

# waste

## MANAGEMENT REVIEW

FEBRUARY/MARCH 2017



## Bins and Circuses

**James Reid on Flemington Racecourse's waste management strategy.**

### FEATURES

Deakin University uses waste plastic for 3D printing  
NSW's ambitious plan to recycle textile waste  
Inside the City of Nedland's new, inclusive diversion strategy  
Introducing Gayle Sloan, the new CEO of WMAA

### REPORTS

Smart IoT networks that could change waste management  
The MCC's innovative approach to keeping the 'G' clean  
Are we any closer to implementing a national plastic bag ban?  
How puppet-making helps share the recycling message

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## COVER STORY **12** BINS AND CIRCUSES

*Deeply entrenched in the fabric of Australian society, horseracing is as much of a logistical challenge as it is a cultural institution – especially when it comes to waste management. James Reid, Senior Manager Event Operations at Melbourne's Flemington Racecourse, explains how the venue is able to handle some 122 tonnes of waste on the day of the world-famous Emirates Melbourne Cup.*

"I DON'T SEE MYSELF AS AN ENVIRONMENTALIST. DIVERTING WASTE FROM LANDFILL IS A COST-SAVING TOOL FIRST AND FOREMOST. SUSTAINABILITY IS A BY-PRODUCT, IF YOU WILL."

James Reid, Flemington Racecourse

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## From the Acting Editor Flexibility is key

SOMETIMES LIFE JUST DOESN'T GO TO PLAN, especially in the often ridiculously fast-paced media industry. That's why I've long made peace with the fact that planning a magazine is but one step on a journey into the unknown, with the actual production process often leading to a very different outcome than anticipated.

Be it a new industry trend, a business deal or an interview opportunity too good to be missed, something will always challenge the initial game plan. Quite often the issue is timing, too: Many an impactful story will simply derive from the journalist being at the right place at the right time, and not involve any planning at all. That's why our forward-planning isn't always as accurate as we'd like it to be, for example – even though we generally try to over-deliver on content instead of over-promising anything.

"As for the future, your task is not to foresee it, but to enable it," legendary French pilot (and poet) Antoine de Saint-Exupéry once wrote, and I think it's applicable to both publishing and the business world. We can't plan everything, but we can create a business model that is capable of handling the volatility around us and turning it into an advantage.

To me, that last element – enabling action – is key. Over the Christmas break, I learned that the US Army acronym VUCA – short for volatility, uncertainty, complexity and ambiguity – is currently en vogue in management circles again. I've also been warned that it's effectively used as a catchall for *Hey, it's crazy out there* – and often as an excuse for failure or a lack of preparation.

I'm reasonably sure that's not the response the US Army was aiming for when coining the phrase, and I know for a fact that it's not a suitable reaction in magazine publishing or waste management, where not delivering is simply not an option. Maybe that's why VUCA didn't really stick with me – in 2017, I'd rather keep it with Saint-Exupéry and make sure every plan I make has a contingent for change.

Sebastian Grote  
Acting Editor  
Waste Management Review

**waste**  
MANAGEMENT REVIEW

### PUBLISHER

John Murphy

john.murphy@primecreative.com.au

### ACTING EDITOR

Sebastian Grote

sebastian.grote@primecreative.com.au

### DESIGNATED EDITOR

Toli Papadopoulos

toli.papadopoulos@primecreative.com.au

### ART DIRECTOR

Michelle Weston

michelle.weston@primecreative.com.au

### DESIGN

Blake Storey, Sarah Doyle, James Finlay

### BUSINESS DEVELOPMENT MANAGER

Trevor Herkess

trevor.herkess@primecreative.com.au

p: +61 411 411352

### CLIENT SUCCESS MANAGER

Justine Nardone

justine.nardone@primecreative.com.au

### COVER PHOTOGRAPHER

Blake Storey

### HEAD OFFICE

Prime Creative Pty Ltd

11-15 Buckhurst Street

South Melbourne VIC 3205 Australia

p: +61 3 9690 8766 f: +61 3 9682 0044

enquiries@primecreative.com.au

www.wastemanagementreview.com.au

### SUBSCRIPTIONS

+61 3 9690 8766

subscriptions@primecreative.com.au

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## Global investor acquires Waste Services Group

In partnership with the US-based Riverside Company, global direct investment business, Silverfern Group, has acquired Australian waste collection specialist, Waste Services Group.

Waste Services Group provides waste collection services to the Australian commercial and industrial sectors, utilising front-lift waste removal trucks to collect customer waste streams. The business also provides national broker and account management services for commercial and industrial customers with multi-site and complex waste collection

requirements.

"We are excited to partner with management and Riverside in the acquisition of a leading Australian waste management company with significant local and national growth opportunities," said Silverfern Managing Director, Mark Baldassarre. "Waste Services Group is a specialised provider of waste management services with a flexible and scalable asset light strategy that enables it to focus on superior account servicing, a key differentiator for Australian waste management customers."

Silverfern Co-Managing Partner,

Clive Holmes, added. "Our investment in Waste Services Group further demonstrates that by partnering with lead investors and management with deep industry insight and local knowledge, Silverfern can effectively become a local investor, globally. We look forward to contributing to continuing and accelerating Waste Services Group's growth in the fragmented Australian waste management industry."

The acquisition of Waste Services Group, is Silverfern's fifth platform investment and eighth global investment in the past year.





## Mandate to boost Queensland biofuels market

The Queensland Government has introduced a new biofuels mandate that will see biodiesel make up half a per cent of the diesel available for sale.

According to Minister for Energy, Biofuel and Water Supply, Mark Bailey, the biofuels mandate requires liable fuel sellers to sell a minimum amount of bio-based petrol (three per cent), such as E10, and bio-based diesel (0.5 per cent), to boost the Queensland fuel industry and the jobs that come with it, giving consumers cleaner fuel choices at the pump, but allowing the driver to choose fuel made in Queensland, Australia.

"Following extensive industry consultation, the ethanol component of the mandate will only apply to fuel retailers who sell more than 500,000 litres of petrol at a site each calendar quarter or who own 10 or more sites," Minister Bailey said.

"By doing this we are protecting the continued development of our biofuels industry while simultaneously protecting our small businesses – and the jobs that come with them.

"The threshold means that 93 per cent of all regular unleaded petrol sales in Queensland will continue to be captured by the mandate, but that

smaller businesses, who don't sell much petrol will not need to comply."

In addition, the Minister said the biofuels mandate will play a key role in Queensland's move to a clean energy economy, protect smaller fuel businesses and drive jobs growth in regional part of the State, which is also home to a new biofuels laboratory, which opened last December.

"Our ethanol mandate is set at a level that seeks to ensure fuel retailers continue to offer a broad range of fuel grades," he added. "This gives motorists more access to cleaner sources of fuel, while maintaining choice at the bowser."

## Suez partners with software company

Waste transport company Suez has partnered with cloud-based waste software specialist, Rubicon Global, to improve recycling and recovery initiatives across the US and European markets.

According to Suez, the partnership will help deliver new technology and data, accelerating the development and deployment of Rubicon's proprietary cloud based hauler management platform, customer

portal and mobile apps.

Suez will use Rubicon's technology in its fleet of waste vehicles across its US and European operations.

"This is a new day for the global waste and recycling industry and an extraordinary opportunity to change the world," said Nate Morris, Founder, Chairman and CEO of Rubicon Global. "Waste is an issue that affects every single person living on the planet. Through technology

and innovation, we can make it less expensive and more responsible, and this partnership with Suez will help us do just that."

In addition, the partnership will focus on improving service for municipalities through smart city innovation, helping city governments improve residential waste and recycling services through data collection and analysis, as well as fleet optimisation and efficiency.



# Research shows recycled tyre oil sustainable

Exhaust emissions from oil from recycled tyres have been found to have 30 per cent less nitrogen oxide, which contributes to photochemical smog and lower particle mass than oil from fossil sources, but almost the same performance.

The research, conducted by the Queensland University of Technology (QUT), involved mechanical engineers testing the oil that – when blended with diesel in small percentages – gives a fuel that reduces emissions

and with no loss of engine performance. The percentage of fossil fuel was varied during the tests and will continue to be in subsequent testing.

The tyre oil comes from new tyre recycling technology and is a world breakthrough that was developed by Australian company, Green Distillation Technologies (GDT).

GDT collaborated with QUT mechanical engineer Professor Richard Brown and Bangladeshi-born

PhD student, Farhad Hossain, to test the oil for emissions and performance at the QUT Biofuel Engine Research Facility.

"There are 1.5 billion tonnes of tyres discarded globally each year and Australia, alone, generates around 55 million disused tyres a year by 2020, while the USA more than 200 million," Hossain said. "Getting rid of old tyres – in an environmentally friendly way – is a universal nightmare for authorities." (continues on next page)

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# News



Green Distillation Technologies' Chief Operating Officer, Trevor Bayley, said that up to this stage they had believed the oil from recycled tyres could be used without refinement as a heating fuel or further refined into automotive or aviation jet fuel, but the QUT research could change this assumption.

"We are delighted at the findings of the QUT research as it will help

us promote the sustainable use for end-of-life tyres, as it has already been found by refinery Southern Oil that our oil from recycled tyres has been overlooked as a potential biofuel source, yet they say it is the most reliable and easiest to refine of all.

"A recycled 10kg car tyre will yield four kilograms of carbon, 1.5kg of steel and four litres of oil, while the 70kg truck tyre provides 28kg of carbon,

11kg of steel and 28 litres of oil.

"We have been studying the logistics of how to handle those extra-large 'off the road' (OTR) tyres that are used by heavy duty mining dump trucks, large agricultural tractors and road-making equipment."

GDT was Australia's first ever nominee in the US International Edison Awards last year, the world's top award for innovation where they

# \$5m grants to boost recycling in NSW

New South Wales' waste industry has been buoyed by the latest \$4.7 million grant, as part of the NSW Environment Protection Authority's (EPA) *Waste Less, Recycle More* program.

According to EPA NSW, the grants are aimed at recycling facilities and will be delivered through its partnership with the NSW Environmental Trust.

"In this fourth round of funding we are particularly looking for projects that will increase recycling of construction and demolition waste, including bricks, concrete, soils and natural aggregates," said Steve Beaman,

EPA Executive Director of Waste and Resource Recovery.

"This is an increasing waste stream in our communities so developing processes that will ensure the recovery of clean reusable materials from this product is important.

"Supporting initiatives that improve and expand recycling capabilities is fundamental to achieving the NSW Government's target to divert 75 per cent of all waste from landfill by 2021.

"This Resource Recovery Facility Expansion and Enhancement grants program has already delivered more than \$13 million in grants since 2014

to divert an expected 174,000 tonnes of waste per year."

NSW Environmental Trust Director Grants, Peter Dixon, added. "We are pleased to offer this new round of funding to support waste organisations to divert waste from NSW landfills.

*Waste Less, Recycle More* is a nine year \$802 million waste grants initiative designed to transform waste management and recycling in NSW. More information about *Waste Less, Recycle More* and how to apply for a Resource Recovery Facility Expansion and Enhancement grant is available via [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au).



## Sustainability Victoria CEO to lead for another term

Sustainability Victoria Chief Executive Officer, Stan Krpan, has been re-appointed to lead the organisation for another three years.

Krpan has guided Sustainability Victoria for the past five years, providing leadership on the SV2015 strategy, which included key reforms in integrated waste management and improved resource efficiency.

A notable achievement under Krpan's leadership was the release of the Statewide Waste and Resource Recovery Infrastructure Plan in 2015, which was developed with industry and stakeholders.

An Australian-first, the Plan outlines goals in planning for greater waste and resource recovery infrastructure over 30 years. It has become

a template for other jurisdictions across Australia.

According to Sustainability Victoria, Krpan will continue to work with its Board and staff to raise the profile of climate change in our communities, while stimulating demand for sustainable products and services across the community.



# Wastech puts Tieman businesses up for sale

Waste equipment specialist, Wastech, has confirmed that the Tieman Tail Lifts and Whiting Door businesses are currently for sale, just over a year after it acquired the two.

Hallam-based Wastech Field Service – the rebranded Tieman National Service business that was also acquired by Wastech in August 2015 – made the announcement in the *Australian Financial Review* in December.

According to Wastech, the sale of

the business includes all inventory, sales and distribution agreements, client base, and the Tieman brand.

Wastech CEO, Brett Jones, told *Waste Management Review* the sale of the Tail Lifts and Whiting Doors businesses was in line with Wastech strengthening its focus on the waste industry, and removing 'non-core' concerns.

"We purchased the Tail Lifts and Whiting Doors businesses when we bought the company's National

Service business in 2015. The key was to stabilise the businesses and introduce design improvements to the Tieman product," Jones said. "What we're selling is a great business. It's an opportunity for an investor to acquire quality products and a great brand, and continue focus on building the business."

Wastech Field Service will reportedly remain unaffected by the sale.

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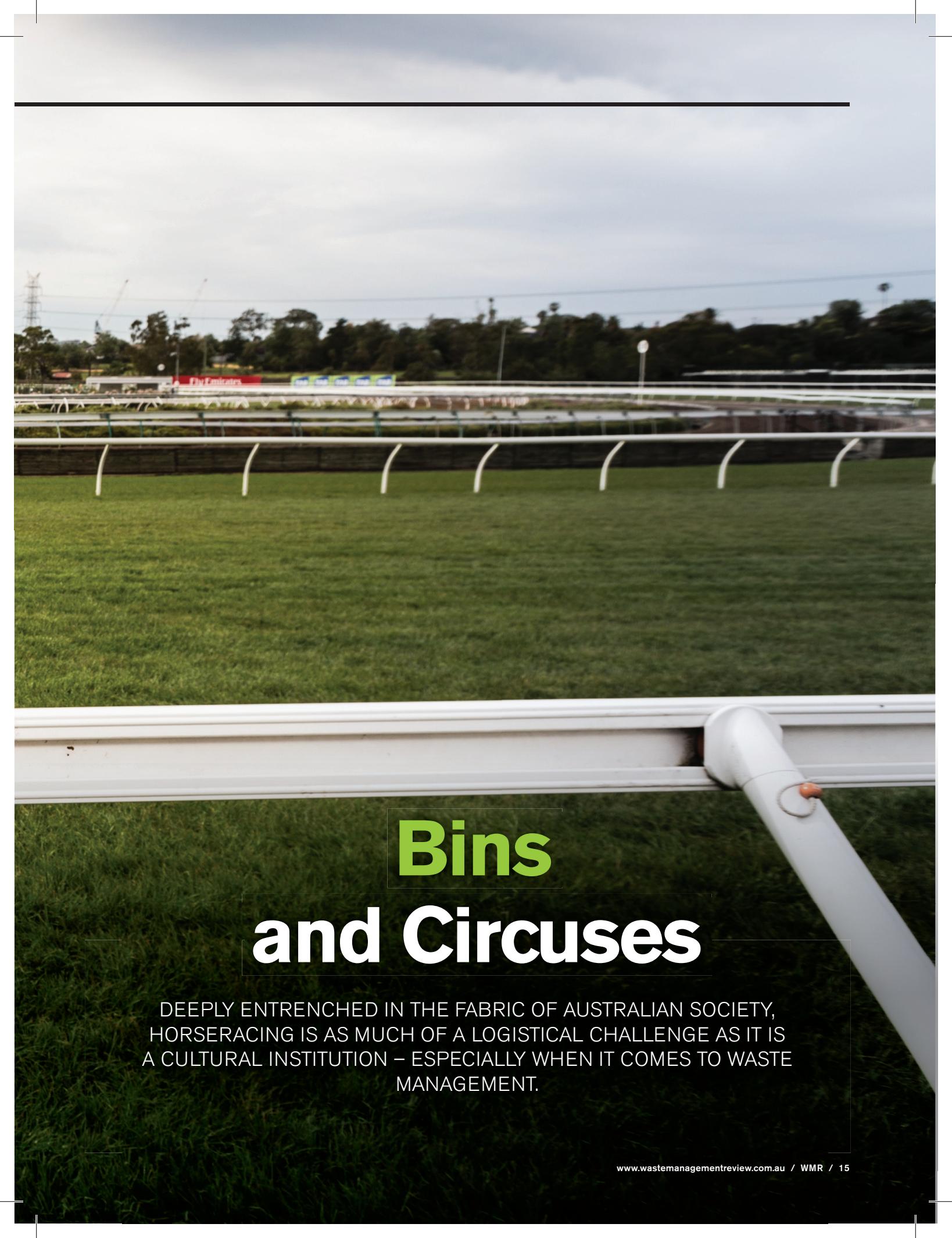


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As Senior Manager Event Operations at Melbourne's Flemington Racecourse, James Reid is also responsible for managing the waste created during the annual Spring Racing Carnival.



# Bins and Circuses

DEEPLY ENTRENCHED IN THE FABRIC OF AUSTRALIAN SOCIETY, HORSERACING IS AS MUCH OF A LOGISTICAL CHALLENGE AS IT IS A CULTURAL INSTITUTION – ESPECIALLY WHEN IT COMES TO WASTE MANAGEMENT.



**A** century and a half before the first waste paper collection from Melbourne households inspired the idea of systematic waste recycling, thoroughbred horseracing began shaping the very fabric of Australian society. A relic of English colonialism, the first races were held in Sydney as early as 1790, not long after the colony was settled.

Today, horseracing is the third most patronised sport in Australia after AFL and rugby league, and the only event able to ‘stop’ the nation for a single 3200m race – the Emirates Melbourne Cup held at Flemington Racecourse.

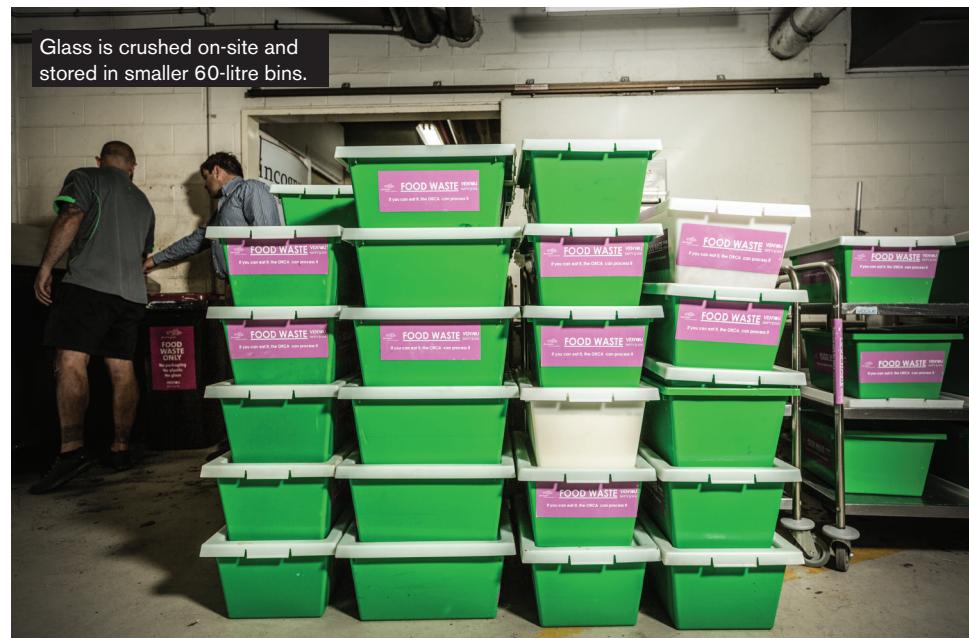
Throughout the Melbourne Cup Carnival – consisting of the world-famous Emirates Melbourne Cup as well as AAMI Victoria Derby Day, Crown Oaks Day and Emirates Stakes Day – some 318,900 local and international visitors flocked to Flemington in 2016, making it the world’s most vibrant horseracing venue and placing complex challenges on the local waste management team.

Led by James Reid, Senior Manager Event Operations, the team had to handle some 122 tonnes of waste on

Cup Day alone. Over the four-day Melbourne Cup Carnival, an additional 350 tonnes had to be managed – and that’s just the venue’s core offering. With Flemington Racecourse’s evolution into an all-year event location over the past decade or so, handling all types of waste has become a full-time job for Reid, who has partnered with Melbourne consultancy, Incognitus,

to ensure the world-famous venue is managed to an equally world-class standard.

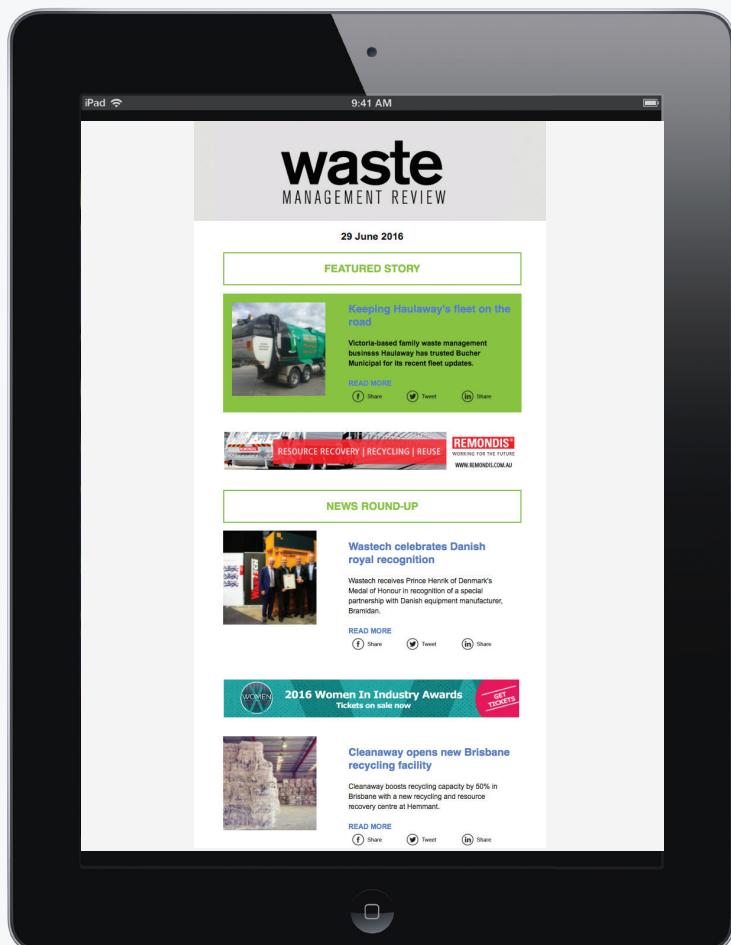
Reid’s self-imposed key performance indicator is to reduce diversion from landfill to the smallest possible amount, he explains, “a seemingly simple measure that’s incredibly complex to control.” During the 2016 Melbourne Cup Carnival, Flemington Racecourse



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achieved a staggering 98.05 per cent diversion rate – a long way from the 25.9 per cent in 2008, when Reid and his team first embarked on the sustainability journey.

“I don’t see myself as an environmentalist,” he says, with the stoic calm of someone who has had to endure many a frantic race day at Flemington. “Diverting waste from landfill is a cost-saving tool first and foremost. Sustainability is a by-product, if you will.”

Driven by a ‘natural urge’ to keep improving, Reid says his competitiveness has helped achieve results quickly – the first year saw the largest improvement to date – but that doesn’t mean Flemington’s sustainability program will come to an end any time soon. “When you start on a journey like this, success may come quickly, but you also plateau out relatively soon. That’s where it’s getting interesting for someone like me, who is naturally wired to continuously improve,” he explains – adding that the idea of promoting sustainability as a way of life has since become more important for him personally and the Flemington operation at large.

“It’s fair to say my mindset has changed from viewing recycling as a cost-saving measure alone to now regarding it as a holistic societal challenge that iconic venues like Flemington Racecourse have to contribute to,” says Reid, who became a father in January. “It still doesn’t mean I’m a green activist; but as a team, we’ve certainly realised just how important it is for us to have a strong position on sustainability and take our responsibility not just in the racing community, but in society, seriously. At the end of the day, a world-leading venue has to lead the way on every level – including waste management.”

Waste Stream	Tonnage	%
Comingle	308.59	73.87
Glass	50.76	12.15
Organic	50.05	11.98
Diversion from landfill	409.4t	98
General	8.34	2
<b>Total</b>	<b>417.74t</b>	<b>100</b>



In line with his reflective, yet liberal, stance on the issue, Reid's approach to waste management is straightforward and as "non-lecturing" as possible, as he puts it.

Instead of leaving the waste sorting to patrons, for example, he has created a back-of-house sorting system to avoid contamination. After pre-sorting the material into comingle, glass and organic waste, it is handed

over to an on-site service partner for further processing.

All glass is crushed on-site using 27 crushers to achieve maximum payload per 60-litre transport bin. "One 60-litre bin of crushed glass equals eight 240-litre bins of untreated bottles, so there's a notable efficiency advantage in doing it all on-site," he says. "Again, it's driven by cost savings. Transportation costs are substantial, so we want to

make the most out of every run we pay for, of course."

For the treatment of organic waste – next to food waste, Reid also has to process the green waste that comes with managing a 380-acre site – Flemington has had access to an on-site digester for the past few months now, a welcome aid for an operation that is becoming increasingly self-sufficient, as Reid explains.



Communication is key to achieving lasting success in the waste management space, Flemington Racecourse found.



### *Did you know...*

#### **Incognitus**

Melbourne consultancy, Incognitus, supplies cleaning and waste management services for Flemington Racecourse year round, including the Melbourne Cup Carnival. The Principal of Incognitus, Craig Lovett, has been involved in the cleaning and waste at Flemington for 30 years, as well as a number of large-scale events, such as the Olympic Games in Sydney.



"We are trying to close the cycle as much as we can – be it by re-selling grass clippings or chipping trees on site. We also have six In Situ Desalination plants on-site producing approximately 120 million litres of fresh water per year for use of our tracks and gardens."

He adds, "The sustainability mindset has certainly permeated the entire operation here at Flemington. We always ask ourselves how to treat a waste product without having to transport it anywhere or pay for landfill. How can we reuse it? Who might have a use for it? That's more or less our standard approach."

Once the technical infrastructure is in place, he adds, managing processes is the key to success: "It's a giant operation on race days, with hundreds of external parties on site, so communication is key. Luckily most vendors – especially those in the food industry – get on board quickly, because they often share the same notion of reusing left-overs and reducing our environmental impact."

Instead of putting some rigid reinforcement policy into place, though, Reid says his strategy is to be on hand during each event to educate vendors in person and communicate his waste handling strategy directly – thus creating a distinct "team dynamic" where small improvements add up to a positive overall result. Supporting Reid are a number of 'waste ambassadors' that patrol the venue and car park and "help out where they can".

"As much as we'd like to be, we're not a closed-loop venue," he says – pointing to the tonnes of waste left behind by punters in the General Admission section on any one race day. "Given that inherent complexity, 90 per cent diversion from landfill is our 100 per cent, if you will. We first reached 91 per cent in 2014, and it was a true milestone for us. In turn, the low point was a 79 per cent result during Derby Day 2015, which has been a real wake up call and a sign that dropping the ball in the waste management

game is just not an option. We felt the economic impact just as much as the disappointment that comes with having added to landfill. Never again." ■



### *Did you know...*

#### **Green Birdcage**

The much talked-about Birdcage at Flemington Racecourse, an exclusive VIP section where local and multi-national businesses host commercial guests and celebrities alike, has embraced the venue's sustainability program wholeheartedly – especially as a promotional point of difference. Lexus' 2016 marquee, for example, was partially built from recycled cardboard. Dubbed 'Futurecave', the 650m<sup>2</sup> three-level structure openly used recycling as a design theme. For maximum effect, the interiors juxtaposed 'raw concrete sheeting' for the ceilings, pure white peony roses, Carrara marble and raw cardboard tubing for the bar fronts, walls and even as integrated vases for the flowers.

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**WASTE MANAGEMENT REVIEW** is the latest resource providing insights on industry developments and the people and companies shaping its future.

The cover of the February/March 2017 issue of Waste Management Review features a portrait of James Reid, CEO of Flemington Racecourse, standing outdoors. The background shows the racecourse's green fields and buildings. The title 'waste MANAGEMENT REVIEW' is at the top, with 'FEBRUARY/MARCH 2017' below it. A large green box on the right contains the headline 'Bins and Circuses' and the subtext 'James Reid on Flemington Racecourse's waste management strategy.' The left side has sections for 'FEATURES' and 'REPORTS' with brief descriptions of articles.

**FEATURES**  
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Are we any closer to implementing a national plastic bag ban?  
How puppet-making helps share the recycling message

*Waste Management Review* provides a window on the continual developments within the waste, recycling and resource recovery sectors.

Published bi-monthly, the magazine includes in-depth interviews with prominent industry figures, and profiles on people and companies innovating new technology or trialling new solutions. The publication features the latest products to hit the market and showcases successful collaborations between equipment suppliers and service providers.

*Waste Management Review* is a "must read" for those leading, working in, or associated with the industry.

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# A new dimension of plastics recycling

DEAKIN UNIVERSITY RESEARCHERS HAVE RUN A SUCCESSFUL TRIAL IN USING WASTE PLASTICS AS A RAW MATERIAL FOR 3D PRINTING. KNOWN AS ECOPRINT, THE TECHNOLOGY HAS EXCITING POTENTIAL FOR COMMUNITIES IMPACTED BY POVERTY OR NATURAL DISASTERS.

**G**lobal plastic production is increasing rapidly. In 2013 alone, some 299 million tonnes of the material were produced – its popularity stemming mainly from its qualities of being lightweight, durable and suitable for a wide range of applications and industries.

However, its rise has inherent consequences for the environment, as disposal and recycling of this complex material has become one of the biggest challenges of the modern age. Australian recycling organisations highlight that plastic is the most abundant type of rubbish found during

'Clean Up Australia' days, representing 30 per cent of all rubbish collected over the past decade.

Against this backdrop, Dr Mazher Mohammed and a group of his students have worked on a project to reconstitute plastic waste as printer filament, the feedstock for 3D printing.

Mohammed joined Deakin University's School of Engineering in January 2015, taking on the lecturing role as Research Fellow in Advanced Design, where he teaches students about matters relating to sustainability in an engineering context.

As part of the new role, and with a

personal background in 3D printing, Mohammed quickly started thinking about the main commercial products in 3D printing being plastic-based. Plastic is made from oil, a finite resource that is likely going to be depleted in the future. Mohammed says that as plastic is so prevalent in everyday items – from devices to packaging – it must be considered an important material for engineering and, as such, a resource that the world needs to manage wisely.

"I wondered if we could come up with a system to take spent plastic and reconstitute it to use in 3D printing in order to manufacture new end-

products," he explains. The question eventually led to the design of a new study focused on producing usable plastic filament as a viable means of consuming waste plastics and reducing the amount sent to landfill.

To make the ambitious project a reality, Mohammed says he was keen to source the raw material as cheaply as possible, or even for free – and turned to the industry he originally meant to supply. After all, prints can fail in 3D printing, too, with failed prints normally ending up in the bin and generating substantial volumes of waste. When students work on 3D printing projects to make parts, they also regularly end up as waste when the project is over.

"The logical thought was, 'could we take those waste streams as a feedstock to explore the idea of recycling plastic in our project, converting them into plastic filament for printing?'" Mohammed says.

Another material source Mohammed identified was all the High Density Polyethylene (HDPE) milk cartons the school uses for coffee. "That led to me thinking that this is another free resource, so could we take these HDPE cartons and do the same thing as we were planning with scrap Acrylonitrile Butadiene Styrene (ABS) plastics?" he says.

Local business, GT Recycling, also got on board to help give the project a commercial edge. "We wanted to develop a viable commercial venture in itself, where we could look to reinvigorate the local manufacturing scene in Geelong, which has suffered a huge decline due to the closure of the Ford plant," Mohammed adds. "With the local infrastructure available through GT Recycling, which processes large volumes of plastics waste and

**"The logical thought was, 'could we take those waste streams as a feedstock to explore the idea of recycling ABS plastic in our project, converting that into plastic filament for printing?'"**

Dr Mazher Mohammed Deakin University





granulates it into a feedstock, we realised they could be the perfect fit for such a venture."

#### Developing the EcoPrint concept

Work on a pilot started in May 2016, when two students studying for Master's degrees in Engineering, Anirudra Das and Meera Mohan, joined Mohammed for the project.

During the trial, the waste plastic collected from 3D printing and milk cartons was granulated using a combination of direct cutting with scissors or wire cutters and a paper-shredding machine. The team separated the pieces by size using sieves with mesh sizes of about 5mm and 2.4mm, respectively.

The products were then processed through a filament production device intended for the home consumer market, which feeds the granulated material into a heating zone, where the plastic liquefies and is then extruded through a brass nozzle to form the printer filament.

As the speed of the drive screw is fixed on the device, the resulting filament diameter can be controlled by

photovoltaic cells.

"Being a self-confessed hippy, I always want to make the world a better place if I can," Mohammed explains. "So we started to look at the use of renewable energy to enable operation of the technology off the grid."

For Mohammed, by running the EcoPrint machines off renewable energy, they could be used in remote or low socio-economic settings, such as Aboriginal communities in rural Australia, or places recovering from the effects of natural disasters.

"Based on the type of model used in the home consumer market, like we used for EcoPrint, we found it could reasonably run off a 100W solar-powered system," Mohammed states. "That same system could also be used to charge a battery to run the machine at night or when sun isn't as readily available. That's the beauty of this product – it's low powered and amenable to renewable energy."

Building on that result, the team set to work on an all-inclusive system that would allow for the new technology to become an effective portable manufacturing machine. The goal was to use it in aid relief scenarios to empower those communities with a means to be self sufficient in manufacturing with waste plastics, a feedstock that commonly litters poor or disaster-hit areas.

Mohammed is now in discussions with aid agency Plan International and is trying to develop a system that could be implemented in disaster zones or relief scenarios to prove the concept. He is currently waiting to hear whether it may be trialled in the Solomon Islands, which is the type of area for which, as well as being impoverished, waste is often a problem.

Having access to the technology would provide a mechanism for using

its waste streams and compel people in those communities to start perceiving waste plastic as a resource, Mohammed says. For example, the EcoPrint system could be used to make items to fix critical systems in infrastructure, such as pipes for carrying water and sewage.

#### Progressing the concept

Mohammed and his team have been demonstrating the EcoPrint prototype since August. To gain feedback from the waste and recycling industry, they also displayed it at the Waste Expo in Melbourne this past October.

"We were delighted to have gotten such a positive reaction," says Mohammed. "As a result of showing it there, we've had some other companies get in touch about developing similar concepts or forming partnerships."

The team is currently looking for financial support towards putting all of this technology – from waste plastic processing to 3D printing – into a single device. This forms part of the project it hopes to deliver with Plan International.

"My aspiration is that this technology is developed as one of the tools in the toolkit that aid agencies have to empower communities," says Mohammed. "The altruistic idea would be to leave these systems with those communities for them to develop and use as they see fit."

Mohammed explains that different places have diverse challenges about what they would like or need to manufacture. Therefore, in one setting, the EcoPrint systems could be used to create critical infrastructure to help with providing fresh drinking water and repairing pipes for sanitation, while in another area the requirement could be low-cost prosthetics.

"Instead of being detached from the concept of what happens to their waste and plastic, they could be empowering themselves and converting that material into all sorts of useful objects," he summarises. "They could unleash the power of their own imagination, making things meaningful to them."

Overall, Mohammed and his team are optimistic about the potential for their innovation. They see the system as having multiple applications, from artistic ventures or enabling design training to stimulating a low-cost sustainable manufacturing sector in Australia.

"Instead of Australia being reliant on imported plastics, we could make better use of the plastic resource that has been brought into country already," states Mohammed. "It's a low-cost and socially responsible solution."

For more information, contact Dr Mazher Mohammed on mazher.mohammed@deakin.edu.au. ■

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# Tying up loose threads

A NEW SOUTH WALES INITIATIVE IS LOOKING AT HOW TO RECYCLE THOUSANDS OF TONNES OF TEXTILE WASTE – POTENTIALLY CREATING A WHOLE NEW BUSINESS MODEL ALONG THE WAY.



In late 2016, Edge Environment brought together key stakeholders to discuss how to best recycle NSW's textile waste.

**T**he key to creating sustainable solutions to environmental problems is to build strong business cases around them. That is the approach Tom Davies and his team at Edge Environment took when they were tasked with finding an



industrial solution to divert waste from landfill through the New South Wales Environmental Protection Agency's (EPA) Circulate program.

By engaging 1,000 medium-to-large enterprises, Circulate aims to divert some 160,000 tonnes of waste to landfill between 2014 and 2017 and generate \$21 million in additional income or savings for those involved. The program is part of the NSW EPA's *Waste Less, Recycle More* initiative, which uses funds from the waste levy to drive behaviour change, infrastructure investment and innovation in new resource recovery solutions.

As a starting point for the project, Davies and his team analysed a range of NSW commercial and industrial waste audits to determine the most significant material streams coming out of the State. "We've been working with a lot of large corporates as part of the process and a common issue proved to be workwear," he says – adding that large companies go through hundreds of tonnes of workwear every year. "So we started investigating textiles as a waste."

#### Textile as a waste

As part of his initial research, Davies found that NSW generates about 153,000 tonnes of textile waste per year – the whole of Australia produces about 375,000 tonnes – and most of that is going directly to landfill. Of that textile waste, a massive 64 per cent is corporate workwear, a ratio too big to ignore, as Davies points out: "You need to find a starting point. To

us, it quickly became clear that point had to be corporate workwear – it's a huge volume of manmade fibres that could be turned into new products."

Davies points to the iconic Australia Post organisation as an example for smart fibre-recycling: "Australia Post had 200 tonnes of textiles as redundant stock that it had accumulated over two years, as it's constantly evolving its uniforms. To address the problem, they teamed up with Dunlop and turned the waste into carpet underlay."

While highly effective, the solution was a one-off only, Davies says: "What we were looking for was a long-term, self-sustaining solution. We roughly knew the breakdown of those materials, so it was obvious it was all valuable stuff that was ending up in landfill," he explains.

"[Building on the Australia Post experience,] we knew there were processes to recycle and reclaim them in a way that was economically sound, for example for polyester."

In order to find a more long-term solution to the problem, Davies brought together a broad range of stakeholders in November 2016. The objective was "to establish a new industry to remove textiles from the waste stream and produce new materials and products in the ecologically sustainable circular economy".

Attendees at the 'Circular Threads' event heard that the re-use of post-consumer textile waste is dominated by charities in Australia, who fill a critical space in resource recovery



and social responsibility.

Kerryn Caulfield from the National Association of Charitable Recyclable Organisations explained that clothes from textile waste have a high rate of recovery, with most unrecovered textile waste coming from toys or furniture. “Australians donating clothes to charity, meanwhile, can know that many clothes get re-sold directly on the shop floor, donated to those in need or are ragged for mechanical workshops,” she explained.

#### **Post-consumer textiles**

One business that is taking on a leading role in recycling textiles beyond that stream is Textiles Recyclers Australia, which takes clothes that contain at least 80 per cent of polyester and re-spins them into new yarns through a network of textile fabric mills and a recycled yarn manufacturer in China. There is no restriction on colours, knit or woven polyester textile. To demonstrate the new technology, the company’s Maureen Taylor used the Circular Threads platform to exhibit a polyester shirt made from

fully recycled polyester, something Davies says is exactly where the future of textile recycling will lie: “The participants at the workshop came from across the whole supply chain, be it fashion, corporate workwear or manufacturing. There were also textile technologists who understand issues around processing manmade fibres, and technologists who’ve worked out how to use the recycled product, government and corporate representatives.”

“I think it was testament to what a wicked problem this is – everybody is looking for a solution and so many people are involved in a small way.”

Another idea for a lasting solution to the conundrum of waste in corporate workwear was a leasing model. “The end-of-life onus of workwear would be put back on the leasing company,” he says. “It’s good for their bottom line – it’s a business cost. At end of life, everyone gets a new uniform. The corporate workwear provider would supply the new one, take the old one back and send it to a processor... it would be a massive win for the environment.”

With this idea in mind, Davies and his team have already got to work on the next steps. They plan to run

a course to educate large corporates about the problem and how they can be part of the solution.

They also plan to promote best practice around workwear, introducing those companies who already have models that address the issue to Edge Environment’s network of large corporates to promote their success.

Already, Davies’ team has a name for the concept they are promoting – product stewardship.

“It’s about creating a coalition of all big brands who have this common problem and want a solution,” he says. “If we can bring together 100 companies, we talk about 20,000 tonnes of textiles on which to base a business, to create a demand for that product.”

Davies says that this scheme could have important economic, as well as environmental, effects on Australia. “Although this is a program driven by reducing waste, it’ll have many other benefits in terms of innovation, in terms of new industry and jobs – it’s an opportunity to bring some jobs back on shore,” he says.

“If we can separate all our resources and present them to an Australian industry, the innovation is there to make new industries and new jobs.” ■





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## and effective

AN INNOVATIVE NEW STRATEGY WILL HELP THE CITY OF NEDLANDS DIVERT 65 PER CENT OF ITS WASTE FROM LANDFILL. MAYOR MAX HIPKINS EXPLAINS HOW THE PLAN WILL INCORPORATE GREATER RESOURCE RECOVERY WHILE STILL REDUCING COSTS.



**P**erth's City of Nedlands has set itself an ambitious target: By 2020, the Council plans to divert 65 per cent of its waste from landfill, up from 49 per cent in 2016, without redirecting the cost back to ratepayers. To help it get there, it has developed a new Waste Minimisation Strategy that will see it become the first local government to adopt new technologies to recycle compacted verge-hard waste, in addition to increased community education.

Mayor Max Hipkins says recycling group, West Tip Waste Control, has been appointed to the task after

a competitive tendering process.

"The [tender] for the bulk collection and disposal services has managed to achieve projected savings of approximately \$65,000\* annually," he explains.

At the core of the winning tender is West Tip Waste Control's new Resource Recovery Plant, which will enable the City to recover household furniture, white goods and metal products with minimal contamination. At the plant, he says, all waste brought in from collection vehicles will undergo an initial inspection for non-conforming items, which will be

followed by an extraction of oversized items. Recyclables will then undergo a multi-stage segregation process.

The Mayor expects that with the help of West Tip Waste Control, about 765 tonnes of hard waste will be diverted from landfill and recycled each year, putting the City closer to achieving its target. To make full use of the new Plant, he adds the Council will focus on reducing illegal dumping by offering two bulk verge collection services per year, delivered directly to West Tip Waste Control's site. It also allows commercial and business precincts to receive kerbside waste and



recycling collection on request.

Knowing a successful resource recovery strategy must be holistic in nature, Mayor Hipkins says the ongoing risk of contaminated household recycling continues to pose challenges to the community, too – especially with green waste and putrescible (general) bin services, which are part of the City's three-bin set-up. Under the three-bin system, the City provides weekly putrescible waste collections, as well as green waste and recycling services operating on alternating fortnights.

"The first bin works very well, but there's a contamination issue with the second, recycling bin," he explains. "Over 80 per cent of residents are using the small putrescible rubbish

bin, while 21 per cent use the complimentary second recycling bin."

To raise that ratio, all bins are colour coded and stickers are given out to say what can go in them. Additional education in the field is meant to help the Council reinforce the message.

"I think it's really tackling the whole of the waste stream. In the past, councils have concentrated on the obvious things," he says. "We're trying to raise (the public's) awareness whenever they put things in the bin. If it's a bigger item, we're making them think about what happens to it."

Mayor Hipkins says the City's new Strategy will build on the highly successful previous one, which led to 49 percent of waste being diverted from landfill with minimal



### *Did you know...*

#### **City of Nedlands at a glance**

A community survey is undertaken every two years where residents are asked about a range of topics, including waste management, which is then compared to other councils.

Another strategy helping to reduce waste is the City of Nedlands' worm café.

Mayor Max Hipkins says the City provides subsidised worm farms to its residents, which have a number of benefits: They reduce rubbish going to landfill and establish new garden beds, which can be used as a super fertiliser for plants and cut down on water usage.



contamination, for example by introducing a separate collection service for e-waste and mattresses, and completing an independent waste audit in 2014.

He adds the City's previous waste strategy reduced its annual residential waste charges by 12 per cent since 2013 – helping its waste service get rated as the 'best performing city service' by residents in a community perception survey. What's more, ratepayers saved through economically sound waste and recycling tenders, which provided increased levels of service at a reduced cost.

The new strategy of working towards 65 per cent waste diversion is in line with the Western Australian Government's Waste Strategy, which aims to reduce the risk of recycling contamination, which is an on-going issue nationwide.

To actively engage with the community, the Mayor says the Council will be posting additional messages on its website, send out regular newsletters and forge a stronger relationship with the local newspaper, "which is a good medium for getting to people."

"We also have a sustainability committee to address waste and other things, initiatives in schools and working with a whole range of people. The Council goes around aged care centres – we go from cradle to grave."

Next to improving bulk verge collection and community engagement, Mayor Hipkins says the Council's new Waste Minimisation Strategy is also aiming to achieve greater resource recovery from construction and demolition waste (C&D).

"C&D is something that's lagging in WA," he explains. "There is a shortage of building materials in the area. The main roads department is the main user of road base, but they have strict requirements for material that can be used. "Meanwhile, we have a constant rebuilding and remodelling of houses, so there is a lot of C&D waste. We are now looking at how we might get

involved and help align supply and demand somehow."

Hipkins says the City of Nedland's Waste Minimisation Strategy 2017-2020 is anticipated to be approved by Council in March or April 2017, with the community education program planned to commence immediately. ■

*\*excluding GST*



# Closing the loop

THE NEW CEO OF THE WASTE MANAGEMENT ASSOCIATION OF AUSTRALIA TELLS WASTE MANAGEMENT REVIEW ABOUT THE MAIN CHALLENGES FACING BOTH THE ASSOCIATION AND THE INDUSTRY.

**W**hen Gayle Sloan assumed the role of Chief Executive of the Waste Management Association of Australia (WMAA) in November 2016, she did so with the promise of finding a balance between the organisation's role as a lobbyist on behalf of the industry and as a body that serves its members.

Since her appointment, Sloan has been seeking to make good on that promise by getting around to as many WMAA branch meetings as possible, while also getting familiar with the relevant government and institutional bodies that she will work with in her new role.

"I think we need to better at lobbying, advocacy and policy development and ensure that we include the membership in this process," Sloan tells *Waste Management Review*. "Through

our branches and meetings with government agencies, I'm hearing very clearly that they want to deal directly with one body as a national peak body, so we can get the best policy outcomes for the industry."

WMAA is well placed to do so, Sloan says, given it is a 'broad church' that represents all areas and sectors of the industry. In fact, its unique Division Structure enables it to provide very specific and technical policy input that has been well tested due to WMAA's diversity.

While the new Chief Executive has come to the WMAA role after three years in contract management and government relations at Visy Recycling, her passion for the industry stems from more than a decade of experience working in government and policy: It was while working for the City of Sydney in 2002 under the

administration of Frank Sartor and then-Lord Mayor Lucy Turnbull that Sloan first came into contact with the waste industry, working on the city's cleaning and domestic waste functions, while also doing tenders and procurement in the field.

As such, an area Sloan is keen to see significant development in is the field of legislation: "One of the industry's biggest challenges is getting consistent legislation across Australia," she says. "We need a common approach to issues such as levies and getting that unified approach of understanding and issues."

Sloan points to one specific example of this as being the Container Deposit Scheme, which is being enacted in New South Wales this year, and then starting up in Queensland in 2018. Under the scheme, anyone who returns an empty eligible beverage container to an approved NSW collection depot or reverse vending machine will be eligible for a 10-cent refund. A network of depots and reverse vending machines will open across NSW to receive the empty containers.

However, for companies with operations across both states, this staggering of the timeline will present a number of practical challenges as they try to manage their business operations across both legislative regions, Sloan explains.

On the membership side, she adds that the WMAA is focusing on



initiatives to broaden the recognition of the people participating in the industry. One of these initiatives is the WMAA Women in the Environment Award, which began as an initiative of the WMAA Victoria Branch, and recognises the achievements of women in the environment industry.

"The Award focuses on women in the environment sector who have made a significant contribution to environmental sustainability in Australia over the past five years. This year, nominations came from almost every state of Australia, many of which reflected significant experience in the waste industry," she says. "The winner of the Award in 2016 was Samantha Cross, the Director of Cross Connections Consulting. Cross is a leader in the circular economy space across industry sectors. She presents waste generators, business and government with alternatives to landfill, facilitating opportunities to achieve enhanced sustainability and commercial outcomes."

Another area of focus is the WMAA's Young Professionals Group, with a rebadged young professional's scholarship expected to provide participants with the opportunity to

present at conferences and be seen by the wider industry. "We want to have the future leaders coming to the industry, to make the industry one that is celebrated," Sloan says. "This is a merit-based industry – there are opportunities for everyone."

According to Sloan, she is the best example of the opportunities that await in the waste management space. During her three years at Visy, she was largely focused on recycling, she says, and has only positive memories to look back to. "Visy is one of those companies genuinely practising the circular economy in Australia," she says. "Resource recovery – closing the

loop and the circular economy – really excites me.

"If I have learned anything during my time at Visy, it's that our industry and society are evolving rapidly from the 'take, make and dispose' idea towards a truly circular economy. More and more, we are recognising that important decisions need to be made in all industries about what resources are used and how they can best be recovered – naturally, the waste and resource recovery industry has to be at the forefront of this process and needs to play an active part in areas such as product stewardship and the circular economy in Australia." ■



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# Making sustainability **CHILD'S PLAY**

A MELBOURNE-BASED COMPANY IS COMBINING PUPPET-MAKING AND TRASH TO SHARE THE 'REDUCE, REUSE AND RECYCLE' MESSAGE

**W**hen I was young, my ambition was to be one of the people who made a difference in this world. My hope is to leave the world a little better for having been there.”

While Jim Henson's famous saying may reflect a common-enough sentiment, but the incremental betterment of the world and humanity doesn't usually cause puppets to spring to mind. For one Melbourne-based company, however, that is exactly what is entailed within its efforts to make the world a better place.

Jhess Knight worked within the

local puppetry industry for the past five years before realising the joys of using recycled or reused materials. Alongside her good friend, Lucy Hedd, she has since developed the Trash Puppets initiative, which combines entertainment with education in the sustainability space.

“During my Master's at the London School of Puppetry, we were encouraged to create mock-ups of our puppets. Quick and rough, a process that enabled us to see the design of our puppet and what the challenges might be,” explains Jhess. “Usually thrown together with basic materials such as

newspaper or cardboard, I often found myself falling in love. Their simplicity was incredibly charming and made them even more magical when they came to life.”

The process of making Trash Puppets thus came about organically, and Jhess found the process to be therapeutic in its own right. “I knew this was something I wanted to share,” she says.

After having the idea suggested by a friend who works as a schoolteacher, Jhess and Lucy have gone on to create a profitable business in teaching kids to make puppets from rubbish – but it also has applications beyond the classroom.



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"We also operate in the corporate world, where we do team-building and corporate parties," she explains – revealing it is her savvy business thinking that ensured Trash Puppets grew into a profitable enterprise.

Having participated in a number of projects at the local council level, Trash Puppets is now poised to gain greater levels of notoriety as it spreads throughout the Greater Melbourne region. So far, it has participated in a competition for the Whittlesea Council, appeared at the Belgrave Platypus Festival and helped the City of Melton get the word out about differences in

recycling hard versus soft plastics.

Ultimately, Jhess tells us, all of that comes second to teaching kids an important message in such a way that they also have fun while learning. "Recently, a mother told us about her son, who had participated in one of our sessions previously. She told us he won't let her put the recycling out anymore until he's had a chance to check it for potentially useful items."

Not content to rest on Trash Puppets' laurels, Jhess and Lucy are now planning a bigger show, due to debut at Melbourne Fringe and later to appear at Auckland Live in September.

Like the Trash Puppets' education offerings, Jhess tells us to expect sustainability themes, but they won't be forced down the audiences' throats.

"I think we need to avoid being a didactic show when it comes to those themes," she explains. "It doesn't need to be so obvious – instead we can explore other themes as well, like friendship, loyalty and fitting in."

"Of course, the whole show will be made from reused rubbish items and will be set in a dump. Currently, the lead character is a non-degradable cup."

Find out more at [www.trashpuppets.com](http://www.trashpuppets.com). ■



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# Best on Ground

THE MELBOURNE CRICKET CLUB GOES TO GREAT LENGTHS TO REDUCE THE AMOUNT OF WASTE PRODUCED AT THE MCG.



You may not know what they're called, but chances are if you've been to a large sporting event in recent years, you'll know what they sound like.

Thundersticks have become a fixture at many sporting events in the past few years, and the little inflatable tubes that make a spectacular racket when clapped together en masse have become a particular fixture of the Big Bash cricket over the past two summers.

But it almost wasn't so – at the Melbourne Cricket Ground (MCG), at least. When the Big Bash league first raised the idea of handing out thundersticks to spectators with the venue management, the reception

was not immediately positive.

"I denied the request originally as we didn't know if it was a recyclable product," says Vince Macolino, who is the Venue Presentation Coordinator for the MCG's managing body, the Melbourne Cricket Club (MCC).

Such is the Club's commitment to waste reduction that they worked with Terracycle to send the thundersticks in question over to the US to be analysed, and only approved their use once it was determined that they could be recycled.

This is the kind of thinking that has seen the iconic 'G' recycle more than 77 per cent of the 1691 tonnes of waste it produced in 2016.

When Macolino joined the MCG's team at the end of 2013, he conducted a thorough review of the venue's waste management procedures.

While the venue was doing a reasonable job at the time, with multiple recycling streams capturing just over 60 per cent of the waste generated on-site, Macolino set to work with external consultant David Raiko and KS Environmental to find ways to improve.

"We came up with a training and education program that was targeted at our contractors and caterers – the main people who produce waste and needed to be aware of the waste management procedures," Macolino



says. "We identified the waste streams at the MCG, what they looked like, where they were located, and everyone who attended those sessions was then responsible for on-training their teams."

Macolino implemented monthly reporting procedures to track how they were performing and to help identify any problem areas.

"For example, if we've sent more waste to landfill, investigate why that's happened," he says. "We make each department and contractor accountable for their own recycling – if you're doing the wrong thing, we'll follow up on it."

Macolino's team developed a waste

**"We came up with a training and education program that was targeted at our contractors and caterers – the main people who produce and needed to be aware of the waste management producers."**

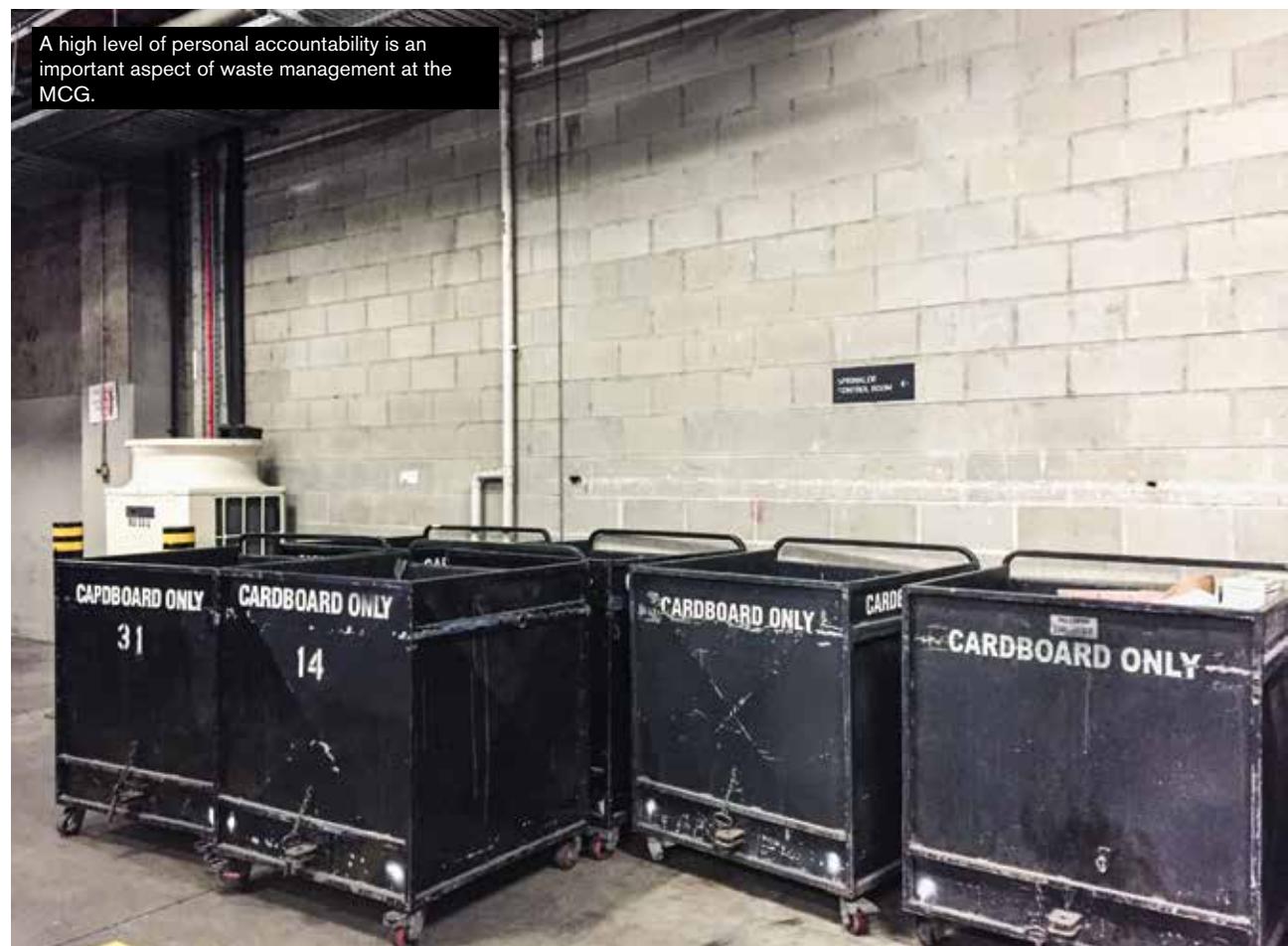
Vince Macolino **Venue Presentation Coordinator, MCG**

hierarchy that prioritises avoidance, reuse and recycling of waste that is now regularly communicated to all departments within the venue.

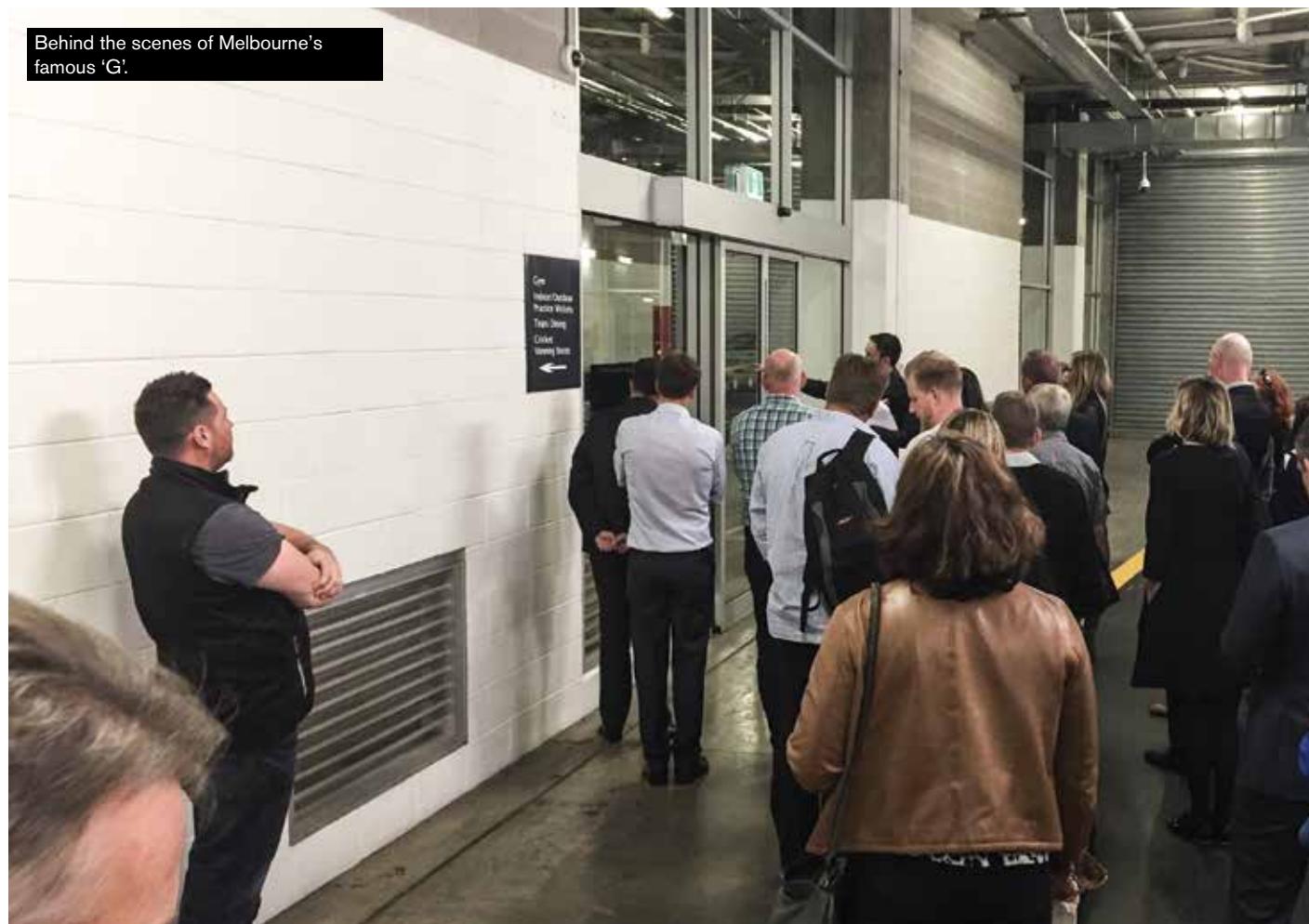
"People can also phone me if

they're unsure," he says. "Over the past year, I got a whole range of phone calls from staff and contractors asking about how to dispose of a waste properly, because people are

A high level of personal accountability is an important aspect of waste management at the MCG.



Behind the scenes of Melbourne's famous 'G.'



aware that we're doing something about it."

One of the MCC's key partners in this task is ISS.

"ISS is on the ground day-to-

day - it's one of the big companies responsible for recycling at the MCG," Macolino says. "It's invested in our recycling rates as well and trying to get the best for MCC."

Macolino says that one of the biggest challenges is dealing with what people bring into the MCG and leave behind on event days, such as bags, food packaging and drink bottles that might not be recyclable.

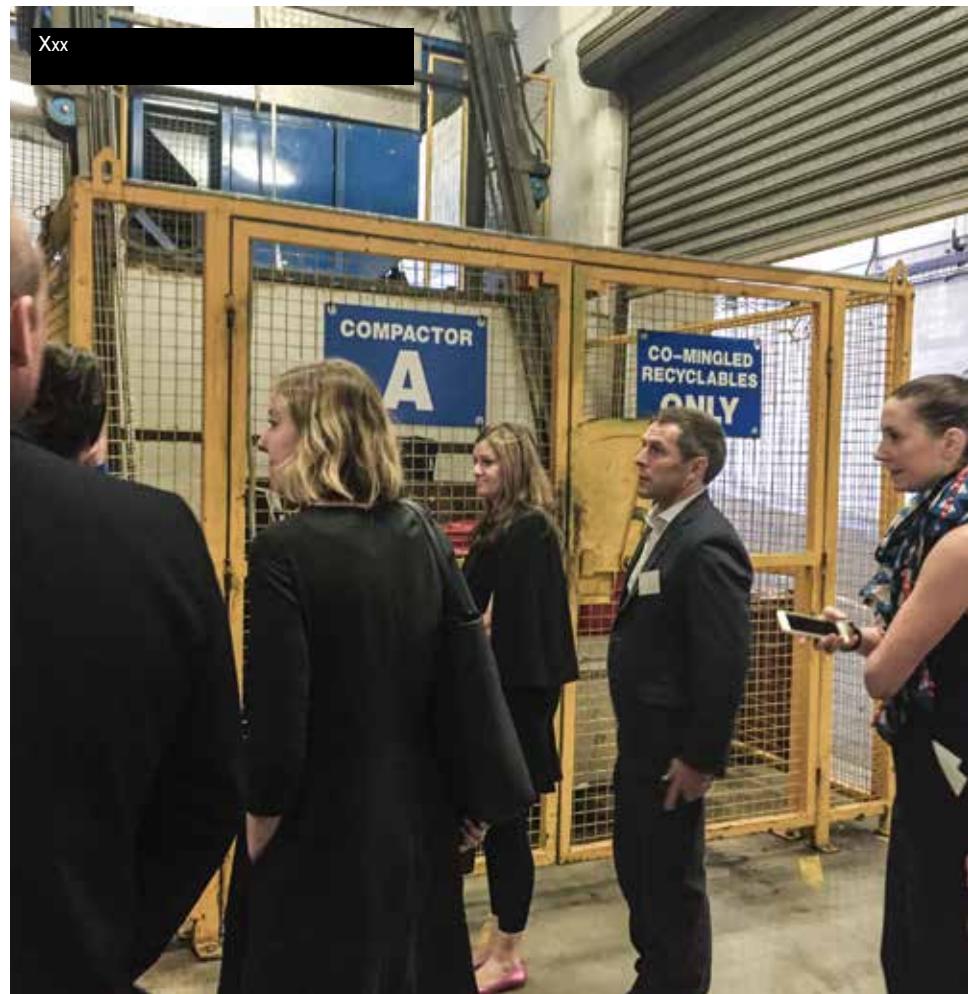
"Not everything is recyclable," he explains. "[But] we're constantly upgrading and innovating – it's about looking for a place for those items at the end of their lifespan.

In order to minimise the amount of non-recyclables being brought into the ground on event days, since 2015 the MCC has implemented a zero-tolerance policy to prevent promotional giveaways from being made from non-recyclable materials.

"People would just leave them after a game and contaminate our recycling,"

**"We put together the policy and educated the clubs and marketing companies and we have seen the results – in 2013 we were recycling 66 per cent of event day waste, and in 2016 we're recycling 79 per cent."**

Vince Macolino **Venue Presentation Coordinator, MCG**



Macolino says. "We put together the policy and educated the clubs and marketing companies and we have seen the results – in 2013 we were recycling 66 per cent of event-day waste, and in 2016, we were recycling 79 per cent."

Driven by these results, Macolino and his team are always looking at ways of reducing the venue's waste from its day-to-day operations as well.

For example, in 2014 the MCC 'Arenas' team performed a major renovation of the playing surface, which resulted in more than 2,500 tonnes of soil being changed over. Due to the fine plastic wire that runs through the turf, the soil would have been sent to landfill, but the Arenas team was able to divert it re-use it at schools, parks and motor-cross tracks around Victoria instead.

"Diverting the waste had a great impact on the recycling levels at the 'G,'" Macolino says. "We now recycle a lot of unwanted turf."

Another example was also from 2014, when the MCC identified that the Northern Stand was in great need of a carpet upgrade.

Carpet, if not recycled, can remain in landfill for up to 40 years. Taking this into consideration, the MCC set out to find a high-quality carpet that was recyclable at the end of its lifespan. After extensive research and meetings, they found a suitable, high-quality product that replaced over 6000m<sup>2</sup> of space at the Northern Stand – and will be fully recycled once worn out.

With that in mind, the MCC

continues to look at new ways of reducing waste, Macolino says. For example, the Club is working with companies Replas and Red Group to take soft plastics captured from the venue and create new usable items for the MCG – a relationship that has already led to the MCC buying 40 bollards made from 100,000 recycled plastic bags for use throughout Yarra Park.

Macolino says the MCC now works closely with its suppliers to make sure that the materials that are brought into the ground have a plan in place for disposal or recycling. All of this, he adds, is taking the world-famous 'G' towards its ultimate goal of recycling more than 90 per cent of waste. ■



# MANAGING **THE FUTURE**

MOMENTUM IS BUILDING TO CONNECT CITY SERVICES LIKE WASTE MANAGEMENT WITH SMART IOT NETWORKS, A NEW REPORT HAS FOUND.



**A**lthough the smart waste collection technology industry is still in an early phase, Internet of Things (IoT)-enabled smart bins and sensors are slowly gaining traction globally.

According to a new report by US research company Navigant, the market is expected to grow from US\$57.6 million (A\$77 million) in 2016 to more than US\$223 million (A\$300 million) in 2025, with a 16.3 per cent compound annual growth rate.

“Currently, most municipal waste collection operations focus on emptying containers according to predefined schedules,” explains Christina Jung, a Research Associate with Navigant. “This is inevitably inefficient, with half-full bins being emptied, poor use of city assets and unnecessary fleet fuel consumption.”

Jung says the smart waste collection solutions of the future will be able to track waste levels and provide route optimisation as well as operational analytics – providing new opportunities to optimise waste management: “More and more municipalities and waste service managers are realising that these solutions can help them meet sustainability goals, improve services for residents and reduce operational costs [at the same time].”

She adds, “There is a growing awareness among city leaders of the potential benefits of multi-application approaches to the deployment of smart city infrastructure. At the heart of this transformation is IoT technology that connects a range of intelligent sensors and devices to monitor and automate city operations. Areas where technology is having the greatest impact include street lighting, public safety, traffic systems and waste collection.”

Jung’s observation comes on the back of TDC, Denmark’s largest

telecoms company, and Cisco forming a partnership agreement in June 2016 to deploy a digital IoT city platform in Denmark. As part of the initiative, Dublin company SmartBin deployed its sensors to a range of waste and recycling containers that were integrated with the city’s digital platform. In addition, lamp posts and traffic lights were equipped with sensors that are able to send data to a control console at the town hall and allow real time monitoring of waste production.

A similar project took place locally in Australia 2014, when the Sunshine Coast Council partnered with Cisco and Telstra to develop the so-called Smart City Framework, a portfolio of 13 municipal service areas including waste management. Here, Enevo and its Brisbane-based partner, Smarter Technology Solutions, saw the successful initial deployment of Enevo’s smart fill-level sensors.

“Another example of an integrated smart waste collection solutions are solar-powered waste bins equipped with Wi-Fi units,” Jung says. “While many smart city initiatives propose to provide public Wi-Fi hotspots, it can be expensive to lease areas to host the equipment. However, with Wi-Fi-enabled smart bins, cities can run access points by using the solar energy already collected by the bins.”

According to Jung, the town of Sharjah in the United Arab Emirates installed ten solar-powered Bigbelly bins with Wi-Fi as early as June 2016 and is planning to deploy several hundreds more of them.

“Yet, despite the successful [early] deployments, there is still limited demand for smart waste collection solutions due to the lack of awareness about cost [recovery] and the effectiveness of the technology.” ■

# TURNING TIME INTO MONEY

SUEZ IS USING AZMEB'S UNIQUE SIDE TIPPERS TO BOOST PRODUCTIVITY AND HALVE OPERATION COSTS FOR SOME OF THE MOST CHALLENGING WASTE MANAGEMENT HAULS IN THE COUNTRY.

**W**ith the acquisition of Perth Waste in June last year, Suez is now the largest waste management company operating on the Australian west coast – and it is showing no signs of slowing down.

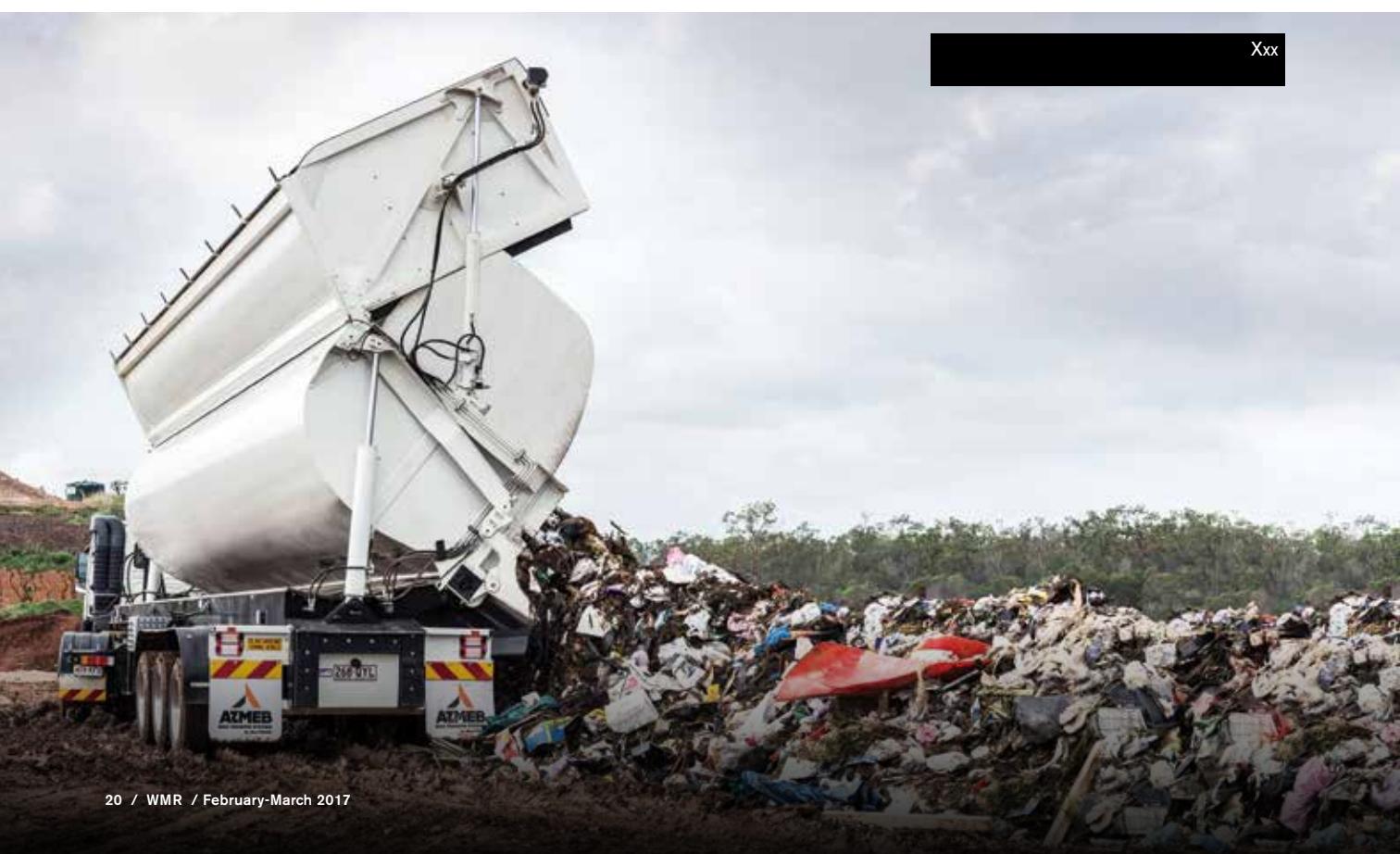
To support its ambitious growth objectives, it relies heavily on its fleet of collection vehicles that were specifically

designed for the efficient and safe transport of waste materials between Western Australian sites. Most recently, the fleet has been bolstered with a \$3.5 million investment in Azmeb's High Volume Side Tippers, which Suez' WA State Equipment Manager, Peter Spight, considers ideal to navigate the difficult terrain and lengthy hauls native to the

WA countryside.

"The company was successfully operating these trailers in Cairns," says Spight, who has been responsible for the purchase of company equipment for over five years. "We collected and viewed the data on the efficiency of the units and bought our first two units in 2013. The quick tip time over

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our current moving floor fleet and the much lower maintenance were the two key factors in our decision to go with Azmeb."

Azmeb's one-of-a-kind tippers can unload up to 10 times faster than traditional moving floor trailers, offering major productivity gains for companies like Suez. The units feature hinged upper bodies which effectively double their volumetric capacity with little increase in tare weight, while their simplified designs require half the maintenance of its moving floor counterparts, according to Azmeb.

Spight says the purchase was approved on a tonnes-per-dollar basis, taking into account costs, maintenance, depreciation and purchase price. When compared to compaction and walking floor trailers, Azmeb's side tippers came out on top over a seven-year period. "Particularly when considering unloading times, maintenance costs and capital outlay the side tippers ticked all the right boxes," he explains.

Suez's new fleet of 14 side tippers, operational since October 2016, are primarily responsible for transporting commercial and household waste from Suez's transfer station in Welshpool to

landfill in North Bannister – a 130km trek. The side tippers run in a pocket road train configuration, consisting of seven units each hosting two trailers and a dolly.

Quick tipping times result in less time spent by the road trains at the landfill site, Spight adds, with the fleet managing up to three trips and carting 120 tonnes of waste per day. Further, after identifying that the mix of product was changing towards lower tare industrial and construction waste, Suez was able to specify larger capacity tubs on the new trailers. The new trailers have a total volume of 69m<sup>3</sup> compared to the previous trailers, which measured 63m<sup>3</sup> – a 9.5 per cent jump in capacity which has helped Suez increase its payload and returns.

Driver safety also improved with tipping managed entirely from the cab in order to reduce the likelihood of accidents, Spight explains. "The tip face time for unloading ensures fast turnaround – no need to split the trailers as we had to with the walking floors. Our drivers spend about 15 minutes at the landfill site, compared to 45 minutes for the previous walking

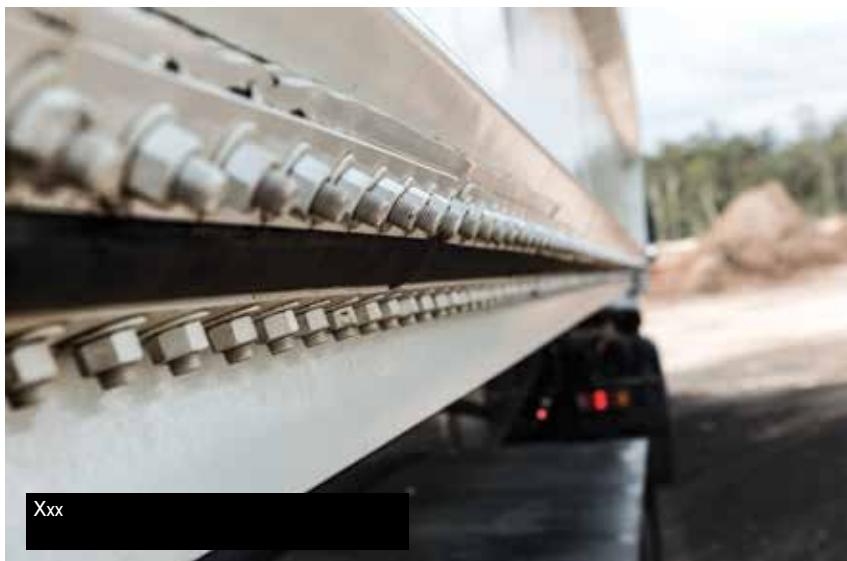
floor trailers. So they've made a big difference."

Greater efficiency is supported by decreased maintenance requirements – a key factor in running a streamlined waste operation. Spight explains the unit utilises simple and fast hydraulics, two rams doing the job of three at each end, and fewer parts and hoses. The bowl is said to be "incredibly durable", made from one piece of 450-grade wear plate sitting on full-length rubber pads that absorb loading shocks.

Add in fewer grease points serviced by remote grease lines, and maintenance budgets can be drastically cut: Suez expects a 45 per cent reduction on annual maintenance costs using Azmeb's High Volume Side Tippers over the existing fleet of walking floor trailers. "There's now far less moving parts and the waste can be quite hard on the trailers, so the side tippers wear far better," says Spight.

The side tippers' ability to adapt and endure is reflected in their handling of varying waste densities. Spight cites the units' patented full-length rubber hinges for allowing high moisture loads to be moved without risk of spillage – which is better for business and better for the environment. "Although we mostly transport hard household and commercial waste, the side tippers ensure that any liquid in the rubbish doesn't end up on the road – where previously it had," he says.

For Spight, there is no looking back from Azmeb's High Volume Side Tippers for optimising Suez' WA operation, which has to navigate one of the toughest operating environments in Australia: "I definitely think it's worth it for us. We certainly recognise the pay off a lot quicker than with the walking trailers we were previously using, especially given its high productivity and low costs." ■



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# Waste not, want not

AN INTEGRATED, COLLABORATIVE APPROACH TO MANAGING WASTE COULD HELP BUSINESSES ACT MORE ECONOMICALLY – FOR EXAMPLE IN WEIGHBRIDGE MANAGEMENT.

**W**ith ever-increasing amounts of waste and decreasing resources, escalating environmental concerns and rising input costs, the waste management industry is expected to face some tough challenges in 2017.

As such, key industry players increasingly question whether or not they are operating as economically and efficiently as possible, knowing

that an integrated approach to waste management could be the key to unlocking a myriad of benefits and achieving more sustainable success over the long-term.

With a growing number of stakeholders involved in the process of waste management – each looking to manage their resources as efficiently as possible – integration and knowledge sharing are thus becoming more

important than ever before, says Bill Ambrose, Regional General Manager for WA and SA at AccuWeigh, Australia's biggest supplier of weighbridges, weighing equipment and product inspection equipment.

"Business-to-business communication can lead to better economies of scale, more streamlined reporting and savings in terms of both money and time," says Ambrose. "What's important to



note here is that collaboration among partner companies doesn't mean giving away trade secrets or opening up vulnerabilities for others to exploit. It's merely a tool to facilitate lean systems and lasting success."

According to Ambrose, advanced software and technological developments enable operations to do business in a dramatically different way nowadays. "Digital communication makes it possible for data to be captured



### Did you know...

- Toxfree, a national leader in waste management solutions, has recently installed two sophisticated, feature-rich AccuWeigh weighbridges at its facility in Karratha, Western Australia.
- The inbound weighbridge weighs the waste coming into the facility, while the outbound bridge weighs trucks that are leaving the site to transfer processed waste to other facilities, such as landfill or for further treatment.
- The inbound weighbridge is a 38m-long single-deck manned weighbridge, with a driver control station (DCS) for afterhours operation by drivers.
- The outbound bridge is a 54m-long, seven-deck unmanned, fully automated weighbridge with a DCS that employs some of the latest technologies to help Toxfree implement crucial Chain of Responsibility mass management safeguards at this critical control point. This has helped the company to eliminate employee, driver and public exposure to the risks presented by driving overloaded vehicles.

and shared wirelessly and remotely – for example from an unmanned weighbridge to a central processing system or between truck drivers in the field and their home base – and waste companies should be actively pursuing ways of exploiting technology for both financial and operational gains."

He adds that weighbridge integration is a case in point: "An integrated weighbridge software solution makes it possible to centrally manage all your weighing operations, whether you operate a single weighbridge or have installations at several different sites," he explains. "It can also be used as a comprehensive vehicle management system, a traffic management system capable of reducing bottlenecks and streamlining the flow of vehicles and an on-site security system capable of controlling security cameras, entry and exit barriers and checking number plates automatically."

"Systems can be fully configurable for each application, producing digital records of each and every vehicle entering and leaving the sites and providing operators with comprehensive data that can be used for a range of functions."

Weighing systems expert Ambrose says integration takes much of the paperwork – and, consequently, the likelihood of human error – out of the equation and can provide operators with a wealth of information that can be used to optimise the business. From data on the number of vehicles entering the site each day, volumes (on an hourly, daily or weekly basis), vehicle turnaround time and revenues (by customer and sector) to profitability and resourcing, there are many areas where businesses can turn knowledge into operational and

resourcing – and possibly revenue – improvements, he says.

"The waste industry has historically been characterised by multiple operators along the supply chain, but a worldwide trend is for larger operations to achieve economies of scale through mergers or by acquiring smaller players. The response has to be a renewed focus on integration and collaboration.

"Advancements in weighbridge integration enable much more productive outcomes among the partners in the waste process – even among competitors – and allow larger, merged operations to marry the systems of their multiple divisions together to achieve substantial savings in time and costs." ■



This article has been produced in collaboration with AccuWeigh. With a portfolio of over 1,000 weighbridge installations throughout Australia and New Zealand, AccuWeigh has the experience to identify individual weighbridge needs and provide businesses with the best integrated weighbridge solution. More information at [www.accuweigh.com.au](http://www.accuweigh.com.au).

**In each edition, we feature a selection of the latest products or updated models to be launched to waste management businesses. In this issue, we focus on equipment used by councils around Australia to service public spaces and precincts.**

### / MORBARK 40/36 WHOLE TREE MICROCHIPPER

The Morbark 40/36 Whole Tree MicroChipper is a compact, affordable and productive drum chipper designed with the biomass industry in mind. Equipped with the same internal drive perfected on Morbark's horizontal grinders, along with an extra-wide feed opening, the 40/36 model is meant to "aggressively" feed brushy tops and limbs, quickly and effortlessly filling a chip van to maximum legal load capacity.

At the heart of the MicroChipper is Morbark's 16-knife Advantage 3 Drum, which is meant to decrease downtime while providing higher-quality, more uniform Micro-Chips. The 16-knife Advantage 3 Drum can also be quickly and easily converted to an eight-knife unit to produce a standard chip.

The feed system, meanwhile, is more efficient due to a staggered knife configuration and contains fewer moving parts, thus reducing maintenance. In unison with the Morbark Integrated Control Systems (MICS), it automatically adjusts feed rates and monitors pressures and feed wheel position to maximize production and engine efficiency.

The directional flow discharge chute is hydraulically adjustable by remote control for maximum chip loads. "The Morbark 40/36 Whole Tree MicroChipper is available as either a Wheeled

or Tracked unit," Morbark distributor, Lincom Group, explains, adding that "due to the versatility of the 16 Knife Advantage 3 Drum, and economy, due to low fuel consumption per tonne produced, the Morbark 40/36 MicroChipper is an ideal unit for any forward-thinking business within the Biomass Industry".

[www.lincom.com.au](http://www.lincom.com.au)



### / TRIDENT PLASTICS' FOUR-WHEEL BINS

Trident Plastics, the largest custom moulder in South Australia, has launched a new range of Australian-made four-wheel bins for commercial and multi-unit dwelling use. The new 660- and 1100-litre bins are made of injection moulded high-density polyethylene (HDPE), which is UV stabilised to provide "excellent strength and durability", as Trident explains, adding: "With our four-wheel bin range, we aim for excellent value for money in the same way that our two-wheel bins have become so popular in Australia and New Zealand in recent years."

Featuring flat sides to enable pockets to be installed, as well as high quality wheels, two of them with locks, and noise-reducing tyres, the new four-wheel range comes fully equipped and will be available in a whole range of colours for both body and lid.

Trident Plastics commenced manufacturing two-wheel bins in 2012 and has since increased its range each year. Now supplying 80-, 100-, 120-, 140-, 240- and 360-litre two-wheel bin sizes, the innovative company says the new four-wheel options further complete its portfolio.

All two- and four-wheel bins are made under strict quality and environmental standards, such as ISO9001 and ISO14001.

[www.tridentaustralia.com](http://www.tridentaustralia.com)



## / WEST-TRANS LAUNCHES NEW WASTE TARP TECHNOLOGY

New South Wales transport equipment specialist, West-Trans Equipment, is now distributing TransCover tarpaulin systems to the Australian market.

The new tarpaulin technology is manufactured by UK-based TransCover and is purpose-built for the waste transport industry.

According to West-Trans Equipment, the TransCover system is lightweight, easy to install and economical to maintain. "TransCover achieved this by developing a tarp cover that could operate in unison with a hooklift or a skiploader, which it called a HyCover and a Mini HyCover," says Les Carpenter, General Manager of the West-Trans Group.

Carpenter adds a key feature of the HyCover and

Mini HyCover is that both products use air rather than hydraulics to extend the tower, and a high-duty cycle electric motor to extend and retract the tarp. "This results in a system that weighs just under 200kg, which is half the weight of the traditional hydraulically actuated tarps currently being used in Australia, at roughly 70 per cent of the cost.

"In addition, TransCover also manufactured an entry level tarp system to cater to budget-conscious operators, known as the PullCover. The PullCover system is fixed into the load board and operates with a simple spring-loaded drum, similar in operation to a Holland blind. All versions are available with and without side flaps."

[www.west-trans.com.au](http://www.west-trans.com.au)





# Back and forth

ACCORDING TO NOT-FOR-PROFIT ORGANISATION PLANET ARK, EIGHT OUT OF 10 AUSTRALIAN COUNCILS REPORT PLASTIC BAGS AS THEIR BIGGEST RECYCLING PROBLEM. ARE WE ANY CLOSER TO IMPLEMENTING A COMPREHENSIVE NATIONAL BAN?

The debate around the banning of single-use plastic bags is all but new, yet continues to spark controversy on a global level. While Australia is still in the process of putting a national policy on the issue in place – South Australia, Tasmania and the Australian Capital Territory have established plastic bag bans, while NSW, Queensland and Victoria have all committed to investigating the introduction of a ban – the US is currently experiencing a concerning turnaround on the topic: Last month, Michigan became the fourth US state to place a ban on banning plastic bags, following the example of Idaho, Arizona and Missouri.

To put the development into perspective and explain just why back-pedaling is not an option, Peter McLean, Executive Officer at the Australian Organics Recycling Association (AORA), summarises the state of play in Australia.

"AORA has held a long-term national policy on banning single-use plastic bags since 2015. We want to ensure that

**"We want to ensure that only Australian Standards certified, compostable bags are exempt under any plastic bag legislation because they will break down under the parameters of a commercial composting facility."**

Peter McLean **Executive Officer, Australian Organics Recycling Association**

only Australian Standards (AS) certified, compostable bags are exempt under any plastic bag legislation because they will break down under the parameters of a commercial composting facility.

Ensuring this very strict standard means that all other degradable, oxo-degradable and biodegradable plastic bags will also be banned, as there are no guarantees that these types of bags will break down under specific timeframes and not produce any residuals like micro-plastics.

The only fail-safe method with so much confusion about product claims in the marketplace is to use AS4736 for commercial composting and AS5810 for home composting. Even biodegradable bags need to be left aside, as biodegradable doesn't always mean compostable. This is due to them not always meeting the Australian Standards in regards to time to decompose and complete biodegradation, which means they would have to leave zero residues other than some water, carbon dioxide and biomass.

This will also reduce the many

deceptive statements currently in the marketplace, which allow manufacturers to use statements like 'this product is degradable and breaks down when exposed to the environment'. Although not incorrect, statements like this fail to highlight the fact that those products



### Did you know...

- Biodegradation is a biological process in which materials, with the help of microorganisms, break down to less complex compounds and elements?
- In 2014, plastic grocery bags were the seventh most common item collected during the Ocean Conservancy's International Coastal Cleanup?
- San Francisco was the first major US city to impose a plastic bag ban, all the way back in 2007. According to the Earth Policy Institute Right there are currently around 130 plastic bag bans in place around the world.

**"It simply doesn't make sense for any country to be burying critical organics resources in landfill, especially when Australian soils are low in organics matter yet we want to increase our agricultural yields and grow food for export"**

Peter McLean **Executive Officer, Australian Organics Recycling Association**

often take decades to degrade and when they do they are simply breaking up into numerous little pieces.

This, in essence, is AORA's government submission and advice to all State Governments considering plastic bag bans, including the QLD Government submission due in February 2017. AORA has been engaging with State and Federal jurisdictions to ensure we convey these important points and to ensure introduced legislation achieves positive outcomes for all parties.

It is worth pointing out that the AORA is primarily focused on banning uncertified compostable and non-compostable bags due to their high contribution to contamination in the organics recycling process and the confusion between the non-certified types of plastic bags and Australian Standards-certified bags. Other drivers for banning plastic bags include litter, waste and threat to marine environments which are also important to AORA but not the primary motivations. Certified compostable bags also provide a very convenient

receptacle for domestic food waste collection. From the kitchen into the food and garden organics collection bins for council kerbside collection, people simply want a receptacle which is no mess and no smell, and this is why these processes are already in place across dozens of councils in Australia. Certified compostable bags also provide excellent solutions for source separated collections in commercial circumstances and therefore a number of sized bags are available in the marketplace.

The current state of play is that South Australia, Tasmania and Australian Capital Territory have established plastic bag bans in place while NSW, Queensland and Victoria have all committed to investigating the introduction of a ban, which was discussed at a Meeting of the Environment Ministers (MEM and previously COAG SCEW) and agreed to be led by NSW and QLD. Since then, we have seen a private member's bill drafted by the NSW Shadow Environment Minister, a plastics packaging ban bill drafted in Victoria and an indication to ban plastic bags

as well as a request for consultation released in QLD.

The ideal outcome for all groups involved – including the consumer – is to ensure we have consistent legislation in all States and Territories, which makes it simple and straightforward for everyone to know that we don't use single-use plastic bags in Australia.

This will then eliminate the misconceptions and 'green-washing' of pseudo environmentally friendly bags and only allow for proper Australian Standards-certified compostable bags, which will continue to provide convenient solutions towards increasing our recycling of important organics resources.

**It simply doesn't make sense for any country to be burying critical organics resources in landfill, especially when Australian soils are low in organics matter yet we want to increase our agricultural yields and grow food for export."**

For more information, visit [www.aora.org.au](http://www.aora.org.au). ■



**Peter McLean.**

# Trailer

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## AUSTRALIAN WASTE TO ENERGY FORUM 22-23 FEBRUARY

**Ballarat, VIC**

The annual Australian Waste to Energy Forum aims to provide a platform for stakeholders from a range of backgrounds to discuss the development of a 'waste-to-energy' industry within Australia with reference to international experience. The theme for the 2017 renewal is, *Waste to energy: what it means in an Australian context*.

**[www.aien.com.au/wteforum](http://www.aien.com.au/wteforum)**

## INTERNATIONAL AUTOMOBILE RECYCLING CONGRESS 22-24 MARCH

**Berlin, Germany**

Featuring a full conference program, site visits and an exhibition, IARC 2017 offers a platform for discussion of the latest developments and challenges of vehicle recycling. It reportedly brings together more than 250 decision makers.

**[www.icm.ch/iarc-2017](http://www.icm.ch/iarc-2017)**

## 2017 AUSTRALIAN LANDFILL & TRANSFER STATIONS CONFERENCE 27-30 MARCH

**Sydney, NSW**

This WMAA-hosted conference recognises the integral role landfills and transfer stations play in the waste management industry. The program will encompass all areas of this sector, from innovation and design to operation and regulation. The event also includes a conference dinner, where winners of the 2017 National Landfill & Transfer Stations Innovation and Excellence Awards will be announced.

**[www.landfill.com.au](http://www.landfill.com.au)**

## TOTAL FACILITIES 29-30 MARCH

**Sydney, NSW**

Total Facilities is marketed as Australia's largest industry exhibition for those responsible for managing, maintaining and enhancing working environments. Exhibitors include recycling and waste management suppliers and service providers.

**[www.totalfacilities.com.au](http://www.totalfacilities.com.au)**



# WASTE 2017

## 2-4 MAY

Coffs Harbour, NSW

'Coffs' is often regarded as the leading conference for the waste management industry in Australia. It is expected to attract more than 550 delegates, over 80 sponsors and exhibitors and in excess of 90 presenters.

[www.cooffswasteconference.com.au](http://www.cooffswasteconference.com.au)



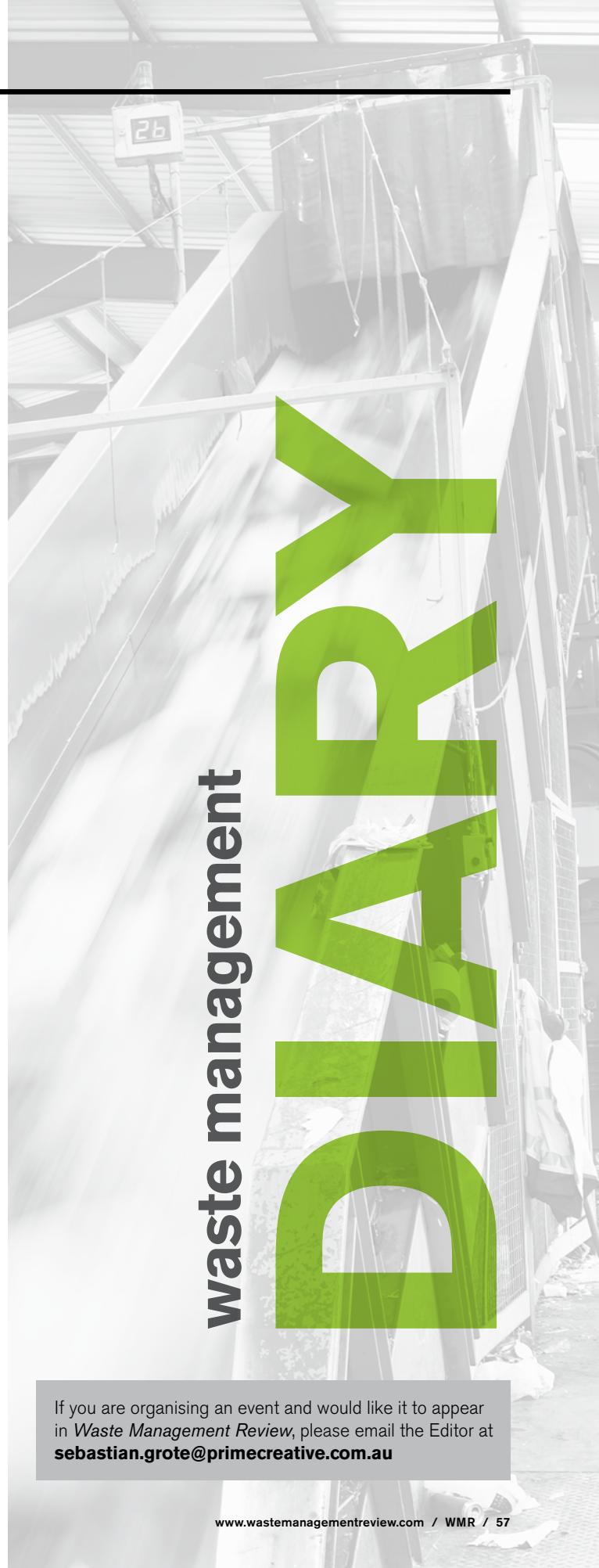
# AORA NATIONAL CONFERENCE 2017

## 10-12 MAY

Adelaide, SA

The theme for the 2017 Australian Organics Recycling Association Annual Conference is, *Healthy Soil, Healthy Food*. This is the main event for those working in or connected with the organics recycling sector.

[www.aora.org.au](http://www.aora.org.au)



waste management

WASTE MANAGEMENT

If you are organising an event and would like it to appear in *Waste Management Review*, please email the Editor at [sebastian.grote@primecreative.com.au](mailto:sebastian.grote@primecreative.com.au)

# Work to be done

MIKE RITCHIE FROM SYDNEY-BASED CONSULTING FIRM MRA REFLECTS ON THE IMPORTANCE OF SOLID GROUNDWORK IN THE POLITICAL REALM TO FACILITATE REAL CHANGE IN WASTE MANAGEMENT.

**O**ur waste problems are urgent. Waste is pouring out of the economy at a compound average growth rate of 6.3 per cent, and waste volumes double every 12 years. To tackle the issue, most Australian States and Territories have set ambitious recycling targets for 2020/21.

For Municipal Solid Waste (MSW), the diversion target is generally 65 to 70 per cent, except in the ACT where it's 85 per cent. For commercial & industrial (C&I) waste, the target is higher still – typically ranging from 70 to 80 per cent. Except, again, for the ACT, where it's 85 per cent. The highest targets, meanwhile, are reserved for construction and demolition (C&D) waste, with most state targets ranging from 75 to 85 per cent.

These are big numbers, and it's still a long way to go until we reach them – particularly for MSW, where new data shows that diversion rates need to increase by about 50 per cent to stay on track. But there is no alternative: The work we need to do is important and structural, even though it can be unexciting. It's work that is unlikely to capture the public's imagination in the same way as single use battery, coffee cups, CDs or light bulbs might be able to.

Some say that the schemes that

get people's attention, that win environment awards, are worth every cent because they attract media attention and money, as well as political capital. They connect people to waste problems.

But the problem is that money and political capital are not unlimited. Connecting people to waste problems is fine, but it doesn't build infrastructure or set realistic market prices. What you spend on one project is not available to another. So, can we really afford 'puff projects'?

The next few years must see the States and Territories being very focused on the structural changes required to achieve their 'boring' diversion targets. First, we need to get the infrastructure in place. That involves ensuring the economic signals for investment are right (gate fees, levies, grants), that the true cost of landfilling is reflected in gate fees by local government – including post closure and externalities.

It involves FOGO (food organics and garden organics) bins being rolled out to all households across Australia, and the organics composted for use, including in agriculture. It requires greater efforts in commercial and construction recovery in areas that are currently uneconomic. It involves infrastructure planning, reserving buffers, and it necessitates throwing

the book at illegal dumpers.

Simultaneously, we need cultural and economic change to make the decoupling of economic growth from waste generation a reality, not just a dream.

This is big and hard. It requires regulations to build product externalities into their pricing, and requires legal frameworks to make the circular economy a reality, not just a vision.

This is unsexy work. We almost certainly will not achieve the targets through splashy niche recycling, but instead through large-scale change working across the economy. We need to get better at recognising this important work. Most importantly, we need to recognise the work of the bureaucrats who create the legal and policy framework for real structural change.

When was the last time you saw a State Government policy officer awarded a prize for a new policy or regulation? What about the regulator who chased the cowboys out of town?

We need to recognise the gains of structural change and acknowledge the architects of those reforms. Sexy? Perhaps not. Important? Absolutely. So to all those groups and associations working in waste, please bring on "The award for boring but really important waste reforms...". ■

# waste

## MANAGEMENT REVIEW

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