iLembe WEEE Landscape Report
iLembe Local Project Component

Final Report
04 November 2022

Turning Waste Into Resources For Development

SRI builds capacity for sustainable recycling in developing countries. The programme is funded by the Swiss State Secretariat of Economic Affairs (SECO) and is implemented by the Institute for Materials Science & Technology (Empa) and the World Resources Forum (WRF). It builds on the success of implementing e-waste recycling systems together with various developing countries since more than ten years.
## Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ARO</td>
<td>African Reclaimers Organisation</td>
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<tr>
<td>DCLM</td>
<td>Dolphin Coast Landfill Management</td>
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<td>DCWM</td>
<td>Dolphin Coast Waste Management</td>
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<tr>
<td>DFFE</td>
<td>Department of Forestry, Fisheries and the Environment</td>
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<td>DM</td>
<td>District Municipality</td>
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<td>DSI</td>
<td>Department of Science and Innovation</td>
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<td>dtic</td>
<td>Department of Trade, Industry and Competition</td>
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<td>DUT</td>
<td>Durban University of Technology</td>
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<td>EDTEA</td>
<td>Economic Development, Tourism and Environmental Affairs (KZN)</td>
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<td>EEE</td>
<td>Electrical and electronic equipment</td>
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<td>EPR</td>
<td>Extended producer responsibility</td>
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<td>GDP</td>
<td>Gross domestic product</td>
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<td>ICT</td>
<td>Information, and communication technology</td>
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<td>IDM</td>
<td>iLembe District Municipality</td>
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<td>IDP</td>
<td>Integrated Development Plan</td>
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<td>IWMP</td>
<td>Integrated Waste Management Plan</td>
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<td>KDM</td>
<td>KwaDukuza Local Municipality</td>
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<tr>
<td>KSIA</td>
<td>King Shaka International Airport</td>
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<td>KZN</td>
<td>KwaZulu-Natal</td>
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<td>LM</td>
<td>Local municipality</td>
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<td>MLM</td>
<td>Mandeni Local Municipality</td>
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<td>MPLM</td>
<td>Maphumulo Local Municipality</td>
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<td>MRF</td>
<td>Materials Recovery Facility</td>
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<td>NLM</td>
<td>Ndwedwe Local Municipality</td>
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<td>NPO</td>
<td>Not-for-profit company</td>
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<td>NWMS</td>
<td>National Waste Management Strategy</td>
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<td>PCBs</td>
<td>Printed circuit boards</td>
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<td>PROs</td>
<td>Producer responsibility organisations</td>
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<td>SAWPA</td>
<td>South African Waste Pickers Association</td>
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<td>SETA</td>
<td>Sector Education and Training Authority</td>
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<td>SMME</td>
<td>Small, medium and micro enterprise</td>
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<td>SOWR</td>
<td>South African State of the Waste Report</td>
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<td>SRI</td>
<td>Sustainable Recycling Industries (Programme)</td>
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<td>TVET</td>
<td>Technical and Vocational Education and Training</td>
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<tr>
<td>UKZN</td>
<td>University of KwaZulu-Natal</td>
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<td>WEEE</td>
<td>Waste Electrical and Electronic Equipment</td>
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1 Executive Summary

1.1 Background
The overall development objective of the Sustainable Recycling Industries (SRI) programme (Phase II) is to contribute to favourable framework conditions that enable the development of a sustainable recycling industry for waste electrical and electronic equipment (WEEE) and related waste streams in SECO1 partner countries. As part of the South African national project, within Outcome 1 (policy & legislative framework), a National WEEE Landscape Report is to be developed. This iLembe Landscape Report will form part of the National WEEE report and is one of the main local project outputs within Outcome 1.

1.2 Research Scope
The report was developed using both primary and desktop research methodologies. Approximately 40 individual engagements were undertaken with more than ninety national, provincial and local government officials, informal sector representatives, waste management companies, recyclers, producer responsibility organisations (PROs), and research institutions. This was supplemented by a review of policies, strategies, plans and research documents.

The study area comprises the entire iLembe region, including the iLembe District Municipality (iDM) and its four local municipalities, namely, KwaDukuza (KDM), Mandeni (MLM), Maphumulo (MPLM) and Ndwedwe (NLM).

1.3 Status Quo in iLembe
Only a third of all households in iLembe receive a weekly waste collection service, while 48% of households use their ‘own refuse dump’. This indicates that waste management within the district requires urgent attention. There is currently no public landfill site within the iLembe region, although the iDM does intend to develop a public landfill site, and a scoping report has been completed for this. There are only two transfer stations that are currently functional, both of which are located in KDM. The transfer stations generally operate as facilities where waste is offloaded and separated, and thereafter, recyclable materials are sold and any remaining waste residuals are taken to landfill.

Data on waste volumes within the region is greatly limited, which can mainly be attributed to the fact that waste management and recycling activities are in the hands of the private sector. Little is therefore known about the volumes of WEEE that are generated and recycled in iLembe. Considering that WEEE estimates range between 7-8.25kg per capita in South Africa, using a projected population of 708,392 people in iLembe in 2022, it is estimated that between 4,959 tonnes and 5,844 tonnes of WEEE was generated. However, with an understanding that iLembe’s population is substantially more rural in comparison with the rest of South Africa3, it is assumed that these WEEE volumes are in fact much lower and realistically closer to 3,500 tonnes as a more location and socio-economic profile relevant estimate.

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1 Switzerland’s State Secretariat for Economic Affairs
2 Population of iLembe was 678,048 in 2019 as per the IDP. Growing this at the average annual growth rate from 2009-2019 of 1.47% per annum on average, you arrive at 708,391 people in 2022
3 Traditional dwellings in iLembe comprised 17% in 2016 compared to 7% in South Africa (www.wazimap.co.za)
1.4 The iLembe WEEE Value Chain Stakeholders

Section 5.2 of the report provides a detailed mapping of the direct WEEE stakeholders in iLembe, with a particularly focus on the generators, collectors and recyclers of WEEE. WEEE is generated by households, businesses and institutions and if reflecting national research, the respective contributions would be around 20% from households, 45% attributed to government, and another 35% generated by industry (Mintek, 2017).

1.4.1 WEEE Generators

Domestic
At the household level, there is limited education and awareness about the proper disposal of WEEE. As such, most WEEE is either being passed on to friends and staff, donated/given away or ends up in refuse bags or skips where it is either being reclaimed by waste pickers, or is collected as part of the waste collection service and ends up at landfill. Some WEEE does however end up being dropped off directly by households to recyclers or is collected by waste management companies and the recyclers themselves.

Business
For commercial and industrial businesses who generate WEEE, many either have contracts with waste management companies or recyclers themselves, or these services are contracted to the industrial/business estate within which they are located.

Government
In relation to WEEE generated in government facilities, current legislation inhibits WEEE from being readily released into the recycling market, and is therefore generally the case that this WEEE is stockpiled. Currently, as spearheaded by the Vuthela Local Economic Development (LED) programme, with support from the SRI, the Municipal WEEE Asset Disposal Project is underway. The project seeks to identify more efficient and effective ways of disposing WEEE and is in the process of developing a toolkit to provide a blueprint to local governments for WEEE asset disposal.

1.4.2 WEEE Collectors

Informal
Within iLembe, waste pickers are mainly active within urban residential, commercial, and industrial nodes. During their usual collection of plastics, cardboard, paper, cans, and metals, waste pickers will collect WEEE when they come across items that have value. They first attempt to repair items that can be repaired and sell these items into the informal economy markets. If items cannot be repaired, they manually extract valuable fractions (such as metals) from the WEEE, usually by physically breaking apart the WEEE, which would then be sold on to scrap dealers. Other non-valuable fractions, which can be hazardous, are then usually discarded/dumped at the site where the WEEE was informally dismantled.

Formal
Formal WEEE collection is generally done by waste management companies or by WEEE recycling companies directly. Several waste management companies are active within the iLembe area, and comprise companies based both within and outside of the iLembe region. Generally, waste management companies do not undertake any dismantling activities. Depending on the client or type of WEEE, they either collect WEEE as part of their general service to clients or refer clients directly to WEEE recyclers. When collected, they usually pass this WEEE onto certified WEEE recyclers.

1.4.3 WEEE Recyclers

There are three dedicated WEEE recyclers in the region, namely, Recycle X, Reclite and Indalo Electronic Recyclers. These recyclers generally have some direct relationships with the bulk generators of WEEE, including businesses. All recyclers do some form of dismantling, where materials are separated and then consolidated and sold to end markets such as plastic recyclers, scrap dealers or exported to global recycling markets. Materials that cannot currently be recycled, such as certain types of plastics and glass, end up at landfill. Recyclers also do refurbishment of WEEE, while only RecycleX pre-processes WEEE in iLembe. Printed circuit boards (PCBs) are mostly consolidated and exported to smelters which have the technology to separate different precious metals. As such, a lot of WEEE fractions are being exported outside of iLembe and opportunities for local beneficiation are being lost.
1.4.4 Other Stakeholders

National and Provincial Government
National government stakeholders have a critical role in establishing the policy framework for waste management and recycling in SA. The provincial government, primarily through the KZN Department of Economic Development, Tourism and Environmental Affairs (EDTEA) is responsible for enforcing and monitoring the national waste management framework, while supporting local government in iLembe with their waste management objectives. They have noted as a key concern that no direction or guidelines has been provided about what the recent ban on WEEE to landfill means for local government. EDTEA are currently blocked by legislation and are working with departments to try and change asset disposal legislation. EDTEA also have a WEEE project that comprises training of recyclers, assessing legislation to unlock WEEE from government departments, undertaking research on WEEE, and a waste to art project. They also conducted basic research on how to extract gold from PCBs themselves.

Local Government
Local government is responsible for the provision of waste management and enforcement of waste by-laws, while the iDM is responsible for oversight and support to local municipalities, as well as for managing waste infrastructure (although there is currently no public landfill in iLembe). Currently, waste management focusses primarily on waste collection and there is limited recycling occurring and a lack of knowledge around WEEE recycling and opportunities for small, medium and micro enterprises (SMMEs). The district and all four local municipalities have developed integrated waste management plans (IWMPs), which provide strategies and targets across the entire waste management hierarchy (from the initial target of minimising waste through to disposal). However, there is limited information or data on WEEE volumes or specific initiatives to support the WEEE industry. KDM, MLM and MPLM have integrated waste management by-laws that provide a good framework for collection, recovery, recycling and disposal of waste, but do not make any specific reference to WEEE. Some of the challenges faced by local government include a lack of budget and infrastructure to expand recycling initiatives; a lack of capacity and technical skills to implement recycling initiatives; and a lack of awareness and responsibility of residents to support initiatives; and lack of capacity to enforce by-laws.

PROs
PROs have a critical role in providing support to the WEEE industry, especially in providing an interface between producers and recyclers and reporting to national government on extended producer responsibility (EPR) target-related performance. They are also responsible for supporting the Department of Forestry, Fisheries and the Environment (DFFE) in the creation of public education materials and supporting the Sector Education and Training Authority (SETA) in the development of accredited training curricula. They have noted that there are a number of challenges being faced in relation to the EPR scheme, including concerns around the increased cost to comply which might price producers out the market compared to non-compliant producers, and fear from large producers that their fees will be excessive.

Informal Sector Representing Organisations
The African Reclaimers Organisation (ARO) and South African Waste Pickers Association (SAWPA) provide support to informal waste pickers, and both do not have much of a footprint in the iLembe region. They are both responsible for driving registration of waste pickers onto the national database as part of the packaging industry EPR and are interested in identifying and registering iLembe waste pickers. Both organisations indicated that the biggest challenge waste pickers face is access to markets for WEEE they collect.
1.5 Summary of Key Challenges Identified

Based on the detailed landscape assessment that was undertaken, the following key challenges are highlighted within the iLembe WEEE industry:

1. Municipal waste management is a challenge within the district, with limited public sector waste collection and no public landfill.

2. There is little data available on the types and volumes of WEEE generated and what is being collected, recycled and/or landfill.

3. Municipal recycling initiatives are limited within the district due to a lack of budget and infrastructure, a lack of capacity and technical skills, and a lack of awareness and responsibility of residents.

4. Municipal IWMPs contain little mention of WEEE as a waste stream, little or no data on WEEE volumes, and no specific initiatives or projects to drive the WEEE industry. Waste management by-laws provide no regulations around collection, recovery, recycling and disposal of WEEE, and capacity to enforce by-laws is limited.

5. There is limited awareness amongst households about WEEE recycling in iLembe and few sites where WEEE can be discarded. As such, WEEE is either stored or ends up in municipal refuse bags and goes to landfill, and this limits the potential volumes of WEEE that could be recovered for recycling.

6. An increasing interest in high value WEEE fractions, coupled with the high cost of licencing to be compliant, has led to an increase in unlicenced recyclers and scrap dealers dismantling WEEE, cherry-picking and selling the valuable fractions, and then dumping or sending the remaining low value fractions to landfill.

7. The WEEE industry in iLembe is losing out on potential opportunities for local beneficiation, as most WEEE fractions are being exported outside of the region.

8. Informal waste pickers are currently underrepresented in iLembe. Their biggest challenge is a lack of access to markets, and as such, they strip down products, extract the valuable fractions (mainly metal), sell this to scrap metal dealers, and dump the remainder of the WEEE. Education of waste pickers is a key challenge, as they are generally not aware of the potential value of selling complete WEEE products rather than dismantled products.

9. Legislation is also a current challenge. Current asset management legislation inhibits WEEE from being released from government stockpiles into the local market, while new legislation that bans WEEE from landfill (although positive), has raised concerns with both provincial and local government stakeholders, as there has been little guidance and support from the DFFE.

10. Finally, the EPR scheme is floundering, with PROs raising concerns about DFFE’s lack of perceived conviction towards implementation. Issues include the increased cost to comply, which might price compliant producers out the market, while there is uncertainty about EPR fees.
1.6 Opportunities for Projects in iLembe

In light of the challenges being experienced, a number of possible opportunity areas have been identified for the iLembe WEEE industry.

These are:

1. Enhancing WEEE awareness to encourage greater release of WEEE
2. Supporting integration of waste pickers to ensure compliance and safety
3. Improving WEEE collection through exploring new collection mechanisms
4. Identifying SMME growth and development opportunities within the WEEE industry
5. Investigating local WEEE beneficiation opportunities
6. Ensuring harmonisation of policy and release of government WEEE

As part of a way forward for the SRI project in iLembe, a collaborative partnership mechanism will be developed. This mechanism will allow for greater integration of the WEEE industry in the region, for these opportunities identified to be collectively explored, and for viable projects and interventions to be co-developed.

Keywords
Waste management; waste electrical and electronic equipment; recycling; iLembe.
2 Introduction

2.1 Background
The overall development objective of the Sustainable Recycling Industries (SRI) programme (Phase II) is to contribute to favourable framework conditions that enable the development of a sustainable recycling industry for waste electrical and electronic equipment (WEEE) and related waste streams in SECO partner countries.

As part of the South African national project, within Outcome 1 (policy & legislative framework), a National WEEE Landscape Report is to be developed. The National WEEE Landscape Report provides a status quo for the WEEE industry in South Africa by mapping the WEEE recycling value chain and stakeholders, unpacking SRI project implications linked to the Extended Producer Responsibility (EPR) legislation and formation of Producer Responsibility Organisations (PROs), identifying technical solutions for better WEEE management, and presenting academic research on WEEE Management.

This iLembe Landscape Report will form part of the national WEEE report and is one of the main local project outputs within Outcome 1. This report includes a mapping of the local iLembe WEEE landscape with a focus on the stakeholders within the iLembe WEEE industry, their roles and responsibilities, relevant policies, programmes and projects, challenges being experienced, and opportunities and initiatives to drive development of the WEEE industry.

The key opportunities and initiatives identified to drive development of the industry in iLembe will be workshopped with all local stakeholders, and thereafter, a strategy will be developed suggesting how the SRI project deliverables can be institutionalised beyond Phase 2.

2.2 Methodology
The methodologies utilised in this report include both primary and desktop research.

A detailed stakeholder engagement process was undertaken between February and August 2022, with the bulk of the engagements occurring between April and June 2022. A summary of the stakeholder engagement process is unpacked below and provides list of all stakeholder engagements with various interest groups, which includes national, provincial and local government, informal sector representatives, waste management companies, recyclers, PROs, and academia and research institutions.

Approximately 40 individual engagements were undertaken with a reach of more than 75 individuals. The specific stakeholders engaged are included in Annexure 1 of this report. Each stakeholder engagement was approached in a similar manner, firstly providing a background to the SRI project in SA and iLembe, and then focussing on the following key areas:

- Unpacking the iLembe WEEE landscape.
- Understanding the policy environment in iLembe.
- Identifying the need for a WEEE collection app and others in use.
- Identifying the potential for a WEEE facility in iLembe.
- Identifying opportunities and areas for future innovation.

The key findings from the above engagements form the basis of the iLembe Landscape Report, supported by desktop research. Desktop research was done to develop a comprehensive understanding of the size and composition of the iLembe WEEE industry and identify the roles, responsibilities, programmes and projects of key stakeholders. Desktop research comprised a review of a variety of reports and publications as listed in the Bibliography.
3 iLembe in Context

3.1 Study Area

The study area comprises the entire iLembe region, including the iLembe District Municipality (iDM) and its four local municipalities: KwaDukuza (KDM), Mandeni (MLM), Maphumulo (MPLM) and Ndwenwe (NLM). The iLembe District Municipality is located in the east of the KwaZulu-Natal Province, and is bordered by the eThekwini Municipality to the south, King Cetshwayo District to the north, and uMzinyathi and uMgungundlovu Districts to the west. The map below presents the structure of the iLembe region and the four local municipalities.

Figure 1: iLembe District Municipality

![Map of iLembe District Municipality](image)

Source: (iLembe District Municipality, 2021)

The iLembe region is centrally positioned between the Port of Durban and the Port of Richards Bay (which includes the Richards Bay Integrated Development Zone). The region is dissected by the N2 national highway and R102, which gives the district direct access to these ports, as well as King Shaka International Airport (KSIA) and Dube TradePort Special Economic Zone, which is located a few kilometres to the south of the iLembe border. Approximately 63% of the total iLembe area comprises traditional authority areas, while another 31% is commercial farming area (iLembe District Municipality, 2021).
3.2 Composition of iLembe District

KZN experienced real regional GDP (GDP-R) of R504 billion in 2019, with eThekwini Municipality being the largest contributor at 59.6% and iLembe being the fifth largest contributor at 2.9% (KZN Treasury, 2021). The largest sectors are finance and business services (18.4%), manufacturing (18.2%), wholesale, retail, trade, and accommodation (15.9%) and general government services (14.3%) (COGTA, 2020).

The main commercial activities are concentrated in KwaDukuza (Stanger town), Ballito and Mandeni/Sundumbili areas, while the main industrial activity is primarily within the Isithebe Industrial Park with secondary, light-industrial activities found in Imbonini Park, Ballito Business Park, Shaka’s Head Industrial Park, and Shaka’s Kraal. Other significant industrial activity includes sugar milling at the Gledhow and Darnall mills in Stanger and the Sappi Paper mill at Mandeni (iLembe District Municipality, 2021).

The population of iLembe has grown on average at 1.47% per annum between 2009 and 2019, increasing to 678,048 people and 191,369 households in 2019 (COGTA, 2020). The core urban areas within the region are Ballito and Stanger, while the region hosts a wide range of coastal housing estates located in Ballito, Compensation, Tinley Manor, Blythedale, and Nonoti. Other urban town centres include Maphumulo, Ndwedwe, Darnall, Groutville and Sundumbili (iLembe District Municipality, 2021).

According to the AfrAsia Bank SA Wealth Report for 2019, the Umhlanga-Ballito corridor was considered the “fastest growing wealth market in South Africa with a 25% growth trajectory over the last decade”, in comparison to Cape Town with 11% and Johannesburg with 9% (COGTA, 2020).
4 Waste Management in iLembe

4.1 Status Quo of Waste Management

Waste management services, including the collection, transport and disposal of waste, is the responsibility of local municipalities in South Africa. However, waste collection is limited to mainly urban areas. Only a third (32.5%) of households in iLembe receive a weekly waste collection service while 48% of households use their ‘own refuse dump’. This indicates that waste management within the district requires urgent attention, especially in less urban municipalities such as Maphumulo and Ndwedwe, where only 0.25% and 1.13% of households respectively receive weekly waste collection (iLembe District Municipality, 2021).

Within KwaDukuza, waste is collected by the municipality, by Dolphin Coast Waste Management (DCWM) and via skips placed in more rural areas. Waste collection within Mandeni is done by the municipality, with only the main Mandeni suburb receiving kerbside collection. For the rest of the peri-urban and rural areas, skips are used. In Maphumulo, only the towns of Maphumulo and Ntunjambili receive waste collection, with waste being collected by the DCWM. Within Ndwedwe, only houses within Ndwedwe and Glendale receive waste collection, with the NLM removing black bags and placing them into skips, which are removed by DCLM (iLembe District Municipality, 2019).

There is no public landfill site within the iLembe region. As such, the KDM, MPLM, and NLM dispose of their waste at the privately owned Dolphin Coast Landfill Management (DCLM) site in KwaDukuza, while Mandeni disposes of their waste at the King Cetshwayo Landfill Site in Empangeni (iLembe District Municipality, 2019). There is another privately owned landfill (SAPPI landfill site) in Mandeni, but this site does not accept waste from public or external organisations. The iLembe District Municipality does intend on developing a public landfill site, and a scoping report has been completed. There are three transfer stations in iLembe, two located in KwaDukuza and one in Mandeni:

- Yellowwood Drive Transfer Station, Stanger (owned and operated by KDM)
- Ballito Transfer Station (owned by KDM but operated by the DCWM)
- Isithebe Transfer Station, Mandeni (owned and operated by iThala) – not currently operational.

The transfer stations generally operate as facilities where waste is off-loaded and separated, and thereafter, recyclable materials are sold off and general waste is taken to landfill. More information is provided on both the current state of landfills and transfer stations in Section 5.2.5 and 5.2.6. In relation to recycling, there are a few recycling initiatives being implemented within the KDM and MLM and these too will be explored in more detail Section 5.3.3.
4.2 Size of the WEEE Industry

Estimates for WEEE generation in SA have varied widely. The 2018 South African State of the Waste Report (SOWR) indicates that 361,526 tonnes of WEEE was generated in total in SA in 2017 (DFFE, 2018). As such, WEEE accounts for 0.7% of total waste generated, which was 52 million tonnes. The report further states that 86.4% of WEEE is stored/stockpiled, while only 9.7% was recovered/recycled, none was treated, and 3.9% was discarded. The SOWR, which separates batteries from WEEE, notes that 34,393 tonnes of batteries were generated in total, with 90% being recovered/recycled and only 10% being stored/stockpiled. Considering the population of South Africa was 56,5 million (2017), the per capita contribution to WEEE (both WEEE and batteries accounting for 395,919 tonnes) equates to approximately 7kg per capita.

The Global E-Waste Statistics Partnership’s E-Waste Global Map indicates that 416,000 tonnes of WEEE was generated in 2019, which related to 7.1kg per capita, noting that only 5% was collected (GESP, 2019). In addition, in a 2019 publication for Trade and Investment KZN (TIKZN), based on statistics from the E-Waste Global Map in 2015, it was estimated that 470,067 tonnes of WEEE were produced per annum which equates to 8.25kg per capita. Using this approach and applying this to the KZN region, TIKZN estimate that 94,050 tonnes of WEEE was generated in KZN in 2018 (TIKZN, 2019).

Considering that WEEE estimates have ranged between 7 and 8.25kg per capita and using a projected population of 708,391 people in iLembe in 2022, the total WEEE volumes generated in 2022 is estimated as being between 4,959 tonnes and 5,844 tonnes. However, with an understanding that iLembe’s population is substantially more rural in comparison with the rest of South Africa⁵, it is assumed that these WEEE volumes are in fact lower.

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⁴ Population of iLembe was 678,048 in 2019 as per the IDP. Growing this at the average annual growth rate from 2009-2019 of 1.47% per annum on average, you arrive at 708,391 people in 2022
⁵ Traditional dwelling in iLembe comprised 17% in 2016 compared to 7% in South Africa (www.wazimap.co.za)
5  iLembe WEEE Stakeholder Mapping

5.1 Overview of the WEEE Value Chain

The image below provides an overview of the structure of the WEEE value chain in iLembe. The value chain is briefly explained below, and thereafter, the specific stakeholders that have a role within the iLembe WEEE value chain are unpacked in more detail.

![WEEE Value Chain in iLembe](Image)

The direct WEEE value chain (see Section 5.2) comprises electrical and electronic equipment (EEE) producers, who sell EEE to the consumer market which, after its useful lifespan, ends up as waste electrical and electronic equipment (WEEE). This is either passed on directly to those who treat or refurbish WEEE (referred to as ‘recyclers’), or first to formal collectors (such as waste management companies) and then to WEEE recyclers. Currently, there is limited data on what type of WEEE is being collected and/or recycled in iLembe. WEEE does end up going directly from collectors into the end market, mostly when included in the municipal waste stream ending up in landfill, as there is limited education and awareness around disposal or WEEE in iLembe.

WEEE recyclers in iLembe refurbish, and/or dismantle, and/or pre-process WEEE. Refurbished items are sold to end markets (such as consumers). All recyclers do some form of dismantling, where materials are separated and then consolidated and sold to end markets (such as plastic recyclers, scrap dealers or exported to global recycling markets). Materials that cannot currently be recycled, such as certain types of plastics and glass, end up at landfill. Some pre-processing takes place, where complex WEEE components are processed (i.e., crushed), separated from each other and consolidated, and mainly exported for processing at smelters in global markets where technology is available to do complex processing of PCBs, for example. As such, as lot of WEEE fractions are being exported outside of iLembe and opportunities for local beneficiation are being lost.

WEEE is also collected informally by waste pickers who generally manually dismantle WEEE on the spot (i.e., smashing the WEEE) to extract valuable fractions such as metals, and then sell these fractions to the end market and dump the
non-valuable fractions, usually at the same spot where it is dismantled. Where possible, waste pickers would repair WEEE that is still useable, and sell this in the informal market. The informal sector is underrepresented in iLembe and little is known about their role in recovering WEEE; there are no facilities to support waste pickers in iLembe.

Policy, regulatory and other supporting stakeholders in the value chain (Section 5.3) include national, provincial and local government, PROs, industry associations (including informal economy), business chambers, and academia and research institutions. National government stakeholders have a critical role in establishing the policy framework for waste management and recycling in SA, while provincial government is responsible for enforcing and monitoring this framework. Local municipalities are responsible for the provision of waste management and enforcement of waste by-laws, while the iDM is responsible for oversight and support to local municipalities. iDM are also responsible for managing waste infrastructure, however, there is currently no public landfill in iLembe. At the local government level in iLembe, waste management focusses primarily on waste collection, there is only limited recycling occurring, and there is a lack of knowledge around WEEE recycling and opportunities for small, medium and micro enterprise (SMME) development in this space.

PROs, although having a national footprint, have a critical role in providing support to the WEEE industry, especially in proving an interface between producers and recyclers and reporting to national government in relation to EPR. Industry associations and organisations also play a role in creating a conducive environment for WEEE stakeholders. The African Reclaimers Organisation (ARO) and South African Waste Pickers Association (SAWPA) provide support to informal waste collectors, and both do not have much of a footprint in the iLembe region.

Although not indicated on the value chain diagram, the iLembe Chamber of Commerce, Industry and Tourism represents the interests of WEEE businesses in iLembe, while Enterprise iLembe is the District Economic Development Agency responsible for driving economic development and promoting trade and investment into the region.

5.2 Direct WEEE Stakeholders

Direct WEEE stakeholders are those in the value chain from the point of production of electronic and electrical equipment through to the disposal of WEEE.

5.2.1 EEE Producers

Producers of EEE comprise those who either manufacture and/or assemble EEE, those who import EEE, dealers of EEE (e.g., between manufacturers and retailers), and the wholesalers and retailers that sell EEE to the end user.

Within iLembe, KIC (previously Whirlpool), based in the Isithebe Industrial Estate, is a large manufacturer of fridges and freezers. A range of smaller EEE manufacturers, distributors and suppliers are based throughout the iLembe region. EEE is generally sold by such distributors and suppliers into the commercial sector or through the retail sector directly to the public.

5.2.2 WEEE Generators

WEEE in iLembe is generated by residential households, through commercial and industrial activities, and via institutions such as educational and governmental institutions. In South Africa, it was estimated that the main source of WEEE as inputs into the recycling sector was from government departments (45%), the business sector (35%) and households (20%) (Mintek, 2017). These figures have however been disputed by some stakeholders, who believe that government departments have a smaller contribution and households have a larger contribution.
The following table indicates the categories of WEEE produced in South Africa according to the 2017 Mintek study.

**Table 1: Categories of WEEE in South Africa**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small household appliances</td>
<td>Vacuum cleaners, coffee machines, toasters, irons</td>
</tr>
<tr>
<td>Large household appliances</td>
<td>Washing machines, refrigerators, dryers, air conditioners</td>
</tr>
<tr>
<td>Office, information, and communication technology (ICT) equipment</td>
<td>PCs, laptops, mobile phones, fax machines, printers, and photocopiers</td>
</tr>
<tr>
<td>Consumer electronics and entertainment equipment</td>
<td>Televisions, VCR/DVD/CD players, Hi-Fi sets, radios, train sets, coin slot machines, parking ticket equipment</td>
</tr>
<tr>
<td>Lighting equipment</td>
<td>Fluorescent tubes and lamps, sodium lamps</td>
</tr>
<tr>
<td>Electrical and electronic tools</td>
<td>Drills, electric saws, sewing machines, lawn mowers, large stationary tools, machines</td>
</tr>
<tr>
<td>Security and healthcare equipment</td>
<td>Surveillance &amp; control equipment, medical instruments &amp; equipment</td>
</tr>
<tr>
<td>Mixed waste electrical &amp; electronic equipment</td>
<td>Various WEEE</td>
</tr>
</tbody>
</table>

Source: (Mintek, 2017)

The main sources of WEEE from households are generally small and large household appliances, ICT equipment, consumer electronics and lighting equipment. The commercial and industrial sectors, as well as institutions, are large generators of ICT equipment, lighting equipment, tools, and security and healthcare equipment. It is important to note, that within the current EPR regulations for the WEEE industry, WEEE is only categorised as large equipment, medium equipment and small equipment, as well as batteries.

5.2.2.1 Residential

As indicated within Section 3.2, the core urban areas in the region are Ballito and Stanger, while the region hosts a wide range of coastal housing estates located in Ballito, Compensation, Tinley Manor, Blythedale, and Nonoti. Other urban town centres include Maphumulo, Ndwedwe, Darnall, Groutville and Sundumbili.

Currently, no data exists that indicate the volumes of WEEE that is being generated by residential households in the iLembe region. However, using the iLembe and local municipal IWMPs, WEEE volumes can be estimated. The waste characterisation that was done for KwaDukuza indicated that 0.3% of total waste was WEEE (excluding batteries), while in Mandeni, this was 0.34%. The KDM IWMP indicates that the majority of WEEE found in the waste characterisation process was wiring from electronic equipment and some electronic equipment (KwaDukuza Local Municipality, 2019). No WEEE was identified in the Ndwedwe and Maphumulo waste characterisation exercises, however, given the less urbanised structure of these municipalities, the lower percentage is used as a proxy (0.3%). Using the total domestic waste generated for 2019 for each local municipality (iLembe District Municipality, 2019), and projecting these at the annual population growth rate, one arrives at a figure of 123,608 tonnes of domestic waste generated for iLembe in 2022. Applying the above WEEE generation percentages, it is estimated that approximately 388 tonnes of WEEE was generated by households in 2022.
This figure is significantly lower than when South Africa’s per capita average is used (see Section 4.2), which estimated as between 4,959 tonnes and 5,844 tonnes of WEEE was generated in iLembe in 2022 (total across all sectors of the economy). It is expected that this is partially because these figures only account for domestic WEEE generation, so excludes any WEEE generated by businesses and institutions. However, other reasons for the relatively small amount of WEEE identified in domestic waste streams is that:

- Households are giving away old WEEE to their domestic workers, and/or to waste pickers to be repaired.
- Households are holding on to their WEEE due to perceived financial and/or sentimental value.
- Households are holding on to their WEEE due to fear of data privacy and they don’t know how to properly dispose of it.
- Households are dropping WEEE off/getting this collected by WEEE recyclers directly or taking part in WEEE collection campaigns that are organised by recyclers.

The MLM IWMP indicated that the low volumes of WEEE found could be a result of the low average household income, with households already separating out more valuable waste streams such as metals and WEEE (Mandeni Local Municipality, 2019).

As noted in Section 4.1, waste management within the district is limited, with only third of households receiving a weekly waste collection service, which is limited to main urban areas. Specifically in relation to the disposal of WEEE, there is limited education and awareness about the proper disposal of WEEE. As such, it is expected that most WEEE is either being donated/given away or ends up in refuse bags or skips where it is being recovered by informal collectors or ends up in landfill. Some WEEE does however end up being dropped off directly by households at locations such as at RecycleX or is collected by recyclers such as Indalo and Reclite. RecycleX indicated that they host collection days where they put out a call for households to bring all their WEEE to a single location, such as a school, to be collected by them.
5.2.2.2 Commercial and Industrial

The main commercial activities are concentrated in Stanger, Ballito and the Mandeni/Sundumbili areas. The main industrial activity is primarily within the Isithebe Industrial Estate with light-industrial activities found in Imbonini Park, Ballito Business Park, Shaka's Head Industrial Park, and Shaka's Kraal. Other significant industrial activity includes sugar milling at the Gledhow and Darnall mills in Stanger and the Sappi Paper mill at Mandeni (iLembe District Municipality, 2021).

For commercial and industrial business who generate WEEE, many businesses either have contracts with waste management companies or recyclers themselves, or waste management companies or recyclers are contracted to the industrial or business estate within which the companies are located. For smaller businesses, especially within the commercial space, disposal of WEEE is more ad hoc, with companies reaching out to waste management companies or recyclers as and when they have WEEE that needs to be disposed of. However, it must be noted that several waste management companies operational within iLembe do not handle WEEE and refer business generators of WEEE directly to recyclers.

A waste efficiency study was done in 2019 as part of the Vuthela LED Programme. The study received 35 responses to a survey circulated to commercial and industrial businesses located within KDM and MLM relating to their general and hazardous waste generation. Of the total 80 tonnes of waste generated per month, only 3kgs was WEEE. Businesses indicated that they disposed of WEEE at recyclers such as RecycleX and Indalo (iLembe District Municipality, 2019).

Within the Isithebe Industrial Estate, which is the largest industrial area in the district with approximately 268 tenants, a waste management service is provided to some tenants by the estate itself (via a waste service provider), while other tenants contract waste management companies directly. For the waste collected by the estate collection service, this waste used to be transferred to the Isithebe Transfer Station (see section 5.2.4) where it was spread across a concrete floor and recyclable materials were reclaimed by informal waste pickers and then sold off to collectors and/or recyclers. However, the manager of the estate has indicated that the transfer station has been temporarily closed as they were issued a non-compliance notice by KZN Department of Economic Development, Tourism, Environmental Affairs (EDTEA) due to the state of the facility. Currently, all waste is being taken to a site across the road, loaded into containers, and removed by the service provider. It was indicated that the main waste streams are plastic and textiles, and that very little is known to be WEEE.

The Isithebe Waste Beneficiation and Linkage Survey, initiated by the iLembe Chamber of Commerce and iLembe Business Cluster, was undertaken by the Durban University of Technology (DUT) and surveyed 22 companies in the Isithebe Industrial Estate. The largest waste streams were metals (27%), largely due to waste from KIC (previously Whirlpool) from the manufacture of EEE, plastics (27%), textiles (14%) and wood (14%). There was no indication of WEEE generated by companies in the estate, which aligns to the inputs received by the estate manager.

5.2.2.3 Institutions

Institutions generally include educational institutions, religious institutions, hospitals, and governmental services and facilities. Most institutions have contracts with waste management companies, who collect waste directly. In relation to WEEE, this would either be diverted by the waste management company to recyclers such as RecycleX (where separated or larger volumes of WEEE are collected), or if in smaller volumes and disposed in general waste bins, could end up in landfill. WEEE is also collected directly from institutions by recyclers.

As noted earlier, it was estimated government departments contribute 45% to total volumes of WEEE in the recycling industry (Mintek, 2017). However, during engagement with iLembe stakeholders, it was noted that current legislation inhibits WEEE from being released from government stockpiles. This is to do with the fact that the asset management policy considers items such as ICT and electronic equipment as an asset with residual value, which prevents local government from releasing WEEE for recycling. Another challenge relates to how WEEE is disposed of – through an auction or tender process. During an engagement with the EDTEA, who are internally driving a WEEE project (see section 5.3.2), this was confirmed. The department indicated that they have been attempting to access WEEE from government departments but have been failing, as currently legislation around disposal of assets does not allow them to release WEEE for recovery or recycling purposes. This is driven by the fact that a value is placed on an asset, which depreciates over years, and if the EEE expires prior to the total depreciation value, that asset cannot released. It was noted that this WEEE is likely being stored.

Currently, as part of the SRI and Vuthela LED programmes, the Municipal WEEE Asset Disposal Project is underway.
and seeks to identify more efficient and effective ways of disposing WEEE and to provide a toolkit to local government to support this. In addition, EDTEA is also working to find a solution to the release of governmental WEEE.

5.2.3 Collectors

Collection of WEEE generated by businesses and institutions in iLembe is primarily done through formal waste management companies, but also directly by recycling companies. Household WEEE often ends in refuse bags and is either reclaimed by informal waste pickers directly from the refuse bags or is collected as part of the general waste collection service done by the relevant local municipality and generally ends up at landfill. More informed households get their WEEE collected via contacting recycling companies directly, through partaking in special collection days organised by WEEE recycling companies, or if they are part of a residential estate that has a waste service.

5.2.3.1 Formal Collectors

As noted above, formal WEEE collection is generally done by waste management companies and recycling companies directly. The latter will be dealt within in more detail the following Section (5.2.4), while this section will speak specifically to the role of waste management companies in iLembe.

The main distinction between ‘collectors’ (i.e., waste management companies) and recyclers is that collectors would not undertake any dismantling activities, but rather, collect WEEE as part of their general waste management service to clients. Several waste management companies are active within the iLembe area, and comprise companies based both within and outside of the iLembe region.

DCWM, based in iLembe, collects waste directly from clients, but is also contracted to the KwaDukuza, Maphumulo, and Ndwedwe local municipalities to collect and dispose of general refuse. The service varies according to the agreement but includes a residential and commercial collection service in southern KwaDukuza, residential collection in only two main nodes and from businesses within Maphumulo, and via as skip system within Ndwedwe (iLembe District Municipality, 2019). DCWM transfer some of this waste to the King Shaka Transfer Station in Ballito (waste from southern KDM and Ndwedwe) where it is separated and non-recyclable materials are sent to landfill, while other waste goes directly to landfill (iLembe District Municipality, 2019). During stakeholder engagements, it was noted DCWM is one of the main clients of the DCLM landfill site in Stanger. The DCWM noted that when they come across WEEE, this is passed along to Reclite. However, DCLM noted that when WEEE ends up in household refuse collected by DCWM, it is not easy to identify as it is in black bags and would end up in landfill.

Several large national waste management companies service the iLembe region, including WastePlan (who recently acquired SmartMatta) and Don’t Waste. The Reclamation Group (Reclam) also collect waste and have a facility in Isithebe Industrial Estate but are considered a recycler and included in Section 5.2.4. These waste management companies generally provide a waste collection service to clients, which mostly comprise businesses (including retail centres). When they are requested to collect WEEE, depending on the volumes and types of WEEE and the requirements of the client, this is either referred directly to a WEEE recycling company such RecycleX or Reclite in iLembe or EWaste Africa in Pietermaritzburg, or collected by the waste management company and then sold or given way to a WEEE recycling company. In certain instances, waste management companies would need to pay WEEE recyclers to accept WEEE, for instance, where this is hazardous and requires a fee to be correctly discarded.

Dematrans Waste Services, which is a local waste management company based in iLembe, provides a recyclable waste collection directly to households. Although they do not have a formal arrangement with the municipality, they provide refuse bags to households and collect mainly paper, cardboard, and plastics, which they then sort, bail, and sell to recycling companies such as Mpact. They indicated that WEEE from households is a small percentage of their total volumes (only 0.5%). When they do come across WEEE, they would do some basic dismantling (if possible), then sell the metal to scrap yards, take the plastic to the Shaka’s Head Transfer Station, and other WEEE components to recyclers such as RecycleX. Super Waste, also based in iLembe, collects waste mostly from housing estates such as Zinkwazi. They indicated that when they remove WEEE, that they too would dismantle, and sell scrap metal to scrap dealers and other electronic components to RecycleX.
5.2.3.2 Informal Collectors

Waste pickers (or ‘reclaimers’) are at the frontline of collection and separation of recyclable waste materials in South Africa and play a critical role in diverting recyclable waste away from landfill. In 2014, eWASA estimated that 25% of total WEEE volumes recycled in SA was collected by waste pickers (Mintek, 2017). Within the WEEE industry in South Africa, many medium-large WEEE recycling companies prefer not to purchase WEEE from informal waste pickers and rather source directly from businesses and accredited suppliers. Smaller businesses, who generally dismantle WEEE, do however accept WEEE from waste pickers (Mintek, 2017).

Within iLembe, waste pickers are active in most areas where substantial amounts of waste are disposed, particularly within urban residential, commercial, and industrial nodes. During engagements, stakeholders shared a common understanding about the role of waste pickers within the WEEE industry in iLembe. Essentially, during their usual collection of plastics, cardboard, paper, cans, and metals, waste pickers will collect WEEE as and when they come across items that have value. Waste pickers will attempt to repair electronic or electrical items that can be repaired and sell these items in the informal economy. If items cannot be repaired, they would manually extract valuable fractions (such as metals) from the WEEE, usually by physically breaking apart the WEEE, which would then be sold on to scrap dealers. Other non-valuable fractions, which can be hazardous, are then usually discarded/dumped at the site where the WEEE was informally dismantled.

Recyclers such as RecycleX and Indalo have indicated that they purchase WEEE from informal collectors in iLembe. However, both have noted that WEEE is generally stripped down, and that only certain fractions (such as PCBs) are sold to them. An increase in awareness about the value of fractions contained in WEEE has led to more scrap dealers accepting WEEE, and this has reduced the amount of WEEE that Indalo have been receiving. Another challenge being experienced is around the burning of WEEE such as copper cables, where certain scrap yards are buying this burnt copper even though this is illegal, according to the Second-Hand Goods Act (Act 6 of 2009). Indalo indicated that they have seen a greater volume of items that they consider to be stolen over the past year and have stopped purchasing copper from waste pickers.

Recyclers agree that greater value could be passed on to the waste pickers if they sold complete WEEE products to certified recyclers rather than try to strip or dismantle these products informally, however waste pickers are generally not aware of this. With EPR for the WEEE industry in the process of being implemented, there is a provision for licenced and legally compliant recyclers to get remunerated by PROs when complete items are logged on their systems (i.e., a complete Casio calculator), which can be passed along to the waste pickers as an incentive. Recyclers are trying to encourage waste pickers to approach WEEE in this way, however, many waste pickers are desperate and prefer to strip items to sell valuable fractions to the easiest and quickest buyer.

Engagements with SAWPA and ARO, who represent the wider common interest agendas of waste pickers in South Africa (such as access to waste and provision of waste sorting and safe temporary storing sites), have indicated that there is little representation of waste pickers in the iLembe region. Both organisations are currently undertaking a drive to register waste pickers onto the national registration system, which is in line with Department of Science and Innovation (DSI) and Department of Forestry, Fisheries and the Environment (DFFE) Waste Picker Integration Guidelines for South Africa. The intention is for waste pickers to be renumerated as part of the EPR scheme for the paper and packaging industry, via the PROs for the collection services they render. A few stakeholders who were engaged acknowledged the importance of this new system, but strongly felt that the potential role of waste pickers in the WEEE collection space is limited, mainly due to issues around data security in relation to ICT equipment and the fact that WEEE is classified as a hazardous type of waste unless completely depolluted. However, given that waste pickers are at the coalface of waste management in South Africa, they will inevitably continue to reclaim WEEE as part of their collection processes.

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6 The Isithebe Industrial Estate previously allowed waste pickers to sort and reclaim recyclable materials at their Transfer Station, but as noted in Section 5.2.5, this site has been temporarily closed. However, the manager of the estate has noted that very little WEEE is generated by companies in the estate. Reclam also noting that most businesses would send their WEEE to head offices to be processed.

7 Depolluted is defined as “to remove the pollution from”, which in this case, refers to removing pollutants from WEEE.
Considering all of the above, while opportunities could be explored to support and grow waste pickers in iLembe it might not be ideally in the space of WEEE management integration. Any attempt to create an enabling WEEE collection environment needs to consider WEEE along with other waste materials, as it is known that waste pickers do not have access to sufficient volumes of WEEE to survive. The registration of waste pickers onto the national system (as described above) is critical in forming an understanding of which and what type of waste pickers are active in the area, and in educating waste pickers about how they can be integrated into formal value chain and be remunerated accordingly. Opportunities therefore exist to support the integration of the informal sector. Finally, development of small-scale facilities to support SMME development in the WEEE industry could incorporate waste pickers to some degree, both as part of the SMME and through creating a market for WEEE derived from waste pickers.

5.2.4 WEEE Recyclers

Within South Africa, most medium-sized recycling companies within the WEEE industry do collection and dismantling of WEEE and sell fractions to companies that pre-process and/or process these fractions in both local and export markets (Mintek, 2017). Dismantling is the first level of treatment, which involves breaking down WEEE into components, fractions, or materials such as PCBs, ferrous, and non-ferrous metals. Pre-processing is a more complex process of liberating (i.e., shredding) multi-material WEEE components through force and separating into materials such as PCBs, iron, steel, copper, aluminium, plastic, and glass, etc. (Mintek, 2017). Due to the more complex nature of pre-processing, much fewer companies undertake pre-processing. Processing within the WEEE industry is generally focussed on recovery of ferrous, non-ferrous, and precious metals within complex fractions that require treating in smelting and refining plants. Rand Refinery and SA Precious Metals are the only processors in SA, with SA Precious Metals being the only company recovering metals from PCBs in South Africa (Mintek, 2017).

Within iLembe, there are several recycling companies, however, most (Dematrans and Super Waste as per Section 5.2.3) deal with a range of waste materials, and only collect and dismantle WEEE when this opportunity arises. The Reclamation Group (Reclam), based in Isithebe Industrial Estate, said that they do not come across a lot of WEEE in the area, and that many companies in the region send their WEEE to their head offices in Durban or Johannesburg to be dealt with. When they are requested to collect WEEE, this is sent to their branch in Prospecton, Durban, where it is consolidated and sent to their head office in Johannesburg to be pre-processed.

There are three dedicated WEEE recyclers in the region, namely, Indalo Electronic Recyclers, Reclite and RecycleX. These recyclers generally have direct relationships with the generators of waste, particularly businesses. Once WEEE is collected or delivered, these recyclers dismantle WEEE into various fractions or components. Currently, only RecycleX does pre-processing at their facility in iLembe. Depending on the fractions, components or materials that come out of dismantling and/or pre-processing, these would either end up within the local market (such as plastics into the local recycling industry or scrap metals to scrap metal dealers) or exported into the global market. Materials that cannot be sold, scrapped, or exported often end up at landfill.

Indalo predominately collects WEEE from businesses, occasionally from residential households, and to a lesser extent, from informal collectors directly. They noted that the iLembe WEEE industry is small, and that their main market for WEEE is eThekwini. They also regularly service areas as far as Richards Bay and Pietermaritzburg. Indalo dismantle WEEE that is easiest to do manually, then consolidate and sell fractions to either RecycleX or Reclite, or occasionally to Desco Electronic Recyclers in Gauteng. PCBs are specifically sold to RecycleX and Desco. Indalo also refurbishes WEEE, mainly ICT equipment, and refurbished items are sold to end markets from their factory directly.

Indalo highlighted that one of the challenges facing the local WEEE industry is awareness, as people do not know what WEEE is. Scrap metal dealers and other collectors are also seeing the value in WEEE, and as such, Indalo’s WEEE volumes from waste pickers have declined.

RecycleX is the largest of the WEEE recyclers in iLembe, and only one of a handful of companies that do pre-processing of WEEE in South Africa. They access WEEE directly from businesses (including multinational companies around South Africa and Africa), do national collection days at school and housing estates, receive WEEE that is dropped off by waste management and/or recycling companies from around KZN, and even receive WEEE that is dropped off directly from households and informal collectors at their facility.
RecycleX have a global footprint, and even import obsolete ICT equipment from corporate businesses across Africa. This business-to-business model is driven in part by the EPR requirements of these businesses, but also due to their data security requirements. As such, they offer ‘take backs’, data wiping, refurbishments, and recycling to the corporate market. Given their access to international markets (i.e., access to smelters and offset markets), RecycleX often buy WEEE fractions (including PCBs) that they consolidate and sell into global markets, which often fetch a higher price than local markets. They current treat approximately 300 tonnes of WEEE per month.

Within the household market, through WEEE collection days, RecycleX have been successful in accessing low-grade household WEEE such as fridges, stoves, washing machines, lighting, kettles, stoves, irons, and plugs. ICT equipment such as cellphones and computers are less readily available. A large part of their household WEEE volumes is generated from the iLembe market due to the volume of townhouses and estates within the region. RecycleX have also placed skips in residential estates in iLembe to collect residential waste. However, they have cautioned again this as a method of collection unless controlled, as people often dump unwanted waste (e.g., nappies, rubble, etc.) or strip WEEE of valuable fractions and dump the remaining low value fractions in the skip.

RecycleX have also been instrumental in the establishment of the WeCare\(^8\) non-profit company. The WeCare model includes a 20ft container that is placed at community centres in rural areas, which focuses on selling low-end refurbished computers into the rural market. People are trained, supplied with equipment, and sell these items into the local market. The container also acts as a point for WEEE to be purchased from the local community.

Reclite has facilities in Gauteng, Western Cape, and KwaZulu-Natal, and offers refurbishment, dismantling and recycling of WEEE. Gauteng is the head office and the largest facility, and the majority of their WEEE volumes are from that region. They also import obsolete ICT equipment from Madagascar, Lesotho, Namibia, and Eswatini. The head office houses all their technology and equipment which enables them to process lamps, glass, solar panels, lithium-ion batteries, household batteries and other WEEE. Many recyclers dismantle and export, whereas Reclite treats WEEE which goes back into local markets. Additionally, they have a gas recovery system that is used to recover gas from heat exchange machinery (e.g., canisters) or from compressors from aircons, fridges, etc. They sell this to gas companies who scrub the gas and feed it back into their gas supplies and into the market.

The KZN facility, which is Reclite’s smallest branch based in iLembe, mainly does pre-sorting and consolidation of WEEE that is then sent to the head office for pre-processing. They do however do some dismantling where fractions can be sold off into the local market, such as metals to licenced scrap metal dealers. They have indicated that they are looking to expand local operations in the next couple years to undertake pre-processing of PV panels and batteries. They service the entire KZN and Eastern Cape region, however, current volumes in the Eastern Cape are not substantial enough to be viable. Their main markets for WEEE includes businesses, corporates, hospitals (lamps, batteries, machinery, etc), households (general household appliances), waste management companies, the DCLM landfill, and a landfill on the South Coast.

A challenge that has been experienced by Reclite relates to the issue of compliance and licencing. A licence is required to process WEEE in any way if the daily permitted limit of 500kg per day is exceeded (for hazardous waste), and separate licences are required for dismantling, refurbishment, and treatment. Accordingly, Reclite have seen an increase in unscrupulous recyclers who merely dismantle WEEE, sell the valuable metal fractions to scrap dealers, and dump the remining fractions.

\(^8\) [http://www.wecarenpc.com/](http://www.wecarenpc.com/).
5.2.5 Transfer Stations and Drop-Off Centres

There are currently two active transfer stations in iLembe, both located in KwaDukuza. The Yellowwood Drive Transfer Station in Stanger is owned and operated by KDM, while the Ballito Transfer Station in Ballito is owned by KDM but operated by DCWM (iLembe District Municipality, 2019). The transfer stations generally operate as facilities where waste is off-loaded and separated, and thereafter, recyclable materials are sold off and general waste is taken to landfill.

The Yellowwood Drive Transfer Station is the site of the newly constructed waste drop off centre which began operations on 10th August 2022. The Ballito Transfer Station is used as a facility for DCWM, who collect household waste from the southern areas of KDM and deliver this to the site. Thereafter, the waste is separated, and recyclable waste material is sold to a recycling company in Durban while non-recyclable material is taken to the Dolphin Coast Landfill (iLembe District Municipality, 2019). KDM are also in the process of initiating a buy-back centre at the eNtshaweni Cluster. However, this process is still in its infancy and no information exists.

The Isithebe Industrial Estate in Mandeni had a transfer station which was owned and operated by iThala, but this is no longer operational. The manager of the estate indicated that due to the poor condition of the site, EDTEA issued a non-compliance notice, and the facility was closed. They intend to rehabilitate the site and identify how to best facilitate waste management and recycling, including incorporating waste pickers again.

NLM have indicated that they are preparing tender documents for the establishment of a buy-back centre, while MLM indicated during the engagement process that they are in the process of identifying a site for a buy-back centre.

5.2.6 End Market

As indicated within the iLembe WEEE value chain, there are several end markets for WEEE fractions. Refurbished products are sold back to consumers thus re-entering formal markets directly through recyclers themselves or via channels such as the WeCare NPO. Repaired products are being sold by waste pickers into the informal market. Metal is being sold to scrap dealers who are either based in iLembe or in the broader KZN region, and large volumes are exported to global markets; this would significantly be impacted should the current proposed legislation to ban the export of scrap metal be adopted. Other value factions include plastic which can be sold off to plastic recyclers, many of which are based in Durban, and PCBs which are mostly consolidated and exported to smelters in Asia that have the technology to separate various precious metals.

The last remaining non-value fractions, such as certain plastics or glass, end up at landfill. There is no public landfill site within the iLembe region, but waste management companies generally dispose of their waste at the Dolphin Coast Landfill site, which is privately operated. The iDM does intend on developing a public landfill site, and a scoping report has been completed. During engagement, it was raised that the current Dolphin Coast Landfill could be a potential location for a pilot project around WEEE, especially due to its proximity to informal communities.
### 5.3 Policy, Regulatory and Other Supporting Stakeholders

The table below provides a summary of all the stakeholders that have a role in providing a policy and regulatory framework and creation of a supporting environment for the WEEE industry in iLembe.

**Table 2: Stakeholders, role/mandates, and relevant policies, programmes, and projects**

<table>
<thead>
<tr>
<th>Category</th>
<th>Stakeholder</th>
<th>Main Role/Mandate in Relation to the WEEE Industry</th>
<th>Policies, Programmes, Projects and Plans Relevant for iLembe</th>
</tr>
</thead>
</table>
| National Government | DFFE       | • Develop and implement legislation, policy and regulations (incl. Waste Act, NWMS, EPR, WEEE Policy and Norms and Standard)  
• Create an enabling environment for producers/PROs to fulfil their EPR obligations | • Operation Phakisa  
• EPR Scheme  
• National Waste Picker Integration Guidelines |
|                   | dtic        | • Support the enforcement of the EPR regulation  
• Collation of data on WEEE businesses  
• Support development of local WEEE collaboration and co-working facilities  
• Design and administer incentives to support entrepreneurs in the WEEE industry | • Eco-Industrial Parks Programme |
|                   | DSI         | • Drive research in partnership with academic and research institutions in areas of developing local end processing technology solutions and treatment solutions for hazardous WEEE residuals | • Waste Roadmap (together with CSIR) |
| Provincial Government | EDTEA     | • Ensure regulation of waste activities in KZN  
• Promote and support implementation of the NWMS and national norms and standards (and WEEE Policy)  
• Develop a provincial IWMP that includes WEEE  
• Support local government’s ability to perform its waste management activities  
• Request guidance from DFFE about how to realise the national ban of WEEE to landfill in practical terms | • Cedara E-waste Project  
• iLembe Renewable Energy Hub |
|                   | TIKZN       | • Support identification of opportunities in the WEEE industry  
• Promotion and attraction of investment into the WEEE industry | • Feasibility study and business plan for e-waste refurbishment centres |
<table>
<thead>
<tr>
<th>Category</th>
<th>Stakeholder</th>
<th>Main Role/Mandate in Relation to the WEEE Industry</th>
<th>Policies, Programmes, Projects and Plans Relevant for iLembe</th>
</tr>
</thead>
</table>
| **Local Government**   | iLembe District                       | • Develop an IWMP that includes WEEE and harmonise relevant legislation (ban of WEEE to landfill with future local waste management planning  
• Create public awareness around WEEE  
• Support local municipalities in enforcing WEEE by-laws  
• Support local municipalities in promoting recycling and in facilitating local solutions such as drop-off centres | • Development of a public landfill site  
• Integrated Waste Management Plan |
|                        | Local Municipalities                  | • Provide an effective waste management service that diverts WEEE from the municipal waste stream  
• Encourage recycling and separation of waste at source and discourage any disposal of WEEE to landfill  
• Facilitate solutions such as drop-off sites and buy-back centres  
• Collect data on WEEE volumes  
• Develop an IWMP that includes WEEE and spells out the WEEE landfill ban  
• Develop and enforce local WEEE by-laws  
• Create public awareness around WEEE and drive collection days | • Integrated Waste Management Plans |
| **Development Agencies** | Enterprise iLembe                    | • Support local government by coordinating and driving LED activities and packaging projects accordingly  
• Market and promote the district as an investment destination | • Incentive scheme  
• Business incubator  
• SMME development |
| **Business Associations** | iLembe Chamber of Commerce, Industry and Tourism | • Represent the interests of businesses in iLembe, including WEEE producers, collectors, and recyclers  
• Support the creation of awareness around WEEE and any intrinsic business opportunities linked to WEEE management | • The Entrepreneur Programme (business accelerator) |
| **PROs**               | eWASA, ERA, Lightcycle, R2E2, Circular Energy KZN | • Implement EPR scheme on behalf of members, including mandatory informal sector integration  
• EPR reporting requirements to DFFE  
• Support DFFE in the creation of public education materials  
• Support SETA in the development of accredited training curricula | • EPR scheme |
<table>
<thead>
<tr>
<th>Category</th>
<th>Stakeholder</th>
<th>Main Role/Mandate in Relation to the WEEE Industry</th>
<th>Policies, Programmes, Projects and Plans Relevant for iLembe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal Sector Representation</td>
<td>SAWPA, ARO</td>
<td>- Represent the interests of waste pickers&lt;br&gt;- Drive national waste picker registration</td>
<td>- National Waste Picker Registration</td>
</tr>
<tr>
<td></td>
<td>Groundwork</td>
<td>- Represent the rights of waste pickers</td>
<td>- Zero Waste Project</td>
</tr>
<tr>
<td>Academic and Research Institutions</td>
<td>CSIR</td>
<td>- Define required WEEE research areas and provide grant funding for academic institutions&lt;br&gt;- Establish and further develop the National Registration Database for Informal Waste Pickers</td>
<td>- Waste Roadmap (together with DSI) National Waste Picker Integration Guidelines</td>
</tr>
<tr>
<td></td>
<td>Tertiary Education Institutions (UKZN, DUT and Umfolozi TVET)</td>
<td>- Encourage and support research within the WEEE industry in KZN&lt;br&gt;- Drive training and skills development within the recycling space</td>
<td>- Isithebe Waste Beneficiation and Linkage Survey (DUT)&lt;br&gt;- Pilot plant for recovery of rare earth metals</td>
</tr>
<tr>
<td>Donor Funding</td>
<td>SECO</td>
<td>- Fund the SRI Programme and Vuthela LED Programme in iLembe</td>
<td>- SRI iLembe local component</td>
</tr>
</tbody>
</table>
5.3.1 National Government

National government, primarily through the DFFE, is responsible for creating a conducive and enabling environment through the development and implementation of relevant environment legislation, policy and regulations. This includes the Waste Act, National Waste Management Strategy (NWMS), EPR, development of norms and standards, and implementation of the national WEEE policy that is currently in development.

The Department of Trade, Industry and Competition (dtic) provides support in the enforcement of the EPR regulations and in capturing, collating WEEE businesses in South Africa, and creating incentives that support entrepreneurs and businesses. Of particular relevance to the iLembe region, given their role implementing the Eco-Industrial Parks Programme in South Africa, dtic can support the development of local WEEE collaboration and co-working facilities.

Finally, the DSI, through its mandate to drive socio-economic development through research and innovation, has a role in driving research in partnership with academic and research institutions. The DSI, along with the CSIR, were responsible for development of the Waste Research, Development and Innovation Roadmap (Waste Roadmap) as a means of supporting implementation of national waste policy and strategy. Future research to support the WEEE industry could focus on areas such as developing local end-processing technology solutions and treatment solutions for hazardous WEEE residuals. This would greatly assist in identifying potential opportunities that could be implemented within iLembe.

5.3.2 Provincial Government

Provincial government, through the EDTEA, is responsible for regulating waste activities within the province, which includes the issuing of licences for certain waste activities. Additionally, EDTEA is responsible for promotion and supporting implementation of the NWMS and national norms and standards, including the WEEE norms and standards that are being developed as part of the SRI Programme in South Africa.

EDTEA are also required to develop a provincial IWMP, which needs to be aligned to the national WEEE policy under development and consider strategies for how WEEE can be addressed within the province. Finally, EDTEA are also required to support local government’s ability to perform waste management activities. In engagement with EDTEA, they acknowledged this role, specifically in assisting local government to adhere to national legislation that bans WEEE from landfill. However, it was raised as a concern that this ban has taken effect but that no direction has been given to provincial government about what this means, what comes next and who is responsible. EDTEA require guidance from DFFE in order to further support local government in understanding what this means for them. A challenge identified by EDTEA relates to a lack of neither quantitative nor qualitative data around WEEE in KZN.

EDTEA noted that they have an E-Waste Recycling Project established at Cedara Agricultural College. It started as a pilot to merely understand WEEE and how best to manage it but has developed into a larger project that comprises training of recyclers, trying to access WEEE stockpiled within provincial government departments through looking at unblocking inhibiting procurement/asset release legislation, research on WEEE, and a waste to art project. Through this, they are trying to promote the correct management of WEEE within the provincial government. This aligns closely with the iLembe Municipal WEEE Asset Disposal Project that is being undertaken, and further collaboration between SRI and EDTEA is required going forward.

TIKZN are an entity of EDTEA, and although they do not have a direct role within the WEEE industry, are mandated to support identification and promotion of investment opportunities in KZN. In line with this mandate, they commissioned a research study to determine the feasibility of an “E-Waste Refurbishment Centre” in KZN, along with a business plan for this project. These reports provide a good base to assess which future work relating to the development of a WEEE co-working facility can be developed in the most feasible and practical manner.
5.3.3 Local Government

District municipalities are responsible for the management of landfills, while local municipalities are responsible for collection and disposal of waste, as well as diverting recyclable waste materials from landfill. Within iLembe there are no publicly operated landfills, and as such, private landfills, waste management companies, and recyclers own most of the data on waste volumes. This creates a challenge for iDM in monitoring and supporting the waste management sector, particularly the WEEE industry for which even less data is available. Due to this, iDM have not been compliant with both the first and second National Waste Management Strategy.

However, supported by the Vuthela LED Programme, the iDM have completed a scoping report for the development of a public landfill site in iLembe. Three sites were identified, and a detailed scoping is required for each site, after which engineering drawings can be developed and development cost and funding models can be constructed. Finally, a waste licence application and environmental impact assessment process will need to be completed (iLembe District Municipality, 2019). In planning for a public regional landfill, given the recent ban of WEEE from landfill, there must be a strong stance (from an educational and practical point of view) towards the identification and implementation of WEEE initiatives to ensure that no WEEE ends up at this new site.

As part of local municipalities’ obligations of providing waste management services, supported by the district municipality, they are also responsible for promoting recycling (including encouraging separation at source), creating public awareness, managing data on waste volumes, and facilitating local solutions for the public such as drop-off centres. The district and all four local municipalities have developed IWMPs which are intended to assist sustain and improve waste management in the district. These IWMPs also contain specific strategies of how municipalities can collect, minimise, reuse, recycle and recover waste, how waste should be treated and disposed of, and even provide targets and initiatives for the minimisation, reuse, recovery and recycling of waste. However, in all these IWMPs, there is limited information or data on WEEE volumes or suggestions on specific initiatives to support the WEEE industry. The outcomes of the iLembe Landscape Report should be used to assist local government to boost their current IWMPs through including WEEE, which must then also be translated in municipal IDPs.

Additionally, local government is also responsible for the development and enforcement of local by-laws, with the support of the district municipality. Specifically, integrated waste management by-laws provide regulations for a range of waste management services such as collection and removal of waste, operation of garden sites, obligations for hazardous and industrial waste, and to encourage recycling of waste. The table below indicates the status of municipal integrated waste management by-laws in iLembe.

### Table 3: Status of Integrated Waste Management By-Laws in iLembe

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Waste Management By-Law Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>iLembe District Municipality</td>
<td>No by-laws in place. By-laws to be implemented before construction and operation of a regional landfill site.</td>
</tr>
<tr>
<td>KwaDukuza Local Municipality</td>
<td>By-laws have been drafted in 2022 but have not been gazetted.</td>
</tr>
<tr>
<td>Mandeni Local Municipality</td>
<td>By-laws were gazetted in 2010 and reviewed in 2015.</td>
</tr>
<tr>
<td>Ndwedwe Local Municipality</td>
<td>No waste management by-laws existed for NLM at the time of this report.</td>
</tr>
<tr>
<td>Maphumulo Local Municipality</td>
<td>By-laws have been drafted. It is not yet clear when they were drafted and if they have been gazetted.</td>
</tr>
</tbody>
</table>

While most of the by-laws provide some framework for collection, recovery, recycling and disposal of waste, they do not make any specific reference to WEEE. In addition, capacity to enforce by-laws has been raised as a major challenge in most municipalities. Given that WEEE has been banned from landfill (requiring new solutions for WEEE management) and that accredited/licenced service providers are required to handle and treat WEEE, a stronger focus needs to be given to WEEE in local by-laws. The iLembe Policy Summary Report, a supporting deliverable as part of the iLembe WEEE project, provided some recommendations as to how by-laws can be harmonised in iLembe.
They are:

- Waste by-laws should ensure that WEEE is specifically defined and managed separately from other hazardous or industrial waste.
- Waste by-laws should explicitly state that WEEE is banned from entering any South African landfill and provide guidance as to the routes that any generators of waste can take to correctly divert their WEEE (as per below).
- Waste by-laws should include a separate clause that deals specifically with the processes to be followed by all generators of WEEE including guidance around how to avoid, reduce, reuse, and recycle WEEE.
- Waste by-laws should enforce collection and reporting of WEEE volumes by those generators of WEEE that are required as per the EPR regulation related National Environmental Management: Waste Act (NEM:WA 59 of 2008) requirements.
- Waste by-laws must provide clear guidance as to how and by whom the above recommendations will be enforced.
- Finally, once WEEE has been incorporated as per the above, waste-by laws must be gazetted and enforced.

Some relevant recycling programmes and/or projects have been implemented by iDM which include on-going waste awareness campaigns, and waste recycling initiatives, however, none of these have a focus on WEEE. Within the KDM, there are a few initiatives relating to the separation and collection of recycle materials (paper and plastic), while as noted earlier, a drop-off centre has recently been developed at the transfer station and begun operation in August 2022. Households can use this site to drop off recycling materials, and the KDM intends to include WEEE as one of the materials that is collected in the future. Additionally, engagements with the district and local municipalities also indicated that a site has been identified for a transfer station/drop-off facility in NLM, while a site is being sought in MLM. Within the MLM, an office paper recycling initiative has been implemented. Within both the NLM and MLM however, there are no recycling initiatives as both municipalities have insufficient resources (which includes skilled staff, finances, infrastructure and equipment) to initiate recycling projects (iLembe District Municipality, 2019).

The IWMPs highlight some of the common challenges that have been facing both the district and all local municipalities in both delivering waste management services and in driving recycling initiatives:

- Lack of budget and infrastructure to expand projects and initiatives.
- Lack of capacity and technical skills to implement recycling initiatives.
- Lack of awareness and responsibility of residents to implement initiatives.
- Data on recycling volumes are unknown (iLembe District Municipality, 2019)

It is clear that more needs to be done within the district to not only encourage recycling, but to create awareness around WEEE and the recycling of WEEE. The proposed drop-off/buy-back centres in KDM, NLM and MLM are likely to be the best possible facilities to support the collection of WEEE and to create awareness.
5.3.4 Development Agencies and Business Chambers

Enterprise iLembe is the district economic development agency that is responsible for supporting local government by coordinating and driving LED activities, packaging catalytic projects, and marketing and promoting the district as an investment destination. Through this, they implement projects on behalf of government and in partnership with private sector. Although they currently do not have a focus on recycling, in a recent strategic board session, they identified recycling and renewable energy as a priority sectors.

The iLembe Chamber of Commerce, Industry and Tourism represents the collective voice of business in iLembe, including WEEE producers, collectors, and recyclers, and lobby and advocate on behalf of businesses. As part of this role, they can assist to create awareness around WEEE in iLembe and encourage businesses to support and drive WEEE recycling initiatives in iLembe. The chamber currently runs ‘The Entrepreneur Programme’ as a business accelerator, which in 2019, was officially accredited as a short course through UKZN’s Graduate School of Business and Leadership. Through this programme, support has been provided to some waste recyclers. Although the programme does not specifically support WEEE recyclers, recyclers who are active in the area have been provided with mentorship by established recycling companies in the region. Additionally, the chamber, in partnership with the iLembe Business Cluster, were responsible for initiating the Isithebe Waste Beneficiation and Linkages Survey (see 5.2.2.2).

5.3.5 PROs

PROs are responsible for the implementation of the EPR scheme on behalf of producer defined members, including supporting integration of the informal sector, and reporting to the DFFE on the EPR scheme regarding the collection and recycling rates verifiably achieved. They are also responsible for supporting the DFFE in the creation of public education materials and supporting SETA in the development of accredited training curricula. There are currently a number of PROs with a WEEE focus, namely eWASA, ERA, Lightcycle, R2E2, and Circular Energy KZN.

PROs have raised concerns about the current EPR scheme and its regulations. Firstly, it was noted that producers don’t want to be part of EPR because they have to increase their prices to include compliance, which will price them out of the market when compared to a producer that does not comply. There is also uncertainty about the levy contribution, which is calculated per kilogram produced, which for some producers, is an excessive amount. As such, uptake has been slow. Most PROs agree that the DFFE is not indicating a strong intention to implement and drive or actually enforce the regulations related to the EPR scheme. They also noted the DFFE missed the deadline to respond around confirmation of the EPR fees, which has been causing further hesitancy, especially from larger producers, who until recently refused to pay any PRO contribution in the absence of guidance from government.
5.3.6 Informal Sector Representation

Waste pickers in the informal sector are represented by ARO and SAWPA. ARO is mainly active in the Gauteng region, but are also driving a pilot project in Buffalo City. Although SAWPA is represented in all 9 provinces, representation within the iLembe region is limited. As part of the DFFE and DSI's Waste Picker Integration Guidelines for South Africa, ARO and SAWPA have received funding to be able to assist government to undertake a national waste picker registration process. This is intended to create a database of waste pickers, who will then be remunerated by the PROs as part of the paper and packaging industry EPR scheme.

Both these organisations acknowledge that WEEE only plays a small part in the volumes collected by waste pickers, and that challenges such as cherry-picking value fractions are common in the WEEE industry. Both organisations also highlighted that a lack of markets for WEEE is a challenge being faced by waste pickers and that this is likely the reason that cherry picking is occurring. Some guidance provided by these organisations in relation to waste pickers in the WEEE industry are:

- Any project or initiative must be in accordance and full alignment with the principles outlined in the National Waste Picker Guidelines.
- Infrastructure is required to accommodate the informal sector, including access to a safe space to dismantle and store their goods, within close proximity to buyer markets.
- Informal collectors need more direct access to WEEE processors as there are too many middlemen in the value chain so there is no real financial incentive.

Groundwork is an environmental justice organisation that works with vulnerable people, including waste pickers. Asiye eTafuleni, although based in eThekwini and focussed on Durban’s inner-city, work both locally and globally around inclusive planning and design in integrating waste collectors. Both organisations are currently working on the Warwick Zero Waste project that aims to create a case study which can be replicated in other marketplaces in Africa. Both organisations have a close relationship with waste pickers in KZN and provided valuable insight into better understanding the role of waste pickers in the WEEE industry. Asiye eTafuleni noted that within the Warwick area, there is an informal electronics market that has been established as a result of WEEE being repaired by waste pickers and other entrepreneurs, and that a similar opportunity could be considered for iLembe.

5.3.7 Academia and Research Institutes

Academia and research institutes within the province play an important role within the WEEE industry. The CSIR has had a central role in driving research around waste management and recycling by issuing university-based research grants for academic research contributions supporting the development of the Waste Roadmap. The CSIR is also supporting the process of integrating waste pickers through registration on the national registration database, specifically around defining and introducing the technology elements that will enable waste pickers to be remunerated. Specific to WEEE, CSIR can continue to define the required WEEE research areas and provide grant funding for academic institutions.

Universities such as the University of KwaZulu-Natal (UKZN) and DUT, although having little role in the WEEE industry to date, are instrumental in encouraging research within the WEEE industry in KZN and iLembe. DUT was responsible for undertaking the Istimhe Waste Beneficiation and Linkage Survey. The study identified numerous opportunities for how to enhance the on-site beneficiation of waste at the estate through an analysis of the waste streams of a selection of surveyed industrialists. The Umfolozi TVET college currently offers a recycling course. Additionally, UKZN have entered into an agreement with EWaste Africa in relation to the construction of a prototype rare earth metals recycling facility in Pietermaritzburg. A pilot plant was constructed and operated by UKZN and used to refine the technical knowledge required to operate the facility.

5.3.8 Donor Funders

SECO is currently funding the SRI Programme in South Africa and Vuthela LED Programme in iLembe. As part of these programmes, the SRI iLembe local component is providing support to the district and local municipalities to identify opportunities to grow and support the iLembe WEEE industry.
6 Implications for iLembe

6.1 Key Challenges

This section summarises the key challenges that have been identified in the landscape report. These challenges are used to assist identify opportunity areas for the iLembe WEEE industry in Section 6.2.

Legislation at both the national and local government level has been described as a challenge in the WEEE industry. The recent ban on WEEE to landfill, although a positive move for the country, has raised concern with both provincial and local government stakeholders as there has been little guidance or direction from the DFFE about what this means for district and local municipalities, and what can be done to support this, and how EDTEA can support local government. Another challenge is that current asset management legislation inhibits WEEE from being released from government stockpiles into the local market. The Vuthela LED Municipal WEEE Asset Disposal Project seeks to address this challenge.

Municipal waste management is a challenge within the district; only a third of households receive a weekly waste collection service, while 48% of households use their ‘own refuse dump’. There is limited municipally-run waste collection, with this function largely contracted out to DCWM. There is also no public landfill site, with most waste going to the DCLM landfill site or to landfills in neighbouring municipalities. As such, data on waste volumes is in the hands of the private sector and municipal recycling initiatives are limited within the district. Challenges being experienced in relation to municipal recycling include a lack of budget and infrastructure to expand initiatives; a lack of capacity and technical skills to implement recycling initiatives; and a lack of awareness and responsibility of residents to support initiatives.

An assessment of municipal plans and by-laws in iLembe has highlighted that there is limited knowledge about the WEEE industry. Within the IWMPs, there is little mention of WEEE as a waste stream, little or no data on WEEE volumes, and no specific initiatives or projects to support the WEEE industry. While most of the available integrated waste management by-laws, provide a good framework, they do not make any specific reference to the collection, recovery, recycling and disposal of WEEE. In addition, capacity to enforce by-laws has been raised as a major challenge in most municipalities.

The WEEE recycling industry in iLembe is well structured with the presence of a few major recycling businesses who have a national footprint and linkages to global markets. However, there is limited public awareness about WEEE, especially amongst households, and limited sites where households can dispose of WEEE. As such, WEEE is either stored or ends up in municipal refuse bags and goes to landfill. This limits the potential volumes of WEEE that could be recovered for recycling. There is also little data available on the types and volumes of WEEE are generated by households and businesses, and what is being collected, recycled and/or landfilled.

Another challenge facing the industry relates to WEEE fractions. There is an increasing interest in high value fractions such as metals, but due to the high cost of licencing to be compliant, this has led to an increase in unlicenced recyclers and scrap dealer accepting WEEE. They often dismantle the WEEE, cherry-pick and sell the valuable fractions, and then dump or send the remaining low value fractions to landfill. Finally, the industry in iLembe is losing out on potential opportunities for local beneficiation, as most WEEE fractions are being exported to outside of the region while certain fractions are being landfilled.

Informal waste pickers are currently underrepresented in iLembe, and little is known about their role in recovering WEEE. The biggest challenge waste pickers face in the WEEE industry is a lack of access to markets. When waste pickers access WEEE, they generally strip down the product, extract the valuable fractions (mainly metal), sell this to a scrap metal dealer, and dump the remainder of the WEEE. This creates health risks to both the waste pickers and the environment, and additional litter in public spaces. Education of waste pickers is a key challenge, as they are generally not aware of the potential value of selling complete WEEE products rather than dismantling. WEEE recyclers in iLembe try to encourage this, but many waste pickers prefer to strip items to sell valuable fractions to the easiest and quickest buyer. It has also been raised that certain scrap yards are acting illegally by purchasing burnt copper from copper cables, which is against the law and encourages theft in the informal economy. Recyclers have noticed that this trend is on the rise in iLembe. Finally, another challenge is positioning the role of waste pickers in the WEEE
value chain. Although waste pickers collect WEEE, albeit in an ad hoc fashion, there are issues around data security for ICT equipment and the hazardous nature of WEEE unless completely depolluted.

Finally, there are a number of challenges being faced in relation to the EPR scheme. There is currently reluctance from producers to join PROs, firstly because the increased cost to comply might price producers out the market compared to non-compliant producers and secondly because large producers fear that EPR fees will be excessive. This is being worsened by DFFE’s perceived lack of intention to implement the EPR regulations, having missed the deadline in the past to respond to EPR pricing fee proposals of all PROs.

### 6.2 Identification of Opportunities

In light of the challenges being experienced, this section presents possible opportunity areas to enhance the WEEE industry in iLembe. These opportunities are largely based on the key findings and above challenges that emerged from the stakeholder engagement process.

The WEEE value chain diagram presented below provides a visual identification of the areas where there are operational, technical and/or administrative gaps in WEEE management reported by stakeholders. These present opportunities for SRI collaboration and multi-stakeholder partnerships. These opportunities are aligned with existing programmes or projects that are readily driven by certain key stakeholders in the iLembe region.

*Figure 3: Areas of potential opportunity for WEEE industry development in iLembe*

The potential project opportunities that have been identified by stakeholders within the wider iLembe WEEE landscape as pictured are:

1. Enhancing WEEE awareness to encourage greater release of WEEE
2. Supporting integration of waste pickers to ensure compliance and safety
3. Improving WEEE collection through exploring new collection mechanisms
4. Identifying SMME growth and development opportunities within the WEEE industry
5. Investigating local WEEE beneficiation opportunities
6. Ensuring harmonisation of policy and release of government WEEE
6.2.1 WEEE Awareness

Most stakeholders noted that in iLembe there is a general lack of public awareness regarding the potential negative environmental, health and safety implications of mismanaged WEEE. The recent ban of all WEEE to landfill nationwide has added to the growing confusion of stakeholders as to how to correctly dispose of WEEE going forward. There is a dire need for households and businesses in iLembe to know which service providers and locations can be trusted to safely receive and manage WEEE according to the legally-prescribed integrated waste management principles. With this current lack of essential knowledge regarding correct end-of-life practices, recyclers pointed out that volumes for formal WEEE recycling in iLembe are reduced and publicly-generated WEEE ends up in landfill or gets dumped after high-value fractions have been cherry-picked.

Greater awareness is required to enhance public knowledge around WEEE recycling and to highlight the required role the end consumer has in ensuring that WEEE is correctly and safely recovered for treatment and/or refurbishment. It is expected that this would increase the volumes of WEEE that are voluntarily handed over to accredited collectors and/or recyclers as well as deposited at municipal drop-off centres. Ultimately, more WEEE released and available for recycling or refurbishment rather than stockpiled at home, sent to landfill or dumped, will provide greater opportunities for structured SMME development in the WEEE value chain.

6.2.2 Waste Picker Integration

It is unknown if there are any waste pickers operating in iLembe who exclusively specialise in WEEE. The general consensus amongst interviewed stakeholders is that when WEEE is encountered by a waste picker, it is stripped for valuable fractions (such as metal or PCBs), and then sold to recyclers or scrap metal dealers. Greater value could be passed on to the waste pickers if they sold complete WEEE products to certified recyclers, rather than stripping or dismantling these products informally; however there is a lack of awareness of this by waste pickers.

Conversely, certain stakeholders in the industry feel that the potential role of waste pickers in the WEEE collection space is limited, mainly due to issues around data security (particularly in relation to ICT equipment) and the fact that WEEE is classified as a hazardous type of waste unless completely depolluted. Regardless of the above, given that waste pickers are at the coalface of waste management in South Africa, they will inevitably continue to reclaim WEEE as part of their collection processes.

In light of the recently enforced EPR regulations, there are clearly defined requirements from producers, via the instructed PROs, to demonstrate successful and meaningful waste picker integration in accordance with the recently released waste picker integration guidelines (DFFE, 2020). In line with the paper and packaging industry EPR, the CSIR has embarked on a nationwide registration drive of informal collectors/reclaimers, supported by ARO and SAWPA.

With EPR for the WEEE industry having been enacted, waste picker integration within the WEEE industry needs to be considered. Stakeholders must prioritise waste picker education to ensure that WEEE is correctly disposed of. This will not only assist to reduce issues of data privacy and negative impacts to the health of waste pickers and the environment, but also increase the value that waste pickers can receive by selling complete WEEE items.
6.2.3 WEEE Collection

WEEE recyclers in iLembe have indicated that one of the greatest challenges within the region is access to WEEE within households; this is largely due to a limited awareness about what WEEE is, and how to correctly dispose of WEEE.

Recyclers have indicated that they have been fairly successful in unlocking WEEE volumes via collection days that are organised in collaboration with schools and shopping centres. As such, there is an opportunity to leverage such collection mechanisms via greater collaboration within the district. Additionally, municipal facilities such as drop-off and buy-back centres (including transfer stations), can be adapted to receive WEEE to provide further mechanisms for households and businesses to correctly dispose of WEEE. Through all this, there is a need for greater coordination between collectors and recyclers around the capturing of WEEE data within the district.

The opportunity for improving collection goes hand-in-hand with the creation of awareness around WEEE, and simultaneously, will assist to release volumes of WEEE that are currently being stockpiled by both households and businesses. The SRI programme will be initiating further research, which will include a survey of households and businesses, in order to identify stockpiles of WEEE as well as preferred collection methods.

6.2.4 SMME Opportunities

There is an evident lack of SMME development within the iLembe WEEE value chain. WEEE consolidation, treatment and disposal locations are not available beyond the premises of formal WEEE recyclers. Additionally, informal sector organisations such as ARO and SAWPA have highlighted the need for government and the private sector to create (with support from EPR funds, and the now legally required integration measures) spaces where value materials collected (packaging waste included) can be safely consolidated and further processed to create value add and better/more income opportunities for entrepreneurs. This requires a model of developing product innovation and beneficiation spaces as an extension of traditional collection and sorting activities typical for the informal waste sector. In addition, international SRI-related pilot projects have had promising starts in places such as India⁹, equally testing the viability of co-working spaces centred around the better and more inclusive management of WEEE.

As such, there is an opportunity within iLembe to support the further growth and development of SMMEs, including integration of informal collectors. To support the need for greater WEEE collection in the region, existing small waste collectors or recycling companies should be encouraged and upskilled to include WEEE as a waste stream. In addition, small-scale facilities where households and businesses can drop off WEEE, and where refurbishment and dismantling of WEEE can occur, would further enable the release of WEEE in iLembe. Such spaces should allow for temporary consolidation and safe storage of large enough amounts of dismantled value fractions derived from WEEE (and safe containments for any residuals requiring landfilling) before these materials can be channelled into the WEEE value chain partners downstream (e.g., recyclers, scrap dealers).

Such opportunities will require strong collaboration between existing small and medium collectors, WEEE recyclers, the iLembe Chamber of Commerce, Enterprise iLembe, and PROs (who via the EPR regulations are required to ensure integration of waste pickers and WEEE industry development).

⁹ https://www.ecowork.international/
6.2.5 Local Beneficiation of WEEE

Currently there is very limited value retention and no real value add within the WEEE industry in iLembe, with scrap metal sent to scrap dealers, PCBs being pre-processed and exported, and other waste streams (e.g., recyclable plastic) going to recyclers outside of iLembe. There is an opportunity to explore how more high-value fractions can be retained and value extracted to locally benefit iLembe. There is scope for local beneficiation of WEEE materials that are currently either being blended, exported or simply landfilled, but this requires a deeper investigation into the materials that are being exported and landfilled to identify the opportunities for local beneficiation.

As such, stakeholders within the WEEE industry in iLembe should be encouraged to collaborate to explore future potential beneficiation opportunities. Collaboration models could build on the growing pool of existing research (e.g., through various universities some with CSIR research grants such as the University of Cape Town, Stellenbosch University, UKZN, and the University of Johannesburg) in this field. Existing processes such as small rotary smelting technology for PCB treatment, cable granulation, and high-value plastics recovery could be explored.

6.2.6 Municipal Policies and Asset Release

As part of concurrent projects being done by the SRI iLembe team, a review of WEEE management-related policies and by-laws and a municipal asset disposal pilot study have been completed. Assessment of policies and by-laws has highlighted the need for the harmonisation of such documents to optimally align with the future National WEEE policy. On a practical level, harmonisation is required to encourage and enforce the diversion of WEEE from landfill, and to provide strategies, programmes and projects that support growth and development of the WEEE industry. The municipal asset disposal pilot study highlighted the need for changes in current government legislation and in-house management protocols to release WEEE from government stockpiles.

The creation of toolkits on harmonisation of policies and by-laws and municipal asset disposal are currently being developed as part of the SRI iLembe project.
7 Conclusion

This iLembe Landscape Report is one of the main local deliverables of the SRI Programme (Phase II) South African project. The report includes a mapping of the local iLembe WEEE landscape with a focus on the stakeholders within the iLembe WEEE industry. It outlines their roles and responsibilities, relevant programmes and projects, challenges being experienced, and potential opportunity areas to drive local development and strengthening of the WEEE industry along the entire value chain, reaching across all stakeholders.

There are a range of stakeholders that have a role in the development of the WEEE industry in iLembe, ranging from consumers who require a responsible and safe end-of-life management solution for their WEEE to all operators in the processing chain and regulatory authorities who create a conducive environment to do so. While the industry is complex and faces a number of key challenges, there are numerous opportunities to support and grow the industry in iLembe.

WEEE is generated by households, businesses and institutions within iLembe. Formal waste collection is limited at a household level, with only a third of households receiving a weekly collection service and almost half of households using their ‘own refuse dump’. Recyclable waste, including WEEE, is separated from some of the refuse that is formally collected from households, but it is understood that most household WEEE is either stockpiled or ends up at landfill. The latter is particularly problematic since all disposal of WEEE is now banned by the DFFE, as of 23 August 2021.

Formal collection of WEEE from businesses and institutions is generally more structured, and either occurs through waste management companies, other SMME collectors (often referred to as recyclers), or directly through dedicated WEEE recycling companies. The release of WEEE through government is currently inhibited by asset management legislation and is generally being stockpiled. As such, the creation of awareness, improved WEEE collection mechanisms, and the release of government assets are all opportunities that will assist to release greater volumes of WEEE for treatment in iLembe.

Informal waste pickers are active within the iLembe District and currently collect WEEE as and when the opportunity arises. WEEE is usually dismantled manually and stripped for the high-value fractions, with the remaining low-value (and often hazardous) fractions being dumped ad hoc. To adhere to EPR regulations, to enhance waste picker integration, and to create greater value for waste pickers, more needs to be done in order to educate waste pickers about the correct process of recovering WEEE (i.e. selling complete WEEE items to licenced recyclers rather than informally dismantling) to avoid issues of data privacy and negative impacts to the health of waste pickers and the environment. The EPR system will be crucial for recyclers to create a financial incentive by offering a premium to waste pickers for whole equipment rather than selected components.

Dedicated WEEE recyclers in iLembe refurbish, dismantle, and pre-process WEEE. Recyclers refurbish WEEE, where items are sold to back to consumers, and all recyclers do some form of dismantling, where materials are separated and then consolidated and sold to end markets. Some pre-processing takes place, where complex WEEE components are processed (i.e., crushed), separated from each other and consolidated, and mainly exported for processing at smelters in global markets. Opportunities for future beneficiation of local WEEE fractions, particularly fractions that are not being recycled, need to be explored within the iLembe region.
As a way forward, a collaborative partnership mechanism between key WEEE stakeholders in iLembe will be developed to support institutionalisation of the SRI programme. This mechanism will allow for the opportunities identified within the iLembe WEEE industry to be collectively explored, and for viable projects and interventions to be implemented through partnerships. This will assist to achieve greater horizontal integration of the WEEE industry in the region and aid in creating a more level playing field that offers safe entry level opportunities for SMME operations, especially in the collection and dismantling space. Opportunity areas to be explored through this partnership in iLembe are:

1. Enhancing WEEE awareness to encourage greater release of WEEE
2. Supporting integration of waste pickers to ensure compliance and safety
3. Improving WEEE collection through exploring new collection mechanisms
4. Identifying SMME growth and development opportunities within the WEEE industry
5. Investigating local WEEE beneficiation opportunities
6. Ensuring harmonisation of policy and release of government WEEE
8 Bibliography


## Annexures

### Annexure 1: Stakeholders Engaged

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