cases, **reduce waste management costs**, as:

- The gate fees of many of these solutions are often cheaper than landfill<sup>1</sup> gate fees.
- Reducing the frequency of collections, particularly if private, can also reduce costs
- By diverting organic waste streams, landfills with less stringent containment barriers can be used which can lead to further reduction in gate fees.

Certain companies are also willing to buy organic wastes, while others offer significant cost reductions when compared to landfill (depending on the cost of logistics). However, there are usually conditions / specifications associated with the sorting and the handling of the material to enable these solutions to be used.

The type of waste generated, and the degree of effort required to separate waste, will determine the solution applicable to your organisation, as well as the investments required for on-site infrastructure to enable source separation. Information of the existing solutions, and ones under development in the Western Cape, can be found in **Appendix A**<sup>2</sup>.

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<sup>1</sup> City of Cape Town charges R443.20 (incl. VAT) per tonne of general waste and R587.30 (incl. VAT) per tonne of special waste in 2016/17.

<sup>2</sup> GreenCape maintains a database of solution providers. Please contact GreenCape's Waste Sector Desk at [waste@greencape.co.za](mailto:waste@greencape.co.za) for contact details of companies outlined in Appendix A that provide the type of solutions your organisation would like to consider or to be added to the database as a solution provider.

### Available solutions

The Western Cape boasts an array of organic waste solutions that can serve customers from households to industrial and commercial entities. Some require a specific<sup>3</sup> type of feedstock (e.g. plant-based materials), but most allow for varied feedstock (i.e. mixed organic waste). These solutions can be broken down into **five types**, namely:

- **Waste-to-fine chemicals/pharmaceuticals:** These are **chemical manufacturers** that are able to convert organic waste to high value fine chemicals for the chemical or pharmaceutical industry. These solutions often require highly specific, high volume, and homogenous feed stocks.
- **Waste-to-food:** These are **feeding programmes**<sup>4</sup> and **stock retailers** that take surplus or obsolete food products from manufacturers, wholesalers, and retailers to be redistributed for human consumption. These solution providers are often only able to receive food that has yet to reach “best before” dates and is fit for human consumption.
- **Waste-to-feed:** These are **livestock farmers** and **insect farmers**, and **animal feed additive manufacturers**. Livestock farmers feed organic waste from crop farmers, food manufacturers, wholesalers, retailers, and restaurants to their animals. Livestock farmers usually take post-harvest and pre-consumer waste, whilst insect farmers tend to accept both pre-consumer and post-consumer food waste. Animal feed additive manufacturers typically take refined vegetable oils and animal fats to process into formulated energy feed additives.
- **Waste-to-soil:** These are **compost** and **vermiculture** solutions that use aerobic conditions and worms respectively to convert organic waste from farmers, manufacturers, wholesalers, retailers, restaurants and households into compost. Most solution providers are flexible with the type of feedstock and are able to de-package on their site.
- **Waste-to-energy:** These are solutions that process organic waste into transport fuel or generate heat and/or electricity. **Biodiesel manufacturers** are able to process refined vegetable oils and animal fats into an alternative to petroleum based diesel. **Biogas manufacturers** rely on anaerobic conditions to process organic waste into biogas that can be used as a transport fuel as well as a fuel source for burners to generate heat and/or electricity. When used as a transport fuel or fuel to be taken off-site, the biogas is further processed into carbon dioxide<sup>5</sup> and a purer methane product<sup>6</sup>. Biogas solutions may require highly specific, high volume, and homogenous feed stocks or skilled feed preparation to enable use of mixed feedstocks.

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<sup>3</sup> For example, minimum tonnage, homogenous, and/or de-packaged waste.

<sup>4</sup> Some, but not all, of these programmes are run by recognised public benefit organisation (PBOs) that are eligible to issue tax deductible receipts having obtained approval in line with Section 18A of the Income Tax Act of 1962.

<sup>5</sup> Can be used, for example, for greenhouse crop production, refrigeration and carbonated beverages.

<sup>6</sup> A highly flammable and potent greenhouse gas that, when burnt, converts to heat, water, and carbon dioxide (CO<sub>2</sub>).

### Regulations affecting separation at source and storage of waste

In South Africa, waste management is governed by the National Environmental Management: Waste Act (59 of 2008) (NEM:WA) and the collection and storage of waste is regulated through subsidiary legislation (i.e. norms and standards, regulations). The subsidiary legislation primarily targets the handlers of waste (municipalities or waste service providers), but this does not exempt the waste generator from responsibility. The NEM:WA imposes a general duty, in respect of waste management, that **all waste producers** should implement reasonable measures to **reduce, re-use, recycle and recover waste**.

In terms of the South African Constitution and the Municipal Systems Act (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. Although national laws do not directly regulate the separation and storage of waste for the generator, the MSA, in conjunction with the NEM:WA, empower municipalities to develop by-laws that fulfil this purpose. Thus, the **waste management** of your company, and that of any company you use to assist you in waste management, **needs to adhere to local government by-laws**.

Broadly, municipal by-laws regulate the service provided to the waste generator and/or may impose further obligations for the management of waste generation (i.e. waste avoidance and minimisation), as well as cleaning, separation, storage, collection, processing, treatment, recycling, re-use and disposal of waste. Such by-laws typically also cover littering, illegal dumping and the regulation of facilities used for the management of waste.

### The future for organic waste

According to the Consumer Protection Act (68 of 2008), businesses need to be prepared to accept the return of goods (e.g. organic waste) should new legislation be passed or come into effect that prohibits the disposal of the product into a common waste collection system.

Relevant legislation for those producing food waste and organic waste include:

- Waste Disposal Restriction in terms of the National Norms and Standards for disposal of Waste to Landfill (August 2013):
  - Liquid Waste (coming into effect in 2019):
    - Waste which has an angle of repose of less than 5 degrees, or becomes free flowing at below 60°C or when it is transported, or is not generally capable of being picked up by a spade,
    - Waste with moisture content of >40% or that liberates moisture under pressure in landfill conditions, and which has not been stabilised by treatment
  - Non-infectious animal carcasses can only be disposed at a lined landfill (class B or GLB+). Infectious animal carcasses are prohibited from going to landfill.
- The Western Cape Provincial Government's Department of Environmental Affairs and Development Planning (DEA&DP) has developed an abattoir waste management guide. This guide assists the abattoir sector with guidance on legislative compliance (including expected bans on landfilling of abattoir waste by local municipalities), whilst providing available waste management options available <sup>8</sup>.

This industry brief draws on the City of Cape Town's (CCT) by-law as a resource. However, most Western Cape municipal waste by-laws have similar requirements.<sup>7</sup>

The CCT by-law requires that businesses **separate waste** with the aim of minimising waste to landfill and its impacts on the environment. Furthermore, waste that can be recycled, reclaimed or reused should be **stored separately** from non-recyclable waste.

The CCT's Integrated Waste Management by-law of 2009 (as amended in 2010 and 2015), requires any organisation who is involved in waste management activities or services within its boundaries to **register** and be **accredited** with the CCT<sup>8</sup>. Thus to reduce risk to your organisation, it is imperative that the waste service provider being used is accredited with the CCT. The by-law also requires certain industrial waste generators of particular streams, based on type and tonnage, to register and develop a **waste management plan**. Section 23 of the by-law also provides for the CCT to penalise those persons who transgress the by-law.

Each organisation should ensure that the management of waste be done in such a manner that it does not endanger health or the environment, or create a nuisance.

### **Best practice**

Separating dry<sup>9</sup> waste and wet<sup>10</sup> waste streams is a key step in unlocking the value inherent in organics and recyclables, but also for increasing the efficiency of recovery of dry recyclables. Mixing wet waste and dry waste, particularly those that are sensitive to contamination, can often be a barrier to recovering value through recycling.

As a minimum requirement, waste generators are expected to separate waste streams at the point of generation. This is called **separation at source**. There are a handful of best practices that will increase your ability to separate at source.

These include, but are not limited to:

- **In-house waste champion:** It is vital that an operation has a champion to drive responsible waste management in the organisation. The champion's role is to coordinate, monitor and execute the organisation's waste policy, all with agreement and buy-in from all members of the organisation. This may not be a full-time position and can be an additional role for someone within the organisation.
- **Separation at point of generation:** There are often specific waste streams produced at various points of production. At these points it is easy to intercept these streams before they are mixed with, and potentially contaminate, other streams. This is the easiest way to keep waste streams separated. This can be aided considerably by having bins for specific streams readily available where the specific stream is generated.

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<sup>7</sup> *Municipal by-laws are typically available from the solid waste department of the municipality in which service provider operates and/or the facility is located.*

<sup>8</sup> *For further information on the abattoir guideline contact the Waste Management division of DEA&DP via telephone (021 483 4091) or email (enquiries.eadp@westerncape.gov.za)."*

<sup>8</sup> *To apply for accreditation, or to confirm if a waste service provider is accredited, contact the CCT's solid waste department via telephone (0860 103 089) or email (wastewise.user@capetown.gov.za).*

<sup>9</sup> *Recyclables: paper, cardboard, glass, metal, plastic, textiles, packaging.*

<sup>10</sup> *Food leftovers and scraps, peels, cut flowers, coffee grindings, rotting fruit and vegetables, dairy products.*

- **Waste bins:** The type of bin system depends on the size and complexity of the site. A two bin system should be a minimum<sup>11</sup>, with three more typical<sup>12</sup>. Alternatively, depending on the waste streams generated (type/volume) on site, the number of storage containers should reflect the number of solutions available. An organisation can be proactive in engaging with its waste service provider to provide a service (including number of bins for different types of waste) tailored to its needs rather than accepting a generic service.
- **Reducing foul odours:** Stored organic waste has a tendency to generate foul odours. A strategy needs to be put in place to avoid/manage rotting and associated odour.<sup>13</sup>
- **Waste management area:** Ensure that there is a formal area where the waste generated on site can be consolidated and stored before transportation. The area should consist of suitable storage space for bins / skips that meets the needs of the materials being stored, i.e. at least accommodate for wet and dry materials. Bins/skips should also be weather, vermin and leak proof. These bins/skips must be well marked and easy to interpret and cater for the duration that the materials will be stored on site. It is advised to discuss this bin design and labelling with your bin / waste service provider to meet the requirements of your business and specific personnel.
- **Procurement policy:** Procurement can be a powerful tool for forcing waste service providers / contractors to divert waste from landfill. Waste specifications should be included in contracts that would require waste management services to send waste streams to preferred solutions; providing multiple bins tailored to the client's needs; and finally to ensure that Safe Disposal Certificates<sup>14</sup> are provided for auditing purposes.
- **Staff involvement:** Most importantly, ensure that all staff, at all levels, are aware of the separation at source initiative; explain why this is being done; and illustrate, on a regular basis and in a creative way, the impact of the initiative. If required, you could consider implementing incentives for staff to drive separation of the waste. Some waste service providers are willing to brief staff to assist in effective source separation.

### Conclusion:

Organic and food waste are often perceived as valueless and sent to landfill at a cost. This primarily results in the mixing of wet and dry waste which is often one of the biggest barriers to extracting value out of waste streams. It is therefore important that **wet/organic streams are separated from the dry streams.**

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<sup>11</sup> One bin for dry waste streams and one for wet / organic waste streams.

<sup>12</sup> One bin for dry waste streams, one for wet / organic waste streams, and one for residual waste.

<sup>13</sup> Bokashi is one technique to reduce odour. The technique uses micro-organisms to initiate the fermentation process to stop the rotting of organics (plant and animal based), thus eliminating foul odours. Purchasing the Bokashi bran will have financial implications, but may reduce the number of collections required, thus offsetting the Bokashi bran costs.

<sup>14</sup> A safe disposal certificate is a document that a waste service provider provides to its client to verify that the waste has been received by a reputable solution for treatment, recycling, value-add or disposal.

Many businesses, especially those that produce a lot of food waste can reap the benefits of good organic waste management. Whether you sell your organic waste, re-use it onsite, save on gate fees or meet your sustainability requirements, there is likely a solution for your business.

The Western Cape has experienced rapid growth in organic waste solutions, thus turning a “problem waste” into a usable commodity.

**What to do next?**

For more help on waste solutions, or if you have any questions about this brief, please contact GreenCape’s Waste Sector Desk: [waste@greencape.co.za](mailto:waste@greencape.co.za).

### 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.

### Acknowledgements

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### Disclaimer

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## Appendix A: Detailed description of solutions in the Western Cape

**Table 1: Existing food waste solutions in the Western Cape as at March 2017:** For further details, contact GreenCape's Waste Sector Desk: [waste@greencape.co.za](mailto:waste@greencape.co.za)

| Type               | Value add <sup>15</sup> | Technology                | Location                | Feedstocks / Input Wastes   | Requirements   | Products produced   |
|--------------------|-------------------------|---------------------------|-------------------------|---|--|---|
| Waste to chemicals | Fine chemicals          | Fine chemical manufacture | Wolseley                | Grape pomace  | Large volumes<br>Homogenous waste<br>Grape pomace only   | Calcium tartrate<br>Wine spirits<br>Grape seed tannin<br>Grape seed oil                       |
| Waste to food      | Food                    | Feeding programme/scheme  | Cape Town               | Packaged pre-consumer food<br>Fresh pre-consumer produce<br>Frozen pre-consumer meat<br>Products          | Contains a best before date<br>No meat products<br>No spoilt fresh produce                                 | Packaging<br>Food for humans<br>Waste food (destined for compost)<br>Section 18A certificates |
|                    |                         | Obsolete stock retailer   | Cape Town               | Packaged pre-consumer food<br>Obsolete food stock   | Only food safe for consumption<br>No meat products<br>No fresh produce                                     | Packaging<br>Food for humans<br>Waste Food  |
| Waste to feed      | Feed                    | Livestock farmers         | Across the Western Cape | Plant based pre-consumer food<br>Plant based post-consumer food   | No meat<br>Receiving facility may need waste license<br>Feedstock may need to be registered as animal feed | Packaging<br>Protein<br>Manure  |
|                    |                         | Insect farming            | Cape Town               | Pre-consumer organics<br>Post-consumer organics<br>Cooked meat  | No abattoir waste / raw meat<br>Own waste logistics required   | Packaging<br>Protein<br>Feed oil<br>Compost   |
|                    |                         | Animal feed additive      | Cape Town               | Used vegetable oil<br>Animal fats   | Own waste logistics required   | Poultry feed additive<br>Pet feed additive<br>Organic sludge                                  |
| Waste to soil      | Materials               | Vermiculture & composting | Cape Town               | Unpackaged pre-consumer food<br>Unpackaged post-consumer food<br>Fresh pre-consumer produce<br>Vegetation | Depackaging required<br>No salt<br>No citrus<br>No oil<br>Limited tonnages a day<br>Own logistics required | Compost<br>Vermicast<br>Vermitea  |
|                    |                         | Composting                | Cape Town               | Packaged pre-consumer food<br>Fresh pre-consumer produce<br>Post-consumer food<br>Vegetation              | No abattoir waste  | Packaging<br>Compost  |
|                    |                         |                           | Cape Town               | Manure<br>Garden greens<br>Post-harvest residues  | No packaging<br>No abattoir waste  | Compost   |

<sup>15</sup> Based on the bio-based value-add hierarchy from the Bioeconomy Study Tour, Netherlands Department of Foreign Affairs (2015)

| Type            | Value add <sup>15</sup> | Technology          | Location  | Feedstocks / Input Wastes   | Requirements   | Products produced  |
|-----------------|-------------------------|---------------------|---|---|--|--|
|                 |                         |                     | Cape Town   | Manure<br>Abattoir waste<br>Post-harvest residues<br>Wood chips/sawdust   | No packaging<br>Own waste logistics required                               |  |
|                 |                         |                     | Riebeeck West   | Manure<br>Abattoir  |  |  |
|                 |                         |                     | Malmesbury  | Post-harvest residues<br>Wood chips/sawdust   |  |  |
|                 |                         |                     | Klipheuwel  | Post-harvest residual<br>Vegetation<br>Garden greens  | No fats<br>Logistics to Municipal drop-offs                                |  |
| Waste to energy | Transport fuels         | Biodiesel           | Cape Town   | Used vegetable oil<br>Animal fats   | Requires oil decanting / storage   | Biodiesel<br>Glycerine<br>Organic particulates   |
|                 |                         |                     | Cape Town   | Used vegetable oil  | No fats  |  |
|                 |                         |                     | Mossel Bay  |   | Requires oil decanting / storage   |  |
|                 | Transport fuels         | Anaerobic digestion | Cape Town   | Food produce mixed with general waste<br>Packaged pre-consumer food<br>Fresh pre-consumer produce<br>Post-consumer produce<br>Fruit pomace<br>Frozen pre-consumer meat products | No abattoir waste<br>No cooking oil<br>No fats<br>Waste logistics required | Recyclables<br>Non-recyclables<br>Biogas (methane / CO <sub>2</sub> )<br>Solid digestate<br>Liquid digestate |
| Power / heat    | Anaerobic digestion     | Grabouw             | Post-harvest residual<br>Fruit pomace<br>High sugar content | Homogenous<br>Large volumes<br>No abattoir waste  | Biogas (methane / CO <sub>2</sub> )<br>Sludge<br>Wastewater                |  |

**Table 2: Future food waste solutions in the Western Cape<sup>16</sup>: For further details, contact GreenCape's Waste Sector Desk: [waste@greencape.co.za](mailto:waste@greencape.co.za)**

| Type            | Value add    | Technology          | Location   | Input   | Requirements   | Output  |
|-----------------|--------------|---------------------|------------|---|--|---|
| Waste to Energy | Power / heat | Anaerobic digestion | Malmesbury | Manure  | Waste logistics company required   | Under development/ to be finalised  |
|                 |              |                     | Wellington | Food produce mixed with general waste<br>Packaged pre-consumer food<br>Fresh pre-consumer produce<br>Post-consumer produce<br>Fruit pomace<br>Frozen pre-consumer meat products | No abattoir waste<br>No cooking oil<br>No fats<br>Waste logistics company required | Recyclables<br>Non-recyclables<br>Biogas (methane / CO <sub>2</sub> )<br>Solid digestate<br>Liquid digestate<br>Electricity |
|                 |              |                     | Saldanha   | Food produce mixed with general waste<br>Packaged pre-consumer food<br>Fresh pre-consumer produce<br>Post-consumer produce<br>Fruit pomace<br>Frozen pre-consumer meat products | No abattoir waste<br>No cooking oil<br>No fats<br>Waste logistics company required | Recyclables<br>Non-recyclables<br>Biogas (methane / CO <sub>2</sub> )<br>Solid digestate<br>Liquid digestate                |
|                 |              |                     | Klipheuwel | Under development   | Under development  | Recyclables<br>Non-recyclables<br>Biogas (methane / CO <sub>2</sub> )<br>Solid digestate<br>Liquid digestate                |
|                 |              |                     | Worcester  | Under development   | Under development  | Biogas<br>Water (AD treated)<br>Heat<br>Electricity   |

<sup>16</sup> Expected to become operational in the next 1-2 years.