

RēSource

Promoting integrated resources management



Institute of
Waste Management
of Southern Africa

ENVIROSERV Engineering the future of landfills

Where does refurbishment fit into EPR?

COMPLIANCE IN THE
SCRAP METAL SECTOR:
AN URGENT CALL

How one landfill
went from marked
for closure to
award winning



ECO WARRIOR

South Africa's largest retailer's waste management practices

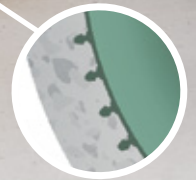
“Shoprite's value proposition is that we are affordable, and this naturally drives efficiency as a company practice. We are always looking for ways to push sustainability and efficiency in the company.”





Sanjeev Raghbir Chief Sustainability Officer for the Shoprite Group

AKS™ CONCRETE PROTECTION LINER

MANUFACTURER OF CONCRETE PROTECTION LINER

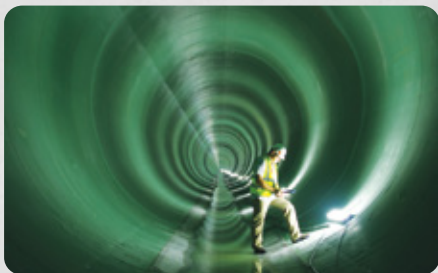
ROBUST HDPE CAST-IN CPL



-  Anchors locked into concrete
-  High abrasion resistance
-  Protection against chemical attack
-  Acid-Proof

TYPICAL APPLICATIONS

LARGE DIAMETER
SEWERAGE TUNNELS



DIGESTERS



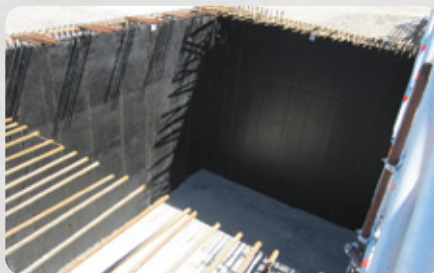
WASTE WATER
TREATMENT WORKS



RESERVOIR



CHEMICAL
STORAGE TANK



CONTAMINATED
WATER STORAGE



Supplied in thickness from 1.65mm up to 10mm in wide sheets or rolls to suit project requirements.



To provide the best protection solutions for your concrete project, please contact our Sales Engineers at:



AKS Lining Systems (Pty) Ltd
SPECIALIST MANUFACTURER OF THERMOPLASTIC LINERS

 aksmarketing@aks.co.za
 www.aks.co.za



Management System
ISO 9001:2015
ISO 14001:2015
ISO 45001:2018



www.aks.com
ID 919586659

CONTENTS



07

IWMSA
50TH



20

METAL
WASTE



28

LANDFILLS



36

RECYCLING



ON THE COVER

Landfills, depending on who you speak to, are either highly engineered last resort environmental barriers, or the biggest openly legal threat to environmental health. The truth is that the role of the landfill has changed over the years, and its ongoing utility is the cornerstone of good waste management practice. **P10**

REGULARS

Editor's comment	3
IWMSA News	4
President's Comment	15
IWMSA 50 th Anniversary	7

PRODUCER RESPONSIBILITY

Where does reuse fit into EPR?	16
--------------------------------	----

METAL WASTE

Compliance in the scrap metal sector	20
--------------------------------------	----

ECO WARRIOR

Retail spotlight: How the largest retailer in SA handles waste	22
--	----

WASTE 2 ENERGY

Small scale, big solutions	25
----------------------------	----

SUSTAINABILITY

Recycling targets in clothing	27
-------------------------------	----

LANDFILLS

From doomed to award-winning	28
------------------------------	----

RENEWABLE ENERGY

Off-grid logistics in South Africa	31
------------------------------------	----

LIQUID WASTE MANAGEMENT

Sewage to solutions	34
---------------------	----

RECYCLING

Shrink sleeve solutions enable more recycling	36
---	----

ABSORBENT HYGIENE PRODUCTS

Spotlight: Community-driven project in Limpopo	38
--	----

HAZARDOUS WASTE AND SPILL CLEAN UP

Private equity and waste	40
--------------------------	----

GREEN FINANCE

Carbon credits and tax markets	42
--------------------------------	----

FLEET AND EQUIPMENT

Electric urban mobility	44
-------------------------	----

SMART WASTE TECHNOLOGY

AI platforms in waste management	46
Nation Waste Facilities Locator	47
The future if recycling in Africa	48



Water & Sanitation Africa

Complete water resource and wastewater management

www.infrastructurenews.co.za
and service delivery



The official magazine of the Water Institute of Southern Africa

www.wisa.org.za

Water & Sanitation Africa, weekly newsletters, www.infrastructurenews.co.za and social media posts are the platforms used by your target audience for information on the water and sanitation sector.

OUR READERS ARE YOUR BUYERS

Advertise with us and make your presence known to your target market across our **print** and **digital platforms**.

COMPLETE WATER RESOURCE AND WASTEWATER MANAGEMENT

Engage in conversation with your defined target audiences

TO ADVERTISE

Sindi Moni

+27 (0)82 212 4574

sindi@infrastructurenews.co.za

TO SUBSCRIBE

+27 (0)83 433 4475

kirsten@infrastructurenews.co.za

SCAN FOR FREE NEWSLETTER SUBSCRIPTION



infrastructurenews

infrastructure4

infrastructure-news



Managing Editor: Kirsten Kelly
kirsten@infrastructurenews.co.za

Editor: Duncan Nortier
duncan@infrastructurenews.co.za

Digital Manager: Chelsea Gillespie
digital@infrastructurenews.co.za

Designer: Beren Bauermeister

Contributors: Dr Mark Williams-Wynn

Advertising Sales: Sindi Moni

c +27 (0)82 212 4574
sindi@infrastructurenews.co.za

Publisher

Infrastructure News
47 Grove Road, Orange Grove, Johannesburg
Gauteng, 2192
Tel: +27 (0)83 433 4475
www.infrastructurenews.co.za

The official journal of the



Institute of
Waste Management
of Southern Africa

Institute of Waste Management of Southern Africa

Tel +27 (0)11 675 3462
Email iwmsa@iwmsa.co.za

Annual subscription

kirsten@infrastructurenews.co.za
R200.00 (incl VAT) South Africa
ISSN 1680-4902

Copyright 2026. All rights reserved. All material herein is copyright protected. The views of contributors do not necessarily reflect those of IWMSA or the publishers.

All material herein **ReSource** is copyright protected and may not be reproduced either in whole or in part without the prior written permission of the publisher. The views and opinions of authors expressed in the magazine do not necessarily reflect those of the publisher, editor or the Institute of Waste Management of Southern Africa.



The ABC logo is a valued stamp of measurement and trust, providing accurate and comparable circulation figures that protect the way advertising is traded. **ReSource** is ABC audited and certified.

Progress against the norm

The story of human progress is marked by looking back and being horrified at our previous inhumanity.

There were points in the human timeline where children working as coal miners were not just normal but a respectable profession for the tiny tots. Closer to home, it was socially acceptable to oppress people based solely on their skin colour, something that should horrify us in our day-to-day lives, how fragile normal feels. If the past is rose-tinted, it is solely to hide the blood.

Right now, there are indignities carried out that might appear 'normal' or 'natural' even, but give it a few years, and we won't believe it; it will seem like a crime that this generation carried these views. Presently, we are sitting on the precipice, a cusp between linear and circular, and soon enough, it will seem absolutely bonkers that we ever lived linearly. Part of this, maybe the most important part, is that the human beings who reclaim waste are vastly treated like irritants, are unwelcome, and work in conditions that would make a Victorian child queasy.

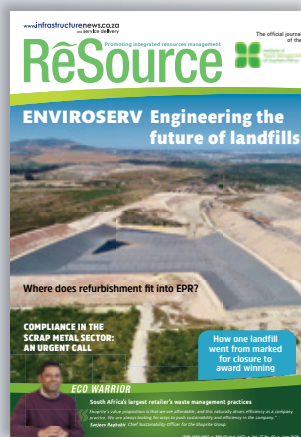
These people, men, women, young, old, are the backbone of all of South Africa's waste sector. Without their sweat, the system collapses, no hyperbole. South Africa has an abysmal overall recycling rate. Of the 122 million tonnes of annual waste, 10% is recycled. Specific waste streams do better; paper has a recycling rate of 63%, while mechanical plastic recycling sits at 28%. The point is that the vast majority of the reclamation is done by an informal sector that

is underpaid, undervalued, and absolutely vital. Our landfills could not bear the volume of waste if not for the waste reclaimers (note: *waste picker* is widely used, but *reclaimer* is the preferred term).

It is this fact that drives a lot of the formal sector collaboration with this informal space, ensuring they are registered, properly outfitted, have access to the gear, and are treated like human beings. According to 2024 data, the upper-end of waste pickers could pocket R7 000 a month, all that work, abuse, walking, sifting through waste, for a salary that does not reflect their importance. It is imperative that this labour isn't just valued but valued correctly, and that the work of the reclaimers is understood in broader environmental protections.

In a few years, we will look back and be disgusted by the society that allowed the ongoing dehumanisation of vital work, while also doing little in the way of protecting the environment. My hope is that the contributors to the sector and this magazine will be remembered for their early adoption and advocacy of a more sustainable, fairer life. ■

Duncan



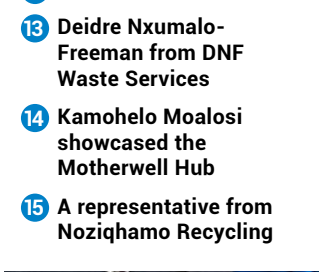
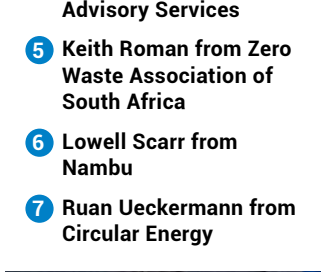
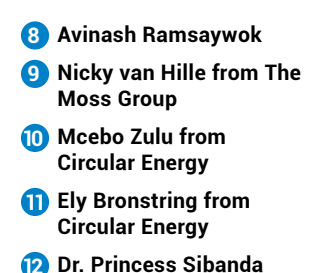
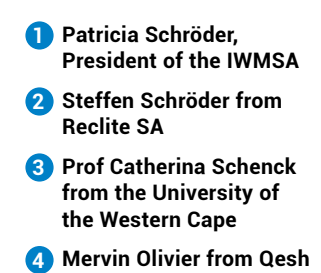
COVER OPPORTUNITY

In each issue, **ReSource** offers companies the opportunity to get to the front of the line by placing a company, product or service on the front cover of the magazine. Buying this position will afford the advertiser the cover story and maximum exposure. For more information, contact Sindi Moni on +27 (0)82 212 4574, or email sindi@infrastructurenews.co.za.

IWMSA Eastern Cape conference: Innovations in waste

One of the year's most exciting events was the two-day Eastern Cape branch conference, looking to unpack innovations in waste from an African perspective. The event was held in KuGompo (formerly East London) on the 7th and 8th of May, and brought together voices from across the waste value chain.

The event concludes with celebrating the unsung heroes of the waste sector, recognising the important work of reclaimers



- 1 Patricia Schröder, President of the IWMSA
- 2 Steffen Schröder from Reclite SA
- 3 Prof Catherina Schenck from the University of the Western Cape
- 4 Mervin Olivier from Qesh Advisory Services
- 5 Keith Roman from Zero Waste Association of South Africa
- 6 Lowell Scarr from Nambu
- 7 Ruan Ueckermann from Circular Energy
- 8 Avinash Ramsaywok
- 9 Nicky van Hille from The Moss Group
- 10 Mcebo Zulu from Circular Energy
- 11 Ely Bronstring from Circular Energy
- 12 Dr. Princess Sibanda
- 13 Deidre Nxumalo-Freeman from DNF Waste Services
- 14 Kamohelo Moalosi showcased the Motherwell Hub
- 15 A representative from Noziqhamo Recycling





IWMSA sees coal ash as a valuable resource

Executive Officer for the IWMSA, Nicolle de Bruyn, with SACAA President Roelf de Beer at the Annual SACAA Conference hosted at Sasol Place in Sandton, a gathering of minds committed to shaping the future of coal ash in South Africa.

The South African Coal Ash Association (SACAA) continues to lead the charge in transforming coal ash from a waste challenge into a valuable resource. By uniting industry leaders, researchers, regulators, and practitioners, SACAA is unlocking innovative, responsible solutions that benefit both the environment and the economy.

Because when collaboration meets purpose, real change happens.

Convening for the future

The Institute of Waste Management of Southern Africa Council recently convened in Durban for a dynamic two-day meeting focused on shaping the future of the Institute and the waste management sector at large. As one of the most important gatherings on the IWMSA calendar, the Council meeting provided an opportunity for strategic planning, collaboration, and meaningful discussions on the direction and growth of the organisation.

The IWMSA wishes to extend our sincere appreciation to the Council members for generously dedicating their time, sharing their valuable knowledge, and contributing their expertise and leadership in driving the IWMSA forward. Their commitment continues to strengthen the Institute's impact and vision for a more sustainable future.



The IWMSA turns 50! Join the celebration at the 26th WasteCon

This year, the Institute of Waste Management of Southern Africa (IWMSA) proudly marks its 50th anniversary – a milestone reflecting five decades of commitment, innovation, and leadership in sustainable waste management.

As they celebrate our golden legacy, they look forward to a green future, embracing innovative solutions, technologies, and practices that drive excellence across the waste and circular economy sectors. WasteCon 2026 brings together industry leaders, innovators, and

stakeholders to reflect on our journey, share knowledge, and collaborate on shaping a sustainable tomorrow.

Who Should Attend?

- Waste management contractors and service providers
- Suppliers of waste management equipment and technology
- Researchers, academics, and lecturers in waste management-related fields

- Engineers and technical specialists
- Regulators and government officials in environmental health and waste management
- Environmental impact practitioners
- Industrial waste producers
- Entrepreneurs and innovators
- Any professional or individual committed to environmental health and the circular economy

WasteCon 2026 is your chance to:

- Network with industry leaders
- Showcase your solutions and innovations
- Learn from leading experts in the field
- Celebrate IWMSA's 50th anniversary

For more information on WasteCon 2026, please contact +27 11 675 3462

WasteCon 2026

Golden Legacy, Green Future

Innovating for Excellence



Date: 20 – 22 October 2026
Venue: Emperors Palace,
64 Jones Rd, Kempton Park, Johannesburg, 1620



IWMSA welcomes Incoming Vice President Gareth Goosen

Gareth Goosen brings a clear vision for the future of the IWMSA, centred on building upon the Institute’s strong foundation as a respected leader in the waste management sector.

He is passionate about ensuring that the IWMSA remains the first point of reference for professionals seeking growth, recognition, and meaningful engagement within the industry.

Gareth believes that by expanding access to high-quality training, continuous professional development opportunities, and collaborative networking platforms, the Institute can continue to enhance its value to members while supporting industry growth, research, innovation, and the adoption of sustainable best practices.

A strong advocate for collaboration and partnership, Gareth is committed to strengthening the IWMSA’s role as a trusted voice within the sector. He sees the Institute playing an increasingly important role in shaping policy and regulatory frameworks, while working alongside government, industry, and other stakeholders to address key challenges and opportunities facing the waste management sector.



His key priorities include advancing the circular economy, supporting skills development and professional excellence, growing the Institute’s membership and influence, and ensuring that the IWMSA continues to drive positive environmental, social, and economic outcomes across Southern Africa.

Goosen says, “I am honoured to serve as Vice President of the IWMSA and look forward to working alongside our members to advance innovation, sustainability, and professional excellence within the waste management sector.”

Executive officer Nicolle de Bruyn says, “It is with great pleasure and enthusiasm that I share the appointment of Gareth Goosen as the incoming Vice President of the Institute of Waste Management of Southern Africa (IWMSA) for the 2026–2028 term. Gareth brings a wealth of industry knowledge, leadership experience, and a deep commitment to advancing sustainable waste management practices across Southern Africa.

We are excited to welcome him into this important leadership role and look forward to the valuable contribution he will make in supporting the Institute’s vision, strengthening our impact, and helping guide the future of our profession.”

Mooiplaats landfill and recycling facility site visit

Executive Officer, Nicolle de Bruyn, recently visited the Mooiplaats landfill and recycling facility, operated by The Waste Group, following an invitation from the organisation to gain first-hand insight into their operations. The Waste Group is a proud member of the Institute of Waste Management of Southern Africa.

The visit provided valuable exposure to the day-to-day management of a general waste disposal site, including the systems and processes that ensure safe, compliant, and efficient landfill operations. It was particularly insightful to see how well-coordinated site management underpins environmental responsibility and service delivery at scale.

Such facilities play a critical role in the waste management value chain, and it was encouraging to observe the structured approach taken to operational oversight, compliance, and environmental stewardship.

IWMSA thanks The Waste Group for the opportunity to engage and for the informative walkthrough of their Mooiplaats facility.



Celebrating years of innovation and expertise

The Institute of Waste Management for Southern Africa (IWMSA) is preparing for WasteCon2026, as well as celebrating its 50th year!

To celebrate this milestone, the Central Branch hosted a gala evening bringing together past presidents, long-time collaborators, and the members whom they rely on.

Opening the event, Makgabo van Niekerk, central branch committee chairman and council member, reflected on the organisation's origins, growth and ongoing role in advancing South Africa's waste management sector.

She explains that IWMSA was founded in 1976 by "a group of visionaries" who recognised shortcomings in the industry and wanted to drive improvements through education, collaboration and advocacy. According to the speaker, the founders were concerned by the lack of training opportunities, poor cooperation between the public and private sectors, and insufficient national attention being paid to solid waste management.

Van Niekerk highlighted several milestones in the institute's history, including the election of its first female president in 2000, its first black president in 2006, and its support in training hundreds of municipal officials. She also noted the significant contribution made by the Central Branch, which has produced more than half of the institute's presidents since its inception.

A key theme of the address was the evolution of the waste management sector itself. The speaker noted that "legislation has been key in driving the changes that we see in waste management today" and praised the growing engagement between government and industry stakeholders. She pointed to recent consultations around the National Waste Management Strategy as evidence of improved cooperation, saying that "we have seen greater collaboration in the waste management industry in recent years".

The address also reflected the changing nature of the industry. While waste management was once largely focused on landfill disposal, the speaker said the sector is now experiencing significant innovation and growth. "The industry previously was very landfill-focused, and recently we are seeing such interesting developments," she said, adding that the increasing number and diversity of waste management companies represented at the event demonstrated how much the sector has matured.

Looking ahead, she encouraged younger professionals to take advantage of the experience and expertise available within the industry. Describing the waste sector as highly collaborative, she shared an example of a WhatsApp group consisting of around 20 chief executives who regularly discuss legislation and common industry challenges. Concluding her remarks, she called for continued partnership across the sector, urging stakeholders to "please collaborate" to ensure the industry continues to progress.

Also peaking at the event, the MEC for Environment in Gauteng, Ewan Botha, gave a keynote address. Botha outlined a vision for transforming South Africa's waste sector from a disposal-focused industry into a driver of economic growth, sustainability and job creation.

Reflecting on his own changing perspective, Botha admitted that he had not previously paid much attention to waste management, but that his current role had exposed him to the realities faced by communities living near landfills and the broader environmental consequences of poor waste practices.

He argued that the traditional waste management model, centred on collecting, containing and burying waste, is no longer fit for



purpose. According to Botha, valuable resources continue to be lost through landfilling, particularly organic waste and recyclable materials. He described this as a missed economic opportunity, stating that “what we call waste is often wealth in the wrong place”.

A major focus of the speech was the potential of the circular economy. Botha argued that waste should be viewed not as a problem to be discarded, but as “material in transition”, capable of being reused, recycled or recovered for energy generation. He pointed to the global circular economy, valued at more than US\$50 trillion, as evidence of the economic opportunities available to countries that successfully embrace resource recovery and circular business models.

The MEC painted a picture of a future waste system in which manufacturers operate closed-loop production systems, municipalities support material recovery facilities instead of relying on landfill disposal, and reclaimers are integrated into formal value chains. He emphasised that this vision is not theoretical, noting that “the circular economy is not a theory. It is already being built in cities and countries around the world”.

Botha also highlighted the important role played by informal waste reclaimers, who contribute significantly to South Africa’s recycling rates despite often lacking formal recognition, contracts and support. He argued that the sector must move towards greater inclusion and formalisation, ensuring reclaimers have access to equipment, secure income opportunities and participation in

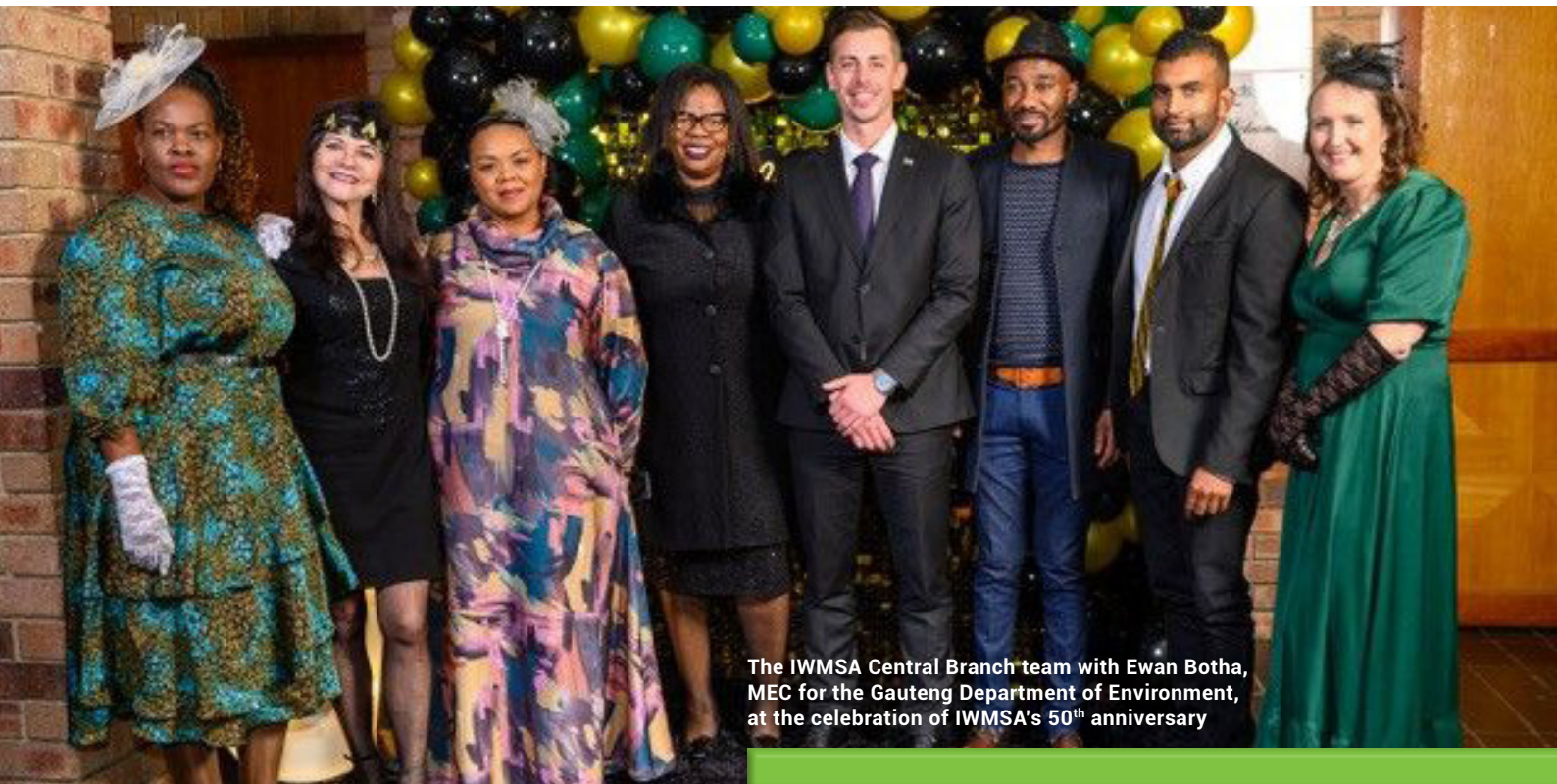


Makgabo van Niekerk (Central Branch Committee Chairman and Council Member) with Ewan Botha, MEC for the Gauteng Department of Environment

official collection systems. Addressing investment needs, Botha said the sector has historically been viewed as a cost burden rather than an economic asset. “For too long, waste has been treated as a cost centre rather than a revenue-generating asset,” he said. To unlock the sector’s full potential, he called for increased investment in material recovery facilities, organic waste beneficiation, waste-to-energy projects and digital infrastructure, alongside regulatory reforms and improved access to finance.

Concluding his address, Botha said the waste sector stands at a critical moment of transition. He argued that achieving a circular

economy would require transformation across infrastructure, supply chains, workforce development and industry culture. The future, he said, lies in moving beyond the traditional linear model because “the future of waste management is not linear. It is circular.” ■



The IWMSA Central Branch team with Ewan Botha, MEC for the Gauteng Department of Environment, at the celebration of IWMSA's 50th anniversary

IWMSA WESTERN CAPE BRANCH CELEBRATES 50 YEARS

On 21 May 2026, the IWMSA Western Cape Branch marked the significant milestone, 50 years of the Institute being in existence. The evening brought together about 50 members, past and present, for a cocktail celebration that was both a reunion and a time for reflection.

The event was opened by WC Chair Dr Shaazia Wiggins, who welcomed everyone and acknowledged sponsors AKS and JG Afrika, whose continued support makes events like this possible. WC Vice President Reon Pienaar (and incoming IWMSA President) delivered the opening address before Quinton Williams took over as the MC for the evening.

The highlight of the formal programme was a reflections session featuring past IWMSA Presidents and WC Chairs. Jarrod Ball (Rod) opened, reflecting on his tenure as IWMSA President from 1994 to 1996, a period that coincided with one of the most significant moments in South Africa's history. Rod, mentioned that the IWMSA was called upon to provide input in the forming of the new Constitution of the country. Peter Novella (IWMSA President 2002-2204) inputted with a story that many in the room may not have known: it was Peter who, in 1994, proposed the motion at the IWMSA AGM to allow the formation of Specialist Interest Groups, an initiative driven by Western Cape members including Bill Ross, Annette Naude and Mary Chettle. The motion faced opposition, including from Council members, and was only

carried with the support of the President of the time, Jarrod Ball. The first interest group, the Landfill Interest Group (LIG), was established in Cape Town in 1996 and these groups are widely credited with changing the face of the IWMSA. A fitting piece of history to share on the same evening, in the same room.

Alison Evans, former Chair of the Waste Minimisation and Recycling Interest Group (WMRIG) from 2008 to 2012, and Richard Emery, who chaired the WC Branch (2008 to 2012) and has served as branch treasurer from (2012), each added their chapter to the story. Jan Palm, IWMSA President from 2016 to 2018, rounded out the reflections with his perspective on a more recent era.

Quinton then turned to WC Branch Manager Linda Campbell, asking her to reflect on managing three active interest groups: the Landfill and Alternative Waste Treatment Interest Group (LAWTIG formally LIG), the Collection and Transport Interest Group (CTIG), and the WMRIG, alongside the branch itself. Linda directed her thanks squarely at the members who volunteered their time and energy over the years to keep everything running. IWMSA Executive Officer Nicolle de Bruyn closed the formal programme,



Jarrod Ball, past IWMSA President



Reon Pienaar, past Vice-President of the IWMSA

thanking all those present for their continued commitment to the Institute and acknowledging patron members AKS and JG Afrika for their support of the evening.

What followed was exactly what a 50th anniversary should look like, members catching up, old colleagues reconnecting and more than a few stories that probably deserved their own session. A good evening for a branch with a lot to be proud of. ■



About 50 current and former members gathered for an evening cocktail function that combined a warm reunion with an opportunity to reflect on the organisation's journey

THE ONGOING CASE FOR LANDFILLS IN THE EVOLVING LANDSCAPE OF WASTE MANAGEMENT IN SOUTH AFRICA



Temporary capping system installed

Landfills, depending on who you speak to, are either highly engineered last resort environmental barriers, or the biggest openly legal threat to environmental health. The truth is that the role of the landfill has changed over the years, and its ongoing utility is the cornerstone of good waste management practice.



The modern landfill site differs greatly from the original; they are designed by engineers who take precautions to protect the environment and must meet stringent regulations to be compliant. They are also increasingly becoming hubs for other waste management activities.

Kate Stubbs, director of strategy, marketing & business development for EnviroServ, one of South Africa's largest waste management companies, whose portfolio includes four hazardous waste sites, as well as two general waste sites, says, "Landfill sites form the base of critical environmental infrastructure that enables municipalities and industry to protect public and environmental health." The key point here is that landfill sites form the backbone of waste management. Both municipalities and businesses have a duty to manage the waste they produce, and as the focus shifts toward waste diversion, the role of waste disposal facilities becomes about dealing with waste that cannot be diverted more than "just dumping."

But how have landfills changed? Stubbs explains, "The role of modern landfills has changed dramatically. Historically, in South Africa, waste was disposed of at dumpsites with very little engineering or regulatory standards guiding waste management and disposal practices." Since then, South Africa's waste management regulations have evolved significantly since the early 2000's with the implementation of the National Environmental Management Act (NEMA: 1998) and National Environmental Waste Management Act (NEM:WA 2008). "NEMA and later NEM:WA were developed by combining international sustainable development



Kate Stubbs, director of strategy, marketing & business development
EnviroServ, a SUEZ company



Progressive permanent capping

“Progressive capping delivers environmental benefits immediately rather than decades later.”

principles, constitutional environmental rights, and global best practice in environmental governance. They are often regarded as some of the most progressive environmental laws in the developing world,” explains Stubbs.

Today, landfills are recognised for playing an important role in climate mitigation, climate adaptation, pollution prevention and resource recovery. Stubbs adds, “Modern landfills are engineered systems designed to ensure the safe disposal of waste through preventing underground seepage and contamination, capturing and controlling leachate and storm water systems, harnessing and managing landfill gas, minimising environmental impacts and maximising opportunities for resource recovery. Increasingly, operators are capturing methane for flaring or electricity generation, recovering materials where possible, reducing greenhouse gas emissions, and progressively rehabilitating land.”

Stubbs says that EnviroServ views landfill management as “active environmental stewardship” and that their responsibility goes far beyond compliance. Shifted public perceptions, heightened regulations, and increasing awareness of environmental issues mean that EnviroServ see “protecting ecosystems, conserving water resources, reducing emissions and building resilience to

climate change” as explicit duties that form part of their management practice.

Capping

One of the ways landfill sites have evolved since the 90s is that they are rehabilitated after closure, to do this capping is required. Landfill capping is an engineered containment system placed over a closed landfill. It acts as a protective shield to isolate waste from the environment, prevent rainwater infiltration, manage hazardous gas emissions, and prevent soil contamination.

Landfill capping is the practice of containing closed landfills by engineering a layer that acts as a shield between the environment and the waste. This prevents leachate, manages gas emissions and prevents soil contamination. The process is designed with rehabilitation as the end goal.

One of the common practices EnviroServ employ on their landfill sites is “progressive capping” which entails capping the independent cells of the landfill as they reach capacity rather than waiting for the entire site to close. Stubbs says, “Progressive capping delivers environmental benefits immediately rather than decades later. By capping completed sections of a landfill as they reach final levels, we significantly reduce rainwater infiltration into the waste body, which in turn reduces leachate generation and contaminated stormwater volumes. It also

improves slope stability, controls odours, enhances landfill gas management and accelerates rehabilitation.”

Progressive capping occurs while the site is still in operation, which Stubbs says, “This reduces environmental risk over the life of the landfill rather than postponing rehabilitation until closure.”

Another important factor is that landfill sites are already divided into cells, which means that operations can start and finish on one cell, while the rest of the landfill is still being constructed. It is important to note that there is no regulation stating that progressive capping is a requirement, and the practice is rather one undertaken out of responsibility.

Similarly, EnviroServ also employ temporary capping. These are short-term measures that provide containment of one cell on a landfill site that is not yet ready for permanent capping. The cell could be inactive for a period, or deprioritised, and rather than letting these cells produce methane and leachate, they are covered with a geomembrane to temporarily reduce their impact, until the cell is needed later.

Stubbs adds, “EnviroServ’s Holfontein, Shongweni and Vissershok waste disposal facilities have undertaken temporary capping projects, delivering measurable reductions in leachate generation while improving environmental performance and operational resilience.”

While diversion is the main focus, the landfill still has relevance for waste streams that cannot be reclaimed

Managing leachate in a changing climate

While capping is an important tool for reducing environmental impacts, one of the most significant operational challenges at any landfill remains the management of leachate; the contaminated liquid generated when water passes through waste.

According to Stubbs, modern facilities bear little resemblance to the disposal sites of previous decades. “Modern landfills are fundamentally different from historical waste disposal sites,” she says. “Today’s facilities are designed with



A landfill gas-to-energy facility harnessing methane emissions to generate clean, renewable electricity

“Many people still view landfills as passive waste disposal sites, whereas modern facilities are highly engineered environmental infrastructure assets that deliver essential environmental services.”



Chloorkop gas flare

sophisticated liner systems, leachate drainage layers, collection infrastructure, storage facilities and treatment technologies that work together to prevent contamination of soil and groundwater.”

EnviroServ’s approach combines engineered containment with active water management. Stubbs explains that the company utilises “high-density polyethylene (HDPE) liners, drainage systems, leachate collection networks and dedicated treatment infrastructure to manage contaminated water.”

Prevention, however, is becoming just as important as treatment. Stubbs says the company is investing heavily in source reduction through temporary and permanent capping projects. At Holfontein, temporary capping has already “reduced leachate generation by approximately 40%, significantly reducing environmental risk and treatment costs.” Similar projects at Shongweni and Vissershok are producing “measurable improvements in water management performance.”



The results reinforce a broader shift in landfill management philosophy. As Stubbs notes, “Our temporary and permanent capping processes have clearly demonstrated that investing in prevention initiatives is becoming just as important as treatment.”

Climate change is adding a new dimension to these challenges. More frequent extreme weather events and intense rainfall place increasing pressure on landfill infrastructure and water management systems.

“We are certainly experiencing these impacts across the country,” says Stubbs. “Climate change and these extreme weather events are fundamentally changing how landfill operators design and manage infrastructure.”

She explains that “more intense rainfall events increase the volume of stormwater entering landfill systems and place greater pressure on leachate collection, storage and treatment infrastructure,” while also affecting “slope stability, erosion control measures and operational access.”

As a result, climate adaptation has become a core operational requirement rather than a future consideration. “At EnviroServ, we are increasingly innovating and investing in approaches to cater for such events such as enhanced drainage systems, progressive capping programmes and improved climate resilience planning,” says Stubbs. The company also continuously reviews infrastructure performance against monitoring data, changing weather patterns and future climate scenarios.

“Climate adaptation is no longer a future consideration,” she adds. “It is an operational necessity for responsible landfill management today.”

Capturing methane

Methane emissions from landfills remain a major global climate concern. As organic waste decomposes, it produces landfill gas

that consists primarily of methane and carbon dioxide. Managing this gas effectively is one of the most important environmental functions performed by modern landfill operators.

“Landfill gas monitoring combines engineering, environmental science and data analysis,” explains Stubbs. A network of vertical and horizontal extraction wells is installed throughout the landfill and connected through a collection system.

“Operators continuously monitor gas quality, flow rates, pressures and methane concentrations,” she says. “Surface emission surveys are also undertaken to identify potential fugitive emissions.”

The information gathered through these systems enables operators to optimise performance and reduce emissions. “The data allows us to optimise gas extraction, improve system performance and identify opportunities for emissions reduction,” says Stubbs.

Technology is also playing an increasingly important role. Monitoring systems are becoming more sophisticated and now incorporate “digital technologies, remote monitoring and predictive analytics that enable proactive management of landfill gas infrastructure.”

Once methane is collected, it can either be utilised as an energy source or destroyed through flaring. Stubbs describes flaring as “one of the most effective climate mitigation interventions available at landfill sites.”

“When methane is combusted in a flare, it is converted primarily into carbon dioxide and water vapour,” she explains. Although carbon dioxide remains a greenhouse gas, its warming potential is significantly lower than that of methane. “In practical terms, destroying methane through flaring can reduce the climate impact of landfill gas by more than 90%.”

One of the most notable examples of this approach in South Africa is EnviroServ’s Chloorkop landfill gas project. According to

“The future landfill will not simply manage waste, it will actively recover resources, generate energy, reduce emissions, support climate adaptation and be integrated into the circular economy.”



Stubbs, more than 195 million cubic metres of landfill gas have been flared or utilised since the project was commissioned in 2008.

The project has generated “approximately 1.5 million carbon credits over its lifetime,” demonstrating the environmental value that can be unlocked through effective landfill gas management. Where possible, she adds, “the next step beyond flaring is beneficial utilisation through electricity generation or other energy recovery applications.”

Balancing sustainability and economics

Despite significant technological advances, landfill operators face several obstacles when implementing greener infrastructure.

“The biggest challenge is balancing environmental ambition with economic reality,” says Stubbs.

Infrastructure upgrades require substantial investment in areas such as “design and engineering, capping, leachate treatment, gas extraction systems, renewable energy projects and climate resilience measures.”

At the same time, operators must navigate increasingly complex regulatory requirements, changing climatic conditions, specialist skills shortages and the need for long-term financial sustainability.

Public perception also remains a challenge. Stubbs notes that “many people still view landfills as passive waste disposal sites, whereas modern facilities are highly engineered environmental infrastructure assets that deliver essential environmental services.”

To accelerate progress, she believes that stronger collaboration is required across the sector. “The industry will need continued collaboration between government, regulators, private operators and financiers to accelerate investment in climate-resilient waste infrastructure.”

The landfill of the future

Far from becoming obsolete, landfills are evolving into integrated environmental management facilities that support resource recovery, renewable energy generation and climate resilience.

“The future landfill will not simply manage waste,” says Stubbs. “It will actively recover resources, generate energy, reduce emissions, support climate adaptation and be integrated into the circular economy.”

She expects significant growth in advanced landfill gas utilisation, renewable energy generation, real-time environmental monitoring, AI-enabled predictive management and enhanced leachate treatment technologies.

Emerging technologies are also beginning to influence the sector. Stubbs points to growing international interest in “carbon capture from landfill gas systems, drone-based monitoring, and technologies that enable operators to model environmental performance and climate risks.”

At the same time, landfill management is becoming increasingly connected to recycling infrastructure, resource recovery systems and alternative waste treatment technologies.

Demonstrating results

Several recent EnviroServ projects illustrate how these principles are already being applied in practice.

At the Holfontein waste management facility in Gauteng, a temporary capping initiative delivered an approximately 40% reduction in leachate generation, reducing both environmental risk and management costs.

At Shongweni in KwaZulu-Natal, temporary capping improved stormwater management and gas control while reducing contaminated stormwater volumes and operational costs.

Meanwhile, at Vissershok in Cape Town, permanent capping infrastructure has been

installed using advanced drainage and gas venting systems. The project is expected to significantly reduce leachate generation while improving environmental performance and supporting landfill gas recovery.

These projects have also contributed to greenhouse gas reductions. Stubbs points to the Chlookop landfill gas project as “one of South Africa’s most successful examples of methane management,” noting that it has generated renewable electricity for a neighbouring manufacturer while reducing emissions and producing approximately 1.5 million carbon credits.

Taken together, these projects highlight how modern landfill management is changing. As Stubbs concludes, they demonstrate that landfill operations can “simultaneously improve environmental performance, strengthen climate resilience and create long-term value for communities and the environment.” ■



ENVIROSERV

a SUEZ company



www.enviroserv.co.za

WasteCon 2026

Golden Legacy, Green Future

Innovating for Excellence



Date: 20 – 22 October 2026
Venue: Emperors Palace,
64 Jones Rd, Kempton Park, Johannesburg, 1620

DELEGATE REGISTRATION

IWMSA Member – Late Registration	-	R 9 000	(Incl. VAT)
Non-Member - Late Registration	-	R 10 500	(Incl. VAT)
Presenter - Registration	-	R 7 000	(Incl. VAT)
Student – Late Registration (<i>No Gala Dinner included</i>)	-	R 3 000	(Incl. VAT)
Additional Exhibitor	-	R 1 800	(Incl. VAT)
Government/Municipal Official	-	R 7 000	(Incl. VAT)
Technical Tour (<i>Tour details to follow</i>)	-	R 850	(Incl. VAT)
Gala dinner (<i>limited to 540 people at 1st come first serve</i>)	-	R 850	(Incl. VAT)

Book a full table of 10 delegates for the Gala Dinner and enjoy a 10% discount. Plus, you'll have the exclusive opportunity to select a premium table on a first-come, first-served basis.

Book a delegation of 10 or more conference paying attendees and enjoy an exclusive 10% discount.

Should you wish to book the exhibitors to attend the Gala dinner please contact Nicolle de Bruyn 011 675 3462 or iwmsa@iwmsa.co.za

EXHIBITOR REGISTRATION

3x3m (<i>Includes: basic 3x3 shell scheme - no artwork, 1 basic table and 2 chairs</i>), 1 free exhibitor	-	R 30 000	(Incl. VAT)
2x2m (<i>Includes: basic 2x2 shell scheme - no artwork and no furniture</i>), 1 free exhibitor	-	R 15 000	(Incl. VAT)
Tabletop (<i>Includes: 1 Trestle table & 2 Chairs</i>), 1 free exhibitor	-	R 7 500	(Incl. VAT)
Outdoor (<i>Floor space only</i>), 1 free exhibitor	-	R 40 000	(Incl. VAT)

NOTE: Exhibitor passes do not include access to the conference sessions or the Gala Dinner as spaces are limited

A 10% discount is available on an additional stand, provided that at least one stand is booked at full price

WasteCon 2026

WE WOULD LIKE TO THANK OUR WASTECON 2026 SPONSORS TO DATE



Reflecting and looking forward

As my tenure as President of the Institute of Waste Management of Southern Africa (IWMSA) draws to a close, I find myself reflecting with immense gratitude on what has been one of the most rewarding chapters of my professional life.

Serving as President has been both an honour and a privilege, made even more meaningful by the knowledge that I am only the fifth woman to hold this role in the IWMSA's proud 50-year history.

Leadership is never a solitary endeavour. Throughout my journey, I have been continually inspired by the people who make this Institute what it is: our members, volunteers, branch committees, Council members, staff, strategic partners, academics, and industry professionals. Together, they represent the heart of the IWMSA – a diverse and passionate community united by a shared commitment to professionalism, ethical conduct, environmental stewardship, and the advancement of sustainable waste management across Southern Africa.

When I assumed the presidency, one of my key priorities was to strengthen and modernise the Institute's governance structures. Working alongside a dedicated Council, we embraced contemporary governance practices that have reinforced transparency, accountability, and integrity, ensuring that the IWMSA remains well-positioned to serve both its members broader society for years to come.

Another important focus has been fostering stronger collaboration with the Department of Forestry, Fisheries and the Environment (DFFE). Through constructive engagement and open dialogue, we have continued to build a relationship that enables the IWMSA to contribute meaningfully to policy discussions and advocate

for solutions that support both environmental sustainability and economic development.

I am equally proud of the growth and influence of our regional branches. From the Eastern and Western Cape, KwaZulu-Natal, and the Central Branch, to our expanding presence in Eswatini and Botswana, the IWMSA's footprint continues to grow. This expansion reflects not only the relevance of our work, but also the dedication of individuals across the region who are driving positive change within their communities and industries.

Representing the IWMSA on the international stage has been a particular highlight of my presidency. Hosting the International Solid Waste Association (ISWA) Congress in Cape Town in 2024 - the first time the event was held on African soil - was a landmark achievement. The conference showcased African innovation and expertise to a global audience and demonstrated the calibre of thought leadership that exists within our region. Carrying that momentum forward to the 2025 ISWA Congress in Argentina reinforced the value of international collaboration, while reminding me that meaningful progress is driven just as much by local initiatives and passionate individuals working within our branches every day.

As we look ahead, the future of the IWMSA is filled with promise. We stand on the threshold of celebrating our 50th anniversary – a remarkable milestone that speaks to five decades of commitment to environmental responsibility, professional excellence, and industry leadership. It is fitting that this anniversary coincides with WasteCon 2026, our flagship conference, where we will not only celebrate our past but also collectively shape the future of the sector.

One of the priorities closest to my heart has been ensuring that the Institute remains relevant and accessible to the next generation. The future of our industry depends on the energy, innovation, and perspectives of young professionals. I am therefore particularly proud of the progress made in establishing a dedicated youth portfolio, creating opportunities for students, entrepreneurs, and emerging professionals to engage with and contribute to the waste management sector.

As I hand the presidency over to Reon Plenaar, I do so with great confidence and optimism. Reon brings a wealth of experience, insight, and passion to the role, and I know the Institute will continue to thrive and flourish under his leadership.

While my chapter as President comes to an end, my commitment to the IWMSA does not. As I transition into the role of Past President, I look forward to continuing to support the Institute that has given me so much, and to witnessing its continued growth and impact.

To everyone who has been part of this journey: thank you. It has been a privilege to serve alongside you. Together, we have strengthened an organisation with a proud legacy, and together, we will continue building a future that is even more impactful than the last 50 years. ■



Patricia Schröder, President of the Institute of Waste Management of Southern Africa (IWMSA)

IWMSA PATRON MEMBERS



Refurbishment's place in South Africa's e-waste systems



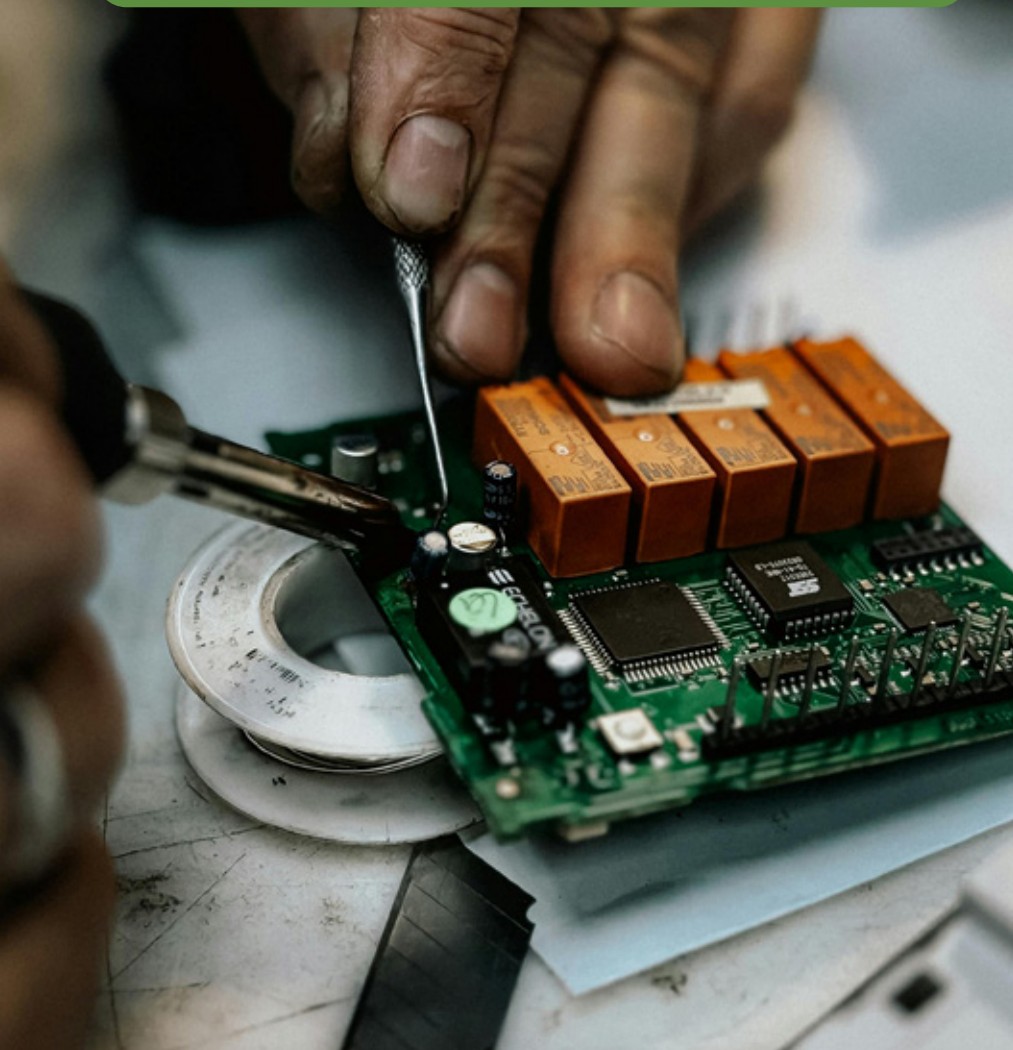
As South Africa's extended producer responsibility (EPR) framework matures, refurbishers are emerging as a critical yet underdeveloped link in the country's e-waste value chain. According to Keith Anderson, CEO of eWASA, the shift from a recycling-led mindset to one that prioritises reuse is both necessary and overdue.

Refurbishment is the process of improving, repairing, cleaning, and re-equipping an existing building, room, or piece of equipment to restore it to a "like-new" condition or to enhance its functionality. It is on a technical level bound to "reuse" and this article will refer to both refurbishment and repair interchangeably.

"Reuse is always preferable to recycling," Anderson states, framing refurbishment as a higher-order intervention in the waste hierarchy. "Refurbishers shift the narrative from recycling to reuse." He does note that recycling is still vital, but a laser focus on downstream interventions like recycling can close off other paths towards circularity and emphasises that extending product life through refurbishment directly supports waste diversion and reduces the need for raw material extraction.

A tiered system with blurred definitions

South Africa's recycling ecosystem operates across multiple levels of capability, yet policy has not fully



Keith Anderson, CEO of eWASA

“The right to repair” argues for the consumer to have more control over end-of-life assets

Repair can bring life to old products and create sustainable income in underserved communities

kept pace. “There are five tiers of recyclers, but regulations talk about them in general terms,” Anderson explains, pointing to a lack of clarity in how different actors are defined and measured.

At the top end, Tier 1 recyclers are equipped to handle the full lifecycle of electronic products. “A Tier 1 recycler has all the infrastructure and necessary tools that can take a product, dismantle it safely, check pieces for life, and if it can be refurbished, then it goes there. Recycling is a last resort,” he says. This includes safety processes such as lithium battery fire checks and component testing.

Lower-tier recyclers, however, often lack the infrastructure and training needed to move up the value chain. “There is a place for Tier 5 recyclers, but they need investment and training to move them up the value chain,” Anderson adds, noting that EPR schemes and producer responsibility organisations (PROs) have a role to play in this transition.

Consumer behaviour and the perception gap

Despite growing awareness, consumer behaviour continues to favour new purchases over refurbished products. Anderson attributes this to a mix of socio-economic factors and perception.

“The affluent sector always wants the best and the latest,” he says, while middle-income consumers often prioritise brand value and support networks. At the lower end of the income scale, functionality and affordability drive purchasing decisions.

A key barrier is perception. “Many consumers still associate refurbished with second-hand or unreliable,” Anderson explains. However, this is beginning to change. “As more refurbished equipment becomes available with a warranty and in good use, then it becomes normalised.”

Market dynamics also play a role. “In the electronic space, bundles play a role in purchasing,” he notes, referring to telecom

contracts and device incentives that encourage frequent upgrades. Planned obsolescence further compounds the issue.

Informality, risk, and opportunity

A significant portion of South Africa’s refurbishment activity takes place informally, particularly in township economies. While this reflects entrepreneurial initiative, it also introduces risks.

“The township spaces have long been repairing and refurbishing, but it is very ad hoc, often under-trained,” Anderson says. “You have individuals with limited knowledge and that’s the challenge.”

However, he sees this as an opportunity rather than a liability. With targeted support, informal refurbishers can be integrated into the formal economy. “EPR now can train them, upskill, and invest in this to become proper and reliable repairing creating circularity, jobs, and products in a lower-income area.”

Crucially, formalisation hinges on traceability. “One of the key things is to ensure that there’s always an auditable trail left of what you’re doing,” he explains. “That helps us as PROs and it shows exactly what has been repurposed, refurbished, or recycled.”

Gaps in the current system

While refurbishers are increasingly recognised, they remain insufficiently integrated into the EPR framework. Anderson argues that this is partly due to how outcomes are defined and reported.

“Refurbishment should be treated as a formal EPR outcome, not only as an informal activity before recycling,” he says. This would require clearer definitions for repair, reuse, and recycling, as well as standardised reporting metrics that capture reuse-based performance.

The lack of formal recognition limits investment and scalability. “Repairing is an



industry, but it needs to be auditable to grow it,” he adds. “Small investments can have massive results here.”

Within this evolving landscape, eWASA has prioritised refurbishment as a strategic focus. “We’ve identified it as a gap, and we’ve invested in this gap,” Anderson says, noting that the organisation works closely with refurbishers across the value chain.

Auditing plays a central role. “We regard auditing not as a big stick, but as a milestone to check where the gaps are,” he explains. This approach enables continuous improvement

while building trust with producers, who are often cautious about brand risk and intellectual property.

One persistent challenge is the export of high-value components such as laptop motherboards. “The motherboard is the most financially rewarding part but the investment to valorise it is large,” Anderson says. As a result, many recyclers export these components rather than process them locally.

To address this, he advocates for co-investment models. “You might need R20 million, but PROs can co-fund and make that facility available.” This would retain value within South Africa and strengthen local circularity. Anderson points out that PROs have a responsibility to invest in waste management infrastructure in South Africa, and that softening large upfront capital is one way of “moving the needle.”

Collaboration as a prerequisite for progress

A recurring theme in Anderson’s assessment is the need for greater collaboration across the value chain. “If we all continue to work in isolation, then we are wasting opportunities,” he says.

South Africa currently has 22 PROs in the e-waste space alone, a level of fragmentation he describes as unsustainable. In response, initiatives such as the PRO Alliance South Africa (PASA) aim to coordinate efforts and align strategies.

“Collaboration works when there are no hidden agendas,” Anderson notes. Shared infrastructure models, such as hub-and-spoke collection systems, can reduce duplication and improve efficiency. Standardised auditing frameworks can further enhance transparency and compliance.

The right to repair gains traction

The global right-to-repair movement is also beginning to influence South Africa’s e-waste landscape. “Right to repair is finally gaining traction after years of rejection from producers,” Anderson says.

However, tensions remain. Producers are often reluctant to disclose detailed product information due to intellectual property concerns. “They’ve invested billions and are wary of disclosing the full internal workings,” he explains.

Even so, consumer awareness is shifting. “People are starting to ask: can I repair this? Is it easy to get parts?” Anderson notes, suggesting that repairability may become a competitive differentiator in the future.

He once again evokes the spirit of collaboration, where consumer spend can shape producer behaviour and PROs can then



step in to facilitate this, especially since it is already happening.

Anderson points to how repairing electronics is already prevalent in the informal economy, and by formalising this process it creates meaningful jobs. One example is South Africa’s Taking Care of Business which teaches people to repair certain electronic products with permission from the producer, this has led to income in informal sectors and has expanded access to electronics in lower-income areas.

While this practice is historically associated with the informal sector, the last few years have seen an uptick in refurbishment within the middle-income space. Apple’s certified pre-owned, along with similar businesses sell refurbished electronics with the confidence of “virgin product” often coming with warranties. This further illustrates growth within this space, and the stigma of “second hand goods” being eroded by economic and environmental pressures.

Building a circular future

For South Africa to fully realise the benefits of EPR, refurbishment must move from the margins to the mainstream. This will require investment, policy clarity, and a coordinated effort across producers, PROs, and recyclers.

“Have we moved the needle? Have we built the sector?” Anderson asks. “Repairing is an industry and it can help, but it needs to be auditable to grow it.”

The potential impact is significant. By formalising and scaling refurbishment, South Africa could not only reduce e-waste but also create jobs, support township economies, and retain valuable materials within its borders.

“Small investments can have massive results,” Anderson concludes. ■

Repairing electronics is already prevalent in South Africa, the task to formalise it into waste management practices to reduce waste volumes



Your All-in-One EPR Solution

THE EPR WASTE ASSOCIATION OF SOUTH AFRICA (EWASA) IS YOUR COMPREHENSIVE ONE-STOP-SHOP TO MANAGE YOUR COMPANY'S EXTENDED PRODUCER RESPONSIBILITIES (EPR). WE PRIDE OURSELVES ON OUR EXPERTISE ACROSS FIVE KEY EPR SECTORS.



ELECTRICAL &
ELECTRONIC EQUIPMENT



LIGHTING
EQUIPMENT



PAPER &
PACKAGING



PORTABLE
BATTERIES



LUBRICANT
OILS



EPR Waste Association
of South Africa

Why juggle multiple providers when eWASA offers integrated solutions? Streamline your EPR responsibilities - let us do the heavy lifting for you. Join our community of members today and discover why eWASA is the trusted choice for innovative EPR solutions.

MAKING EPR MANAGEMENT EASIER FOR YOU



SCRAP METAL COMPLIANCE REMAINS CRITICAL TO SOUTH AFRICA'S CIRCULAR ECONOMY

South Africa's scrap metal sector already delivers one of the country's most effective circular economy systems, but aligning compliance requirements with the operational realities of the industry remains a major challenge, says Alfred Julius Ueckermann, general manager at Circular Energy.

Ueckermann explains that the scrap metal industry is a "key contributor to South Africa's circular economy" because of its high recycling and recovery rates, established collection systems, and the inherent value retained in ferrous and non-ferrous metals. "The scrap industry works, but compliance must align," he says

Drawing on more than a decade of experience in the sector, Ueckermann notes that the industry functions through a deeply integrated informal and formal value chain, where informal collectors supply formal recyclers. "The informal collectors feed the formal recyclers. Rather than having distinct sectors it comes along as one system."

He explains that the industry is highly price-driven, with commodity values determining collection volumes and operational efficiency. "It's high volume, it's fast paced, and I feel that the formal industry is very advanced in processing, advanced pricing, processing techniques, and the system works." He frames the industry as highly efficient, which is why the industry should focus on compliance to ensure its efficacy as South Africa moves towards more circular economic models.

Compliance in the sector is shaped by environmental legislation, trade controls and law enforcement mechanisms, including the National Environmental Management: Waste Act, Extended Producer Responsibility (EPR) Regulations, ITAC export restrictions and the Second-Hand Goods Act.

Operations and the elephant in the room

While the sector is fragmented, with informal and formal collectors operating under vastly differing circumstances, Ueckermann stresses it is not willfully noncompliant, but that operational realities often make compliance difficult in practice, adding, "because it's high volume, it's fast-moving transactions. There is a mixed load of commodities that's coming into the scrap industry." He also explains

that administrative systems often struggle to keep pace with operational speed, particularly where paper-based processes remain dominant within the informal sector. "Compliance is harder in practice than on paper," he notes, adding that "systems aren't always aligned with operations."

Ueckermann is not coy about the reality that the scrap metal industry has a reputation for facilitating stolen and vandalised metals. While he does say that some collectors are less scrupulous than others, the actual problem is not actively engaging with crime but a matter of traceability.

"Where are you going to trace this small

Traceability is major obstacle in the scrap metal space



Alfred Julius Ueckermann, general manager at Circular Energy



“If alignment is achieved, it allows for a system that is not only compliant, but also practical, inclusive and sustainable.”

piece of steel? Where are you going to get your copper from if there's no traceability?” Ueckermann asks.

The presentation identifies traceability of material flows, integration of the informal sector, fragmented regulation, economic pressures and theft as key systemic challenges facing the industry.

Ueckermann openly addresses the issue of illegal activity within the sector, particularly infrastructure and copper theft.

“The part that we don't like to talk about in the scrap industry is the illegal trade and the non-compliance,” he says.

“Copper and infrastructure-related theft is massive. It's an ongoing thing, and it's a difficult thing to talk about, but the scrap industry isn't going anywhere. We have to get them aligned.”

He explains that illegal flows of material, cash-based transactions and unregistered operators complicate compliance efforts and distort recycling data.

“Data and traceability are core to compliance,” he says.

The presentation further notes that non-compliance is often driven by broader socio-economic

conditions rather than simple bad behaviour.

“Non-compliance is driven by systems, not just behaviour. Economic and social factors do matter. We need to fix the causes, not just the symptoms,” Ueckermann says.

He argues that EPR regulations present an opportunity to improve accountability and strengthen data systems within the industry, provided they are integrated into existing scrap metal operations rather than duplicating systems already in place.

“EPR gives structure, it gives opportunities, and we should really integrate it with existing systems and not duplicate it,” he says.

The presentation recommends recognising the scrap industry as a compliance contributor, improving digital traceability systems, aligning environmental and trade regulations, supporting informal sector integration and incentivising compliance.

During the discussion session following the presentation, attendees raised concerns around informal collectors operating along major transport routes and the lack of support structures available to them.

Responding to a question on regulation, Ueckermann cautions against over-regulating the sector.

“If you're going to go into the scrap industry and you want to enforce regulations, you're not going to win, and it's just going to cause more issues,” he says.

Instead, he advocates for building trust through established operators that already comply with regulations.

“I think if you can get one big guy that can comply, it's going to go down straight to the informal recyclers, and that's how you can build trust,” he says.

Addressing the realities faced by informal collectors, Ueckermann describes the difficult conditions experienced by many reclaimers transporting scrap over long distances.

“They line up on the roads. It's unsafe. They wait for days. There's no food,” he says.



The scrap metal industry must address compliance to gain trust and be efficient

He suggests that better integration between formal scrap operators and informal reclaimers could improve both compliance and livelihoods.

On the issue of self-regulation, Ueckermann points to stronger enforcement of existing legislation, particularly the Second-Hand Goods Act.

“The rules already state I need to keep the stock that I bought for seven days,” he says. “I think if that can be followed right through, and it can be enforced, it is already in the regulations.”

Commodity price volatility also remains a concern for waste pickers and reclaimers.

“A lot of the scrap industry is based on the London Metal Exchange,” Ueckermann explains. “Local scrap metal pricing is influenced by international commodity prices, particularly the London Metal Exchange, as well as exchange rate movements and local market conditions.”

He advises reclaimers to work with compliant companies offering transparent pricing structures, saying “Work with the people that are doing the right thing.”

Ueckermann concludes that the industry already delivers strong circular economy outcomes, but that compliance systems must evolve in a way that strengthens rather than disrupts existing operations.

“There is an opportunity to strengthen the system, not to rebuild the system,” he says.

“If alignment is achieved, it allows for a system that is not only compliant, but also practical, inclusive and sustainable.” ■



RETAIL EFFICIENCY MEETS WASTE REDUCTION

The Shoprite Group’s Centurion distribution centre has achieved Level 2 Zero Waste to Landfill certification, confirming that more than 90% of waste generated at the site is diverted from landfill. This reflects a broader operational model within the business, where waste management is integrated into logistics, procurement, and store-level processes.

To consolidate this data, the group is investing in a centralised technology-led Environmental, Social, and Governance (ESG) platform that integrates inputs across operations.

Environmental performance is also embedded in governance mechanisms. “20% of executive bonuses are linked to environmental key performance indicators,” Raghubir notes. These include renewable energy targets, recycling volumes (particularly cardboard and plastic), and packaging metrics such as recyclability and recycled content.

This structure links operational performance directly to leadership accountability.

Reverse logistics forms the backbone of material recovery

A principal component of the Shoprite Group’s waste diversion model is reverse logistics, which ensures that transport capacity is utilised in both directions.

“The worst thing a truck can do, is travel empty,” says Raghubir.

In practice, trucks delivering goods from distribution centres to stores return with separated waste streams, primarily cardboard and plastic. At the store level, materials are sorted into dedicated streams and transported back to distribution centres for consolidation.

The scale of this system is significant. “About 70 000 to 75 000 tonnes of cardboard and plastic every year,” Raghubir says, “That’s roughly a herd of 30 elephants a day.”



Shoprite diverts 75 000 tonnes of cardboard and plastic from their distribution centres every year

According to Sanjeev Raghubir, Chief Sustainability Officer for the Shoprite Group, the certification is linked to how sustainability is positioned within the organisation. Sustainability is not structured as a standalone function. “It doesn’t sit in marketing or public relations, it sits closer to operations,” Raghubir explains. “Whatever we do is directly related to how the business runs.”

This integration is tied to the group’s broader business model. “We’re focused on affordability, and that drives efficiency,” he says. “When you’re efficient, you’re using less energy, less water, less diesel, and producing less waste.”

Performance tracking and governance structures underpin delivery

The Shoprite Group manages environmental performance through a structured system of measurement and reporting. “We track dashboards weekly, monthly, quarterly,” says Raghubir. “Water, electricity, diesel we monitor all of it so we can identify outliers and act.”

Sanjeev Raghubir, Chief Sustainability Officer for the Shoprite Group



Once returned, materials are directed into recycling streams. “Plastic is recycled back into carrier bags and cardboard goes to mills and ultimately back into packaging,” he explains.

The process is monitored continuously. “We track this on a monthly basis where we can see which stores have sent back and which haven’t,” Raghbir notes.

Beyond environmental performance, the system contributes financially. “In some cases, it becomes an income generator,” he adds, referring to the resale of recyclables and cost savings from material recovery.

Organic waste requires a multi-tiered intervention model

Raghbir identifies organic waste as a structurally complex issue within retail operations. “Organic waste is the unseen problem,” he says.

The Shoprite Group addresses this through a hierarchy that prioritises prevention, followed by reuse and recovery.

At the prevention stage, the group has invested in data-driven forecasting. “We’ve implemented artificial intelligence that predicts the rate of sale,” Raghbir explains.

These models incorporate variables such as weather, timing, and local demand patterns. “It looks at the weather, time of day, time of month and predicts what the store should order,” he says. This is especially important for the retailer, as availability is key to customer retention across the board.

The outcome is dual: “It has reduced food waste and increased sales,” he notes.

Where surplus still occurs, in-store reprocessing is used. “We’ll rework it; sell it loose or cook it in-store,” Raghbir says, referring to deli operations that convert surplus into prepared foods.

Donation forms the next layer of intervention. “Last year, we donated more than R250 million worth of surplus food and goods to over 500 beneficiary organisations,” he states.

Material unsuitable for human consumption is redirected further. “It goes to animal feed or composting,” he explains.



Using solar where possible drastically reduces carbon footprint, and improves self-sufficiency within operations

Only residual waste is disposed of. “Landfill is the last resort,” Raghbir adds.

Supplier engagement is required to resolve problematic materials

Some waste streams cannot be addressed internally and require intervention at the supplier level.

“We had yoghurt trays made of black PET that nobody could recycle,” Raghbir says.

Because recyclers do not accept black PET, the material accumulates within the system. “We had to go back to the supplier and say this is a problem,” he explains.

The outcome was a shift to clear PET, which is recyclable.

Potato packaging presented a different challenge. “They look like paper, but they’ve got a wet-strength additive, so they’re not recyclable,” Raghbir notes. An in-house team, as part of a leadership development programme at the Shoprite Group, worked with suppliers to redesign the packaging. “They worked with

suppliers to develop a bag that still performs but can be recycled,” he says. This was an especially important task for the retailer as Raghbir notes that they sell the most potatoes of any retailer in South Africa, and getting this right was an operational victory.

The group’s influence varies depending on control. “We can’t impose conditions on suppliers,” he adds. However, private label products provide a direct lever. “About 20% of our products are private label and that’s where we decide on the packaging,” Raghbir explains. Within this segment, more than 90% of packaging is already recyclable, reusable, or compostable.

The Shoprite Group’s approach to plastic focuses on material recovery rather than elimination. “If plastic used in a circular manner, it becomes very useful.”

Since 2013, the group has produced carrier bags made from 100% recycled plastic sourced through its own recovery systems. These bags are designed for reuse and supported by return



Reverse logistics improves efficiency across the business and minimises waste



Sorting waste by stream is a key step in achieving zero waste to landfill

incentives, linking consumer behaviour to the broader circular model.

Data intensity and verification define certification

Achieving zero-waste certification required detailed tracking across all waste streams and facilities.

“Good data is the biggest asset. You need to trust it when it goes to auditors,” Raghurir says.

The process requires full traceability. “You’ve got to track and trace everything, what’s generated, what’s recycled, where it goes,” he explains.

Verification is conducted externally, which introduces structural constraints. “There’s only one entity in South Africa that does this,” he notes, referring to certification capacity.

The concept of ‘zero waste’ is also defined by thresholds. “One could get to 100% diversion, but it starts to cost a lot of money,” Raghurir says. For the Shoprite Group, the objective is to maximise diversion without increasing operational costs.

The Centurion facility also serves as a reference point for broader implementation. “Our hyper-supermarkets are close to 90% already, now we can replicate the methodology where applicable.”

The retailer is applying the same systems, measurement, separation, reverse logistics, and supplier engagement, across other distribution centres, stores, and offices.

Replication does not necessarily mean duplication. “We won’t do the exact same thing everywhere,” he notes, indicating that site-specific adaptations are required.

Partnerships enable downstream recovery

The Shoprite Group relies on external partners for waste management and recycling, with Raghurir saying, “While sustainability is embedded within

Shoprite Group’s operations, we are not a recycling company, and we cannot do this alone.”

The group works with multiple service providers rather than a single national partner. “We don’t put all our eggs in one basket,” he explains. These partners play a role in identifying new recovery pathways. “The best ones come with solutions new off-takers or new ways of diverting waste,” he says.

An example includes the recycling of polypropylene trolley wipes. “We collected them at stores, sent them back to DCs, and they were recycled into products like jungle gyms,” Raghurir notes.

The Shoprite Group participates in South Africa’s Extended Producer Responsibility framework through multiple Producer Responsibility Organisations, including Polyco, Fibre Circle, and MetPac. Raghurir explains: “We are compliant and actively involved. EPR has enabled a lot of action within this space,” and adds, “We insist that our private label suppliers are signed up to a PRO too.”

Energy and infrastructure considerations

The Centurion facility’s waste performance is supported by broader energy initiatives.

The Shoprite Group has implemented rooftop solar across more than 100 sites, with additional installations on leased properties. “About seven to seven-and-a-half percent of our electricity is now from solar PV,” Raghurir says.

The group has also piloted electric delivery vehicles. “We were the first South African retailer to pilot an electric truck,” he notes.

However, limitations remain. “There’s no genuine environmental benefit if the electricity is still coal-based,” he adds, referencing South Africa’s energy mix.

Additional efficiency measures include large-scale LED rollouts and ongoing improvements in refrigeration, one of the group’s largest energy demands.

The Centurion certification reflects a system rather than a single initiative. Waste diversion is achieved through coordinated interventions across forecasting, logistics, supplier engagement, data systems, and partnerships.

As Raghurir summarises: “It’s about joining the dots, moving material in an efficient way so it can be recycled.” ■

Organising waste into distinct material streams is crucial for maximising recovery and minimising disposal



South Africa's waste and energy issues can seem impossibly large, especially when focusing on major metros. The larger metros are seen as epi-centres of the crisis and draw large portions of the available funding.

Small-scale, big solutions:

WHY BIOGAS IS RURAL SOUTH AFRICA'S ANSWER TO SUSTAINABLE ENERGY

Thabo Mngomezulu, director of Kasi Gas, a biogas company, says, "I grew up in a rural area. I know firsthand how opportunities are passed over us in favour of funding projects in the cities." For Mngomezulu, the neglect of rural areas is shortsighted and opposed to real notions of sustainability. "I sum up this problem with this: If you drive to a village and you see a solar panel, it will be for a telecom tower. No one sees the land and thinks 'solar farm,' no one sees small-scale farmers as economic resources the way large-scale farmers are seen," adds Mngomezulu.

He also says, "When government fails in large metros, the private sector is there to fill those needs or push the government to do what it is supposed to do. We need this spirit in rural areas, too. When we are not given proper waste removal, we need to turn to ourselves to find solutions. What I am finding is that people are very willing, and if enough is done to show these communities that they can change their communities and boost their livelihoods at the same time, then these neglected areas will become a hotspot for innovation and change."

The challenges of rural life

Far away from city planning, rural communities are often left out of water, waste, and energy operations, instead relying on old methods of community management, which are at odds with the economic expectations placed on them. The rural communities that Mngomezulu seeks

to work with comprise subsistence and small-scale farmers, labourers, micro-businesses, and families who are trying to make do with what they have. With no formalised waste management, rural communities are left out of recycling conversations and rely on local waste entrepreneurs rather than integration in larger systems of waste diversion.

On the energy front, Mngomezulu says, "The prime need and use of energy is for heating and cooking, not necessarily electricity. When we think of waste-to-energy as an initiative, we can put too much emphasis on adding electricity to the grid, but in these villages, there is no grid to speak of. People are heating their homes and using energy to cook for their families or businesses."

Mngomezulu asserts that in rural areas, the main sources of energy come from wood, LP gas, and paraffin, all of which pose their own risks. "The dangers of paraffin are well documented, LP gas can leak and lead to fires, and often, rural communities' use of wood is unsustainable and inefficient."

Biogas

One of the ways rural communities can get their heating and cooking needs met without the dangers, costs, and inefficiencies is through biogas. This gas consists of methane as opposed to the propane and butane of LP gas, which makes biogas less volatile, less explosive, and more efficient. Mngomezulu explains, "Compared to LP gas and paraffin, biogas is much safer, and as methane burns more efficiently than both, there is greater efficiency when using it for cooking and heating. Of course, there must still be safeguards against leaks, but comparatively it is much less dangerous."

Biogas is also made through a process that is much more sustainable than wood farming and addresses waste within these communities. Organic waste is collected and put into anaerobic digestors, which produce gas and a rich fertiliser which can be used by small-scale and subsistence farmers.

Anaerobic digestors are also scalable, and in Mngomezulu's case, this is where they become especially useful in rural areas. "Having a massive digester that requires too much input is a liability in rural South Africa. Making these digestors smaller and manageable means that people can use and benefit from them daily without much interruption."

While Mngomezulu says that securing funding for these smaller-scale projects is challenging,



Thabo Mngomezulu, director of Kasi Gas

Rural communities often use wood for cooking, which is unsustainable and less reliable than biogas



he hopes that his case will make way for more serious investment. In 2014, when he set out to make this project a reality, he ran into this problem, but his belief in this project led him to apply for the Mercedes-Benz Fellowship, where he was shortlisted to pitch and secure funding. “When Kasi Gas was selected, it was very affirming; it showed me that my ideas and beliefs were worth investing in, and allowed Kasi Gas to get the funding it needed to run a pilot project. South Africa is very risk-averse, and investors like projects that are already proven, and now this was the opportunity to have a working model to show South Africa that rural investments are worth taking note of.” The location for the pilot project is near the village where Mngomezulu grew up in Mpumalanga.

Micro-franchising and community engagement

The model that Mngomezulu worked with in the pilot project was designed by South African company Agama and built to Kasi Gas’s specifications. “We wanted something smaller, so we commissioned a one-tonne digester,” adds Mngomezulu. This smaller scale allows villages to create the gas they need and maintain the amount of organic waste needed to sustain the use. Too big and there would be lags in waiting time where gas is not created, and too small, then there would not be enough gas to be useful.

Sourcing the organic waste was a crucial step, and Mngomezulu explains, “I wanted the waste

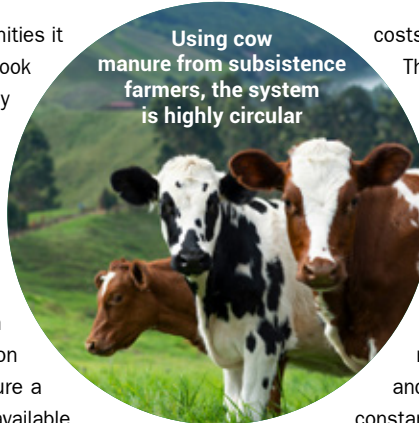


Many biogas initiatives in the global north focus on scalability whereas South Africa benefits from smaller localised solutions

to come from the communities it would serve. Kasi Gas partook in extensive community engagement to ensure that local businesses like the women selling food are able to discard their waste to be used in the digester. We have also partnered with schools in the area that are reliant on feeding schemes to ensure a constant stream is made available. Farmers are also encouraged to give the waste over during harvest.”

The business model that Kasi Gas is exploring is that of a micro-franchise, which means that villages own and operate the biogas digesters for their own use, and the design, installation, and maintenance are handled separately. This ensures that the community feels part of the process, “We did not want to come in and give away the digester. What we wanted was something the community could own and take pride in, which opens them up to the project and its benefits while making it as easy as possible,” adds Mngomezulu. Rural areas are ideal locations for co-operative ownership models and decentralised networks that immediately add value to an area by directly addressing the needs there.

The value proposition is more than just offering sustainability, and Mngomezulu wants to avoid this sort of moralising, instead focusing on how this project can help communities and be sustainable in tandem. “If biogas ended up being more expensive than LP gas, it would not work. These are fragile economic ecosystems, and the competitive price point of biogas is a big draw for villagers. LP Gas is more expensive outside the city due to travel

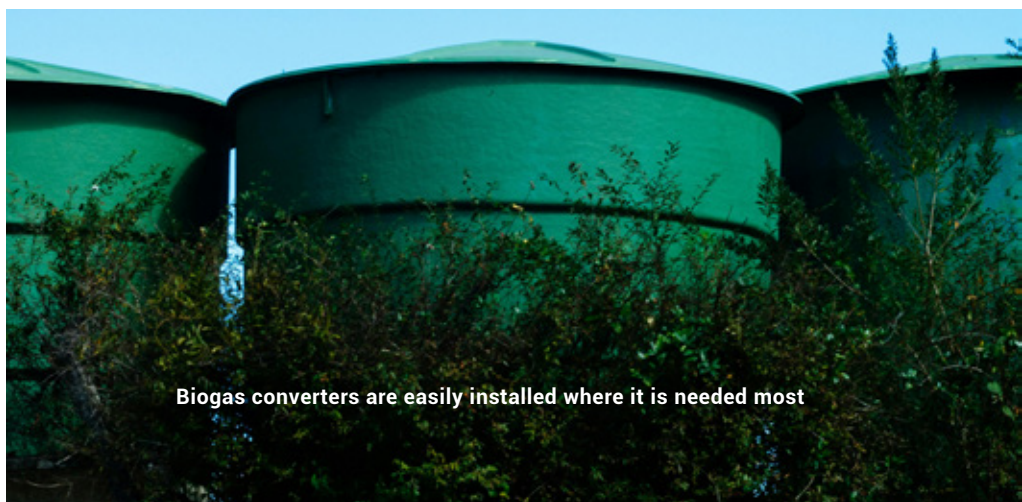


Using cow manure from subsistence farmers, the system is highly circular

costs and is not always available. The price of Biogas is R150 for 5 kgs, which is significantly lower than LP Gas in rural areas, and always available because these plants will be in the community they serve. This means the women who operate small food businesses can make more money on their product, and those who need heat have a constant and cheap source.”

The byproduct of these biogas digesters is a nutrient-rich fertiliser, which further adds to the economic and sustainable goals of Kasi Gas. Rural areas in South Africa rely on subsistence and small farms, which can pose their own challenges. Using chemical fertilisers and depleting the soil is a real problem according to Mngomezulu, who says, “By having fertilisers sold for cheaper than chemical fertilisers, it encourages farmers to buy locally and opens up the conversation about sustainable farming too. Having this byproduct also generates income and helps the local community is as important as the energy generated.”

For an initiative like this one, the circular economy and the push for sustainability can create real economic growth in rural South Africa, and by partnering with local companies like Agama and engaging with the communities directly, Kasi Gas are paving the way forward for sustainable businesses to develop in rural areas. “I hope that Kasi Gas can serve as a touchpoint for people looking to invest in rural-based solutions and show investors that this is not just doable but necessary in terms of the circular economy and aiding these communities who get left out.” ■



Biogas converters are easily installed where it is needed most

H&M targets 100% recycled or sustainably sourced materials by 2030

In setting new science-based land targets, H&M Group aims to have all its materials either be recycled or sustainably sourced by 2030.



agenda on biodiversity and ecosystems and strengthen the long-term resilience of its materials sourcing and production processes.

Following SBTN's guidance, H&M Group confirmed priority landscapes, with a focus on cotton and wool, and prioritised supporting the transition to agricultural practices that improve soil health, water retention, and biodiversity.

Two projects in which the group is already engaged through its partnership with WWF have been identified through the SBTN assessment and validated as part of H&M's suite of land targets. H&M Group says it will continue to strengthen requirements for its suppliers to ensure deforestation- and conversion-free material sourcing.

The group also expressed its commitment to reducing its agricultural footprint by increasing the share of recycled content in its products, saying it will continue its work with local organisations to restore degraded land and increase the use of regenerative agriculture practices in selected sourcing regions. ■

Guided by the Science Based Targets Network (SBTN), these ambitious new targets include avoiding land conversion, minimising land footprint, and engaging in priority landscapes.

The core three:

- No conversion of natural ecosystems targets
 - H&M has set a target for their upstream impacts, with low exposure to the conversion of natural ecosystems in its direct operations.
 - It plans to achieve this by targeting 100% sustainably sourced material by 2030 and strengthening risk management processes.
- H&M Group has committed to reducing its absolute agricultural land footprint from upstream impacts 3.85% by 2030 from a 2019 base year, by increasing the share of recycled materials to 50% by 2030.

The Swedish multinational clothing company is engaged in the Regenerative, Ecologically and Economically Viable Agriculture (REEVA) project in Central India and the Regenerative

Wool Project in the Eastern Cape Drakensberg Grasslands of South Africa and will continue to financially support partnership projects with the WWF. The group's ambition is for all its materials to either be recycled or sustainably sourced by 2030, with biodiversity and agricultural practices that improve soil health playing an important role.

In this work, H&M Group follows SBTN's ARRRT framework (Avoid, Reduce, Restore, Regenerate, Transform).

Preventing the conversion of ecosystems from their natural state is a key priority, and the group invests in agriculture projects to counteract biodiversity loss and protect nature, while strengthening communities, supply chains, and its business to become more resilient to the impacts of climate change.

Long-term resilience

By aligning with SBTN's framework and validating its work through the Accountability Accelerator, H&M Group aims to clarify its

🌱 The Regenerative Wool Project in the Eastern Cape Drakensberg Grasslands of South Africa and will continue to financially support partnership projects with the WWF



Bontebok Landfill in the Swellendam municipality has undergone an impressive compliance turnaround. What was once a declining landfill that scored low compliance scores and had airspace concerns is now a compliant and environmentally responsible landfill, drastically improving its audit scores.

From doomed to award winning, the story of the Bontebok Landfill site

Bontebok waste disposal facility, before intervention in 2024, had faced significant challenges, from ageing infrastructure and equipment to poor airspace and waste volume practices, all exacerbated by operational inefficiencies such as inconsistently applying the daily cover, and no formal compaction programme, along with uncontrolled waste collecting on site. In 2021, when the current Waste Manager was appointed, the site scored 44.14% on its external compliance score, indicating poor performance and marking the site as high risk.

As early as 2018, the Overberg District Integrated Waste Management Plan flagged

the Bontebok facility as an “Open dump” with an immanent air space crisis. Reports from the time projected that the site would close by March 2025, leading to a contingency plan that would transport the waste 140km to the regional landfill and cost as much as R42 million per annum.

It is in this context that Swellendam Municipality put out a tender for the management of the Bontebok waste disposal facility and appointed Raalebberg through its supply chain processes to aid them with the management and rehabilitation of the site. This partnership allowed for the fast turnaround and demonstrated the value of intervention and what can happen when efficient and effective contractors work with municipalities.

From low to high

Following the appointment of Raalebberg Environmental in July 2024, the Bontebok landfill underwent a structured and intensive operational turnaround. Initial site assessments revealed severely degraded conditions, including vandalized infrastructure, a working face that was not being managed correctly, and heightened risks of spontaneous combustion. Immediate stabilisation measures focused on rehabilitating essential infrastructure, securing the site perimeter, repairing access roads, and introducing a defined, cell-based disposal system. Critically daily waste compaction and cover were consistently applied, dramatically reducing odours, fire risks, and environmental exposure.

A key shift in the landfill’s performance came through the introduction of a real-time waste tracking system. This enabled hour-by-hour monitoring of incoming waste volumes, improved airspace modelling, and more informed decision-making at both operational and municipal levels. Environmental controls were simultaneously strengthened through dust suppression, stormwater diversion, groundwater monitoring, and reshaping of the waste body to limit infiltration and contamination risks. These interventions marked a transition from reactive management to a data-driven, compliance-focused operation.



Johan van Niekerk, Senior Manager: Waste and Environmental and Raalebberg staff members



The facility now has many waste diversion strategies like chipping garden greens



By mid-2025, these initiatives had delivered measurable improvements, with compliance scores rising above 80% and reaching 83–87% by early 2026, the highest levels in the facility’s history. The most recent independent audit, done by Afriforum recorded an outstanding audit score of 93%. Governance and oversight have also strengthened considerably, underpinned by rigorous quarterly audits, independent environmental assessments, and proactive regulatory engagement. The landfill is now compliant with the National Environmental Management: Waste Act and all associated landfill regulations.

With consultation from Raalebborg, the municipality paused their waste-to-energy initiative. While waste-to-energy is often seen as a cure-all solution to enhancing a landfill and

promising green energy, Raalebborg stand by the fact that these schemes can be prohibitively expensive and are highly dependent on incoming waste streams, while not against them, they recommended deep analysis to ensure that it makes sense. For this landfill site, it didn’t and the delays compounded existing problems so Swellendam adopted other diversion strategies such as garden refuse chipping, the recovery of builders’ rubble, diversion of industrial waste to the correct facilities and the launch of a recycling buy-back centre in November 2025. Waste-to-energy will continue to be explored and implemented once the process reaches the efficiency threshold needed to make it economically and technically viable for medium-sized landfills like Bontebok. Together, these initiatives now divert over 1000 tonnes of

waste monthly, while also creating safer and more structured opportunities for local waste reclaimers. The integration of community-based solutions has played a key role in reducing informal waste picking and improving overall site safety.

One of the most significant developments came with the discovery and correction of a decades-old error in the positioning of the site’s boundary fence. For over 30 years, this perimeter fence has limited the available airspace. Its realignment effectively unlocked additional airspace, extending the landfill’s operational lifespan by one to two years. Combined with improved waste management practices, the site is now projected to remain operational until approximately 2034, avoiding the immediate need for costly regional



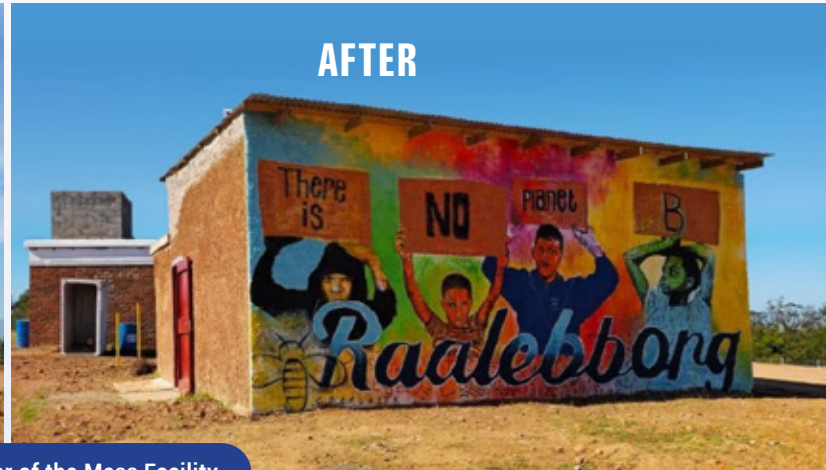
The turnaround included training, certification and on-site mentorship to strengthen staff operational knowledge.



BEFORE



AFTER



Before and after of the Mess Facility

waste transport solutions and allowing other technologies time to mature that might herald a new age for waste management.

Impact

The turnaround at Bontebok also underscores the broader social and economic role that well-managed landfill sites can play at a municipal level. Beyond compliance, the site now contributes to local economic activity through structured procurement and enterprise participation, particularly via recycling and diversion initiatives adding to the circular economy of the town. The establishment of the buy-back centre and the integration of local contractors into operational processes demonstrate how landfill rehabilitation can support small business development while reducing environmental pressure.

A key component of the site's recovery has been structured skills development and capacity building. Training programmes implemented during the turnaround have equipped staff with formalised operational knowledge, supported by

certification and on-site mentorship. This has not only improved day-to-day efficiency and safety but has also embedded a level of professionalism that is often lacking in smaller municipal landfill operations.

The Bontebok case must also be understood within the wider national context, where many municipalities face similar legacy challenges. Poorly managed landfill sites across South Africa present risks ranging from groundwater contamination and uncontrolled fires to environmental degradation and safety hazards for informal waste pickers. At the same time, the cost and complexity of developing new compliant landfill facilities, often exceeding tens of millions of rands, make the optimisation of existing sites a critical priority. In this regard, Bontebok serves as a practical benchmark for how intentional, targeted interventions can extend landfill life and delay the need for costly new infrastructure.

Strengthened governance and oversight have been central to sustaining improvements.

The introduction of regular internal audits, independent environmental assessments, and structured review processes has created a multi-layered accountability framework. This has ensured that compliance gains are maintained over time, while also improving transparency and alignment with regulatory requirements.

Operationally, the shift to a more controlled and systematic landfill environment has been equally important. The introduction of defined traffic routes, strict management of the working face, and reshaping of the waste body have improved both efficiency and environmental performance. These measures, combined with enhanced stormwater management and groundwater protection systems, have significantly reduced the risk of leachate contamination and other long-term environmental impacts.

In May 2026, the site was awarded a National Waste Management Award for “most improved municipal landfill operation site and management,” proving that the effort goes noticed. ■

Launch of the Polyco sponsored buyback centre



SOUTH AFRICA'S ELECTRIC LOGISTICS SHIFT GAINS MOMENTUM AS OFF-GRID CHARGING EXPANDS ALONG THE N3

South Africa's transition to electric mobility may be closer than many realise, with new off-grid charging infrastructure projects aiming to tackle one of the country's biggest transport and energy challenges: how to electrify long-distance logistics without relying on an already constrained national grid.



According to Joubert Roux, co-founder and director of Zero Carbon Charge, the future of electric logistics in South Africa will depend less on the vehicles themselves and more on the energy systems supporting them. Roux says, "The truck is not the revolution; the energy source is."

The company recently launched two new charging stations along the N3 corridor, marking what it describes as the country's first renewable energy-powered electric-vehicle charging corridor. The development follows over four years of technical development and testing.

"The N3 is a central point of logistics in South Africa," Roux explains, "You don't realise the volume of traffic until you stand there for extended periods. It's seven days a week, 24 hours a day." According to Sanral, the N3 handles 60% of South Africa's road freight, and if South Africans

remember the 2021 riots that rocked KwaZulu-Natal, having the N3 closed for only a short period had prolonged knock-on effects on the prices and availability of everyday items.

Off-grid charging designed for South African conditions

Unlike many international EV charging models that depend heavily on established electrical infrastructure, CHARGE's system was designed specifically around South Africa's energy constraints.

"What makes South Africa unique is that we have population centres, urban centres and harbours far apart from each other," says Roux. "That forces long-distance travel, both passenger and commercial, and we simply

do not have the grid infrastructure to supply the power required."

The company's approach combines solar generation, battery storage, and charging infrastructure in an off grid microgrid model. While the chargers, batteries and solar panels themselves are commercially available for technologies, Roux says the challenge lies in configuring them into a reliable, scalable energy system capable of supporting logistics operations.

"We generate electricity, store it and supply it where it's required," he says.

"If you strip everything away, that's what we do."

According to Roux, developing the software and management systems required to coordinate generation; storage and charging also proved technically



Joubert Roux, co-founder and director of Zero Carbon Charge

demanding. He explains, "What had not been done anywhere in the world was creating a charging network specifically aimed at supplying energy to vehicles entirely off grid."

The company's first proof-of-concept station went live in November 2024 after approximately 16 months of construction and testing.

Rising fuel prices are accelerating the EV case

Roux argued that rising fuel costs and energy insecurity are rapidly strengthening the business case for electric fleets, particularly in logistics, agriculture and waste management sectors.

"The war in Iran has again highlighted how fragile energy systems are," he says. "You cannot build a modern economy while depending on geopolitics and imported hydrocarbons."

According to Roux, CHARGE's internal studies show Eskom electricity tariffs increasing at roughly 12.5% annually, while petrol and diesel prices continue to establish progressively higher baselines after each global oil shock.

"Every time oil prices spike; the baseline resets higher," he says. "It never goes back to where it was before."

At the same time, battery and solar technology costs have dropped dramatically over the past two decades.

Roux pointed to the price trajectory of lithium-ion batteries, which he says had declined from approximately US\$7,600 per kilowatt hour in the late 1990s to US\$71/kWh today.

"The combination of batteries and solar panels has completely reset the economics of energy," he says. He compares the pace of EV adoption to the rise of smartphones. "The iPhone launched less than 20 years ago," Roux noted. "Now you can't imagine life without one. Electric mobility will follow a similar path." While this may seem hyperbolic



Hub-and-spoke logistics model gaining traction

A central component of CHARGE's strategy is its "hub-and-spoke" charging model, aimed particularly at businesses operating regional fleets within defined driving radii.

The company says its charging network will initially cover South Africa through approximately 60 sites spaced at 300km intervals before eventually densifying to 150km intervals as EV adoption increases.

"When we started the business, we thought we needed 150km intervals immediately," Roux explained. "But battery technology evolved so quickly that now even smaller urban EVs can comfortably travel 300km."

The company plans to

permit and develop up to 138 charging sites along national routes.

Roux says interest from logistics operators accelerated once the N3 charging corridor plans became public.

"The logistics revolution initially seemed far off," he says. "But as soon as we started talking about opening corridors, people came on board."

The company is also targeting sectors such as waste management, municipal services and farming operations where vehicles typically operate on predictable daily routes.

For fleets operating within 150km of a base, electric vehicles are already viable, he says.

Economics driving fleet electrification

According to Roux, the economics of electric fleet operations are increasingly difficult for businesses to ignore.

"The total cost of ownership is definitely lower now," he says.

Fuel savings and reduced maintenance costs are major contributors.

"With electric vehicles, you remove internal combustion engines, gearboxes and many moving parts that require maintenance," he explained. "Manufacturers in China work on at least a 50% maintenance saving."

He noted that while large transport companies may have fuel recovery clauses built into contracts, many smaller operators do not.

"If diesel doubles overnight, smaller operators absorb that cost themselves," he says. "With renewable electricity, we can provide predictable long-term energy costs."

Under CHARGE's proposed model, operators commit to fleet usage targets while the company provides charging infrastructure and energy supply solutions.

"We can say to operators: give us your current fuel usage and costs, and we can provide an electric fleet solution at a lower cost per kilometre," Roux says.





Battery technology remains key challenge for heavy freight

While Roux believes medium-duty electric trucks are already commercially viable in South Africa, ultra-heavy freight remains dependent on further battery improvements.

“Anything under 14 tonnes, and up to non-rigid 20-tonne payloads, is absolutely workable today,” he says.

However, vehicles operating in the 36-tonne to 90-tonne range remain more challenging due to energy demand and battery limitations.

“To make the heavier payloads viable, battery technology still needs to advance,” he explained. “But that is happening rapidly.”

Roux expects developments in battery density and charging systems over the next 12 to 24 months to significantly improve the economics of long-haul heavy freight electrification.

He noted that European commercial trucks are already adopting megawatt charging protocols, while passenger EV charging systems continue improving rapidly.

There’s no difference between truck and passenger EV charging, Roux says. “The difference is scale. A truck uses about nine times more energy than a passenger vehicle.”

Local manufacturing and partnerships expanding ecosystem

Roux also pointed to increasing local assembly activity as a sign that South Africa’s EV ecosystem is maturing.

“When we started the business, we thought we needed 150km intervals immediately. But battery technology evolved so quickly that now even smaller urban EVs can comfortably travel 300km.”

Chinese manufacturers including SANY and Foton have already announced or begun local assembly operations, while operators such as Golden Arrow Bus Services are progressively transitioning fleets toward electrification.

According to Roux, Golden Arrow’s decision to electrify its fleet was driven primarily by economics.

“They ran BYD buses for several years, and the numbers made sense,” he says. “They are now replacing buses with electric units as part of their normal fleet renewal cycle.”

The company is also partnering with mobility platform Zimi Charge and CHARGE partnership announcement to help accelerate EV adoption and charging accessibility in South Africa.

Roux believes Chinese manufacturers have fundamentally reshaped the global EV sector.

“Five years ago, people laughed at Chinese vehicles,” he says. “Now many of those vehicles outperform established brands at significantly lower cost.”

Energy security and localisation opportunities

Beyond emissions reductions, Roux believes transport electrification could become one of South Africa’s biggest economic localisation opportunities.

South Africa currently imports large volumes of petroleum products annually, much of which is consumed by transport fleets.

“If we migrate passenger and commercial transport to locally generated renewable electricity, we replace that hydrocarbon import bill with local economic activity,” he says.

He argued that distributed renewable charging infrastructure could also strengthen national energy resilience.

“Energy security means being realistic,” Roux says. “You still need backup systems where required, but renewable systems with storage can already provide 80% to 90% supply security in many regions.”

According to Roux, the modular nature of renewable systems allows charging infrastructure to scale alongside demand growth far more efficiently than relying on grid expansion alone.

“The grid simply was not designed for this,” he says. “It also makes no sense to charge electric vehicles using coal-generated electricity.”

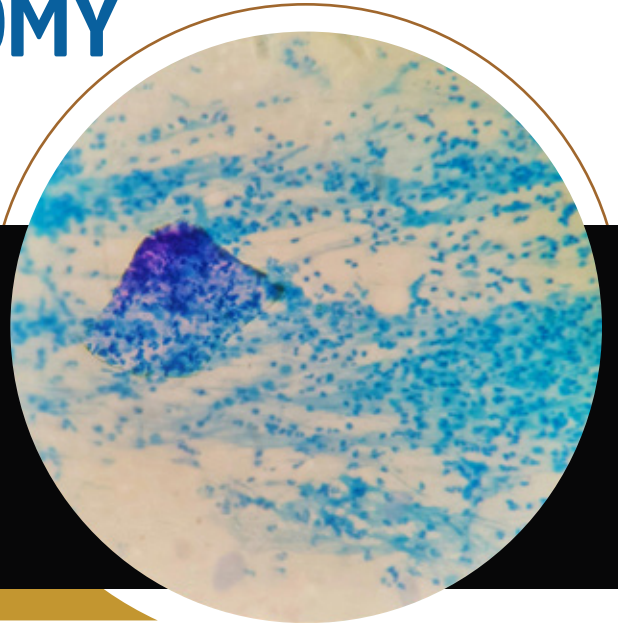
He adds that South Africa’s energy transition could mirror how the country leapfrogged fixed-line telecommunications infrastructure directly into widespread mobile adoption.

“With telecoms, Africa skipped the fixed-line era entirely, saved a few places, and moved directly to smartphones,” Roux says. “I think mobility and logistics are going to follow a similar path.”

If green mobility is the future, charging stations will be the infrastructure backbone supporting this transition



SEWAGE TO SOLUTION: THE CIRCULAR ECONOMY OPPORTUNITY



Wastewater contains untapped resources that, if reclaimed, could power agriculture, global sanitation, and its own treatment to help meet United Nations's Sustainable Development Goals, according to a review published in *Frontiers in Science* in February 2026.

Every year, the global community produces about 359 billion m³ of wastewater, enough to fill the Gariep Dam, South Africa's largest dam, 68 times over.

Half of global wastewater is discarded, with the rest expensively and inefficiently treated for re-use. Emerging microbially powered tech could reclaim these resources from the drain, save money, and reduce environmental harm.

"Globally, our wastewater contains over 800 000 GWh of chemical energy, equivalent to the annual output of 100 nuclear power plants. It's also rich in nutrients used in agricultural fertilisers, which, if reclaimed, could supply 11% of global demand for ammonia and about 7% for phosphate," says lead author Prof Uwe Schröder at the University of Greifswald, Germany.

This new review by an international team of researchers explores how

Microbes within wastewater are overlooked and could yield new ways of utilising waste as a resource

technologies using electricity-generating bacteria could help reclaim resources currently being flushed away.

However, the researchers argue that deploying this on a larger scale will need a broad coalition of researchers, water providers and policymakers to overcome its challenges, which range from the over-regulation of circular economics to engineering obstacles.

A circular economy of energy and nutrients

The researchers discuss microbial electrochemical technologies (METs) as a more efficient way to treat wastewater, using microbes known as electrogenic bacteria.

While microbes are already used to treat wastewater through anaerobic digestion, this approach converts just

28% of chemical energy to electricity. By contrast, METs can be integrated into these systems to boost energy recovery and improve overall treatment efficiency.

These bacteria transfer electrons to their surroundings, creating an electrical current when they are connected to electrodes in a fuel cell. In laboratory settings, they can convert up to 35% of wastewater's chemical energy into electricity. The authors say that, in principle, the power generated could even help run the water sector itself, which currently accounts for around 4% of global energy use.

The microbes can also help to extract nutrients from wastewater, cleaning it for further use. Critical fertiliser ingredients are typically produced in these energy-intensive or unsustainable processes. Removing these compounds





from wastewater would have the double benefit of reclaiming valuable resources and reducing pollution, as releasing nutrient-rich wastewater can cause algal blooms in waterways, which starve fish of oxygen.

“These are valuable chemicals that we cannot afford to throw away. After removal, the resulting water can be reused in many ways, like watering crops or industrial cooling. It could then be further treated to produce drinking water,” says co-author Dr Elizabeth Heidrich from Newcastle University, United Kingdom.

There may be many other niche applications, from recycling nutrients in hydroponic systems to powering self-sustaining sensors that detect pollution.

SDG 6

The researchers argue that, by enhancing both sanitation and resource recovery, METs present a compelling solution to address the Sustainable Development Goal (SDG) 6 to ensure availability and sustainable management of water and sanitation for all.

METs have proved efficient in pilot trials, offering the opportunity to treat more water under a wider range of conditions. For example, a urine-powered MET called Pee Power® was trialled at the Glastonbury Festival in 2015, one of the world’s largest outdoor music festivals. It has since proved successful in longer-term field trials in Uganda, Kenya, and

South Africa. The system converts wastewater to electricity, powering lighting around the toilets to reduce safety risks in areas without an electricity supply.

“Globally, about 3.5 billion people cannot access dignified sanitation. Expanding wastewater treatment could help improve living conditions for many of the world’s poorest people, as well as prevent ecological damage. METs could be a local solution to turn harmful sewage into a valuable resource,” says co-author Prof Ioannis Leropoulos from the University of Southampton, who also serves as a director of MET-C, which is commercialising the microbial fuel cell technology.

Overcoming obstacles

Despite their potential, these technologies face challenges to widespread adoption. Tight regulatory frameworks are often not suited for circular economies that repurpose waste. For

example, in many countries, urine-derived fertiliser cannot be used for growing food or animal feed.

There are also engineering obstacles in ensuring that the MET materials maintain high performance when running continuously.

“While it would be a stretch to imagine powering our homes with wastewater, METs could enhance existing water treatment processes. Rolling METs out widely would be especially beneficial for heavily

The global community produces about 359 billion cubic meters of wastewater annually, enough to fill the Gariep Dam, South Africa’s largest, 68 times over



Urine powered electricity has been piloted for lighting outdoor toilets



The microbes can also help to extract critical fertilizer elements from wastewater

loaded types of wastewater or in places where existing treatment is too expensive or doesn’t reach everyone,” says co-author Prof Falk Harnisch, from the Helmholtz Centre for Environmental Research, Germany. ■

Problematic shrink sleeves made from PET, PETG and PVC can disrupt PET bottle recycling. Plastic Reboot – South Africa explores how collaboration across the plastics packaging value chain unlocks PET bottle recyclability through floatable polyolefin shrink sleeves as a redesign solution. **By GreenCape**

Transitioning from problematic shrink sleeves to floatable polyolefin material in South Africa



Plastic labels remain a significant hurdle to PET recyclability, often complicating sorting and processing within recycling systems

PET (polyethylene terephthalate) bottles are one of the most widely used packaging formats in the food and beverage sector, protecting products, extending shelf life and enabling efficient distribution across global supply chains. Yet packaging can quickly become waste when it is not designed with recycling in mind. Materials that are functional for production and marketing can disrupt recycling systems, making thoughtful material selection one of the most important steps in designing packaging for a circular economy for plastics.

Plastic Reboot – South Africa works with stakeholders across the plastics value chain to promote the uptake of circular solutions for the food and beverage sector. A key focus area of this initiative is the elimination of problematic and unnecessary plastics by providing direct support to the private sector to support their mid- and upstream circular plastics interventions.

A case study developed by GreenCape, Secretariat of the South African (SA) Plastics Pact, highlights how early adopters of polyolefin shrink sleeves succeeded in improving the recyclability of PET beverage bottles. The SA Plastics Pact is a voluntary initiative that brings together businesses, government and civil society to accelerate the transition to a circular plastics economy. The case study shows that this progress depended on close collaboration between value-chain role players.

The problem: PET, PETG or PVC shrink sleeves

PET beverage bottles are one of the most successfully recycled packaging formats in South Africa, with 67% reportedly collected for recycling in 2024. However, shrink sleeves – a 360-degree, form-fitting label that fully wraps around the bottle – present a significant challenge to this otherwise effective recycling stream.

Shrink sleeves made from PET, PETG (polyethylene terephthalate glycol-modified) or PVC (polyvinyl chloride) materials have been identified by the SA Plastics Pact as a priority problematic and unnecessary plastic item. Among the 12 priority items outlined on the Phase 1 list, PET, PETG and PVC shrink sleeves currently represent the largest share by weight still being placed on the market by Pact members. This makes these shrink sleeves a high-impact opportunity for intervention.

The challenge lies in how these materials behave during recycling. PET, PETG and PVC sleeves are difficult to separate from PET bottles during standard recycling processes. As a result, they contaminate the recycling stream or require costly manual removal. In many cases, bottles that are technically recyclable are rejected during

sorting and are ultimately landfilled or become litter in the environment because of the sleeves attached to them.

A viable substitute: floatable polyolefin material

From the SA Plastics Pact Action Groups, members identified several pathways to address the shrink sleeve challenge, including replacing them with labels, eliminating the sleeves entirely or substituting the sleeve material.

For some products, replacing shrink sleeves with smaller labels can improve recyclability while still providing essential product information. However, labels do not always offer the same branding space or product protection as shrink sleeves. For many applications, elimination is not practical because shrink sleeves perform important functions. They provide space for regulatory information and branding, and sometimes protect the product from light exposure.

Material substitution through the use of floatable polyolefin sleeves has emerged as the most viable near-term solution. Polyolefin materials include polyethylene (PE) and polypropylene (PP). Unlike PET, PETG or PVC sleeves, these materials can be separated from PET bottles during recycling through float-sink processes. The floatable polyolefin material collects at the top of the tank and can then be easily captured and removed, whereas the PET material sinks to the bottom. This compatibility preserves the shrink sleeve's pre-recycling functional advantages while allowing the bottle material to be recovered during recycling.

Success stories emerging from collaboration between SA Plastics Pact members provide some best practice examples that address problematic shrink sleeves. Woolworths, a leading multinational brand owner and retail company, worked with a locally operating multinational supplier and label manufacturer, MCC, to find an alternative. The alternative was PP, a floatable polyolefin material compatible with PET recycling processes. In 2023, Woolworths transitioned its first product line to PP shrink sleeves. Since then, more product lines have followed.

SPUR Corporation, a leading multinational franchised casual-dining restaurant group,



Initiatives such as Plastic Reboot by GreenCape help determine what is recovered for recycling and what ultimately ends up in landfill

conducted test trials with printing supplier and a PET bottle manufacturer, Polyoak Packaging, to identify floatable polyolefin material as a suitable alternative. In 2024, SPUR transitioned from shrink sleeves (supplied by MCC) on sauce bottles to polyolefin material.

Unlocking full circularity: adoption at scale

Collective action across the value chain can enable a market-wide transition to polyolefin shrink sleeves. To unlock the full circularity of this shift, importers, brand owners and retailers

Woolworths' in-house iced tea brand fitted with PP shrink sleeves, which won the 2024 Petco Award for Best Design for Circularity, alongside SPUR's range of restaurant sauce bottles fitted with polyolefin shrink sleeves

need to take up polyolefin shrink sleeves on PET beverage bottles at scale. The broader circularity benefits include the decreased use of virgin fossil-based plastic, less waste to landfill, and reduced plastic leakage into the environment. The SA Plastics Pact provides a platform for knowledge sharing and collaboration and supports brand owners and retailers to accelerate the adoption of polyolefin shrink sleeves on PET beverage bottles.

This article is based on the case study, Shrinking the Problem? Addressing Problematic PET, PETG and PVC Shrink Sleeves on Food and Beverage Bottles, produced by GreenCape under Component 3 (Private Sector Engagement) of Plastic Reboot – South Africa. This publication was funded by the Global Environment Facility (GEF). The contents of this article are the sole responsibility of GreenCape and do not necessarily reflect the views of the GEF Secretariat. ■





RURAL DIAPER DUMPING CRISIS DRIVES COMMUNITY-LED WASTE SOLUTIONS IN LIMPOPO

A community-driven project in Limpopo is demonstrating how collaborative governance, environmental education and local economic participation can help address one of South Africa's most overlooked waste streams: disposable diapers.

Researchers and project partners involved in the initiative say indiscriminate diaper dumping is creating growing environmental, health and social risks in rural communities, particularly in areas without formal waste collection services.

Presenting findings at the Institute of Waste Management of Southern Africa Eastern Cape Conference, Prof Catherina Schenck of the University of the Western Cape says the project focuses on implementing governance systems and innovative interventions at the village level to improve diaper waste management.

"We found that disposable diaper management includes burning, burying and dumping," Schenck says. "Communities identify these practices as a threat to human and animal health, the environment, livestock and cultural practices."

The project is led by the DSTI/NRF/CSIR SARChI Chair in Waste and Society at the



Prof Catherina Schenck of the University of the Western Cape

University of the Western Cape in partnership with Kruger to Canyons Biosphere (K2C) and Aquila Environmental and funded by the Council for Scientific and Industrial Research (CSIR)

Disposable diapers are becoming a growing rural waste challenge

The research is conducted in rural municipalities where formal waste services remain limited or absent.

The study area is described as an unserved rural region that is also a strategic water source and biodiversity area managed by both municipal and traditional councils.

Researchers completed 1 575 questionnaires, 18 focus groups and multiple mapping exercises to better understand diaper use and disposal practices in local communities.

The findings reveal the widespread reliance on disposable diapers.

"97% of caregivers use disposable nappies," Schenck says. "The reasons include convenience, accessibility, water scarcity and perceptions that disposable nappies are fashionable."

The scale of the waste stream proves substantial.

The research estimates that approximately 37 000 diapers are generated daily in the Maruleng Municipality, while around 172 000 diapers are generated daily in the Bushbuckridge municipal area.

According to the presentation, many households are heavily dependent on social grants, with caregivers spending an average of R385 per child per month on disposable diapers.

Communities co-develop governance systems

Rather than imposing external solutions, the project focuses on facilitating collaborative governance structures through community participation.

Schenck says the initiative prioritises co-created systems developed with local residents and stakeholders.

“Co-creation, collaboration and participatory community-based solutions are intensive in terms of time and input, but non-negotiable,” the project team notes in its lessons learned.

The project includes the facilitation of a collaborative governance framework between 2023 and 2024, followed by the scaling up of pilot projects between 2025 and 2027.

According to the presentation, village committees are democratically elected to manage complex multi-stakeholder programmes.

Schenck says, “Never underestimate communities. Appreciate and build on what already works. Co-design your future waste governance systems.”

Eco-savings groups support sustainable alternatives

A major component of the project is the establishment of Eco Savings and Credit Groups, known as E-SCGs.

The groups function as community-managed savings and loan systems consisting of between 10 and 20 members.

According to the researchers, these groups allow households to access financial support mechanisms that can help families transition toward reusable absorbent hygiene products and improved sanitation practices.

“Eco Savings and Credit Groups are at the heart of the scaled project,” the presentation notes. “Resources are pooled together, and governance is amplified.”

The project also supports local economic development through partnerships with micro-businesses producing reusable sanitary products.

The initiative helps local seamstresses expand their businesses while simultaneously promoting more sustainable hygiene alternatives.

Environmental and policy impacts emerging

Researchers say the project is already producing measurable environmental benefits.

“Less disposable nappies are entering rivers and ecosystems,” Schenck says.

“Conservation agreements have also been signed with the participants”

The initiative is also beginning to influence national policy discussions around diaper waste management.

“Findings directly informed South Africa’s national disposable diaper strategy through the Department of Forestry, Fisheries and Environment,” the project team states.

According to the researchers, the work also contributes academically by producing what they describe as the first life cycle assessment examining the impacts of diaper disposal practices in rural unserved communities.



Community outreach and engagement is the best foot forward in solving complex social problems

Local partnerships critical to success

One of the strongest lessons emerging from the project is the importance of trusted local partnerships.

The project team describes the role of Kruger to Canyons Biosphere as “irreplaceable and critical”.

“Project sustainability is impossible without a local partner,” the presentation states.

Facilitative leadership and long-term community engagement are also identified as essential to the project’s success.

For Schenck and the wider project team, the initiative demonstrates that environmental waste challenges in underserved communities require more than technical interventions alone. “Collaborative strength demonstrates that when universities and communities work as equal partners, respecting both academic rigour and indigenous knowledge systems, transformative solutions emerge.”



Nappies and pads hung from trees



Reusable pads are one solution, but cultural perceptions need to shift

Waste management is vital, in South Africa it's near a human right as Section 24 of the constitution guarantees everyone the right to an environment not harmful to their health or well-being. It is also costly, and despite the flippancy many have towards waste, it is big business.



PRIVATE EQUITY AND WASTE: ONE PERSON'S TRASH IS ANOTHER'S TREASURE

At a casual glance, a private equity firm investing in the waste sector may seem odd, but waste management companies are some of the largest in the world. In South Africa, the current airspace crisis, as well as problems of municipal service delivery, have led to growth in the private waste management sector. Spurred on by world-class academics and scientists, the space is ripe for investment.

Agile Capital is a respected, black-owned and managed investment company based in Johannesburg, South Africa, that focuses on investments in sustainable businesses. The company invested in Seche Environment's South African businesses, specifically hazardous waste and spill response. To help make sense of the financials, ReSource spoke to Tshego Sefolo, CEO of Agile Capital.

What made hazardous waste and environmental response an attractive investment theme? To what extent is this investment driven by ESG versus commercial returns?

We see this sector aligning easily with ESG (Environmental, Social, and Governance) goals, allowing firms to drive sustainability while generating strong financial returns. It also serves as a strong investment conduit by creating and conserving a sustainable environment. While

this makes financial sense, it also ensures green goals within the economy and environmental rehabilitation. The UN's environmental goals in South Africa include supporting a transition to an inclusive, green economy and promoting sustainable consumption and production (SCP) patterns. The business is also able to leverage compliance level demands, along with being an essential service, as clean-ups are non-discretionary.

We have seen a strong correlation between commercial growth and building sustainability within the business. Customer expectations have shifted, and ESG is now seen as a core

compliance and business requirement. We also see that more regulations in terms of environmental management have driven growth.

How do you evaluate environmental services businesses differently from traditional industrial investments?

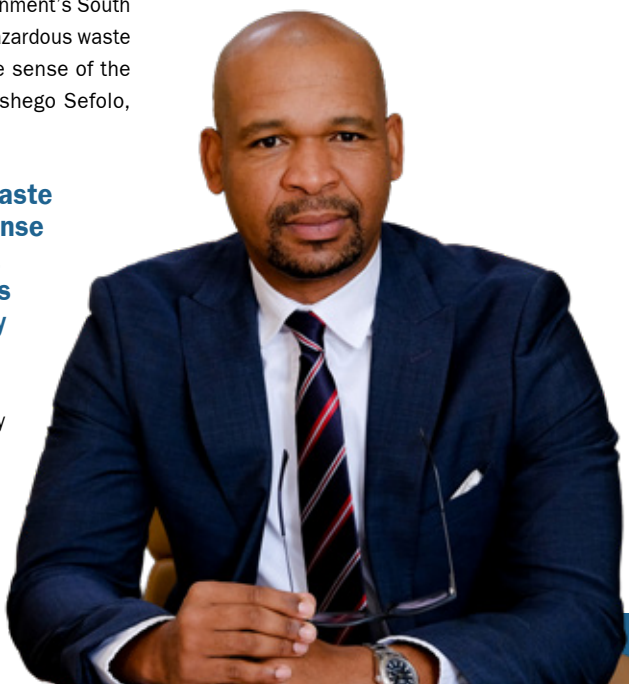
While impact and being responsible investors remain more important in the sector, we evaluate commercial returns in the same way as we would for any other business.

Globally, there has been a shift in ESG, and our due diligence allows for understanding that environmental services companies will probably experience growth driven by more regulations in terms of waste management.

What are some of the barriers? What mistakes can businesses make when looking for investment, particularly in this space?

One aspect is that they can be capital-intensive. The infrastructure required can be expensive. The business will need to manage specialised treatment facilities, landfills, and incinerators, along with specialised vehicles to transport any hazardous materials; additionally, ensuring that staff are up-skilled and trained to manage any response is time-consuming and costly.

It's important to carefully consider long-term capital requirements when assessing any potential investment in the sector.



Tshego Sefolo, CEO of Agile Capital

How can you/do you structure investment in hazardous waste spill response?

For us, it's very much like any of our other investee businesses. Our outlook is generally risk-averse.

Our focus remains on established businesses with demonstrable track records and tangible growth prospects.

A solid management team is often the key to the success and growth of a business, and we require a good fit for our partnership. We are not troubled by the usual exit timing pressure and therefore consider our partnerships to be long-term. Agile Capital also looks at the financial history of the business, including profits and cash flows, and future growth prospects.

Over what time periods are you looking to realise value from this investment?

We are in a unique position as a private equity (PE) business, as we are not constrained by the usual exit pressure, timing, and therefore consider our partnerships to be long-term.

Hazardous waste and spill response require significant upfront investment in equipment, vehicles, and specialised facilities. How do you balance capex with operational efficiency?

Our approach has always been to do meticulous long-term planning. By careful consideration of the sector and outlook, we seek to ensure that any long-term strategy supports the investment.

We've also found that allowing a business to focus on operational excellence and look to improve, streamline, or innovate its core business often means that any capital expenditure pays off through client retention and new clients coming on board.

Do you see a growing role for "environmental services as a service" models in this space?

Yes, in the PE sector, there has been an uptick of interest in this segment of the services industry. It allows other industrial businesses to focus on their core services and outsource non-core elements.

We also think this enables companies to treat hazard waste management as an operating expense and therefore not to invest heavily in the infrastructure required, while still managing any environmental risk responsibly.

We've seen that by offering outsourced waste management/reduction and hazardous spill services, our partner companies are able to leverage their position as specialists in the field.



What are the biggest funding challenges facing environmental services businesses in South Africa?

We've not seen any real stumbling blocks. Many commercial banks appear to be willing to fund these businesses. We believe that this is driven by the growing demand for sustainable investment opportunities, along with a real need in the market for specialists in the field. Our mining, petrochemicals, and energy sectors currently rely heavily on road transportation, which could also be a factor in the growth we see.

Is there a role for public-private partnerships in funding environmental response infrastructure?

We believe that there is a strong investment case to be made for PPPs in the sector.

The private sector can become a crucial part of the funding to ensure adequate and timely environmental response. The capital that can be deployed within businesses to assist with growth - whether this is due to technical or geographical requirements - is one of the ways to build a solid infrastructure to manage these risks.

Governance and reporting are strengthened when these partnerships are formed. This can also mean that companies best suited for the roles they play have an additional advantage, ensuring that no unreliable companies enter the sector.

How do you quantify the environmental impact of your investment beyond financial returns?

We've seen the amount of waste collected and disposed of increase and the use of specialised absorbents that allow for more effective treatment compared to traditional, high-volume disposal.

We have also seen how much soil contamination has been dealt with by providing specialised remediation, rehabilitation, and clean-up services to restore polluted land, leading to properties being rehabilitated for use, rather than simply disposing of contaminated soil.

Part and parcel of this is managing hazardous materials to prevent them from entering general waste streams.

We see this as part of a drive to really make an environmental impact on the actual site and the surrounding communities. We also believe that there is a case to be made that enables healthier ways to manage risks in the environment.

What trends are you seeing globally that could shape investment in South Africa?

The opportunity in turning waste into biomass, which is still in its infancy in South Africa, as well as developing plants that convert organic waste into energy, is also in its infancy.

Additionally, deepening renewable energy deployment, the investment opportunities in solar, wind, and, in particular, the development of storage technologies that are suitable for South Africa. Along with developing infrastructure to support a green hydrogen economy.

Water conservation and innovative infrastructure are also vital. This would include a shift from traditional management systems to smart, circular solutions. ■

MONEY

CARBON CREDITS, TAXES AND MARKETS: HOW THE MARKETS ARE POSITIONING CLIMATE RISK

Climate risk is no longer a niche concern for businesses and has become central to understanding a business's financial risk. Put simply, as the Earth's climate changes, how a business reacts and prepares for the future is becoming more important to investors.

company have a future without sustainability?' and the JSE is shaping how sustainability is measured, reported, and understood in South Africa, and that allows capital to be allocated accurately preparing the economy for long-term resilience. ."

Key concepts

When looking at the ecosystem of sustainability in South African markets, there are several terms used that may seem simple on the surface, but form part of a larger regulatory strategy that aims to move businesses away from high emissions towards a more sustainable operational model, as well as to get businesses to understand climate-related risk and integrate that into their risk assessment. Naidoo notes, "Like finance, sustainability has its own jargon. It can seem confusing at first, but once learned, it becomes a practical tool for better decision-making."

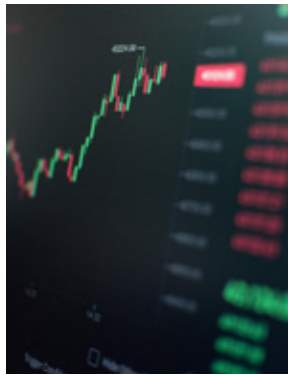
Carbon tax: The carbon tax places a price on greenhouse gas emissions worked out in a carbon dioxide equivalent (CO₂e). A business must understand its carbon emissions and is then taxed on them. Naidoo explains that taxes are not just a way of generating income for the government but are designed to influence behaviour. They encourage businesses to understand their emissions profile and make more sustainable operational choices. South Africa introduced the carbon tax in 2019 under a "polluter pays" model, and Naidoo explains, "The purpose of this tax is not to punish high emitters, but rather to get them to pay fairly for their emissions while incentivising them to become more sustainable." Each year, the amount increases as South Africa approaches its broader sustainability goals, trying to persuade the private sector to align with them. In 2026, the tax is R308 per tonne of CO₂e and is expected to

Climate risk is increasingly treated as a financial risk, and climate disclosure, the reporting of an entity's climate-related risks, opportunities, and environmental impacts, such as carbon dioxide emissions, is becoming a standard practice across the world. This, alongside the emergence of green bonds, sustainability-linked bonds, carbon credits, and carbon taxes, illustrates a real shift in policy and attitude towards sustainability.

For South Africa, the Johannesburg Stock Exchange (JSE) continues to play an important role in shaping how sustainability is priced in South Africa. Acting as a marketplace that connects capital with opportunity, the JSE lends trust and transparency to investors and the market, who are increasingly looking at climate as a deciding factor to invest. Loshni Naidoo, Chief Sustainability Officer at the JSE, says, "The JSE has understood for a while that climate risk is financial risk, and that any possible future requires sustainability to be upfront, rather than an afterthought." Putting it bluntly, she adds, "the market is asking, 'does your

Loshni Naidoo, Chief Sustainability Officer at the JSE

rise to R462 per tonne in 2030. “Companies must report their emissions to the Department of Forestry, Fisheries and Environment (DFFE), and while the goal is to get businesses to drive emission reductions and decarbonisation, the financial implications for high emitters will become increasingly material,” says Naidoo.



The JSE plays a key role in changing the perception that circularity and sustainability is a cost rather than an opportunity

Carbon credit: A carbon credit attaches a financial value to one tonne of reduced CO₂e. This may be used to help organisations meet their compliance obligations or net zero commitments. Companies that invest in or are a part of low-carbon projects can get these projects verified and may use those credits to offset a portion of their carbon tax liability. “The amount you can offset is capped. This ensures that businesses prioritise reducing their own emissions rather than relying solely on offsets.” Currently, offset use is generally limited to 5-10% of your total carbon tax, depending on sector and activity, with reforms under Phase 2 of the carbon tax providing additional detail. She adds, “offsetting is attractive to businesses, but international best practice and science-based targets are clear, the starting point must always be to measure your own emissions and reduce them first before looking to offset.” Importantly, for a project to be deemed “low-carbon” it must be a verified project, and these could include taking renewable energy, energy efficiency, and community-driven programmes into account.

Rewarding sustainable projects with carbon credits incentivises sustainability as a business practice

Paris agreement goals and corporate net zero commitments.

Climate disclosure: South Africa has a voluntary disclosure ecosystem, while other countries have been quick to introduce mandatory reporting. Naidoo says, “South Africa is evaluating a shift from voluntary disclosure to mandatory climate disclosure. However, right now we have voluntary reporting, which is still useful as this practice does provide investors with information to evaluate climate risk. There is increasing demand for consistent, decision-useful climate information to assess risk and opportunity which only highlights the growing importance of sustainability being seen as financial risk.” The JSE has played a significant role in supporting voluntary disclosure, by promoting

Carbon market: The JSE has created a structured and credible marketplace to support local and continental carbon markets under the JSE Ventures platform. The JSE Ventures platform is geared to support Carbon Tax eligible carbon credits, Corsia credits trading and other voluntary market carbon credits issued by global standards. The marketplace enables companies to negotiate carbon credit prices transparently and trade. Naidoo elaborates, “The role of the JSE here is to create trust and transparency. Only by establishing a market that investors and companies can rely on, can we expect carbon markets to grow globally and in South Africa.” Future carbon market growth may also be in response to policy changes and regulatory compliance, to meet

alignment with international standards. While voluntary, the continual improvement of reporting makes them understandable for investors as they cover necessary information to support decision making. “It is not only about risk, but the reports show opportunities for growth as well as performance against targets. This allows a business to go above carbon footprints and, in many cases, show how sustainability and climate resilience actively help a company to “future-proof.”

The changing landscape

The JSE’s unique position means that while it does not monitor companies outside of listing requirements, it can see how companies are changing within the space. Naidoo says, “We are seeing action. We are seeing a shift from generic boilerplate disclosures that include measurable targets set against strategic goals. This is also driving demand for better quality data. As climate risk becomes more central to a company’s future, reliable data enables investors to compare companies more effectively and invest with greater confidence.”

Naidoo does foresee mandatory reporting based on the current Department of Trade Industry and competition (DTIC)/ Companies and Intellectual Property Commission (CIPC) process, but explains, “South Africa is complex with interlinked social and environmental challenges. Therefore, any move to impose sustainability reporting requirements must be a whole economy approach so that we work towards achieving South Africa’s sustainability goals as a cohesive collective. Hence, we continue to collaborate with regulators and the government to ensure reporting produces benefits. While this is in the future, the JSE continues growing the market, gaining trust within that market while raising awareness that this is for the best interests of the economy, companies, and the environment.”





The next step toward

ELECTRIC URBAN MOBILITY

Golden Arrow Buses, a passenger transport, has taken a bullish stance on electrification. They plan to replace all their Cape Town internal combustion engine (ICE) buses with electric ones.

Gideon Neethling, company engineer for Golden Arrow Buses, explains why the company took the leap and what they have learned from the ongoing transition.

How many buses (ICE and EV) are in your fleet? How many EVs do you purchase a year? Will you replace your entire fleet? If so, by when?

Golden Arrow Bus Services currently operates a total fleet of approximately 1 200 buses, of which 120 are electric vehicles (EVs).

Prior to investing in electric buses, Golden Arrow has always recapitalised its fleet at a rate of 60 – 65 new buses per year. This ensures that our oldest buses are removed from operation

on an ongoing basis and keeps our fleet age at ideal levels.

After extensive testing, research and development, an agreement was signed with BYD to deliver 120 electric buses over the course of 2025. This purchase of two years' worth of new buses has allowed us to undertake the first live testing of electric buses at scale in South Africa. With just under four million kilometres of data generated, we are now in a position to confirm that we will be purchasing electric buses rather than diesel buses going forward.

While the long-term goal is to continue expanding the EV fleet, a full transition at the current recapitalisation rate would take approximately 18 years. In the interim, the company will continue to operate a hybrid ICE and EV fleet.

What model EV are you using, and what are the specifications?

GABS currently operates the BYD B12 electric bus model with a seating configuration based on our existing fleet specifications to maximise seating.

Key specifications include:

- Battery capacity: 230 kWh
- Typical charging time: Approximately 2 hours, depending on the charging schedule and operational requirements
- Technology features: The buses are equipped with regenerative braking technology, which allows energy generated during braking to be fed back into the battery system, improving overall energy efficiency.

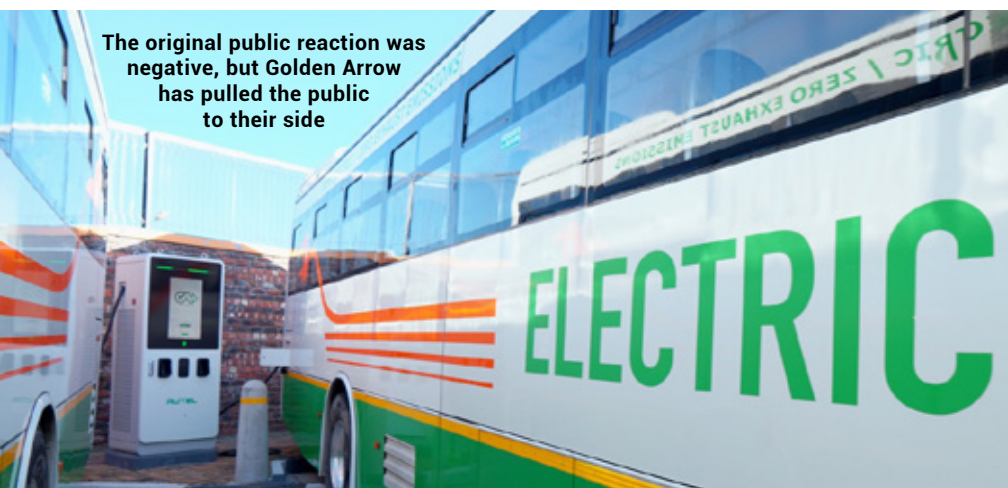
Could you explain the reason for the switch to electric?

Golden Arrow can trace its roots back to 1861 (165 years ago), and the introduction of the first electric buses into the South African commuter bus industry in the present day feels like a full circle moment since we were the first company to introduce electric trams in 1896.

We were given the opportunity to test four electric buses in 2021, and we cautiously committed to putting the vehicles through their paces in our very intense operating environment. After rigorous testing and projections, it became clear that there was a real business case for introducing these buses at scale.

At the time, the decision was met with a fair amount of scepticism, but today 120 of these buses are operating daily across Cape Town's communities, including Nyanga, Khayelitsha, Delft, Bellville and Mowbray.

From an environmental perspective, electric mobility aligns with GABS' broader sustainability objectives by reducing carbon emissions and supporting cleaner public transport solutions.



The original public reaction was negative, but Golden Arrow has pulled the public to their side



Financially, diesel prices are highly volatile and create uncertainty in long-term operating costs. Electricity pricing, while still subject to increases, is generally more stable and predictable. In addition, investments in solar generation, battery energy storage systems (BESS) and strategic charging schedules help mitigate electricity costs and improve energy resilience.

Operationally, electric buses have fewer moving mechanical components than conventional diesel buses, resulting in reduced maintenance requirements and potentially lower long-term servicing costs.

How does the daily operation of electric buses differ from that of ICE buses?

The operational cycles of diesel and electric buses differ primarily in how downtime between peak periods is utilised. Diesel buses are refuelled while electric buses are charged over a period of about two hours. This needs to be factored in in terms of charging infrastructure, scheduling and depot infrastructure.

The introduction of electric buses has been much more complex than simply charging buses.

This project has been a result of collaboration in order to acquire the buses, build the infrastructure and reticulation and equip the workforce with a variety of new skills. Golden Arrow has funded this all without any assistance from the government, with investment costs sitting at around R750 million.

In the process, we have created a solid local skills base in terms of reticulation, charging units, solar electricity generation, charging management, depot configuration and optimal electric bus scheduling.

Do you have current and estimated CO₂ savings?

Golden Arrow has invested heavily in solar generation capacity and is still looking to increase generation capacity and onboard independent



power producers to augment our own supply. In a twelve-month period, we have been able to produce 3 266 megawatt hours of solar energy, which is the equivalent of 3.3 million kilometres when used to power electric buses.

Based on current estimates for the 2025/2026 financial year, and using the previous diesel consumption benchmark, GABS estimates that its electric bus operations have reduced carbon emissions by approximately 1 405 411 kg of CO₂ compared to operating the same kilometres using diesel buses.

What charging infrastructure do you use?

GABS has developed a dedicated charging infrastructure at its Arrowgate depot, which currently includes 60 DC charging stations.

The depot layout and charger configuration allow up to 120 buses to be charged simultaneously, ensuring sufficient capacity to support daily fleet operations and charging schedules.

Lessons learned or surprising facts about this transition?

One of the key lessons from the project has been

that purchasing the buses is only one component of a successful EV transition. The real complexity lies in coordinating the supporting systems around the fleet.

This includes electricity infrastructure planning, charging schedules, operational planning and workshop integration. The project has required close collaboration between engineering, operations, infrastructure and maintenance teams, ultimately fostering a far more integrated way of working across the organisation.

We believe that this project is a real homegrown success story as the initial public reaction to the introduction of the electric fleet was, by and large, negative with many forecasting that we were doomed to fail. With 120 buses successfully operating every day, a highly skilled workforce and plans to expand the fleet, Golden Arrow has proved that South African companies can innovate successfully. We are very proud to be at the frontier of electrifying road-based public transport and believe that we are paving the way for other operators to follow in our footsteps. ■

AI platforms for construction waste management

CG Waste Data has launched Africa's first unified smart waste infrastructure platform, aimed at transforming the construction industry through AI-driven waste management and circular economy solutions.



The integrated platform combines waste lifecycle intelligence, a digital marketplace for recycled materials, automated regulatory compliance systems, and sustainability-focused building design consultancy into a single solution.

Designed for architects, builders, recyclers and regulators, the platform seeks to reduce landfill waste, improve resource recovery, and support greener construction practices across the African continent.

Africa's construction and demolition (C&D) sector generates millions of tonnes of waste annually, the vast majority of which ends up in landfills. CG Waste Data is disrupting this model by digitising the entire waste lifecycle, from design stage through demolition and recovery, enabling builders, architects, recyclers, and regulators to track, recover, recycle, and rebuild with data-driven precision.

"Waste is not waste, it is value," said a spokesperson for CG Waste Data. "Our platform gives every stakeholder in the construction ecosystem the intelligence they need to turn waste streams into revenue streams, reduce emissions, and build a circular Africa."

Platform solutions

The platform integrates four core solutions designed to improve sustainability and efficiency:

Waste intelligence cloud: Real-time AI analytics predict waste volumes before demolition begins, track material flows from site to destination and deliver actionable

sustainability dashboards. The platform achieves 92% model accuracy on waste forecasting.

Circular marketplace edge: A digital materials exchange connecting buyers and sellers of recycled construction materials, from



reclaimed bricks and steel rebar to timber beams and recycled aggregates, across Africa, turning debris into demand.

Green compliance systems: Automated ESG reporting, regulatory compliance tracking, and sustainability dashboards aligned with global standards, including GRI, EU Taxonomy, and ESG frameworks, helping projects achieve 100% compliance readiness.

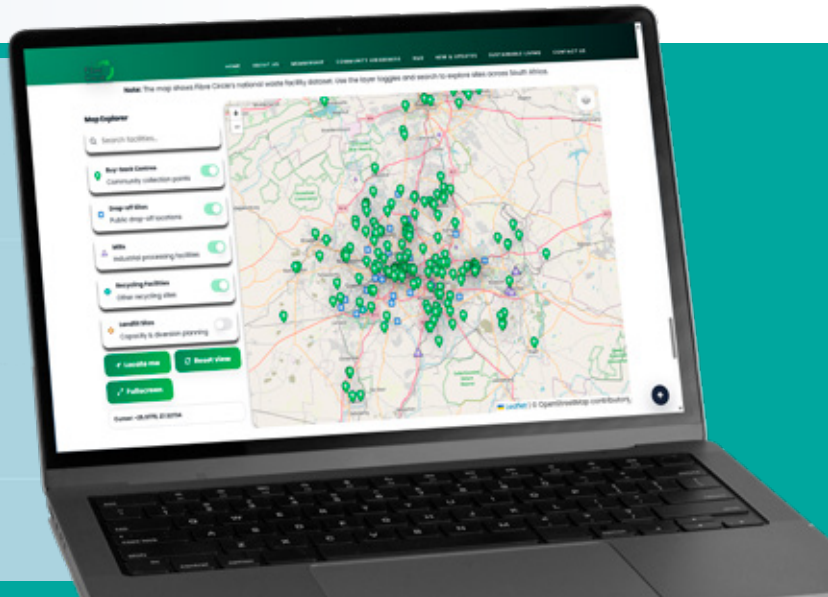
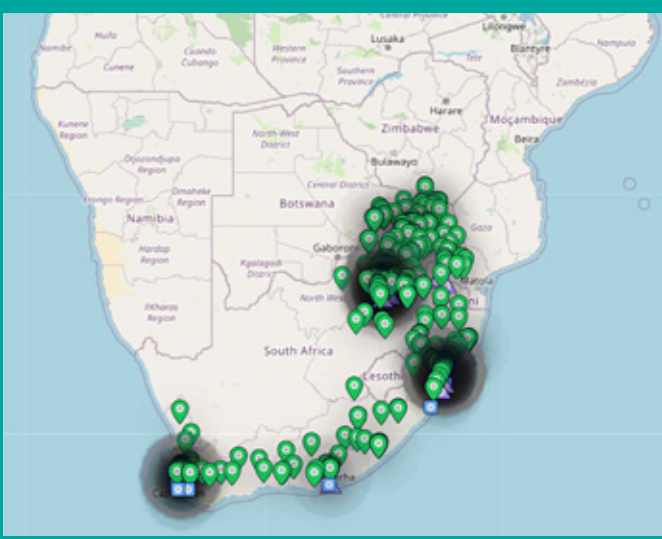
Edge building design consultancy: Sustainability intelligence embedded at the design stage, delivering 20%+ water and energy savings, 20–30% embodied energy reductions, and 20%+ carbon-emission cuts, while increasing project value and ESG scores.

The platform serves architects, builders, recyclers, and regulators across Africa, with a pan-African vision of one platform delivering limitless impact. CG Waste Data is currently active in Uganda, Nigeria, and Kenya, with expansion plans across sub-Saharan Africa.

Key impact metrics

Early adopter projects on the CG Waste Data platform have reported a 52% reduction in carbon emissions, 78% material recovery rates, 20%+ water and energy savings, and a marked increase in project ESG scores and asset value. "Sustainability begins at the design stage," the company emphasises. "By integrating intelligence across every phase of a construction project from blueprint to demolition, we make it possible for Africa to build smarter, waste less, and build better." ■

National Waste Facilities Locator TO MAKE RECYCLING MORE ACCESSIBLE



South Africa’s recycling efforts are gaining momentum. The most recent Fibre Circle statistics show that 72.1% of recyclable paper was diverted from landfills, evidence of both progress and public willingness to participate.

Yet for many households, businesses and waste pickers, recycling still breaks down at a practical level: not knowing where to take materials, what each site accepts, or who to contact.

To address this everyday barrier, the Producer Responsibility Organisation (PRO) for the paper and fibre-based packaging industry, Fibre Circle, has launched the national Waste Facilities Locator, an interactive, web-based map designed to help South Africans quickly find nearby waste and recycling facilities.

The platform enables users to identify buy-back centres, public drop-off sites, recycling facilities, mills, and landfill sites across the country. Each listed facility includes key information such as location, type of site, materials accepted and, where available, contact details and website links.

“Recycling often fails at the first step: access to clear, reliable information,” says Edith Leeuta, CEO of Fibre Circle. “We know South Africans are willing to recycle. But willingness needs to be matched with practical tools. By making recycling infrastructure

visible and easy to navigate, we can remove friction and improve recovery rates.”

One of the common challenges in recycling is the cost of uncertainty. Arriving at a site that does not accept certain materials or discovering too late that it is not the correct facility type results in wasted time and transport costs. By presenting essential information upfront, the Waste Facilities Locator helps users plan before they travel, supporting cleaner loads, reduced contamination and more consistent participation.

Enabling smarter planning for waste pickers and municipalities

The interactive database is designed to add value across the recycling chain, making it easier for households to identify drop-off points and acceptable materials, and for businesses to plan collection partnerships.

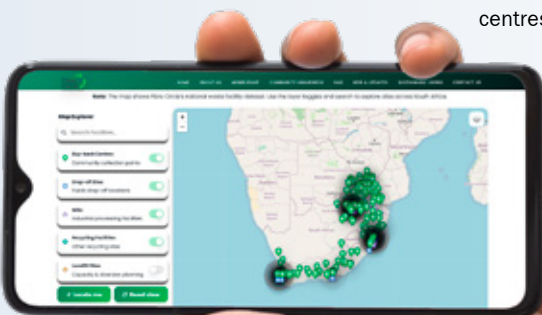
The greatest impact will be felt by waste pickers and municipalities. For waste pickers, time and transport costs can determine whether a day is profitable, and being able to identify buy-back centres and confirm accepted materials helps waste pickers plan smarter routes and avoid unnecessary travel. Municipalities can improve resource diversion planning and support more targeted investment in recovery infrastructure, as the mapped view of waste infrastructure helps highlight gaps in service coverage.

Circular economic integration

Leeuta emphasises that strengthening South Africa’s circular economy depends not only on awareness campaigns, but on improving access to infrastructure. When recycling becomes simpler and more predictable, participation becomes routine, and volumes increase.

“In a country where unemployment and service delivery pressures are real, circular economy growth is also an opportunity for inclusive economic activity. We want to make it as easy as possible to move material back into the economy,” says Leeuta.

As the Waste Facilities Locator expands, maintaining current data and broad geographic coverage will remain a priority, particularly in underserved areas. By making waste and recycling infrastructure searchable and transparent, Fibre Circle aims to support a more connected, efficient recovery system and help move more materials back into productive use. ■



AI, Smart Waste Systems and the Future of Recycling in Africa

Africa's waste challenge is well documented. Rapid urbanisation, infrastructure deficits, and constrained municipal budgets have long placed recycling and resource recovery at the margins of development priorities. But a technological shift is underway, and it is arriving faster than many anticipated. **By Dr Mark Williams-Wynn, Vice Chair of the KZN branch of the IWMSA**



Artificial intelligence (AI), smart sensor networks, and data-driven logistics are beginning to transform how waste is collected, sorted, and recovered across the continent.

For the Institute of Waste Management of Southern Africa (IWMSA), these developments represent both an opportunity and a responsibility. As the professional body advancing responsible waste management practice in the region, the IWMSA is closely tracking the convergence of digital technology and circular economy principles - and engaging with various stakeholders on what this transition demands in practice.

Smart waste systems, which integrate AI-powered image recognition, route optimisation algorithms, and Internet of Things (IoT)-enabled bins, are already being piloted in several African cities. These technologies allow municipalities and private operators to move away from fixed collection schedules toward dynamic, demand-responsive services that reduce costs, lower emissions, and improve recovery rates. In the recycling sector, machine learning tools are enabling more accurate material sorting at materials recovery facilities (MRFs), reducing contamination and increasing the commercial viability of secondary materials.

The implications extend beyond efficiency gains. When waste data is properly collected, analysed, and shared, it becomes a policy instrument. Municipalities gain the evidence necessary to plan infrastructure investment. Extended producer responsibility (EPR) schemes gain the traceability

tools they require. And informal waste reclaimers - who remain the backbone of recycling in many African contexts - can increasingly be integrated into formal digital platforms that protect their livelihoods while improving system performance.

However, whilst the IWMSA remains cautiously optimistic, this is tempered by the necessary context. Africa's waste sector is not homogeneous. Connectivity gaps, skills shortages, capital constraints, and regulatory environments vary significantly across the continent. For smart waste systems to deliver equitable outcomes, implementation must be grounded in local realities and guided by professionals with the expertise to bridge technology and practice.

Yet there is a dimension of AI's environmental footprint that the waste management profession cannot afford to overlook. The computational power underpinning AI systems - housed in energy-intensive data centres that generate significant volumes of electronic waste, cooling water, and hardware requiring end-of-life management - is itself a growing sustainability concern. As AI adoption accelerates globally, the waste and resource implications of the technology itself must be part of the conversation. We believe that a truly circular approach to AI-enabled waste management must account for the full lifecycle of the digital infrastructure that makes it possible.

As an organisation, the IWMSA encourages government bodies, corporate sustainability teams, academic institutions, and civil

society organisations to engage actively with this evolving landscape through its events, training sessions, publications, and professional development programmes. Africa's transition to a circular economy will not happen by technology alone; it requires informed governance, cross-sector collaboration, and a skilled waste management profession at its core.

William-Wynn says, "The question is not whether AI will change waste management in Africa - it already is. The question is whether we build systems that are resilient, inclusive, and professionally managed enough to sustain that change." ■



Dr Mark Williams-Wynn, Vice Chair of the KZN branch of the IWMSA

OPEN THE DOOR TO OPPORTUNITIES

... and unlock the many benefits of IWMSA MEMBERSHIP...

BUILD

BUILD YOUR REPUTATION

through aligning with the principles of the IWMSA

BUILD YOUR FUTURE

through sponsorship opportunities that will be invested by the IWMSA in the sustainability and growth of the Waste Management Industry

BUILD YOUR NETWORK

through regular interaction with diverse individuals that are working towards shared goals

REDUCE

REDUCE RISK

by using up-to-date technical information accessed through the IWMSA website & network

REDUCE TIME

through easy access to trusted advice and information from the IWMSA Technical and Training Division

REDUCE COST

of maintaining your professional excellence by attending events discounted exclusively for IWMSA members

GAIN

GAIN INSIGHT

to new technology, innovation and processes by attending events and conferences

GAIN OPPORTUNITIES

by supporting an institution that actively participates in advocacy and lobbying on behalf of its members

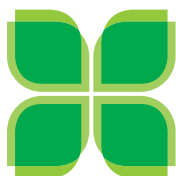
GAIN TRUST

through adhering to the IWMSA code of conduct trusted by clients in the waste environment

APPLY

APPLY ONLINE AT
WWW.IWMSA.CO.ZA

- Patron member
- Organisation member
- Individual member
- Associate member
- Student member



Institute of
Waste Management
of Southern Africa

www.iwmsa.co.za | info@iwmsa.co.za | 011 675 3462

Visit us on :

facebook.com/iwmsa or linkedin.com/company/iwmsa or Twitter @IWMSA

Holding the key to a sustainable tomorrow



With over 45 years of experience in the waste management industry, collaborating with customers is how we drive the circular economy. We implement agile and innovative waste solutions, proudly ensuring environmental peace of mind through our commitment to best practice.



FIND OUT MORE

www.enviroserv.co.za | 0800 192 783



ENVIROSERV

a SUEZ company