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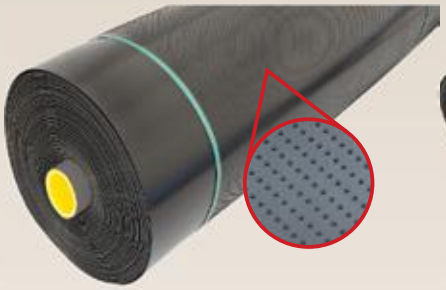

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The disposable society

An alarm goes off. In an effort to stop it, you slam your hand toward the direction of the noise, and the force of your half-asleep, limp arm snaps your phone, ending the alarm. That's fine though, you have a cupboard full of disposable phones.

It's Monday, you have an important meeting, so break open a pack of disposable suits. You get into your disposable car, only one trip left, you will have to stop at the convenience store to pick one up for the trip home.

On the way to work, you get a coffee in a disposable cup and eat breakfast out of disposable containers. Getting into your parking lot, you receive a disposable parking ticket. Passing through the lobby to your office, you pick up a newspaper that you will also dispose of.

Now, why do some things seem 'okay' when we throw them away, and others don't? Is it price, or size or simply a case of "normalisation", the process by which seemingly odd or otherwise objectionable actions become normal through social activity? A follow-up, isnt everything disposable given a long enough timeline?

This isnt just some armchair philosophy, the fact that the latest iPhone starts getting 'buggy' after 3 years is a design choice. The washing machine that stops draining two days after its warranty? Also, a design choice. The cheap family-sized car whose gearbox explodes just when you qualify to refinance? Someone built it to do that.

Planned obsolescence sounds like it came from the mouth of someone wearing a tin foil hat, but the evidence is overwhelming, or as they say, "the truth is out there." There are numerous case studies documenting the phenomenon, and as a technical writer, I want to link them here, but if I take the technical hat off and leave the writer hat on, I would rather offer a personal anecdote.

When I moved in with my girlfriend 6 years ago, we were given a fridge by her grandparents. It was yellow with age, louder than a lawnmower, had the tendency to freeze things that were not meant to be frozen, but it worked. It was from the 70s when "environmentalism" meant burning rubbish and throwing cigarette butts at ducks instead of the floor, but it worked. It worked until last year, when the compressor sang its last song; it lived 50 long years. My new fridge is shiny, has a water dispenser, isnt as loud as a lawnmower, and doesn't actively destroy the ozone layer. The point is that I had to service this fridge just last month, and the serviceman, a third-party guy cheaper than the manufacturer recommends, told me that these models have parts that deteriorate rapidly. He explained that some of the parts made of plastic could be made of better plastic, and there is no real reason for it to be made so cheaply.

If someone decided to start selling disposable fridges, we as a society would all throw rocks at them. Yet, we are sold disposable fridges, and phones, and cars, etc., etc. We have come to accept that things are made to be thrown away; we know this, but we pretend not to.

"They don't make things like they used to" is something I never thought I'd agree with. The fact of the matter is, the 1980s classic sports car is still driving around, and my 2003 Citroen is in the scrap yard. This phenomenon can only change if the entire social order seriously rethinks its consumption and manufacturing practices. The good news is that it has begun. EPR, right to repair, resource scarcity, climate change, and good old-fashioned economic distress are spurring the Circular Economy. There is still some way to go, but until then, we can do our best to join organisations that support zero-waste, the right to repair, and actively engage with recycling. Manufacturers will eventually listen, or close down.

Duncan

COVER OPPORTUNITY

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2026: The year of the Waste Warrior

As the Institute of Waste Management of Southern Africa (IWMSA) goes into its 50th year they call on South Africans to embrace simple changes and collectively protect our planet, this year everyone should be a "waste warrior."

With South Africa sending millions of tonnes annually to over 800 landfills and major cities like Johannesburg and Cape Town having less than five years of remaining landfill capacity, the urgency for sustainable waste practices has never been more imperative.

2026 Trends transforming waste management

The IWMSA are focusing on:

Technology-driven solutions: Smart waste bins with sensors are optimising collection routes, while solar-powered compactors hold up to five times more waste than traditional bins, making waste management more efficient across municipalities and businesses. Although this trend is still in its infancy, the use of AI and robotics is set to irrevocably change the waste management landscape.

Extended Producer Responsibility (EPR): With EPR collection targets effective until May 2026, almost 68,000 tonnes of e-waste have already been diverted from South African landfills through these schemes and look set to gather momentum.

Circular economy focus: The shift from "take-make-dispose" models to circular systems is accelerating, with Botswana set to host the 2026 Circular Hotspot for Africa, positioning Southern Africa as a regional leader.

Right-to-repair legislation: New laws requiring manufacturers to provide repair access are extending product lifespans and reducing electronic waste. Whilst this is currently mostly an EU initiative, it is hoped that this will also be enacted in South Africa as a means to reducing unnecessary waste.

Play your part

While industry innovation and policy changes are crucial, the power to transform our waste crisis lies in the daily choices of every South African. Small actions, when multiplied across millions of people, create an extraordinary impact.

With this said, the IWMSA suggest that we should consider implementing the following initiatives:

At home:

- Make use of reusable shopping bags, water bottles, and coffee cups
- Compost organic waste. Up to 57% of waste is organic material that can create nutrient-rich soil
- Buy thoughtfully, choosing second-hand items or products with minimal packaging
- Separate waste properly and rinse recyclables to prevent contamination

At work and school:

- Go digital to reduce paper waste
- Pack waste-free lunches using reusable containers
- Implement sustainable practices in your workplace or at school to amplify collective impact

In your community:

- Support local recycling programmes
- Repair items rather than replacing them
- Support businesses with sustainable practices

A call to action for 2026

Start with one change this week: take a reusable bag to the shops, start a compost bin, or fix something instead of replacing it. Each small, mindful action contributes to a cleaner, healthier South Africa for future generations.

Innovations in waste

The Innovations in Waste Management Conference is a must-attend event for professionals shaping the future of the waste sector.

Held from 07–08 May 2026 in East London, the conference brings together industry leaders and practitioners to share cutting-edge ideas, practical solutions, and proven best practices.

Delegates will gain valuable insights into strategic advancements and sustainable initiatives, while engaging in meaningful discussions that drive real, long-term impact within communities.

Hosted by the Eastern Cape Branch of the Institute of Waste Management of Southern Africa (IWMSA), this conference offers a powerful platform to learn, connect, and contribute to the evolution of professional waste management in South Africa.

Contact Lizl Badenhorst, Eastern Cape Branch General Manager on 011 675 3462 or email easterncape@iwmsa.co.za

Turning paper into purpose in Durbanville

The Western Cape branch of the Institute of Waste Management of Southern Africa (IWMSA) is proud to launch a community paper recycling initiative in partnership with MES Durbanville and Safe Space Durbanville.

MES does incredible work supporting people experiencing homelessness and poverty in the Durbanville community – and they're just as committed to protecting the environment. With existing initiatives like e-waste collection already in place, the next step was clear: keep recyclable paper out of the landfill.

Too many donated books, papers, and textbooks that can't be reused were ending up as waste, even though paper is highly recyclable. So, we stepped in to help make a practical, sustainable change.

IWMSA has installed three branded recycling bins at the centre, creating a dedicated paper recycling stream. And thanks to a partnership with One Stop Waste, the paper will be collected at no cost to MES, with a rebate paid based on the weight collected.

Eastern Cape clean up

On Saturday, 31 January 2026, the IWMSA Eastern Cape Branch conducted a cleanup initiative in the Cambridge area. The activity was supported by more than 50 participants, including representatives from local businesses, recycling companies, the ward councillor, and community residents. Through this collective effort, a total of 670.5 kg of recyclable waste was collected, making a significant positive impact on the cleanliness of the area.

The IWMSA Eastern Cape Branch extends its sincere appreciation to all participants who contributed their time and effort toward maintaining a clean and sustainable Cambridge area.

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.

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- Researchers, academics, and lecturers in waste management-related fields
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- 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

FIVE YEARS OF EPR:
PROGRESS, PRESSURE AND THE PATH AHEAD

PROs aid in enabling the circular economy through practical examples, like this project with ITB Plastics. Chairs and desks made of recycled material were donated to Isithebe ECD Centre in Kwa-Zulu Natal

It has been five years since the Department of Forestry, Fisheries and the Environment (DFFE) launched South Africa's first rollout of Extended Producer Responsibility (EPR) regulations. These regulations were introduced to support the emerging circular economy and to track and improve South Africa's sustainability performance across multiple waste streams.

Keith Anderson, CEO of eWASA

EPR gives effect to the "producer pays principle", whereby the responsibility to dispose of products sustainably and effectively rests with the producer, rather than solely with the consumer. This has required companies to reassess their products from design to end-of-life, reformulating material choices, manufacturing and distribution processes, and considering what ultimately happens to their products once they reach the end of their usable life.

While companies may manage this independently, the administration and compliance obligations can be outsourced to Producer Responsibility Organisations (PROs). These organisations are mandated to manage EPR compliance on behalf of producers, enabling them to focus on operations while ensuring compliance is properly tracked and administered.

Keith Anderson, CEO of eWASA, a registered PRO, explains: "When EPR was first introduced, there was some confusion regarding the mandatory nature of the regulations. Five years on, producers are far more aware of their obligations, and PROs have played a critical role in that awareness. Education formed a key part of our early mandate, ensuring producers understood what was required, why fees applied, and how those funds were utilised."

Challenges to be overcome

A recurring concern among PROs is the lack of enforcement against non-compliant producers. Anderson notes: "The entire premise of EPR functions only if participation is universal. Although the regulations provide for penalties against free-riders, there has not yet been a notable instance

One of EPR's biggest successes is facilitating waste picker integration

On international e-waste day 2025 eWASA facilitated a five-school e-waste collection drive where 900kgs of e-waste was collected from the community in uMngeni Local Municipality

of enforcement against producers who have failed to comply."

Non-compliant producers, commonly referred to as 'free-riders', benefit from the EPR framework without contributing financially. By avoiding compliance costs, they are able to offer lower prices, creating unfair market advantages while contributing to environmental harm.

Free-riding is not unique to South Africa. It is a global issue, particularly in relation to cheap online imports that bypass regulatory frameworks. PROs face the challenge of securing industry buy-in, while compliant producers question why they should effectively subsidise non-compliant competitors.

Another challenge has been inconsistent fee structures across PROs. Artificially low fees may attract members but can undermine the sustainability of recycling outcomes. Anderson clarifies: "Technically, PROs are not competitive entities in the traditional sense. We are not-for-profit organisations. When fees are lowered outside reasonable norms, it disrupts the entire value chain."

Misinformation has also presented difficulties, particularly where producers receive incorrect legal advice regarding their EPR obligations. While self-managed schemes are permitted, many producers underestimate the complexity, cost and audit requirements involved.

Growth of the sector and the country

Despite these challenges, Anderson emphasises that the overall impact of EPR has been positive. "For a framework that had never previously been implemented in South Africa, industry uptake has been relatively strong," he says.

One of the most significant structural outcomes has been the growth and formalisation of the recycling and waste management sector. EPR funding has enabled recyclers to scale operations, invest in mechanisation, improve compliance, and create jobs throughout the value chain.

Improved data integrity has also been a major development. For the first time, credible and audited data exists regarding volumes placed on the market and materials collected and recycled. Such data enables more realistic and evidence-based target setting.

Has EPR moved the needle on recycling?

According to Anderson, measurable environmental outcomes have been achieved. In the electronics sector alone, recycling rates of approximately 40% are being achieved, with figures independently audited.

Beyond financial audits, verification extends to recycling claims, training initiatives and waste picker support programmes. In 2025 alone, eWASA invested millions of rand in safety equipment, infrastructure and downstream processing capacity, investments made possible through EPR funding.

Shifting design, operations and mindsets

EPR has also influenced upstream decision-making, particularly in product design and material selection. Producers are increasingly considering recyclability and repairability at the design stage, aligning with global movements such as right-to-repair.

Education and awareness initiatives funded through EPR have further supported this shift, extending to schools, universities and industry stakeholders, and strengthening the broader circular economy discourse.

Beneficiation initiatives have demonstrated how recovered materials can generate additional economic value. Examples include recycled glass being used in infrastructure projects, illustrating the tangible economic and environmental benefits of circular economy implementation.

Lessons for EPR 2.0

As South Africa prepares for the next phase of EPR, several lessons are clear: enforcement must be strengthened to ensure a level playing field; fee structures must reflect realistic operational costs; and collaboration between PROs, government and industry must be enhanced within competition law parameters.

"EPR is not a tax," Anderson concludes. "It is an investment in infrastructure, compliance, employment and long-term sustainability. If properly enforced and intelligently refined, the next five years can deliver even greater impact than the first."

eWASA was a large contributor to the scaling up of Electronic Cemetery, an e-waste recycler, a major project that shows off the power of EPR fees

eWASA
EPR Waste Association of South Africa

www.ewasa.org

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The 2026 budget and the future of waste management in South Africa

The 2026 budget, as delivered by Finance Minister Enoch Godongwana on 25 February 2026, arrives at a crucial juncture for South Africa's waste management sector. **By Patricia Schröder, President of the Institute of Waste Management of Southern Africa (IWMSA)**

Viewed in conjunction with the draft National Waste Management Strategy (NWMS) 2026, a progressive policy framework aligned to the Sustainable Development Goals (SDGs) of Agenda 2030, it is clear that government is signalling a decisive shift in how the sector is to be managed, funded, and held to account.

For those of us working within the sector, this is not merely a fiscal document. It is a policy statement. For the IWMSA, it represents both a validation of the principles we have championed and an urgent call to action for all stakeholders in the value chain.

Key takeaways from the 2026 budget and the draft NWMS 2026

1. Performance-linked Funding for Municipalities

Perhaps the most significant development for our sector is the allocation of R27.7 billion over the medium term to support reform in metro trading services, including solid waste. Critically, the budget introduces a performance-linked model that mandates revenue collected for waste services to be reinvested directly into those same services - effectively ending the practice of cross-subsidisation that has for years starved waste infrastructure of the investment it requires.

Minister Godongwana was explicit in his warning: municipalities that fail to meet governance and operational reform targets will face budget reductions. In cases of serious capacity or governance failures, the delivery model will shift to an "indirect" approach, where other agencies will step in to build capacity and ensure service continuity. This is a structural intervention of considerable consequence.

From the IWMSA's perspective, this accountability framework is both necessary and welcome. The sector has long grappled with the consequences of municipal financial distress. A model that rewards performance and penalises neglect creates the right incentive for meaningful change.

2. The Introduction of Deposit Return Schemes (DRS)

The draft NWMS 2026 introduces Deposit Return Schemes (DRS) as a mechanism to strengthen Extended Producer Responsibility (EPR), targeting packaging streams that have not met their recycling targets. This is a significant escalation in the EPR framework and one that the IWMSA views as a constructive development.

Historically, DRS has proven effective in increasing collection rates, driving consumer behaviour change, and enhancing accountability for Producer Responsibility Organisations (PROs). Its introduction signals that the government is prepared to move beyond voluntary compliance, where targets are not being met. It signals that compliance is non-negotiable and that producers must genuinely own their end-of-life responsibilities.

3. A broader focus on previously underserved waste streams

The NWMS 2026 prioritises several waste streams that have previously received insufficient regulatory attention. Over the next five years, specific interventions will target:

- Absorbent Hygiene Products (AHPs)
- Organic waste
- Clothing and textiles
- Automobiles
- Coal ash
- Construction and demolition waste
- Food waste

These are complex, high-volume streams that present both significant environmental risk and meaningful economic opportunity. The formalisation of management frameworks for these streams is a development we have long advocated for, and we look forward to engaging constructively with the government on their implementation.

4. Circular Economy acceleration and infrastructure investment

The Budget Facility for Infrastructure (BFI) continues to support major capital projects, with a growing emphasis on alternative waste treatment technologies and waste-to-energy solutions. This infrastructure orientation, combined with the NWMS 2026's ambitious target of creating 69,000 new jobs in the waste sector, underscores the government's recognition of waste management as an economic driver - not merely a service obligation.

Equally noteworthy is the introduction of right-to-repair legislative frameworks, designed to extend product lifespans and reduce electronic waste. This speaks to a maturing circular economy policy environment in South Africa, one that is beginning to address the full lifecycle of products rather than focusing solely on end-of-life management.

For the IWMSA and its members, these developments represent both opportunity and responsibility. The infrastructure investment pipeline creates real prospects for private sector participation, innovation, and job creation. We encourage our members to engage with these opportunities actively.

5. Strengthening regulatory compliance

The NWMS 2026 mandates separation-at-source programmes across all metropolitan municipalities, secondary cities, and large towns - a foundational requirement for any functioning circular economy. This, paired with the 2026 budget's commitment to tighter monitoring and enforcement of the NWMS, signals a regulatory environment that is increasingly acting in meaningful ways.

As an organisation, we have consistently emphasised that regulation without enforcement is ineffective. We are therefore encouraged by the direction of both the budget and the draft strategy, and we will continue to support the government in building the technical capacity and institutional frameworks required to make compliance a reality rather than an aspiration.

In closing: A turning point for the sector

When viewed in tandem, the 2026 budget and the draft NWMS 2026 represent a decisive departure from a business-as-usual approach. The message from the government is unambiguous: waste management is a strategic national priority, and the era of under-investment, poor accountability, and fragmented governance must come to an end.

The IWMSA welcomes this direction wholeheartedly. Our sector has the expertise, the commitment, and the capacity to rise to this challenge. What has been lacking, in many instances, is the policy framework and the political will to enforce standards consistently. The 2026 Budget and the draft NWMS 2026 suggest that both are now being brought to bear.

Wet tipping, or dumping into water is still ongoing problem despite the progress made within the waste sector. *(Image by Averyaudio, licensed under Creative Commons 4.0)*

IWMSA AT 50:

JARROD BALL REFLECTS ON LANDFILL DEVELOPMENT, POLITICAL SHIFTS, AND THE FUTURE OF WASTE MANAGEMENT

Long before his career in waste management, Jarrod "Rod" Ball used to swim in an abandoned quarry near his childhood home. One day, the municipality began dumping waste into it; an event that left a lasting impression.

At that early age, Ball had an instinctive discomfort about waste being dumped into groundwater. This concern about what is now termed "wet tipping" would later evolve into a successful career in waste management, including his role as coordinating consultant on the country's landmark Minimum Requirements for Waste Disposal by Landfill.

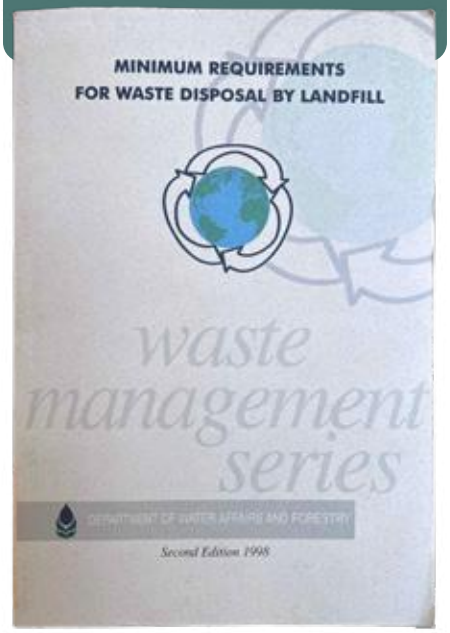
In 1975, while working on his first waste disposal site in Sasolburg, Ball realised that neither he nor the authorities had much knowledge of the potential impact of landfilling on the environment. Consequently, Ball joined the City Engineers Department of Johannesburg, who facilitated 8 years of research into fluid dynamics in their Waterval Landfill. This project was registered at the Wits Department of Civil Engineering under Professor Geoff Blight, with the City's Piet Theron as the scientific advisor. The City of Johannesburg, specifically Stan Verrier, also facilitated 2 years of studying waste management at the University of Wisconsin, USA.

Jarrod Ball, waste management specialist and former IWMSA President

Because of his background, his practical experience and a decade of consulting, Leon Bredenhann of the then Department of Water Affairs and Forestry, (DWAF) approached Ball to become the coordinating consultant for the formulation of the Department's "Minimum Requirements for Waste Disposal by Landfill." For this reason, Ball always describes Bredenhann as "the Father of the Minimum Requirements." To initiate this project, Ball recruited Geoff Blight, Piet Theron, Ray Lombard, and Ken Bromfield, all waste management specialists, to advise him. This team developed the scientifically defensible Minimum Requirements framework. Thereafter, the work was done by the core team, Ball, Blight and Bredenhann, later assisted by the editor Kathleen Langmore.

The Minimum Requirements introduced the critical distinction between hazardous and general waste, and the associated risks. Other landfill variables used were the size of incoming waste stream and the potential for leachate generation. Using these variables, landfills were categorised into different classes. These classes were then used as the basis for developing graded standards, relating to landfill siting, investigation, design, operation, and closure, with the aim of making them appropriate and cost effective. The core team produced 14 drafts over several years, before the Minimum Requirements were finalised in 1998. Ball says that "We thrashed it out properly, weighing every sentence." Consequently, the Minimum Requirements fundamentally reshaped the landfill design and operation in South Africa. Although technology in landfill liner design spearheaded by people like Peter Davies, Kelvin Legge and Peter Legg, and landfill gas management by Stan Jewaskiewitz as well as public participation protocols have significantly exceeded those in the Minimum Requirements, the basic principles contained therein, still hold today.

South Africa's "Minimum Requirements for Waste Disposal by Landfill" was a massive leap forward for effective waste managment in South Africa



Navigating a new political landscape

Ball's presidency of the Institute of Waste Management of Southern Africa (IWMSA) from 1994 to 1996 coincided with South Africa's democratic transition. During that period, he represented IWMSA in making input into the Constitution of the New South Africa. Importantly, at that stage however, everything including waste management faced political scrutiny.

"The political landscape was such that environmentalism became antagonistic rather than functional." Ball explains. "There was an environmental lobby that saw landfilling as entirely bad." He recalls opposition from people who could not accept that landfills are an unavoidable component of waste management, and who did not appreciate that the Minimum Requirements were there to upgrade landfilling, both environmentally and socially. What they offered instead of landfilling was "recycling alone" which is now understood to be unsustainable. Ball is happy that nowadays, environmentalists see landfills as assets to be conserved, with emphasis on diverting waste and enabling circularity.

Another major theme of the 1994 transition to democracy was environmental justice. Landfills had historically developed in the "buffer zones," associated with apartheid spatial planning. Invariably the poorer communities adjacent to these zones bore the brunt of the environmental and social impacts of the landfills, which were simply open burning dumps. At this point, the complexity of waste management met with the complexity of politics. Ball says. "It has taken much effort to address this problem and build the trust of the affected communities through social engagement. However, despite these efforts and the guiding Minimum Requirements, this issue persists.

From the "open burning dump and wet tipping" to the "circular system"

For much of his career Ball, "focused on eliminating open burning dumps, with their feet in the water and replacing them with appropriately engineered landfills that didn't contaminate groundwater and didn't harm people." However, he adds, "You cannot just focus on end-of-pipe

1 **Jarrod Ball preparing to descend a 13 m deep gas filled auger hole at the Waterval landfill**

2 **Jarrod Ball descending down the gas filled auger hole**

3 **Jarrod Ball sampling water that had been contaminated by landfill leachate seepage**

solutions forever. At some point, design, materials, and lifecycle responsibility must come into the picture." Consequently, he says that the current IWMSA President, Patricia Schröder's emphasis on Circular Systems "is music to my ears." He also welcomes the introduction of functional Extended Producer Responsibility (EPR), stating that the concept is not new in South Africa. "It has been around for a long time, actually on and off since the 1970's. In the early days of Keep South Africa Beautiful, (KSAB), there were already discussions about producer responsibility, but back then, lobbying by the packaging industry and economics overrode the environmental argument."

Notwithstanding the above, Ball is adamant that even a circular economy will have significant residues that will need to be landfilled. He explains, "You always need safe, properly engineered and operated landfills as a fundamental component of the waste management system." In this regard, with the difficulty associated with establishing new landfills, he foresees remote regional landfills and increased transport costs.

Persisting challenges and looking forward

Despite major technological and regulatory advancements over the past three decades, Ball believes some of the sector's most fundamental challenges remain unresolved.

He notes that "Although wet tipping has largely been eliminated, many of the old operational problems still persist." While the regulatory authorities are consistent on landfill design, regarding operations, they tend to be harder on the private sector, who generally have better qualified operators than on the public sector. This means that private sector landfills generally adhere to higher environmental and operational standards; large municipalities generally compact and cover their waste, while the smaller municipalities struggle. The problem within the public sector is that municipalities can construct technically sound landfill sites but fail to operate and maintain them properly.

Ball says that the reasons for the problems in the Public Sector are complex. He suggests a lack of technically qualified personnel results in poor decision making. He adds, "Political interference in decision making and prioritisation; as well as underfunding and corruption are major hurdles." Ball goes on to say, "you cannot manage waste properly without properly trained people. This is a technical discipline, requiring technical competence."

He adds with some pride that, since its inception, IWMSA has focused on training, with a view to professionalising waste management. As IWMSA marks its 50th anniversary, Ball remains deeply optimistic about the profession he was privileged to have had a role in developing. "A career in waste management has been one of my greatest gifts! Throughout, it has kept me enthusiastic and committed. Importantly, I have also met numerous people in the IWMSA who feel the same."

His advice to the current IWMSA leadership is: "Promote the science and practice of waste management by continuing to prioritise education, mentorship, and technical rigor. Focus on central, provincial, and particularly local authority staff, so that the decision makers can make informed decisions. Through means such as WasteCon, reach out to and educate the politicians regarding the importance of waste management, so that they can be influenced to make appropriate policy and ensure correct prioritisation."

From a boy concerned about waste being dumped into water in a deserted quarry to someone, who through the support of many people, was able contribute to waste management in South Africa, by guiding the formulation of the national landfill standards, Ball's career mirrors the evolution of South Africa's waste sector itself. From open burning dumps and wet tipping, to regulated engineered landfill designs; and from end of the pipe solutions, to emerging circular waste management systems and extended producer responsibility. In its 50 years of existence, the achievements of the IWMSA stand as a testament

As South Africa's solar panels begin to be decommissioned 'circular uses' like those in Energy 4 Hope will be vital for sustainability

Energy 4 Hope's model for waste reduction offers a safe second life for solar

When a solar panel or energy storage battery reaches the end of its service life, what happens next can make all the difference to the environment and to local communities.

Energy 4 Hope, a proud Circular Energy non-profit initiative under South Africa's Extended Producer Responsibility (EPR) scheme for renewable energy products, is setting the standard for safe, responsible reuse and recycling of renewable energy systems in South Africa.

Established in May 2025, Energy 4 Hope is dedicated to transforming lives by delivering sustainable solar energy solutions to communities in need. Through rigorous inspection, testing, and refurbishment of solar PV modules and energy storage systems, the organisation ensures that only safe, high-performing equipment is donated to schools, community centres and institutions, thereby empowering education, development, and sustainability.

Energy 4 Hope partners with producers and importers, EPCs, local NGOs and training partners, for example, the Council for Scientific and Industrial Research (CSIR), Solar Manufacturers, JA Solar and IBC Solar, Globeleq, and Volvo Trucks SA, among others, to collect, inspect, test, and transport donated PV modules to provide safe second-life energy solutions. It also supports producers' Extended Producer Responsibility (EPR) obligations while setting credible re-use standards and auditability.

From waste risk to community asset

The untested resale or re-use of PV modules and batteries is not only a missed opportunity; it is also a risk. Faulty or degraded equipment, when sold or used informally, can threaten the safety of those who will be using it, and undermine trust in renewable energy. These modules are also banned from landfills. Energy 4 Hope, aligned with the EPR regulatory framework, provides an alternative: every donated module and battery is rigorously inspected, tested, and certified before being deployed to schools, sports fields, and community centres.

"Our testing protocol ensures donor confidence and community safety," says Ely Bronstring, Manager: EPR & Circular

iKhethelo Children's Village in Durban's Valley of a Thousand Hills, where orphaned and vulnerable children in KwaZulu-Natal, South Africa, are given new hope

Circular Energy's "Energy 4 Hope" initiative seeks to repurpose offline solar panels for positive community impacts

Partnerships at Energy 4 Hope. "Compliant technology empowers learning, sport and security, especially after dark."

The impact is self-evident: sports grounds and walkways are illuminated after dark, making communities safer and more vibrant. Children can study longer in the evenings, and public spaces become hubs of activity. At the same time, valuable materials are conserved, and less waste finds its way into landfills, which is especially important as solar modules and energy storage batteries are banned from landfills.

How the testing workflow works

The process starts with an inspection for visible damage. Next, non-destructive tests check electrical output, insulation, and thermal stability. Only units that pass all tests are certified for re-use and donated, resulting in these products being removed from the waste stream and extending the lifespan of the products by many years – those that fail are responsibly recycled, with materials safely recovered, thereby contributing to secondary circular markets.

Equipped with a custom-designed truck and trailer, and purpose-built transportation crates, the initiative guarantees the safe, compliant transportation of the collected renewable equipment to avoid breakages, with the added capability for field inspections. This secure logistics chain is supported by the active participation of local NGOs and technicians. Their involvement at every stage turns a technical installation into a community-led success story, to bridge the gap between high-standard engineering and grassroots development.

Circular Energy uses a specalised custom Volvo truck to safely transport these solar panels

"With Energy 4 Hope, we've created a system that converts end-of-life batteries and solar panels into new opportunities," says Circular Energy's CEO, Patricia Schröder. "Our process ensures that only safe technology is redeployed while everything else is recycled responsibly, creating a circular economy with a clear social impact."

A case in point: iKhethelo Children's Village

The first pilot project to benefit from the Energy 4 Hope initiative is iKhethelo Children's Village in Durban's Valley of a Thousand Hills, where orphaned and vulnerable children in KwaZulu-Natal, South Africa, are given new hope. iKhethelo (meaning 'chosen') is home to 45 children between the ages of two and 21. Each child lives in a nurturing family-style home with up to eight children and a dedicated house mother.

PV modules used in this pilot were donated by Globeleq, a solar energy power provider, from panels recovered from solar farms that had undergone a technology refit. After a thorough assessment and data collection, the PV module and battery storage installation launched in December 2025 and will be tracking outcomes such as additional study hours and improved safety because of receiving responsibly certified reused Solar PV modules.

A call to action

Energy 4 Hope demonstrates that safe, EPR-aligned reuse of solar technology is not just possible; it is essential. The organisation invites recyclers, municipal leaders, and compliance managers to join the movement by donating end-of-service equipment, supporting responsible recycling, and helping to build safer, brighter, more productive communities across South Africa. Look out for the official launch date of the custom-designed truck and trailer when it actively gets on the road to travel throughout South Africa to transport the equipment, as well as the energy switch-on for iKhethelo Children's Village.

CIRCULAR ENERGY

www.circular-energy.org

MINING'S TRANSFORMATIVE POWER

SPURRED BY HONEST ENGAGEMENT

Mines around Africa are creating economic momentum for new local markets and the spread of technology, supporting a level of social transformation that can be enhanced by more effective dialogue between public and private sector players.

Mines around Africa are creating economic momentum for new local markets and the spread of technology, supporting a level of social transformation that can be enhanced by more effective dialogue between public and private sector players

Andrew van Zyl, managing director of SRK Consulting South Africa

As Cape Town hosts the Investing in African Mining Indaba this week, the focus again includes ways to harness mining's contribution to inclusive and sustainable growth. According to Andrew van Zyl, managing director of SRK Consulting South Africa, the sector is an important catalyst in fostering intra-Africa trade, as well as opening up value chains in new technologies with significant social benefits.

"Mines play a vital role – often underestimated – in bringing critical mass to the adoption of valuable technologies that would otherwise struggle to gain a local foothold in communities around Africa," said Van Zyl. "Decentralised renewable energy is a good example, which can rapidly transform livelihood opportunities, productivity and general standards of living among communities."

First movers

He pointed out that mining companies have often acted as critical first-mover customers for innovations in renewable energy, paving the way for value chains to develop into new territories in Africa. This, in turn, allows other stakeholders to adopt and benefit from life-changing products and expertise.

This has occurred with the application of solar power installations at mining operations, thus creating demand for local inventories and expertise for installation and maintenance. Once a mine's investment in this technology has incentivised the establishment of local service providers, more affordable access by communities in the country or region often follows. This opens doors for small businesses and households to adopt innovations that transform lives and livelihoods.

"These processes can advance transformation even more effectively when a country's relevant legislation, regulations and incentives are aligned with the economic and technological opportunities," he explained. "This is best achieved when the private and public sectors are regularly engaged in constructive discussion about adapting legislation and leveraging investment and innovation – ideally through collaboration based on robust relationships and honest engagement."

In South Africa, the licensing exemption threshold for solar and other energy plants was increased from 1 MW to 100 MW in 2021, allowing more private generation of renewable energy. The country's mines

have since put in train around 3,5 GW of power projects, in a pipeline that could reach 5 GW by 2030.

Lessons learnt

The Indaba's focus on collaboration is relevant when considering how technological advancement also requires regulatory innovation, with both aspects – technical and legal – requiring engagement, courage and scientific rigour. Van Zyl highlighted that, while investors and project champions based key decisions on certainty and predictability, all parties still expected the mining sector to continually improve – implying ongoing change.

"Innovating is seldom simple, so it does require a commitment from clients, professionals, operations and government bodies to consider new ideas and technologies in the context of lessons learnt," he said. "This means reflecting carefully on what has worked in the past or elsewhere and applying innovations with the flexibility to make adaptations whenever necessary. We also need to have the courage to share the reasons some innovations have failed as this facilitates progress, helping others avoid making the same mistakes."

He encouraged more discussion on ways to build new ideas into the mining ecosystem at minimal risk, a process that demanded honest assessments of past performance. This approach applied as much to technical aspects of mining as it does to the policy and regulatory framework.

Mining is also a valuable and important catalyst in fostering intra-African trade

"The mining sector – globally and in Africa – has the advantage of extensive studies and reviews of initiatives that have made a difference," he said. "These range from equipment performance to local beneficiation strategies and are all vital to how we learn from our past experience."

Multiplier

He reiterated the figures shared at the Mining Indaba by the Minerals Council South Africa, which showed how mining supported nearly 900,000 jobs and the livelihoods of 3,6 million South Africans. Minerals Council South Africa CEO Mzila Mthenjane noted that mining is a powerful multiplier and as such, growing mining grows the economy and jobs

Van Zyl noted that fostering the impact of mining also meant strong global relationships on a project level. With the growing involvement of China-based mining companies and financial institutions in Africa's mining sector, SRK Consulting (South Africa) regularly collaborated with colleagues across its practices in China.

"This kind of technical collaboration is always rewarding – facilitating sound communication and expectations across the project pipeline," he said. "This has particularly supported our work in the Democratic Republic of Congo, Ghana, and Zambia, but also in a growing selection of other countries around the continent."

Mining plays an underestimated role in technology adoption, fostering social and economic growth

Regionalising Waste: THE WESKUS REGIONAL LANDFILL CASE STUDY

The Weskus Regional Landfill near Vredendal consolidates waste disposal for municipalities across the West Coast District, replacing numerous small and non-compliant landfill sites

For more than two decades, municipalities across South Africa's West Coast District grappled with a mounting waste crisis: small, scattered landfill sites, many of them unlined, overfilled, and poorly controlled, were becoming both environmental liabilities and financial burdens. **Adapted from an article by Chris Koch, Jan Palm and Reon Pienaar**

The regionalisation of waste disposal, long promoted by national and provincial government, has now reached a significant milestone with the completion and commissioning of the Weskus Regional Landfill, a flagship infrastructure project that demonstrates how inter-municipal collaboration, technical excellence, and strategic governance can converge to deliver sustainable waste solutions.

The imperative for regionalisation

The West Coast District Municipality (WCDM) spans five local municipalities: Swartland, Saldanha Bay, Bergrivier, Cederberg and Matzikama. By the late 1990s, it was evident that many of these municipalities could no longer sustain their local disposal sites. Facilities lacked sufficient airspace, proper liners, and leachate control; several posed direct risks to groundwater and nearby communities. In 1997, the WCDM initiated an assessment of landfill capacity and environmental compliance across the region. Following municipal amalgamations in 2000, this evolved into a District Waste Disposal Strategy, the foundation for what would become one of South Africa's most advanced regional landfill developments.

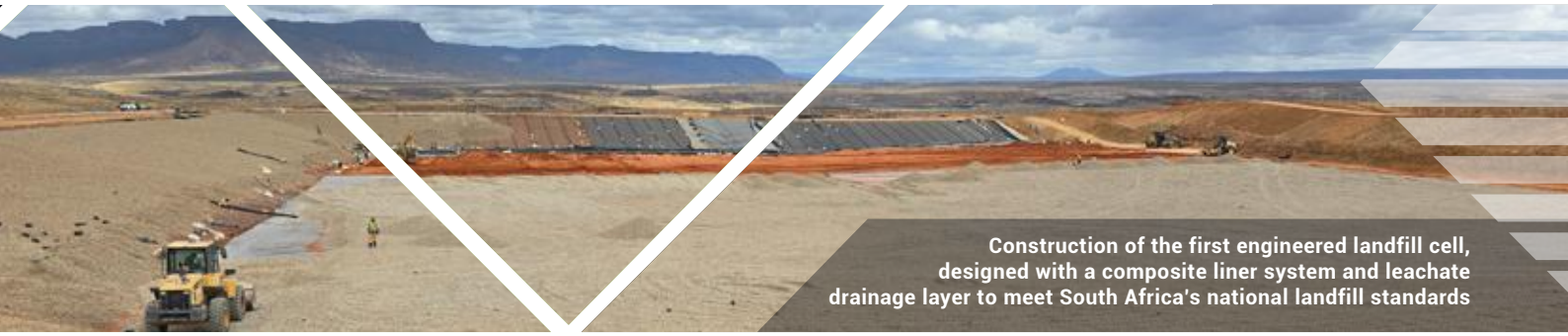
The logic behind regionalisation was straightforward: consolidate multiple non-compliant local dump sites into a single engineered landfill facility, operated to national standards and supported by robust quality assurance and environmental management systems. Section 84 of the Municipal Structures Act (Act 117 of 1998) formally assigned district municipalities the function of establishing and operating shared waste disposal facilities, while local municipalities retained responsibility for collection, diversion, and transport.

This framework aims to rationalise infrastructure and reduce pollution risk. Yet, putting the principle into practice required years of technical studies, environmental approvals, political alignment, and financial coordination, culminating in a project that took more than twenty years to realise.

From strategy to site: Two decades of development

After evaluating eight disposal scenarios in 2001, Cederberg and Matzikama chose the scenario with a regional landfill as its most cost-effective and environmentally sustainable option. The analysis demonstrated that although regionalisation increases transport costs, these

Installation and welding of the HDPE geomembrane liner, a critical component of the landfill's composite containment system that protects soil and groundwater



Construction of the first engineered landfill cell, designed with a composite liner system and leachate drainage layer to meet South Africa's national landfill standards

are offset by economies of scale: the capital and operational costs of a single, engineered site are shared over a greater waste tonnage, lowering the overall cost per tonne. In 2025 values, for example, Cederberg's additional transport cost of R1,219.41 per tonne was more than compensated by combined savings of R2,104.27 in disposal capital and operating costs, a net saving of R884.86 per tonne.

The site selection process began with negative mapping based on the Department of Water Affairs and Forestry's Minimum Requirements for Waste Disposal by Landfill (DWAF, 2005). Areas with "fatal flaws", such as proximity to aquifers, steep slopes, or sensitive ecological zones, were eliminated. The remaining "windows" of potential land were then assessed through field visits and environmental screening.

Four candidate sites were shortlisted within the Cederberg and Matzikama municipal boundaries. Following extensive Environmental Impact Assessment (EIA) procedures, including specialist studies on hydrology, geotechnics, visual impact, and air quality, Site C, located on Farm Vaderlandsche Rietkuil No. 308 near Vredendal, was confirmed as the most suitable. The site's history as a decommissioned gypsum mine offered favourable geotechnical conditions and sufficient land availability. On 10 March 2014, the Western Cape Department of Environmental Affairs issued a Class B Waste Management Licence, setting a statutory commencement deadline for March 2024.

Overcoming administrative and political hurdles

Inter-municipal coordination proved one of the project's most significant challenges. Differing priorities, budget cycles, and procurement frameworks initially delayed progress. The breakthrough came in 2022, when both the Cederberg and Matzikama Councils formally resolved to participate in the regional facility. The WCDM Council followed with final approval in early 2023, unlocking the procurement and construction phases.

This cooperative governance model, underpinned by sustained technical engagement, now stands as an example of how multi-tier government can successfully deliver shared environmental infrastructure.

The final design, completed in 2021 by JPCE (Pty) Ltd, incorporated all requirements of the National Norms and Standards for Disposal of Waste to Landfill (GN R636 of 2013). The facility was designed as a Class B general waste landfill, equipped with a composite containment liner, leachate management system, stormwater controls, and supporting infrastructure to ensure regulatory compliance and operational efficiency.

Key design features included:

- Basal Liner System – A composite liner comprising a geosynthetic clay liner (GCL) replacing locally inadequate clays, overlain by a 1.5 mm high-density polyethylene (HDPE) geomembrane, a geotextile protection layer, and a stone leachate drainage layer.
- Leachate Collection and Evaporation – A dual-lined sump and pumping system directing leachate to an evaporation pond designed to contain effluent under all climatic conditions.
- Stormwater Management – Infrastructure to isolate "clean" external runoff from "dirty" internal leachate-affected water, sized for a 1-in-50-year storm event of 24 hours' duration.
- Access and Control – A 1.1 km asphalt access road from the R27, segmented paving at the weighbridge and gatehouse, and perimeter security fencing.
- Operational Facilities – Administrative buildings, ablution facilities, a weighbridge and data systems for waste tracking, and provision for future waste diversion facilities such as recycling and garden-waste processing areas.
- The first disposal cell provides 271,000 m³ of airspace, giving an estimated seven-year lifespan for incoming waste from both municipalities. Subsequent phases will expand capacity in line with projected population growth and waste generation trends.

Construction and quality assurance

A public tender for construction closed in March 2023, with pre-qualification criteria requiring substantial previous experience in geosynthetic liner installation. Work commenced on 8 December 2023 with a 40-week schedule. Construction coincided with one of the wettest and windiest seasons in over a decade, introducing significant logistical challenges: soils became challenging to work with, wind speeds hampered geomembrane welding, and daily adjustments were required to maintain productivity. Despite these setbacks, practical completion was achieved by 31 January 2025, and the project was successfully completed within budget.

Throughout construction, Construction Quality Assurance (CQA) was central. Independent laboratories tested geomembrane properties; on site testing was done on seam weld integrity, and layer thicknesses. Full-time QA inspectors monitored installation to ensure strict adherence to specifications. A comprehensive Construction Completion Report was submitted to the

Stormwater and leachate infrastructure were designed to separate clean runoff from contaminated water, ensuring compliance with environmental regulations

Department of Water and Sanitation (DWS), which approved the operation of the facility through an official Record of Decision (RoD) on 8 July 2025, following a site inspection in April 2025.

Recognising the 2024 amendment to the National Norms and Standards requiring immediate protection of the separation geotextile, the project team requested authorisation to place the pioneering layer of waste immediately after completion. Permission was granted, enabling early commissioning and safeguarding the integrity of the newly installed liner.

Empowering local economies

Beyond its technical achievements, the Weskus Regional Landfill also served as a vehicle for local economic empowerment. The project created 77 direct jobs during construction, including 21 for youth and 4 for women, and generated R13.7 million in local procurement through subcontracting, fuel sourcing, and material supply. The inclusion of a prefabricated wastewater treatment plant, designed locally, further enhanced sustainability by enabling on-site effluent reuse for landscaping.

Importantly, the project recorded no community resistance or disruptions, a testament to effective public participation and transparent communication during the EIA and construction stages.

Financial sustainability

The total project cost of R93.97 million (including VAT) came in R3.27 million under budget, a rare outcome for a capital project of this scale and complexity. Funding was secured through the Development Bank of Southern Africa (DBSA) as a 20-year municipal loan with a two-year repayment holiday, providing breathing space for tariff stabilisation.

Tariff modelling, developed collaboratively with Cederberg and Matzikama municipalities, translated capital and operational costs into monthly household service charges, benchmarked against provincial medians. Even with the inclusion of transport and future rehabilitation costs, the regional model proved both affordable and fiscally responsible.

Commissioning and operations

Operations commenced in May 2025, with Matzikama Municipality delivering the first waste loads using its existing collection vehicles. Cederberg Municipality also started to use the facility, and full access will follow upon completion of its transfer infrastructure. The operational contract, awarded through competitive tender process, requires the operator to maintain compliance with licence conditions, ensure data accuracy via the weighbridge system, and implement progressive cell development under WCDM oversight.

Contract performance is managed through monthly technical meetings and third-party certification of payments, ensuring transparency and accountability in ongoing operations.

Delivering on governance and sustainability

The success of the Weskus Regional Landfill project is reflected not only in its engineering and environmental outcomes but also in the governance that enabled its delivery. The West Coast District Municipality has achieved clean audits for 14 consecutive years, the most of any district municipality in South Africa, and the landfill project reinforces that legacy of administrative discipline and regulatory compliance.

The project aligns fully with South Africa's waste management hierarchy, where avoidance and diversion remain priorities, but residual waste must still be safely contained. By consolidating numerous non-compliant local sites into one engineered facility, the region has substantially reduced its environmental footprint and established a long-term safety net for waste that cannot be diverted or treated through other technologies.

Lessons for future regionalisation

The Weskus Regional Landfill demonstrates that the regionalisation of waste disposal, when approached strategically, offers measurable technical, economic, and environmental advantages. Key lessons include:

- **Early inter-municipal alignment:** long-term planning and shared commitment are essential to overcome jurisdictional and political barriers.
- **Adaptive design:** anticipating regulatory changes, such as the transition from the Environment Conservation Act to the National Environmental Management: Waste Act, ensures future compliance and project continuity.
- **Integrated CQA:** Full-time quality assurance oversight is indispensable for ensuring liner integrity and regulatory approval.
- **Community partnership:** Transparent communication and local participation mitigate social risk and foster public ownership.
- **Sound financial structuring:** Aligning loan terms, tariff models, and affordability analyses ensures sustainability beyond construction.

The commissioning of the Weskus Regional Landfill marks the culmination of more than twenty years of planning and persistence. It is not merely a disposal site; it is a regional governance achievement, a technical benchmark, and a demonstration of how well-managed infrastructure can support environmental protection and community development simultaneously.

In the years ahead, the facility will continue to evolve, incorporating recycling and diversion infrastructure to further reduce landfill dependency. But its core purpose remains unchanged: to provide a safe, compliant, and sustainable repository for the waste that cannot yet be eliminated.

As the authors observe, "Regionalisation is not only about efficiency, but also about resilience, accountability, and stewardship." The Weskus project proves that when these principles are embedded from the outset, sustainable waste management becomes not just an aspiration but an attainable reality.

Regionalisation is not only about efficiency, but also about resilience, accountability, and stewardship

The fires light up every evening, a symbol of governance failure

HOW GOVERNMENT NEGLIGENCE FUELS AN ILLEGAL WASTE INDUSTRY AT THE EXPENSE OF PUBLIC HEALTH

Every evening in Northern Johannesburg, fires can be seen rising from several illegal dumping sites across Kya Sands. By morning, suburbs stretching from Fourways, Broadacres, Bloubosrand, Northriding, Chartwell, and Cosmo City are shrouded in a haze of toxic smoke. **By Duncan Nortier**

This has been going on for years, and what started as a decommissioning problem has transformed into an organised illegal industry that affects the health and safety of some 150 000 people.

The genesis of this crisis began when the Kya Sands Waste Disposal Site was decommissioned by Pikitup in 2010, having come to the end of its useful life. According to the Kya Sand Burning Wasteland Community Forum, a residents' forum that seeks to document and fight this ongoing crisis, the site was never properly closed nor rehabilitated. This lack of oversight set the stage for illegal operators to reopen the landfill; these "waste lords," as the community has dubbed them, charge clients to dump waste, and they then burn what cannot be recycled or sold. The success of the initial illegal operation created an entire illegal waste ecosystem where operators are illegally using private, provincial, and city property for their commercial gain.

The operation mimics legal waste operations, where clients are charged to dump, but then recyclables and anything of value is separated and sold. The Forum has documented registered waste operators using these illegal facilities, including large tipping trucks and providers of rubble and garden refuse services. Where the illegal waste business differs from legal ones is that there are no waste classifications and properly engineered disposal sites. This means that hazardous waste, as well as organic waste, is being dumped onto unlined ground and set ablaze. These operations charge between R300 and R800 per load, making them attractive to unscrupulous businesses seeking to bypass more expensive legal landfills and save money. The Forum has documented medical waste being dumped; this is especially concerning given the hazardous nature of the waste and illustrates that 'legitimate businesses' are making use of the illegal dumps, as medical waste is highly regulated.

The actions of the community have helped; although difficult to track the Forum estimates that the sites are down to five from ten, this still means that a hundred or more trucks may still be dumping each day. The entire criminal enterprise is tightly controlled; the operations include marshals telling people where to dump, but this level of organisation has led residents being threatened at gunpoint for attempting to document the illegal activities. Landowners have also tried, in vain, to have by-laws enforced, but there is no help from the authorities. When one accounts for the leasing of plots in the adjacent informal settlements and illegal electrical connections, combined with illegal dumping and recycling, these schemes generate roughly R11 million a month. This renders opposition to the illegal dumping even more difficult, as the high profit incentivises the criminals to remain in control.

A public health and environmental crisis

The daily burns are more than "just illegal dumping," and there are profound environmental and health concerns attached to this crisis.

The initial flames and smoke present air quality concerns. Globally, air pollution is linked to approximately 6.5 million deaths annually, and the increased air

The fires spread underground and burn for days, an operation to stop one fire last two days and covered 500 square meters

The original landfill site was never closed properly, the City of Johannesburg has awarded a tender for its rehabilitation but the community fears this is not enough

pollution in northern Johannesburg associated with these daily burns has the community worried. The community commissioned an air quality test in 2024, which confirmed the presence of benzene and other volatile organic compounds which were linked directly to illegal dumping. The community had a legal victory in August 2024 when the High Court ordered the City to conduct air quality testing. Although the April 2025 deadline was missed, these results have now been delivered. The Kya Sands Community Forum's legal team are interpreting the results, but they show evidence of potential non-compliance with South African air quality standards. Anecdotally, the community members report increased frequency and severity of conditions such as allergies, hay-fever, headaches, nausea, asthma, and other more severe respiratory illnesses, all coinciding with the uptick in daily burns. While long-term health impacts are difficult to estimate and "impossible to prove," there is at least one community member with lung cancer. While the Forum indicates that the effects of this smoke do not differentiate between people, heavily polluted air affects the elderly and children at disproportionate rates and will only exacerbate pre-existing conditions.

Aerial view of an illegal dumping operation in Kya Sands

The nature of the burns also means exacerbated health and environmental consequences. Once the initial flames have settled, the dumps smoulder overnight, still producing smoke; it is here that the waste releases its most dangerous toxic compounds, resulting from burning plastics, dry-walling, and tyres and many other materials. These burned materials release dioxins, which are persistent pollutants that the Forum notes "can accumulate in the food chain." These dioxins are highly toxic and are associated with reproductive, developmental, and immune system damage. They also interfere with hormones and are known to cause cancer.

This health problem exists for residents in both the affluent and poorer areas that are affected by the fires. The Forum says that formal, informal, and commercial properties are all affected, and that stopping this crisis brings health and safety to everyone.

Additionally, there are water and soil health concerns around illegal dump sites. While the initial operation took place on an existing landfill, the illegal operations spread to private and public land not engineered for landfilling. The absence of liners and geosynthetics means that leachate

While the initial fires are visually distressing, the smouldering is when the toxic chemicals are released

is allowed to seep into the groundwater, and the Forum notes that one of these sites is on a wetland watercourse. The original landfill's mass is now spilling over the lined space due to increased dumping.

There are also persistent underground fires. As smouldering waste is covered with new waste, the fires continue underneath the freshly dumped waste. This begets a cycle of dumping, burning, dumping, and burning. Effectively stopping these fires requires an earthmoving plant and manually spraying the burning waste with a firehose until the smouldering waste is completely soaked. The Forum explains that one of these exercises took two and a half days, where the fire had spread to 600 square metres.

What does success and failure look like?

The Forum states that this crisis falls squarely on the government. All three tiers of government, local, provincial, and national, have failed the community, starting with the improper closure of the original landfill site.

The Forum has attempted to engage with government at all three levels, but none has offered strong solutions or outcomes that have changed things for the better.

For a period of eighteen months beginning in 2020, the Forum interacted frequently with Pikitup, the City of Johannesburg, the Gauteng Department of Agriculture and Rural Development, and the Johannesburg Metropolitan Police Department and SAPS. The Forum reports that all these organisations sent junior representatives with little or no authority to conduct site visits.

Their most significant engagement was with Pikitup, where the community forum engaged with them at an executive level, even managing to correspond with the CEO. Fifty emails in, nothing was done.

Finally, the Forum used the Chair of the Risk and Audit Committee of the Board for Pikitup to influence the Pikitup executive to recognise the problem. This led to a site visit in August 2021. Under the protection of JMPD and private security, the Chair of the Pikitup Board, the Chair of the Audit and Risk Committee, one other Non-Executive Director, the CEO, the COO, and several other executives of Pikitup met with the community to conduct a high-level joint site visit. Standing on top of the decommissioned but fully operational landfill, the executives claimed to be astonished by what they saw.

This visit led to a workshop hosted in January 2022, which saw more than forty civil servants representing Pikitup, the city, Green Scorpions, immigration, and the SAPS. After the workshop, a 32-page document titled "Integrated Kya Sands Environmental and Enforcement Strategy" was circulated, but this was as far as it went. No follow-through.

The last development was in 2025, when the City of Johannesburg awarded a tender of R150 million to rehabilitate the old Kya Sands Landfill. The Forum feels that this is a narrow scope that does not stop the continued and expanded illegal operations outside of the old landfill.

On a national level, despite formal correspondence, the community "has received no meaningful or substantive response or intervention from national environmental or health authorities."

This has left the community to tackle the problem alone, a task that they are not equipped for without the help of government, who should be attending to the matter in the first place. The community is now receiving pro-bono legal services, which has enabled a comprehensive legal challenge, launched in the High Court in late 2025. The community has also started a non-profit, The Kya Sands Burning Wasteland Community Forum NPC, with a volunteer board of directors who hold themselves accountable to stakeholders.

The community also funded private security to establish four checkpoints, which reduced the illegal operations by 80%. This is an expensive endeavour, and the community has since exhausted its funds for the service, which is now suspended.

In the Forum's words, success in court will be "a coordinated solution which brings national, provincial, and local resources to bear on the problem. We have set timelines for specific actions, but overall, we are demanding that within 120 days, the problem must have been assessed, stakeholders must have been consulted, and an action plan to stop all illegal activities must be devised and implemented. In addition, we are asking that the respondents be compelled to report progress to the Court periodically and that the Court retain supervisory jurisdiction over the matter." They also note that, "It also feels very short-sighted to be spending 150m rehabilitating a dump without providing new alternative dump sites. Urban planning and the existing landfills were for a city that no longer exists due to growth, and to make matters worse the City's other existing dumpsites are about to exceed their capacity as well."

For more information, please visit Kya Sands home page: https://www.kya-sand-burning.com/

The presence of medical waste at these illegal dumps illustrates that even the most regulated of waste management companies are using these dumps

MYTH VERSUS REALITY

What does zero waste really mean? **Kate Stubbs** – the strategy, marketing and business development director at EnviroServ – sheds some light around the realities, misconceptions and practical steps behind the zero waste journey.

"Zero waste is a strategy or philosophy with the goal of designing waste out of a system. In practice, it means managing material flows across the value chain. This starts with sourcing raw materials and continues through to manufacturing, operations and consumption. The aim is to avoid waste first. Materials should then be reused, recycled or recovered, with disposal as the last resort. This is very much in line with the global hierarchy of waste management. Zero waste is much broader than a recycling management philosophy and an operating model. It is a strategic, data-driven approach to materials management that starts with reduction, depends on segregation and traceability, and succeeds through the right combination of recovery, beneficiation and responsible disposal," explains Stubbs.

She goes on to explain what zero waste is not. "Zero waste is not producing absolutely no waste at all. It is not achieved at zero cost. It is not a recycling target. It is not a waste contractor key performance indicator. It is not a single technology or a single recycling stream."

The City of Cape Town's waste strategy notes that organic waste contributes more than 50% of total general waste disposed of in South Africa

The zero waste journey

Every zero waste journey begins with a baseline assessment. This determines what waste an entity generates, where it originates, in what volumes, how often it occurs, what it costs, and where it ultimately goes. This assists in prioritising the right interventions and measuring progress.

"Through a baseline assessment, EnviroServ can identify quick wins, and then match each waste stream to the most appropriate solution across reduction, reuse, recycling, recovery or compliant disposal," says Stubbs.

The best way to get visibility into the type and quantity of waste produced is to combine waste audits, source-level segregation, digital tracking and management reporting with internal objectives and communication campaigns.

It is important to track what leaves the gate, where it goes, who processes it, and what recovery outcome is achieved.

we translate data visibility into practical diversion options. Our most mature clients treat waste data much like financial data; they require regular reporting, traceability, verification and management review," explains Stubbs.

Internationally recognised programmes such as TRUE Zero Waste Certification and UL Solutions' UL 2799 Zero Waste to Landfill validation are based on documented waste measurement and high diversion performance rather than self-declared claims. TRUE is focused on minimising non-hazardous solid waste and improving resource-use efficiency, while UL 2799 validates landfill diversion claims and states that

Kate Stubbs, strategy, marketing and business development director, EnviroServ

90% diversion is required for a Zero Waste to Landfill designation excluding waste-to-energy.

"For South African companies, certification can be useful – but only if it sits on top of robust data, auditable processes and genuine operational change. The market is increasingly wary of green claims that are not supported by evidence," says Stubbs.

The most credible organisations embed a zero waste culture across the entity. They set site-by-site targets, understand their waste profile, separate materials at source, and build reliable off-take channels for multiple waste streams. By doing this, zero waste can become a strategic commitment and, for some facilities, a verified operational standard. Investing in ongoing training, education and awareness is a key element to embedding a sustainable culture and ensuring long-term change.

"What matters is that companies avoid making zero waste a slogan and instead treat it as a disciplined programme built on data, infrastructure, supplier alignment and accountability," states Stubbs.

For EnviroServ, the path to zero waste is not about chasing slogans, but about providing practical, compliant and scalable solutions

Green procurement

She adds that green procurement is one of the most powerful levers when adopting a zero waste philosophy. "Companies should buy with end-of-life in mind, prioritising reusable systems, recyclable materials, responsible packaging choices, supplier take-back schemes and partners that provide traceable downstream solutions"

In practical terms, procurement teams need to include waste criteria in tenders and contracts, not just price and service scope. Buying materials that cannot realistically be recovered in the South African market is effectively buying future disposal cost and environmental risk. South Africa's extended producer responsibility (EPR) framework is also reinforcing the principle that product design and post-consumer management need to be linked.

The theory sounds simple but in practice, green procurement is complex to manage and is still in its early stages in South Africa.

The complexity of the processes required to develop and ensure sustainable beneficiation of materials is almost always underestimated

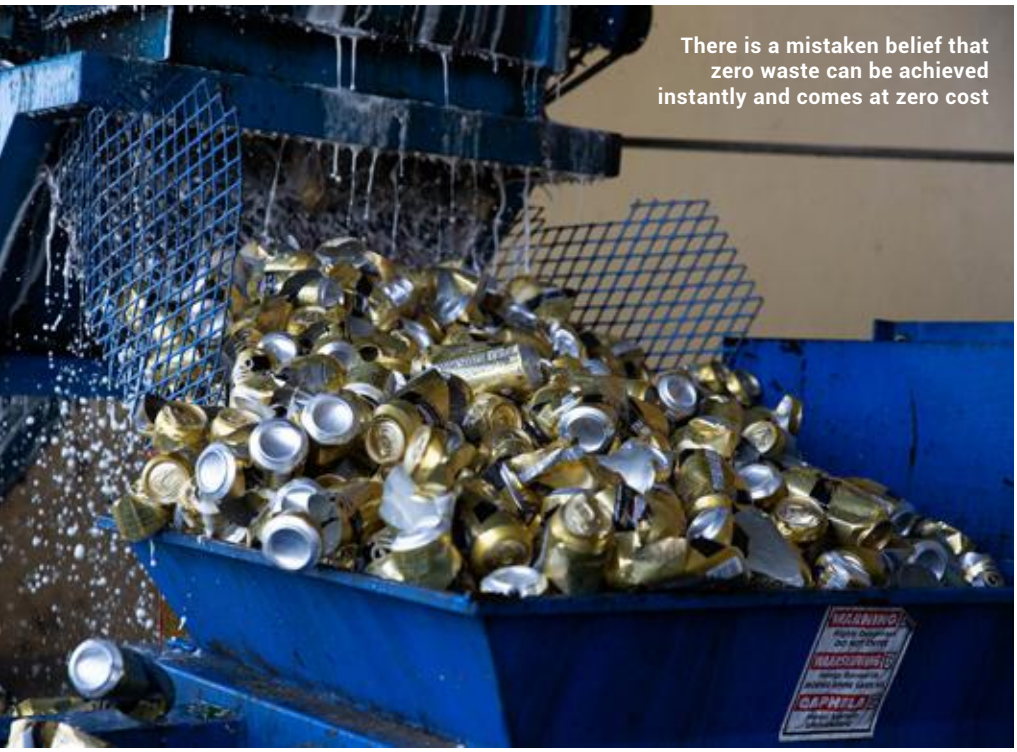
Misconceptions and mistakes

There is a mistaken belief that zero waste can be achieved instantly and comes at zero cost.

Zero waste is a long-term strategic commitment. For most companies, the realistic path is not 'perfect zero', but rather a progressive move towards very high diversion and far better material efficiency. The complexity of the processes required to develop and ensure sustainable beneficiation of materials is almost always underestimated. Often, there is a focus only on office recyclables while ignoring the more difficult streams such as organics, contaminated packaging, process waste, sludge, hazardous waste or mixed industrial waste.

"Another common mistake is believing that recycling rebates will cover waste management costs. In reality, rebates fluctuate with

EnviroServ has a broad service offering and a strong network of downstream off-takers



There is a mistaken belief that zero waste can be achieved instantly and comes at zero cost

market conditions and can help offset costs, but they rarely cover the full cost of effective and compliant waste management services," notes Stubbs.

Often, the most commercially viable method to handle various waste streams is disposal to a compliant, engineered landfill. Alternative recovery or beneficiation solutions can in many cases be more expensive to implement and sustain.

Barriers and difficulties

"A lack of awareness/education on waste, poor data, contamination, fragmented internal ownership, limited onsite segregation, lack of downstream markets for certain materials, and the belief that waste is only an operational issue rather than a strategic one can make the zero waste journey a difficult and unsuccessful one," says Stubbs.

She adds that companies can overcome these barriers by assigning executive ownership, setting measurable diversion targets, investing in segregation infrastructure, engaging employees, and working with service providers that can offer a portfolio of solutions rather than a single outlet. "The South African market is evolving quickly through EPR, circular economy policy and growing demand for diversion, but success still depends on execution at site level. The companies making the most progress are the ones that treat waste as a resource and risk-management issue, not just a cost line."

Waste opportunities

Organic waste, e-waste, and hard-to-recycle packaging fractions, mixed plastics, food waste, industrial by-products and certain construction materials are under-utilised waste streams.

Organics are especially important because they make up a very large portion of general waste to landfill. The City of Cape Town's waste strategy notes that organic waste contributes more than 50% of total general waste disposed of in South Africa. The 2025 National Strategy for Reducing Food Losses and Waste states that about 10.3 million tonnes of food material are lost or wasted annually.

"South Africa has formal norms and standards for organic waste composting and treatment, and policy is increasingly pushing the market toward diversion and beneficiation rather than disposal. That creates major potential for composting, anaerobic digestion/biogas, soil-conditioning products, animal feed pathways where appropriate, and broader circular bio-economy solutions. For many businesses, organics is one of the fastest ways to materially improve diversion rates and reduce methane-related impacts," explains Stubbs.

In the Western Cape, the target of a landfill ban on organics by 2027 has already been articulated in provincial and City of Cape Town strategy documents.

Bans to landfill create both opportunities for innovation but can also be disruptive for businesses that have not prepared accordingly. "For industry, the disruption comes when companies only respond once restrictions are enforced – because then they face rushed segregation changes, new storage requirements, transport redesign, contamination problems and limited treatment capacity. The smarter approach is to act ahead of regulation: measure organics, separate them properly, and build treatment and off-take partnerships now," says Stubbs.

Electronic waste also represents a growing opportunity due to the valuable metals and components embedded in devices. The Department of Forestry, Fisheries and the Environment reported in 2024 that nearly 68 000 tonnes of e-waste had already been diverted through EPR schemes.

In South Africa, zero waste is best understood not as an absolute end state, but as a disciplined shift towards greater material efficiency, regulatory compliance and responsible resource management. Achieving it requires data, infrastructure and a realistic understanding of costs and available technologies. For companies, the real progress lies in steadily reducing waste, recovering value where possible and ensuring that the remaining fraction is managed safely and responsibly.

For EnviroServ, the path to zero waste is therefore not about chasing slogans, but about providing practical, compliant and scalable solutions that help industry move steadily up the waste hierarchy while protecting the environment and supporting a more circular economy.

Zero waste does not mean producing absolutely no waste at all

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The real economics of ORGANIC WASTE

South Africa continues to rely heavily on landfill as its primary waste disposal method, a reality driven largely by cost, but one that carries significant environmental and social consequences.

"Landfilling is the dominant method of disposal globally, and in South Africa more so," explains Paul Jones, director at Lumec, an economic research consultancy, whose recent master's research compared aerobic windrow composting and anaerobic digestion as alternative technologies for managing organic municipal solid waste.

"One of the reasons is its relatively low cost compared to other alternatives," he says. "But the external costs of landfilling, the environmental and social impacts, are not internalised."

According to Jones, an international study suggested that "waste management costs would be between 50 and 100 per cent higher if those external costs were internalised in landfilling".

This matters particularly for organic waste.

"Landfilling organic waste specifically is quite a challenge because it creates methane," he explains. "Methane is a very potent greenhouse gas, which is exacerbating climate change. So, there is an urgent need for us to consider how we divert organics from landfill."

Comparing composting and anaerobic digestion

Jones' study focused on two relatively low-cost and widely adopted technologies: aerobic composting (specifically windrow composting) and anaerobic digestion, which produces biogas.

Paul Jones, director at Lumec

"The objective was to look at these two technologies and compare them to understand what variables essentially make each of these technologies tick," he says.

Using a cost–benefit analysis model, Jones set out to answer three key questions: why landfill remains dominant, what factors drive diversion from landfill, and which technology offers the highest net benefit to society in a South African context.

"The ultimate aim of a cost–benefit analysis is to say: what's the highest benefit to society as a whole of a project or a policy?" He explains. "And then further to that, what are the variables that influence the viability of these technologies?"

His methodology combined literature review, stakeholder interviews with government, academia and industry, and detailed surveys of operational composting and anaerobic digestion facilities.

"I got 28 responses in the end," Jones says. "About 20 were composting facilities, and about eight were from anaerobic digestion facilities and technology providers."

Participants were asked about capital costs (including machinery and equipment), operational expenses, feedstock volumes, staffing, and outputs, but the data received was inconsistent.

"Some people gave me very detailed answers, exactly how many tonnes of food waste and garden waste are going in," he recalls. "Others didn't even know how much feedstock was coming in."

Every facility is different

What quickly became clear was that no two facilities operate in the same way.

"Every single facility across the different technologies is completely unique," Jones says. "They have different processes, different locations, different business models and different structures."

As a result, he adopted what he calls a "generic business model approach," modelling small, medium, and large commercial facilities processing approximately 5, 20 and 100 tonnes of feedstock per day.

His analysis considered both private costs, what operators themselves pay, and total societal costs, including greenhouse gas reductions and social impacts such as the impact on property values near landfill sites.

When you include those external costs, every scale and technology is considered viable, he says.

The only exception was small-scale anaerobic digestion, which was not considered viable when assessed purely on private financial returns.

"However, these results are not definitive," he stresses. "You cannot say outright that a small-scale biogas facility of five tonnes a day will not be viable. The results provide an indication of the factors that generally affect viability."

Gate fees, scale, and feedstock consistency

One of the strongest influences across all models was gate fees; the charge paid to accept waste at a facility. "Gate fees affect all scales, across all technologies, quite a lot," Jones explains.

He also found that smaller facilities are far more sensitive to changes in capital costs, product prices, and operating conditions.

"Small-scale composting was relatively sensitive to a number of variables," he says. "If compost prices drop, it becomes negative. If they cannot rent out surplus equipment, it becomes negative."

Anaerobic digestion on a small commercial scale faces even greater challenges.

"A number of specialists confirmed that it's difficult to be viable on that small commercial scale," Jones says. "It's this middle range that struggles; domestic systems work, and large systems work, but the smaller commercial systems are tough."

Feedstock quality and consistency

"Electricity is low value," he notes. "A lot of biogas facilities in South Africa use biogas to offset expensive energy like diesel, rather than selling electricity to the grid."

Feedstock quality and consistency are perhaps the most decisive variables of all. "You can't compare rotten tomatoes with mouldy bread," Jones says. "You can have the same digester, same capital cost, same operational cost, but a huge variation in gas production depending on the waste stream feeding into the system."

He cites one example where bakery waste produced more than twenty times the biogas of cow manure. "This is why understanding your feedstock is one of the most critical things."

A lack of proper feedstock analysis has already caused major failures. "One of the biggest biogas plants in the country, a R400 million facility in Cape Town, initially failed because the actual food waste received was far lower than projected," Jones explains.

Land access and location

Composting faces its own structural challenges, particularly land availability.

"Composting requires a lot of land," Jones says. "In Cape Town, zoning is pushing composting into industrial areas, which forces facilities further from the city, increases transport costs, and makes businesses less viable."

In a related study conducted by Lumec for the eThekwini Municipality, Jones found that private operators were willing to process greater amounts of organic waste, provided they had access to land close to feedstock sources.

"They said: we'll bring the machinery, we'll cover operational costs, just give us access to land and feedstock."

A case for internalising landfill costs

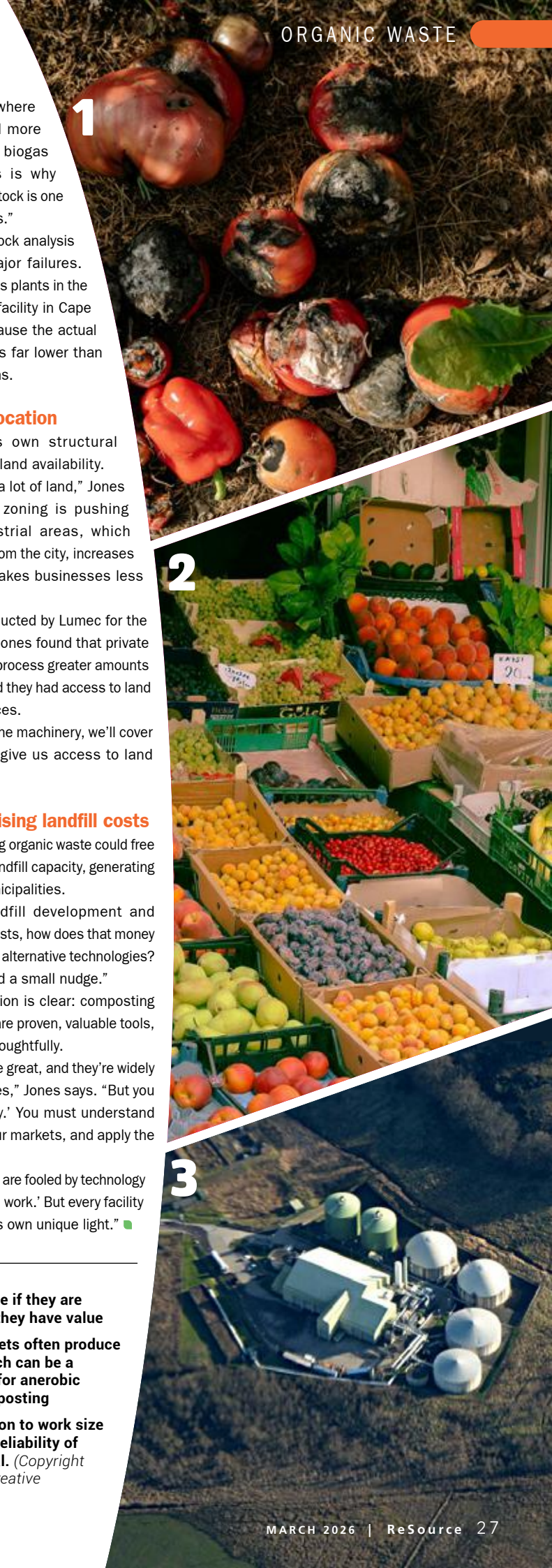
Jones argues that diverting organic waste could free up 30 to 60 per cent of landfill capacity, generating massive savings for municipalities.

"If we can avoid landfill development and associated operational costs, how does that money filter back into supporting alternative technologies? Well, they often just need a small nudge."

Ultimately, his conclusion is clear: composting and anaerobic digestion are proven, valuable tools, but only when applied thoughtfully.

"These technologies are great, and they're widely adopted in other countries," Jones says. "But you cannot do 'plug-and-play.' You must understand your feedstock, know your markets, and apply the right technology."

He adds: "A lot of people are fooled by technology providers saying, 'this will work.' But every facility must be considered in its own unique light."



1 **Organics have value if they are treated as though they have value**

2 **Fruit and veg markets often produce a lot of waste, which can be a reliable feedstock for anerobic digestion and composting**

3 **For anerbic digestion to work size of the facility and reliability of feedstocks are vital.** *(Copyright Thomas Nugent, Creative Commons)*

South Africa's recycling sector has long been framed around waste collection and diversion. But according to Steffen Schröder, managing director of Reclite SA, that mindset limits both sustainability and scale.

By Duncan Nortier

Why recyclers need to think like manufacturers

Reclite SA's decision to position itself first and foremost as a manufacturer, rather than a recycler, has reshaped how the company understands waste, value and the circular economy. "We have developed this way of working to be sustainable for ourselves and for the industry," Schröder explains. "If you are only a recycler, you focus on recycling. But a more complex supply chain, while difficult, is actually better for the larger sector."

At the heart of this approach is a fundamental shift in perspective: waste is not the end of a process, but the beginning of one. "Waste gets value from being a raw material," he says. "We work from the end product, what people want to buy, all the way back to the consumer."

This manufacturing mindset has allowed Reclite SA to influence market dynamics rather than simply respond to them. "We are a manufacturer. We are reacting to and changing the market dynamics," Schröder notes. "We haven't had price increases because of that position; we are sellers of products, not just processors of waste."

Waste as a resource, but not a given

Unlike traditional manufacturers, Reclite SA does not start with consistent, virgin raw materials. Instead, it deals with variability, contamination and uncertainty, which Schröder likens to mining.

"We see waste as a mining process," he explains. "The quality of the 'ore' means there are differing values. Waste doesn't have value; it has value potential. If it's not beneficial, then it's just a waste."

That distinction has major implications. The quality of the end product, Schröder says, is directly linked to the quality of the waste coming in. "We have the power to dictate prices based on cleaner separation," he explains, "and to refuse material based on contaminants."

Steffen Schröder, managing director of Reclite SA

Rather than buying raw materials and hoping the numbers work, Reclite SA works in reverse. "We look at the raw material after processing, then we look at the market, and then supply and demand, incoming waste and outgoing products," Schröder says. "We have stockpiles, not unlike the supply chains of manufacturers using virgin material."

The risk is high. "It's maybe one in ten solutions that succeeds," he admits. But those successes help stabilise the business. "Our products in the market help us keep our service costs down."

Research and development as a survival tool

That willingness to experiment ,and to fail ,is underpinned by a strong emphasis on research and development. In 2025, Reclite SA formalised this commitment by creating a dedicated R&D department.

"We bring problems to them," Schröder says. "We look at what's wrong, what's possible, and if it's possible, whether it's feasible."

Pictured: Steffen Schröder and Dr Dominic Vooght, research and development engineer at Reclite SA. Part of Reclite's strategy is relying on the expertise of their partners

Glass is a key industry for Reclite who have managed to turn a negative waste stream into a positive one

R&D at Reclite SA is not driven by assumptions or trends. “We only go forth on true information,” he explains. “We interrogate research. We look at what people think and feel, and then we look at the facts and figures.”

Failure is treated as part of the process. “We aren’t afraid of failing,” Schröder says. “If something is wrong, then stop and start from scratch.” Importantly, efficiency gains do not translate into job losses. “When we reduce costs, we usually end up employing more people,” he notes. “If you drive the circular economy purely socially, there’s a missing sustainability link. Growth is through jobs.”

For Schröder, the circular economy cannot be one-dimensional. “It has to be social, sustainable and economical aspect,” he says. “It’s not either-or.”

Reclite SA’s progress has also relied heavily on collaboration. “We can’t see or know everything,” Schröder says. “We’re all good at something. Collaborating brings more ideas, more data and better solutions.”

These partnerships range from universities and think tanks to other companies with dedicated research capacity. Producer Responsibility Organisations (PROs), Schröder adds, play a critical role. “PROs like Circular Energy are very collaborative,” he says, alongside growing SMMEs that bring agility and fresh thinking.

One practical example came from machine design. “Something as simple as seals in a machine came from collaborative research,” he notes, a reminder that innovation is often incremental rather than revolutionary.

Custom machinery built for purpose

Seeing recycling through a manufacturing lens has naturally led Reclite SA towards custom machinery. “Custom machines are a natural outcome of looking at recycling as a manufacturer,” Schröder explains.

The company’s development path moves from pilot to artisanal to industrial scale. “From the pilot stage to the artisanal stage, some money is made,” he says. “The machines and production line are cash-positive, and reinvesting becomes a natural process.”

As operations scale, the need for specialised equipment becomes unavoidable. “From local to international markets, the need for machines becomes self-evident,” Schröder says. “It’s a journey from R&D to engineering.”

The end result of this approach is a growing portfolio of products designed to stay in the loop. “Our products can be recycled again,” Schröder emphasises.

Notably, Reclite SA does not insist that waste must return to its original form. “Solar PV to solar PV is complex, expensive and logistically difficult,” he explains. “The waste product doesn’t have to become the same product.”

Fit-for-purpose machines have become vital for turning waste into a resource

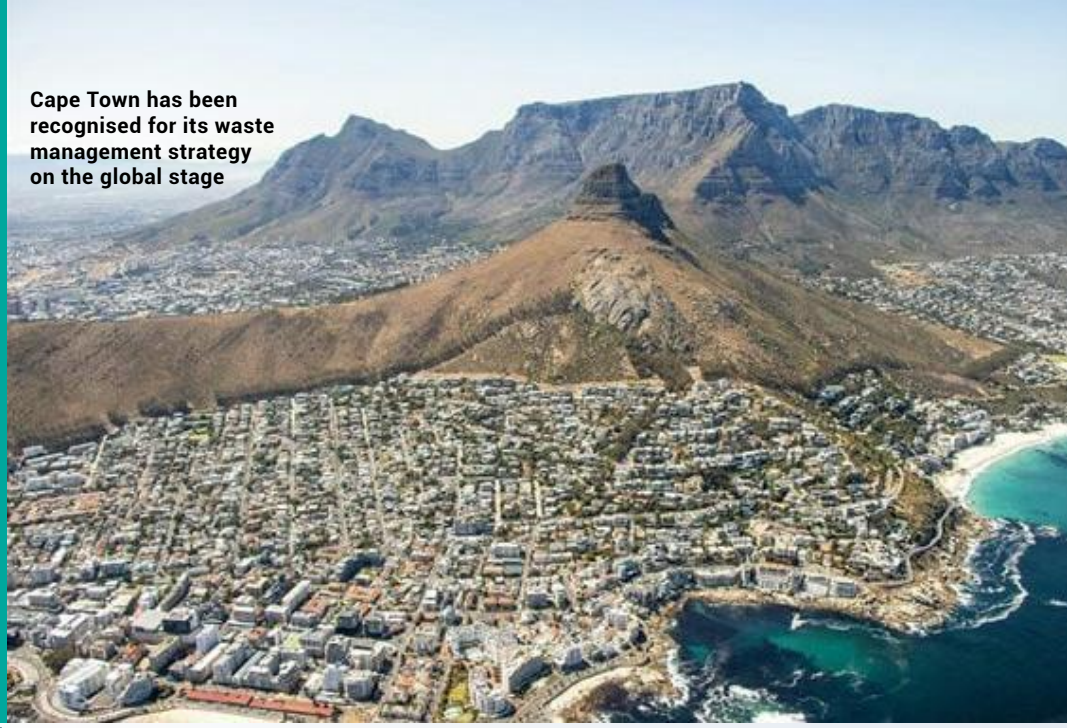
Instead, the company has developed alternative applications: glass for sandblasting and filtration. “Pure glass is important, clean glass that can be recycled again.”

After a decade of development, Reclite’s journey illustrates what can happen when recycling stops seeing itself as the end of a process and starts behaving like the beginning of one. “It took us six years to build the basics and then another ten years to get where we are,” Schröder says. “But if the circular economy is going to work, it has to work in reality, not just in theory.”

As a closing argument Schröder says: “We plan that in the next 10 years we will have the opportunity to industrialise these new circular solutions and create a true meaningful circular economy with an overall value add to the environment, industry and in turn society as a whole.”

Reclite SA treat ‘waste’ as if it were a raw material

The City of Cape Town has secured global recognition after being named one of the winners of the Bloomberg Mayor's Challenge 2025, an international competition that rewards cities developing bold solutions to complex urban issues.



Cape Town has been recognised for its waste management strategy on the global stage

Cape Town's waste strategy wins global award

Backed by Bloomberg Philanthropies, the award includes $1m (about R16m) in funding to scale innovative waste-management initiatives focused on informal settlements. "We are most appreciative of this prize money and support, and we will use the money to scale up our pilot project on waste management in informal settlement communities," said Mayor Geordin Hill-Lewis.

The funding will go to aid Cape Town's waste sector and improve existing strategies like separation at source

Cape Town's winning proposal centres on community-driven approaches to tackling persistent waste challenges in high-density areas where traditional municipal waste systems often struggle to operate effectively. The city's plan builds on pilot programmes that aim to redesign how waste is collected, sorted and managed in partnership with residents.

At the heart of the initiative is the idea that solutions should be co-created with communities rather than imposed from the top down. By involving residents in the design and implementation of waste strategies, the City hopes to develop systems that are more practical, sustainable and responsive to local realities.

The funding will support efforts such as improving waste separation at source, strengthening localised collection systems, and introducing models that better integrate municipal services with community participation.

In many informal settlements, limited space, access challenges and rapid population growth complicate conventional refuse collection. The City's approach, therefore, looks at flexible, neighbourhood-based systems that can adapt to these conditions.

Scaling city solutions

For the construction and infrastructure sector, the recognition highlights the growing importance of innovative urban service-delivery models, particularly in rapidly expanding cities. Informal settlements remain one of the most pressing infrastructure challenges across South Africa and many parts of the developing world.

Effective waste management is not only a sanitation issue but also a key factor in environmental protection, public health and long-term urban resilience.

The Bloomberg competition is known for supporting ideas that can be tested, refined and eventually replicated in other cities. Alongside the financial prize, winning cities typically gain access to technical support, innovation experts and global networks that help turn pilot projects into scalable solutions.

For Cape Town, the award signals international confidence in the City's efforts to address service-delivery gaps through collaboration and experimentation. If successful, the project could help establish a model for improving waste systems in dense, underserved urban areas – a challenge that municipalities across South Africa continue to grapple with.

As cities increasingly look for ways to manage infrastructure pressures while maintaining sustainability goals, initiatives like this demonstrate how targeted funding, community engagement and practical innovation can converge to drive meaningful change on the ground.

JOBURG'S LOOMING REFUSE COLLECTION DISASTER

The Democratic Alliance (DA) was reliably informed that waste management services for the City will come to a standstill as landfill sites were refusing entry to tipper trucks and waste trucks. The fleet is also likely to come to a standstill over outstanding payments to Afrirent. **Issued by Councillor Tyrell Meyers**

Helen Zille's mayoral run for Johannesburg has meant heightened scrutiny on service delivery by the opposition party, DA

DA Joburg Mayoral Candidate, Helen Zille, visited the Robinson landfill waste site in the South of Johannesburg and watched as rubbish trucks were turned away.

Issues of payment have again risen their nasty head, and it is almost certain that refuse collections will come to a complete halt again this week across the City.

Currently, garden refuse dumping sites are closed too. The DA claims that Johannesburg's streets will again turn into dumping sites because of the current alliance between the ANC, EFF and PA's negligence.

The DA calls on the City of Johannesburg to urgently convene a meeting on how it will address the current state of affairs regarding payments to entities to get serviced and delivered. The City also needs to ensure the Robinson landfill site, as well as garden sites, are open and running before the streets are covered in refuse.

The DA asserts that basic service delivery is a non-negotiable.

PROPOSED REFORMS TO MODERNISE ENVIRONMENTAL GOVERNANCE

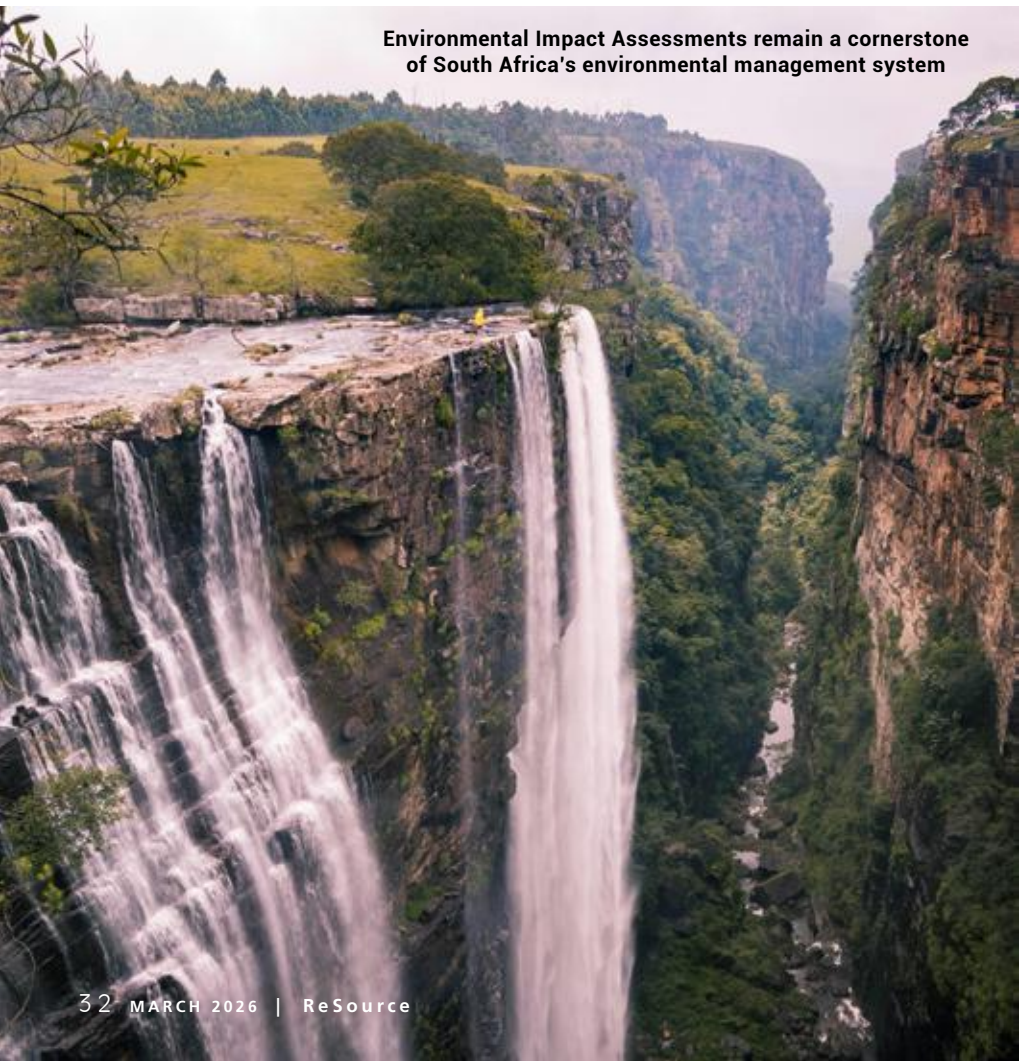
The government has launched a national stakeholder consultation process on the proposed reforms to South Africa's Environmental Impact Assessment (EIA) system.

According to the Department of Forestry, Fisheries and the Environment (DFFE), the consultation process will run from 11 March to 24 April 2026, and will include engagement sessions in each province.

The proposed reforms aim to strengthen the ongoing sector-led initiative to improve the efficacy of the EIA process, allowing flexibility to apply other instruments, modernise and strengthen the country's environmental governance framework, towards sustainable development.

Environmental Impact Assessments remain a cornerstone of South Africa's environmental management system. They give effect to Section 24 of the Constitution, which guarantees the right to an environment that is not harmful to health or well-being, while promoting sustainable development.

"However, the current EIA process has tended to operate independently of complementary environmental instruments, constraining their ability to demonstrate integrated sustainability outcomes. Listed activities automatically determine the type of assessment required, with limited flexibility to respond to the specific environmental risk or sensitivity of a proposed development. The environmental sector is now proposing a more flexible, risk-based screening approach," says the department.



Environmental Impact Assessments remain a cornerstone of South Africa's environmental management system

This system would evaluate the nature, scale and environmental context of a proposed development to determine the appropriate level of assessment required.

Projects with significant environmental risks, particularly those located in sensitive environments, would still undergo full Environmental Impact Assessments that include specialist studies and public participation processes.

Meanwhile, projects expected to have low or insignificant environmental impacts may follow a shorter assessment route or exit the process earlier where appropriate.

Environmental authorities would apply defined criteria and risk-based tools to ensure that decisions remain evidence-based, transparent and accountable.

The department said existing environmental authorisation requirements, public participation provisions and appeal rights would remain unchanged.

The proposed reforms encourage the broader adoption of environmental management instruments such as norms, standards and Environmental Management Frameworks, where these tools are better suited to managing specific environmental risks.

This supports a more integrated and strategic environmental management system and is aligned with strengthening sustainability outcomes while improving regulatory efficiency.

"By focusing regulatory scrutiny where it matters most, the environmental sector aims to build a smarter, more responsive EIA system that supports both environmental protection and responsible development," said the department.

The discussion document and details on how to submit comments are available on the Department of Forestry, Fisheries and the Environment website.

Stakeholders and members of the public have been encouraged to participate in the consultation process.

The department will launch the national stakeholder consultation working in collaboration with the Department of Petroleum and Mineral Resources, provincial Environmental Affairs departments and other relevant sector stakeholders.

PUTTING **REAL SUSTAINABILITY** ABOVE **GREENWASHING**

As sustainability becomes a central focus in the global beauty and wellness industry, so too has the rise of greenwashing, where brands overstate or misrepresent their environmental credentials. **By Dr Stephan Helary, founder of Terres d'Afrique**

If brands don't start practising what they preach, the increased consumer awareness and changing global standards will leave them behind

Dr Stephan Helary, founder of Terres d'Afrique

For South African companies operating in an increasingly global marketplace, the challenge is to move beyond marketing claims and approach sustainability with transparency and accountability. Honesty is the starting point.

Greenwashing is becoming more and more controlled in Europe because of strict regulations on what you can and cannot say or have on your packaging. South African laws need to catch up, but enforcement is also important.

For brands, this means ensuring that sustainability claims are accurate and aligned with the realities of their production processes.

Language around eco-friendly or sustainable practices must be used carefully. You can't call yourself an eco-friendly or sustainable brand when you use plastic packaging or non-biodegradable ingredients.

Even if your plastic packaging is recycled plastic, it remains plastic with the problems that go with it in terms of the environment and public health.

Rather than striving for perfection, brands should focus on reducing their environmental footprint and being transparent about their progress. This is why clean beauty brands must move beyond aesthetics and embrace true sustainability.

ESG and sustainability

No brand can be 100% recyclable, sustainable, or eco-friendly. You inevitably leave a footprint, but you can do the best you can as a business, based on your capabilities and financial means, to minimise that footprint.

No brand is 100% sustainable, implying so is greenwashing, and halts actual progress towards sustainable practices

Education also plays an important role. Brands have a responsibility to help consumers understand sustainability so they can make informed decisions.

As a brand, you also have the obligation to inform and educate your customers so they can make an informed choice. The future of sustainable beauty lies not in bold claims but in measurable action.

Businesses are bound to leave a footprint, but that footprint can be minimised and even compensated for through regenerative practices. The key is always to be transparent about what you are doing and what you are not.

'Eco-friendly' and similar labels actually have to mean something and not mask unsustainable practices

The construction industry must move fast to adopt new technologies to overcome chronic productivity, safety, and efficiency challenges, with the aim of reducing project delays, material waste, and cost overruns.

Cold in-place recycling train makes South African debut on N4 upgrade

W380 CR Cold Recycler

South Africa's infrastructure backlog necessitates adopting and adapting new technologies where applicable. If not, it risks stagnating in chronic productivity, safety, efficiency challenges, project delays and ballooning costs.

This is the view of Wimpie Janse van Rensburg, executive manager: engineering and technical at TRAC, the concessionaire responsible for one of Southern Africa's most important transport corridors, the 580 km N4 Toll Route running from the Solomon Mahlangu off-ramp in Tshwane, Gauteng, to the Port of Maputo in Mozambique.

Driven by this thinking, TRAC has partnered with Tau Pele Construction, the main contractor on the Schoemanskloof road upgrade, and consulting engineers KBK Engineers to deploy South Africa's first Wirtgen cold in-place recycling train.

The technology was first encountered by project stakeholders at the Bauma 2025 construction trade fair in Germany. Its potential value to South Africa's road infrastructure sector immediately stood out, prompting discussions with Wirtgen South Africa about introducing the technology locally.

Just a year later, the system is now operating on the Schoemanskloof section of the N4 in Mpumalanga, where Tau Pele Construction is undertaking a major upgrade of the 68 km stretch of highway.

According to Frans Bouwer, managing director of Tau Pele Construction, the project includes the addition of 50 km of new lanes, alongside the rehabilitation of the existing carriageway and the overlaying of the full route.

A recycling train in action

At the centre of the new approach is the Wirtgen cold in-place recycling train, consisting of six specialised machines working in a continuous process.

The system includes the W 380 CR cold recycler, a VÖGELE SUPER 1900-5X paver, two 12-tonne Hamm HD+ 120 tandem rollers, and two 24-tonne Hamm HP 280 pneumatic rollers.

Waylon Kukard, sales manager at Wirtgen South Africa, explains that the system operates as a mobile processing plant capable of milling, mixing and paving old asphalt in a single pass.

The W 380 CR cold recycler forms the core of the system. With working widths of up to 3.8 metres and a mixing capacity of up to 800 tonnes per hour, the machine granulates the existing asphalt layer and blends it with binding agents such as foamed bitumen.

"Once the material is processed, the cold recycler transfers the recycled mix directly to the VÖGELE SUPER 1900-5X paver via a height-adjustable discharge conveyor," says Kukard.

"The paver then lays the material back to the required thickness, slope and width. The tandem rollers compact the layer, and finally, the pneumatic rollers seal the surface to achieve the required density."

The process produces a homogeneous bitumen-stabilised material (BSM) layer that forms the structural base of the rehabilitated road.

What is cold recycling?

Cold recycling is a road rehabilitation technique that mills, crushes and mixes existing asphalt pavement with binding agents such as foamed bitumen or asphalt emulsion without using heat.

The method can reuse up to 100% of the material in the existing road structure, dramatically reducing the need for new aggregates and minimising waste.

Vogele S1900-5 X Paver

A key aspect of the technology is that the process occurs in situ, meaning the recycling takes place directly on the road itself rather than in an off-site plant.

This approach offers several advantages. By reusing the existing pavement materials on site, the need to haul old asphalt away and transport new aggregates to the site is largely eliminated. Construction times can also be reduced significantly, while traffic disruption is minimised because the work zone moves continuously along the road.

In many projects, cold recycling techniques can reduce construction time by as much as 50% compared with conventional reconstruction methods.

Keeping a critical corridor moving

For TRAC, the ability to minimise traffic disruption was one of the decisive factors in selecting the technology.

The N4 is a major regional trade route connecting South Africa's industrial heartland with the Port of Maputo. More than 2 000 heavy vehicles use the corridor daily to transport agricultural products, minerals and other goods.

"Given the strategic importance of the N4, maintaining traffic flow during construction is absolutely critical," says Van Rensburg.

Traditional road rehabilitation often requires stop-and-go traffic control systems that reduce road capacity for extended periods, leading to long queues and delays.

"By combining milling, mixing and paving in one pass, the cold in-place recycling system allows the rehabilitated layer to be compacted and reopened to traffic almost immediately. This greatly reduces congestion and disruption."

The recycled layer quickly gains stiffness after compaction, especially when foamed bitumen is used as the binding agent, making it stable enough to carry controlled traffic even before the final surfacing layer is applied.

Significant cost savings

Beyond the time advantages, the system also offers major cost benefits.

Joe Deetlefs, director at Tau Pele Construction, notes that the technology can significantly reduce material and transport costs.

Because the system reuses the existing road materials, the only new inputs required are binding agents such as bitumen, cement, lime and water. In some cases, small quantities of virgin aggregate may be added to improve the material gradation.

"Material costs in road rehabilitation projects are substantial, and the ability to reuse what is already in the road structure can lead to major savings," he explains.

According to Kukard, material cost reductions of up to 50% are possible depending on the project conditions.

The reduction in transport requirements also contributes to further savings, as fewer trucks are required to remove old material or deliver new aggregates.

A sustainability advantage

Cold in-place recycling also provides clear environmental benefits.

By reusing the entire existing asphalt layer, the method eliminates landfill waste and reduces the demand for virgin raw materials by up to 90%.

The reduction in material transport can also significantly lower the carbon footprint of road construction projects.

Industry studies indicate that cold recycling techniques can reduce greenhouse gas emissions by more than 60% compared with conventional road reconstruction methods. In some documented projects, reductions in hauling requirements have reached 75–85%, dramatically lowering fuel consumption and associated emissions.

These sustainability gains align closely with the increasing focus on circular construction practices and the responsible use of natural resources.

Construction can lead to a lot of unwanted waste, but with new technologies the sector becomes more sustainable

Foam bitumen stabilised material

Engineering performance and durability

From an engineering perspective, the recycled pavement structure differs from traditional road reconstruction methods.

Instead of relying entirely on new hot-mix asphalt layers, the cold recycling process produces a bitumen-stabilised material layer that functions as a flexible and durable base.

Jaco Markam, contract engineer at KBK Engineers, explains that the stabilised layer offers different mechanical properties from conventional asphalt.

"The recycled layer behaves as an engineered base material with strong flexural and fatigue characteristics. When properly designed and constructed, it provides excellent durability while maintaining flexibility in the pavement structure."

Research has shown that the addition of binding agents such as cement or foamed bitumen significantly improves density, compressive strength and resistance to moisture damage.

Field studies conducted internationally have demonstrated that cold recycled pavements can achieve multi-year service lives with stable rutting performance and manageable cracking behaviour, even under moderate to high traffic volumes.

For the Schoemanskloof project, where the road carries more than 2000 vehicles per day, the system is expected to deliver performance comparable to conventional pavement structures when combined with an appropriate surface treatment.

A glimpse of the future

Markam believes the use of reclaimed asphalt pavement will become increasingly important as natural construction materials become scarcer.

"All stakeholders in the construction value chain must work together to make better use of the materials already available in our infrastructure," he says.

"Reusing in-place materials reduces the need for virgin aggregates and eliminates the costs associated with transporting them to the site. The technology is already proven globally, and we are proud to be part of the team introducing the first cold in-place recycling train in Africa."

As South Africa continues to grapple with ageing road infrastructure and constrained public budgets, innovations such as cold recycling could play a vital role in delivering faster, more cost-effective and environmentally responsible road rehabilitation.

STOP BLAMING LANDFILLS. START FIXING THE SYSTEM.

For decades, landfills have carried the blame for the failures of waste management systems; odour, pollution, groundwater risks, methane emissions, and the visible reminder of "wastefulness." **By Nick Mannie, waste and circular economy executive**

But landfills do not create waste; they merely receive the consequences of upstream design, production, consumption, and policy decisions. Further to this, landfills are often misidentified as "dumps." Dumpsites are uncontrolled, unlined, and unmanaged sites and are responsible for the negative impacts commonly attributed to "landfills." An engineered landfill, by contrast, is a regulated environmental containment system. The real problem is upstream.

As the UNEP Global Waste Outlook states, "Waste is a product of design, not disposal." The landfill is not the villain; it is the scoreboard of how effectively (or poorly) material value is managed across society.

We built disposal systems before we built circular systems. For most of the 20th century, waste systems operated as linear supply chains: Produce → Consume → Discard

Recycling markets were underdeveloped, source separation was limited, and packaging innovation prioritised convenience and cost over reusability and recovery. In many developing countries, recovery was not municipal; it was performed by the informal sector.

For example:

- In South Africa, up to 80% of post-consumer packaging recovery is driven by informal reclaimers.
- In India, segregation programmes in Bangalore and Pune have struggled with inconsistent public compliance and infrastructure support.
- Dandora (Nairobi) and Kpone (Accra) continue to receive large volumes of recoverable material due to weak upstream sorting and market pull-through.

Municipalities were structured to remove waste from sight, not to manage it as a resource. As a result, landfills became the default system, not the fallback.

Not All Landfills Are Equal

There is a critical distinction between engineered landfills and uncontrolled dumpsites. As the composition of waste has become more complex, composite packaging, textile blends, electronics, multi-layer plastics, and engineered landfills are now expected to do more than contain waste.

Landfills as a recovery node

The waste arriving at engineered landfills today is no longer simple or uniform. Instead, landfill operators are increasingly required to:

- Extract recoverable materials
- Convert suitable streams into RDF / SRF fuel
- Recover metals and WEEE components
- Manage bio-stabilisation and gas-to-energy

Decide what is truly residual and requires containment.

In other words:

- The landfill has become the last opportunity to rescue value that upstream systems failed to preserve.

FIGURE 1: Waste value is determined upstream — long before material reaches the landfill.

- This directly reinforces why the goal is not to eliminate landfills, but to dramatically reduce what must reach them.

Sector-specific frameworks are emerging

industries are now beginning to intervene earlier in the material life cycle, especially in:

- Plastics: Global treaty negotiations, EPR, advanced recycling.
- E-waste: Recovery of critical minerals (copper, cobalt, rare earths), design-for-disassembly.
- Chemical waste: Closed-loop solvent systems and industrial symbiosis networks.

These streams are not simply "waste" – they are material systems with economic, environmental, and geopolitical implications.

The circular economy does not begin at the landfill or the recycling plant. It begins at the:

- Design lab (design engineer)
- Polymer reactor (scientist)
- Circuit board assembly line (electronic design engineer)
- Chemical formulation bench (chemical solutions engineer)

Conclusion

Landfills are not the enemy. While the role of landfill operators is shifting toward last-stage value recovery, many industries are now shifting their efforts into some waste streams requiring dedicated frameworks long before they appear in municipal systems. Companies are changing their focus to intervene early in the product life cycle so that they can be looped back into the value chain rather than being disposed off at the landfill. This means focus on innovation, research and development, re-use capabilities, design approach, market uptake and linking up with the global system.

They are the mirror reflecting:

- Our product design choices,
- Our consumption habits,
- Our policy priorities, and
- Our investment decisions.

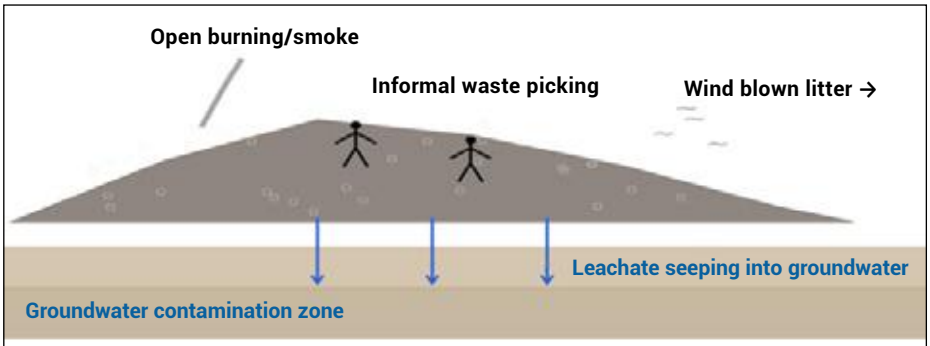


FIGURE 2: Uncontrolled dumpsite showing human exposure, environmental leakage, and unmanaged emissions.

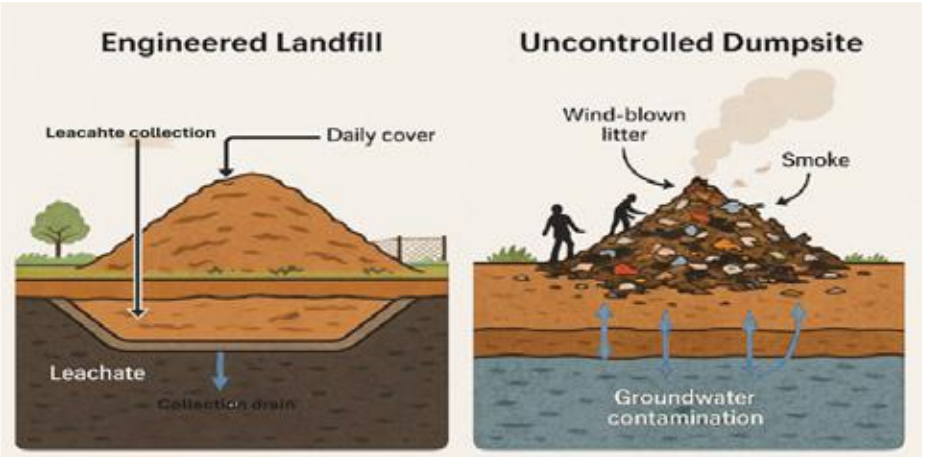


FIGURE 3: Comparison of an engineered sanitary landfill (regulated containment system) and an uncontrolled dumpsite (environmental hazard)

As per the World Bank (2018), global material consumption is expected to double in the next 40 years, driven by population growth, urbanisation, and rising living standards. At the same time, global waste generation is projected to increase by more than 70% by 2050. Collectively, we have to address the direction in which these trajectories are going and we have to look at redesigning systems to start going in the right direction.

As much as we make advancements in building the circular economy future, there is still going to be a need for containment facilities for:

- High-hazard waste,
- Stabilising some waste
- Residual deposition

We cannot continue to think that there will be zero waste to landfills, especially with the trajectories we see currently. What we need to do is stop wasteful landfilling. Landfills should only be taking in waste that has no path back to value creation!

The challenge is not to eliminate landfills, but to reduce what needs to go into them, and to ensure that what does requires safe, engineered containment. Landfills should be residual nodes, not endpoints for wasted value.

Mannie suggests that landfills can be nodes for recycling

As South Africa's private renewable energy market accelerates, Nordex Energy South Africa (NESA) is reinforcing its presence in the Western Cape with the supply of 33 Delta 4000 turbines to the 194 Megawatt (MW) Zen and Bergriver wind projects.

All servicing is done locally, supporting the South African economy

WESTERN CAPE GETS NEW ZEN AND BERGRIVER WIND PROJECTS

Located between Gouda and Saron, the projects, Zen (100 MW) and Bergriver (94 MW) , have entered construction and are scheduled for commissioning in mid-2027. Once operational, they are expected to generate approximately 580 Gigawatt hours (GWh) of renewable electricity annually and displace an estimated 600 000 tonnes of CO_2 each year.

For Robert Timmers, Managing Director of Nordex Energy South Africa, the projects represent more than additional installed capacity.

"We are delighted to strengthen Nordex's footprint in South Africa with the supply and maintenance of 33 Delta 4000 turbines for the Zen and Bergriver wind farms," says Timmers. "These projects are strategically important to our continued growth in the Western Cape, significantly expanding the Nordex installed base and reinforcing our commitment to the country's renewable energy transition."

With the addition of Zen and Bergriver, NESA's total installed capacity now reaches 1921 MW, including projects under construction, with 525 turbines installed locally to date.

Engineering for Western Cape wind

The projects will deploy Nordex Delta 4000 N163/5X turbines, a configuration selected after detailed site modelling.

"The Delta 4000 is the platform, the 163 is the rotor diameter, and 5X refers to the generator size, up to 5.9 MW maximum output," explains Timmers.

He notes that turbine selection is far from simply placing equipment in a windy location.

"What is also important in the modeling process is the consistency of the wind rather than just the strength," he says. "In very windy conditions you need reinforced components and often shorter blades are preferable to longer ones due to longevity and because you'll hit maximum generation earlier. Longer blades however become critical in lower, more consistent wind speeds."

At Zen and Bergriver, average wind speeds of approximately 7.5 metres per second, combined with site-specific modelling of shear, air density and Weibull factors, made the N163/5X configuration the most economically viable option.

"It had the best levelised cost of energy when we modelled it," says Timmers. "So we went with that on 118-metre steel towers."

Expected capacity factors are in the mid-30% range, "about 35%, which is bang on what we see as the average for similar sites in the Western Cape."

Robert Timmers, Managing Director of Nordex Energy South Africa

Grid stability and smart operations

Beyond generation, the turbines are designed to support grid resilience. "Our turbines are capable of providing reactive power even when active output power is zero," Timmers explains. "That means when there's low wind, the wind farm can still contribute to grid voltage stability."

In addition, on-load tap changers in transformers and a central wind farm controller operate using predefined grid set points to ensure compliance with voltage and reactive power requirements.

"These systems automatically adjust in real time to maintain stable operation in line with grid rules," he adds.

Long-term performance is supported by digital monitoring and predictive maintenance systems. Nordex operates all its installed plants locally, supported by global data analytics.

"We have 24/7 SCADA monitoring through our global remote control centres, which gives us real-time visibility of operating parameters, alarms and grid conditions," says Timmers. "We also use a condition monitoring system that tracks the health of major components and identifies early signs of wear."

With approximately 26 GW installed globally on the Delta 4000 platform alone, fleet-wide analytics inform ongoing maintenance strategies.

"That large dataset allows us to update maintenance approaches continuously over the life of the wind farm."

Designing for longevity and circularity

Life-extension and repowering are built into Nordex's long-term strategy.

"We take a structured, two-step approach," Timmers explains, "First, we inspect critical components like blades and gearboxes. Then we conduct analytical calculations based on actual historical site loading compared to what we originally designed and certified for."

If conditions have been less severe than anticipated, operational life can potentially be extended beyond the original certification period.

Beyond extending lifespan, Nordex is investing heavily in recyclability and lifecycle sustainability.

"Currently, around 85% to 97% of a turbine is recyclable," says Timmers. "The steel and concrete are well-established recycling streams. The real challenge is the composite materials in the blades."

The company has set a goal of delivering fully recyclable blades by 2032 and is involved in EU-funded research into innovative composite solutions. An industrial plant focused on recycling composite materials is expected to become operational in 2026.

"We really have to work on innovative solutions to close that gap from 97% to 100%," he says.

Lifecycle carbon performance is also under scrutiny. Nordex now offers a low-emission steel option for towers, which can reduce associated carbon emissions by approximately 75% compared to traditional steel, albeit at a higher cost.

"Additionally the concrete tower technology, which we've used in South Africa, actually has a lower carbon footprint than steel equivalents," Timmers notes.

Local value chains and skills

In a market sensitive to localisation, Nordex positions itself as both global and proudly South African.

"Nordex Energy South Africa is a South African company with 20% South African shareholding," says Timmers. "We have a local team of 170 people, and all local services ,logistics, installation, construction and site management ,are done locally."

Concrete towers have previously been produced locally, while steel towers are sourced locally where feasible and economically viable. Minor components and consumables are procured locally wherever possible in line with enterprise development and BBBEE commitments.

Beyond generation, the turbines are designed to support grid resilience

However, Timmers is candid about the economic balancing act.

"We are trying to solve for three objectives: decarbonising energy, delivering affordable and reliable electricity, and creating local jobs," he says. "If we focus solely on local value chains without scale and certainty, the price of energy will increase. So we maximise local content where it makes sense and where it delivers value for money."

Zen and Bergriver are owned by ACCIONA Energía (51%), with the remaining 49% held by a joint venture between H1 Capital and Chariot Limited. Electricity will be traded by Etana Energy under a 20-year power purchase agreement, supplying commercial and industrial customers including Growthpoint, the V&A Waterfront, Tharisa Minerals, Petra Diamonds and Autocast.

For Timmers, the significance lies in the financing model.

"It's a purely private offtake model, trader-led and completely privately funded," he says. "That successful financial close is a great step forward for the market."

He believes the growth of energy traders supports long-term price stability and investment certainty.

"When you have a willing buyer, willing seller market that shows a real price for energy, that can only mean greater stability going forward," he argues. "Long-term agreements provide certainty of supply and reliability, and allow corporates to achieve their decarbonisation goals directly."

Lessons from the Western Cape

Having constructed nearly 1.7 GW in South Africa, Nordex has refined its approach to local project delivery.

"In South Africa it's about understanding logistics, permitting and having alternative routes if something goes wrong," Timmers says. "We build contingencies into the plan because South Africa always throws some curveballs."

Community engagement is equally critical.

"Smooth passage through local towns and good engagement with communities can really help a project succeed. If it's the opposite, it can cause costly delays."

As South Africa's energy landscape continues to liberalise, projects like Zen and Bergriver illustrate how private renewable procurement, advanced turbine technology and lifecycle sustainability are converging.

For Nordex, the message is clear: "Evolving private demand for renewable power is transforming South Africa's energy landscape," Timmers concludes. "And decarbonised power solutions are becoming central across the economy."

Real time data monitoring means preventative maintenance, a crucial function in South Africa

Pollution in Zandspruit River

Dumping waste into rivers is environmental treason

Purposely dumping waste into rivers has caused horrific damage to the environment, and public health. Considering that South Africa is also water-scarce this environmental crime is tantamount to “environmental treason,” betraying the country in the name of failing service delivery and cost saving. **By Duncan Nortier**

For Dr Ferrial Adam executive director of WaterCAN, the phrase captures the scale of the problem. Rivers are not just natural features; they are essential resources for human health, economic stability, and ecological survival. When they are treated as dumping grounds, the consequences ripple far beyond the water itself.

“The pollution of South Africa’s rivers rarely comes from a lone source. Instead, it is the cumulative result of everyday neglect, industrial dumping, and failing infrastructure. If you can see waste in a river, there is always more that you cannot see,” explains Dr Adam.

Visible pollution includes household litter, garden waste, construction rubble, and illegally dumped refuse. But beneath the surface lie far more dangerous contaminants: chemicals from industrial processes, agricultural runoff, pharmaceutical waste, and poorly treated sewage.

Construction waste is one of the most common offenders. Companies frequently dump rubble to avoid disposal costs, even though they are aware of the environmental consequences. At the same time, ordinary littering contributes to the problem because stormwater systems carry street waste directly into waterways.

“The river actually begins in our streets,” Adam says. In some areas, the effects are stark. One river in Alexandra, she recalls, changed colour repeatedly from blue to yellow to red depending on what was being discharged upstream.

Dr Ferrial Adam executive director of WaterCAN

When water has no value

The scale of dumping reveals a troubling contradiction in how South African society treats water. Everyone understands that water is essential for survival, yet behaviour often suggests the opposite. Dr Adam explains that dumping, whether commercial or individual stems from larger systematic failing, namely the lack of good governance and no enforcement. In communities that face these issues, residents are often left asking a simple question: Where should we put our rubbish?

Dr Adam describes community outreach efforts where activists went door-to-door asking residents not to dump waste, particularly nappies, into nearby rivers. The response was immediate and practical: but without reliable waste services, people had few alternatives. Government responsibility is therefore central to the crisis. When services fail, informal solutions emerge, and rivers become the default disposal system.

At the same time, large industries deliberately cut corners. Waste disposal and treatment can be expensive, and in the absence of strong enforcement, illegal dumping becomes a cost-saving measure.

Water under siege

The environmental consequences of this are severe. Pollution disrupts entire ecosystems, choking rivers with waste, and reducing oxygen levels needed by aquatic life. A study cited by Adam found that 60% of South Africa's river ecosystems are already threatened by pollution.

Wetlands, often described as the "sponges" of natural water systems, play a critical role in filtering contaminants and regulating water flow. Yet many wetlands are being destroyed by development or filled with waste, removing one of the landscape's most effective natural purification systems.

Water source areas are another concern. These relatively small regions generate a huge portion of the country's freshwater supply, yet they remain poorly protected from pollution and development pressures. "The impacts affect all of us," Adam says. "Even people who never see the rivers." For millions of South Africans, polluted rivers are not just an environmental issue; they are a daily health risk.

Approximately 10% of the population relies directly on river water for basic needs such as washing, cooking, and drinking. When those rivers are contaminated, diseases spread quickly. Exposure to E. coli, sewage, and industrial pollutants can lead to skin infections, gastrointestinal illness, and outbreaks of diseases such as cholera.

Communities without reliable water and sanitation services experience disruptions to education and economic activity. Children miss school due to illness, and young women often stay home during menstruation when sanitation facilities are inadequate. Healthcare systems are also strained. Nearly half of South Africa's clinics lack reliable water access, complicating even basic medical treatment.

Meanwhile, small businesses, particularly those dependent on clean water, face additional challenges. From food preparation to small-scale manufacturing, water quality can determine whether a business is surviving.

Pollution in the Jukskei River

River pollution also places pressure on urban infrastructure. Solid waste entering stormwater systems can block drainage networks, increasing the risk of flooding during heavy rainfall. Blockages can also cause pipe bursts and sewage overflows, compounding the contamination problem. Dr Adam notes, "Once these systems begin to fail, the cycle becomes self-reinforcing: broken infrastructure leads to more pollution, which leads to further infrastructure damage."

The governance gap

South Africa has strong environmental laws on paper, but in practice, enforcement remains inconsistent.

According to Adam, the breakdown often begins with something less dramatic than corruption: maintenance neglect. "When infrastructure is not maintained, backlogs accumulate. Overworked municipal staff struggle to keep systems operational; budgets are diverted, and leadership gaps appear. Over time, the system becomes overwhelmed." Enforcement agencies exist, including environmental regulators and specialised "Green Scorpions" units, but they are often under-resourced.

WaterCAN has taken the approach to 'force' enforcement, laying criminal charges against municipalities for pollution caused by failing wastewater treatment plants. In Johannesburg, such action has been taken against facilities that have continued polluting rivers despite knowing the damage they are causing. In other cases, companies have been fined for releasing chemicals into waterways. Yet fines alone may not be enough. "If penalties are small. They simply become another operational cost," adds Dr Adam.

Letting the rivers breathe

Despite the scale of the crisis, Adam believes solutions exist, but they require broader participation. One of the most promising approaches is citizen science, where ordinary residents monitor local waterways, collect data, and report pollution incidents.

"This grassroots monitoring plays two important roles. First, it supplements government oversight by identifying problems early. Second, it rebuilds public trust by giving communities a direct role in protecting their environment. People trust people more than they trust institutions," Dr Adam says.

Community involvement also creates visible feedback loops. When residents monitor and clean rivers themselves, they can see improvements over time, reinforcing the value of collective action. Ultimately, restoring South Africa's rivers will require a combination of stronger governance, reliable municipal services, industrial accountability, and active citizen engagement.

Polluted water running through Kliprivier

Unlocking the value of GLASS RECYCLING

When we talk about recycling, most people immediately think of plastics, paper, or scrap metal. Glass often gets overlooked, despite being one of the most recyclable materials available. **By Francois Marais, sales, and marketing director at Pilot Crushtec**

This modular glass-processing setup, incorporating a belt feeder and impact crusher, is engineered for efficient high volume crushing in demanding glass recycling operations

Unlike many materials, glass can be recycled indefinitely without losing its purity or quality. Every bottle or jar discarded in a landfill represents not just waste but a missed opportunity to reduce energy use, conserve natural resources and create value.

The reality is that South Africa, like many countries, still sends far too much glass to landfill. This is even though glass has the potential to be transformed into countless new products, ranging from bottles and jars to building materials, decorative landscaping features and even road safety applications. The lack of awareness about what recycled glass can be used for is a major barrier. Businesses and communities alike need to understand that glass recycling is not only an environmental imperative but also an economic opportunity waiting to be unlocked.

Glass recycling is powerful because it addresses two pressing needs at once - reducing waste and creating new value streams.

By diverting glass from landfill, we immediately reduce the pressure on already stretched landfill sites which in turn lowers environmental risks. At the same time, when glass is recycled into cullet and reintroduced into production, manufacturers save energy and raw materials. Melting cullet requires less heat than melting virgin raw materials such as silica, soda ash, and limestone and that translates directly into energy savings and lower carbon emissions. In a world increasingly conscious of climate change and sustainability, this is a vital contribution.

The uses for recycled glass are both practical and surprisingly creative. The most familiar use

1 The Pilot Crushtec IC50 impact crusher offers variable speed control settings to optimise glass bottle crushing

2 Crushed glass bottles processed through the Pilot Crushtec VSI crusher, produces superior shaping and further size reduction for cleaner well-formed sand and minus 3 mm fine products

3 The Modular Belt Feeder is an easy-to-feed belt feeder for introducing fresh feed material into the glass recycling plant with a front-end loader

is, of course, the production of new glass bottles and containers. By feeding cullet directly back into the glassmaking process, manufacturers can cut costs while maintaining quality.

However, this is only the beginning. Recycled glass is also essential for producing fibreglass which has applications in insulation for homes and buildings as well as in composite materials used in the automotive and construction industries.

Growing Markets

Construction is one of the most promising growth markets for recycled glass. Crushed glass can be substituted for traditional aggregates in concrete and asphalt. When used this way, it not only reduces the demand for quarried stone but also adds strength and sometimes even a sparkling aesthetic to the finished product.

Road bases, concrete countertops, and bricks can all benefit from the inclusion of glass cullet. In fact, brick manufacturers have found that adding crushed glass to their clay mixtures creates unique finishes and eco-friendly credentials that align with modern sustainability requirements.

There is also a growing demand for recycled glass in landscaping and decorative applications. Once the sharp edges are removed tumbled glass can be used as a long-lasting colourful mulch in gardens or as ground cover in pathways and fire pits. It resists degradation, maintains its vibrancy, and mimics the look of natural stone, providing designers and landscapers with a durable and visually striking option.

Water features, ponds, and aquariums also make use of glass cullet, taking advantage of its reflective and translucent qualities. Artists have embraced recycled glass as well, incorporating it into mosaics, sculptures and mixed-media projects that capture the imagination.

Beyond its visual appeal, recycled glass is also making its mark in functional applications. For instance, crushed glass is increasingly being used as a filtration medium. In water treatment plants, swimming pools and aquariums, glass cullet is proving to be more efficient than traditional sand filters as it requires less water for backwashing and lasts longer. Industrial processes that require filtration also benefit from the durability and chemical stability of glass.

At the other end of the industrial spectrum, glass is being used as a safe environmentally friendly abrasive in sandblasting and polishing. Unlike silica-based abrasives crushed glass does not carry the same health risks, making it a preferred alternative in many applications.

The versatility of glass recycling extends even further. Road safety has benefited significantly through the incorporation of glass into reflective road markings. Glass beads made from cullet are embedded in paints and coatings to make lane markings more visible at night, enhancing safety for drivers.

In some parts of the world, crushed glass is even used in environmental remediation such as replenishing eroded beaches where the processed material mimics the natural appearance of sand.

Each of these examples demonstrates that glass recycling is not simply a matter of reducing waste - it is about unlocking the potential of a material that can drive value across multiple industries. This is where the financial opportunities become apparent.

The potential of glass recycling in South Africa

Demand for recycled glass continues to grow as industries seek sustainable and cost-effective alternatives to traditional raw materials. Companies that position themselves early in this space stand to benefit not only from cost savings but also from meeting the rising expectations of regulators, customers, and investors.

South Africa has an enormous opportunity to grow its glass recycling sector. The move toward greener construction methods, energy-efficient manufacturing and sustainable urban development is creating fertile ground for innovation.

Businesses that invest in glass recycling today are positioning themselves for a future where sustainability is no longer optional but mandatory. Entrepreneurs have a chance to establish themselves in collection, processing, and supply of recycled glass. The circular economy rewards those who can see beyond waste and recognise the long-term value of materials that would otherwise be discarded.

Of course, awareness remains a challenge. Many companies, municipalities and communities are not fully aware of the diverse uses of recycled glass or the financial benefits that can come from it. This is where thought leadership and education are critical. By sharing knowledge and highlighting success stories, we can shift the perception of glass from waste to resource.

At Pilot Crushtec, our focus has always been on providing solutions that help companies process materials efficiently and profitably. Our modular crushing and screening plants are well-suited to the task of turning waste glass into high quality cullet, ready to be reused across multiple industries. But while the technology is important, it is only part of the solution. What is needed is a broader commitment across society to embrace recycling as a business opportunity as well as an environmental responsibility.

Glass recycling represents the perfect meeting point between sustainability and profitability. It reduces waste, lowers energy consumption, and provides industries with valuable raw materials. It creates jobs and stimulates innovation. Most importantly, it helps build a circular economy where resources are continually reused rather than discarded. The glass is not just half full - it is overflowing with potential. The challenge is to recognise that potential and act on it.

Giving waste oil a second life

Waste oil is an environmental hazard; one litre of waste oil can pollute one million litres of fresh water. Coupled with scarcity, lubricating oil accounts for 2-3% of a barrel of crude oil; the need to recycle waste oil is urgent. **By Duncan Nortier**

EWOR (Environmental Waste Oil Recycling) collects and re-refines used lubricating oils, preventing millions of litres from being burnt or dumped and instead turning them back into high-quality base oils for industry.

"We are very passionate about what we do," says Irene von Knoblauch-Dreyer, Managing Director of EWOR. "For a long time, we were banging our heads against a wall, trying to have conversations about the environment and sustainability, and people would always bring it back to only economics. But for us, true recycling is about sustainability in every sense, the product, the environment, the business, jobs, and people."

Von Knoblauch-Dreyer explains that the roots of the business go back three generations. "My grandfather worked as a lubrication engineer in Germany during the war. They did not have access to crude oil refining, so out of necessity, they developed ways of re-refining used oil back into base oil. That technology came with him to South Africa."

Today, EWOR operates alongside its sister company, Flexilube. "EWOR is a waste oil collection company," she says. "Flexilube is a re-refinery and blending plant. For me, it is one business, circular by design, but we keep them as separate entities for identity and regulation."

The focus is on lubricating oils, the industrial fluids that keep engines and machinery running. "We process waste lubricating oil from gearboxes, hydraulics and engines," says von Knoblauch-Dreyer. "You cannot mix cooking oil with hydraulic oil or antifreeze with engine oil; those are classified separately. That distinction is critical, which is why the EPR legislation was so specific."

Lubricating oil is a scarce fraction of crude. "Only one to two per cent of a barrel of crude oil is lubricating oil," she explains. "It takes enormous amounts of energy to extract because it is the last fraction to come off. That makes it precious, so to just burn it at the end of life is madness."

South Africa's head start

South Africa has a long history of oil recycling. "Pre-1994 there was a government subsidy for re-refining raised through a tax on new lubricant sales. For every litre of waste oil you re-refined into base oil, you were paid. It was forward-thinking, driven by South Africa's need to reduce reliance on imported base oils at the time, but with huge environmental benefits, because waste oil was not being dumped or burnt."

Irene von Knoblauch-Dreyer, Managing Director of EWOR

Although that scheme ended, the Rose Foundation, established in 1994, has carried the torch. "As a lubricant producer, you pay a levy to the Rose Foundation for every litre sold into the South African market. That money is used to incentivise collection and support environmentally responsible and compliant practices. In effect, we were practicing extended producer responsibility before it was legislated."

Today, EWOR collects around nine million litres of used oil annually. "It's a competitive market," she notes. "Used oil has always had an inherent value because it can be burnt as fuel. But that is not recycling, that's recovery. True recycling means circularity. We can re-refine the same molecule up to seven times. When you burn it, it is gone, and you are releasing dangerous particulates and heavy metals into the atmosphere."

Use of waste oil as burner fuel results in an increase of up to 99% in emissions of criteria pollutants to the atmosphere compared to re-refinement of waste oil, resulting in a negative impact on the environment and human health.

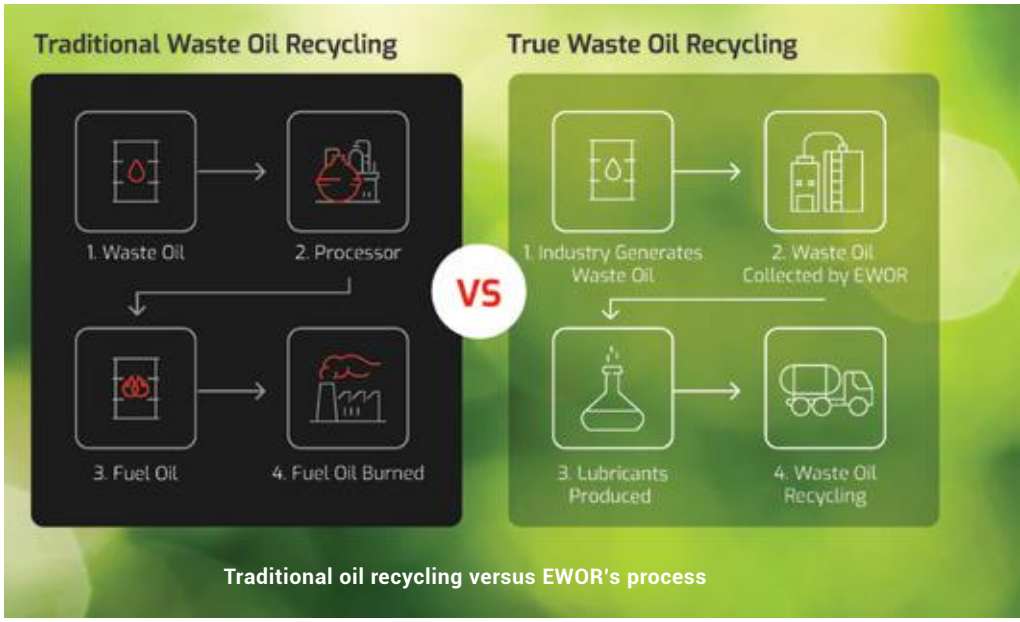
EWOR runs its own fleet of trucks and tankers. "We don't set minimum volumes," says von Knoblauch-Dreyer. "A small generator today could be a major partner in five years. For us, building partnerships is more important."

Safety is central. "Used oil is classified as hazardous waste, so our drivers receive Hazchem & spill response training. We carry specialised

environmental insurance. If a truck accident spills oil, you need expert companies to remediate the soil, test it, and monitor it for months. It is not something you take lightly."

How re-refining works

1. **Collection:** Used lubricating oil is gathered from workshops, mines and factories, stored safely in drums or tanks, and transported to the re-refinery.
2. **Dewatering:** Water and light contaminants are removed. Even a small percentage of water makes the process inefficient.
3. **Thermal & Chemical Cracking:** Heat and chemical treatment break down long hydrocarbon chains and separate impurities from the valuable oil molecules.
4. **Filtration:** Using diatomaceous earth, impurities are trapped and removed. This stage is vital to ensure oil purity.



Traditional oil recycling versus EWOR's process

5. **Distillation:** The refined oil is distilled to produce base oil, ready to blend into new lubricants.
6. **By-products:** Wastewater, tar residues and spent filtration material are carefully managed, with ongoing research into turning them into useful products instead of disposal.

Managing waste streams

Re-refining also produces by-products, which require careful handling. "You've got wastewater, tar residues, and spent filtration on earth," she says. "The problem is you do not always know what you are getting in waste oil. Instead of separating at source, people illegally mix antifreeze, glycols, greases, and all sorts of synthetic fluids. That makes the waste stream unpredictable."

Despite the challenges, EWOR pursues alternatives to disposal. "Our R&D team and external partners are constantly looking at ways to reuse these by-products, whether in bitumen, compost, or even packaging. We cannot talk about true recycling unless we also take responsibility for the waste we generate.

South Africa's energy and water crises have forced resilience. "We see it as an opportunity to improve our business," says von Knoblauch-Dreyer. "We invested in generators years ago, and now we are steadily moving to solar as we expand. On the water side, our aim is to reuse treated effluent in our own processes so that we do not draw from the municipal supply. It is all about becoming more self-sufficient."

Flexilube's re-refined base oils go into industrial applications, mining, manufacturing, hydraulics, and gears. "For mining companies, reducing carbon footprints is critical. Our products offer up to 90% lower environmental impact compared to virgin crude-based lubricants. That is a huge incentive, especially with carbon taxes coming into play."

The future of oil recycling

Von Knoblauch-Dreyer is optimistic. "We now have EPR legislation and a strong industry body in the Rose Foundation. The focus is shifting away from destroying waste oil by burning it and towards true recycling. That is exciting because we have technology, raw materials, and people. This could contribute significantly to South Africa's manufacturing sector.

She adds: "Not one litre of lubricant is refined from crude in South Africa anymore. We are a net importer of virgin base oil. So, if the country is serious about self-sufficiency and sustainability, re-refined base oils are the way."

Her vision is clear: "Our plan is to keep growing, keep investing, and keep educating the industry. There needs to be both carrots and sticks, incentives, and penalties, so that companies choose the environmentally sound option. Only then can this industry thrive.

The reliance on oil is immense, but it is a finite resource

EWOR and Flexilube's recycling facility

A truly 'African' market that can now accommodate and sustain its economic activity

REBUILDING THE HEART OF KINSHASA:

How Zando Central Market was reimagined for people, climate, and the city

In Kinshasa, the Zando Central Market was once a symbol of informal market vitality. Originally designed in the early 1970s to accommodate around 3,500 vendors, Zando Market grew to host nearly 20,000 traders, becoming overstretched without any sanitation, waste management, or infrastructure upgrades to accommodate its growth. **By Duncan Nortier**

This, coupled with expiring maintenance contracts, led to a government tender where a local businessperson contracted Paris-based studio THINK TANK architecture to reimagine what the market could be.

"When it was built just after independence, it was brand new and designed to host about 3 000 to 3 500 sellers," explains Marine de La Guerrande, an architect and founder of THINK TANK architecture who worked on the redesign. "But over the years, it has become out of hand. There were fewer than twenty toilets, no proper cold storage, and no space for garbage. It became really dangerous."

Despite the market's importance to the daily economic life of the city, a management contract with a private Lebanese operator failed to deliver sustained infrastructure investment. When the COVID-19 pandemic hit, the conditions reached a breaking point.

De La Guerrande elaborates, "The governor took two decisions: He did not renew the contract and launched a new tender, and he closed the market because it had become a health risk. One of the city's people who visited the site became seriously ill afterwards. It was really in dire straits."

By the time Paris-based THINK TANK architecture became involved, demolition of the old structure was already underway. The project that followed was not about replacing buildings, but about reimagining the market for modern-day Kinshasa.

"This is not revamping; we really started from scratch. We had to define the programme: what are the needs, how many people, how the market is used, whether it is wholesale or daily, what kind of services are needed," says de La Guerrande.

The winning tender was awarded to Société de Gestion des Marchés Africains (SOGEMA) a Congolese company led by a private client with no prior real-estate development experience.

The historic market grew too big, and though underinvestment became unsustainable

That, according to de La Guerrande, became an unexpected strength. “The client’s expertise was that they knew how to run a business and run it very well. Part of that is trusting those who can help in other areas. He really trusted us, and this opened genuine dialogue which allowed us to perform to our best abilities.”

A market, not a mall

The new Zando Central Market was conceived as a mixed-use public facility, but deliberately not a shopping mall. De La Guerrande explains, “It was very important for us that this market stays open to everyone, whatever your position in society. It is not a luxury area but the heart of the everyday economic life of the city.”

The design includes an open-air central market protected from the sun and rain by a large canopy, surrounded by three storeys of shops. In total, the market accommodates 650 shops of varying sizes, alongside informal trading spaces, logistics yards, cold storage, administration offices, fire and police facilities, and veterinary and hygiene services.

“One of the key principles was separating logistics from people,” she explains. “Delivery trucks access the site from a main boulevard into a closed logistics yard, while pedestrians experience a completely different, safer environment.”

Integrating public features like police and fire stations serves to centralise the market, make it functional and safe to the city and the people who use it.

Building with economics in mind

Africa is a very cost-sensitive market, but the trust between the client and the architect allowed for an open dialogue that led to local solutions.

“We were very aware that if you don’t take economic feasibility into account from the beginning, it remains just a great idea,” de La Guerrande says. “This project had to be built, not just imagined.”

Only two primary materials were used: concrete and terracotta brick, both locally available and well understood by local contractors. She adds, “These materials are heavy, durable, and easy to maintain. Using this locally sourced material benefitted the DRC’s economy as well as kept costs for the project down.”

The market was also conceptualised to work with the city and its available resources, meaning that the focus was on intelligent design and not adding technology, which could make the build cumbersome and expensive. The decision to exclude lifts is a clear example of this pragmatic thinking.

“It’s not just the cost of installing lifts; it’s the cost of maintaining them,” she explains. “In

Rendered design showing the air-flow roof tops

Waste management was designed into the market

a market with thousands of daily visitors, either you maintain them constantly at high cost, or they stop working. So, we designed ramps and slopes instead."

Sustainability

These 'low-tech' solutions were also chosen for their sensitivity to sustainability. Rather than relying on mechanical systems, the market uses passive design to respond to Kinshasa's equatorial climate.

De La Guerrande explains, "It is open-air but protected from rain and sun. Cross-ventilation is fundamental. We did not want air conditioning. Everything is low-tech and low maintenance."

The roof design plays a central role. Composed of multiple sections at different heights, it allows hot air to rise and escape naturally. "It's not just aesthetic," she adds, "It's the only way to prevent hot air getting trapped under such a large roof."

Each roof section also harvests rainwater, which is stored beneath the market. "This water can be used for fire protection, cleaning, and irrigation. If there is a fire, the market cannot rely on the city network to provide enough water."

Native trees and plants are integrated in the 5 patios throughout the site and in the peripheric streets, creating shaded meeting areas and quieter spaces away from the trading zones. "People were already gathering under trees before the demolition," she notes. "So, we kept that logic. It is important for people, but also for birds, insects, and biodiversity in such a dense city."

Waste management, previously non-existent, was treated as a core design challenge. De La Guerrande says, "Every shop is within about one and a half minutes of a waste room. "Garbage is collected level by level by the market administration and removed daily by the city."

By designing waste flows as carefully as people and goods, the project aims to prevent the uncontrolled accumulation that plagued the old market.

Aesthetics

De La Guerrande notes that architects can be very 'precious' about their designs, but this project incorporated human error and the practicalities of the country into the design. "We designed everything, brick patterns, panels, ventilation, knowing we would not be there to supervise the construction phase. If two panels are swapped, or brick colours vary, it does not matter." The bricks themselves come from three different local factories, resulting in natural colour variation. This led to a unique look and feel that embraced flexibility over strict adherence to conceptual design.

While the project is rooted in the Congolese context, it is the product of international collaboration.

"The Client is Congolese, engineers and architects are French, the main contractor is Chinese, financing came from African institutions, and labour and subcontractors are local," de La Guerrande says. "It shows what can be achieved when different cultures work together."

That sensitivity to context was recognised when the project received a sustainability award from the Holcim Foundation.

"One of the jury members, Tosin Oshinowo who is a Nigerian architect, told us: 'I don't care that you are French, this market is African,'" de La Guerrande recalls. "That was the greatest compliment." For THINK TANK architecture, it was important to engage the city as much as possible and not impose Western ideas. "Ultimately, this is an African market, so we listened to the people on the ground, we didn't want to make a Parisian market, so we were open to the ideas and needs of the city."

As Kinshasa continues to grow, the rebuilt Zando Central Market stands as an example of how infrastructure can serve people, climate and culture through collaboration and sustainable design.

The market is designed without fans and allows air to keep it cool

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