Ministry of Foreign Affairs

Pre-PPS Fact Finding Study on Waste Management and Circular Economy in Accra

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PRE-PPS FACT FINDING STUDY ON WASTE MANAGEMENT AND CIRCULAR ECONOMY IN ACCRA

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Pre-PPS Fact Finding Study on Waste Management and Circular Economy in Accra, Ghana

Report

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MAPLE CONSULT
MANAGEMENT PLANNING & ENVIRONMENT

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List of Abbreviations

CE	Circular Economy
ESPA	Environmental Service Providers Association
EU	European Union
GIPC	Ghana Investment Promotion Centre
GPMA	Ghana Plastic Manufacturers Association
MESTI	Ministry of Environment Science Technology and Innovation
MMDAs	Metropolitan, Municipal and District Assemblies
MSWR	Ministry of Sanitation and Water Resources
NGOs	Non-Governmental Organisations
TIN	Tax Identification Number
UNDP	United Nations Development Programme

Plastics

HDPE	High-Density Polyethylene
LDPE	Low-Density Polyethylene
PET	Polyethylene Terephthalate
PE	Polyethylene
PP	Polypropylene
PS	Polystyrene
PVC	Polyvinyl Chloride

Executive Summary

This report represents the output of the assignment contracted to MAPLE Consult by the Embassy of the Kingdom of Netherlands to provide insight into waste management and circular economy in Ghana with the view to identifying business opportunities and potential matchmaking partners.

This report provides an overview of activities undertaken by the consultant as well as key findings from the research. At inception of the assignment the consultant's team leader held discussions with the client to provide further clarifications on various aspects of the assignment. The consultant's team held an in-house start-up planning meeting. This was followed by desk review and consultations and engagement with key businesses and stakeholders in waste management and circular economy.

While the concept of circular economy is not explicitly stated in the waste management policy of Ghana, the idea materials-in-transition (MINT) is embedded in the National Environmental Sanitation Strategic Action Plan (NESSAP). Waste management remains largely a linear economy in Ghana. With current interests and transformations towards recycling and circular economy, there is gradually an increasing group of local business involved in different aspects of the waste recover economy. Except for a few large companies, most of these businesses remain at the SME level. These businesses and innovations present opportunities around which various partnerships could be built.
This report has identified some firms leading in different aspects of circular economy that could be partners for matchmaking. The key interest for these firms is with technology transfer, support for expansion. It is was however noted that technology needs to be appropriate for the local environment while the cost of investment for the technologies should be affordable for the local market.

There is policy support for plastic recovery and recycling through the Ghana Plastic Waste Policy launched at the end of 2019. With the rising interest in circular economy a number of initiatives and partnerships have been identified that could provide points of engagement for businesses. These include the waste recovery platform that brings together key stakeholders in the circular economy space.

The finance tracking showed that there are some commitments made for waste management at the MMDA level. these commitments however do not cover capital investment. Large investments are made on behalf of MMDAs by the central government which also pays for some of the services directly to the contractors.

Government programmes such as the one district one factory and one region one industrial park which is led by the Ministry of Trade and Industry may provide anchor points for some of the initiatives and partnerships. However, it is important to still have collaborative relationships with the key ministries responsible for sanitation and environment. In addition key ministries that will make use of the end products such agriculture (for compost, feed and planting media) an energy (for waste to energy) need to be made a part of the conversation to promote receptive for products

of waste recovery as well as incentives to make the investments in waste recovery and circular economy worthwhile.

1 Introduction

1 Introduction

This report presents the finding of a study conducted by MAPLE Consult in November 2020 to assess the waste management and circular economy sector in the Greater Accra corridor. This study builds upon earlier market survey[1] and study on circular economy in Ghana conducted in 2019. This study identifies key opportunities and partners for collaboration in waste management and circular economy in the Greater Accra Region.

1.1 Objectives and Scope of Assignment

The objective of the assignment is to contribute to the Pre-PPS Fact Finding Study on Waste Management and Circular Economy in Accra. The assignment was expected to cover the following activities:

1. Research on the effects of COVID on waste management, prognosis into the future (including when it will be safe to travel to Ghana for a Dutch delegation)
2. Investigation of viable business opportunities and partnerships for the sector
3. finance tracking in the waste/CE sector
4. Making an inventory of trustworthy organizations and companies in Ghana (especially Accra/Tema) with an interest and capability to work together with Dutch counterparts (including, if applicable, cooperation opportunities with Nigeria)
5. Research into the current status of bilateral and multilateral cooperation initiatives in waste/CE (as mentioned in the market study plus possible additional ones)
6. Research into financing options (multi/bilateral institutions, investors, banks etc.)
7. Inventory of relevant events and networks in waste and circular economy where Dutch companies and organizations could present themselves
8. Inventory of relevant innovation and current initiatives in the sector
9. Follow-up research on specific questions of Dutch entrepreneurs in waste/CE with an expressed interest in doing business in Ghana.
10. Additionally, the consultant cooperates with MetaSus to draft the presentation for the workshop on waste/CE opportunities in Ghana and Nigeria, and (if possible) co-presents the findings in the workshop.

1.2 Approach and Methodology

The approach and methodology adopted by the consultant is described below:

As part of the inception activities, the consultant had a call with Mr. Bert Keesman on the project and Madam Janet Arthur on the expectations of the project. In addition, we undertook a review of selected documents. This review included the following documents

- Market Survey Waste and Circular Economy in Ghana, 2019

[1] Netherlands Enterprise Agency (2019). Market Survey Waste and Circular Economy in Ghana. Report by Bert Keesman for the Dutch Ministry of Economic Affairs and Climate Policy

- National Environmental Sanitation Policy, 2010
- National Plastic Waste Policy
- National Solid Waste Management Model and Strategy
- MMDAs Composite Budget from Ministry of Finance
- District Assemblies Common Fund annual report
- Research on Waste Management in Accra and Ghana

Beyond the desk review, the consultant engaged with a number of sector stakeholder virtually/by phone and in-person. The list of stakeholders engaged during this study is provided in Appendix 1.

1.3 Reporting

Structure of Report. This report is structured into 11 Chapters.

- Chapter 2: provides information on the effects of COVID-19 on the waste sector, measure taken, and the opportunities presented, including future forecast.
- Chapter 3: gives recommendations on viable business opportunities for partnerships in the sector
- Chapter 4: provides a report on finance tracking in the sector and opportunities for the Dutch sector
- Chapter 5: gives list of at least 25 trustworthy candidates for matchmaking in Ghana (especially the Accra / Tema area) (public utilities, companies, individuals), including their contact data and short write-ups on their interests in cooperation and/or business (including, if applicable, cooperation opportunities with Nigeria)
- Chapter 6: A list of multilateral and bilateral cooperation initiatives in waste/CE in Ghana (ongoing and planned) incl. contact persons
- Chapter 7: A list of financing options for environmental improvement projects
- Chapter 8: A list of expected relevant events and networks in waste/CE in Ghana
- Chapter 9: A list of relevant innovation initiatives in the sector
- Chapter 10: Answers to questions of Dutch waste/CE entrepreneurs
- Chapter 11: Conclusions and recommendations

2 IMPACT OF COVID ON WASTE MANAGEMENT

2 Impact of COVID-19 on Waste Management Sector

This chapter presents findings from the review of the impact of COVID-19 on the waste management sector. The focus of the assessment of the impact on COVID-19 on the waste management sector will be on the private service providers and actors in the recycling space.

2.1 COVID-19 in Ghana

Ghana recorded its first COVID-19 case on the 12th of March 2020. This development prompted the establishment of an inter-ministerial committee to prepare a coronavirus response programme. Ghana's COVID-19 response was to achieve five key objectives: limit and stop the importation of the virus; contain its spread; provide adequate care for the sick; limit the impact of the virus on social and economic life; and inspire the expansion of our domestic capabilities and deepen the country's self-reliance. To finance Ghana's coronavirus preparedness and response plan, the cedi equivalent of US$100 million was earmarked for the purpose.

In the immediate aftermath of the first confirmed case in the country, a series of interventions were instituted to curb the spread of the virus in the country. These included the closure of all external borders, the shutdown of schools, a ban on all public gatherings (including conferences, workshops, funerals, festivals, political rallies, sporting events and religious activities). Also, markets and other public spaces were disinfected, enhanced contact tracing was conducted in "hotspot" communities, and a partial lockdown and restriction on movement were imposed on the residents of people in the Greater Accra and Ashanti Regions of Ghana.

Ghana Coronavirus Case Update (as of November 29, 2020)	
Total Confirmed Cases	**51,379**
Recovered	**50,298**
Current Active Cases	**758**
Deaths	**323**
Source: https://www.worldometers.info/coronavirus/#countries	

At present, it would appear the interventions of the Government has paid off as Ghana's case count dropped from the tens of thousands to the hundreds. The attention of the Government has now shifted to reviving the economy by providing stimulus packages to businesses, all while still cautioning residents in the country to continue to adhere to the COVID-19 safety protocols in order not to erode the gains made by the country.

2.2 The Impact of COVID-19 on the Waste Sector in Ghana

Waste management was considered to be one of the essential services during the lockdown period and staff of the waste management companies were allowed to work given that waste generation is continuous even during the pandemic. However, the Waste Management Sector,

much like the entire Ghanaian economy, has been severely affected by the COVID-19 pandemic. According to the results of a COVID-19 Business Tracker Survey carried out by the Ghana Statistical Service (GSS), in collaboration with UNDP and the World Bank, companies in Ghana are experiencing lower demand for their products, difficulties in accessing finance and sourcing inputs, and face an extended period of uncertainty. This development has forced many firms to cut costs by reducing staff hours, lower wages, and in some cases laying off workers. Companies also had to make additional investments to provide protective gear and equipment for their staff.

To assess the extent to which the pandemic has impacted the waste sector in Ghana, we adopted a two-pronged approach- an extensive desk review and interviews with key stakeholders in the waste sector which included ESPA, waste management contractors and businesses, government agencies, and development partners.

Although most of the findings point to the negative repercussions that the pandemic has had on businesses, some state actors interviewed believe that the pandemic was a "blessing in disguise". This is because the lockdown period exposed the precarious state of waste management in Accra and promoted state agencies to launch massive clean-up exercises. Companies such as Zoomlion led by providing a lot of support to the government on clean ups and fumigation of public spaces such as markets as well as public institutions. Currently, the waste management situation has almost reversed back to pre-lockdown status with the lifting of the lockdown. However, this development has brought on a sense of urgency with regards to finding a more sustainable approach to waste management in the country.

We present below are our findings on the effects of the COVID-19 pandemic on the Waste Sector in Ghana. The findings have been summarised into five (5) key points as follows:

1. The increase in household waste generation: The Government imposed a lockdown on the residents of the Greater Accra Region and parts of the Central and Ashanti Regions from the 28th of March 2020 to the 19th of April 2020. With people staying in their homes for most of the period, it increased the quantity of waste generated by households. In a bid to stay safe from the coronavirus, household plastic waste generation also increased due to the purchases of hand sanitisers, disinfectants, gloves, disposable nose masks, liquid soaps etc. Prior to the lockdown, the country already faced infrastructural and systematic challenges in properly disposing off its waste. The increase in household waste generation rate meant a worsening of an already precarious situation.

2. Exposure of waste collectors to COVID-19: the coronavirus also brought to the fore how waste generated is handled in Ghana. Generally, waste generated in Ghana is not segregated at source. Waste collectors faced the challenge of picking up waste from households that had cases of COVID-19 without knowing. Furthermore, the inadequate handling of medical waste meant that both potentially infectious waste such as used gloves, cough tissues, face masks, etc. are mixed with non-infectious waste. These two instances increase the exposure of waste collectors to the virus. Waste pickers at the landfills were also to the virus given the nature of waste that was sent to the landfills. Similar concerns about the non-segregation of waste in Ghana and the risk it poses to waste collectors were raised at a recently held forum of the Waste Recovery Platform. The

forum was facilitated by the UNDP and sought to identify critical issues confronting waste management actors amidst the COVID-19 pandemic. The participants called for greater awareness creation on waste segregation to encourage households to separate potentially infectious waste from other domestic waste. The participants strongly recommended a collective effort to protect frontline waste collectors through the provision of PPEs, specialised training on the handling of potentially infectious waste as well as COVID-19 testing, as some may have been already exposed due to the nature of their work.

3. Reduction in revenue: Waste management service providers complained about how the pandemic has resulted in significant drops in revenue. One of the businesses noted that they are currently generating less than 40% of their projected revenue for the year. Despite more household waste generation, people are finding it difficult to pay for waste collection because of reduced incomes. In addition, at the initial stages of the pandemic, some clients did not want the revenue collectors to access the homes but now the situation has normalized. The waste management contractors also complained about the huge reduction services from lucrative intuitional and commercial clients such as those in the education and hospitality sector who have been hard hit by the pandemic. Businesses in the sector also reported a reorganisation of their operations in line with COVID-19 safety protocols. Adhering to all the protocols has to some extent slowed their operations and reduced the amount of waste they are able to collect daily.

4. Increase in the operational expenditure of waste management businesses: The firms we interacted with reported that they had made significant investments in the area of acquiring PPEs to protect their staff from contracting the coronavirus in the line of work. Since these were unplanned expenditure, their operating capital and profit margins have been significantly affected. This highlights the need for more efficient and sustainable waste management businesses.

5. A decline in the demand of recyclable material on the international market: This was reported in the area of PET where there appears to have been a decline in the quantity of PET demanded on the international market. The situation also seems to be more severe for coloured PET. On the other hand, this development has increased the quantity of PET available for recycling locally. The capacity to recycle PET locally is however a challenge. In addition, one company noted that the government did not consider recycling an essential service during the pandemic and this affected a number of recycling companies that now had more recovered waste and were not able to recycle. Some recyclers were forced to burn their recovered waste which was considered a nuisance by some of the assemblies. A visit to the recycling site shows a lot of bottles that have been accumulated during this period. These challenges highlight the need for building more local capacity for recycling particularly for PET.

2.3 Government of Ghana Support Packages to Businesses

The Government's interventions in the wake of the COVID-19 pandemic sought to revive and support businesses in all sectors of the economy. In view of this, the Government put in place a 1.2 Billion Ghana Cedi (GHS 1,200,000,000) Coronavirus Alleviation Programme to protect jobs, livelihoods and support small businesses. Half of this amount is directed at micro, small and medium scale enterprises (MSMEs). It is however worth noting that while this package is a good initiative, it was not specifically tailored towards the peculiar needs of any sector. In particular the waste sector players have not accessed this support from the fund.

The Government of Ghana also secured a one billion dollar (USD 1,000,000,000) Rapid Credit Facility from the IMF. This facility aims to close the financing gap created as a result of shortfalls in revenues and unplanned expenditures. Furthermore, a three billion Ghana Cedi (GHS 3,000,000,000) credit and stimulus package has been sourced from commercial banks, with the support of the Bank of Ghana, to revitalise industries, especially those in the pharmaceutical, hospitality, services, and manufacturing sectors. These stimulus packages have also not necessarily been directed at the waste management sector. Most of the providers and operators in the waste management sector both formal and informal indicated that they had not benefitted from these packages.

2.4 Key Information for Dutch Delegation Travelling to Ghana

On the 1st of September 2020, the Government of Ghana announced the lifting of some travel restrictions. Key amongst them was the reopening of Kotoka International Airport to international passengers. However, the country's borders by land and sea still remain closed to human traffic until further notice. Below are travel protocols to be taken into consideration by the Dutch Delegation when planning the trip to Ghana:

- Passengers arriving in Ghana must have a negative COVID-19 Polymerase Chain Reaction (PCR) test result from an accredited laboratory in the country of origin. The test should have been done not more than seventy-two (72) hours before the scheduled departure from the country of origin. For passengers who transit through other countries before arriving in Ghana, the first country of departure will be the reference point**.**

- Disembarking passengers must be wearing face masks. Each passenger after disembarking will undergo a mandatory COVID-19 test at the airport terminal, at a fee to be borne by the passenger. The test result will be available within thirty (30) minutes. The virus testing carries a $150 fee per person. Travelers must pay the fee online before departure at https://myfrontierhealthcare.com/Home/Ghana and present proof of payment to the airline before boarding

- Passengers who test positive for COVID-19 will be handled by the health authorities for further clinical assessment and management.

- Passengers who test negative can, thereupon, enter Ghana to go about their lawful activities but are still advised to continue to observe COVID-19 safety precautions during their stay in the country.

2.4.1 Exemptions to Travel Protocols

- Children under the ages of five (5) will not be required to undergo testing at the airport.
- Passengers who arrive under emergency circumstances, such as a diverted flight, will not be required to undergo testing if they do not leave the airport or if they remain in transit such that they do not leave the hotel.
- Passengers who depart Ghana and return within one (1) week will not be required to present a negative COVID-19 PCR test result from the country of departure. A negative COVID-19 PCR test from Ghana will suffice.

2.4.2 Domestic Movement

The delegation upon satisfying all the travel protocols and arriving safely in Ghana can travel free to all parts of the country. All restrictions to public transportation (land, air and water) have been lifted. It must be noted that the wearing of face masks is mandatory in all public places, and non-compliance is punishable by law[2].

2.4.3 Other Information related to COVID-19

- ✓ Hotels and restaurants are operating with appropriate social distancing precautions.
- ✓ Nightclubs, bars, beaches, and cinemas remain closed until further notice.
- ✓ Open-air drinking establishments and Ghana's national tourist sites/attractions are open.
- ✓ Travellers exiting Ghana will undergo temperature screening before departure and will be required to comply with the COVID-19 testing requirements of their destination.
- ✓ Ga East Municipal Hospital, Ridge Hospital, and Korle Bu Teaching Hospital, Tema General, 37 Military Hospital, and University of Ghana Medical Centre Hospital have been designated as the primary COVID-19 treatment centres in the Greater Accra region.
- ✓ The Government of Ghana has set up two phone numbers for questions regarding COVID-19: +233 50 949 7700 and +233 55 843 9868. The Ghana Health Service also maintains a COVID-19 information website with useful information.

[2] Not wearing a face covering in public could result in a fine of 12,000 to 60,000 cedis, and/or a prison sentence of four to ten years

3 Viable business opportunities and partnerships for the sector

3 Businesses and Opportunities in the Waste Management Sector

The National Environmental Sanitation Strategic Action Plan (2010-2015) advocates for the policy of Materials-in-Transition. The idea of MINT according to the action plan is to promote awareness for change of attitude towards the handling and disposal of all types of waste by demonstrating that there is value in all the components of wastes. It is expected that recognising the value of waste will lead to the creation of what is referred to as "green-collar" jobs while reducing the cost of waste management. This chapter of the report highlights some of the businesses and opportunities in the waste management and circular economy sector. The first sub-section provides an update and overview of the current waste management situation in Accra.

3.1 Updates on Waste Management in Greater Accra

This assignment focuses mainly on the Greater Accra Region in Ghana. the Greater Accra Region is home to the capital Accra, particularly the Accra-Tema corridor.

Figure 1 Map of Ghana showing GAR (source: Wikipedia)

The Region has 29 MMDAs (2 Metropolitan Assemblies, 23 Municipalities and 4 District Assemblies). The Ghana Statistical Service[3] (GSS) 2020 population projections for the region is **5,055,883 persons** with females forming 51% of the population. Estimated waste generation rate is put an average of 0.71kg/cap/day (Oduro-Appiah et al, 2020). The previous market study however uses a higher estimate of 1kg/cap/day. Using the range of 0.71-1kg/cap/day puts the waste generation in the region to between 3500 to 5000 tonnes per day. Considering only the urban areas (i.e. Metropolitan and Municipal Assemblies) which is typically referred to as the Greater Accra Metropolitan Area (GAMA), the total waste generation estimates fall to between 3300 to 4700 tonnes per day. The three largest waste constituents based on the previous market survey[4] are organics 61% (between 2000 to 2800 tonnes), plastics 17% (approximately 500 to 800 tonnes) and e-waste 6%. Later in this chapter some of the opportunities related to these are identified.

Waste Management is the responsibility of the MMDAs, and a large portion of waste management is through private contractor or franchises. The private contractors have an umbrella body; the Environmental Service Providers Association (ESPA). ESPA has over 1,500 registered members both in the formal and informal space. About 50% of members operate within the Greater Accra Region.

[3] https://statsghana.gov.gh/

[44] Netherlands Enterprise Agency (2019). Market Survey Waste and Circular Economy in Ghana. Report by Bert Keesman for the Dutch Ministry of Economic Affairs and Climate Policy – page 11

While MMDAs outsource the collection of waste to the private sector, the MMDAs are expected to have the capacity to manage at least 20% of the waste generated. This is however a big challenge for most of the MMDAs especially the smaller municipalities. To solve this challenge the government initiated the Sanitation Improvement Packages (SIPs) where waste trucks and communal refuse containers to all the MMDA's including those of the greater Accra Region. This initiative is done in conjunction with the private sector. Currently Zoomlion provides the sanitation improvement package support to the MMDAs.

In total, it is estimated that about 80% of waste generated is collected. The waste collected sometimes goes through transfer stations or material recovery facilities. The final disposal for materials that are not recovered is the landfill and dumpsites. There are a number of dumpsites and semi-engineered landfill that serves Accra (see diagram below).

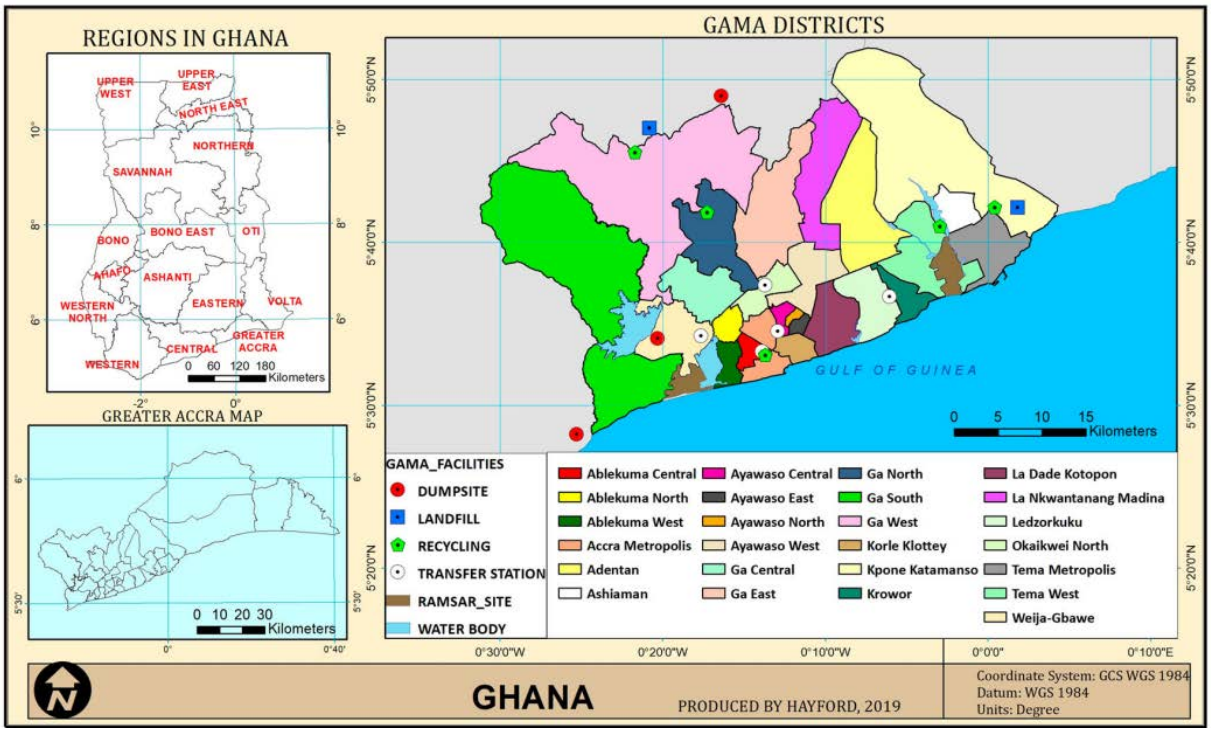


Figure 2 Map of GAMA MMDAs and Waste Management Infrastructure (source: Oduro-Appiah et al, 2020)

The only engineered landfill site within Greater Accra at Kpone is currently being decommissioned. This means that there is an urgent need for final disposal sites within the city. An interview with officials of the Ministry of Sanitation and Water Resources suggest that there are plans to provide landfill and transfer facilities as part of two projects: the Greater Accra Resilient and Integrated Development (GARID) Project and the Greater Accra Sustainable Sanitation and Livelihoods Improvement Project (GASSLIP). The private sector has a number of disposal sites that is currently being used by most of the service providers in addition to the old landfill site at Kpone which is now serving as a dumpsite for waste trucks.

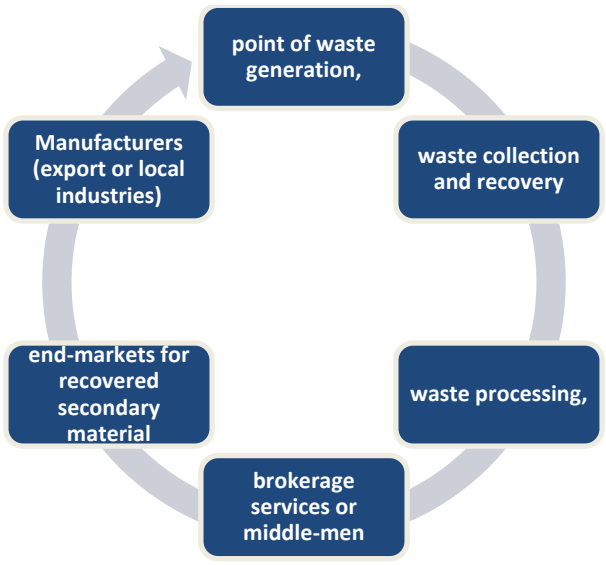
3.2 Waste Recovery and Recycling in Greater Accra

As noted by the previous market survey, waste management in Ghana has a stronger focus on collection and transport of the waste. However, in recent times, the private sector backed by government is leading the construction of several material recovery facility and recycling plants around the country. There are currently 2 facilities in Accra (IRECOP – 400 tonne capacity and ACARP – 600tonne capacity) and there are plans to expand the capacity of ACARP to 1200 tonnes per day. Interviews with the project coordinator of the GARID project also indicates that there are plans from the government to create community based buy-back centres as well as material recovery facilities at the transfer station and the landfill that are expected to be constructed. A private company Tidyup Ghana also provides a transfer station in the western part of Accra. The company has started a recycling programme that is expected to be expanded in the early part of 2021. The recent interest in the recycling plants and material recovery facilities provide opportunities for companies that have appropriate and efficient technologies to explore partnerships with the local firms.

In addition to the large formal private sector players there are a number of informal sector players as well as small scale recycling companies. Recent estimates by Oduro-Appiah et al (2020) suggest that there are about 1618 informal service providers and 646 informal recycling entrepreneurs are collecting 1370 tonnes in GAMA. The paper estimates that the collection rate of the informal sector and small companies represent 46% of municipal solid waste generated in the area. The study furthermore suggests that the informal and small-scale recyclers are able to recover 85,653 tonnes of recyclables annually. this represents a significant portion of the recyclable fraction that can be collected. The report however suggests a relatively low recycling rate of about 6.4%. This means that despite a lot of collection of waste from both formal and informal sector, there is limited recycling that is being achieved. For this research we considered the role of both formal private and informal collectives in the waste management and circular economy.

3.3 Value Chains in Waste Recovery

A number of business opportunities were identified in the 2019 Market Survey Study. This section of the report builds on these opportunities identified and reviews some of the businesses involved in these activities. In order to identify the business opportunities in waste management and circular economy, the study considered points along the value chain for waste recovery based on a review of relevant document and interviews with some of the key organisations and businesses. The Director of Sanitation at the Ministry of Sanitation and Water resources indicated that the concept of circular economy is embedded in the MINT (Materials in Transition) principle that guides the National Environmental Sanitation Strategic Action Plan. The NESSAP suggests an analysis of the value chain to identify business opportunities.



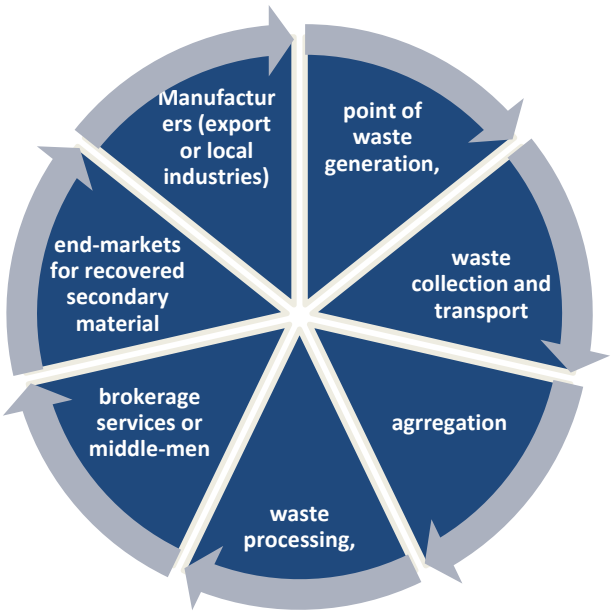
1. Waste Recovery
2. Waste Processing
3. Recycling
4. Manufacturing

The diagram above can be considered for different recyclables. In this section we will consider a number of these including plastic waste, e-waste and organics which as indicated in section 3.1 forms the largest constituents of the waste stream.

3.4 List of Potential Business opportunities

A review of resource recovery businesses by Otoo and Drechsel[5] (2018) rightly identified that may resource recovery businesses often start fully dependent on subsidies and hardly survive their pilot phase. There are however opportunities to tap into entrepreneurial initiatives and public-private partnerships (PPPs) while leveraging private capital to help realize commercial or social value for waste recovery. This idea to move the focus from treatment for waste disposal to treatment of waste as a valuable resource for safe reuse (similar to MINTing concept). Dutch partners building on their wealth of experience can offer to the Ghanaian counterparts the opportunities and partnerships to build more sustainable businesses. The 2019 market research study identifies and number of businesses and opportunities in the circular economy sector. Building on this earlier work, this study makes use of a framework developed by Otoo and Drechsel (2018) that provides guidance for assessing viable business opportunities in the resource recovery space.

[5] Otoo, M.; Drechsel, P. (Eds.) 2018. Resource recovery from waste: business models for energy, nutrient and water reuse in low- and middle-income countries. Oxon, UK: Routledge – Earthscan. 816p.



Plastic Waste Recycling Plastic waste recycling is currently widespread given the recent interest in the managing of plastics from the environment. The first stage involves the recovery of plastics from household waste (a limited number of households separate waste but there are some SMEs engaged collection that promote segregation at source.). The recovery of plastics is done either by SMEs collecting at source, workers in the waste management chain (formal and informal) who collect from the waste, itinerant waste pickers and landfill waste pickers. These pickers are often small scale and informal. These pickers then transport or sell off their waste to aggregators. These aggregators collect the waste, clean the waste and package the waste. Some of these aggregators have light machinery that is used to crush or flake the waste material. From there the waste is sold to a small-scale recycler for further processing. There are examples of these small-scale recyclers (see list in Appendix) at the “Cable and Wireless” site in Accra. Some of these small-scale recyclers are end users, i.e. they process the crushed plastic into finished products such as bowls, curtain ring and footing for chairs. e.g. Pyramid Recycling. Others also just process the crushed plastic into pellets and sell to bigger companies for processing into carrier bags and other products.

Most of the waste management and recycling companies contacted as part of this study are engaged in collection and recycling of plastic waste. As noted in the previous market survey, the plastic recycling industry is the most developed aspect of the informal circular economy in Ghana. Building efficiency and scaling up informal recycling is one of the critical needs of this sector. During the study we identified groups of informal sectors (see Appendix for list of small-scale recycler and collectors under NATUG). While informal sector workers are doing a lot when it comes to collection, their capacities for processing and recycling remains limited. Most of them process less than 6 tonnes in week. Recycling into other products, they process the plastic into pellets for sale to manufacturers. opportunity for the setting up of an industrial part for recycling or the various groups of informal sector players. Land tenure and security is an issue that was discussed with the members of NATUG. These informal sector players work in an informal industrial park, there is the opportunity to set up a more formalised industrial park for Greater Accra under the one region one industrial park initiative from the ministry of trade and industry. This industrial park will be home to thousands of informal workers and collectors engaged in recycling. The federations and associations such as NATUG are anchor organisations that could support the development of these parks working in conjunction with the AGI and the Ministry of Trade and Industry. While local flexible market is saturated, the market for rigid mono-materials has space for addition investment in local manufacturing units or aggregation of waste for export

markets. Interviews with the stakeholders however indicate that they prefer the consumption of the local plastic waste materials locally.

Companies to engage in the Plastic Recycling space include: City Waste Recycling Limited, Komenda Polymer Recycling Company, Pyramid Recycling. Environment-360, Coliba and Companies such as rePatrn collect and process plastic PET bottles for export (see chapter 5 for inventory of companies).

An interview with the Ghana Plastic Manufacturers association indicated that there is a growing interest from its members to recycle plastic PET bottles locally. A list of members provided by the president of the association is provided in section 5.2.

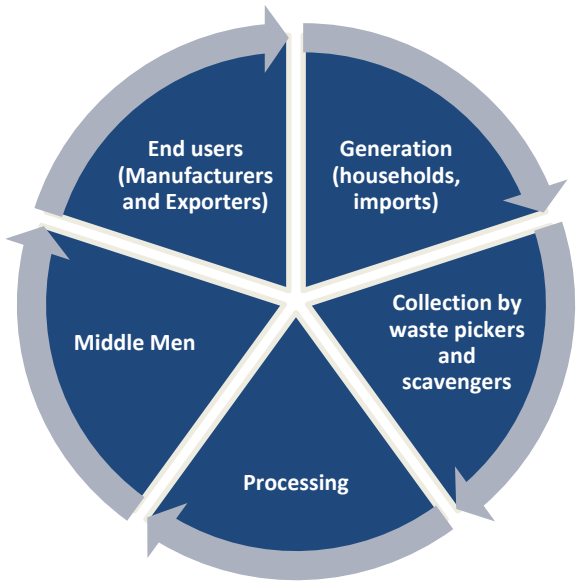
Base on the engagement with stakeholders we completed a viability rating generally for the plastic recycling space. the scores indicate that the sector is viable. There however remain risks with types of plastics such as PET bottles (particularly the cost of recovery high grade PET bottle in a closed loop cycle – bottle to bottle). However, for open loop recycling into other products and for export the risks are relatively lower.

Indicators	Guiding Questions	Measuring Parameters	Rating
Profitability/Cost Recovery	Profit making potential of the business	• Loss making = 1 • Break-even = 2 • Profit = 3	2
	Revenue streams	• Single revenue stream = 1 • Multiply revenue stream = 2	1
	Cost recovery	• Low potential for cost recovery = 1 • Medium potential for cost recovery = 2 • High potential for cost recovery = 3	2
Market for end product	The level of demand for the end products of the business	• Low = 1 • Medium = 2 • High = 3	3
Resource Availability	Quantity of waste generated annually (waste	• Low = 1	2

	is not separated at source and need to be cleaned; furthermore, there is variable availability during the year and the of waste plastic also depends on the oil prices)	• Medium = 2 • High = 3	
Scalability and Replicability	Ease of scaling up the business	• Low = 1 • Medium = 2 • High = 3	3
	Ease of replicating business in other locations	• Low = 1 • Medium = 2 • High = 3	3
Innovation	How innovative is the technology or process	• Known technology or process = 1 • Relatively new to Ghana = 2 • New to the World =3	2
	How innovative is the product or value proposition	• Standard product and value proposition = 1 • Relatively new product or value proposition = 2 • New to the world = 3	2
Legal and regulatory regime	How favourable is the legal and regulatory framework for the business – existence of Plastics Waste Policy that recommends EPR and Recycling; Possibly Plastic waste fund to be established	• Not favourable = 1 • Medially favourable= 2 • Highly favourable = 3	3
	How favourable is the legal and regulatory framework	• Not favourable = 1	3

	for the foreign businesses to enter the market	• Medially favourable= 2 • Highly favourable = 3	
Total			**26**

E-waste Recycling



it is estimated that about 171000 metric tonnes of e-waste is produced in the country. This comes from households, commercial users as well as imports. The handling and processing of e-waste has been a major challenge in Ghana there is a lot of open burning during the recovery particularly by the informal sector. The conditions at the infamous e-waste dumpsite in Agbogbloshie is well documented. There have been a number of initiatives and projects aimed not only at reducing e-waste but also at ensuring that the recovery and processing of e-waste is done in an environmentally friendly manner.

One of the companies interviewed involved in the recycling of e-waste is City Waste Limited. City waste limited is a partner in the projects being undertaken at the scrapyard and support the purchase of waste materials that have been recovered in an environmentally sound manner. the company also de-gases fridges for export and purchase batteries. They have partnered with large companies to provide buy-back for the scrap dealers. They purchase batteries and weigh them together with the acid. This encourages the collectors not to dispose of the acid in drains and in the open environment. The company identifies various opportunities in the e-waste space and considers it as self-sustaining.

Indicators	Guiding Questions	Measuring Parameters	Rating
Profitability/Cost Recovery	Profit making potential of the business	• Loss making = 1 • Break-even = 2 • Profit = 3	3
	Revenue streams (apart from sale of product, one	• Single revenue stream = 1	2

	can claim credit from various green initiatives for environmentally sound recycling or recovery of e-waste)	• Multiply revenue stream = 2	
	Cost recovery	• Low potential for cost recovery = 1 • Medium potential for cost recovery = 2 • High potential for cost recovery = 3	3
Market for end product	The level of demand for the end products of the business (high level of demand for precious metals)	• Low = 1 • Medium = 2 • High = 3	3
Resource Availability	Quantity of waste generated annually	• Low = 1 • Medium = 2 • High = 3	2
Scalability and Replicability	Ease of scaling up the business	• Low = 1 • Medium = 2 • High = 3	3
	Ease of replicating business in other locations	• Low = 1 • Medium = 2 • High = 3	2
Innovation	How innovative is the technology or process	• Known technology or process = 1 • Relatively new to Ghana = 2 • New to the World =3	2

	How innovative is the product or value proposition	• Standard product and value proposition = 1 • Relatively new product or value proposition = 2 • New to the world = 3	1
Legal and regulatory regime	How favourable is the legal and regulatory framework for the business (new e-waste framework and regulatory requirements from EPA)	• Not favourable = 1 • Medially favourable= 2 • Highly favourable = 3	2
	How favourable is the legal and regulatory framework for the foreign businesses to enter the market	• Not favourable = 1 • Medially favourable= 2 • Highly favourable = 3	3
Total			**23**

Recycling of Organics

The previous market report identifies a number of opportunities for processing of organic residue. One of the residues which was missing but is very common in the Accra-Tema corridor is the coconut husk and pods. This the residue from the sale of fresh coconuts. Some companies are turning these into briquettes. There are also opportunities for the production of organic compost and coco peat for use as growing media in the increasing greenhouse industry in Ghana. Ecovon Technologies is also involved in the conversion of coconut fibre in fibreboard and other materials. Biofill and biodigester toilets make use of coconut fibre to create a medium for vermin to digest waste

Neat Eco Feeds Ltd provides feed for chicken from organic waste recovery using worms/ this company though operates outside Accra but is a cohort of the grants from the UNDP Waste Recovery Innovation Challenge.

Vermin composting: Green cycle technologies is involved in this activity

f

Indicators	Guiding Questions	Measuring Parameters	Rating

Profitability/Cost Recovery	Profit making potential of the business	• Loss making = 1 • Break-even = 2 • Profit = 3	2
	Revenue streams	• Single revenue stream = 1 • Multiply revenue stream = 2	1
	Cost recovery	• Low potential for cost recovery = 1 • Medium potential for cost recovery = 2 • High potential for cost recovery = 3	2
Market for end product	The level of demand for the end products of the business	• Low = 1 • Medium = 2 • High = 3	2
Resource Availability	Quantity of waste generated annually (waste is not separated at source and does not produce clean compost. Also, quantity of waste available is variable)	• Low = 1 • Medium = 2 • High = 3	2
Scalability and Replicability	Easy of scaling up the business	• Low = 1 • Medium = 2 • High = 3	2
	Easy of replicating business in other locations	• Low = 1 • Medium = 2 • High = 3	2
Innovation	How innovative is the technology or process	• Known technology or process = 1	1

		• Relatively new to Ghana = 2 • New to the World =3	
	How innovative is the product or value proposition	• Standard product and value proposition = 1 • Relatively new product or value proposition = 2 • New to the world = 3	2
Legal and regulatory regime	How favourable is the legal and regulatory framework for the business	• Not favourable = 1 • Medially favourable= 2 • Highly favourable = 3	2
	How favourable is the legal and regulatory framework for the foreign businesses to enter the market	• Not favourable = 1 • Medially favourable= 2 • Highly favourable = 3	3
Total			**21**

Waste to Energy

In to the use of coconut husks for organic compost and fibre board, there is a company Zaacoal (https://zaacoal.com) that produces charcoal and briquettes from waste coconut and other organic waste. Other companies that produce briquettes include City Waste Recycling Limited. the success of briquette businesses however depends on its ability to compete with the charcoal and firewood that is commonly used as fuel in Ghana. There could also be options to export the briquettes if they are produced to meet international standards. City Waste Limited has the experience in exporting some of its products.

Outside Accra some of the companies that produce organic residue use their biomass to fuel their boilers for production. Examples are oil mills.

Indicators	Guiding Questions	Measuring Parameters	Rating
Profitability/Cost Recovery	Profit making potential of the business	• Loss making = 1 • Break-even = 2	2

		• Profit = 3	
	Revenue streams	• Single revenue stream = 1 • Multiply revenue stream = 2	2
	Cost recovery	• Low potential for cost recovery = 1 • Medium potential for cost recovery = 2 • High potential for cost recovery = 3	1
Market for end product	The level of demand for the end products of the business	• Low = 1 • Medium = 2 • High = 3	3
Resource Availability	Quantity of waste generated annually (waste has high moisture content and is highly organic – option for WTE could be biogas; right waste volumes from MMDAs cannot be assured.	• Low = 1 • Medium = 2 • High = 3	1
Scalability and Replicability	Ease of scaling up the business	• Low = 1 • Medium = 2 • High = 3	1
	Ease of replicating business in other locations	• Low = 1 • Medium = 2 • High = 3	1
Innovation	How innovative is the technology or process	• Known technology or process = 1	2

		• Relatively new to Ghana = 2 • New to the World =3	
	How innovative is the product or value proposition	• Standard product and value proposition = 1 • Relatively new product or value proposition = 2 • New to the world = 3	2
Legal and regulatory regime	How favourable is the legal and regulatory framework for the business	• Not favourable = 1 • Medially favourable= 2 • Highly favourable = 3	1
	How favourable is the legal and regulatory framework for the foreign businesses to enter the market	• Not favourable = 1 • Medially favourable= 2 • Highly favourable = 3	2
Total			**18**

4 Finance tracking in the sector and opportunities for the Dutch sector

4 Finance Tracking for Waste Management

Waste Management is operationalised at the MMDA level, however some funds for waste management, particularly for large scale infrastructure and certain services are provided from the central government level. In addition, some capital investment projects are also financed from donor funding. This makes finance tracking for the waste management sector is one area that is difficult to follow. At the MMDA level waste management contractors work on the basis on franchise and are directly paid by households and institutions that use their service. Beyond the fee fixing resolutions it is difficult to track the finance aspect since most companies are reluctant to provide their turnover. This section focuses on budgets and expenditures of MMDAs and central government allocations that come from the district assemblies' common fund (DACF) as well as projects that are focused on waste management and circular economy. For this aspect of the assignment the consultant relied on information from ministry of finance and the Regional Coordinating council for greater Accra.

4.1 Sources of Funding for waste management

The main sources of funding for MMDAs budgets are from

1. Central Government and common fund transfers
2. Internally generated funds (revenue from fees and fines)
3. Statutory funds
4. Project funds and Development partner funds

4.2 Central Government Financing Support for Waste Management Activities

Central government activities for waste management is financed through a number of options. At National Level large infrastructure and payments for some of the key contracts that MMDAs are unable to pay for is handled through the Ministry of Sanitation and Water Resources. These include landfill fees and evacuation of waste. Previously (before 2017) transfers for waste management were made though the Ministry of Local Government and Rural Development. MSWR 2018 report on budget performance to parliament (Sections 27 (1,2&3) of the Public Financial Management Act, 2016, Act 921) indicates that *out of the total Government of Ghana (GoG) budget allocation of GHS 70,695,435 an amount of GHS 27, 585, 604 was released resulting in actual payments of GHS 25,254, 780. Overall budget performance for the GoG allocations was 39.02%*. Similarly, the 2019 budget performance tracking reported that *out of GHS 246,966,071 requested for sanitation activities, an amount of GHS 78,883,021 representing 31.94%.*

For operational activities at the MMDA level, fund from the Central Government are transferred through the District Assemblies Common Fund (DACF). The Fund was created under Article 252 of the 1992 Constitution to serve as a mechanism for the transfers of resources from the Central Government to the MMDAs. There are direct payments made to contractors working on behalf of the MMDAS by the DACF. In 2018 and in 2019, these direct transfers for sanitation related

expenditure were over 200,000,000 GHS per year. For the transfers to the MMDAs, the assemblies spend a portion of their direct funds on waste management.

4.3 MMDA Expenditure for Sanitation and Waste Management

	MMDA	2018 Expenditure on Sanitation and waste management	2019 Expenditure on Sanitation and Waste Management
1	A M A	30,695,531.79	4,450,454.92
2	TMA	7,103,686.68	8,116,245.84
3	La Dade-Kotopon	371,060.00	1,193,350.70
4	Ga West	1,662,166.68	489,872.17
5	Kpone Katamanso	765,530.10	736,387.21
6	Ga East	926,314.25	857,867.95
7	La-Nkwantanang Madina	605,277.88	580,620.88
8	Weija-Gbawe	735,270.80	660,763.38
9	Ga Central	29,000.00	105,500.00
10	Ashiaman	614,428.70	1,211,271.00
11	Adentan	1,290,823.88	1,065,589.17
12	Ledzekuku	228,000.00	228,000.00
13	Okaikwei North	-	72,067.92
14	Ablekuma North	199,810.00	1,397,014.29
15	Ablekuma West	103,671.00	935,901.21
16	Ayawaso East	139,313.00	986,951.00
17	Ayawaso North	456,487.77	185,203.60
18	Ayawaso West	363,820.00	227,500.00
19	Ga North	56,833.22	130,858.48
20	Ga South	348,521.76	101,943.55
21	Tema West	1,562,000.00	1,949,260.00
22	Krowor	27,846.66	617,649.56
23	Ablekuma Central	-	390,110.00
24	Ayawaso Central	-	200,203.17
25	Korley Klottey	-	892,831.45
26	Shai-Osudoku	41,046.57	80,442.85
27	Ningo-Prampram	483,558.80	195,272.40
28	Ada East District	45,112.72	79,005.00
29	Ada West District	228,354.00	304,650.00
	Total	**49,083,466.26**	**28,442,787.70**

Source: RCC Budget Analyst

4.4 Internally Generated Funds and Fees for Services

Apart from the Central government funding, the MMDAs are allowed to also raise internally generated funds through rates, fees, permits, licenses and fines in accordance with the relevant sections of the Local Governance Act, 2016 (Act 936).

The appropriate fees are determined from a Fee Fixing Resolution which is prepared and gazetted by assemblies each year for various items/services. The local rates for various services, fines and permits are specified in the **Imposition of Rates and Fee-Fixing Resolution** document. The key considerations in fixing fees are as follows

(i) national ceiling provided for the said year and
(ii) the presumed affordability/ public acceptance of rates.

The final figures for fees and levies are often included by local pressures of affordability for the citizens. Our study reviewed the gazetted fees for some of the MMDAs in Accra. MMDAs can use some of their IGF, including market levies for sanitation and waste management. In addition, the service fees for various waste management contractors are also based on the resolution for the collection of waste management. There are different categories of fees for different institutions and organisations including educational institutions, medical facilities and commercial facilities. For domestic waste the general range for service providers is between GHS20 to GHS 100 (for high income areas). These are paid directly to the contractors and not considered as part of the IGF for the respective MMDAs. this makes it difficult to track how much the contractors earn. For households that use communal dumpsites, they employ the pay as you dump system where they pay about GHS 1.00 (one cedi) depending on the load. There are attendants who collect these amounts and when the skip is full, they invite the service providers to lift the skip containers to the landfill site (the minimum cost of lifting is about 300GHS). The following are examples of fees obtained from some of the assemblies along the Accra-Tema Corridor. It is noted that some of these fees are different even for assemblies next to each other (see LEMKA and LADMA below). A question that arises is the basis of some of these fees

Solid waste tipping/dumping (per tonne)			
MMDA	**Ga East**	**LEKMA**	**LADMA**
	cost per tonne		
CAT A- Domestic waste	GHS 30.00	GHS 40.00	GHS 50.00
CAT B- Commercial waste	GHS 50.00	GHS 53.00	GHS 100.00
CAT C-Industrial Waste		GHS 63.00	GHS 120.00
CAT D- Port Waste		GHS 53.00	GHS 50.00
CAT E-Construction Waste		GHS 447.00	GHS 425.00
CAT F- Destruction of Goods		GHS 1,577.00	GHS 1,500.00

Solid Waste Collection (cost per month)			
MMDA	**Ga East**	**LEKMA**	**LADMA**
Communal Containers			

CAT A- Pay as you Dump	GHS 3.00	GHS 2.00	GHS 1.50
CAT - B Pay as you dump (per headload)		GHS 1.00	GHS 1.00
CAT C others		GHS 6.00	GHS 6.00
CAT B- Commercial/Industrial/Institutional	GHS 12.00		
Door to Door Collection Service	**Ga East**	**LEKMA**	
CAT A-1st Class Residential Area	GHS 70.00	GHS 56.00	GHS 70.00
CAT B- 2nd Class Residential Area	GHS 60.00	GHS 41.00	GHS 40.00
CAT C- 3rd Class Residential Area	GHS 45.00	GHS 25.00	GHS 25.00
CAT D- 4th Class Residential Area			
240 L collection once a week			
Commercial Rates (Hiring of Refuse Containers)			
23 cubic metres		GHS 631.00	GHS 325.00
12 to 15 cubic metres		GHS 170.00	GHS 165.00
120 to 240 litre bins		GHS 10.00	GHS 8.00

4.5 Projects

Some projects have been listed in section 6. The following are projects being implemented by ministry of sanitation

Programmes/Projects	Description	Financier/ Amount
Greater Accra Sustainable Sanitation and Livelihood Improvement Project (GASSLIP)	The GASSLIP Project aims to increase access to safe and sustainable sanitation to the residents of the Greater Accra Metropolitan Area (GAMA), targeting the urban and peri-urban poor residents. The Project will provide domestic and municipal level sanitation infrastructure, support skills development and livelihood improvements, and enhance the capacity of sanitation service providers and the participating local government authorities to better deliver and manage climate-resilient sanitation services within GAMA.	**African Development Bank Group US$55.6 million**
Greater Accra Metropolitan Area (GAMA) Sanitation and Water project	The objective of the Project is to increase access to improved sanitation and improved water supply in the GAMA, with emphasis on low-income communities and to strengthen the management of environmental sanitation in the GAMA. This project is mainly focused on liquid waste management. There was a component	**World bank** **US$150 million**

	for gas capture from the landfill, but this was reallocated duration.	
Greater Accra Resilient and Integrated Development (GARID) Project	The Project will construct an Integrated Material Recovery Facility and Solid Waste Treatment Facility to enhance solid waste disposal within the Greater Accra Region	**World bank** **US$150 million (About 45 million is allocated for sanitation and solid waste management)**

The GUMPP (Ghana Urban Management Pilot Project) aims to improve the living conditions in urban areas for the inhabitants of the four selected cities of Kumasi, Sekondi-Takoradi, Tamale and Ho. The GUMPP Project is implemented by the MLGRD worth about 40 million EUR and as part of the project, landfill sites and other waste management facilities will be constructed for some of the MMDAs outside Accra. These are not considered as part of this study.
Opportunities

5 Inventory of potential candidates for matchmaking in Ghana

5 Inventory of Potential Candidates for Matchmaking

This section presents an inventory of various companies that could be considered as potential candidates for matchmaking. This list has been put together based on interviews with ESPA, companies recommended from the (UNDP) Waste Recovery Platform Innovation activities and also based on the consultant's knowledge of the sector. For companies that were recommended from ESPA or the waste recovery platform, follow up calls were made to confirm the interest of the firms in being a part of the matchmaking inventory. Firms that were not available for interview but are still considered worth including have been added to the list. For firms that were reached, interviews covered issues such as impact of COVID-19 and the interest in being part of partnerships. Most firms contact expressed interest in being a part of the matchmaking programme.

5.1 List of Companies and Individuals in Waste Management and Circular Economy

	Company Name	Interests in Circular Economy and Partnerships	Contact Information
1	City Waste Limited	City waste is involved in different recycling and circular economy activities along the service delivery chain.	Name: Vivian Ahiayibor Position: Manager Contact Number: 024 4255782 Email: vahiayibor@yahoo.com
2	Environment 360 (and Evolve Recycling)	Environment 360 (working in conjunction with its sister company Evolve collects waste plastic from homes and corporate bodies). E360 undertakes development of products and training of informal sector. They provide different packages to which clients can sign up. The local market is not strong enough to consume all the plastics they collect. However, given challenges with exports during the outbreak of COVID-19, they are exploring work with a few of the companies to identify to how bring circularity.	Name: Cordie Aziz-Nash Position: CEO Contact Number: +233(0)244- Email: can@environment360gh.org info@environment360gh.org
3	Jekora Ventures Limited	Company has been involved in solid waste collection since 2004. Initiatives include waste segregation programme for Osu Klottey in Accra and Jekora Fortifier Co-composting plant set up in conjunction with IWMI. The facility produces compost from dewatered faecal sludge and organic waste. The company produces 700 metric tonnes of compost per year and 1500 metric tonnes of briquette per year. Other activities include recycling of plastics, organic waste, paper, textiles etc. the company has	Name: Immanuel B. Nartey Tokoli Position: Managing Director Contact Number; 0208171111/ 0558500030 Email: ibnt@jekoraventures.com

	Company Name	Interests in Circular Economy and Partnerships	Contact Information
		a community buy-back centre and compost in Ga-Mashie.	
4	J Stanley Owusu/Komenda Polymer Recycling Plant Limited	Waste Collection Company and recycling company. The Komenda Polymer Recycling Company has the capacity to produce 10 tonnes of plastic a day.	Name: Victor Schafer Position: Lead Consultant. +233243236282 Email: vsmarketinggh@gmail.com
5	Pyramid Recycling Limited	Plastic Waste Recovery. Has innovative products such plastic "wood" boards. Also produces curtain rods and "chair shoes" for footing caps for plastic/metal chairs	Name: Ibrahim Yougbare Position: CEO Contact Number: 024-4641894 Email: alinkobanana@yahoo.com
6	Coliba Limited	Plastic Waste Recovery; PET Bottles	Name: Prince Agbata Position: CEO Contact Number: 0243523824 Email: princeblog2013@gmail.com
7	Alchemy Alternate Energy	Have been in operation for 5 years; core staff are 8. Plastic waste collection and recovery, Lorry tyres; Collect these sachet rubber – recycle PP, PE. Also collect tyres produce Residual Fuel Office (RFO); They have to purchase the tyres. Certified by EPA, use women and disabled people. Have their own collection system; tried to liaise with ZL but the products were so dirty; so we use the women who collect them; 10 tonnes a day capacity but don't use it to full capacity 7 to 8 tonnes; one large tyre is sold for 10 GHS. Also take waste engine oil. Locate in Prampram; Rana motors	Name: Gifty Oduro/S Quansah Position: MD/Deputy MD Contact Number: 0272051157/ 0201748465 Email: Squansah@rad-aid.org
8	Tidyup Ghana Limited.	Tidy up has transfer station that is able to handle about 80-100 tonnes of waste a day. The facility is located in the western part of Accra. Operations affected by illegal dumpsites. The company has recently started recycling…. From January will do recycling for PET, cardboard and sachet water (HDPE). Will create a buy back scheme to encourage the small-scale tricycles to bring it there. It will be an open recycling centre and send it to industry. Also looking to explore the export market	Contact Name: Kofi Ampofo Position: Founder and CEOP Contact: 0208186051 Email: ssiska@hotmail.com Info@tidyupghana.com
9	rePATRN,	Recovery of PET bottles for export and recycling.	Name: Jefferey Provencal Position: CEO

	Company Name	Interests in Circular Economy and Partnerships	Contact Information
			Contact: 233 24 131 48 41 Email: hello@repatrn.com jeffrey@repatrn.com
10	SPECIAL LEARNING MATERIALS, Accra	Company does Learning materials for education. Want to use plastics for the development of learning materials. Developed the formula for the plastics; recycling -products are for children related to learning and the learning materials will include messaging on recycling for young persons.	Margaretha Ubels (originally from Netherlands) Position; CEO 024-3606436 slmghana@gmail.com
11	TOA HOUSE, Accra	Plastic waste recovery	Contact number; 0557759695 Email: toahouseltd@gmail.com; shearforlifeventures@gmail.com
12	Ecovon, Accra	Coconut waste recovery; Been in operations since 2017. Registered Company in 2018. Convert coconut waste to building materials fibre board. In collaboration with DXM Niaga, based in the Netherlands. They are ready to validate the product and partner to export the product to the Netherlands or other places. Organic waste recovery	Isaac Brenya - brenya2011@live.com 0249993141
13	Jumeni Technologies Ltd	IT/NGO Category - Have an app (uber for waste) Have plastic, scraps, paper, organic waste Plastic waste collection and recovery. Work with the informal sector. Have partnerships with recycling companies and transfer to the recycling companies, evolving into a waste management company. Have a truck and also make use of the informal sector. Accra (been in operation for 2 years; started doing pick-ups for past 3 months)	Name: Eyram Amedzor Email: eyram@jumeni.com Contact Number: 020 585 3279
14	Sesa Recycling Company (**Advocacy and Collection)	SESA Recycling GH is a waste recovery company that has set-up an incentive-based scheme for plastics, aluminium and other valuable waste. Has been in operation for a year and half. Does collection in Greater Accra. They work with individual waste pickers and households, School, Churches, companies etc. Have 3 permanent employees and 12 casual staff. Partners with various companies - partnership with	Name: Christopher Gyan-Mensah Position: CEO Contact Number: 0540304865 Email: hello@sesa-recycling.com; gyanchristopher@gmail.com

	Company Name	Interests in Circular Economy and Partnerships	Contact Information
		Miniplast, Asase Foundation, Repatrn Collection capacity is 40 tonnes per month.	
15	Soultown Kinema (**Advocacy and Biogas)	Provide education on sanitation and biogas production through multimedia. Member of ESPA	Name Nana Akuako Nketia Position: Contact Number: 0591558408/ 0207 585383 Email: soultownkinema@gmail.com
16	SkyFox Limited	Partnerships in water and sanitation as well as agricultural businesses.	Name: Patrick Apoya Position: CEO Number: 0244472784 Email: patrickapoya@gmail.com
17	Organic Feeds	Organic waste recovery, Adenta	Name: Contact Number: 020 907 7546 Email: rosebudserwaa22@gmail.com
18	Zaacoal	Zaacoal makes charcoal (Energy) from coconut and other organic wastes.	+233 50 700 5551 info@zaacoal.com https://zaacoal.com/about/
		Research Institutions	
19	CSIR-IIR (Institute of Industrial Research)	CSIR IIR is involved in a number of circular economy projects including ZeWAD (Zero waste project). They also have other innovation projects and are one of the cohorts for the UNDP-WRIC. Their research project seeks to investigate the possibilities of blending palm kernel shell (PaKS) and plastic waste (synthetic rubber from waste tyres, PET bottles and packaging waste) as composition materials for road construction to form water-resistant bituminous surfaces and for paving public places to reduce the colossal amount of waste generation, reduction of dust and its associated problems emanating from these untarred roads.	Dr Mutala Mohammed Number: +233 279 318 852 Email: mmohammed@csir-iir.com mutbaby@gmail.com
20	Ghana National Cleaner Production Centre	The National Cleaner Production Centre is a subsidiary of the EPA of Ghana. The centre is mandated to develop, offer and promote business advisory services, investment and policy decisions on resource efficiency and cleaner production initiatives. The centre is also involved in various research and	Letitia Tuekpe Technical Officer ltuekpe@yahoo.com

	Company Name	Interests in Circular Economy and Partnerships	Contact Information
		capacity building activities in circular economy and industrial symbiosis.	

Members of Jospong Group involved in Recycling

	Company Name	Interests in Circular Economy and Partnerships	Contact Information
1	IRECOP (Integrated Composting and Recycling Plant)	The company has a 400 tonne/day capacity MRF facility in central Accra. The company has plans to establish a number of recycling plants (material recovery facilities) in each of the regions in Ghana. The president of Ghana cut the sod for the construction of these facilities in various regions and recently commissioned the 1200 tonne/day Kumasi Compart and Recycling Plant - KCARP	Betty Brown 0555978178
2	ACARP (Accra and Recycling Plant)	ACARP is a 600 tonne/day material recovery facility. The facility is currently looking to expand to double of its capacity.	Michael Tuwor 0302213500 mtuwor@acarpghana.com
3	Universal Plastic Products &Recycling Co. (UPPR)	Produces plastic products such as bins and liners from waste plastic.	Mr. Asumani 0577681922
4	Zoomlion Company Limited	Largest waste management company in Ghana with offices in all regions of Ghana. Has Compost and recycling plants.	Mrs. Florence Larbi Managing Director 0208630928

5.2 Umbrella Association for Waste Management and Circular Economy Businesses

	Company Name	Interests in Circular Economy and Partnerships	Contact Information
1	Environmental Service Providers Association (ESPA)	The largest association of private service providers in Ghana. Has members in both large scale formal, medium and informal sector. ESPA to facilitate engagements with ESPA members.	Name: Ama Ofori-Antwi Position: Executive Secretary Contact Number: Email:

	Company Name	Interests in Circular Economy and Partnerships	Contact Information
2	Ghana Plastic Manufacturers Association (GPMA)	Association of various plastic manufacturers. Interview with the President of the plastic manufacturers association indicate that several of the members have been involved in recycling, particularly of flexible plastics and have built sufficient local capacity. There is however a gap in the recycling of PET bottles. The following companies were provided as having interest in PET recycling and can be reached through the association • Natfix Company Ghana Limited • Wentech Industries Limited (wentechindustryltd@gmail.com; 024 1011063) • Global Poly Ghana Limited (globalpoly9@yahoo.com; 024 9868663) • Indgha Packaging Industries (indghaagro@hotmail.com; 0244 352250) • Blowplast Industries Limited (m.lakhiani@blowgroup.com; 0244 315535) • Space Plast Limited (: spaceplast@vodafone.com.gh; 024 6984224) • Enviroplast Limited (ybkessie@hotmail.com; 055 8200772)	Name: Ebbo Botwe Position: (President) Ghana Plastic Manufacturers Association. (Chairman) Plastic Waste Management Program, Ghana (Board Chair) Plastic Producer Responsibility Organisation, Ghana (Board Member) Ghana National Plastic Action Partnership (CEO) BG-Ovian Ghana Limited Contact number: +233 244 255564 Email: ebbo.botwe@yahoo.com
3	Plastic Producer Responsibility Organisation, Ghana (PPROG)	The Plastic Producer Responsibility Org Ghana is a recently registered entity that will soon be inaugurated. The objective of the organisation is to promote – voluntary Extended Producer Responsibility (VEPR). The group is made up of GPMA. ESPA, GRIPE, Sachet Water Collectors Association, Food and Beverage Association of Ghana; there are also major shops such as Melcom and Shoprite that have expressed an interest. Bottling companies such as BelAqua and Voltic are part. The idea is to mop up every institution or company that are involved in plastic manufacturing.	
4	National Artisans & Traders Union of Ghana (NATUG)	The association brings together all the plastic recyclers, aggregators and middlemen in Cable and Wireless in Accra. The NATUG has also formed a local association for the plastic recycling association which has been registered. A supplementary list of the small-scale	Name: Mr. David Arthur Position: General Secretary Contact number:

	Company Name	Interests in Circular Economy and Partnerships	Contact Information
		recyclers and contact is provided in the appendix.	
5	**Federation of Plastic Manufacturers Recyclers & Users, Ghana (FEPMRUG)**	NGO that brings together Plastic Manufacturers and Recyclers in Ghana. The Federation is made up of 9 different and is spread across the whole country. The sub-associations include: Ghana Recycling Initiative (GRI) E-Waste Recyclers Association of Ghana (EwRAG) CYZOE Group National Reuse and Recyclers Association (NARRA) Progressive Sachet Water Producers Association (PSWPA) Plastic Waste Pickers Association of Ghana (PWPAG) Waste Tricycle Operators Union of Ghana	**Key Contact:** Daniel Yaw Mensah Tornyigah Position: Director Policy & Sustainability Contact Number: +233 509545639 Email: dannygh2175@gmail.com
6	**Association of Ghana Industries**	Umbrella Association for major industries in Ghana. these include manufacturers as well as the waste management companies. AGI working together with the producers of plastic to implement GRIPE project.	Contact Person Theophilus Arthur-Mensah Research and Policy Analyst Email: thamtheo@gmail.com
7	**CONIWAS**	Coalition of NGOs in the Water and Sanitation Sector	Contact Person: Attah Arhin Email: attah.arhin1@gmail.com Contact: +233244713332

6 Inventory of multilateral and bilateral cooperation initiatives in waste/CE in Ghana

6 Multilateral and Bilateral Cooperation Initiatives in Ghana

This chapter of the report provides an update on the progress for

6.1 Update on Bilateral and Multi-lateral cooperation initiatives in Ghana

Bilateral and multilateral programs

Organization	Cooperation project	Update
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)	Invest EUR 10 million in 1/ policy making regarding e-waste; 2/ developing new business models for e-waste; and 3/ involvement of the informal sector (1,5 years). A further EUR 20 million will be invested in an EPR scheme for e-waste; fee collection by SGS; and setting up a recycling factory for e-waste.	
European Union	E-waste Management in Ghana: From Grave to Cradle. Formalization of informal MSMEs, collection mechanism for e-waste, disseminating best practices and creating awareness. Budget EUR 1.3 million; implementing organization University of Cape Coast	The E-Waste Management in Ghana (E-MAGIN GHANA) Project aims to improve the management of e-waste in these regions towards a Sustainable Consumption and Production (SCP) through an integrated multi-stakeholder approach The project is funded by the European Union and is part of the SWITCH Africa Green Programme (Phase II) and has activities in eight key regions in Ghana including Greater Accra. Demonstration projects are ongoing in Agbogbloshie and partners include Adelhpi, City Waste Recycling Limited and the Ghana National Cleaner Production Centre.
Government of the United Kingdom	Accra Plastics Management Project. Workshops on plastics; scaling up of existing initiatives;	The study has been completed. Power point of the study is attached as a separate document.

	improvement of prices and quantities.	
United Nations Development Program	Launched a “Multi-Stakeholder Waste Resource Platform” initiative which will facilitate investment and access to market, fill data gaps, build capacity of local government operators, raise visibility of service providers in the private sector, and increase awareness across society on the importance of sustainable waste management	The multi-stakeholder platform has been initiated. There is an online platform which serves as a repository of various players in the waste recovery value chain. In addition, there are virtual and physical meetings for the platform. A number of initiatives including Waste Resource Innovation Challenge Competitions have been started. The competition allows companies to make pitches on their innovations for further support from the platform. The platform helps to identify which players are in the value chain and the activities that they undertake. Discussions with the manager of the platform indicate that a platform meeting (B2B) section for business outside and those in Ghana could be organised as part of a future mission. He also indicated that there is the possibility to have data on platform members shared following an open survey to seek permission from the members of the platform.
World Bank	Greater Accra Resilient and Integrated Development Project (P164330) - Objective is to improve flood risk management and solid waste management in the Odaw River Basin of the Greater Accra Region and improve access to basic infrastructure and services in the targeted communities (with MSWR)	This project has started, and a number of studies and consultancies have been commissioned. The project coordinator indicated that there are plans to set up community-based buy-back centres as well as transfer stations which will recover waste. The project intends to construct a landfill facility where waste will also be recovered for recycling. Opportunities for Dutch businesses will be in the area of consultancy. Possible technology transfer and technical assistance services related the provision of infrastructure for waste management. The coordinator also

		indicated they had partnered on a Design to Build Grant for research at the initial stages of the project. He indicated that through bilateral arrangements partnerships could be identified, particularly for the community-based recycling and material recovery centres.
World Economic Forum (WEF)	The WEF is planning to launch a Ghana chapter of its Global Plastic Action Partnership GPAP. Focus areas: (1) engage at highest level; (2) establish science-based targets; and (3) connect strategic investments and pilot projects (2-3 yr. project)	The Ghana chapter of the Global Plastic Action Partnership was launched in October 2019 as part of the formal launching the Plastic Waste Management Policy. Following the launching a Baseline study was commissioned. The objective of the baseline analysis was to identify plastic waste flows. Scenario modelling based on the findings of the baseline is currently being undertaken. The scenario modelling is expected to contribute to the identification of the most effective combination of interventions to tackle plastic waste and pollution in Ghana. the Partnership has key sector players, producers and researcher as part of the expert panel, technical committee and steering board (made of representatives of key ministries including MESTI, MSWR and MoF).

Other Projects

Bilateral and multilateral programs

DP Organization	Cooperation project
African Development Bank	Greater Accra Sustainable Sanitation and Livelihoods Improvement Project (GASSLIP). This is a US$55.6 million project funded by ADB and implemented through the Ministry of Sanitation and Water Resources. The GASSLIP Project is aimed at improving access safe and sustainable sanitation to the low-income residents of the Greater Accra Metropolitan Area (GAMA). Beyond household infrastructure the project is expected to provide and municipal level waste management infrastructure. It is also expected to support livelihood improvements or informal waste management workers. The project has purchased small tricycles and vehicles for the

	collection of solid waste. This is to increase the capacity of the informal sector involved in the provision of sanitation services. providers and local government to better deliver and manage climate-resilient sanitation services.
European Union	the GREEN Project is aimed at Boosting Green Employment and Enterprise Opportunities in Ghana. it is being Implemented by SNV and UNCDF in collaboration with the Ministry of Local Government. It is a 4-year project with 20 million EUR funding from EUTF for Africa and 600,000 EUR counterpart funding from the EKN in Ghana. The jobs being supported include compost/biogas production, organic horticulture production, solar irrigation, waste recycling, plastic recycling, green building construction and solar panel installation. The objective of the support SMEs to develop as well as provide financial serves to support cash for work beneficiaries. Being implemented across 10 MMDAs in Ghana. Targeting about 1500 jobs. Support is also provided to support MSMEs to benefit from the performance-based climate resilience grant system.
NORAD	The NORAD/ BRS project is focused on Promoting the Environmentally Sound Management of Plastic Wastes and Achieving the Prevention and Minimization of the Generation of Plastic Wastes. The time frame for the project is 2018-2021. It is a US$15 million project funded by Norway. The project is designed to support implementation of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. The project is expected to build the capacity of the local agencies including MESTI, EPA etc. to control transboundary movements of plastic waste and also ensure the sound management of plastic waste. It is also aimed at promoting the reduction of plastic waste generation and will consider infrastructure, regulations, institutions as well as the informal sector. It is currently working on building a baseline inventories on plastic waste management expected to be completed by the end of December 2020. .
UNIDO	Supporting MESTI to undertake Plastics Baseline Survey and Circular Economy Survey
Swiss State Secretariat for Economic Affairs (SECO)	Sustainable Recycling Industries (SRI) project is implemented through the MESTI and EPA. The project provides support for small- and medium-sized enterprises interested in sustainable e-waste recycling in Ghana. The project seeks to develop alternative business models as well as provide knowledge and technology transfer on recycling. Also provides capacity development for the enterprises on who to access markets for recycling outputs. In addition, the project addresses issues

	about standards and financing mechanisms to generate favourable conditions for sustainable recycling industries.
German Federal Ministry for Economic Cooperation and Development (BMZ), GIZ; MESTI/EPA, Accra Metropolitan Assembly	Environmentally Sound Disposal and Recycling of E-waste in Ghana – National (2016-2020) this is a partnership with MESTI/EPA and the Accra Metropolitan Assembly (AMA). The project seeks to improve the framework for sustainable e-waste management by providing capacity building to the various stakeholders (both government and private sector). The project also seeks to support to set up an electronic register to record producers and distributors of EEE. The project also provides technical assistance to promote economically viable business models for recycling and disposal of e-waste. The project also provides training in environment and recycling/disposal methods that are environmentally sound and considers the health impacts of e-waste.
BMZ, German Development Bank (KfW), GIZ;	The project focusses on Recycling and Disposal of Waste of Electrical and Electronic Equipment in an Environmentally Sound Way (Phase One) 2018-2020/2021– The project is a collaboration between MESTI/EPA and various partners. The first phase of the project sought to pilot and test a financial mechanism to encourage and enable environmentally sound WEEE disposal. The pilot project was expected to construct and operate a Handover Centre—working with GASDA--where scrap dealers can sell unprocessed e-waste above market prices. It was expected that the materials will be aggregated and auctioned to recycling companies that have EPA permits which are compliant with the national e-waste recycling guidelines. The project created avenue for collaboration between formal and informal recyclers but focus strongly on the transformation of the Old Fadama/Agbogbloshie, into an environmentally friendly and safe recycling enclave. The project created an incentive system for buying back cables and encouraging the collectors not to burn the waste. Partners for the E-waste project included Greater Accra Scrap Dealers Association (GASDA) and City Waste Recycling Limited that supported the recycling of cables. The pilot seeks to transfer lessons learned for the implementation of the National E-waste Recycling Fund introduced in Act 917 (2016). It is expected that second phase of the E-Waste Programme implemented by GIZ will soon take off.

7 Financing options for environmental improvement projects

7 Financing Options for Environmental Improvement Projects

As noted in the finance tracking section. The following options exist for financing environmental improvement projects

1. Loans (mostly concessionary loans)
2. Grants
3. PPPs
4. Households/beneficiaries (payment of services)

NGOs may also benefit from grants. But most private entities will have to rely on commercial loans for the financing of their activities

7.1 Overview of Financing Options

Financing options for environmental improvement projects in Ghana include the following:

1. Central Government Funds

The Central Government through budgetary allocations to sector ministries and their implementing agencies finances environmental improvement projects. The key sector ministries for waste management is the Ministry of Sanitation and Water Resources (MSWR). The Ministry of Local Government and Rural Development (MLGRD) is the supervisory ministry of the MMDAs. other. The other key is the Ministry of Environment, Science, Technology, and Innovation (MESTI),

At the operational level, waste management in Ghana is the responsibility of the MMDAs, and their activities are financed by the Central Government through the District Assemblies Common Fund (DACF). The Fund was created under Article 252 of the 1992 Constitution to serve as a mechanism for the transfers of resources from the Central Government to the MMDAs.

2. Funding from Bilateral and Multilateral Organization

A significant proportion of environmental improvement projects in Ghana are financed by bilateral and multilateral Organizations. These funds usually come in the form of loans or grants.

Some multilateral organizations operating in this space include the following:

- The World Bank
- European Union (EU)
- African Development Bank
- United Nations Development Program (UNDP)
- United Nations Children's Fund (UNICEF)

- World Economic Forum (WEF)

Some bilateral organizations operating in this space include the following:

- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
- Royal Netherlands Embassy
- Government of the United Kingdom
- Agence Française de Developpment (AFD)
- State Secretariat for Economic Affairs
- Embassy of Denmark
- Norwegian Embassy

There are also International Non-Governmental Organizations active in the sector. Examples include:

- Bill & Melinda Gates Foundation
- Master Card Foundation
- Coco-Cola Foundation

3. Public-Private Partnerships (PPPs)

Public-private partnerships are considered one of the main project financing tools in Ghana. The PPP process in the country is guided by the National Policy on Public-Private Partnerships (PPPs) which was launched in 2011. The policy provides the legal and institutional framework for implementing PPPs. The Public Investment and Asset Division (PIAD) of the Ministry of Finance is the key government agency in charge of shepherding the PPP process and all projects must be registered with them. Projects however need to have a partner MMDA or MDA that will support the application. Examples of some of the investments financed through the private sector are:

  - Accra Compost and Recycling Plant (ACARP)
  - Integrated Composting and Recycling Plant (IRECOP)
  - The Kumasi Compost and Recycling Plant (KCARP)
  - The Zoompak Achimota Transfer station and Teshie Transfer Station and Medical Waste Treatment Facility.

4. Financial Institutions

MMDAs typically do not go in for commercial lending. The private sector however could go in for loans for viable business opportunities. It must be noted that the interest rate on loans in Ghana is on the high side, and it could range between 22%-35% per annum. There are a number of financial institutional institutions that provide loans for sanitation-related projects. Examples include Fidelity Bank Ghana Limited and Republic Bank. Fidelity Bank under the SNV P2P project provides loans at between 10-17% interest rate for WASH related projects.

Alternatively, investors could opt is the government's 1 district - 1 factory (1D1F) initiative. Under this program, approved projects received bank loans at an interest rate of 10% per annum.

5. Local taxes and Internally Generated Fund (IGF)

Local taxes and IGFs are key revenue sources for MMDAs, and they serve as a key financing source for environmental improvement projects within their various jurisdictions.

8 relevant events and networks in waste/CE in Ghana

8 Events and Networks in Waste and CE in Ghana

Circular Economy as a concept is increasingly becoming a major topic in Ghana. This section highlights key programmes and networks that either in general waste management and waste recovery or circular economy.

8.1 1.1 Objectives and Scope of Assignment

The objective of the assignment was to contribute to the Pre-PPS Fact Finding Study on Waste Management and Circular Economy in Accra.

	Name of Event	Brief Description of Event	Dates	Venue	Organisers
1	World Resources Forum (WRF2020)	The conference will be organized around three topics "Fair resource extractions for a quality future", "From waste to resources for development" and "Making a case for circular resources". The Delegation of the European Union to Ghana organized a Circular Economy seminar as a side event to the conference. The event combines with a Circular Economy mission organized by the DG Environment from the European Commission to promote synergies and business opportunities between Ghanaian and European companies.	**23-25 June 2020 postponed to 2021 due to COVID-19**	Accra International Conference	Ministry for Environment, Science, Technology and Innovation (MESTI)
2	Water Africa International Trade Exhibition and Seminars 2021	The theme of Water, Sanitation and Hygiene combined with Building Construction will see the introduction of Environmental issues along with the fast-growing area of Green Technology. This covers a wide range of issues including Energy, Building, Water Management and Distribution, Reuse of Wastewater, Recycling of Waste, Selection of Materials and much more. Businesses associated with any form of Green Technology which would improve the Green footprint of Ghana should be involved in this event	14- 16 July, 2021	Kempinski Gold Coast City Hotel, Accra, Ghana	ACE Event Management
3	3rd Talkplast 2020	The third in the series of conferences had the theme for the conference was "Microplast and marine litter: The role of industry and government in West African Countries to reduce and contain spread in post COVID -19 era". The aim was to improve knowledge, information, as well as compile and disseminate detailed baseline regarding	28th -28th October 2020 (Expected to be a recurring event. Update	Kofi Annan Centre for ICT, Near the Parliament	The Federation of Plastic Manufacturers Recyclers & Users, Ghana (FEPMRUG)

		smart environment, climate change business opportunities and policies, promoting and raising awareness about green jobs. The workshop was done in collaboration with the Norwegian Development Assistance Programme against the impact of marine litter and microplastics which looks at Impact through Prevention and reduction of marine litter and microplastics from its sources. A project code named Operation Clean Sweep (O.C.S) was activated with the aim to reduce marine pollution within the West African Sub-region in post Covid-19 period where waste has increased. The target participants were various stakeholders in the sector.	to be provided for the 4th event)	House, Accra	
4	Africa and the circular economy	The WTC Accra had a webinar on the topic "Africa and the Circular Economy: Opportunities, Benefits and Trends. The programme was a 1-day capacity-building and B2B match-making webinar. The purpose of conference was to expose African companies and governments to the concept of the circular economy and highlight its advantages over the traditional linear economy. Other objectives were to match foreign businesses in the Circular Economy to potential partners in Africa and Stimulate partnerships to address gaps in the adoption of the Circular Economy in Africa. **Even though this even has ended there are potential follow up meetings that could be of interest to Dutch partners. Updates to be provided as and when available.	15-Oct-20	Virtual	ACEN/World Trade Centre
5	8th The West African Clean Energy and Environment Trade Fair and Conference (WACEE)	West African Clean Energy and Environment Exhibition and Conference aims at providing a platform for power providers, technology suppliers, investors, industry experts as well as political and economic decision-makers to ensure sustainable development of West Africa's energy and environmental ecosystem The 2020 conference provided insights into the opportunities, challenges and recent developments in the	1-30th September 2020 (WACEE' 2020)	Online conference	Delegation of German Industry and Commerce in Nigeria (AHK Nigeria)

		clean energy, water and circular economy industries in Nigeria and the West African sub-region. It provided a hub for networking among top-level resource persons from Nigeria, West Africa and from around the world. This conference is expected to be a referring conference. The 2019 conference was held in Accra, but the 2020 conference was held online. Updates for upcoming events to be provided			
6	Ghana NPAP Side Event at the world circular economy forum online	This event aims to bring together international partners working on plastic circular economies, as well as Ghana public and private sector partners looking to showcase their work and develop investment strategies for future interventions.	24 November,2020	Online	Global Plastic Action Partnership
7	Ghana National Networking forum	The forum brought together about 150 participants from the private sector, civil society and government. Its main objectives were to discuss the opportunities, challenges and barriers faced by the private sector in transitioning to an inclusive, low-carbon green economy promoting sustainable consumption and production practices and patterns in Ghana. The exhibition covered five projects from the three priority sectors in Ghana: manufacturing, integrated waste management and tourism. SWITCH Africa Green has been organizing a series of programmes. They also SWITCH Africa Green Regional Sector Meeting on Integrated Waste Management 11 - 12 June 2019 and more recently a National Policy Dialogue on Promoting Green Economy Development 9 - 11 November 2020, Accra, Ghana. Updates available at https://www.unenvironment.org/switchafricagreen/events	21-22 March 2017 (SWITCH Africa Green in an ongoing project that organizes various activities and events in the sector	Accra City Hotel	Switch Africa Green
8	National Level Learning Alliance Platform (NLLAP) Meetings	These are monthly meetings held at Coconut Grove on the last Thursday of every month. The meeting is to highlight key activities and events in the WASH sector. Provides as space for companies to make presentations about their businesses. Products and activities in the	Last Thursday of every month		IRC/RCN/MSWR

		WASH sector. Special meetings can be organised for businesses that are interested.			
9	Africa Circular- The 1st Pan-African Conference on the Circular Economy	The conference on the circular economy will identify opportunities and challenges for Africa-appropriate circular economy blueprint initiative, actions and policies. The conference will bring together key stakeholder to drive, fund and implement a necessary circular transformation	Tentative date: 2021	Nairobi, Kenya	African Circular Economy Network
10	The CReWAS conference	An annual conference held by IESS in collaboration with the United Nations University. This year's conference was held on the theme: Climate Resilience and Waste Management for Sustainable Development. The conference provides a platform for researchers as well as entrepreneurs to present relevant research work and sustainable business models in waste management and circular economy as well as climate change., waste management and innovative business models. Companies and businesses will have the opportunity to showcase innovative technologies for climate resilience and waste management	16th -17th October, 2019	University of Ghana	Institute for Environmental and Sanitation Studies IESS and United Nations University – Maastricht Economic and Social Research Institute on Innovation and Technology (UNU-MERIT

There are also a number of trade fair events organised by the GIPC but information on these events come up as and when they are available.

A key network to be part of is the waste federations and umbrella organisations. These are listed in section 5.2 above. The UNDP waste recovery platform is also a network that businesses can join.

9 Innovation initiatives in the waste management/ CE sector

9 Innovation Initiatives in the Waste Management and CE sector

This chapter presents a list of initiatives in the Waste Management and CE sector.

9.1 Current and Planned initiatives in Waste Management and CE.

SN	Project/Programme Name	Implementing Agency	Financing Agency/DP	Project Description/Objective	Scope/Geographic Location
1	21st Century Initiatives: Recycling and upcycling plastic waste	21st Century Initiative LLC	SEED	The 21st Century Initiatives produce eco-plants and eco-pillows from recycled plastic waste. Their activities include collecting HDPE, PP AND LDPE plastic waste, crush it and resell it to various recycling companies. The enterprise also collects the plastic bottles, process them and use them for eco-friendly artificial flowers and plants. Manufacturing of Eco pillows and Eco bricks from hygienically treated plastic waste materials	Taifa, Accra-Ghana
2	Sustainable Community Project: Recycle Act	Green Africa Youth Organization (GAYO)	YEWU partnered with GAYO	One key part of the sustainable communities' project is the Recycle/Up-cycle component which teaches children to make useful products from plastic waste and to generate income from it. The pilot phase of the project saw the production of pillows, cosmetic bags, pen and pencil cases and key holders from plastic water sachets picked from the school compounds.	Schools in Accra
3	New collaborative effort on Standard Operating Procedures for battery recycling	MESTI/EPA and Sustainable Recycling Industries		The Ghanaian Ministry for the Environment (MESTI) and the Environmental Protection Agency (EPA) with support from Sustainable Recycling Industries (SRI) have begun to address the problem of unsound lead battery recycling in a combined effort of auditor qualification, systematic baseline audits and development of improvement plans for all battery recycling facilities in Ghana. To ensure that the initiative's momentum is	

				maintained, and improvement processes are continued on a permanent basis, the Government of Ghana asked SRI to develop Standard Operating Procedures (SOPs) for this sector.	
4	Ghana: An initiative for community plastic waste recovery	Alliance to End Plastic Waste and Asase Foundation		The Alliance to End Plastic Waste has partnered with the Asase Foundation to support women who recycle plastic waste in their communities in Ghana. The partnership is part of Closing the Loop, an initiative of the Asase Foundation to promote the circular economy.	Ghana
5	From the street to the street: The circular Economy in Ghana. (Impact & innovation	The ASASE (Mother Earth) Foundation	Dow Impact fund	The ASASE ('Mother Earth') Foundation has put the circular economy into practice through its CASH IT! social enterprise, aiming to establish a replicable, sustainable business model, formalizing employment, mobilizing volunteers, and creating a product desperately needed by the community from trash that formerly littered the streets. The approach is to collect plastics, diverting waste from the environment, and setting up a small plant with equipment where the plastics could be recycled, with the material used by the company Nelplast, which makes pavement blocks from the recycled plastic mixed with sand. We have made collecting the materials more professional and more reliable.	
6	Urban waste recycling in Ghana: Creating and capturing value (CapVal)	IWMI	EKN	The project, CapVal, proposes three resource recovery and reuse solutions that have a high potential to incentivize local sanitation planning and management in Ghana, reduce waste transport costs, support the lifetime of landfills, and reduce	Ghana

				environmental impacts: 1. Through the establishment of a co-composting facility in the Yilo-Krobo Municipal Assembly (Eastern Region), Jekora Ventures Ltd. will annually transform 5,000m3 faecal sludge and 300 tonnes of organic solid wastes into 200 tons of safe compost ("Jekora Fortifier). 2. Given the high dependence on wood and charcoal and their negative impact on forest resources and health of women and children, we will convert organic solid waste into low-cost fuel (briquettes) for use by households and institutions. The 1,000 tonnes/year briquette plant will also be sited at Yilo-Krobo Municipal Assembly (Eastern Region). IWMI will adapt existing technology and optimize the production process for the local context, allowing Jekora Ventures Ltd. to transform 1,800 tonnes/year of organic solid waste into non-carbonised briquettes.	
7	Revocean Plastic Revolution	Plastic Revolution Foundation	Norwegian businessman and visionary Kjell Inge Røkke	Plastic REVolution is currently investigating the feasibility of running a plastic-to-fuel plant in central Ghana based on pyrolysis technology which enables the conversion of plastic into smaller molecules which can be used either as fuel or to create new plastic.	
8	Nelplast Ghana Limited	Nelplast Ghana Limited		Nelplast Ghana Limited uses plastics for pavement blocks. Currently the company is now adding use of plastic as “concrete” to build roads and houses.	Tema Ghana

10 Responses to FAQs

10 Frequently Asked Questions

This chapter provides a response to questions that have been received from Dutch entrepreneurs and businesses and also based on discussions with the client. The questions and some of the issues raised have been put together under the different sub-headings.

10.1 Question for Plastic Supply

The availability of plastic materials in Greater Accra.

Plastic type	Distribution, by grade (%)	Daily (MT) – based on percentage of estimated plastic waste generated in Greater Accra
LDPE (film)	25.31	144
PET	23	131
HDPE	19.9	114
PP	10.61	61
PS	3.75	21
PVC	4.31	25
Others	13.83	79

Source: WB Country Environment Analysis 2020 (daily tonnage modified to suit Greater Accra)

Upstream supply of Plastics For upstream supply – there a lot of informal aggregators (middlemen and brokers) who are part of the National Artisans and Traders Union that could supply. Engagement with Coliba which is involved in plastic collection and exports indicates that they are establishing a new processing centre and will be in a position to supply 20 tonnes/week of shredded mono plastics.

Downstream users and clients for waste: there is a huge demand for the flexible plastic and the local market is able to consume the recovered waste. They sometimes import additional material from the neighbouring countries. The current market for the crates and other rigid monoplastics is not very large. Interview with local recycler located in Kpone Katamanso indicated that she is able to consume most of the recovered waste materials locally. This can be further explored depending on the type of partnership required with the local client. Most of the local markets use PP for recycling. However local shipping companies are available for shipping.

10.2 Business Regulatory Compliance for Foreign Entities

Foreign entities/investors seeking to do business in Ghana must register with the Ghana Investment Promotion Centre (GIPC). The GIPC is a government agency mandated by the GIPC Act 2013 (Act 865) to encourage, promote and facilitate investment in all sectors of the Ghanaian economy. The registration process with the GIPC is outlined in the steps below:

Step 1: Registration with the Registrar General's Department

The first step in the GIPC registration process is for the foreign entity to incorporate a company at the Registrar General's Department. There are various forms of business entities that can be registered under the laws of Ghana, and investors must choose the right legal structure that best serves their business intentions. The various types include:

- **Companies Limited by shares**
- **Companies Limited by guarantee**
- **Companies with unlimited liability**
- **External Company**
- **Sole Proprietorship**

An external company (branch) is corporate organisation formed outside the Republic of Ghana that has an established place of business in Ghana. The documents required for the registration of an external company are indicated below:

- Name of company (name of head office entity).
- Nature of business.
- Name and details of local manager
- Authorised capital (for head office)
- Issued capital (for head office)
- Address of principal place of business in Ghana
- Address of registered office in country of incorporation
- Name and address of process agent
- Memorandum and articles of association of head office, duly notarised by a notary public in the country of registration
- A power of attorney executed in favour of the local manager, which must also be notarised
- Certificate of incorporation of the head office, duly notarised in the country of registration.

With the automation at the Registrar General's Department (RGD), business registration has become relatively easy. All business registration forms are downloadable on the website of the RGD. Prior to the registration process, all the directors and secretary of the company must obtain personal tax identification numbers (TIN) from the Ghana Revenue Authority (GRA).

Step 2: Minimum Equity Contribution

Foreign investors are required to comply with the GIPC Act 685 regarding the minimum equity. Equity can either be in cash or in-kind as follows:

- US$200,000 for Joint Venture with a Ghanaian partner
- US$500,00 for 100% foreign ownership

If a foreign investor seeks to partner with a local business under a joint venture, then the GIPC Act 2013 (Act 685) stipulates that the Ghanaian partner must not have less than 10% stake in the venture.

Step 3: Registration with the GIPC

After all the requirements in steps one and two have been met, the foreign investor is then registered with the GIPC (after paying the relevant fees) for the process to be complete.

Other Registrations and Operating Licences

The investor would also be required to register other statutory and regulatory agencies such as the Ghana Revenue Authority (GRA), the Environmental Protection Agencies, Metropolitan, Municipal and District Assemblies, etc. The full scope of the agencies to deal with will depend on the business of interest. For instance, should an investor be interested in waste to energy production, the company will need an operating licence for the Energy Commission.

Legislative Framework

Below are Ghanaian laws worth noting for foreign investors seeking to do business in Ghana:

- Companies Act, 2019 (Act 992)
- Income Tax Act, 2015 (Act 896)
- Value Added Tax Act, 2013 (Act 870)
- Restriction on Transfer of Assets Act - 1970 (Act 323)
- GIPC Act 2013, (Act 685)
- Harmonized System (HS) Customs Code [Customs (Amendment) Act, 2015 (Act 905)
- Internal Revenue Act, 2000 (Act 592)
- Foreign Exchange Act, 2006 (Act 723)
- Anti-Money Laundering Act, 2008 (Act 749)
- The Free Zones Act, 1995 (Act 504)

Applicable Taxes

Below is a list of some of the applicable taxes for foreign companies doing business in Ghana. This is by no mean an extensive list:

- Income Tax
- Corporate Tax
- Value Added Tax
- Withholding Tax
- Customs and Excise Tax
- Import and Export Duties

Contributions to retirement benefit (social security) scheme (mainly for Ghanaian employees)

10.3 Free Zone Entity

Companies operating in industries other than mining, petroleum or timber can obtain a license from the Ghana Free Zones Authority (GFZA) to operate as a free zone entity. A company qualifies to operate as a free zone entity if it intends to export at least 70% of its goods or services. The registration as a free zone entity allows the company to enjoy a tax holiday for a period of ten years. After this period the company will be required to pay corporate tax of 25% on local sales and 15% with respect to exports. For companies wishing to set up **industrial parks or factories** for recycling or waste discussions may be held with the authority facilitated though MESTI or MSWR to explore whether such benefits could be allowed given the value of waste management and circular economy.

10.4 Doing Business with MMDAs

To work or conduct business in an MMDA's jurisdiction, the business entity is required to obtain a Business Operation Permit. This BOP is a license that that allows the entity to undertake business operations with the MMDA. The process of acquiring business operating permits is relatively easy and requires the following documents.

- Name of Business
- Name of Business Owner
- Registrar General Business Certificate/Certificate of Incorporation
- Business Location (GPS location)/Address
- Contact Details

Once this set of information is provided and the appropriate fee paid, a temporary permit is issued. This is then confirmed or made permanent after due diligence by the MMDAs.

For waste management, the MMDAs operate a franchise system where. The circular economy space is however more of a free market space. Business are encouraged however to link up with various federations and associations listed in chapter 5 of this report.

10.5 Key Ministries Departments and Agencies to Engage

As noted in the section on financing options, the PPP offers an opportunity for private sector to provide funding or projects. The following represent the milestones for an unsolicited PPP process.

1. Project Inception: Project Brief/Concept Note
2. Pre-feasibility (Stage I approval)
3. Feasibility Study (Stage 2 approval II)
4. Procurement (Stages III Approvals IIIA, IIIB)
5. Contracting PPP Agreements (Stage IV Approval)
6. Commercial Close

7. Financial Close

These processes will require a sponsoring public entity (either Ministry or MMDA) and will have to go through approval process at the Ministry of finance before the government signs onto it. Apart from the Ministry of Sanitation and Water Resources, which is the main ministry for waste management, the other key Ministries to engage include

1. Ministry of Environment Science and Technology
2. Ministry of Trade and Industry (in charge of 1 district one factory, 1 region one industrial park and other trade and business issues)
3. Ministry of Agriculture (composting)
4. Ministry of Energy and affiliated organisations (renewable energy and Waste to Energy)

10.6 Compliance Requirements for Banking (Foreign Entities)

For foreign companies seeking to have onshore accounts for businesses a number of banks offer various products. Examples of Foreign accounts are given below.

Foreign companies may open a Foreign Exchange Account (FEA) or Foreign Currency Account (FCA). Transfers from FEAs to foreign currency accounts (FCAs) are not allowed however Transfers from FCAs to FEAs are allowed. Transfer from both types of accounts to Ghana Cedi accounts are allowed. The threshold for transfers abroad from the FEA account is set at US$ 10,000 without any initial supporting documents. Beyond the threshold amount supporting documents are required. There no such restrictions on the FCA accounts and transfers. With the required supporting documents (e.g. audited accounts, tax clearance certificate), funds such as branch profits, repayment of loans, dividends and management/technical fees can be repatriated in foreign currency after the appropriate withholding taxes have been paid.

There are also options for local Ghana Cedi Accounts.

For this study, the focus was on Fidelity Bank which offers similar options as other banks but with the added advantage of having a specific product for funding WASH services through the SNV P2P Project. This project is supported by the EKN and businesses could seek to build synergies with this existing relationship particularly for their local business partners that might need counterpart funding for projects and business expansions. For Fidelity Bank, the consultant engaged with the Retail Banking unit that provided the following information below regarding the requirements for opening a bank account.

a. **A Board Resolution Letter** on the letterhead of the company requesting for account opening. Authorized officers are required to sign the letter stating the desired signature combination.

b. **Company Registration Documents** (These include - Certificate of Incorporation to Commence Business, Form 3 & 4, Form 17 if applicable, and Company's Regulations, Operating Licenses for Business concerned, Business Operating Permit[6], etc.).
c. **An Undertaking from Auditors/Lawyers** introducing company and directors, and **execution of Introduction Form of the Bank (copy to be attached).**
d. TIN of Directors and Company
e. One **Passport Picture each** and copy of Bio-data Pages of Passport (or any valid national ID, except NHIS) of **All Signatories** to sign on account(s).
f. Copy of Bio-data Pages of Passport (or any valid national ID, except NHIA) of Directors
g. Current Utility/Tenancy Agreement **(if in own name and within the last three months)** of All Signatories and Directors. If the current Utility or Tenancy Agreement is not in name of the officers concerned, then an Address Confirmation Form (to be signed by at least a year-old account holder of Fidelity Bank) or letter from Auditors/Lawyers confirming (in a single letter) residential addresses of officers concerned can be used.

The above is mainly for companies that intend to and will register in Ghana. In the instance where the company is not registered in Ghana but is undertaking a project, Fidelity Bank will require the registration documents of the entity in their resident country and the relevant project documents that the entity is a party to; to be able to open the project account. In that instance, the request for account opening will go through Fidelity Bank compliance processes and the client will still have to complete the account opening pack. Copies of this Bank account opening pack could be made available to interested businesses.

[6] Business Operating Permit can be sought from the local MMDAs where needed

11 Conclusions and Recommendations

1. Circular economy is a relatively new concept that is still evolving in the waste management and environment sector in Ghana. There is implicit support for the concept of circular economy from the sanitation policy and strategic action plan. Similarly, the Plastic Waste Management Policy promotes circular economy around the management of plastics.
2. A number of MSMEs are taking advantage of business opportunities in waste recovery and circular economy particularly when it come to the plastic waste management space. Some of these viable businesses have been identified for the sector. The scale at which these businesses operate are still relatively small.
3. Some innovations, while promising (e.g. “plastic wood” being done by Pyramid recycling) are still at the initial stages and will need further support to scale up. As rightly identified in the initial market survey, some kind of incubation support is need from the government and industry to further develop these innovations. This also presents opportunities for Dutch companies that have more experience and technologies in the circular economy space to invest in viable opportunities that have been identified.
4. Creating value for organics and the environmentally sound recovery of materials from e-waste are also opportunities have so far not been explored to the fullest potential and have more space for investors.
5. Financing waste management operations remains an issue that needs to be tackled. The government provides most of the funding for the sector particularly at the operational level and for capital expenditure. There are some donor investments for some of the large-scale infrastructure. It appears that the exact cost of waste management has not been determined at the different levels. MMDAs invest more of the budget for waste management in funding advocacy and clean-up activities. The capacity of the whole sector right from the MMDAs (public) to service providers (private need to be developed)
6. Capital investments for waste management, particularly for large scale infrastructure comes from the central government. Currently Government investment in recycling has been mainly limited to the construction of material recovery facilities and there is the need to expand scope to other activities and infrastructure along the value chain. A lot of small scale and medium companies have made their own investments in the provision of machinery for recycling of plastic and other materials. there is the need to create an enabling environment to further support investments in waste management. Options of PPP and blended finance could be explored for developing financing options for the sector. This will require some policy and regulatory changes that promote and support investors in the recycling space.
7. There is need for more efficient technology for recycling. Dutch partners can consider the provision of appropriate technology that is adaptable to the local conditions and bringing down cost and increasing efficiency.
8. COVID-19 exposed some of the challenges with the waste management, particularly in relation to the exposure of workers to infectious diseases. These are issues that require action from government. Even though the advent of covid-19 affected the revenue and operations of the waste management companies and recyclers. These companies did not

receive any special support from government bailouts but have managed to maintain their operations by making adjustments to become more efficient.

9. The recommendation for working with smaller and informal groups is to work though association such as FEMPURG, ESPA and NATUG
10. Dutch counterparts to provide further information on the interests and businesses to match with the Ghanaian group; to bring together the key stakeholders and individual to identify some of the

Annex 1: List of NATUG Members involved in recycling

Name of Enterprise	Major products recycled	Location/ contact person	No of workers
Tahiru Recycling	HDPE/PP	0545818805	17
Zigani Recycling	HDPE/LDPE/PP	0249804638	11
Mubarale Masaladu Ventures	HDPE/LDPE/PP	0243569798	10
Dansant Recyling	HDPE/PE/PP	0248889744	21
Sanity Recycling	HDPE/PP/PE/LDPE	0542713321	13
MD Green Ventures	PP	0272998820	22
Iba Abass Ventures	PP/HDPE	0246443195	17
Akyere	PP/HDPE/PET	0548475828	6
Zakari Ibrahim	PP/HDPE	0245407096	5
Dalexco Enterprise	HDPE/LDPE	0249162741	15
Skyyplast	PET/HDPE/LDPE	0243345011	19
Royal Neoka Plastic Recycling	HDPE/PP	0273824553	7
Zigani Plastic Recycling	HDPE/PP	0240219900	25
Dakonya Recycling	HDPE/LDPE	0269236267	11
Star Plastic	Finish products	0244051630	24
PATK 2L Enterprise	HDPE/LDPE/PP	0247559648	13
Giftland Recycling Enterprise	HDPE/ LDPE/PP	0243383585	5
Amala Plastic Ventures	HDPE/LDPE/PP/PVC	0559410903/ 0279439592	22
Elgiver Ventures	HDPE/LDPE/PP/PVC	0243197386	27
AB Serwaa Ventures	HDPE/LDPE/PP/PVC	0247553500	27

Asare Recycling ventures	HDPE/PP	0246621763	18
Ecoman Ventures	LDPE/HDPE	0551882380	9
Larfam Poly Plastics	LDPE/HDPE	0244452473	15
Sulhassan Enterprise	LDPE/HDPE	0246609580	16
J.B Plastics	LDPE/HDPE	0244760637	14
Siedu Amidu Enterprise	LDPE/HDPE/PE/PP	0558816668	11
Coliba Reycling Ltd	PET/PE	0243523824	29
Rahman Recycling Enterprise	HDPE/PP/LDPE	0548677726	50
Shaibu Recycling Enterprise	HDPE/PP	0543152798	11
Obaatan Plastics Enterprise	HDPE/PP	0243731217	10
In God We Trust Recycling	HDPE/LDPE	0245994890	7
Avumey Recycling	HDPE/LDPE	0244927238	12
Umasan Recycling Enterprise	HDPE/LDPE/PP	0244445386	14
Mikeduly Ltd	HDPE/LDPE/PP	0573095731	10
Imogen- Carly Vent	HDPE/LDPE	0552886446	6
Khristy Recycling Enterprise	HDPE/LDPE/PP	0243538743	10
Zhyegu Plastic Waste Recycling	HDPE/LDPE/PP	0244110148	11
Knockjoy Recycling Ltd	HDPE/LDPE/PVC/PP	0242155507	10
Hackman Recycling Enterprise	HDPE/LDPE/PP	0245604612	8
Sawpa Recycling Enterprise	PP/LDPE/PE/HDPE	0540996111	8
Pyramid Recycling Enterprise	Almost all plastics	0244641894	28
Gratify Lord Enterprise	HDPE/LDPE/PP	0246968134 (Accra-Metro)	
Louis Poly Plastic	HDPE/LDPE/PP	Ablekuma	12
Omari Mars Enterprise	HDPE/LDPE	0242856021 (Doblo)	6

Yesu Krom Enterprise	HDPE	0594597973(Doblo)	10
Regen Group Ltd	HDPE/LDPE/PP/PS/Paper/glass	0241948838 (Doblo)	19
Abdullah Yakubu Enterprise	HDPE/LDPE	0243510152 (Darkuman)	10
Kwali kwali Enterprise	HDPE/LDPE/PP/PET	0244660800 (Abossey-Okai)	12
Erkscarp Ventures	HDPE/LDPE/PP	0244469473 (Asutuari Junction)	26
Mohammed Rabani	PP, HDPE	0244486762	12
Alhassan Issaka	HDPE, LDPE	0266840452	5
Safuan Sumaila	HDPE	0245363259	6
Kiendeya Pascal	PP, HDPE	0244976698	10
Shaibu Wango	HDPE, PP	0244628355	7
Peter Jesus Star Number One Enterprise	HDPE, PP, PVC	0245085667	37
Issah Bidomi	HDPE, PP	0241494196	10
Kofi Bidomi	HDPE, PP	0240266191	15
Yaw Yohani	PP, HDPE	0556310654	15
Kwaku Noah	PP, HDPE	0243960174	14
Jababu Donkoh	PP, HDPE	0242786955	12
Danjummah Donkoh	HDPE, PP	0500505774	13
Kojo Mensah	HDPE, PP	0245085667	15
Dagaminna Plastic Waste	HDPE, PET, PP	0246196472	20
Abdul Wahab Issah	HDPE, LDPE	0543206265	6
Abdul Hammed	HDPE, PP	0244197991	4
Adamu Bari Co. Ltd.	HDPE, PP	0243858216	29
Kassim Dawud	HDPE, PP	0243322755	9
Yussif Hassan	HDPE, PP	244771020	6
Ibrahim Issaka	HDPE, PP	0265479391	10
Sarp K Recycling	HDPE, LDPE, PP	0242014411 Nsawam	19

Emmanuel Hodzi Ent.	HDPE, LDPE	0244059473/ Teacher Mante	10

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