A circular approach

Veolia’s Ben Sullivan highlights the company’s innovative new campaign.
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GLOBAL MARKETS
What effect, if any, will US President Donald Trump’s proposed tariffs have on the steel and aluminium global recycling market?

WASTE 2018 WRAP-UP
China’s National Sword policy was front and centre at this year’s event, with government representatives out in full force to discuss its impacts.

ORGANIC GROWTH
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THE TERM “CIRCULAR ECONOMY” GETS FLOATED AROUND MORE OFTEN than our weekly kerbside collection – but what does it actually mean? 

According to the Ellen Macarthur Foundation, it can’t be traced to a single author, but it gained momentum in the 1970s – spearheaded by thought leaders, academics and businesses.

This inspired German chemist Michael Braungart to develop the trademark Cradle to Cradle concept and certification process, which focuses on designing products for continuous recovery and reuse. Likewise, reducing the negative impacts of commerce through efficiency is also an important characteristic of Cradle to Cradle. Today’s meaning is frequently understood to be an alternative to the make, use and dispose model, in which we ensure longevity of our resources and endeavour to extract maximum value from them.

So if it’s been more than 30 years since the idea was envisioned, why are we still talking about it? Unless legislated, a true circular economy really takes generational change to inspire our manufacturers to prioritise recyclable materials over cost, or for major corporations to source their materials from recyclable or reusable resources. It takes generational change, or an ABC-commissioned series led by a comedic talking head, to inspire a consumer to put pressure on our parliamentary leaders to legislate on phasing out polluter materials.

The European Commission has taken important steps with its Circular Economy Package and identified action plans for its member states to keep track of its progress. But this also took time. They adopted the package in 2015 and began reaching agreements on waste targets, including packaging, by the end of 2017.

In Australia, environment ministers have taken practical steps towards genuine action. Off the back of the galling China waste ban, and what feels like never-ending coverage, came substantial commitments at an April meeting of environment ministers. With a host of recommendations, which we have covered online, ministers agreed to revive the National Waste Plan to include circular economy principles.

We’re still not quite sure what “circular economy principles” entail, but many of the recommendations, including a target of 100 per cent Australian recyclable, compostable and reusable packaging, are promising. It is one thing to talk about the ideas in general terms, and another to talk about it practically.

On circular outcomes, we’re proud to showcase the thought leaders within waste, water and energy management company Veolia. On page 14, the company discusses how it is reaching the community through an innovative virtual reality campaign, in addition to an update to their circular-economy-like facility at Woodlawn, NSW.
We rethink water through reuse, rethink waste through recycling and rethink energy through regeneration. Committed to driving improved sustainability outcomes for ourselves, our customers and our communities, Veolia will succeed in our global mission to Resource the World.
Australia’s first lithium battery recycling plant opens

Australia’s first lithium battery recycling plant has opened in Victoria in the lead up to the state’s ban on e-waste to landfill.

Envirostream Australia has opened its $2 million facility at New Gisborne, north of Melbourne, and recycled 240,000 kilograms of batteries this year.

Before the facility opened, most lithium batteries were sent overseas for recycling. Victoria’s e-waste is projected to rise from 109,000 tonnes in 2015 to about 256,000 tonnes by 2035.

The Victorian Government’s election commitment to ban e-waste to landfill now takes effect on 1 July 2019.

Starting the ban mid next year aims to provide extra time for new infrastructure to be established and for the government’s statewide education campaign to reach more people.

It also allows those managing e-waste, particularly local councils, to prepare for the new arrangements.

Sustainability Victoria is rolling out $16.5 million e-waste infrastructure development and awareness program to prepare for the ban.

It includes $15 million in grants to Victorian councils and state government entities to upgrade infrastructure at more than 130 collection sites and a $1.5 million awareness campaign to educate Victorians about how to properly dispose of e-waste.

The upgrades aim to ensure 98 per cent of Melburnians are within a 20-minute drive of an e-waste disposal point, and regional Victorians are within a 30-minute drive of one.

Envirostream received $40,000 from Sustainability Victoria to buy equipment to increase the recovery of valuable materials in batteries.

The 2017 Commodity Research Book Battery Raw Material Review says global consumption of lithium carbonate is expected to grow from 184,000 tonnes in 2015 to 534,000 tonnes in 2025, chiefly through the rapid adoption of electric vehicles, e-bikes and energy storage systems.

Sustainability Victoria Chief Executive Officer Stan Kpran said Envirostream Australia is one of the country’s trailblazers in reprocessing electronic waste and is helping keep valuable resources out of landfills.

“Envirostream is showing how opportunities can be developed in Australia’s resource recovery sector, create jobs in regional communities and capture valuable chemicals, copper, steel, nickel, lithium, other metals and graphene captured so they can be sent to South Korea to be used in new batteries,” Mr Kpran said.

“Only three per cent of Australian batteries are currently recovered. It’s the lowest rate in the Organisation for Economic Co-operation and Development (OECD).”

Envirostream Director Andrew McKenzie said recycling batteries at New Gisborne would create five new jobs over the next year and help build Victoria’s recycling capacity.

“We have a nationally coordinated partnership to increase Australia’s low recovery rates of batteries and mobile phones and want to make sure these recoverable resources are not just thrown away or sent offshore for recycling,” Mr McKenzie said.

“We’re working with Planet Ark and MobileMuster to increase used mobile phone and battery recovery and to educate the community about the need to recycle electronic waste onshore.

“We’re in an increasingly mobile world.

“Lithium batteries are now the dominant mode of energy storage for domestic and industrial uses, and like other e-waste, their use is growing fast.”

In related news, the Battery Stewardship Council has begun designing an industry-led stewardship scheme, which will undertake consultations of the industry and public in the coming months.
CREATING VALUE FROM WASTE

At Repurpose It, we hold the fundamental belief that landfills are a thing of the past, and that all waste can be converted to valuable resources.
Australian-owned e-waste recycling company MRI E-cycle Solutions has called for all types of e-waste with a plug or battery to be included under the Product Stewardship Act.

The news follows an April meeting of environment ministers commitment to fast track the development of new product stewardship schemes for solar panels and batteries. The federal government is also reviewing the Product Stewardship Act 2011, with its findings and recommendations to be provided to Environment Minister Josh Frydenberg by mid-2018.

MRI E-cycle Solutions said in a statement that it was eager to see regulatory reform across all states and territories that facilitates and encourages electronics and battery reuse. It said it hopes to see policies that maximise resource recovery and help local government manage e-waste without being economically penalised.

The company argued that it believes the upcoming Victorian e-waste ban presents an opportunity to synchronise it with an expanded national electronics stewardship scheme. The Victorian Government’s e-waste to landfill ban is expected to commence on 1 July, 2019.

MRI E-cycle Solutions said in its statement that the new start date will better prepare the community and local councils through public education and infrastructure upgrades.

The statement said that while Australia has made significant steps through the National Television and Computer Recycling Scheme (NTCRS) and voluntary programs like MobileMuster, the take-back, and recycling, of many other categories of electrical goods, have gone unfunded due to a lack of stewardship schemes. It noted that this means that e-waste still continues to flood into landfills at a cost to local government and the community.
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*Crumbed rubber asphalt using recycled tyres.

Volume based on Equivalent Passenger Units (EPUs). An EPU is a standard passenger car tyre. Full EPU Ratio Tables available at www.tyrestewardship.org.au
“It is essential that the NTCRS be expanded to include the same types of electronic products that will be covered under Victoria’s landfill ban to avoid shifting the cost of their recovery and recycling from producers and retailers to local councils,” the company said.

MRI E-cycle Solutions Managing Director Will LeMessurier said that Victoria’s definition of e-waste was the most appropriate way to better manage the recovery, reuse and recycling of electrical goods.

However, he noted that without a national electronics stewardship scheme, local governments would feel the brunt of the cost.

“There are still many categories of e-waste that fall outside the NTCRS, including mobiles, photovoltaic solar panels and batteries that will go straight to landfill in the absence of a comprehensive national electronics stewardship scheme to collect, reuse and recycle anything with a plug or a battery,” he said.

MRI E-cycle Solutions in its statement also argued that a mismatch between Victoria’s comprehensive definition of e-waste and the federal regulations will also create confusion for councils and the public as to what can be recycled.

“Expanding industry funded co-regulated and/or voluntary programs under the Product Stewardship Act to cover all types of e-waste will significantly improve economies of scale for industrial processing and create new employment opportunities.”

“It will also contribute to higher recycling rates nationwide and ensure the cost burden is shared equitably among producers, retailers, consumers and local government.

“Australia will then truly have a best practice model to the envy of other countries battling the challenge of e-waste.”
AWRESOME

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Australian company will convert China’s waste plastic to fuel

Australian company Integrated Green Energy Solutions (IGES) has announced a joint venture agreement with the Chinese Crown World Holdings (CWH) to expand its plastic to fuel production in China.

The agreement targets construction of a waste plastic to fuel facility in Weifang in China’s Shandong Province. The facility will have an initial production capacity of 200 tonnes per day, producing 70 million litres of road-ready fuels per annum.

The proposed site has existing infrastructure and sufficient space to expand the facility to more than 600 tonnes per day as the joint venture ramps up supply and offtake activities.

The first project will be jointly funded by both parties, with IGES contributing US$12.75 million (AU$16.41 million) and CWH contributing US$12.25 million (AU$15.77 million).

Crown World Holdings is a wholly owned subsidiary of Beautiful China Holdings (BCH), committed to becoming the leading eco-environmental protection operation and service provider in China.

In 2017, the Chinese government notified the World Trade Organization it intended to ban the import of all scrap plastics and unsorted paper by the end of 2017 as part of a broad clean-up effort against “foreign garbage”.

As of January 2018, China has enforced this policy. The move has hit Europe’s recycling industry hard, as 87 per cent of Europe's waste ended up in China.

As China has committed to cleaning up the plastic problem that has led them to ban foreign plastics, IGES is using the opportunity to help the country convert the waste plastics into road-ready diesel fuel, using its patented pyrolysis technology.

IGES’s patented plastic to fuel process enables the company to reduce the environmental impacts of waste plastic that would otherwise be used in landfills or discarded into the environment.

Earlier in January, IGES had announced the purchase of an Amsterdam-based entity with a fully approved and sanctioned Environmental Approval Permit, enabling IGES to produce road-ready diesel that meets European Standard EN590 and gasoline by December 2018.
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Rethinking **Sustainability**

VEOLIA’S BEN SULLIVAN, NSW GROUP GENERAL MANAGER, TELLS WASTE MANAGEMENT REVIEW ABOUT THE COMPANY’S INNOVATIVE VIRTUAL REALITY CAMPAIGN AND HOW RAISING COMMUNITY AWARENESS HAS FORMED AN INTEGRAL PART OF ITS APPROACH TO INFRASTRUCTURE.

In the early 19th century – there were one billion people on our planet. Today, there are more than seven billion.

Securing ample resources for our vastly populated planet, now and into the future, is inherently linked to “sustainable development” – an idea that has become increasingly mainstream in the last two decades. The origin of the term is most frequently cited as having emerged at the 1987 United Nations World Commission on Environment and Development. The UN-commissioned Brundtland Report famously stated: “Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.”

This need for longevity and preserving resources has manifested
in history through the development of sustainable outcomes which meet evolving community needs – a core focus of global integrated environmental services provider Veolia for more than 160 years.

The company’s journey began in 1853, when an organisation, known as Compagnie Générale des Eaux, was established in the French town of Lyon. Its first Lyon contract sparked a chain reaction that marked the beginning of a more than 50-year journey, with new approaches to city planning – buttressed by clean drinking water and treated wastewater, and large-scale energy production by the 1900s.

Veolia’s global expansion has, over time, allowed it to become a world-leading influencer in the environmental services sector – now active in more than 40 countries. In 2014, it integrated its water, waste and energy businesses into one organisation.

Promoting widespread reuse of resources through materials and waste recovery, water and wastewater treatment and optimising energy use has established Veolia as an expert in the delivery of a circular economy.

Understanding we live on a planet of finite resources, the company has made it its mission to help consumers and businesses and governments worldwide switch from a resource consumption model to a use and recovery approach.

Within Australia and New Zealand, Veolia is working with businesses, consumers and all levels of government to more efficiently use, reuse and recover water, waste and energy. It is also rationalising operational costs in the process while reducing its environmental impact. Veolia has taken this journey a step further with the launch of its Rethinking Sustainability campaign – exemplified through a new and innovative virtual reality video.

A NEW REALM

Rethinking Sustainability was developed in collaboration with brand agencies Republic of Everyone and The Bravery, and creative film production company Paper Dragon. Its aim is to encourage the community to rethink their everyday habits by showing them how their household waste is being transformed into a new resource.

The concepts of a circular economy and sustainability can be complex and often difficult to understand in practical terms. As such, Veolia wanted to create a story which was simple, engaging and communicated the real ways in which waste can be repurposed, recovered and given a new life.

Using virtual reality technology, viewers are taken on a behind the scenes journey of what happens to their waste once it leaves their hands and the value that can be recovered.

It begins with a 360-degree view of a bin-bound tomato, tracking its journey to a mechanical biological treatment facility (MBT), where it is sorted and separated from residual waste and processed into compost. The visualisation of the tomato’s re-emergence as a seedling set to start the process of life again demonstrates the circular economy. Veolia aims to ensure the audience realises the final message before it is shown on screen: “It’s with yesterday’s old that we build a new tomorrow – together.”

Ben Sullivan, Veolia NSW Group General Manager, explains that the presentation of Veolia services can often be technical and/or targeted at commercial or business clients. He says that through Rethinking Sustainability, the company wanted to simplify and breathe life into how waste is transformed into a recoverable resource.
“While our initial story focuses on waste, we hope to also showcase the same concepts of recovery and optimisation for all the services we deliver, including water, waste and energy,” Ben says.

“After all, when we think about how individuals and/or businesses can best reduce their impact, this forms the basis of any sustainability journey.”

Ben says Rethinking Sustainability is evolving Veolia’s message to include examples of its energy recovery through better monitoring and technology upgrades. He says Rethinking Sustainability is also characterised by optimising water and wastewater recovery through better operational efficiency of water utilities and assets.

“Fundamentally, we want to reach a wider audience with a focus on avoidance, reuse and recovery,” Ben says.

“It’s really leveraging the social change we’ve seen in recent time around environmental awareness with programs like War on Waste. We are seeing our customers experiencing more difficult operating conditions, so driving efficiency and increasing productivity in line with improved environmental performance is the response to a perfect storm.”

Ben says the new virtual reality storytelling platform has significant cut-through from an educational and empathetic viewpoint through its interactivity and social media shareability.

“The tomato travels in a waste receptacle from the point of disposal – a home in Sydney – through Veolia’s Banksmeadow transfer station via rail, before arriving at Veolia’s MBT facility at Woodlawn.

“You can actually see what Sydney’s putrescible waste looks like when it’s amalgamated, then going through the separation, and eventually, fermentation process, where maturation happens.

“All the filming was done through the Veolia supply chain – on our sites and facilities – from transport through to end disposal and recovery. We have made the concept of a circular economy real and accessible for the everyday Australian,” he says.

COMMUNITY INSIGHTS
Statutory authority Sustainability Victoria’s research with CSIRO, Engaging communities on waste, showed knowledge about household collections was good, but knowledge about landfills and the use of recycled materials was low. Ben says there is a lack of understanding around the complexity of the different types of waste and its various treatment processes.

“Many people see waste as just something that is put in a bin and taken from the kerb once a week,” he says.

Veolia aims to show how the organisation is investing in technology, people and infrastructure to ensure that the value of waste, at all stages of its life cycle, can be recovered and returned. Ultimately, Rethinking Sustainability aims to assist viewers to reconsider their everyday habits.

“If we reflect back 20 or 30 years ago, the campaign around waste and knowledge is not dissimilar to campaigns around skin cancer such as ‘Slip! Slop! Slap!’ or even ‘Life. Be in It’ for healthy living,” he says.

“We need to do more with less, and we need to make sure we are ready for the future.”

While aiming to be accessible to a wide audience, Veolia believes there is great value in targeting younger generations, such as millennials. Rethinking Sustainability has been trialled with virtual reality headsets with more than 200 students at primary schools in Newcastle. Ben says reaching schools will have a direct impact on generational change and open up conversations around dinner tables for families about what they can do differently.

He says community confidence is paramount in the face of China’s enforcement of non-acceptance on 24 categories of solid waste with a 0.5 per cent contaminant or more. Veolia sees this as a fundamental shift in the market. At the same time, there is an opportunity for the waste industry to adapt and create local markets to retain the value of the waste we generate in Australia. This has flow-on effects in creating Australian jobs and stimulating investment in recycling and resource recovery technology.

“If the community loses confidence that we aren’t recycling valuable materials, then it will take a long time to rebuild that trust, particularly if they are already committed to separating their waste materials across different bins,” Ben says.

He says while there has been initial support from some states in supporting councils financially, it is important not to lose sight of the need to stimulate local recycling markets, which takes years to develop.

“We just can’t develop these facilities overnight. We need planning approval and investment surety and we need mandated markets for the product. While the initial support is encouraging, we need federal support and cohesion as well.”

MECHANICAL BIOLOGICAL TREATMENT
This commitment to investment in deriving value from what would otherwise remain waste is evidenced by Veolia’s $100 million investment at the Woodlawn eco-precinct. It is located on a rehabilitated mine site in the NSW town of Tarago, 240 kilometres from Sydney. The eco-precinct includes a bioreactor landfill, bioenergy facility and an MBT.
Supporting the major infrastructure on site are aquaculture and agricultural outputs, a wind farm and a community education centre, garnering up to 2000 guests a year, including schools, universities and community groups.

The MBT is the most recently commissioned component of Veolia’s Woodlawn eco-precinct and receives household waste from a number of Sydney councils.

It helps them meet their targets of diverting 70 per cent of waste away from landfill by 2021. Councils deliver the household collected waste to the two waste transfer stations (located in Clyde and Banksmeadow), where it is compacted into shipping containers at a rate of 31.5 tonnes per container. From there, it is taken to Veolia’s Woodlawn eco-precinct by rail.

Waste is combined with air and water in large rotating bio-drums which breaks down the waste before it undergoes anaerobic digestion to produce a compost product. Residual waste is then transported to the onsite bioreactor, which accelerates waste decomposition, maximises landfill gas recovery and extracts methane gas to convert the waste into energy and heat.

Ben says this precinct is a tangible example of Veolia’s investment in technology which extracts as much value out of the waste cycle. He says it reduces the nation’s long-term environmental impact while also helping the company’s customers achieve their sustainability goals.

SERVICING MELBOURNE

AT BULLA

In Melbourne’s north, Veolia’s organic waste facility in Bulla uses local technologies to turn thousands of tonnes of organics from 11 councils in the north and west into high-grade compost. Bulla processes 85,000 tonnes of bush trimmings, lawn clippings, garden waste and food scraps which would otherwise have gone to landfill. This is converted into about 60,000 tonnes of compost which is sold to commercial operators.

Veolia collects and transports the green waste to its Bulla facility where a large external pad screens the material for contaminants before shredding it down.

It is stockpiled until an enclosed in-vessel compost tunnel becomes available. Ben says the innovative design allows for a quicker biodegrading process.

“Air is recycled through the stockpile as part of the biodegrading process and the biological breakdown kills pathogens and weeds in the green waste,” Ben says.

“It takes about a week, which is a fairly fast process, versus the traditional process where you might shred and leave external through windrows.” He says it ends up on a final maturation pad before the compost product is developed.

The investment in technology at facilities like Bulla allows Veolia to contribute to reducing the industry’s waste-related environmental footprint. Veolia is working with local communities and customers to shift the focus nationally to reuse and recovery. This same mentality and examples of technical innovation go across all areas of its business, from waste to water and energy.

“Rethinking Sustainability celebrates the ways in which Veolia, in partnership with its customers and the community, is challenging the creation and consumption of water, waste and energy. It’s showcasing how investment in the technologies and people-power will create a new sustainable future for Australia and New Zealand.”

To view the 360-video visit: www.veolia.com/anz
Data is one of the building blocks that make a smart city. From real-time information on the next available bus, to tools to improve response times to emergencies, smart cities have the potential to revolutionise the provision of public services. Finding ways of capturing and broadcasting information is the first step to create an interconnected city.

Bristol is one example of such innovation. Through its Bristol is Open project, the south-west English city has developed a network of fibre in the ground and a wireless network which incorporates Wi-Fi, 3G, 4G and 5G, combined with a radio frequency mesh network of 2000 of the city’s lampposts. This allows for thousands of real-time data applications in sectors such as health, education, local government and other businesses.

But what exactly is a smart city? Some expert organisations, including the UK Government in 2013, have acknowledged there is no absolute definition. According to a background paper by the Department for Business Innovation and Skills, the concept is static, there is no end point. It is rather a process, or a series of steps, in which cities become more “liveable” through modern digital infrastructure.

**CONNECTING CITIES**
Consultancy firm Adelaide Smart City Studio defines a smart city by its use of “technology and data to drive economic activity, accelerate innovation and better manage energy, resources and services”. It says collecting, analysing and intelligently
using data is central to the concept of a smart city. According to its website, the Internet of Things is the next logical step in the internet revolution, allowing everyday objects – appliances, cars and city infrastructure – to be connected to computer networks.

Public utilities with sensors and connective abilities can provide a way of finding out how and where infrastructure is being used. With information from smart furniture, city planners and councils are able to optimise how they design and operate essential services and infrastructure.

For example, a network of streetlights could automatically turn themselves on and off when required to save energy. Park benches could detect when they haven’t been sat on for extended periods of time, which can tell councils if infrastructure is being unused. Smart rubbish bins can send out alerts when they are 80 per cent full to give collection teams a better understanding of where they need to travel.

To gather evidence on how smart cities can benefit social health through improved public spaces, researchers from the University of New South Wales (UNSW) are collaborating with Street Furniture Australia and Sydney’s Georges River Council. Through this, they will investigate the long-term effects of sensor-based smart furniture.

The grant project is funded through the federal government’s Smart Cities and Suburbs Program and is entitled Smart Social Spaces: Smart Street Furniture Supporting Social Health.

The research team will analyse data from smart infrastructure installed within Sydney’s Georges River Council over six months and analyse how effectively the council can use the technology. Dr Nancy Marshall, Senior Lecturer in City Planning at UNSW, says the team has already been collecting data manually to compare the difference in results.

**SMART BIN POTENTIAL**

Nancy says the project aims to ensure cities and governments are able to get the best use out of high quality spaces by being smarter with their resources. UNSW is targeting infrastructure such as park benches, seats, tables, outdoor barbeques, lights, and most importantly for the waste industry – bins.

“With bins, there’s already a significant amount of technology available. Sensors inside bins are able to detect how full it is, letting garbage contractors know when they need to pick it up. It can also be fitted with a heat sensor to alert emergency services in case of a fire,” she says.

“This means that if someone was to throw out a lit cigarette butt, the bin would be able to automatically inform the correct people about a possible fire.”

Nancy says that by collecting data and taking an evidence-based approach, UNSW will be able to provide councils with information to support their decision making.

“The sensors inside the bin aren’t obvious to the outside, as they are encased inside. I’ve been told that they use less power than a watch and can help to get users engaged with the technology.

“Because they provide councils with information in real time, they’re able to route their waste collections more efficiently and stop issues like bins overflowing. With that long-term data, they can assess whether an area needs more or less bins, whether they need to be moved and the behaviours of waste generators.”

Bins are also able to be outfitted with solar panels to power other helpful, and potentially lifesaving, abilities.

“Smart bins have the capability of making public announcements. For example, they would be able to alert people nearby to evacuate a plaza and all kinds of public service announcements.”

Street Furniture Australia is coating

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**Fast Fact**

Solar smart bins use as much energy as a Christmas tree light bulb, and are able to function in shaded areas 24-hours a day. They’re also able to function indoors, powered by 240 volts, usually in airports or shopping centres. Neither model is energy intensive and they can use the power they generate for Wi-Fi, traffic management, or even people counting.
the smart bins with a teflon paint that is largely graffiti-proof – to improve area aesthetics and reduce council clean-up costs.

Nancy says this technology can also be used in regional areas and is ideal for farmers.

“Drone technology is already being used in some areas, while sensors are able to check water tanks which could be kilometres away. It saves property owners time and money, and the speed of data available is incredible.”

Nancy and the team’s research into smart sensors aims to have flow-on health benefits and pleasing aesthetics for urban areas.

“There’s nothing more unappealing than a bin that’s overloaded with garbage. They’re messy, they can attract wildlife and are unhealthy. Solar compacting bins can help deal with these issues, which is critical in dense areas,” she says.

“Successful governments and businesses will need to be nimble and open to seeing the benefits of smart infrastructure.”

SMART BINS IN VICTORIA
Victoria’s Wyndham City Council has invested in a trial of smart bins across the growing region. It installed 16 bins as a test to gather data and see if they would be a good fit for the council.

Tessa O’Brien, Waste Education Officer at Wyndham City Council, says the data has been useful to boost the efficiency of waste collection, with information available 24/7, including reports on an individual bin’s performance.

The bins are able to hold more than five times the capacity of a standard 120-litre bin thanks to its compaction capabilities. Its solar panels generate energy to compress the waste and are equipped with sensors which provide data that can be accessed via a dashboard and through mobile apps that can notify the collection staff.

“We’ve set up these smart bins in high traffic areas to gain the best performance and education outcome. We were collecting the original street bins every one to two days. Now, we’re collecting these smart bins on average only five to six times a month. That’s a big reduction in pick up demand.

“We’re able to see exactly how full each bin is and time our collections accordingly. One bin has been placed in an awkward and lower traffic spot, where we had been visiting once every couple of days on the usual round – now it’s once every 15 days,” Tessa says.

Tessa says reports of street litter have been reduced, particularly around the local government area’s train station, where there was often an issue of overflowing bins.

“We haven’t had the issue of overflowing bins since we installed them. We wouldn’t be able to know beforehand there’s a problem unless the community informed us, or there had been an event on with staff around. Now, instead of relying on our litter crews to perform visual checks, we have up to date data on bin performance all the time.”

Wyndham City Council’s goal is to divert 90 per cent of waste from landfill by 2040. Tessa says that to accomplish this, the council needed to innovate and take advantage of the new technology.

The City of Wyndham’s population is growing and saw the second largest percentage increase in population in Victoria between 2011 and 2016, with 55,000 new residents arriving in five years, according to the council’s website.

“We had a great education opportunity to get the community involved and show off the new bins. They are bright and engaging. We’ve had particularly positive feedback from the community, who are really happy with them,” Tessa says.

“Our solar bins have also been accompanied by a significant increase in street recycling bins within the municipality, as we had a key goal to increase public recycling services.”

Tessa says the collection process has become simplified. She says they’re functioning well and still look brand new. She says that they are serviced annually through council’s contract and under warranty for five years.

SOLAR BINS IN AUSTRALIA
Leon Hayes, Managing Director and Founder of Solar Bins Australia and Smartsensor Australia, says smart bins have a lifespan that provides councils and businesses a much higher return on investment than standard bins.

“When you take into account the
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efficiency benefits that come from the bins over the lifespan, it significantly outweighs the initial cost.

“A traditional stainless-steel bin generally lasts around five to 10 years, but it doesn’t provide anything further,” Leon says.

“A smart bin provides data to the customer over time, saving them anywhere from $30 to $50 a week per bin in operational savings alone. We’re seeing councils make a return on investment easily within two years of purchase when compared with a standard bin.”

Leon says this type of smart technology is the future, adding that he estimates $2.3 billion will be invested in this technology by 2022.

“Australia has a real opportunity to be a pioneer in adopting it. Over the next five years, I estimate a vast majority of bin manufacturers will be creating smart bins,” he says.

“Solar-powered bins have come a long way since they were first introduced. They’re now self-sustaining hubs with Wi-Fi and can power small cell networks. They’re an integral part of activity in urban centres and connect to a network of waste data collection points.”

He says that data is the foundation of a smart city and provides insight for planners to make decisions quicker and provide a greater financial benefit.

Leon explains that interoperability, which means the collusion of datasets and financially driven capabilities, allow cities to take what is already being done and engage with technology to remove hindrances.

He says connectivity of other data can reveal more about the city than just waste habits and provides a direct reflection of a city’s operational efficiency.

“We have the data from waste users to analyse what happened on any given day. It allows us to plan properly for events, and even predict where issues may occur in future and put measures in place prior to it occurring.”

“Replacing power poles, updating street parking and other smart infrastructure can be invasive to install, whereas bins or sensors can be set up in minutes.

“When governments and councils begin seeing the data, they’re able to consolidate different types of smart technology with the information they already have learned.

“Smart waste sensors are able to begin capturing data about the community and any changes it may be undergoing at a low cost.”

Leon says that councils are able to be more efficient with their waste collections, which can ultimately go towards saving the ratepayer money, with Solar Bins Australia saving businesses and governments anywhere from 40 to 80 per cent on their collection activities.

“By optimising for the future, you can reduce carbon emissions from trucks, as well as reduce the amount of times you need to send vehicles out to harder to reach areas,” he says.

Hume City Council has seen the benefits of Solar Bins in action, installing them last year. Sean Sciberras, Waste Manager for Hume City Council, says waste collections have reduced by 60 per cent.

“As the population in the area grew, there was a need for more services and collections.

“The bins have provided a cost-effective way of managing that increased demand,” Sean says.

“They’ve gone into a mixture of high and low traffic areas, and in particular, in areas where there was a lot of litter that regular bins didn’t have the capacity to handle.”

Hume City Council took advantage of its bin rollout to visit schools and engage the community, holding art competitions for designs on the bins.

“The community has really embraced the bins, and we’re able to service more areas now that we’re collecting waste more efficiently.”
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It’s ground zero and all eyes are on Australia as the nation fearfully awaits the day where the taps turn off. We have run out of water.

It may be reassuring to think this scenario wouldn’t have played out during the Millennium drought – one of Australia’s worst droughts on record. But that was cold comfort for water authorities who were under immense pressure to secure water supplies for states and territories nationwide. No longer would Australia be reliant on its flourishing dams, but a network of new water infrastructure and programs to change consumer behaviour.

While not entirely a nationwide drought, it affected most of the country and much of the Murray-Darling basin. As different cities experienced varying levels of drought, the years 2006 to 2008 were the driest on record for many parts of the country. Fortunately, the waterless scenario never came to fruition, as Australia transitioned to a wet La Niña period in 2010 – marking the end of the drought.

Despite the rains arriving, the reaction to the nation’s crisis marked the dawn of a new era. It was an era characterised by new technologies, including desalination plants to provide rainfall independent supplies and recycled water, stormwater and groundwater. Desalination plants were invested in heavily during the Millennium drought, including in the Gold Coast, Perth, Sydney, Binningup in WA, Adelaide and Melbourne. The plants involve taking the salt out of water to make it drinkable via water distillation and membrane processes.

With population growth comes numerous challenges. As we move towards an urbanised future – an eclectic mix of technologies could be required to aid the transition. One of the most significant is the provision of affordable water.
affordable water in the midst of more stormwater and sewage generation, which places pressure on the existing infrastructure.

According to Briony Rogers, Senior Lecturer with Monash University’s School of Social Sciences and research leader with the Cooperative Research Centre for Water Sensitive Cities, many states acted quick enough with water conservation and desalination, but if the rains hadn’t come, a more severe management response would have been required.

“It was certainly a wake up call and we had to make decisions around desalination in a crisis context,” she says.

“There wasn’t time to have extended discussion on the best way forward. If water authorities had a longer lead time, they would have been able to explore a range of decentralised water recycling technologies.”

As there are many technologies for the future, Waste Management Review discusses these in further below.

**URBAN ENVIRONMENTS**

Melbourne is expected to reach five million residents by 2025 and overtake Sydney’s population growth in the 2050s. By then, both cities will house more than eight million residents. The recent projections are a stark contrast to the 1998 Australian Bureau of Statistics Population Projects, which had initially projected both populations under five million by 2051. Sydney is already at five million and Melbourne is creeping close at 4.8 million.

Dealing with this population growth requires a multipronged approach. In its Melbourne Water System Strategy, Melbourne Water highlights that sewage and stormwater are no longer considered waste products – sewage can generate recycled water, biosolids and biogas. Last year, City West Water, South East Water, Yarra Valley Water and Melbourne Water predicted that in the lowest supply and highest demand scenario, Melbourne will have a shortfall of water of more than 450 billion litres of water.

The document, *Water for a future-thriving Melbourne*, explains how recycled water can be used to irrigate farms and parks, flush toilets and in industrial processes. The benefits range from reducing the volume of polluted stormwater and treated sewage discharged into waterways and bays, to taking pressure off the water needed from the water supply system.

**RECYCLED WATER LEADERS**

One of the progenitors of recycled water in Australia has been WA – headed by the state-owned authority Water Corporation WA. A Water Corporation spokesperson tells Waste Management Review that WA didn’t experience the Millennium drought seen on the east coast in the 2000s, but rainfall has been steadily declining since the 1970s. Since then, May to July rainfall in the south west of WA has reduced by around 19 per cent, but streamflows to dams have declined much more dramatically.

The state-owned Water Corporation supplies water to two million people in Perth, the Goldfields and agricultural region and some parts of the south-west.

The 2016 *Future Opportunities for Water Services in Perth* report showed a water shortage predicted in the drought-ridden city, highlighting that the city must more than double the amount of drinking water it supplies to meet its growing population by 2050. The Water Corporation spokesperson says investment in climate independent sources has been a crucial part of its work to tackle climate change, as outlined in its 10-year Water Forever plan – a three-pronged approach, which includes working with the community to reduce water use, increasing the amount of water recycled and developing new water sources. It complements a 50-year plan to tackle water supplies to meet its target of 30 per cent recycled wastewater by 2030.

Contrary to a nationwide trend towards desalination, Perth responded with additional wastewater treatment facilities, such as the Beenyup wastewater treatment plant. This plant uses groundwater replenishment – a concept where treated wastewater is further treated to drinking water standards. It includes processes such as ultrafiltration, reverse osmosis and ultraviolet treatment to remove suspended soils, viruses and bulk and trace organics, and for final disinfection.

The water is then recharged into the natural underground aquifer where it will remain for potentially decades before being drawn out at another location, treated at a water treatment plant and added to the water supply scheme.

**TYPES OF RECYCLED WATER**

There are several types of water recycling in Australia, including non-potable reuse – water that can be used for industrial purposes, agriculture or landscape irrigation, or flushing toilets.

Direct potable reuse is safe for drinking and other purposes and indirect potable reuse is water that is reclaimed and returned into the current/natural water cycle. Indirect potable reuse can be returned into a natural water system, such as a groundwater aquifer, to treat the water for human consumption.

It is used in projects such as the Queensland Government-owned Western Corridor Recycled Water Project, which is followed by treatment processes such as microfiltration, reverse osmosis and advanced oxidation.
No Australian urban water supply uses direct potable reuse to treat its sewage – but the option was investigated further in a study by the Australian Academy of Technological Sciences and Engineering. Its review of existing Australian legislation and frameworks found a well-designed and operated direct potable reuse project could be used as a water resource management option.

Ian Wright, Senior Lecturer in Environmental Science at Western Sydney University, says Perth is sourcing more of its supplies from groundwater replenishment.

“Perth and Adelaide are really water stressed and I think they’re a good example for us in the east – Sydney, Brisbane and Melbourne in particular.”

“South Australia had to rely on flows down the Murray, which got really unreliable in the Millennium drought, while both Melbourne, Sydney and south-east Queensland had desalination ready to flick the switch.

“Perth does too – but they realised there’s a lot less salt in sewage. You can actually treat that and I honestly think that’s the answer.”

Ian says desalination is probably more expensive because of the energy, membranes and chemical engineering required. He adds that extracting that fresh water from salty is hard work.

“With the shortage of electricity we face now, that’s one of its biggest drawbacks.”

The Water Corporation spokesperson says its Southern Desalination Plant, which produces up to 100 billion litres of water each year, uses energy recovery devices to capture the hydraulic energy from the high pressure reject stream of the seawater reverse osmosis process. They said these devices transfer this energy to low-pressure feedwater, which reduces the overall amount of energy required in membrane desalination by up to 60 per cent.

NO SILVER BULLET

Briony believes that there is no single answer when it comes to selecting from a host of recycled water technologies, but the key is building climate resilient systems.

She says desalination is suitable for handling larger volumes of rainfall-independent water and more sustainable when supported by renewable energy. Lower energy technologies such as recycled stormwater can be useful for environments where there are catchments available and hard surfaces for the stormwater to run off and collect.

Ian says it’s important to adapt to future climate change coming our way. He says the Western Treatment Plant in Melbourne is a good example of this.

He says there is also potential for Melbourne Water Western Treatment Plant to be used further for non-potable reuse and indirect potable reuse with careful treatment – meaning it would be a drinkable water source.

REVERSE OSMOSIS

Ian says reverse osmosis is one of the new and emerging technologies for sewage. Reverse osmosis is used to remove contaminants from water by pushing this water under pressure through a semi-permeable membrane.

“The old treatment for sewage still had high nutrients in it, but it took a lot of the biological oxygen demand so you didn’t get that unhygienic effluent.

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water treatment with reverse osmosis as the last step and that is the future,” he says, adding that he predicts huge investment in this area.

Ian says Perth has been the leader in recycled water, relying heavily on desalination and groundwater for its water supply.

Perth diversified its water supply, with desalination and groundwater extraction providing about 90 per cent of the city’s water supplies. About 10 per cent of Perth’s sewage is recycled via advanced treatment and replenishment into groundwater supplies.

The Water Corporation spokesperson says works on an Australian first-of-its-kind groundwater replenishment scheme in Perth’s northern suburb of Craigie was completed last year.

It has the capacity to recharge up to 14 billion litres of drinking quality water to Perth’s aquifers.

“Work on the Stage 2 expansion of the scheme is under way, which will see the scheme’s capacity doubled to be able to recharge up to 28 billion litres of water each year,” the spokesperson adds.

By 2060, groundwater replenishment could supply up to 20 per cent of Perth’s drinking water, or around 115 billion litres each year.

COMMUNITY CONSULTATION

Ian says longstanding concerns about drinking recycled sewage can be allayed, as many dangerous waterborne diseases, such as cholera, are incredibly rare in Australia.

“Investment in advanced water treatment is in the millions and there is quite a lot of discomfort in the wastewater industry about a lot of governments going for desalination when it is likely more efficient to turn sewage into a useful product, rather than desalinate water,” he says.

“Brisbane, Melbourne, Sydney and Canberra have a fair bit of water needs, as sewage flow is predictable when compared to rainfall.

Briony highlights direct potable and indirect potable reuse are already happening in cities around the globe, including in Singapore. She adds that the technology to support recycled drinking water is already well established, it is now a matter of encouraging more community dialogue in Australia. In her research, the community has shown an interest in pursuing recycled water.

She says drinking recycled water could be part of a portfolio of options for cities in the future.

“Climate change is leading to lower overall rainfall and extended periods of drought, not only impacting on our water storages, but drying the catchments so that when it does rain, less water ends up running off into the dams.

“From a flooding perspective, when it does rain it will come in more intense, shorter periods, so drainage infrastructure will come under greater pressure from flash flooding.”

Ultimately, it’s about a shared vision, she says, with organisations and the community unified by a common direction and commitment to action for improving our climate resilience and city liveability through water innovations.
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Increasing recycled glass uptake

TOWNSVILLE CITY COUNCIL’S WASTE SERVICES TEAM MANAGER MATTHEW MCCARTHY TELLS WASTE MANAGEMENT REVIEW ABOUT ITS TECHNOLOGICALLY ADVANCED MATERIALS RECOVERY FACILITY AND USE OF RECYCLED GLASS IN ITS PUBLIC WORKS.

Q. We understand Townsville City Council recently completed a major refurbishment of its Materials Recovery Facility (MRF). Can you tell us about the journey of getting the upgrades organised?

A. The Townsville MRF opened last year and is operated by waste and resource recovery specialists Re.Group.

Council is working in partnership with Re.Group to ensure only the highest quality materials are collected and processed through the MRF.

The new facility is performing well, with a great team of around a dozen people. It uses the latest, best practice equipment to make the highest quality products possible. Our investment into a best practice facility has meant that, even in the challenging global markets, we are able to make and sell quality products.

The Townsville Recycling Facility takes everything that’s in the recycling bin and separates it by material type, so that we can sell it to the people who need it to make new products. The actual buyers change month by month, and we sell our different products to a range of local and international buyers. The single exception is glass, where 100 per cent of the product is made into sand used locally.

Q. What are some of the standout features of the facility?

A. Re.Group installed the Alchemy Optical Sorting system for sorting containers at the Townsville MRF. This system takes a high resolution image of each item passing the head scanner, and compares that image to a database of tens of thousands of stored images.

It works just like a human – once it has been taught that a specific item goes into a certain bunker, it will eject...
it to the right bunker each time it sees that sort of item pass.

The system allows Re.Group to sort plastic containers to grade, minimising the volume of low-value mixed plastic produced.

Also installed is the Krystelline Glass Implosion system, which converts all glass into high quality sand products.

The inclusion of a glass sand drier and various product screens at the Townsville MRF allows for production of speciality products, such as replacements for sand blasting and pool filtration media.

However, the major focus is on civil applications and to increase the use of recycled glass in public works so that the materials recovered go back into useful developments for the community. The MRF also uses the latest screening technology from Machinex to achieve high quality standards on recovered paper and cardboard.

We have also ensured we have adequate space for education and are in the process of fitting this space out to continue to engage with the community.

Q. How did council collaborate with the North Queensland Regional Organisation of Councils to establish a regional waste plan and what were some of the key achievements?
A. Townsville is the largest regional city in Northern Australia. It is a long way from the markets for recoverable commodities and associated waste management infrastructure in comparison to the metro areas in south-east Queensland.

We saw this as an opportunity to work together with our neighbouring councils, as these challenges present opportunities to look at innovative, tailored regional solutions that manage waste as close to the source as possible. The plan sets our regional agenda for a coordinated and more efficient approach to waste management, now, and into the future.

We’ve completed a lot: regional awareness packages, regional processing contracts, organics feasibility studies, waste audits, setting recovery baselines and measuring our performance on a regional level. This is important as we work towards our targets, consolidating our waste infrastructure across the region and closing landfills progressively. We’ve also established local markets for problem wastes – in particular glass.

We are now at the stage where we’ve completed a number of actions within the plan, but we now need to pause and review our course of action. We need to ensure we are aligned with the revised 2009 National Waste Policy and the inclusion of circular economy principles, as well as halving food waste by 2030. The Queensland Government’s review of the state waste strategy will also guide us to look towards emerging industries using diverted wastes. As we all know, there is no silver bullet and we need a range of measures to address the entire waste stream using a whole-of-waste hierarchy approach.

Q. How important is working with other councils to managing north-east Queensland’s waste, particularly as waste is often a shared responsibility?
A. It is now more important than ever that we are working together to achieve outcomes on a regional basis. Waste is everyone’s responsibility, and by working together, we can reduce the duplication within our systems and create a highly efficient service for our communities. There are synergies between the councils that we can take advantage of, especially when it comes to funding future waste infrastructure that will be required on a regional basis. We want to take a whole-of-system approach and establish resource recovery precincts on a regional level.

Q. Townsville City Council has recently trialled glass in asphalt at its landfill site. How is this progressing so far?
A. We recently built a transfer station at one of our sites – Stuart Transfer Station – and we used around 40 tonnes of the glass sand in the asphalt layer at a mix of around eight per cent. This blend equates to around 230,000 empty bottles being reused.
within the road network. Now, when our customers arrive at the facility, the road literally sparkles. This is only the tip of the iceberg though. We have another 1500 tonnes going into the construction of the road network at our Hervey Range Transfer Station site.

We are also using the materials for pipe bedding, concrete applications such as bus stop hardstands and footpaths, abrasive blasting, filtration media and tile construction.

Q. Added costs have been placed on some councils as a result of National Sword. How has Townsville City Council been affected?
A. Like any market, when there is less demand for recycled products, the value of those products drops. Materials will continue to be recycled, but we are still discovering what the commercial impact of China’s decision will be locally.

Q. How important is emphasising the importance of kerbside to residents through this process?
A. It’s never been more important for householders to be vigilant about what they put in their yellow top recycling bins. We need the best quality material with low contamination rates. We want every beer can, soft drink bottle, milk bottle, newspaper and pizza box in town to be sent to us so we can recycle it.

We’ve just refreshed our contamination action plan and will continue to push messages to make sure customers don’t put general rubbish or garden organics in with their recycling. We will also push the importance of placing recycled items loosely in the yellow top recycling bins. As we know, placing recycled items in plastic bags, such as single-use shopping bags, leads to lower recovery rates. Single-use shopping bags cannot be recycled through the yellow top bins.

Q. What do you look for in a collections contract tender and how do you go about it?
A. We actually conduct our own collections in-house, using a dedicated team of professional drivers. We’ve been operating this way for generations. We pride ourselves in being as good as, or better than, our best competitors. Our team are all 100 per cent focused on customer outcomes and we prefer to have close control over this aspect.

We see our ratepayers as shareholders in our business and take pride in returning any dividends back to the community.

Q. What is council’s vision for waste management in Australia and where does it see the future heading?
A. Ideally, we will begin to see a harmonisation of the industry across the states: moving from the linear “take, make, use, dispose” mentality to a more circular thinking where we retain products within a closed loop system to derive as much value as we can.

We have some huge potential opportunities in terms of a national professional development program for the industry, and there are definitely some greater opportunities around product stewardship nationally.

Consistency of waste definitions, especially hazardous wastes, will ensure consistency of regulation, but also enhance our data capture. This data is critical so we can use it to guide our decision making and investment when making the next step changes.
The Waste Management Review website features:

• Breaking news, updated daily
• Features loaded in fully digital form
• Events section
• Search bar for easy access to relevant information
• Mobile-friendly for updates on the go
Over the past decade, a hefty number of end-of-life tyres generated in Australia were exported for reuse and energy recovery – particularly in cement kilns. According to the National Market Development Strategy for Used Tyres, almost 15 million equivalent passenger units (EPUs) were exported to countries such as South Korea, Malaysia and India in 2015-16, where they are predominantly used as a tyre-derived fuel or processed into products such as crumb rubber.

Tyre Stewardship Australia (TSA) has been working diligently to increase domestic recycling. Its market development strategy shows local recycling doubled to 44,000 tonnes in 2015-16 – equating to a 10 per cent reuse and recycling rate. There are so many opportunities to process these tyres onshore for use in valuable end markets, including on our roads in asphalt, alternative fuels for local manufacturing or even crumb rubber explosives in the mining industry.

To stimulate the conversation, TSA hosted the second Tyre Industry Conversation in April to discuss with the tyre resource recovery industry and government, what can, and should be done in response to disruption to local markets from international policies and commodity price fluctuations.

Some of the discussion was predicated on the recent National Sword policy, which restricted specific waste streams with a contaminant of more than 0.5 per cent from being exported into China. While the policy has not affected tyres as significantly, it has shown how policy changes in a global marketplace can have flow-on effects that impact the entire supply chain.

Peter Taylor, Secretary General of the UK Tyre Recovery Association, was a keynote speaker at the conversation. He brought 15 years of knowledge with the UK’s tyre recovery and recycling industry. He says that everyone in the supply chain needs to come together and discuss the issues facing the industry as they appear. Peter says that it’s important for tyre recycling stakeholders to see themselves as part of an industry – not just a service. In doing so, it changes how the supply chain interacts with one another and coordinates.

“One of the major lessons that can be learned from Europe is to avoid allowing ourselves to be in different corners. In some countries, new tyre manufacturers often feel the need to lead and dictate policy, and there’s a good reason for them to step in there, but it’s not the way. There is often too much factionalism in the industry, but we should be encouraging everyone to be involved,” Peter says.

A hot button issue discussed at the conversation was the need to explore more local processing to ensure...
Australia is not so reliant on exports. Peter says it’s no secret that many in the industry are exporting waste tyres to countries like India. However the example in China indicates that ongoing dependence on such outlets may not be prudent or sustainable in the long term.

The National Market Development Strategy for Used Tyres report says demand for baled tyre exports to Korea and India has increased significantly. A report on the Indian tyre industry by the University of Calicut found that Indian tyre production was expected to grow at a compounded annual growth rate of for more than 13 per cent during 2011 to 2017 – with eventual implications for its end-of-life management. India’s population is also expected to surpass China around 2024 to reach 1.5 billion in 2030, according to a 2017 report by the United Nations Department of Economic and Social Affairs.

“With India’s growing vehicle generation, it will need an efficient recovery system to handle more and more waste tyres. It’s very likely that countries receiving the tyres will begin developing their own local facilities and industries to handle their own supply,” Peter says.

“If we see India or another country decide to limit the number of waste tyres they accept, it could leave the industry suddenly trying to find a new outlet to handle it. If it happens to one country, then it will affect all the countries that had been exporting and the issue compounds itself.”

Liam O’Keefe, Market Development Manager at TSA, says the conversation was important to improve communication through all levels of the industry, from recyclers to exporters, importers and end users.

“We had a broad range of stakeholders from right across the industry engaging in mature discussion about some pretty challenging topic areas. The discussion was quite sophisticated and advanced in the issues raised and challenges posed,” Liam says.

“There are both benefits and challenges associated with the local market participating extensively with international markets. There are exposures to all waste markets, from changes in prices and policy, and we have to be aware of those to insulate appropriately so we’re not exposed to the risks of market fluctuations.”

Liam says the conversation focused on aspects of the industry that often don’t get much attention. He says it goes beyond those who are most immediately exposed to the practices of international trade themselves, including recyclers, traders and regulators. By facilitating such conversations, this helps stakeholders understand other perspectives within the resource and recovery industry, which allows collective initiatives to be undertaken.

“TSA has a strong role to play in creating a mutual understanding about what the challenges are and the collaborative efforts that can overcome them. It acts as an agent that can bring those elements together and provide a comprehensive picture of what’s happening and correct it if need be,” Liam says.

“We depend on collaboration with other agencies, including recyclers, international markets, governments and traders. Coordinating activities with them helps each other out.”

Liam says taking an Australian approach to an international issue is important when talking policy. Australia’s context is significantly different to Europe’s, America’s and Asia’s but learning from other countries provides valuable insight.

“There’s a lot we can learn from the principles and broad approaches in other countries, but we need to be aware of the Australian context. We need to learn what other organisations are doing well, but also understand that no system is perfect. We have to be open and engage with the industry and not exclude any parties to progress,” he says.

Liam says that diversifying the markets for tyre-derived products is vital to protect the industry from a potential flow-on effect.

“Diversity reduces the exposure to fluctuations in commodity prices and policies that are detrimental to the local resource recovery industry. Regulators, communities and the industry suffer when it’s not done right.”

Peter adds that the flexibility provided by a diverse market for tyre-derived products is essential to make sure there is a strong resource recovery industry.

“Tyres contain important resources, including carbon, oils, steel, gas, and tyre-derived fuel. By filling niches in both mainstream and smaller niche markets, it provides the industry with protection from a changing market.”

He says the way tyre recycling is governed is also important, praising the Australian method for its flexibility.

“Hybrid models that don’t restrict opportunities and allow for new markets to develop is important for healthy growth. Market-led methods allows for plenty of opportunities to provide for a conducive development and TSA is providing this,” Peter says.

“In some countries, like France or Spain, the mandated and rigid systems are set up with central bodies allocating resources. These models can stifle emerging business models, unduly influence markets and potentially hamper growth.

“A market-based system with some measures of oversight offers the greatest flexibility, avoiding rigid controls or a total free-for-all.”

A glass residuals solution

RESOURCE RECOVERY SPECIALIST REPURPOSE IT WILL USE AN AUSTRALIA-FIRST TECHNOLOGY TO HELP RECYCLE RESIDUAL GLASS FROM MATERIALS RECOVERY FACILITIES FOR CIVIL CONSTRUCTION.

Glass was discovered more than 5000 years ago and it takes one million years to break down naturally.

If businesses recycle it instead, it not only preserves landfill space – but the environmental footprint is significant – saving energy and raw materials. Per tonne, recycled glass conserves more than 1.1 tonnes of raw materials, including sand, limestone and soda ash, and uses 75 per cent less energy – according to a Planet Ark fact sheet.

Glass ready for treatment is categorised as glass cullet – sorted and crushed glass that is appropriate for manufacturing. Glass fines are crushed glass and often unsuitable for use in manufacturing due to the particles being too small, or contaminated with ceramic, stoneware, Pyrex and plastic. They are predominately used in civil construction in the form of a sand replacement in asphalt, concrete, road base and pipe embedment. There is also post-consumer glass, which includes windows and packaging waste.

As Australia’s recycling industry faces a glut of glass at a significantly reduced value, there are inevitably materials left over to be landfilled or stockpiled.

For resource recovery business Repurpose It, targeting the highest order recyclable is a priority, and in an ideal world, help it go straight back into manufacturing.

Repurpose It is in the process of installing Australia’s first construction and demolition waste washing plant, which will treat the residual waste from materials recovery facilities (MRFs) and process it back into materials suitable for civil construction. Based in Melbourne, Repurpose It will wash materials including rail ballast, glass, excavated materials and demolition waste fines.

FROM MRFS TO REPURPOSE IT

Repurpose It’s George Hatzimanolis says that some glass fines are already arriving at its Epping site from MRFs mixed with ceramic, stone and porcelain.

He says the materials are typically less than 20 to 30 millimetres in particular size and carry the risk of contamination if not treated properly.

“One of the more problematic materials is glass fines. The glass out of a MRF from kerbside collection is left with residual contaminants in there, from organics to sugars, and molasses and alcohol and all the other residues from your kerbside bin,” George says.

“Even though you’ve got glass that’s been fractionated to a suitable size for a sand replacement or road base material, there is still a residual amount of organics and contaminants on that that limits its use.”

He adds that this also comes with odour and bacteria issues, and potential leachate if disposed of to landfill.

George says that glass fines are commonly used in road base, but if treated properly, the resource recovery
industry can begin to set its sights on higher value materials such as pipe bedding, sand replacements or manufactured asphalt or concrete. This is because odour becomes an issue when the materials come into human contact.

Its one of the reasons Repurpose It has invested in the C&D washing plant, slated to be fully operational in November. The washing plant will take glass fines and scrub them clean through wet processing – a stark contrast to the current dry processing technology used in Australia.

“What we will end up with is a clean glass fines material that is a similar particular size to virgin sand and free of any contaminants, bacteria, odours or organics. This will enable a greater reuse of where that material can go, both from a performance point of view, occupational health and safety and managing our environmental risk,” George says.

“This is really about targeting the residuals – the really problematic waste streams that our MRFs can’t deal with. These are the materials ending up stockpiled.”

He adds that disposal costs to Repurpose It are cheaper than landfill and offer greater economic value to MRFs.

“On top of that, we are offsetting a lot of carbon because our carbon footprint is significantly less than landfill.”

**SAND PRODUCTION**

George notes that sand quarries are being pushed further away as a result of the urban sprawl – prompting more demand for sand replacements. For this reason, Repurpose It is aiming to produce replacements comparative to virgin sand, with some limitations depending on the application. The company has established arrangements with Melbourne-based MRFs to remove and process their existing stockpile of glass. Repurpose It has established in-principle agreements to onsell the clean glass sand it will produce to the construction industry. At full capacity, there is an opportunity to wash 200,000 tonnes of glass each year.

The process will involve the material being picked up from the MRF in granulate form, or sand, and then screened for unrecoverable materials. Eddy currents will remove non-ferrous or ferrous metals and contaminants, before moving to wet processing, where glass will be blasted with clean water to remove organic or contaminant fractions.

From there, it will travel through a scrubbing process with forced abrasion. This will follow with a secondary wet screening process. Finally, forced flotation will remove any organics or lighter particles and separate them by density.

George says this will result in a clean glass stream fractionate of roughly up to three millimetres and three to seven millimetres, with the ability to blend it to meet the particular size requirements of its customers.

He says cullet goes through the same process, with the ability to feed in anything less than 150 millimetres.

**COLLABORATION**

George says Repurpose It is continuing to work with the Australian Road Research Board, Cement & Concrete Aggregates Australia and VicRoads to modernise their specifications in line with new technologies.

VicRoads’ Technical Note TN107 stipulates the use of recycled materials in road construction, with glass fines able to be added to some granular products, some non-wearing course asphalt mixes and granular filter materials.

It is intended to act as a guide for the use of recycled materials in place of those derived from quarried sources.

George is also working towards securing Green Building Council of Australia Green Star certification.

“The opportunity with these products is to support projects that are striving to achieve an Infrastructure Sustainability Council of Australia rating,” he says.

“We can’t afford to just get rid of glass fines in road base anymore as they offer viable alternatives to higher end products.”
IVECO’S EURO6 EUROCARGO CATERS TO AN INCREASED PRIORITY TOWARDS SAFETY AND ENVIRONMENTAL PERFORMANCE.

SUEZ’s ongoing trials of an IVECO Eurocargo-based compactor have proved the refuse vehicle’s capabilities in servicing higher density residential developments, including gated communities and townhouse developments.

The 2018 SUEZ trial was primarily focused on testing a waste collection vehicle that was developed to handle infrastructure with lower gross vehicle mass limits and dimensional constraints. But despite this important feature, there are other significant priorities for IVECO in the refuse manufacturing space. Marco Quaranta, IVECO ANZ Product Manager, says the company’s Eurocargo caters to an increasing industry direction towards environmental and safety performance.

The new Eurocargo was awarded International Truck of the Year 2016 and is available in a number of 4x2 model variants with gross vehicle mass ratings ranging from 12 to 18 tonnes. A 15-tonne GVM 4x4 model is also available.

Marco says safety is becoming an important consideration for commercial vehicle customers. “Notable safety advancements in recent years across light commercial vehicles is leading buyers to question why many of these features have not been available in the medium duty market,” Marco says.

“These changing attitudes, combined with increasingly stringent occupational health and safety requirements, particularly among the larger fleets, were two of the catalysts for making the latest generation Eurocargo an extremely safe vehicle.

At the heart of the IVECO range is a six-cylinder, 6.7-litre Tector 7 engine, featuring high pressure, common rail, electronic injection, turbocharging and 24 valves. Available in two power ratings, the Tector 7 delivers 250 horsepower (185 kilowatts) and 627 foot-pound (850 Newton metres) in ML120 models. The ML160 and ML180 models offer 280 horsepower (206 kilowatts) and 738 foot-pound (1000 Newton metres). All figures come at low revolutions per minute for improved response and added fuel efficiency.
To meet stringent Euro6 emissions standards, IVECO models use its innovative new HI-SCR system, a single after-treatment system featuring passive diesel particulate filter. The HI-SCR system aims to be simple, lightweight, efficient and Marco says it provides contrasting benefits to exhaust gas recirculation and selective catalytic reduction equivalents, including reduced fuel consumption and tare weight.

The system also uses fewer components for increased simplicity and does not require driver regeneration, providing reduced vehicle downtime. It also lowers the risk of the vehicle entering limp home mode, a set of parameters that react against vehicle damage to provide safety in the event of driver neglect.

Other benefits of the Tector 7 engine range are generous oil change intervals of up to 80,000 kilometres (application dependent), further reducing the total cost of ownership. The engine oils used are low viscosity, which reduces friction for improved efficiency.

Coupled with the efficient engines are a choice of a manual ZF nine-speed overdrive transmission with dash-mounted gear shift or the Allison S3000, five-speed full automatic, which provides a more relaxed drive experience, particularly in start and stop refuse collection applications.

Along with increased environmental performance, the new Eurocargo also caters to another area of growing importance for fleet operators and government agencies – occupational health and safety.

All new IVECO Eurocargo variants feature standard front and rear disc brakes with anti-lock braking systems, electronic stability programs, anti-slip regulator, hill holder and advanced emergency braking system.

Using a radar integrated into the front of the truck, the system measures the distance to the vehicle in front and calculates the time remaining to take action before a potential collision. An audible double warning is triggered before the brakes are applied.

In the event of a moving obstacle, the system intervenes automatically reducing speed to 32 kilometres per hour to avoid impact. If the obstacle is stationary, the system can moderate or possibly prevent the impact by further reducing speed to 10 kilometres per hour.

Steering wheel-mounted controls for audio and Bluetooth also allow the driver to maintain both hands on the steering wheel for constant control. Other standard features include daytime running lamps for added visibility.

“The latest models offer an extensive list of safety equipment as standard, plus introduce optional additional features providing Australian buyers with the latest technologies from Europe, such as adaptive cruise control and lane departure warning systems,” Marco says.

“The safety equipment in the Eurocargo is comparable to what you would find in high end European passenger cars. As well as being a leader in efficient engine technologies, cabin ergonomic and low whole of life vehicle costing, IVECO is extremely proud of its safety offerings in the latest Eurocargo range.”

Operators can also select additional equipment including the innovative lane departure warning and adaptive cruise control.

Using the AEBS radar, adaptive cruise control adjusts speed by maintaining a safe distance to the vehicle in front. The feature has a range of up to 120 metres and automatically intervenes in various stages, first by reducing torque, then by applying the engine brake and finally, the service brake.

Other new driver assistance technology includes a lane departure warning system that warns the driver if the vehicle is moving from its lane.

Thanks to a windscreen-mounted camera, the system can recognise the road markings and will sound an alarm if the vehicle changes lanes without the driver signaling.

Marco says that for operators not yet requiring a Euro6 vehicle, IVECO also offers a selection of Euro5 environmentally enhanced vehicle-rated Eurocargo models. The Euro5 package provides different safety options for operators whose application might not warrant the full contingency of advanced features.

“With both Euro6 and Euro5 models available, prospective customers have more choice than ever before if they want to reap the benefits of a high quality, European truck.”
WHEN REPURPOSE IT NEEDED A RELIABLE AND VERSATILE TRAILER TO HANDLE ITS WASTE, IT TURNED TO THINWALL TRAILER’S GARBAGE GALOSH WALKING FLOOR TRAILER.

Repurpose It believes that all waste can be converted into valuable resources. Its vision is to help build a world that no longer needs landfills, by using the most advanced waste processing technology available.

Based in Melbourne, the company works to identify products at the end of their life cycle, which are then transformed into new materials for reuse. This occurs across multiple waste streams, including industrial, construction and demolition, solid inert, drilling and drainage and organics and other municipal waste.

The company processes incoming waste by separating waste types, shredding bulkier items for easier recycling and washing materials in its construction and demolition washing plant, slated for completion in November.

Repurpose It regularly carts construction and demolition and green waste, as well as landscaping materials and scrap metal throughout Victoria and interstate, which means it needs to use heavy vehicle equipment customised to specification.

The company also operates multiple transfer stations, including one of Australia’s largest, and has a dedicated fleet of walking floor semi-trailers to provide waste transportation and collection services to suit a variety of needs from the construction industry, recyclers and local government.

Part of this fleet is Thinwall Trailers’ Garbage Galosh Walking Floor trailer, designed to handle a variety of materials while maximising payloads. Thinwall Trailers Australia is the exclusive agent for this particular trailer design, which has developed a close relationship with the Canadian
company, Titan Trailers. The company aims to offer a durable product that can handle some of the most challenging cargo, including sand, dirt and glass, green, hard and wet waste.

Anthony Van Schaik, a Director at Repurpose It, says that Repurpose It looked at a range of trailers on the market, including overseas, and found the Garbage Galosh to be the best.

“We trialled the Garbage Galosh first and it stood up to the test when compared to other trailers,” Anthony says.

“The trailers are able to handle a large variety of waste products, from heavy construction and demolition, to the lighter organics. Because we cater to a range of waste streams, we needed to make sure our fleet was versatile.”

Repurpose It’s fleet needed to also cater to rugged environments while maximising payloads. The Garbage Galosh trailer’s enhanced efficiency, such as its faster loading and unloading, lets the trailer take more loads in a day.

“Everything we process should be of a high quality similar to virgin materials and it’s important to maintain that level in the harsh environment of waste,” Anthony says.

According to Thinwall Trailers, walking floors unload two to three times faster than other walking floors, and the Walking Floor Garbage Galosh trailer can save vehicle operators up to 10-15 minutes per trip.

Anthony says the process of loading and unloading a trailer can be tedious and time-consuming if the vehicle operator has to manually clean the trailer out. The moving floors shift bulkier materials from the front to the rear, via mechanical slats, to automate the process.

Thinwall Trailers distributes a range of moving floor-specified trailing equipment for fleets throughout the country. The Titan 14.63-metre three-axle Thinwall walking floor trailer is suitable for waste and recyclable payloads. As safety in the waste industry is paramount, the trailer comes equipped with WABCO electronic braking systems (EBS) – allowing for faster braking response times and reduced braking distance by several metres.

It also features the Keith Walking Floor V-Floor system which helps to reduce alignment, breaking or stretching issues with long-lasting aluminium floor stats. JOST landing gear ensures strength, lightness and safety. The combination of this and Thinwall’s patented aluminium body works to provide less downtime and a longer product life. Anthony says the trailers have proved effective with minimal maintenance issues.

The walking floor system also allows cargo to be safely and efficiently unloaded without having to tip the trailer. “Because they’re able to unload almost anywhere, it makes them flexible for more sites. From a safety perspective, it’s also a no-brainer, as a lot of the time we are unloading on uneven ground,” Anthony says.
In the agricultural industry, the term provenance is linked to knowing the origins of where your food came from. Understanding where food has travelled from can be difficult to ascertain, as there can be multiple stakeholders involved in the supply chain.

Fortunately, growing food and keeping it within a reduced radius has numerous benefits, from reduced greenhouse gas emissions associated with fewer trucks on the road, to supporting local industries.

This method is one of the guiding aims of regenerative farm – 96 Bangalow. Based in the Northern Rivers region of NSW, 96 Bangalow functions as both a place to dispose of food waste and grow local crops.

**SUPPORTING THE COMMUNITY**

The company’s mission is to develop a space which helps create a healthy lifestyle through regenerative land use and sustainable processes. It aims to create zero emissions while supporting ecological values and sustainable economies, supplying the community with locally grown produce, services, employment and education.

The facility operates on an 86-acre property that was once a cattle and stone fruit farm. Now, it has transformed into a place that seeks to close the waste loop and build a circular economy.

Blair Beattie, Project Manager at 96 Bangalow, says its regenerative agricultural practices and systems have been providing food for the community while diverting waste from landfills. The company has partnered with local cafes such as Harvest, sustainable consultancy firm Trust Nature, restaurants such as Barrio and a number of others.

“We work with local cafés and restaurants to supply them with bins, as well as educating them about source separation with best practice.
information. It’s vital that things like onions and plastics are filtered out into a different waste stream,” Blair says. “We collect that waste and use it for composting, in our worm farms and for premium food for our plants.”

He says the company is in an excellent position to help the local community and businesses embrace a provenance style of consumption. “Our aim is to help the entire shire become a purchasing platform for local growers. We want to cut down on the transport costs associated with food production.”

Blair says at the moment, it’s not uncommon to see stock being shipped up to Queensland, only to be distributed back to NSW. “That’s a lot of kilometres and wasted time that leaves food just sitting there when it should be eaten. We aim to ensure sure that the community is purchasing locally grown food, but also disposing of that waste locally as well.”

Blair says the farm has been steering clear of monoculture farming practices and wants to promote Australian bush foods. “Our bush food laboratory has been really great as an educator. Restaurants have gotten people into it, as well as people looking for some variation in gourmet diets,” he says. “We’re taking a permaculture approach to how we grow our plants. We plan to use a system called successional agroforestry, which involves planting timber, fruits and perennials in the same area to create a food forest,” he says.

“It means we don’t have to spend time fertilising or mulching, because the system supplies all inputs and the plants are more resilient, so there’s less of a need for pesticides. It produces nutritious products while helping plants come to fruit production quicker.”

**A LEARNING PROCESS**

Blair says the community has been eager to get involved and learn how to be more environmentally conscious. “Education is one of our passions, because a lot of people haven’t had great experiences composting at home. Compost produced in a household should ideally be done in an aerobic state, but for most, it becomes anaerobic, as it’s not maintained properly. With the right education, compost can be made without pests, smells or slime.”

At the moment, 96 Bangalow has three worm farms in operation, providing the company with valuable nutrients in the form of worm juice and castings. This is used as a nutrient to assist in plant growth.

96 Bangalow is planning on upscaling their operation, but to do that, Blair says they need a solid backend system of data. “It’s baby steps at the moment, but we’re hoping to really expand our systems. We plan to work closely with Byron Shire Council and businesses in the area to try and tap into the market with local growers,” he says.

“We can provide businesses with a healthy and environmentally friendly narrative, which we hope will incite change in consumers. When people learn how much waste is being sent to landfill, they’re usually quite shocked.”
“Our aim is to help the entire shire become a purchasing platform for local growers. We want to cut down on the transport costs associated with food production.”

Blair Beattie, Project Manager at 96 Bangalow

CIRCULAR DATA
To support its expansion, 96 Bangalow has been working with software specialists Mandalay Technologies to start collecting and analysing its business intelligence.

“When we have the data, we can begin to monitor business behaviours. It can help us with feedback from growers and gives us a deeper understanding about what waste will be created and where, and how we can tap into that to utilise it for our facility,” Blair says.

“It means we can keep track of how much we can intake and onsell to growers. If we’re able to record sales data, movements, purchases and quantities on a backend, we can properly prepare for how much organic matter we receive.”

Simon Kalinowski, Mandalay Technologies Managing Director and 96 Bangalow owner, says he bought the business a year ago to support the creation of a circular economy. He says taking food from the surrounding businesses and converting it into compost allows the circular economy to take effect.

Simon says the idea for the business was inspired by his own personal journey of having grown up in the Northern Rivers and later worked in a city. He notes that often we’re detached from the realities of food production and waste, which is why he encourages Mandalay staff to work remotely on the farm.

MICROECONOMIC INFLUENCE
Simon says 96 Bangalow is able to move waste in around 15 to 20 minutes – keeping transport costs to a minimal.

“You’ve got thousands of regions in Australia that are struggling with economic problems, yet consumers are still purchasing their meat or fruit from places that are grown thousands of kilometres away and that just doesn’t make sense,” Simon says.

“On a macro scale, and when you think about it from a consumer perspective, if you are purchasing food that is grown locally in your area it’s probably one of the best ways to build economic and job security.”

He says applying some of these principles locally can prove beneficial to supporting a government’s waste strategy.

“If we are going to achieve the sorts of waste targets that we set in order to create a circular economy, then all of these related benefits need to be measured. From a software point of view, I am curious to see what the data points we need to capture are and measure these so that councils can really support these initiatives,” he says.

Simon says the next step for 96 Bangalow future is involving Mandalay software to allow it to regionally source their food, but also learn about the practical methods to build a circular economy at home.

“We’re approaching it from a business point of view so that other local areas can personalise and customise it to their needs. The most exciting part is becoming an enabler for food to be grown locally and encouraging councils to divert waste from landfill into composting,” he says.
WHATEVER YOU NEED, FIND IT ON FERRET. THE SEARCH IS ON.

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Odour and dust management specialist biOx knows all too well the risks of not dealing with environmental, health and safety operational issues in the right way.

With increasing Environment Protection Authority (EPA), WorkSafe and council requirements, dust and odours can no longer be managed with a simple garden hose. In providing a solution, biOx has leveraged its more than 20 years of experience across Australia and New Zealand to reduce business costs and help them find best practice equipment for the task.

Peter Heeney, Sales Director at biOx, says that risk mitigation processes are crucial to preventing superfluous costs and EPA scrutiny.

biOx works with landfills and transfer station owners/operators to provide a custom solution to the challenges within the industry.

“The nature of the waste industry is dealing with odorous products, from food scraps to organic matter that breaks down,” Peter says.

“Although a lot of it can be managed by operations in the facility, but it doesn’t remove the risk that you’re bringing a product into the facility that might smell before it even gets there.”

He says that some site managers will assume they can just hose their facility down, without calculating the added costs of doing so.

“What is it worth to a company to be issued an abatement notice over a site? That’s compared to paying a modest
cost for an odour and dust management solution, allowing you to continue working uninterrupted,” Peter says. He adds that odour and dust management solutions were once considered an optional spend.

With the right technology in place, odour and dust can be eliminated. biOx are the Australian and New Zealand distributors for Spraystream. Spraystream uses cannon componentry and high pressure pumps to generate microscopic air droplets capable of weighing down and suppressing dust and odour.

The key to effective dust suppression is creating minute water droplets in the fine micron range that are a similar size to the dust particles the site manager is hoping to suppress. Splitting water up into micron-sized droplets increases the opportunity for dust suppression, including dust in the harmful particulate matter 10 size range.

For odour control, water is the carrier of a low dose odour elimination product carried within the droplet itself. Eliminating odours by oxidation or encapsulation renders the molecule odourless, preventing neighbouring businesses being adversely affected by a business’ operations.

Peter says Spraystream works in both high and medium pressures, with low volume nozzles that can be adjusted to suit the application – a key differentiator to competitor products. biOx systems come in medium – 20 bar/300 psi (pounds per square inch) and high – 100 bar/1450 psi pressure, low volume options.

He says many competitor products with low pressure units, or units without pressure pumps, create a much larger droplet that simply moves around the dust particle. This fails to collide with the dust particle and weigh it down, leading to further operational problems such as excessive surface water and run off. He says this is great for wetting down dust already on the floor, but ineffective at hitting the airborne dust fractions or keeping people safe from breathing these particles in.

Conversely, splitting a normal droplet several thousand times over creates a high surface area, low volume droplet – creating millions of opportunities to knock out dust. Many of the droplets evaporate, preventing unwanted runoff and welcomed cooling in the hot Australian climate.

He says finer droplets outside are susceptible to wind, while heavier droplets tend to be not so susceptible, so it is application-driven. Peter asserts higher pressure units are ideal for indoor and outdoor due to the impact on water volumes and operating costs. He adds that they are also suitable for very fine dust particles, such as concrete dust or asbestos.

“Medium pressure units are good outdoors, addressing both airborne dust and potentially dampening down on the ground, or a stockpile you can’t reach with your water cart,” Peter says.

“You’re minimising the dust being put into the air while addressing airborne dust.”

biOx is on hand to work with its clients and provide a custom solution to their individual needs, aiming to reduce their operational costs with a Spraystream configuration suited to their application.

“We understand the waste industry will have its own operational constraints and if we can save water usage, we’re going to be able to save on odour product usage and costs as well – adding value to our clients.”

As one example, its SS50i units (50 metre throw) have been used in New Zealand landfills to reduce water output and costs via high pressure and reduced volume pump options, lowering overall chemical consumption. The SS25i (25 metre throw) has also been used at a Melbourne landfill due to the low water volume consumption (6.5 litres per minute) and the ability of the cannon to be raised with a telescopic retractable tower to tackle large distances.

He says other products use steel componentry which can easily damage and rust, while the Spraystream is a fully composite, fibre-glass cannon, which protects it from becoming easily damaged, and a composite fan for added safety. Composite cannon construction, stainless and galvanised componentry work to ensure longevity in harsh environments, including landfills or for applications such as leachate evaporation.

“This would absolutely destroy other cannons out there. They just wouldn’t last, whereas we’ve got corrosion resistant options for durability,” Peter says.

Spraystream maintenance and operational costs are relatively low, he says, with smaller fans and smart design allowing air to be accelerated through the cannon. This aims to achieve larger throw distances with reduced power costs when compared to competitor systems. Pressure water pumps also help to lower water costs.

“I’ve seen some businesses out there with massive systems arguing they are capable of being blown by half a kilometre. On the other hand, Spraystream are about targeting sources of dust suppression and odour cost effectively.

“If we can get close to the source of the dust or odour and apply some fogging around that area, it is far better than doing it outside the building or on the periphery of your site. This is because you’ve got the same amount of odour spread out over a wider distance and it’s harder to control.”

He adds that biOx carries a number of its items in store for demonstration and hire, and can offer the waste industry a solution fast.
An oily solution

RESEARCHERS AT ADELAIDE’S FLINDERS UNIVERSITY HAVE DISCOVERED A NEW PRODUCT TO QUICKLY REMEDIATE OIL SPILLS – MADE ENTIRELY FROM WASTE PRODUCTS.

On 20 April, 2010, the oil drilling rig Deepwater Horizon, working in the Macondo Prospect in the Gulf of Mexico, exploded and sank, causing the largest oil spill in the history of marine oil drilling operations.

Four million barrels of oil emerged from the damaged Macondo over an 87-day period before the damage was reined in. Oil spills such as in the Macondo are all too common and can have devastating impacts on the environment and marine life. According to the International Tanker Owners Pollution Federation, around 7000 tonnes of crude oil spilled from tankers into oceans in 2017.

Spills can take anywhere from weeks to years to clean up and depend on a range of factors, including the type of oil spilled, the temperature of the water and the types of shorelines involved.

It’s why a team of researchers at Flinders University have looked at a more cost effective and sustainable way of doing things. Dr Justin Chalker, Senior Lecturer in Synthetic Chemistry at Flinders University in Adelaide, led an international research team which recently discovered a new way to soak up crude oil with an absorbent polymer – made entirely from waste products from the petroleum and refining industries.

The project was funded by a range of sources, including Flinders University, the federal government’s National Environmental Science Program emerging priorities funding, the Foundation for Science and Technology Portugal, the Royal Society University Research Fellowship, the Engineering and Physical Sciences Research Council and the European Research Council starting grant.

The absorbent polymer, made from waste cooking oil and sulphur, was found to be able to clean up crude oil and diesel spills. It acts similar to a sponge to absorb the waste materials from sea water and can be squeezed to recover the oil for reuse. The polymer is buoyant, so it will not sink to the bottom of the ocean. It aggregates so that when the water comes into contact with the polymer, the polymer forms a gel that can be easily scooped out. It can be added directly to a spill or packed through a filter to pass the oil water mixtures through and discharge the remaining water into the supply.

The discovery was made six months ago and requires field trials before it can be commercialised, but could be available by the end of this year.

Justin tells Waste Management Review that there are a range of commercial sorbents on the market, from polypropylene fibres to polyurethane foams, effective at removing oil from water, but these come with added operational costs, including deploying sea vessels to take them to the site.

“In contrast to those sorbents, our materials are comparable in the amount of oil they can take up. Our
polymer is elastic like a sponge and the oil can be recovered more readily than you can with many of the other skimming technologies,” Justin says.

He says an influx of petroleum feedstock with no end destination makes the concept a valuable business proposition. While the clean-up depends on economies of scale, Justin says the raw materials are virtually free. He says it should be easy for industries to source used cooking oil as it is primarily used in the production of biodiesel.

“Sulphur is stockpiled across the globe because the petroleum industry rightfully de-sulphurises crude oil when they refine it so we don’t make acid rain. The problem is, you have millions of tonnes of aboveground deposits of sulphur and not much to do with it.

“In contrast, the other commercial sorbents are mostly prepared from non-sustainable petroleum feedstocks. Sulphur is a petroleum feedstock but there aren’t a lot of uses for it currently, so this study is also important for managing chemical lifecycles.”

He says it could be deployed in nations that lack the remediation resources, including in the Niger Delta in Nigeria and Amazon basin in Ecuador, suffering from active spills that have remained unclean for years.

“Our polymer is also non-toxic. We’ve done toxicity studies, which is important if you’re going to use the polymer in open water or even in ports on some small scale manual clean ups, so you want to make sure you’re not putting anything in the water that is going to cause harm.”

Justin adds that surfactants, another cleaning agent, may conversely have toxic ecological effects as the oil breaks up into tiny droplets and is degraded biologically.

“The fact that our polymer works on contact is very promising for mitigating damage quickly,” he says.

“The next steps are to test this in the field and in parallel to that, we’ll be working on establishing a pilot plant in South Australia so we can make the quantities required to be a serious competitor in oil spill remediation.”
Lights out

IN THE FIRST PART OF THIS TWO PART SERIES, WASTE MANAGEMENT REVIEW LOOKS AT THE EFFECT OF RISING ENERGY COSTS ACROSS THE WASTE INDUSTRY, WHY IT IS HAPPENING AND WHAT CAN BE DONE TO MANAGE IT.

We’re hearing a lot about Australia’s electricity affordability problem. The Australian Competition and Consumer Commission’s (ACCC) 2017 Retail Electricity Pricing Inquiry Preliminary Report, paints a picture of the last 10 years. Based on consumer price index, retail electricity prices have gone up by 80 to 90 per cent in the past decade to 2017. As the major industrial users, including organics processors and other recyclers, largely rely on natural gas to power their heating systems, the prices of these fossil fuels dictate the bottom line.

Likewise, Australian Renewable Energy Agency (ARENA) Renewable Energy Options for Australian Industrial Gas Users report breaks down the largest uses of gas as those involved in metal and alumina production, followed by food, pulp and paper manufacturing, dairy production, beverage, wood manufacturing and a range of other areas. The ACCC’s report argues the international competitiveness of Australian manufacturers has diminished over the past 10 years due to price increases. It notes that the increased cost of gas only adds pressure to the decline of manufacturing, with the exception of the food industry, which is growing.

While reports of how rising power prices specifically affect waste management businesses are
limited, Dr Georgina Davis, Founder of consultancy firm The Waste to Opportunity Enterprise, tells Waste Management Review that unlike other sectors, the waste and recycling sector has been quiet on the subject of rising electricity costs. She says it is a significant and growing issue for the industry.

“We need to be putting pressure on governments, state and federal, to address the rising cost of electricity. Our sorting facilities and technologies depend on it, as does our ability to access viable domestic markets and remanufacturers with our products (recyclate),” she says.

Mark Smith, Victorian Waste Management Association Executive Officer, says feedback from members has been that that any site operating heavy machinery is feeling the pinch of rising power costs, in particular those working in metals, liquid waste and soil processing.

Last year, Adelaide recycling business Plastics Granulating Services was forced to close due to power bill increases of $100,000 over the preceding 18 months. Managing Director Stephen Scherer told the ABC News in 2017 the high cost of power had crippled his business of 38 years.

But why exactly have prices gone up?

GETTING THE PRICE RIGHT

In 1990, former Prime Minister Paul Keating, who was Treasurer at the time, asked the Industry Commission, an independent productivity authority, to investigate performance improvement opportunities in the energy market.

The 1993 Hilmer report led to National Competition Policy in 1995. Prior to this, the entire market was government-owned, with vertically integrated supply businesses in charge of the generation, transmission and retailing of electricity in the states and territories.

As a result of the report, some state and territory governments, including Victoria, began to privatisethe entire supply chain – dubbed the poles and wires – paving the way for competition in the generation and retail segments.

Keating also helped establish a National Energy Market (NEM) in 1995 – a wholesale electricity market in which generators sell electricity to retailers and energy onsellers to sell to consumers and industrial users. Responsible for 80 per cent of the nation’s electricity consumption, the NEM covers 4500 kilometres across five state and territory-based networks in New South Wales, Queensland, South Australia, Victoria and the Australian Capital Territory.

The ACCC report notes that reforms emerging from the National Competition Policy, privatisation of electricity assets, formation of the NEM and gradual opening of retail markets led to initial efficiencies in competitiveness and greater choice for consumers. But that all started to change in the 2000s.

The Grattan Institute’s index of retail electricity prices in its report: Price shock: is the retail electricity market failing consumers? shows real retail electricity prices decreased from the 90s until the late 2000s – where prices start rising sharply.

The prices retailers could charge businesses and consumers were limited by price controls until the mid 2000s, imposed by state regulators. This was dismantled in most states in favour of an advisory body for state and territory governments in 2005 known as the Australian Energy Market Commission (AEMC). The AEMC was established by the Council of Australian Governments to govern the nation’s main energy markets and makes and amends national gas, electricity and energy retail rules underpinning the NEM.

Victoria, the ACT and rural Queensland still regulate retail electricity prices for smaller customers. Electricity businesses are also state-owned in Tasmania and Queensland. Another body known as the Australian Energy Regulator (AER) regulates electricity networks and sets the amount of revenue that the network businesses can recover from using the networks, in all jurisdictions except Western Australia. However, it does not set the price of energy.

AEMC’s National Electricity Rules set a maximum market price cap on the cost of electricity and the Australian Energy Market Operator (AEMO) manages the set of procedures which send signals to generators guiding them how much energy to produce each five minutes, according to demand.

DEMAND FOR GAS

AEMO’s 2017 Update to gas statement of opportunities highlights that gas-powered generation demand is also dependent on the behaviour of coal-fired generation and other electricity suppliers using fuels other than natural gas. With gas generators providing electricity generation which adjusts during the day as demand changes, and a mix of renewable energy supplementing the prevailing incidence of coal in the NEM – demand for gas-powered generation varies. ARENA’s renewable energy report also mentions the amount of gas consumption, consumer bargaining power, timing of contract negotiation and proximity to the distribution system are additional prevailing factors in the price.

Gas-powered generation demand in
the NEM is dependant on a range of multifaceted factors. The main reason for price increases or decreases is pinpointed by a complex interaction of the gas, renewable energy and electricity sector (including network costs), energy supply and demand, competition and controls and price dynamics.

To make matters more complicated, the withdrawal of some old coal fired power stations such as Hazelwood in Victoria, Playford and Northern in South Australia and the now-planned closure of Liddel in NSW puts consumers and businesses in a situation where demand for gas has recently increased. AEMC in its May 2017 State of the Energy Market report finds network costs (wholesale and retail), were the main driver of higher retail bills in 2016, forecasting an upward trend over the next three years. AEMO’s modelling projects that the delivered wholesale cost of gas in Australia will increase by 48 per cent in 2036. The report highlights that wholesale gas prices make up a smaller percentage of the retail gas price paid by energy consumers, so the retail price will be lower in percentage terms. Despite this, high costs are still projected to contribute to less gas being used domestically.

**EXPORTATION**

Australia has, over time, become a major exporter of liquefied natural gas (LNG), with Queensland driving much of the investment, exporting it to nations such as Japan, China, South Korea and Taiwan. The federal government’s Australian LNG website describes the nation as the third largest LNG exporter in the Asia Pacific region, which plays a role in boosting the prices up and reducing supply in the local market.

The ACCC’s 2017 report also highlights that as a result of power station closures such as Hazelwood, gas power has become the marginal source of generation, particularly in Victoria and South Australia. With a tighter supply-demand balance, it becomes even more difficult for standalone retailers to compete with vertically integrated “gentailers” – those who own and operate both the generation and transmission infrastructure.

AEM’s statement of opportunities takes current forecasts to suggest a risk of shortfall in the total annual quantity of gas to supply the energy needs of the domestic market. Projections of aggregated gas product and LNG are dependant on market conditions and contracting – leading to a “dynamic situation” that can rapidly change.

Roger Horwood, Associate at energy consultancy firm Energetics, notes that the future of gas prices is largely preordained by the infrastructure already in place.

“Gas prices are almost locked in to some extent. We’ve already built these LNG plants to send it overseas and therefore whatever the price is to send it overseas will be the baseline in Australia,” he says.

Prices are also driven by how much gas is needed by domestic gas-powered generators, he says, used for peak load control in high demand times such as summer. Gas prices are currently going down, he notes, but the future remains uncertain.

Roger applauds federal government initiatives such as demand response, which has seen electric system planners and operators balance supply and demand in peak periods.

Under the federal government’s Renewable Energy Target (RET), which sets a benchmark to ensure 33,000 gigawatt hours of Australia’s energy come from renewable energy sources, financial incentives are provided for investing in these sources. The RET ends in 2030 and there will be no more certificates released in 2020. According to the Clean Energy Regulator’s large-scale generation certificate market update, there is likely to be a surplus of large-scale certificates through to 2020.

Roger says the absence of a coordinated energy policy framework and response at federal and state levels is a key contributor to the supply issue.

“You need some certainty around
what direction Australia is taking. It’s OK to say we’re going to support renewable energy so we can achieve a greenhouse emissions reduction target – essentially 20 per cent renewables into our power generation mix, and there’s incentives around it through large and small-scale certificates.

“But you need to consider the role of gas-fired generation, together with batteries, pumped hydro and demand response, to support the rapid growth in renewables.”

Dr Ariel Liebman, Deputy Director of the Monash Energy Materials and Systems Institute, says that since the AEMC and AER took over regulation of the energy network, it remains unclear as to who is really in control of price intervention.

“Distribution prices seem to have gone up since 2009 in NSW and QLD and they stayed relatively stable in Victoria. Western Australia went up. South Australia went up, which is surprising considering they were still private,” he says.

According to the 2017 ACCC report, in 2014, the AER found that Victorian and South Australian electricity businesses were more efficient than other distribution businesses that had, at the time, remained under state ownership. In 2014-15, the largest component of the customer bill was the cost incurred for transmitting electricity over transmission and distribution networks. “NSW was the worst – they had the highest distribution cost increases. Between 2009 and 2014, their distribution prices doubled, so the cost of using the low voltage network on average. The federal government didn’t gain control, which is the problem. They just had a regulatory framework,” Ariel says.

BUSINESSES AFFECTED

Ariel says the biggest pressures of energy costs have been placed on the small to medium enterprises.

“They’re the ones that struggle the most, because you’re talking about whether it’s worth having full-time people employed managing energy. But the commercial and industrial sector got good deals. The margins they were being charged by the retailers are pretty tight.” He adds that this only applies to the wholesale market price component. They pay more or less the same distribution network prices as the smaller end of town. Ariel says energy costs in the wholesale market have been historically efficient in their energy generation, leading to a competitive and relatively affordable retail price.

“It got bumped up by the distribution costs in NSW and Queensland and there’s nothing they could do about that. They can’t negotiate that price with anyone as it’s a monopoly business.

“What’s pushed their prices up, until recently, was the distribution prices when they’re connected at reasonably low voltages. The higher the voltage you’re connected to, the more you’re safe because you’re closer to the transmission network and you’re not paying as much of the distribution costs.”

He says the closure of power stations such as Hazelwood has brought the market into a tight balance of supply, allowing certain players to game the market.

TAKING CHARGE

Roger says managing the grid presents further challenges which will emerge down track, as some businesses take electricity generation into their own hands. “You’ll see groups of businesses taking advantage of lower cost renewables and innovative new technologies, working together to look after their own power needs. But they’re also connected to the grid and so the management required is different to what’s needed under a system with centralised power stations.”

Many waste businesses and even water utilities are using solar to reduce their costs. New South Wales’ Newcastle City Council is taking advantage of renewables to manage its costs. In March, the municipality secured a $6.5 million loan from the federal government specialist financier, Clean Energy Finance Corporation (CEFC), to
build the region’s biggest solar at the Summerhill Waste Management Centre. With construction beginning in June, the solar facility is predicted to save council $9 million in operational and construction costs across its 30-year lifespan. The five-megawatt installation is anticipated to reduce council’s annual $4 million electricity bill, after it doubled over the past two years. The electricity generated will flow into the nearby Ausgrid substation to offset electricity used at council facilities across the local government area and is expected to cut overall electricity usage by 30 per cent to 2020.

VWMA’s Mark Smith says that when it comes to awareness of potential cost savings via renewables, there has been a mixed response in the waste industry. “It’s not as simple as talking about cost savings, as all this stuff has a payback period. Many operators have flagged that if the payback period is over four to five years, it’s hard to get the project off the ground.

“For many operators it’s not just to invest, in say, solar panels. For example, it also requires investment in reinforcing the roofing on warehouses to support the added weights.”

RELIABLE SYSTEMS
Ariel says that proclamations that renewable energy has caused wholesale energy prices to increase is “fake news”.

“The system is as reliable as it was in the 90s. The risks to reliability will come when we move to huge penetrations of wind and solar because their output can’t be controlled, but there’s still some time to adapt to that,” he says.

“New build renewables are now cheaper than new build coal and gas for Australia because of the rising cost of building a coal-fired power station and the fuel costs are no longer as cheap.” He adds that renewables will replace ageing fossil fuel generators and become cheaper in the long term. In the mean time, Ariel suggests stronger regulatory powers for the ACCC and the AER – a tough decision politically.

The Federal Government’s National Energy Guarantee is aiming to offer reliable electricity and lower carbon emissions as it will require energy retailers and large-scale energy users to write contracts to meet emissions reduction and reliability obligations. The reliability obligations will be conditional on meeting the NEM’s existing Reliability Standard, which will only have to be met if AEMO forecasts the standard may not be met years in advance. Retailers will have to comply with a 26 per cent reduction in emissions by 2030. Waste Management Review has contacted the federal government for comment on the National Energy Guarantee and the Renewable Energy Target, but did not receive a response.

HOW TO REDUCE YOUR POWER COSTS
Rather than waiting for governments to take action, there are measures that can be implemented to reduce power costs. Mark explains that getting an idea of where a business’ main energy consumption is the first step. He says to ask yourself: what machinery or operations chews up the most electricity? Is this machinery efficient and effective or can we do better?

“But this approach only works if businesses have got time and the people available to carry out an assessment or audit. Many don’t,” he says.

“As an association, we are looking at partnerships with energy providers to offer these assessments to our members to tackle the hassle out for them.”

Mark advises to look to numerous energy assessment grants, such as those offered by Sustainability Victoria (https://bit.ly/2tY1Rgt), the Lord Mayor’s Charitable Foundation (https://bit.ly/2I2tM2K) and the CEFC (www.cefc.com.au). When applying for these grants, Mark notes it’s important to understand the criteria the funding body is looking for and articulate how you are addressing that criteria, as opposed to just outlining cost savings. He adds that marketing yourself is crucial.

In part two, Waste Management Review looks at the role of waste to energy in lowering power costs.
SORTING AND SEPARATING EQUIPMENT

From magnetic separators to optical sorting systems, Waste Management Review’s August edition explains how materials recovery facilities and recyclers are leveraging the latest equipment to improve efficiencies and gain a competitive edge in the marketplace.

As a key communication platform to waste generators, service providers, manufacturers, councils and consultants, Waste Management Review is the ideal medium to reach a major market and detail exactly what makes your product stand out from the rest.

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Global markets

WHAT EFFECT, IF ANY, WILL US PRESIDENT DONALD TRUMP’S PROPOSED TARIFFS HAVE ON THE GLOBAL RECYCLING MARKET FOR STEEL AND ALUMINIUM? WASTE MANAGEMENT REVIEW REPORTS.

On 19 January, 2018, the US Secretary of Commerce, appointed by US President Donald Trump to promote local industries, provided the President with a report into an investigation into the effect of imports on aluminium and steel on the nation.

In a 8 March proclamation, the President wrote that the Secretary advised him of his view that aluminium was being imported into the US in such quantities and circumstances which threaten to “impair” its national security. The current quantities of aluminium imports and the circumstances of global excess capacity were “weakening” the nation’s internal economy leaving the US “at risk of becoming completely reliant on foreign producers of high-purity aluminium that is essential for key military and commercial systems.”

Likewise, excess global capacity for producing steel was also said to be “weakening” the economy, resulting in the persistent threat of further closures of domestic steel production facilities.

In drawing this and several other conclusions, the US government responded with a 25 per cent tariff on steel and 10 per cent tariff on aluminium imported from all countries except Canada and Mexico. Trump has so far hinted Australia may be exempt by mentioning its strategic relationship with the oceanic nation, but not explicitly absolved. The White House in March confirmed Australia, Europe, South Korea, Canada, Mexico, Argentina and Brazil would be exempt until 1 May.

In a February statement, Namik Ekinci, Chairman of the Turkish Steel Exporters’ Association, said it would hamper the development of US industry and inflict harm on the domestic industry in the medium run.

“Both during the election process and after assuming office as the president, President Trump issued statements that new investments will be made,” he said.

“Considering that the US production stood at 72 million tons in the first 11 months of 2016 according to the USITC data, while consumption was 100 million tons and imports stood at 38 million tons in the same period, we estimate the US will have to import steel in order to realise the promised investments.”

In a March statement from Cecilia Malmström, the European Commissioner for Trade, she said the US measures will have a negative impact on transatlantic relations and global markets.
“In addition, they will raise costs and reduce choice for US consumers of steel and aluminium, including industries that import these commodities,” the statement said.

While the World Trade Organization has the ability to sanction nations that impose arbitrary tariffs, international recyclers wait patiently in anticipation of its effect.

Figures from 2017 by the American Iron and Steel Institute show the amount of finished and semifinished steel shipped by China into the US had reduced since 2016 at 813,000 tonne, with other nations forming the majority, such as Brazil at 987,000 tonne, Taiwan at 1.2 million, Germany at 1.4 million, Japan at 1.5 million, Turkey at 2.2 million and South Korea at 3.7 million.

According to an economic impact study by the US-based Scrap Recycling Industry 2017, the activities of the scrap recycling industry in the US generate nearly $117 billion in the country, accounting for 0.63 per cent of the nation’s total economic revenue. Scrap commodities are the nation’s largest exports by value.

George T. Haley, Professor of Marketing & International Business, University of New Haven, told American Recycler that the tariffs will probably affect the US recycling industry favourably in the short term. Following that, it depends on how negatively the global economy is affected by a potential trade war. He said US steel and metal prices are generally competitive, but the US metals industries won’t be able to satisfy demand on their own, so prices will go up due to scarcity and costs associated with paying tariffs.

Doreen Edelman, co-leader of Baker Donelson’s Global Business Team legal firm, told the publication the impact of tariffs on recyclers depends on where the recycler gets the materials.

“There are many sides of this problem,” she said.

“For example, will there be more work for recyclers because more US metal will be recycled and reused? The Aluminum Association also released a statement in March saying the organisation appreciates the President’s commitment to strengthening the US aluminium industry.

“We look forward to working with the President on implementation and to creating a more level playing field,” the statement read.

While Trump has hinted Australia would be excluded from the protections, figures show the nation relies more so on eastern nations for its exports.

Australia’s waste exports of metal have been mainly to China, which account for 31 per cent of total exports.

The next major partners are Taiwan, Malaysia, Indonesia, South Korea and Vietnam, according to 2011-12 Australian Bureau of Statistics data. The National Waste Report 2016 also noted the local metals recycling industry depends on exports markets, which have been under pressure over the years.

Tony Makin, Professor of Economics at Griffith University, tells Waste Management Review Australia isn’t a large exporter of steel or aluminium and therefore it will only have a small effect on the local economy. These exports are also covered by Australia’s Free Trade Agreement, which should ensure adequate protections.

“It’s not going to impact Australia unless exports from other steel and aluminium producing countries are diverted here for sale at very low prices. In this case, the federal government’s Anti-Dumping Commission can impose duties on those dumped at below cost of production prices,” Tony says.

Tony says that, generally speaking, tariffs only benefit favoured industries in the short term, but at a cost to households, other industries and exporters in the longer term.

“If tariffs become sizeable and widespread it forces companies to put their prices up, and that could also be inflationary.”

Overall, Tony notes the irony that the US manufacturing sector could suffer greater damage from losing its international competitiveness, rather than due to cheap steel and aluminium imports.
SUSTAINABILITY IN BUSINESS

Since 2016, Leftover Lovers has been holding public workshops to educate Australian businesses on how to reduce their food waste.

More than 5.3 million tonnes of food intended for human consumption is wasted from households and the commercial and industrial sector each year, according to the National Food Waste Strategy.

Likewise, FoodWise estimates Australian households turf $8 billion worth of edible food each year.

The figures drove Jessica Allice, a cook, to investigate a wiser way of making a difference to lower these volumes, educating the hospitality industry in the process, and establishing her business, Leftover Lovers.

Since 2016, Jessica has been purchasing leftover food waste to use in public workshops at a range of Melbourne organisations, including the Melbourne Farmers Markets, South Melbourne Market, Queen Victoria Market and City of Monash.

Jessica says it’s food that is still fit for consumption, but either doesn’t pass the cosmetics standards of the facility, or where an oversupply of food is leftover from the day.

The Food and Agriculture Organization of the United Nations estimates that 20 to 40 per cent of fresh product in the market is excluded due to high cosmetic standards in the retail industry – a figure regularly quoted in an Australian context.

“My experiences working in a food waste kitchen and seeing the impact of unnecessary waste on the farmer inspired me to show its true value and start a new conversation about what we are actually throwing out,” Jessica says.

She adds that much of the cosmetic standards in the retail industry are devaluing the hard work of farmers.

When establishing the workshop, Jessica decided to partner with another chef, Lynton Tapp, who had an understanding of rural life and the ability to achieve more with less. Lynton’s skills as a media personality and chef from the remote Northern Territory Roper River region also helped him communicate the values of improving food security and reducing waste.

Leftover Lovers works with stallholders to identify what produce they will have to bin if it’s not sold on the day. Jessica says these usually...
comprise seasonal items that are bought to excess, but can also be those that fall below cosmetic standards, including undersized and oversized eggs and broken carrots.

Leftover Lovers then takes these items back to the outdoor kitchen and in a public display, shows two meals that can be made at home with tastings throughout. It also displays messages to customers about how they can reduce their food waste at home.

She says food audits at the South Melbourne Market have had an impact. Since 2017, based on South Melbourne foot traffic, one per cent of the 5000 people that visit the market daily are taking on board the Leftover Lovers message of purchasing seasonal produce, and choosing food that would otherwise be thrown away. If the opportunities continue to be realised, up to 10 tonnes of food waste per month could be saved at the South Melbourne Market alone.

“A person taking on our message is going to purchase on average four kilos of food that would otherwise go to waste,” Jessica says.

“If 50 people take on this message, purchasing four kilograms of food each, that is 200 kilograms per market as a direct impact. If each person tells 10 more people, then this impact could be as much as 2000 kilograms per market.”

She says there are often three simple tips households can follow when it comes to reducing waste: buy less, as we often purchase more than we need to, exercise portion control, which will in turn benefit our health, and don’t be scared to experiment with recipes.

The ideas align with Sustainability Victoria’s Love Food Hate Waste campaign, which focuses on raising awareness about avoidable food waste in households.

The campaign quotes figures which estimate that 25 per cent of the contents of the garbage bin is made up of avoidable food waste.

Leftover Lovers is now taking its work a step further in working with a Melbourne not-for-profit social enterprise to assist a café in Brunswick to reduce its food waste. It is currently developing a three-year circular economy plan for the café after spending a few months auditing its waste operations, including its packaging suppliers and use of plastic bags.

“We will then come back with services and preserving food targets for them. We’ve also encouraged them to look at plastic-free Tuesdays,” she says.

The work of Leftover Lovers is an ongoing process, and one which involves changing people’s perceptions of what is classified as “real food”.

GOVERNMENT REPRESENTATIVES WERE OUT IN FULL FORCE AT THIS YEAR’S WASTE 2018 TO DISCUSS THE CHALLENGES FACING KERBSIDE RECYCLING.

From National Sword to the future of waste, this year’s Waste 2018 tackled all the big issues, while providing a constructive discussion of solutions to the problems facing kerbside recycling.

As one of the industry’s long-running conferences, established in 1996, the Coffs Harbour waste management conference has become a staple event for the waste sector. This year’s conference was no exception, with high profile presenters, networking functions and exhibitors showcasing the latest technologies.

Some of the highlights included Sustainability Victoria’s (SV) data analytics specialist, Guy Pritchard, Manager, Data Investment and Procurement, who had a foretelling presentation. SV has a publicly available data portal, which shows actual and projected waste quantities and recovery rates in Victoria – broken down by material. It has established this using a circular economy model to integrate its 15-years’ worth of trend data. The presentation showed how modern data and predictive analytics can be used to drive operational directions and be proactive rather than reactive. Guy explained traditional data was used to measure past performance, but now the industry can leverage data to a greater extent in their planning.

“One of the things that’s apparent almost immediately when we did this – we’ve got very good data on the collection, we’ve got pretty good data on the generation, we’ve got good data on sorting and landfill,” Guy told the audience at Waste 2018.

“But as we go further around the circle, our data becomes less and less reliable and we actually don’t have anything in design and production stages…but we started out with 12.6 million tonnes of waste being generated. We’d actually like to add in material flows so we know how much material is actually remaining in the economy, not just that which is coming through as waste and we’re working on that.”

Guy said materials such as plastics could be measured by volume, instead of tonnes going forward. This includes polystyrene, which has significant amounts still going to landfill.

“What we really need to do with plastics is probably map value, rather than tonnes.”

Throughout Waste 2018, councils and consultants showcased their progressive projects, from Victoria’s Albury City Council five-local government strong collaborative project – enabled halve waste, to northern Tasmania’s Justwaste Consulting, which has looked extensively into food and garden organics collection.

But a prevailing conversation was China’s National Sword policy – the nation’s ban on 24 categories of solid waste with strict contamination rules.

A noticeable presence of government representatives took the reins to explain how they were responding to the crisis, which has plunged numerous council contracts into renegotiations. These discussions took place over several panels, including Wednesday’s panel dedicated to the impact of China and Thursday’s talk, focusing on waste policies and regulations across the states and territories.

The discussions were met with constructive feedback from a couple of waste industry stalwarts, who frustratingly argued that they were ready and willing to establish new facilities, namely waste to energy, but raised the question: when will they finally have the investment certainty and the confidence to proceed?

Wednesday’s panel saw a lively debate on the impact of National Sword.

“What I’ve been impressed with is there’s enormous goodwill from local government, the community, state and businesses to find a solution. Not once have I heard people pointing fingers or blaming each other. In fact, they all recognise the size and the complexity of the problem,” said Stan Krpan, Chief Executive Officer of Sustainability Victoria.

“A million dollars is to support a transition. Bearing in mind, that a
million dollars doesn’t go very far in the waste sector, but that’s in addition to $30 million of additional investment in resource recovery.”

Tony Khoury, Executive Director, Waste Contractors and Recyclers Association of NSW, said the industry has long regarded kerbside as a free service, but China has now thrown that out the door. He also cautioned against putting recyclables into waste to energy.

States such as Victoria, NSW and SA have all provided some short-term assistance for the sector in response to National Sword, with other states also investigating the impacts to develop a solution.

On Thursday, SUEZ’s Justin Frank, Director of Marketing, Communications and National Key Accounts, spoke of the future of waste in Australia. Justin mentioned that a decade of economic growth in Australia and a short term approach has led to cheaper material imports. The key consequences in the industry have been investment in recycling facilities, a commodity price shock and an inability to react quickly. He argued that we need to play to our strengths and mandate glass in construction. This includes setting a minimum recycled content in products and using construction material as road base. It fed into discussions of a national approach to waste management.

Thursday’s panel included representatives from the ACT, Victorian, Queensland, NSW and South Australian government departments, chaired by Re.Group’s Chief Development Officer Garth Lamb. Topics covered ranged from waste to energy, container deposit schemes, the recent meeting of environment ministers and the National Waste Policy.

Despite the fluid situation in Queensland, Geoff Robson, Executive Director, Environmental Policy and Planning, Department of Environment and Science, pointed out that Queensland this year had a positive story to tell – with plans for a waste levy and new strategy.

Geoff said it was now time for the government to create the policy setting to boost its less than 50 cent recycling rate. He said it is useful for Queensland to learn from other states in developing policies, and the government is looking for alignment in this area where possible. He said the government is discussing the single-use plastic bag ban and container deposit scheme with other states. On waste to energy, Geoff noted the state’s local government association has expressed a strong interest in this space.

Dominik Nicholls, Manager, Waste and Resource Recovery, Victorian Department of Environment, Land, Water and Planning, noted the huge opportunity from April’s meeting of environment ministers and plan for an updated National Waste Policy. She mentioned the noticeable absence from the federal government on the Waste 2018 panel and praised national bodies such as the Australian Council of Recycling and the Waste Management Association of Australia for their leadership. On matters of container deposit schemes (CDS) in Victoria, Dominik said the government was watching NSW closely and wanted to see if a CDS scheme would stack up economically in the state.

Gayle Sloan, Chief Executive Officer, Waste Management Association of Australia, said we need to start thinking like the European Union when it comes to circular economy policy. She mentioned that if the 16 key deliverables were adopted from the 2009 National Waste Policy, then the panel would not be sitting there having this discussion.

On the quality of exhibitions, Lacey Webb, Commercial Strategist at Mandalay Technologies, told Waste Management Review, that Waste 2018 offered a great opportunity to catch up with the industry and discover some of the regulatory and data challenges they’re facing. She said there’s been an interesting focus on Queensland and what’s to come as a result of the planned landfill levy and the data capture required, including what will need to be tracked and how.
Soldiering on

WASTE MANAGEMENT REVIEW SAT DOWN WITH DIAL A DUMP INDUSTRIES MANAGING DIRECTOR IAN MALOUF AT WASTE 2018 TO DISCUSS GOVERNMENT POLICY AND THE STATUS OF THE NEXT GENERATION PROPOSAL AT EASTERN CREEK.

It was touted as the world’s largest waste to energy plant (WtE), but in March this year, Ian Malouf’s $700 million proposed facility, The Next Generation (TNG), at Eastern Creek, was struck a blow.

A New South Wales parliamentary inquiry established its terms of reference in 2017 to “report on matters relating to the waste disposal industry in NSW with particular reference to ‘energy from waste’”.

Of its 36 recommendations, one said that, subject to the current assessment process being conducted by the NSW Department of Planning and Environment, the NSW Government does not approve the facility. The NSW Department of Planning has now ruled it should be refused on several grounds and the Independent Planning Commission will have the final say shortly.

Industry advocacy bodies, such as Alex Serpo of the National Waste and Recycling Industry Council, last month in Waste Management Review argued that the inquiry was established off the back of the TNG proposal, with few chapters in the end actually devoted to WtE.

Waste Management Review sat down with Dial A Dump Industries Managing Director Ian Malouf at this year’s Waste 2018 event at Coffs Harbour, talking National Sword, government policy and the TNG proposal. But the battle for the Eastern Creek plant is far from over, as Ian says he’s prepared to take the matter to court if necessary.

“We’ll soldier on with the plan for Eastern Creek. We’re not going to stop that process,” Ian says.

“We’re going to turn our mind to establishing facilities in other regional areas in the state of NSW, in areas that want us and we will power their town. So we’re putting it out to all councils if someone wants us, we can collectively group councils together.”

TNG was planned to be located 35 kilometres west of Sydney in Eastern Creek and divert 500,000 tonnes of residual non-putrescible solid waste each year from landfill – enough to power 100,000 homes. The same site is home to the Genesis Xero Waste Recycling Facility, a material processing centre for waste from the construction and demolition, and commercial and industrial sectors, as well as landfill capacity and waste disposal facilities.

Its proximity to the NSW power grid provided a strategic outlet for the facility, and TNG had also offered to supplement free power for 1000 homes in western Sydney. Its vision remains to deliver a net positive greenhouse gas effect, eliminating about 1.5 million tonnes of greenhouse emissions per year.

In the consultation process, TNG
conducted multiple presentations to council and officers, two public exhibitions, 8000 DVDs and pamphlet drops delivered door to door, and online radio, news and television promotion. In addition, it door-knocked neighbouring businesses, corresponded with key stakeholders and community groups and participated and took questions in the parliamentary inquiry process.

Hitachi Zosen Inova Australia declared itself the technology supplier, offering its moving grate combustion technology, which is currently used in more than 500 projects worldwide.

Ian says the parliamentary inquiry decision went against the grain of WtE as being an important part of a waste hierarchy – with landfill at the bottom.

“We started this journey four years ago. Now, there is a real groundswell of support for us from industry. They can’t believe we’re not getting up on this, especially at this time right now,” he says.

It comes as the federal government has indicated a strong willingness to prioritise WtE projects in response to National Sword.

In late April, after a meeting of environment ministers, Environment Minister Josh Frydenberg said he asked the Clean Energy Finance Corporation and Australian Renewable Energy Agency to prioritise WtE and build on the $200 million invested in this area. Minister Frydenberg noted at the time how common it was in Europe to process residual waste through WtE.

It’s particularly challenging times for the industry with National Sword, and Ian says it isn’t helped by the fact that manufacturers have continued to import packaging products from overseas, as it is currently cheaper to import glass bottles than to recycle them.

“The fact that we export our mixed plastic waste and then we buy it back as a bottle is ludicrous. Bottles shouldn’t be coming into our country, they should be transported in bulk. Anything they want to bring in, whether it is beer, water or wine should be coming in vats and bottled here. That way, we create a new industry and we solve our glass problem. The same should apply to plastic.”

At April’s meeting of environment ministers, ministers agreed to a target of 100 per cent of Australian packaging be recyclable, compostable or reusable by 2025.

While making a number of pledges, ministers agreed to have a mid-June teleconference to discuss progress on recycling, and to meet in late 2018 to further progress delivery of the commitments.

The NSW Government released a one-off $47 million package to offset increasing kerbside collection costs and improve recycled product production, but Ian questions just how far the figure will go to solving the problem.

“You need billions of dollars of infrastructure to solve this problem in doing it correctly to reuse the materials here.”

When it comes to waste, Ian says it’s the jobs of governments to create markets by insisting on the use of Australian recycled products and following the practice themselves. Ian says once they do this, and stop trying to influence what should go in the household bin, the industry will do the rest.

He notes that that’s what industry does: if there is a market, the industry will supply it. Attendees at the environment ministers’ meeting agreed to advocate, where appropriate, to increase the recyclable materials in goods purchased by governments, such as paper, road base and construction materials.

Ian says once governments create markets, they should let the waste industry get on with the job.

“We’re here trying to spend a billion dollars for a waste to energy plant and we asked for nothing.

“As a company we are high achievers, and our goal is to have the most sophisticated and integrated waste facility in the world – something that all Australians can be proud of and that NSW should be embracing.

“We have the country’s best recycling plant and we’re expanding that now at Eastern Creek as our next stage of constant improvement.

“We’ve got the landfill, which in the modern world is necessary for contaminated soils, but not for combustible materials and the energy plant will complete that circuit.”

In an April statement, Professor Mary O’Kane, Chair of the Independent Planning Commission, said the commission will examine the application, the department’s report and other relevant material, providing a further layer of scrutiny to the process, and carefully weigh all views – community, proponent and government agencies’, before deciding if the proposed facility is in the public interest.
As the principal conference in Australia for the recycled organics industry, the 2018 Australian Organics Recycling Association (AORA) Annual Conference focused on a timely development in the industry – the beneficial use of soil conditioners, composts and mulches derived from recycled organic materials. The theme, Recycled Organics – The Circular Economy in Action, exemplified this topic. Through numerous workshops, presentations, a gala dinner and networking function, the event, which took place 2-4 May, offered an opportunity to gain insights into the latest developments in the organics industry. Experts from around the globe, including academics, government representatives, agricultural businesses and organics recyclers, touched down at the Hotel Jen in sunny south-east Queensland.

The recycled organics industry processes around six million tonnes annually in Australia and is seeking to increase its volumes through beneficial reuse.

The conference’s theme highlights that where policies, practices and technologies allow, every kilogram of organics has potential for beneficial reuse, taking material back to agricultural and other soils where needed. Importantly, it tackled the key issue of contamination, treatment and risk management, and compost user experience and performance data. The risks of contamination become a particular issue as more surplus organic materials are reused. A cost-effective driver of organics recycling is also generating market demand, which formed the basis of assessing the current performance of the industry.

The conference included experts such as Ramani Narayan, Distinguished Professor at Michigan State University in the US, who discussed designing single-use disposable packaging and products for complete biodegradability-compostability.

As a representative of Macadamia and Horticultural Services, Brice Kaddatz brought his agricultural industry knowledge – explaining how erosion and topsoil loss causes is detrimental to soil function and health. He addressed how compost could address this problem.

Another relatively new organisation, the Cooperative Research Centre (CRC) for High Performance Soils, will use its networks in the agricultural industry to identify soil research priorities and tailor its work towards meeting their needs. It will do so by advancing new products to increase soil fertility and function, while measuring the performance of soils, establishing mechanisms to reward high performers financially and developing new integrated soil management solutions to encourage greater precision.

Dr Michael Crawford, Chief Executive Officer of the CRC for High Performance Soils, provided an introduction of the CRC to the organics industry. He told Waste Management Review it is the biggest collaborative soil research effort in Australia’s history, with eight universities, three state government agencies, 19 farmer groups and a variety of industry partners.

Natalie Williams, Soils for Life, presents at the 2018 AORA Annual Conference. Photo credit: Paul Benjamin photography.
on board. AORA is a partner in the CRC which will help accelerate the uptake of composts and mulches in the agricultural market.

He says that the CRC for High Performance Soils was established to help provide farmers with the tools to more effectively manage their soils, improve productivity and profitability and ensure long-term sustainability. The organisation, of which AORA is a member, has secured 10 years’ worth of funding to further its research, including $40 million from the Australian Government, along with $124 million from 39 partners. It was announced in March 2017 and commenced in July 2017.

“We are looking at how we can add value to composted materials in a way that makes them more palatable and acceptable to farmers. Some of the major barriers which we want to overcome are the costs associated with transport, logistics and handling,” Michael explains.

“At the end of the day, the nutrient balance and ratio of nitrogen to phosphorus through compost material doesn’t always suit what the compost or plant needs.”

He adds that for these reasons, the CRC will focus its research efforts on manipulating the end product and increasing the concentration of nutrients tailored to a farmer’s requirements.

He explains AORA members will benefit from the CRC with more investment in developing soil amendments from recycled organics, and through opportunities for members to reach farmer groups and access research and researchers from across Australia.

“For me, the conference has been a real eye-opener in the great work being done in the organics industry and the opportunities for farmers and the environment,” Michael says.

The CRC will be identifying the key physical, chemical and biological indicators of soils in a range of climates, regions and land uses and the development of sensors to better manage these indicators and make sense of big soil data. Research will target the development of novel materials to address surface and subsurface soil constraints, and new moisture-retaining and microbial carrier products to deliver beneficial microorganisms.

“In many ways the appropriate technology is available to us, but we can be a lot more precise in tailoring our management because we can better understand the soil chemistry, biology and physics in a way we couldn’t do before,” he says.

“Right across Australia, our soils are inherently infertile. They are fragile and sensitive to degradation. We’ve achieved great success in agriculture over the last 100 years, but in many cases, our soils are now starting to feel the impact.”

Michael adds that there is an opportunity to take advantage of the growth of global markets through high-performance soils.

“The future is bright for agricultural exports in Asia as global demand for food increases as the world’s population increases.”

In 2018, the CRC will investigate innovative technologies to concentrate and recover nutrients from waste streams with minimal contaminants. They will also seek to boost the bioavailability of waste-derived nutrients from various soils and understand the influence of key waste inputs on the mobilisation and plant availability of major nutrients, including nitrogen, phosphorus and potassium (NPK) – a complex fertiliser required for healthy plant growth.

Another newly formed partnership with AORA is the not-for-profit Soils for Life. Soils for Life was established to enhance the natural environment through information and education on leading regenerative landscape management. Regenerative landscape is the application of techniques which restore landscape function, including organic composts, fertilisers and bio-amendments. Natalie Williams, ACT Chairperson, at the conference highlighted the importance of maintaining synergistic relationships between the organics recycling industry and agricultural industry. Soils for Life recently partnered with AORA and the presentation noted the importance the two relationships will play into the future.

Natalie tells Waste Management Review an increase in the uptake of the use of compost will expedite the improvement of soil much quicker than traditional fertilisers, due to its higher nutrients and water holding capacity.

“Most farmers are still applying non-organic fertilisers such as NPK and monoammonium phosphate (MAP),” she says.

“Regenerative landscape is important for future generations, because we can’t keep mining the carbon out of soil at the rate we have been doing. The co-benefits of using regenerative land management practices not only improve landscape health, but they decrease food and water security issues.”

She says what’s needed now is rigorous research on a commercial scale and Soils for Life is currently investigating a business case for more regenerative agriculture in Australia.

“We’re in the midst of rolling out nine business case exemplars on regenerative land management in Australia – this will form part of 100 case studies.” She says a variety of measurement tools for farmers will be part of the business case exemplars – which highlight regenerative land management practices of a farm in its entirety.
A greater push towards safety and efficiencies is driving legislative changes and updated guidelines about how waste is transported.

From Performance-Based Standards galvanising smarter trailer combinations for waste transport, to load restraint and Chain of Responsibility law changes propelling tarping solutions for skip loaders and hook lifts, the industry is embracing change.

As legislators place a greater emphasis on compliance, it becomes increasingly paramount that regulators and the broader supply chain collaborate. Bridging the gaps between industry segments that have previously operated in isolation was the focus of an exciting new international trade event – MEGATRANS2018.

The three-day expo, delivered in partnership with the Victorian Government, brought together those who plan, implement and control the efficient and effective forward flow and storage of goods, services and related information between the point of origin and point of consumption.

MEGATRANS2018 put key decision makers from across the entire supply chain under one roof. The event this May saw waste transport operators, suppliers, distributors, warehouse managers, infrastructure developers, telematics companies and more come together to discuss ways to improve safety, connectivity and efficiency in Australia’s transport and logistics sectors.

**COLLABORATING AS ONE**
The event explored new technologies, highlighted how development costs and lead time can be reduced with best practice systems, accelerated market entry by helping to find new joint venture partners and created new services by discovering new innovations.

Spread across the Melbourne Convention and Exhibition Centre in May, MEGATRANS2018 included multiple events in the lead up and during the expo, including the Australian Road Transport Suppliers Association Global Leaders’ Summit, the Victorian Government’s Ministerial Breakfast and the Logistics and Materials Handling Mercury Awards.

Kicking off the event was the Ministerial Briefing Breakfast, hosted by the Victorian Transport Association (VTA) Chief Executive Officer Peter Anderson and featured an address from Victorian Roads and Road Safety Minister Luke Donnellan.

With greater collaboration between statutory authorities, Transport Certification Australia was on hand to discuss how the ability to plan, monitor operations and mitigate risks in the supply chain is becoming more accessible through big data, global positioning systems and telecommunications. These innovations can ultimately help waste transporters carry more loads in fewer trips.

Cities and urban spaces are also changing which has sparked innovations. At the event, Muscat Trailers showcased its ED Etnyre Live Bottom trailer, which uses a conveyor belt in the trailer floor to allow for efficient material delivery without the need for tipping the trailer, helping it navigate tight spaces.

Other trailers, such as the Queensland-based original equipment manufacturers, Tefco Trailers, showcased their innovations. The Trail King live bottom setup includes remote controlled belt with door opening and locking, Hendrickson suspension and axles and Wabco Electronic Braking Systems for added safety.

**RECYCLING ON DISPLAY**
Australian tyre recyclers and manufacturer of tyre-derived products Tyrecycle were on the show floor, teaching people about the process of collecting end-of-life tyres.

Jason McGuirk, Tyrecycle Business Development Manager, brought in some samples of the company’s products made from crumb rubber and tyre-derived fuel. Jason said a lot of products recycled tyres are used into the creation of everyday utilities, including spray sealing for bitumen and material for playgrounds and athletics tracks.

He said the event has been positive and he will be coming back in the future.
“It’s a great opportunity to have a chat and catch up with some old faces and meet some new ones.

“We’ve had some interest from fleets who were thinking about bringing tyres to us and wanted to know about collection rates in relation to what we can do for visiting outlets to collect tyres,” he said.

He said there’s been interest from Tyrecycle partners in helping to outline the end destination for waste tyres, rather than going to landfill.

**SECRURING LOADS**
Manufacturer of recycled tyres Regupol Australia showcased a variety of load restraint systems made from recycled waste tyres. Regupol Australia was exhibiting its line up of load restraint systems. The system provides friction to make sure loads don’t slip and are usually placed between a steel deck and steel load.

The contemporary systems align with the National Transport Commission’s (NTC) 2018 Load Restraint Guide, which states that loads of all sizes and types should be restrained to prevent any part of the load from unacceptable movement during all expected conditions of operation.

The NTC’s updated Load Restraint Guide 2018 was released in February and provides practical advice on how to safely transport a load.

Regupol Australia General Manager Nicholas Anasson and Sales Consultant Daniel Anasson said they have never been to a show like MEGATRANS2018 before.

“We can put quite heavy loads on them – up to 80 tonnes per square metre – and can they be used in the weather or inside a factory,” he said.

Daniel said a lot of people at MEGATRANS2018 are already aware of Regupol’s brand.

**EFFORTLESS MOTION**
Isuzu Australia proudly displayed its new pair of concept electric vehicles, fitted with existing Isuzu vehicle cab-chassis. The trucks were being evaluated for urban applications, in particular for parcel and food deliveries services.

Simon Humphries, Chief Engineer – Product Strategy Isuzu said with vast improvements in battery density, new options are being opened up for electric light-heavy vehicles for urban applications.

“Telematics is becoming the norm and will most likely be the standard within the next five years,” Simon said.

Simon said he didn’t believe the current infrastructure in place would facilitate the broader commercialisation of autonomous heavy-vehicles within the next 30 years. He noted that as refuse vehicles are stop and start, they are unsuited to a driverless model, highlighting that too much of the operation relies on driver imprint.

Commenting on the success of the event, Simon Coburn, Show Director said it has been great to hear all the feedback from the industry and realise what a much-needed event for the logistics and supply chain sector.

“We look forward to working with you all on the next MEGATRANS2018 event,” Simon said.
Quantifying our contribution

WASTE AND RECYCLING INDUSTRY QUEENSLAND (WRIQ) HAS RELEASED A NEW REPORT WHICH SHINES A LIGHT ON THE REAL ECONOMIC VALUE OF WASTE MANAGEMENT AND SECONDARY RESOURCES IN THE STATE, WRITES CHIEF EXECUTIVE OFFICER RICK RALPH.

I have previously argued that the Queensland waste and recycling industry has had to endure more than its fair share of regulatory and policy instability. Over the years, we’ve had numerous changes of environment ministers with which we’ve had to negotiate with, and significant policy uncertainty through the now defunct Waste Avoidance and Resource Recovery Strategy.

But in the last decade, not many have sought to quantify the real value of employment that the industry brings to the economy.

We’ve focused broadly on waste generation and fate, but not on ultimately what is going to bring the productivity gains to invest in new technologies, build critical infrastructure or instil the confidence the industry so crucially needs. Importantly, we haven’t quantified our sectors real contribution to the economy.

In late 2017, the Waste and Recycling Industry Queensland (WRIQ) commissioned economist Nick Behrens to complete for us a report that quantifies the economic and social contribution of the waste management and secondary resources industry to the Queensland economy.

We circulated an electronic industry census questionnaire to WRIQ members, and survey responses were received from organisations – accounting for 67.4 per cent of all headline waste collected in Queensland. We extrapolated the statistics using a range of data sets, including the member responses, the Recycling

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**Headline wastes generated and recovery rates in Queensland 2016-17 (tonnes)**

- **Municipal solid waste**: 832,058 | Recovered: 1,861,301 | Recovered rate: 30.9 per cent
- **Commercial and industrial waste**: 1,318,612 | Recovered: 1,440,642 | Recovered rate: 47.8 per cent
- **Construction and demolition waste**: 2,213,422 | Recovered: 2,146,308 | Recovered rate: 50.8 per cent
- **Total**: 4,365,392 | Recovered: 5,450,651 | Recovered rate: 44.5 per cent

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[Graph showing headline wastes generated and recovery rates]

To put it in perspective, in an Australian first we have quantified Queensland’s waste management and secondary resources industry provides 11,835 jobs to Queenslanders, that is one in every 200 jobs – and $825 million in wages and salaries paid.

In terms of employment, the industry has grown by 17.7 per cent, a figure which is slightly lower than Queensland’s employment growth of 18.6 per cent over the same period. We believe this lower growth in employment is closely related to an industry trend towards increased efficiencies in a traditionally labour-intensive industry – whether that be higher quality compaction to preserve airspace, or advanced software to capture important site data and prevent unnecessary red tape.

In the interests of our more than 100 members, governments and the waste industry, we’ve shown how the state’s employment fares nationally. By state, Queensland directly employs 6432 persons in the waste management and secondary resources industry – with 842 operating their own businesses. We are the third largest employer behind only New South Wales at 9550 and Victoria at 7657. That’s 4404 more jobs than South Australia’s 2028, or 3103 more than Western Australia.

“"In terms of diversion, the worst performers are local government where it is only recovering 31 per cent of municipal solid waste.""  

Rick Ralph, Chief Executive Officer at WRIQ

Broken down by industry, the bulk of the direct employees includes greater Brisbane, followed by the Gold Coast, Sunshine Coast, Cairns, Central Queensland and the Darling Downs. That means most of the 11,385 jobs are in greater Brisbane at 5761. In regional terms, the opportunity for growth is real. But before that can happen, we have to unlock the potential in local reprocessing of materials collected. Demographically, Queensland is arguably the most challenged state in terms of its population centres and distance to markets. Therefore, the real opportunity lies in creating local value and more local use of materials where possible.

Over the past decade, the industry has grown broadly in line with many other major economic indicators for Queensland. In current prices, it’s risen by 58.4 per cent – just slightly ahead of the state’s gross state product of 57.8 per cent. When we look at what waste contributes to the state as a whole – in 2016-17 the industry’s direct value contributed $834 million to the economy. That’s $66 million more than the previous year, but almost on par with 2014-15 at $830 million. We’ve come a long way since 2006-7 when the industry was valued at $527 million.

But the investments need to keep up with growth of the economy and wastes that are generated – which is growing at an exponential rate. In 2016-17, 9.8 million tonnes of headline waste were reported – an increase of 648,000 tonnes from 2015-16. Removing the interstate figures locally, we produced 8.9 million tonnes.

In terms of diversion, the worst performers are local government where it is only recovering 31 per cent of municipal solid waste. Whereas in the industrial and business sector, the numbers are better, but improvement is needed with 48 per cent commercial and industrial and 51 per cent construction and demolition diverted. This represents a lost economic opportunity for the state if markets can be created. This is hard data that we should be focusing our conversations on going forward, not just empty rhetoric surrounding unfair landfill levies or interstate waste transport. WRIQ is focused on achieving real outcomes for the state and is optimistic that the Stakeholder Advisory Group will help the government co-design a waste strategy that provides certainty
But as new legislation and planning doesn’t happen overnight, WRIQ is offering practical solutions. At April’s Queensland Secondary Resources Forum, the industry released a five-point action plan in response to the issues facing the kerbside recycling market nationwide. The five-point plan, titled the Bundaberg Protocol, focuses on education and awareness, collection, procurement, contracting and regulation.

The industry will hold all those listed for action, including itself, accountable and will report on its progress by 18 October.

A snapshot of this plan includes:

- Education and awareness through improved standardised community education to inform approved items for kerbside recycling bins.
- A working group to develop an education program project scope for councils.
- A plan to trial two local government kerbside collection systems and monitor the reduction of contaminants, including in glass, flexible plastics and non-bottle plastics.
- A recommendation that the Queensland Government’s procurement policy be amended to mandate the use of recycled content in public policy and purchasing, with a preferred weighting to Queensland generated recycled product. This includes recycled glass for reuse in infrastructure, plastic for feedstock in manufactured public infrastructure, paper and cardboard for reuse and organics for street scapes, landscapes and other composting activities.
- Separating recyclables processing and recyclables collection contracts.
- The inclusion of risk sharing provisions with commodity prices and contamination between councils and contractors.
- Preparing notices of intent for the introduction of priority product statements on materials which include non-CRS glass item, non-bottle plastics and textiles.
- Amending Australian standards to allow for/encourage recycled content to be used in product manufacture.

WRIQ will work with all the stakeholders involved in this process, from state government to materials recovery facilities, industry contractors, local government and other industry advocacy groups. Now is the time to take action and show the nation what Queensland is made of.

The finer details of The Bundaberg Protocol can be read by contacting me at: rick.ralph@wriq.com.au
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