Innovate UK Global Expert Missions

Sustainable Plastics in South Africa

March 2025

Contents

01. Executive Summary

This Global Expert Mission (GEM) to South Africa explored the challenges and opportunities for accelerating the transition to a more circular and sustainable plastics economy. It brought together UK experts from business, academia, and policy to engage with South African counterparts across government, industry, and civil society.

The mission found strong alignment between South Africa's strategic priorities and UK innovation capabilities. There is growing appetite in both countries to collaborate on solutions that address the environmental and socio-economic impacts of plastic waste, particularly through innovation in packaging design, recycling infrastructure, data systems, and reuse models.

South Africa's plastics sector faces persistent barriers including infrastructure gaps, enforcement limitations in Extended Producer Responsibility (EPR), and the marginalisation of informal reclaimers despite their vital contribution to plastics recovery. However, it also benefits from an active innovation ecosystem, policy momentum, and strong networks such as the South African Plastics Pact.

The mission identified several high-potential areas for bilateral collaboration:

- **Modular recycling infrastructure** for under served regions;
- **Design-for-recyclability standards and labelling** aligned with UK systems;
- **Reuse and refill innovation**, especially in informal retail contexts;
- **Behaviour change and communications** tailored to local realities;
- **Joint research and technical standards** for high-quality recyclate;
- **Data integration tools and traceability systems;**
- **Inclusive training and enterprise models** for informal sector integration.

To deliver on these opportunities, the report recommends targeted investment in joint R&D, business innovation programmes (e.g. GBIP), and bilateral capacity-building across academia, government, and industry. Key to success will be long-term partnerships built on mutual respect, context-specific design, and knowledge exchange.

This mission has laid a strong foundation for strategic, impactful UK–South Africa collaboration on sustainable plastics—linking environmental ambition with inclusive innovation and shared economic opportunity.

02. Acronyms

The following are common acronyms used throughout this report:

AI	Artificial Intelligence
ARO	African Reclaimers Organisation
B2B	Business to Business
B2C	Business to Consumer
B2G	Business-to-Government
BSI	British Standards Institution
CE	Circular Economy
CR&D	Collaborative Research and Development
CSIR	Council for Scientific and Industrial Research
DBT DSI	Department for Business and Trade Department of Science and Innovation
DSIT	Department for Science, Innovation and Technology
DTIC	Department of Trade, Industry and Competition (South Africa)
EPR	Extended Producer Responsibility
EWASA	e-Waste Association of South Africa
FCDO	Foreign, Commonwealth and Development Office
FMCG	Fast-Moving Consumer Goods
GBIP	Global Business Innovation Programme
GCRF	Global Challenges Research Fund
GEM	Global Expert Mission
GIP	Global Incubator Programme
G2G	Government-to-Government
LDPE	Low-Density Polyethylene
MoU	Memorandum of Understanding
NGO	Non-Governmental Organisation
OPRL	On-Pack Recycling Label
PETCO	PET Recycling Company (South Africa)
PRO	Producer Responsibility Organisation
RAM	Recyclability Assessment Methodology
RDI	Research, Development and Innovation
rPET	Recycled Polyethylene Terephthalate
SA	South Africa
SABS	South African Bureau of Standards
SADC	Southern African Development Community
SAPRO	South African Plastics Recycling Organisation
SIN	Science and Innovation Network (now STN)
SME	Small and Medium-sized Enterprise
STI	Science, Technology and Innovation
STN	Science and Technology Network (formerly SIN)
TIA	Technology Innovation Agency (South Africa)
TVET	Technical and Vocational Education and Training
UKRI	UK Research and Innovation
WRAP	Waste and Resources Action Programme

03. Introduction

Innovate UK, Innovate UK Business Connect and the Global Expert Missions

Innovate UK supports business-led innovation and is part of UK Research and Innovation (UKRI)[1]. UKRI convenes, catalyses and invests in close collaboration with others to build a thriving, inclusive research and innovation system. To this end, Innovate UK helps businesses to identify the commercial potential in new technologies and turn them into new products and services that will generate economic growth and increase productivity. With a strong business focus, Innovate UK drives growth by working with companies to de-risk, enable and support innovation. Innovate UK Business Connect exists to connect innovators with new partners and new opportunities beyond their existing thinking – accelerating ambitious ideas into real- world solutions. Innovate UK Business Connect is part of the Innovate UK group.

As innovation is increasingly a global endeavour and the ambition of UK businesses to become truly international enterprises is at its highest, Innovate UK established its Global Expert Mission (GEM)[2] programme in 2017. Delivered by Innovate UK Business Connect, in partnership with the UK Science and Technology Network (STN)[3], GEMs help further Innovate UK's global strategy by providing the evidence base for where it should invest and by providing the opportunities for UK businesses to build partnerships and collaborations with key economies.

1 https://www.ukri.org
2 https://ktn-uk.org/programme/global-expert-missions/
3 https://www.gov.uk/world/organisations/uk-science-and-innovation-network

Mission Overview and Objectives

Innovate UK Business Connect delivered a Global Expert Mission (GEM), bringing together key stakeholders from the UK and South Africa to exchange knowledge and showcase developments in sustainable plastic packaging.

The GEM explored the South African technology and innovation landscape in sustainable plastics, including feedstock availability, supply chain contacts, data management systems, compliance, and regulatory and policy frameworks.

In 2023, South Africa produced approximately 2.4 million tonnes of plastic waste[4]. Out of this, only about 14% was recycled[5]. Given the scale of the plastic waste challenge in South Africa, there is an urgency to explore bi- and multilateral innovation opportunities to deliver clean growth in the UK and South African plastics industry, with a reduction in the most problematic plastic waste entering the environment.

This Global Expert Mission focused on how UK innovators can collaborate with South African partners to improve mechanisms to collect, recycle and valorise plastic packaging, excluding incineration. The mission looked at synergy between South Africa and the UK for collaboration to enhance the circular supply chains that reduce the carbon intensity of plastic packaging and develop solutions that underpin the South Africa Plastic Pact targets:

- **Take action on problematic or unnecessary plastic packaging:** Eliminate, redesign, innovate, or find alternative delivery models for plastic packaging that is not reusable, recyclable, or compostable.
- **Ensure 100% of plastic packaging is reusable, recyclable, or compostable:** All plastic packaging entering the market should meet this criterion.
- **Achieve 70% recycling rate for plastic packaging:** At least 70% of plastic packaging should be effectively recycled.
- **Increase recycled content:** Ensure that there is an average of 30% recycled content across all plastic packaging.

4 https://www.developmentaid.org/news-stream/post/137299/south-africa-is-increasing-plastic-production-but-reducing-recycled-waste
5 https://endplasticwaste.org/en/news/alliance-to-end-plastic-waste-2023-progress-report

The objectives of the Mission were to:

- Help determine how Innovate UK can best support UK businesses more effectively and efficiently when considering sustainable plastics innovation partnerships with South Africa.
- Review key enabling technologies to support the UK's plastics recycling industries, focus on chemical and mechanical recycling, reuse and refill, compliance and data management.
- Provide insights into where there are synergies in policy and strategy between the two countries to determine whether there is an appetite for further collaboration in plastic packaging sustainability, mainly related to packaging data and software tools, infrastructure and recyclability by design.
- Enable UK companies to better understand the South African market and key stakeholders in plastic packaging sustainability by providing UK businesses with access to material manufacturers, packaging manufacturers, product manufacturers/packer fillers, brands/retailers, waste and/or recyclers/reprocessors, local authorities (or government departments responsible for dealing with waste), compliance schemes (or their equivalent) and local software providers (if they exist).
- Identify challenges and opportunities for developing innovative technologies, products and services when considering collaboration on sustainability with the South African plastic packaging sector.
- Develop strategies for long-term engagement for new technologies, products and services.

Mission Scope

Built around UK business, policy and research representation, the GEM aimed to:

1. **Inform UK businesses and government**

The mission findings and expert insights resulting from the GEM are made available to UK businesses and government departments. These inform UK businesses and the Government about potential opportunities for innovation in a country of interest and how it can help UK businesses make the most of those opportunities.

2. **Build International Collaborations**

The expert insights will help inform how Innovate UK can best help UK businesses find and exploit the opportunities for innovation partnerships. The GEM creates connections with key organisations and people that will deepen and widen the collaboration with the partner country to benefit UK business.

3. **Share UK Capabilities**

During the Mission, the delegation of experts will use the opportunity to promote and share the UK's innovation strengths.

A full life cycle, supply chain approach is needed to deal with the issue of plastic waste. Splitting this into two main areas: Upstream (retailers, packaging manufacturers and brands) and the downstream actors (waste and recycling companies), as each needs different interventions and innovation solutions, however, the two are not mutually exclusive and need to work together to really achieve impact in tackling the problem of plastic waste.

Upstream Innovation: Revise products and services at the design stage to design out packaging waste. For example:

- Flexible film packs, including small formats advancing refill/reuse solutions that eliminate the use of small format sachets/packs.
- Design solutions to ensure recyclability
- Innovations that reduce the need for multilayer laminated packs e.g., monolayer materials to replace multilayer materials.
- Reusable packaging and refill business models. New reusable packaging design solutions to replace non-recyclable or single-use packs, with a focus on urban areas.

Downstream Innovation: Affects a product or material after its first use. For example:

- Flexible film packs, including small formats new, sustainable models for the collection, sorting and recycling of flexible packaging and small format packs and sachets.
- Collecting, cleaning, decontaminating, sorting and separating. New technology or innovations to support the informal waste sector with a focus on transparent pricing, traceability and inclusion.
- Technology to reduce contamination, sorting, separation or recycling for rigid plastic or flexible plastic packaging that is appropriate for the context (for example, small scale, low cost, small footprint, modular).
- End market development innovative recycling and sorting technology to overcome barriers to greater use of recycled plastics in new and existing applications, opening high-value end markets.

04. Sector Overview

The South African plastics industry is a cornerstone of national manufacturing, with critical links across sectors including packaging, construction, automotive, agriculture, and retail. It is also central to South Africa's broader transition toward a circular economy. Yet despite its importance, the sector faces systemic constraints that continue to limit growth—most notably underinvestment, infrastructure deficits, and structural inequalities, and entrenched behavioural norms. Low levels of environmental literacy, limited household recycling participation, and widespread littering reflect broader societal challenges that directly impact material flow and sector performance.

4.1 Market Size and Value

In 2023, domestic plastics consumption in South Africa totalled approximately 1.98 million tonnes—comprising 1.57 million tonnes of virgin polymer and 416,000 tonnes of recycled polymer (**Figure 1**).

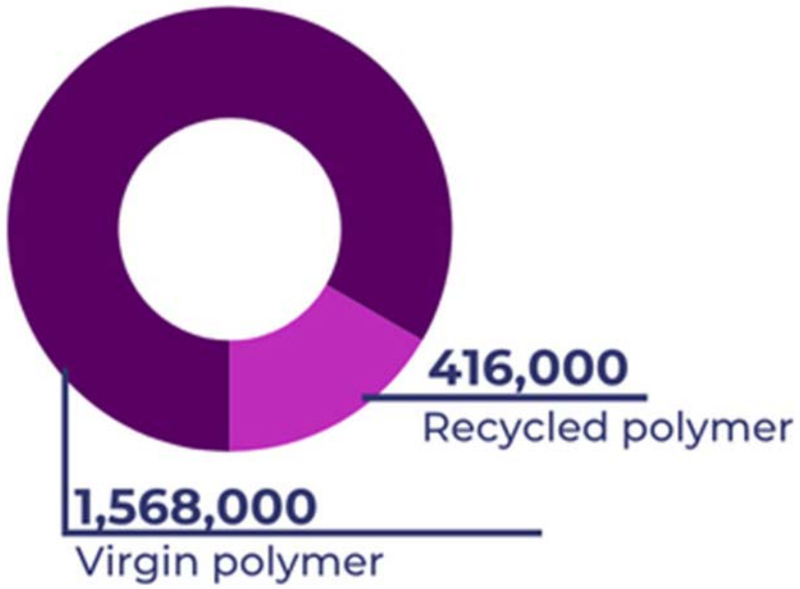


Figure 1: Breakdown of polymer usage in tonnes (2003)[6]

6 Data presented by Plastics SA on 12/03/2025

Although this represents a modest 1% annual increase, the market has remained largely stagnant over the past decade, fluctuating between 1.6 and 2.0 million tonnes since 2013.

Per capita virgin plastic consumption has declined from 27.2 kg in 2016 to 25.3 kg in 2023, suggesting saturation in some areas of demand, lighter-weight packaging design, and increased recycled content uptake. (**Figure 2**).

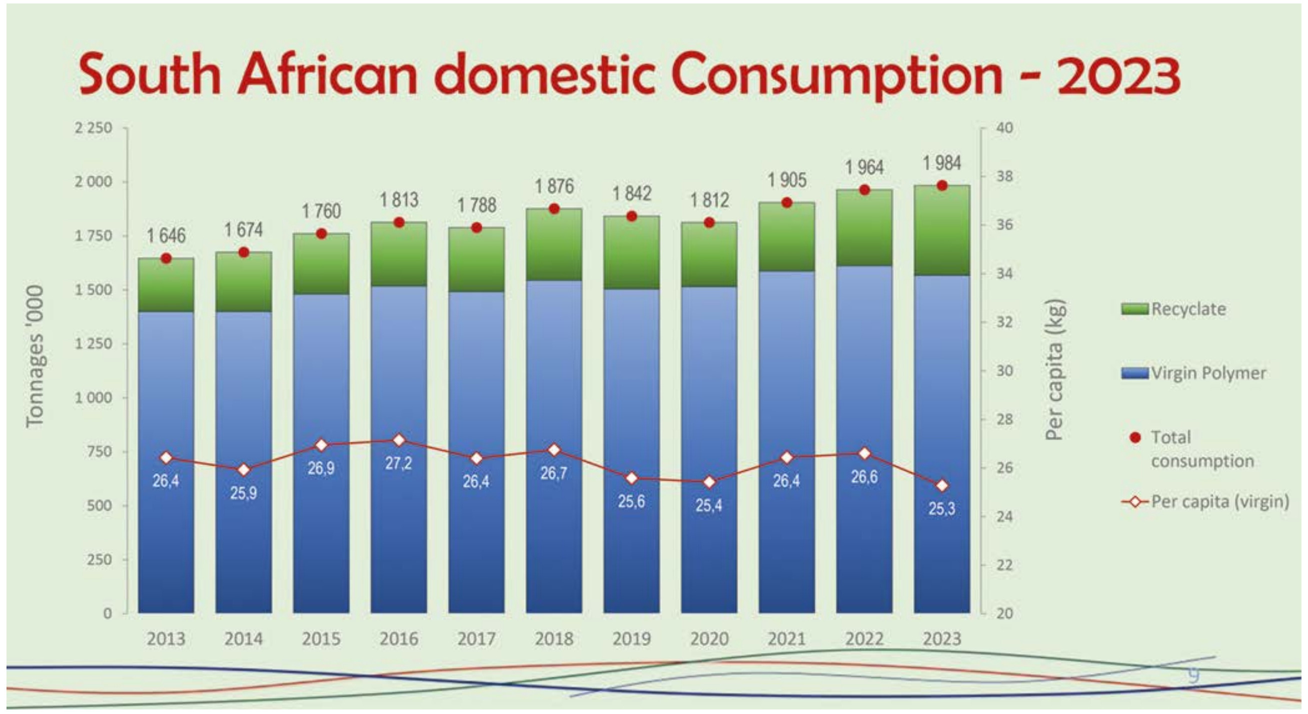


Figure 2: South African domestic consumption 2013-23[7]

7 Data presented by Plastics SA on 12/03/2025

The industry was valued at R83.4 billion in 2023 (£3.43 billion), contributing roughly 1.8% to national GDP and 15.8% to manufacturing GDP. South Africa's plastics sector is the largest in Sub-Saharan Africa, but its global share is limited—representing less than 0.4% of global plastic consumption.

Future growth is expected to remain modest, with potential concentrated in regional trade and investment in recycling infrastructure. Exports to neighbouring Southern African Development Community (SADC) countries were valued at R16.1 billion (£68M) in 2023—66% of all plastic-related exports—mostly in semi-finished goods[8].

By contrast, the UK's plastics market is more diversified, mature, and regulated. In 2021, the UK placed approximately 2.2 million tonnes of plastic packaging on the market and had an estimated total plastic recycling capacity of 950,000 tonnes, including 730,000 tonnes for packaging specifically[9]. The UK market is evolving steadily through innovation in bioplastics, increased use of recyclate, and expanding refill and reuse models. While per capita consumption remains higher than in South Africa, it is declining in response to net-zero targets, Extended Producer Responsibility (EPR), and packaging minimisation policies.

8 Data presented by Plastics SA on 12/03/2025

9 Plastics Market Situation Report 2022, WRAP (2023)

4.2 Industrial Base and Adoption Trends

South Africa's plastics value chain is broad but uneven. In 2023, 295 recycling operations were active nationwide, with more than half located in Gauteng. That province alone handled 57% of total recycled tonnage, while others—including the Northern Cape—had no significant recycling infrastructure[10].

Uptake of circular practices is highly variable. The South African Plastics Pact— launched in 2020 and coordinated by GreenCape—represents a growing commitment to circularity in plastic packaging. This voluntary, multi-stakeholder initiative mirrors the ambitions of the UK Plastics Pact[11] and is aligned with the Ellen MacArthur Foundation's global Plastics Pact Network[12]:

- **Target 1:** Elimination of problematic and unnecessary plastic
- **Target 2:** 100% of plastic is recyclable, reusable, or compostable
- **Target 3**: 70% of plastic packaging is effectively recycled
- **Target 4:** 30% average recycled content across all plastic packaging

Pact members accounted for approximately 24% of plastic packaging placed on the market in 2023[13].

10 An analysis of the 2023 South African plastics industry data. Plastics SA (2024)
11 The UK Plastics Pact | WRAP - The Waste and Resources Action Programme
12 The Plastics Pact Network | Ellen MacArthur Foundation
13 SA Plastics Pact Annual Report 2023, GreenCape (2024)

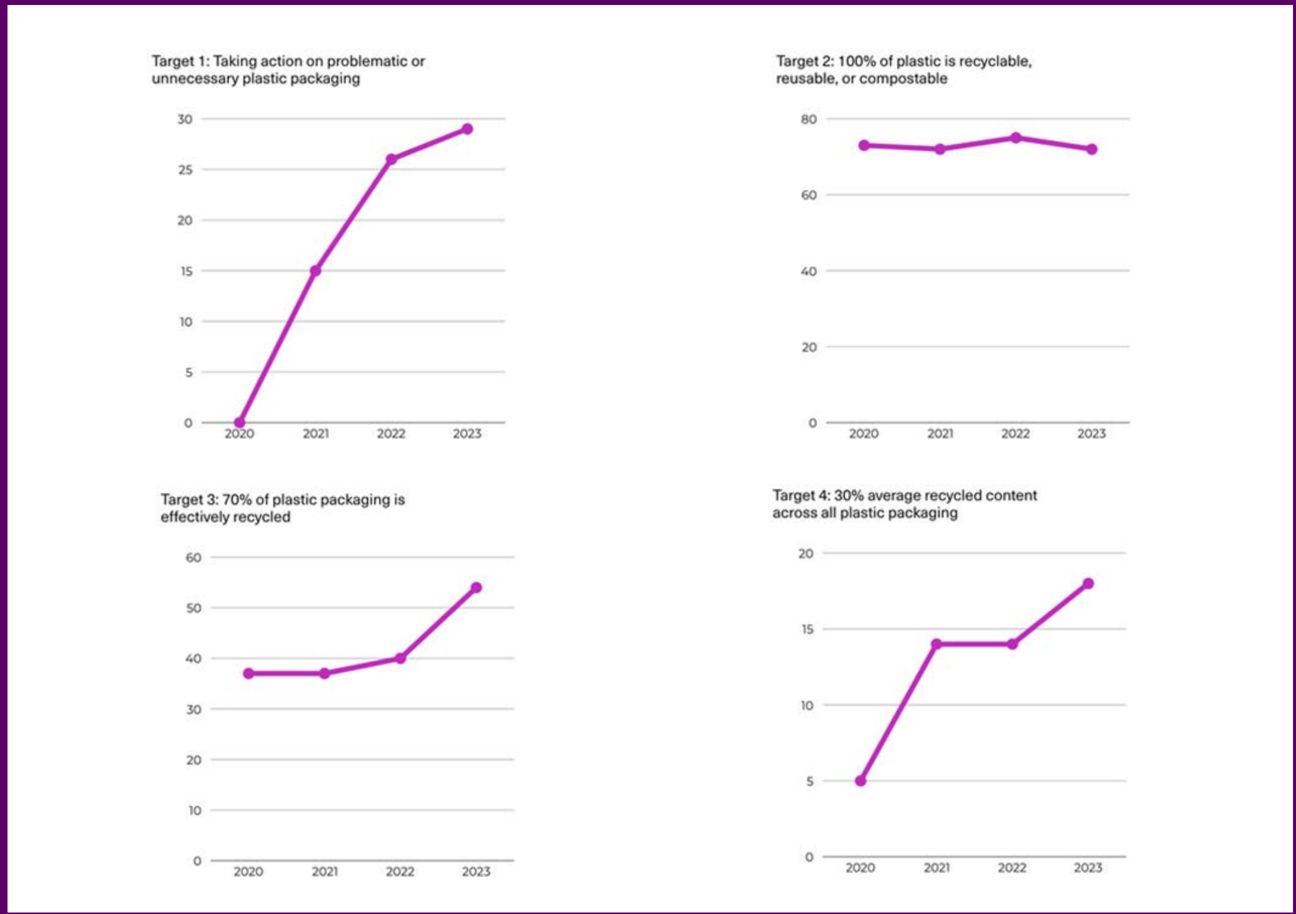
Case Study: South African Plastics Pact – Progress to date

Launched in 2020 and facilitated by GreenCape, the South African Plastics Pact is a collaborative initiative uniting stakeholders across the plastics value chain to drive a circular economy for plastic packaging. With support from the Ellen MacArthur Foundation and WRAP, the Pact sets out four ambitious 2025 targets and publishes annual progress updates to track collective impact.

As of 2023, Pact members have made strong progress towards each of the targets[14]:

- Eliminated 42 million problematic plastic items;
- Achieved a 29% reduction in target items such as oxo-degradables, straws, and barrier bags;
- Ensured 72% of packaging is recyclable, reusable, or compostable;
- Reached a 54% input recycling rate (45% output rate);
- Raised average recycled content in plastic packaging to 18.3%;
- Invested over R3.4 billion in circular economy solutions since 2020.

These outcomes demonstrate the potential for pre-competitive collaboration to drive systemic change, despite the underlying constraints.



14 SA Plastics Pact Annual Report 2023, GreenCape (2024)

4.3 Workforce and Skills Landscape

The plastics sector supports a dual labour market comprising (**Figure 3**):

- An estimated 14,500 formal jobs in recycling and associated supply chains; and
- Around 95,900 informal reclaimers, who are responsible for the majority of post-consumer plastics recovered from waste streams.

Informal workers, particularly reclaimers, play a vital role in capturing flexible polyethylene films and other valuable materials. However, their contributions often go unrecognised, and they operate without reliable income, safety protections, or formal integration into municipal systems.

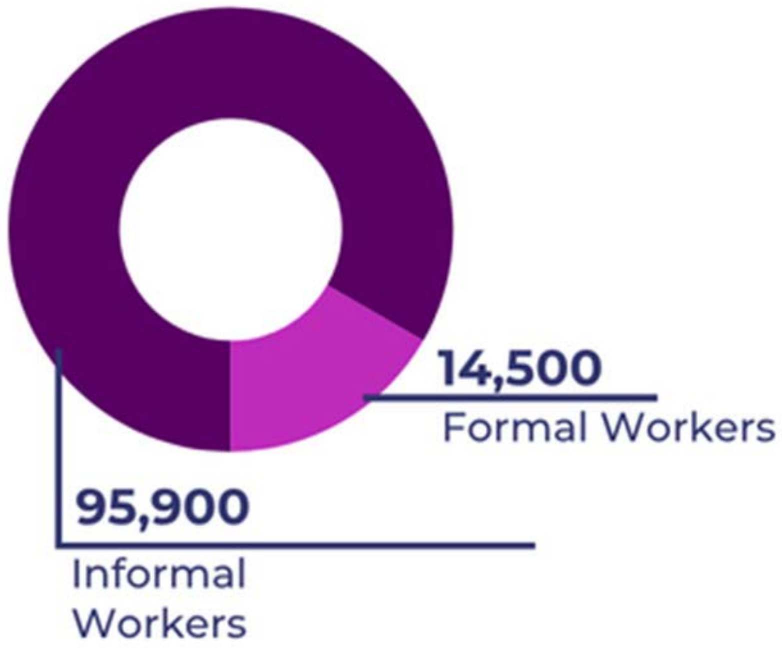


Figure 3: Formal vs Informal workers in the South African plastics value chain

Case Study: African Reclaimers Organisation (ARO)

The African Reclaimers Organisation (ARO) is a member-based, grassroots organisation representing informal waste reclaimers—those who collect, sort, and sell recyclable materials from households and public spaces across South Africa.

ARO was founded in response to the growing marginalisation of reclaimers in formal waste management systems, with the aim of securing recognition, rights, and remuneration for their essential environmental and economic contributions. Operating primarily in urban centres such as Johannesburg and Tshwane, ARO works to integrate reclaimers into municipal waste systems through inclusive models that preserve their livelihoods. This includes household separation-at-source programmes co-designed with communities, education campaigns, and advocacy for reclaimers to be paid for the collection services they provide.

ARO's broader vision is one of social and environmental justice—transforming the waste economy into a more equitable system that values both people and the planet.

More broadly, formal skills development in the sector remains limited. Many SMEs and micro-recyclers lack access to vocational training, polymer processing certification, or capital for modern equipment. There is a strategic need for upskilling—particularly in modular processing, AI-enabled sorting, and other advanced recycling technologies - however for many, the cost of training and equipment is prohibitive, suggesting that more scalable, low-cost, and context-appropriate technology solutions may be necessary to drive widespread adoption.

4.4 Emerging Technology and Use Cases

Several promising use cases for cross-sector innovation are emerging, including:

- **B2C:** Retail-led refill and reuse pilots, such as pre-fill beverage dispensers, are drawing on UK models. However, uptake is challenged by fraud risks, regulatory constraints on weights and measures, and concerns over brand consistency.
- **B2B:** FMCG companies are collaborating with recyclers to incorporate more food-grade rPET into beverage and personal care packaging.
- **B2G:** Local governments are testing informal reclaimer integration models with technical assistance from NGOs.
- **G2G:** South Africa and the UK are collaborating through platforms like the Plastics Pact Network to share best practice and drive policy alignment on EPR and circular design.

4.5 Market Entry Challenges

South Africa's plastics sector faces several interlocking barriers:

1. **Infrastructure Deficits:** Collection and processing infrastructure is uneven, with minimal access outside major metros. Most municipalities lack basic separation-at-source systems.
2. **Demand Constraints:** Weak end-markets for recyclate—especially for flexibles and multi-layer packaging—undermine investment. Virgin polymer often remains cheaper than recycled alternatives. Mandatory recycled content requirements are absent.
3. **Policy Gaps:** EPR implementation is progressing, but enforcement is inconsistent. The absence of a national on-pack recyclability label hampers both consumer participation and design for recyclability. Local authority practices vary widely.
4. **Socioeconomic Barriers:** High unemployment, low environmental literacy, and spatial inequality hinder household recycling. Littering and contamination are prevalent, and public awareness campaigns remain fragmented.
5. **Financial and Technical Constraints:** SMEs struggle to access finance for capex-intensive upgrades (e.g. wash plants, densifiers). Load shedding, high energy costs, and skills shortages restrict operational resilience and technology uptake.

05. The Innovation Landscape

Innovation in South Africa's plastics and circular economy sector is underpinned by a growing ecosystem of public, private, and non-profit actors. These include national research bodies, dedicated funding programmes, science policy frameworks, and multi-stakeholder platforms.

This section outlines the key innovation support structures, current policy direction, and areas of international collaboration with relevance to sustainable plastics.

5.1 Innovation Support Structures

Council for Scientific and Industrial Research (CSIR) & Department of Science and Innovation (DSI) - Government

The CSIR, in partnership with the Department of Science and Innovation (formerly the Department of Science and Technology), is implementing South Africa's Waste Research, Development and Innovation (RDI) Roadmap[15]. Launched in 2015 and running through 2025, this initiative was designed to guide investment into waste- related innovation, with approximately R3.9 billion allocated over the period. It promotes context-appropriate technologies, supports postgraduate research, and strengthens national capacity in recycling and resource recovery, including for plastics.

Recent outputs include pilot projects in decentralised waste processing, the development of new polymer characterisation tools, and funding for postgraduate theses on materials recovery and circular economy interventions. The roadmap is closely aligned with the goals of the National Waste Management Strategy and acts as a delivery mechanism for South Africa's STI White Paper ambitions.

Technology Innovation Agency (TIA)

The Technology Innovation Agency (TIA) in South Africa plays a pivotal role in advancing recycling initiatives and promoting sustainable plastic solutions. As a public entity under the Department of Science and Innovation (DSI), TIA bridges the gap between research and commercial application by providing funding and fostering partnerships among small and medium-sized enterprises (SMEs), industries, universities, and science councils. TIA's funding mechanisms, such as the Industry Matching Fund (IMF) and Innovation Fund, are designed to support initiatives in recycling and sustainable plastics. These funds have attracted partnerships from various stakeholders, including venture capitalists and development finance institutions, to invest in innovation that addresses environmental challenges.

GreenCape - NGO

GreenCape is a leading green economy NGO that plays a pivotal role in enabling investment, providing market intelligence, and convening cross-sector collaboration. Its Circular Economy team has been especially active in the plastics space, serving as the Secretariat for the South African Plastics Pact and producing annual Market Intelligence Reports on the waste and recycling sectors.

GreenCape's hub has supported innovations such as reuse pilot programmes in partnership with the V&A Waterfront and Oranjezicht City Farm Market, and technical briefs on scaling end-markets for recyclate. Its position as a neutral convenor has enabled collaborative action between municipalities, informal reclaimers, and retail sector stakeholders.

15 Waste Research, Development and Innovation Roadmap – A waste R&D and innovation programme for South Africa

Plastics SA – (Industry Body)

As the main industry body for the plastics sector, Plastics SA represents the full value chain—from raw material producers to converters and recyclers. It is an important source of data, coordination, and advocacy. The organisation collaborates with Producer Responsibility Organisations (PROs) and supports industry training and awareness campaigns. Its annual "Plastics SA Market Situation Report" provides critical data on polymer flows, recycling rates, and material destinations, used by both government and industry to guide investment and R&D focus areas.

SA Plastics Recycling Organisation (SAPRO)

SAPRO represents South African plastics re-processors (recyclers) and is mandated to drive growth in the recycling industry with focus on increasing quantity and quality of recycling feedstocks and demand for recyclate. SAPRO promotes the cause of recycling to government and the public. It hosts the annual SAPRO Best Recycled Plastic Product Awards, which recognise companies innovating to give recycled plastics new life. SAPRO provides a free design for recycling tool for packaging designers. SAPRO's efforts support market pull for recycled content and encourage product/packaging innovation in line with circular economy principles.

South African Plastics Pact (Voluntary Commitment)

Launched in 2020, the SA Plastics Pact is a voluntary multi-stakeholder platform aligned with the Ellen MacArthur Foundation's global Plastics Pact Network. It brings together 30 business members and 24 supporting stakeholders to drive a circular economy for plastics. The Pact's 2025 Roadmap13[16] outlines specific innovation needs, including:

- Designing out problematic and unnecessary plastics;
- Developing scalable reuse/refill models;
- Innovating in compostables where appropriate;
- Improving collection and sortation systems; and
- Strengthening markets for recycled content.

The Pact has published a suite of tools including a Design for Circularity guide, recyclability assessments, and a phase-out list of problematic items. Members have piloted refill stations and redesigned packaging to meet recyclability thresholds, demonstrating how voluntary commitments can accelerate applied innovation across the value chain.

16 https://www.dffe.gov.za/registration-terms-regulations-regarding-extended-producer-responsibility-2020#:~:text=Introduction%20and%20background,of%20the%20circular%20economy%20initiatives.

5.2 Innovative businesses in Sustainable Plastics

During the South Africa GEM week, the delegation had the privilege of meeting with leading businesses in Sustainable Plastics. These stakeholders were carefully chosen for their forward-looking innovations in the space and potential international collaboration. The delegation participated in in-depth discussions, delving into emerging trends and ground breaking technologies shaping the industry. They also observed some of these advancements first-hand through company and lab visits.

Reusefy (Reuse & Refill Business)

Runs reuse and return systems in Cape Town, including a successful reusable cup scheme at the Oranjezicht City Farm Market. Their model combines technology and incentives to reduce single-use packaging in informal and semi-formal retail settings.

Sonke Refill Solutions (Reuse & Refill Business)

Provides modular refill kiosks for low-income communities, offering essential goods in reusable containers. Their model reduces plastic waste while improving affordability and access.

PepsiCo South Africa (FMCG Business)

Redesigning its snack and beverage packaging to be more circular, focusing on removing problematic materials and increasing recycled content. They are exploring flexible packaging alternatives and international collaboration on recyclability and reuse.

Unilever South Africa (FMCG Business)

Phasing out materials like PVC and PS and transitioning to recyclable mono-material films. They are also piloting reuse and refill systems, especially in homecare, while advocating for improved labelling and infrastructure.

Myplas (Recycler)

Recycles both flexible and rigid PE and PP at its advanced Cape Town facility, producing food-safe pellets for major brand owners. Their high standards and partnerships help strengthen South Africa's circular plastics economy.

Superthene (Recycler & Converter)

A vertically integrated converter and recycler of flexible packaging, using high-performance extrusion technology to incorporate recyclate. Their work supports closed-loop solutions for retail, agriculture, and industrial film applications.

Tuffy Brand (Converter & Manufacturer)

A plastic bag manufacturer producing bin bags made from 100% recycled materials. Their commitment to incorporating post-consumer waste is a great example of how businesses can minimise environmental impact.

EnviroServ, Chloorkop (Disposal Operator)

The EnviroServ Chloorkop Landfill, a licensed waste facility for Johannesburg and Ekurhuleni, collaborates with 16 recyclers in Gauteng to recycle about 3,500 tons of plastic waste annually. The facility is also expanding to add a Material Recovery Facility to improve the recycling of plastics and other materials.

Premier Plastics (Converter & Manufacturer)

A flexible plastic packaging manufacturer producing a variety of flexible plastic packaging products, including HDPE, LDPE, and recycled carriers, both plain and printed up to six colours for the retail industry. They have experience in blown film extrusion, bag making, printing, and recycling, and their products are used by major supermarket chains such as Pick 'n Pay, Shoprite Checkers, Spar, Pep, OK Foods, and ICC Cash & Carry Stores. They recycle 100% of factory waste and have an EFSA- approved recycling process.

Case Study: Extrupet, Cape Town (Recycler)

Extrupet's Cape Town facility stands as a world-class example of PET bottle-to- bottle recycling, showcasing Africa's leadership in circular plastics. This state-of- the-art plant, developed in partnership with PETCO, is the first of its kind in the Western Cape and went fully operational in early 2025.

The facility added an additional 15,000 tonnes per annum of food-grade recycled PET (rPET) output capacity. This expansion will increase Extrupet's total food- grade rPET capacity to over 60,000 tonnes per year. The plant utilises Erema Vacunite technology, ensuring that the recycled material meets global standards for traceability, safety, and certification.

Extrupet's recycled PET, marketed under the PhoenixPET® brand, is used by leading South African and international clients including Nampak Liquid, Woolworths, Pick n Pay, and Astrapak. Applications include fruit punnets and beverage bottles, and the facility is aligned with European Union legislation requiring certified recycled content for certain export products.

This facility not only enhances South Africa's recycling infrastructure and circular economy ambitions but also sets a benchmark globally for scale, quality, and technical sophistication in plastics reprocessing.

5.3 Policy Frameworks and Roadmaps

2019 White Paper on Science, Technology and Innovation

The national South African STI White Paper[17], published in 2019, provides the strategic framework for science and innovation policy across government. It includes specific focus on sustainability, circular economy, and inclusive innovation. The associated Decadal Plans (2021–2031) identifies key missions for R&D, including waste innovation, sustainable materials, and climate resilience. These documents underpin the rationale for state investment in plastics-related R&D.

National Waste Management Strategy (2020) and EPR Regulations (2021)

The 2020 update to the National Waste Management Strategy[18] introduced new goals on waste minimisation, increased diversion from landfill, and a shift toward circularity. This was operationalised through new EPR regulations under Section 18 of the National Environmental Management: Waste Act, implemented in November 2021[19]. The rules mandate that producers finance and organise the collection, sorting, and recycling of plastic packaging.

As a result, PROs such as PETCO, Polyco and Polystyrene Association of SA now fund infrastructure upgrades, educational campaigns, and innovations in collection models (e.g. reverse logistics, front-of-store collection). These developments are fostering new partnerships with SMEs and stimulating demand for recycling-related technologies.

17 White Paper on Science, Technology and Innovation, DST (2019)
18 National Waste Management Strategy 2020, DEFF (2020)
19 Waste Act: Chapter 4, pt3, Section 18, DEA (2021)

South African Plastics Pact: Roadmap to 2025

The Pact's Roadmap to 2025[20] functions as an industry-aligned R&D agenda. It prioritises actions that complement national strategies, such as reducing hard-to- recycle formats, piloting closed-loop reuse systems, and expanding compostables where appropriate. These priorities have been reflected in academic and private sector R&D efforts, including in materials science, advanced mechanical recycling, and AI- supported sortation. The roadmap has become a key reference point for funders and policymakers evaluating plastics innovation proposals.

20 https://www.saplasticspact.org.za/wp-content/uploads/2021/01/ROADMAP_5_10_20.pdf

5.4 International Scientific Collaboration

UK–South Africa Science and Technology Network (STN)

The UK Science and Technology Network (STN) maintains a country snapshot for South Africa[21] that outlines key areas of bilateral collaboration. South Africa is a priority partner within the FCDO's Africa strategy, with cooperation covering climate change, health, circular economy, and industrial innovation. The 2022 renewal of the UK–South Africa Science MoU reaffirmed this partnership and expanded joint programmes across eight thematic areas, including green energy, life sciences, and sustainable development.

Research Quality and Impact

UK–South Africa joint research is consistently recognised for its high quality, with citation rates for co-authored publications in environmental and engineering disciplines frequently exceeding global averages, according to the UK's Science and Technology Network and UKRI summaries on international research impact. The UK remains among South Africa's top two international research partners, especially in agriculture, health, astronomy, and waste management.

In the plastics and circular economy domain, bilateral efforts have explored bio-based alternatives to fossil polymers, modular micro-recycling infrastructure, and digital tools to trace packaging from production to reprocessing. These projects, funded through Newton Fund and GCRF mechanisms, have supported university-industry partnerships, knowledge transfer events, and data standardisation pilots.

Thanks to such mechanisms, the UK–South Africa science partnership is regarded as one of the most productive in the Global South. Beyond academic outcomes, this cooperation has yielded tangible technology demonstrations and contributed to shaping national innovation agendas.

21 UK Science and Technology Network summary: South Africa - GOV.UK

06. Collaboration Opportunities

Opportunities for collaborative innovation between the UK and South Africa in plastics circularity are broad-ranging and well-aligned with both nations' respective strengths. For the UK, these collaborations represent significant commercial, academic, and strategic opportunities—ranging from the export of innovative technologies and services, to access to new testbeds for product development, and deepened global leadership in circular economy systems. This section explores specific areas for joint R&D, commercial partnerships, policy development, and knowledge exchange, with an emphasis on UK growth potential and the role of UK businesses, institutions, and investors.

The opportunities matrix (**Table 1**) summarises these opportunity areas, outlining example interventions, relevant stakeholders, and recommended next steps to guide future UK–South Africa collaboration.

6.1 Collaboration on Modular, Distributed Recycling Solutions

South Africa's vast geography and fragmented infrastructure have created demand for decentralised, low-cost, and context-appropriate recycling solutions. UK start-ups and SMEs developing compact mechanical or hybrid recycling systems—including modular wash and extrusion units—are well-positioned to meet this need while expanding into emerging international markets.

There is scope for co-development projects between UK innovators and South African NGOs, buy-back centres, and township-based cooperatives. Joint R&D calls and demonstration programmes co-funded by Innovate UK and the Technology Innovation Agency (TIA) could enable UK companies to trial and refine technologies in high-need environments, creating replicable models for other low- and middle-income markets and generating new revenue streams through hardware sales, technology licensing, or service-based models.

The Global Business Innovation Programme (GBIP) could serve as a platform to identify partners, secure in-country insights, and raise the international profile of UK low-resource innovation capabilities.

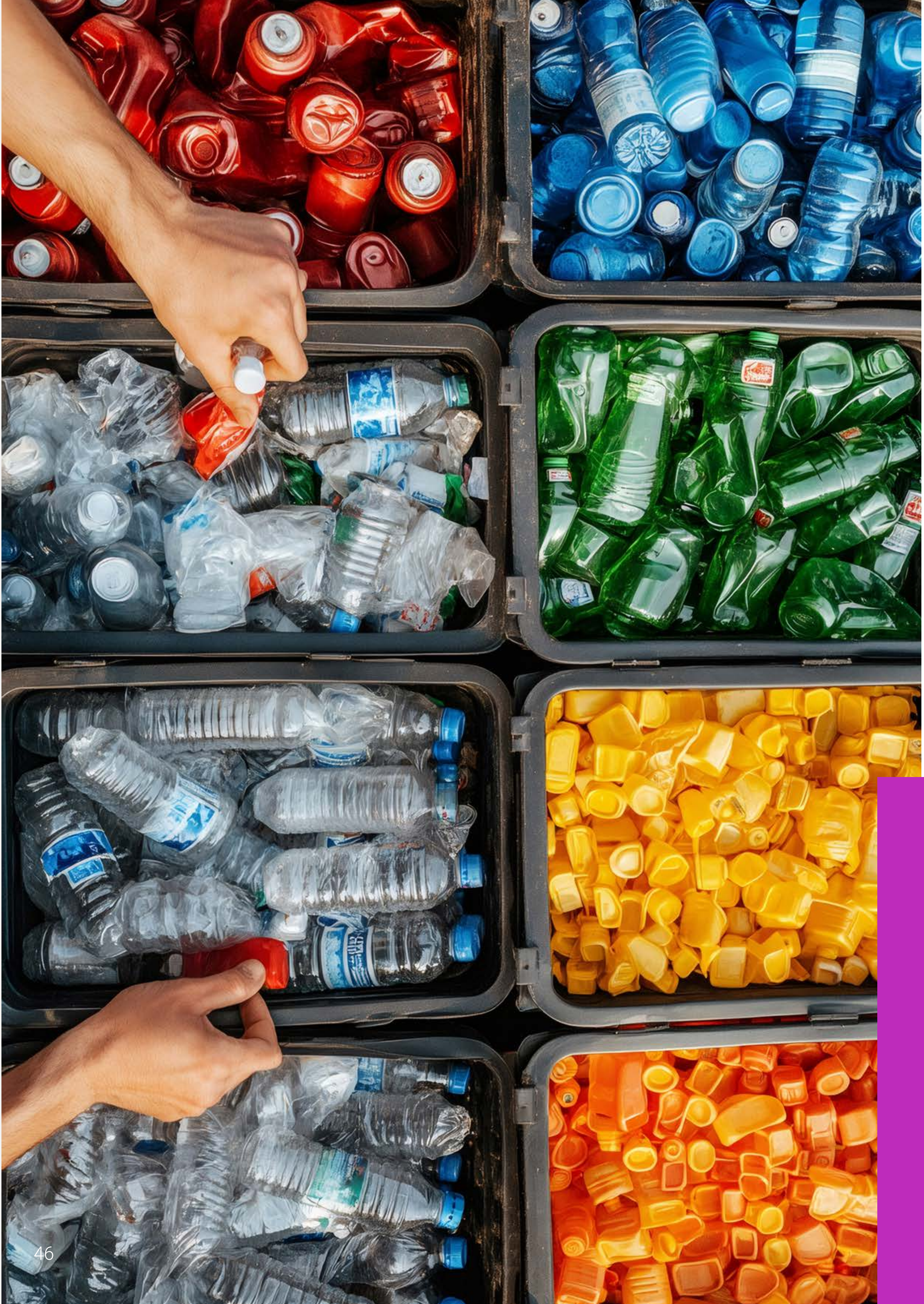
6.2 Upskilling and Entrepreneurship Pathways for the Informal Sector

With over 95,000 informal workers active in South Africa's plastics recovery system, skills development and enterprise formalisation are critical to both social inclusion and sector resilience. For UK institutions with experience in vocational training, enterprise development, and social franchising, this presents a unique opportunity to scale their methodologies internationally and form strategic delivery partnerships.

UK organisations can support by:

- Co-designing training programmes in safe materials handling, sorting, and micro- enterprise development;
- Embedding entrepreneurial modules in circular economy accelerators or township incubators;
- Piloting reclaimer-operated modular recycling systems, with mentoring from UK social enterprise models.

These efforts would not only drive inclusive growth in South Africa but also strengthen the global credibility of UK approaches to just transition and skills for circular economy careers.



6.3 Design for Circularity and Recyclability Labelling

UK frameworks such as design for recyclability and On-Pack Recycling Label (OPRL) generated strong interest from South African stakeholders during the mission. Their implementation abroad offers potential for licensing, technical consultancy, and research partnerships that would directly benefit UK institutions and standards bodies.

There is a clear opportunity for UK stakeholders to:

- Transfer knowledge on recyclability testing methodologies;
- Provide technical expertise in packaging and product design for circularity, including mono-material formats, reduced inking, and easy-to-separate components;
- Support the development and governance of a national labelling system;
- Share reflections on the UK's early experiences implementing modulated EPR fee-setting, including lessons learned.

These collaborations position the UK as a thought leader in evidence-based recyclability systems, strengthening commercial potential for UK-developed tools and increasing demand for British technical expertise and guidance.

6.4 Knowledge Sharing on Reuse and Refill Systems

The growing appetite for reuse in South Africa opens opportunities for UK businesses and research consortia to pilot emerging technologies, collaborate on behaviour change interventions, and export services. Pre-fill and closed-loop systems piloted in the UK can be adapted and trialled through South African retail networks, generating insights applicable to both developed and developing markets.

UK stakeholders can add value by:

- Sharing insights from UK-led pre-fill, in-store refill, and closed-loop logistics pilots;
- Collaborating on challenge-led innovation funds targeting reuse systems for informal and price-sensitive retail;
- Facilitating bilateral study tours or twinning arrangements for retailers and regulators.

Such engagements provide UK companies with global first-mover advantage in the reuse economy and strengthen their case for further investment and adoption domestically.

6.5 End-Market Development for Recycled Plastics

South Africa's limited market for high-quality recyclate presents a direct commercial opportunity for UK organisations with capabilities in standards development, certification, and market-building. In return, UK manufacturers and procurement bodies can access novel recyclate applications, diversify supply chains, and support ethical sourcing commitments.

UK collaboration could include:

- Co-funding feasibility studies on high-value recyclate applications in construction and industrial design;
- Co-creating product specifications and harnessing UK technical skills to support South African partners;
- Supporting UK procurement teams to trial South African recycled-content products in suitable sectors.

These partnerships reinforce the UK's commitments to responsible supply chains while opening up market development and certification consultancy opportunities for British firms.

6.6 Data, Traceability and Investment Readiness

With South Africa's EPR scheme in early stages of rollout, UK tech companies have a timely opportunity to provide digital traceability tools, analytics dashboards, and systems integration services. These solutions not only support South African compliance, but also serve as demonstrators for international deployment.

UK tech providers can collaborate on:

- Developing open-source EPR data platforms or standardised traceability protocols;
- Piloting QR codes, blockchain, or material passports for flexible plastics;
- Building digital tools to support investment readiness of recyclers and social enterprises.

These opportunities allow UK firms to test innovations in complex real-world environments with a view to eventually export circular economy digital infrastructure globally.

6.7 Ocean Plastics & Environmental Tracking

Beyond packaging traceability and EPR compliance, there is a shared interest in addressing plastic leakage into the environment—particularly through enhanced ocean plastics monitoring. South Africa's extensive coastline and riverine systems are key conduits for plastic pollution, but data on leakage pathways and material fate remains limited. UK organisations with expertise in satellite monitoring, AI-driven analytics, or environmental sampling protocols can contribute to improved tracking of ocean-bound plastics.

There is also scope for co-developed education and outreach programmes that link ocean plastics tracking with citizen engagement—mirroring UK campaigns such as the Big Plastic Count or Marine Conservation Society's beach audits. These collaborations can support improved environmental policy, raise public awareness, and provide UK businesses in environmental data services or plastic footprinting with entry points to pilot tools and expand commercial offerings abroad.

6.8 Policy and Regulation Alignment

South Africa's evolving regulatory landscape provides UK institutions with an opportunity to export policy models, co-develop technical guidance, and build strategic alliances in international standard-setting. These engagements strengthen the UK's global influence on EPR policy architecture and support regulatory consultancy and advisory roles for UK experts.

Opportunities include:

- Bilateral policy dialogue on EPR implementation and enforcement models;
- Technical working groups on recyclability assessment to inform fee-setting approaches;
- Peer exchanges between regulators, PROs, and municipalities.

This type of collaboration supports the UK's international leadership on circular economy regulation and creates future advisory opportunities linked to treaty implementation.

6.9 Collaborative Research on Alternative Materials and Biopolymers

The UK's growing ecosystem of biopolymer innovators, academic centres, and ethical investors is well positioned to support and benefit from South Africa's emerging bio-based materials sector. The underutilised potential of seaweed, currently mainly used in agriculture and animal feed, represents a clear opportunity for joint investment and infrastructure development.

UK-South Africa collaborations could include:

- Joint research into biopolymer performance and degradation;
- Trials of compostable materials in local use cases;
- Joint ventures between UK and South African SMEs working with biomass (e.g. seaweed, bagasse);
- UK investor support for building in-country seaweed processing capacity.

These initiatives allow UK institutions to lead on global innovation in alternative materials, while creating future commercial supply chains that align with environmental and trade objectives.

6.10 Cross-Cutting Enablers

To maximise impact across all themes, the following enablers should be prioritised:

- Joint R&D Calls: Supporting UK-led pilots, technology transfer, and systems innovation with South African relevance;
- Global Business Innovation Programme: Enhancing market access and brokerage for UK SMEs in the circular economy space;
- Challenge Funds: Focusing UK innovation on solving real-world problems in a commercially meaningful way;
- Capacity Exchange: Providing UK researchers, entrepreneurs, and policy leaders with global exposure and partnership networks.

Together, these mechanisms support UK industry growth, enhance institutional leadership, and build export pathways for circular economy solutions rooted in real-world collaboration.

Table 1: Opportunities Matrix

Recycling Infrastructure & Technologies

Challenges

Poor Infrastructure & contamination issues

Lack of (widespread) advanced recycling technologies

Microplastic leakage into wastewater

Opportunities

Modular/localised recycling plants near to waste streams

Advanced recycling technologies (de-inking, chemical recycling etc)

Microplastics capture & filtration

Potential Collaborations

Join investment in modular & advanced recycling technologies

Technology transfer & co-development solutions

Biobased & alternative materials

Challenges

Resistant from traditional plastic stakeholders (seen as a inhibitor to recycling).

Lack of infrastructure for compostables or bioplastics.

Opportunities

Strong potential from natural resources (seaweed, agricultural waste)

Interest in sustainable alternatives to fossil plastics

Regenerative agricultural support

Potential Collaborations

Joint UK-SA R&D on bioplastics

Feasibility studies & pilot programmes

Develop value chains around bio-based, complementary to existing streams

Socio-economic & Informal Sector Engagement

Challenges

Deep social inequalities

Informal reclaimers marginalisation

Concerns over job automation

Opportunities

Informal sector vital for recycling

Local job creation

Modular processing & economic benefits

Potential Collaborations

Inclusive business models

Policy for informal sector integration

Socio-economic focused programmes

Research & educational partnerships

Challenges

Limited academic involvement

Insufficient skills programmes

Opportunities

University & college involvement

Circular economy education & research

Potential Collaborations

Join academic research & funding

Knowledge exchange programmes

Ocean Plastics & Environmental Tracking

Challenges

Limited tracking technology & implementation

Lack of data on environmental impact

Opportunities

A lot of coastline for plastics tracking

Increased Environmental awareness

Potential Collaborations

Joint educational programmes/ campaigns

UK-SA collaboration on Ocean plastics tracking

Innovation & Market development

Challenges

High cost of recyclate

Unclear market demand

Opportunities

Food-grade plastics & high-value recyclates

Difficult-to-recycle plastics into wood replacements

Investment in innovations

Potential Collaborations

Feasibility studies on market opportunities

Investment funding & incubation programmes

Sharing of UK technology and knowledge

Data, Transparency & Standards

Challenges

Limited existing data

Data controlled by industry (Plastics SA)

Opportunities

Interest in improved waste data & open standards

SA seen to be a CE testbed

Potential Collaborations

Joint data standards & tracking frameworks

UK support in data systems

Reuse & Refill Systems

Challenges

Retailer hesitancy (branding, fraud, user experience)

Infrastructure & logistics gaps

Limited policy incentives

Opportunities

Consumer interest in reuse/refill

Entrepreneurial potential for refill initiatives

Sharing of successful UK models

Reusable secondary packaging in existing supply chains

Potential Collaborations

Knowledge-sharing on UK trials

Collaborative pilots

UK pre-fill model sharing

Policy, Regulation & Governance

Challenges

Weak EPR enforcement & unclear regulations

Fragmented municipal policies

Opportunities

Opportunity to shape EPR policies

Desire for standardised (and governed) recycling labels

Scope for policy refinement

Potential Collaborations

Knowledge exchange on policy design & enforcement

Collaboration/knowledge exchange on standardised On Pack Recycling Labels

UK-SA regulatory collaboration

UK-SA voluntary EPR scheme/fund

07. Barriers to Collaboration

While the Global Expert Mission uncovered strong appetite for UK–South Africa collaboration on plastics circularity, it also surfaced a number of barriers that, if unaddressed, could limit the success of future initiatives. These barriers are not unique to the South African context but are particularly pronounced given the country's economic inequalities, spatial disparities, and dual-track recycling system. Addressing them will require deliberate, inclusive, and context-sensitive approaches.

7.1 Navigating Formal vs Informal Workforce Dynamics

South Africa's plastics recovery system is supported by an extensive informal workforce, estimated at over 95,000 individuals, who manually collect and sort recyclables. These reclaimers are responsible for the bulk of post-consumer plastics entering the recycling stream, often under precarious and unsafe conditions.

Efforts to formalise the waste sector, while critical for improving traceability, working conditions, and income stability, risk side lining the very individuals who keep the system running. During the mission, diverging views were expressed: some advocated for faster formalisation, while others cautioned against displacing reclaimers without viable alternatives. UK partners must approach engagement with awareness of these tensions and design inclusive models that strengthen, rather than undermine, informal sector livelihoods.

7.2 EPR Transition and Regulatory Growing Pains

South Africa's transition to mandatory Extended Producer Responsibility (EPR) represents a structural shift. However, while legislation is in place, implementation is uneven. Enforcement mechanisms are still developing, data systems remain fragmented, and smaller producers—particularly informal and non-compliant ones— are not yet fully integrated.

The coexistence of older voluntary programmes with emerging EPR mandates has led to confusion over compliance requirements, fee structures, and reporting duties. For UK collaborators, this underscores the need for flexibility and partnership-building. Engagements should support local capacity building, particularly in data collection, monitoring, and institutional governance. Working closely with Producer Responsibility Organisations (PROs) will be key.

7.3 Cultural Attitudes and Waste Perception

Perceptions around waste and recycling vary widely across South Africa. In some areas, littering is normalised or even seen as beneficial, generating informal employment opportunities. In others, environmental concerns may be de prioritised due to more immediate socio-economic challenges.

These attitudes present a challenge to the uptake of initiatives such as source separation, reuse systems, and infrastructure investment. They also present an opportunity for co-creation of citizen engagement strategies grounded in local realities. UK experience in designing national behaviour change campaigns can support South African stakeholders, but only if adapted to social norms and communicated through trusted, community-based messengers.

7.4 Infrastructure Inequality and System Fragmentation

Waste management infrastructure in South Africa is unevenly distributed. Many municipalities lack consistent collection services, and reprocessing capacity is heavily concentrated in urban hubs. Where infrastructure does exist, coordination between public and private actors is often lacking, leading to duplicated efforts or material loss. UK organisations must tailor technologies and business models to this variability. Solutions that assume standardised infrastructure may not translate effectively to dispersed or under served areas. Modular design, decentralised processing models, and co-design with local stakeholders can mitigate these risks and improve long-term adoption.

7.5 Persistent Data Gaps and Interoperability Issues

Circular economy strategies depend on data—from packaging composition and recyclability to collection rates and end-market performance. Yet across many parts of South Africa's plastics value chain, reliable and consistent data remains elusive. Some PROs are investing in better systems, but gaps persist at the municipal, SME, and informal sector levels.

Lack of standardisation and limited sharing between actors compound the challenge. UK stakeholders entering partnerships should be prepared to invest in capacity- building for data collection and interoperability, while also adapting to a lower baseline of initial data availability. Piloting traceability systems or open-source data platforms could contribute meaningfully to system improvement.

7.6 Innovation Uptake and Market Hesitancy

Despite encouraging signs of innovation—notably within the South African Plastics Pact and through individual SMEs—stakeholders reported that uptake remains slow. Proven technologies and models, such as reuse systems or flexibles recycling, often struggle to gain traction beyond pilot phase.

Challenges include financing gaps for scale-up, conservative procurement practices among larger firms, and scepticism toward emerging materials or business models. UK innovators should approach the market with patience and partnership, recognising that success will likely depend on sustained engagement and localisation of offerings. Public-private partnerships, tailored incubator support, and joint demonstration pilots can help bridge the adoption gap, but only if backed by credible market pathways and trusted local delivery partners.

These challenges do not diminish the value of collaboration. Rather, they clarify where thoughtful design and sustained partnership are most needed. By engaging with humility, sharing technical expertise, and co-developing solutions rooted in local context, UK organisations can help unlock meaningful progress in South Africa's plastics circular economy journey.

08. Conclusions

This Global Expert Mission has reinforced the critical role that innovation and collaboration will play in accelerating South Africa's transition toward a more circular plastics economy—while simultaneously generating mutual benefits for UK businesses and researchers. Across all exchanges throughout the GEM, the mission surfaced both the scale of the challenge and the strength of local ambition to develop solutions that are inclusive, locally appropriate, and environmentally effective.

South Africa's plastics system is characterised by stark inequalities, fragmented infrastructure, and a highly active informal workforce that remains under-recognised in formal strategies. Yet it also features a robust policy foundation, growing commitment from industry, and an expanding innovation ecosystem supported by NGOs, research bodies, and voluntary platforms like the SA Plastics Pact. Against this backdrop, UK stakeholders are well-positioned to contribute both technical expertise and systems-thinking approaches, drawing from experience with Extended Producer Responsibility, recyclability assessments, reuse system design, and data-led policy-making.

While the mission uncovered clear opportunities—from co-developing modular recycling technologies to piloting reuse systems and building shared standards for recyclate quality—it also identified significant barriers. These include inconsistent enforcement of EPR, patchy data, infrastructure gaps, and cultural perceptions of waste that may differ from UK contexts. Future collaborations must therefore be designed with sensitivity to these conditions, and with the flexibility to co-create solutions that genuinely meet local needs.

The recommendations set out in this report provide a roadmap for deepening bilateral engagement. Through targeted programmes, knowledge exchange, and business-led innovation, there is clear scope to deliver measurable impact. The opportunity is not only to reduce plastic pollution but to strengthen value chains, support inclusive economic development, and showcase a model of global partnership grounded in mutual learning and innovation.

09. Annex 1 – List of UK Participants

Ecosurety
Materiom
Notpla
Open 3P
Sortology
University of Portsmouth
Unpackaged

Technical Writer: Adam Herriott, WRAP

In country Consultant: Oliver Bonstein, SAPRO

CONTACTS

Dr. Geraldine Durand

Knowledge Transfer Manager - Global Alliance

07732 692208

geraldine.durand@iukbc.org.uk

Innovate UK, part of UK Research and Innovation (UKRI), is the UK's innovation agency.

It works to create a better future by inspiring, involving and investing in businesses developing life-changing innovations. Its mission is to help companies to grow through their development and commercialisation of new products, processes and services, supported by an outstanding innovation ecosystem that is agile, inclusive and easy to navigate.

For more information visit ukri.org/councils/innovate-uk/

Follow us

Telephone: 01793 361000

Email: support@iuk.ukri.org

ukri.org/councils/innovate-uk/

© 2025 Innovate UK part of UK Research and Innovation. All rights reserved