GreenCape

Industry brief
2020

Food loss and waste
A case for reduction, recovery and recycling

Main insights:

- *In the Western Cape, municipalities will be required to divert 50% organics from landfill from 2022, and 100% from 2027. This includes organic waste from businesses.*
- *Landfill disposal costs continue to increase, resulting in increased overheads for businesses which continue to dispose of waste at landfill.*
- *Whether it's increasing disposal overheads, opportunity loss, CSI and corporate image, investor confidence pressures, or internal and external agreements, food waste is becoming more of a liability to businesses along the food supply chain.*
- *The Western Cape has a growing diversity of solutions, accompanied by progressive government support, to reduce food loss and waste, recover surplus food, and recycle organics in general.*

Context

In 2011, South Africa wasted 27% of its produced and imported food. This resulted in the generation of an estimated 10.2 million tonnes of food waste along the supply chain. Unlike more developed economies, which experience substantial food waste at the post-consumer stage, South Africa's food waste takes place before the consumer:

- Agricultural production - 26% lost;
- Post-harvest handling and storage – 24% lost;
- Processing & packaging – 25% lost;
- Distribution & retail - 20% lost;
- Consumer - 5% lost.

In addition to the obvious social and environmental impacts of food loss, there are financial and business brand implications. In 2011, the total cost of edible food waste was estimated at R61.5 billion, which equated to ~2.1% of South Africa's GDP that year. Such figures illustrate inefficiencies in South Africa's food supply chain, but also highlights opportunity loss.

The Western Cape will be the first province to implement landfill restrictions of organic waste, including food waste. By 2022, municipalities will be required to divert 50% organics from landfill, and 100% by 2027. This includes organic waste from businesses.

With increasing overheads, and a changing regulatory landscape that seeks to disincentivise/restrict disposal and incentivise beneficiation, businesses will need to find solutions to reduce food loss and waste or risk losing their competitiveness.

This industry brief is written for businesses throughout the food supply chain that generate food waste and residues which are either disposed at landfill or are not extracting full value.

Food Loss	Food Waste	Food Residues
Food mass that is extracted, spilled, spoilt, or lost; or food that incurs reduction of quality and value during processing along the supply chain before it reaches human consumption. Food loss typically occurs at pre-harvest, post-harvest, and processing stages of the food supply chain; and is potentially avoidable[1].	Food that is fit for human consumption, has made it through the supply chain to be available for consumption, but is never consumed for whatever reason. Food waste typically takes place at retail and consumption stages of the food supply chain; and is potentially avoidable[1].	Organic components that accompany food but are not typically recognised as food and are not consumed. Organic residues are typically generated throughout the supply chain as by-products of the preparation process; and are often unavoidable.

Food loss and food waste is measured only for food products that are destined for human consumption, and exclude animal feed and food residues, parts of which are not recognised as edible. Therefore, food that was originally meant for human consumption but exits the human food chain is considered as food loss or food waste, even if it is diverted from landfill to a non-human food use (animal feed, composting, bioenergy etc.).

The benefits of organic waste management for business

Competitiveness	Social	Environmental
▪ Reduction in landfill disposal costs ▪ Revenue generation in secondary / tertiary markets ▪ Tax deductible donations ▪ Corporate social responsibility	▪ Meal recovery and reduce food insecurity ▪ Job creation and security	▪ Landfill diversion ▪ Reduction in greenhouse gas emissions ▪ Increased water conservation ▪ Reduced energy consumption ▪ Healthier soils

1 Parfitt et al, 2010

Drivers for Reduction and Beneficiation

Recognition of Food Waste's Impact on Climate Change: Globally, policy makers and planners recognise the impact food waste has on, amongst others, climate change. Project Drawdown, a world leading resource that seeks to use science driven research to help the world reach "Drawdown"[2], lists 80 solutions needed to reach drawdown[3]. Reducing food waste is listed as number one and number three depending on scenarios.

National Abattoir Waste Landfill Ban: The national norms and standard for the assessment of waste for landfill disposal (R.636 of 2013) provides directives for the disposal of waste to landfill. This includes a list of waste streams that cannot be landfilled by given dates. As of 2013, this includes infectious animal carcasses and animal waste. However, non-infectious animal carcasses can only be landfilled in Class B landfills and higher. Although Cape Town hosts a Class A and a Class B landfill, other municipalities do not have this luxury and so are obligated to refuse to accept abattoir waste.

National Liquid Waste Landfill Ban: As of August 2019, the national norms and standard for the assessment of waste for landfill disposal (R.636 of 2013) mentioned above requires that landfills are no longer allowed to accept liquid waste[4].

The Western Cape's Organic Waste 2027 Landfill Restrictions: The Western Cape's Department of Environmental Affairs and Development Planning has implemented an organic waste diversion strategy that seeks to divert 50% of organic waste from landfills by 2022, and 100% by 2027. In effect, Western Cape based landfills will no longer be allowed to landfill organic waste in 2027. This restriction is being applied through the variation of the waste management license for landfills.

Sustainable Development Goal 12.3: The South African government is signatory to the United National's Sustainable Development Goals (SDG). Goal 12.3 seeks to "By 2030 halve per capita global food waste at the retail and consumer level, and reduce food losses along production and supply chains including post-harvest losses". This goal forms the basis of a number of key agreements being discusses in South Africa, as well as internal targets for large and multinational brands.

Increasing Overheads: Food production overheads are increasing, including: labour, water, electricity, heat, transport, and of growing importance, landfill disposal. As a result, the generation and landfill of waste is a growing liability to business seeking to be more competitive in a constrained market. Investments must be made to reduce or recover waste, or to support cheaper waste beneficiation solutions.

Cost of Landfill Disposal: The cost of landfill disposal (the gate fee charged per tonne) continues to be relatively low in South Africa compared to other economies. In spite of this, waste generators still regard landfilling as a costly overhead. This is especially the case in the Western Cape where the City of Cape Town metropolitan area has the highest landfill gate fees[5] compared to the other seven metros. This gate fee is expected to increase well above inflation in the coming years.

Landfill Airspace: South Africa is running low on landfill airspace. This includes the Western Cape, where most municipalities have less than five years of airspace left. Although a number of regional landfills are proposed, these will take several years to establish, in which case the 2027 organic waste landfill restrictions will be closer.

Indirect Impacts: Facilitating separation of organics from the waste system has the potential to add indirect value to other waste sector stakeholders. Separation ensures access to higher quality and subsequent quantity of valuable dry recyclables reaching recyclers. It also ensures that recyclers are paying the true weight of material. Further costs are incurred by waste handlers and recyclers through overheads having to dispose of non-recyclable tailings.

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[2] Drawdown refers to the future point in time when levels of greenhouse gases in the atmosphere stop climbing and start to steadily decline

[3] https://drawdown.org/sites/default/files/pdfs/Drawdown_Review_2020-Mar-2.pdf

[4] Liquid waste is defined as waste which has an angle of repose of <5 degrees, or becomes free-flowing at/or below 60oC or when it is transported, or is not generally capable of being picked up by a spade / shovel; or waste with a moisture content of >40% or that liberates moisture under pressure in landfill conditions, and which has been stabilised by treatment.

[5] In cost of landfilling one tonne of general waste for 2019/20 was R507.74 (excl. VAT) in the CCT


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Enablers for Beneficiation

Food Loss and Waste Voluntary Agreement: The Consumer Goods Council of South Africa (CGCSA) and the national Department of Trade, Industry and Competition (DTIC) are developing a Food Loss and Waste Voluntary Agreement for South Africa. This voluntary agreement will require signatories to commit to reducing food loss and waste by 50% by 2030[6] . Various large brand owners have shown active interest in this agreement, and it is expected that such an agreement will filter down supply chains.

Composting Norms and Standards: The national Department of Environment, Forestry and Fisheries (DEFF) are developing norms and standards for the composting of organic waste (GN1135 of 2019). This should reduce the regulatory barriers for composting. If promulgated, composters processing more than 10 tonnes a day of general organic waste will no longer require a waste management licencing process, and subsequently go through a costly/time consuming Environmental Impact Assessment (EIA) process. This should facilitate the establishment of composting solutions.

Organic Waste Treatment Norms and Standards: The DEFF is also considering the development of broader organic waste beneficiation norms and standards. These would go beyond just composting and include other organic waste treatment solutions. This should further reduce regulatory barriers for broader organic waste solutions.

Carbon Tax Act: Section 13 of South Africa's Carbon Tax Act (Act 15 of 2019) provides offset allowances for heavy greenhouse gas emitters. These emitters are afforded the opportunity to reduce their carbon tax liability by purchasing carbon credits from approved carbon credit projects as regulated by the carbon offset regulations (GN1556 of 2019). Organic waste solutions may seek to strengthen the business case for organic waste recycling by registering their activity as a carbon credit project, and benefit from carbon credits.

Independent Power Producer: The business case for waste-to-energy solutions has traditionally been poor due to the inability to sell energy back to the grid. However, in his State of the Nation Address on 13 February 2020[7], South Africa's president Cyril Ramaphosa announced that his government would seek to put in place measures to enable municipalities in good financial standing to procure their own electricity from Independent Power Producers. This should strengthen the business case for waste-to-energy solutions.

Tax deductible donations: Section 18A of South Africa's Income Tax Act (Act 58 of 1962) allows for tax deductible donations in the form of, amongst others, surplus food products. Such donations must be made to approved Public Benefit Organisations (PBO)[8] and must be accompanied by* the necessary Section 18A certificate. Such regulations allow food manufacturers and distributors to leverage Section 18A food redistribution PBO's to not only reduce disposal costs; but also, strengthening corporate social responsibility and corporate image, and meeting internal waste diversion targets.

[6] This target aligns with the United Nations Sustainable Development Goal 12.3.

[7] www.gov.za/speeches/president-cyril-ramaphosa-2020-state-nation-address-13-feb-2020-0000

[8] PBO's are approved under section 30(1)of the Income Tax Act and are listed www.sars.gov.za/ClientSegments/Businesses/TEO/Pages/Approved-Section18A-PBO's.aspx

Barriers for Recovery and Beneficiation

Lack of source separation: Contamination of organics, especially organic fractions of municipal solid waste, by non-organic dry waste streams is a major barrier that limits the scope of available value-add solutions. This also limits the end marketability of the by-products of solutions. Until separation at source is actively implemented and enforced in South Africa, it is unlikely that sensitive organic solutions will thrive, or that the business case for solutions that rely on end products will be strong.

Composting Registration Regulations: In order to sell compost, the end product needs to be certified as such. This certification is regulated by the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947). This certification process is costly and limits the variety of feedstock. The benefits of certification are higher prices than non-certified compost.

Short procurement durations: Large scale organic waste solutions often require long term offtake agreements with waste suppliers. This is to ensure large investments in processing technology. Unfortunately, it is difficult for private solutions to secure longer term procurement longer than three years. This is not to say it is not possible.

Fear of liability: Food donations can be limited due to fear of liability. Section 61 of the Consumer Protection Act (Act 68 of 2008) provides for strict liability of producers, importers, distributors or retailers of a products, including surplus food, if the product causes harm to a consumer. A good samaritan regulations has been proposed in South Africa in the form of a draft Ubuntu Surplus Food Donations bill.

Date labelling: The Foodstuffs, Cosmetics and Disinfectants Act (Act 54 of 1972)[9] regulates date labelling in South Africa, including: 'sell by', 'use by' and 'best before' dates. These dates are for ensuring marketability / quality of food and not food safety. However, manufacturers and retailers are wary of liability and thus are cautious to sell food products past these dates.

Date labelling interpretation: legislation does not require descriptions to accompany date labels on food products. The onus is on the consumer to make their own interpretations. However, consumers are ill informed of how to interpret these labels and are likely to dispose of food still fit for purpose.

Food Waste as Animal Feed: South Africa's Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947) regulates feeding food waste to livestock. According to the Act, no person can sell waste as feed unless it is registered as feed. Furthermore, no person can manufacture or sell feed containing bone or any other substance derived from an animal carcass, unless such substances have been sterilised at a registered plant. This is further regulated by the Animal Disease Act (Act 35 of 1984) which does not allow the feeding of food scraps or food waste that contains or has come into contact with meat or meat products.

Confidence in bioenergy projects: GreenCape's engagements indicate that some financial institutions and investors are losing confidence in bioenergy projects. Various factors have affected the viability of biogas projects in South Africa, including: types and security of feedstock; availability of realistic revenue streams; the cost of managing digestate; the project/stakeholder structure; the choice of technology; the conditions of contract agreements; and a lack of skills to operate facilities.

Feeding biobased electricity onto the grid: The South African electricity market is currently managed on a single-buyer model by the state owned entity, Eskom. Eskom is responsible for the generation and transmission of electricity, and also controls a minority share of the distribution market. Current regulatory barriers prevent the sale of electricity to the grid, nor do they allow the wheeling of energy that enables third parties to utilise distribution grids to sell to willing buyers, also known as wheeling. However, there are movements to a more liberalised energy system.

The Solutions

There are 29 solutions to reducing food loss and food waste and for beneficiating the organics that would have otherwise have been landfilled. These solutions fall under three overarching categories: prevention, recovery, and recycling. Each solution requires the partnership of various stakeholders. Table 1 provides a list of 29 whilst Figure 1 provides a heuristic for food waste value add potential.

[9] Regulation 146 of 2010

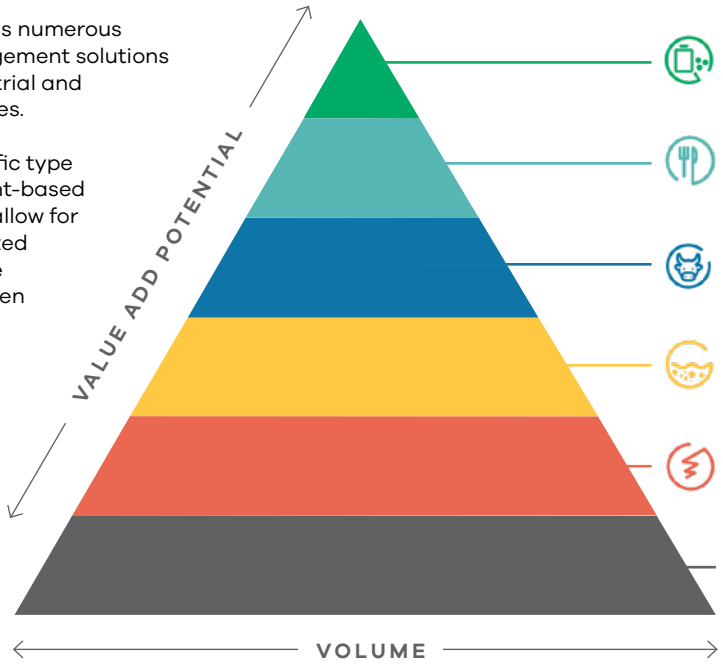
Table 1: List of food waste reduction, recovery and recycling solutions, and associated stakeholders involvement.

		Direct							Support		
		Farmer	Manufacturer	Retailer	Hospitality	Resident	NPO	Loc Gov	Loc Gov	Prov Gov	Nat Gov
Prevention	Standardise Date Labels		✓	✓							✓
	Packaging Adjustments		✓	✓							
	Spoilage Prevention Packaging		✓	✓							
	Imperfect Produce Specifications	✓	✓	✓							
	Smaller Portions				✓	✓					
	Trayless Dining				✓	✓					
	Waste Tracking / Analytics	✓	✓	✓	✓				✓		✓
	Cold Chain Management	✓	✓	✓	✓	✓					
	Spoilage Reduction Technology	✓	✓	✓	✓	✓					
	Improved Inventory Management		✓	✓							
	Secondary Resellers	✓	✓	✓							
	Manufacturing Line Optimisation		✓								
	Consumer Education Campaigns	✓	✓	✓	✓		✓		✓	✓	✓
Recovery	Donation Matching Software	✓	✓	✓	✓		✓				
	Donation Storage and Handling	✓	✓	✓			✓				
	Donation Transportation		✓	✓			✓				
	Value-Added Processing	✓	✓	✓	✓		✓				
	Donation Liability Education		✓	✓			✓		✓		✓
	Standardized Donation Regulation										✓
	Donation Tax Incentives		✓	✓							✓
Recycling	Home Composting					✓		✓	✓		
	Community Composting					✓	✓	✓	✓		
	In-Vessel Composting		✓	✓	✓			✓			✓
	Centralized Composting		✓	✓	✓			✓		✓	✓
	Feed Upgrade	✓	✓	✓				✓			
	Livestock Feed	✓	✓	✓				✓			
	Centralised Biogas Facility	✓	✓	✓	✓			✓		✓	✓
	Commercial Greywater		✓	✓	✓			✓		✓	✓
	Water Resource Recovery (Biogas)		✓	✓	✓			✓		✓	✓

Source: Expansion of ReFED (2020) food waste solutions

The Western Cape has numerous organic waste management solutions for homes, and industrial and commercial businesses.

Some require a specific type of feedstock (e.g. plant-based materials), but most allow for varied feedstock (mixed organic waste). These solutions can be broken down into **five types** as illustrate on the right:



Waste-to-Pharma/Chem
Conversion of organics to fine chemicals for the chemical/ pharmaceutical industry.

Waste-to-Food:
Redistribution of surplus/ obsolete food to initiative feeding people.

Waste-to-Feed:
Forwarding of food and organic waste to animals/ livestock.

Waste -to- S01
Processing food and organic waste into compost and soil enhancers.

Waste-to-Energy:
Processing of organic waste into fuels or generate heat/ electricity.

Landfill:
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Figure 1: Food waste value add heuristic

Recording and Monitoring

It is difficult to manage what you cannot measure. It is well understood by waste experts that South Africa lacks reliable organic waste data, let alone specifically food loss and waste data. In order to an understand the problem and where the pinch points are along the supply chain, there must be a standard protocol for recording food loss and waste data. One such standard was developed by the World Resource Institute, called Food Loss and Waste Accounting and Reporting Standard (FLW Standard)[10]. This standard provides a protocol that ensures the consistent collection and reporting of data within operations and has greater impact when such recording and reporting is undertaken in a collaborative manner such as along supply chains. Implementing the standard forms the first task for signatories of the South African Food Loss and Waste Voluntary Agreement.

[10] www.flwprotocol.org

Next steps

For further information and support on any of the content provided here, please contact GreenCape's waste sector desk: waste@greencape.co.za.

Additional resources are available from:
https://www.green-cape.co.za/content/sector/waste

Author: Sam Smout
Reviewer: Nicholas Fordyce

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