waste
MANAGEMENT REVIEW

OCTOBER/NOVEMBER 2017

In the limelight

CMA Ecocycle's Doug Rowe on mercury recycling and the challenges that lie ahead.

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LIGHTING GOES FULL CIRCLE

Find out how one of Australia's major mercury recyclers is dealing with lighting waste in an environmentally-responsible way.

Doug Rowe, Chief Executive Officer of CMA Ecocycle, discusses the company's efforts in keeping hazardous mercury waste out of landfill, and the challenges ahead at a government and corporate level.

"WE'RE READY. WE'VE GOT ALL THE NECESSARY INFRASTRUCTURE IN EACH OF THE STATES. WE'VE GOT THE TRANSPORT, THE TRUCKS, THE CONTAINERS AND THE PEOPLE AND THE CAPABILITIES."

In this issue

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From the Editor

Controversial coverage

THE IDEA OF THE "FOURTH ESTATE" HAS EVOLVED INTO A TERM USED to describe a journalist's role in providing the public with information that is in their interest.

Philosopher Thomas Carlyle attributes the concept to liberalism proponent Edmund Burke, which has been disputed in some literature. But regardless of who envisioned the idea, the concept remains: that the fourth estate is a power that wields an indirect, but nonetheless powerful, influence on society.

This principle is one reminiscent in recent media coverage in Australia's waste management industry. Programs like the *War on Waste* and *Four Corners* have recently brought attention to a range of contentious, yet important issues. From interstate waste transport to Queensland to the stockpiling of recyclables, the high profile nature of the ABC as a public broadcaster provides the impetus for governments to take action on issues such as landfill levy avoidance, which waste management consultant Mike Ritchie says, on page 22, has been prolonged for years on end.

In the weeks after the controversial *Four Corners* program, *Trashed*, the Queensland Government responded to the interstate waste transport issue with a three-month independent investigation to reform its regulation and prevent the movement of waste from other states. The Federal Government also announced its own inquiry into the waste and recycling industry.

As with all information in the public interest, a duty exists to report all sides of the story. *Waste Management Review* is committed to growing Australia's waste management industry. For these reasons, we want to ensure all voices are heard and have endeavoured to do so with our coverage on the controversial *Four Corners* report, which speaks to both the ABC and industry.

Another issue we feel needs to be highlighted is China's proposed waste ban of 24 different types of solid waste from Japan, USA, Australia and other source countries. Industry is saying that this is a significant macroeconomic event with consequences for the local market. Turn to page 59 to find out the industry viewpoint on what this will mean for the local and international recycling market.

Most importantly, we want to hear your thoughts on these issues and other important topics as they evolve.

For article ideas or general enquiries, you can contact me directly by email at toli.papadopoulos@primecreative.com.au or phone (03) 9690 8766.

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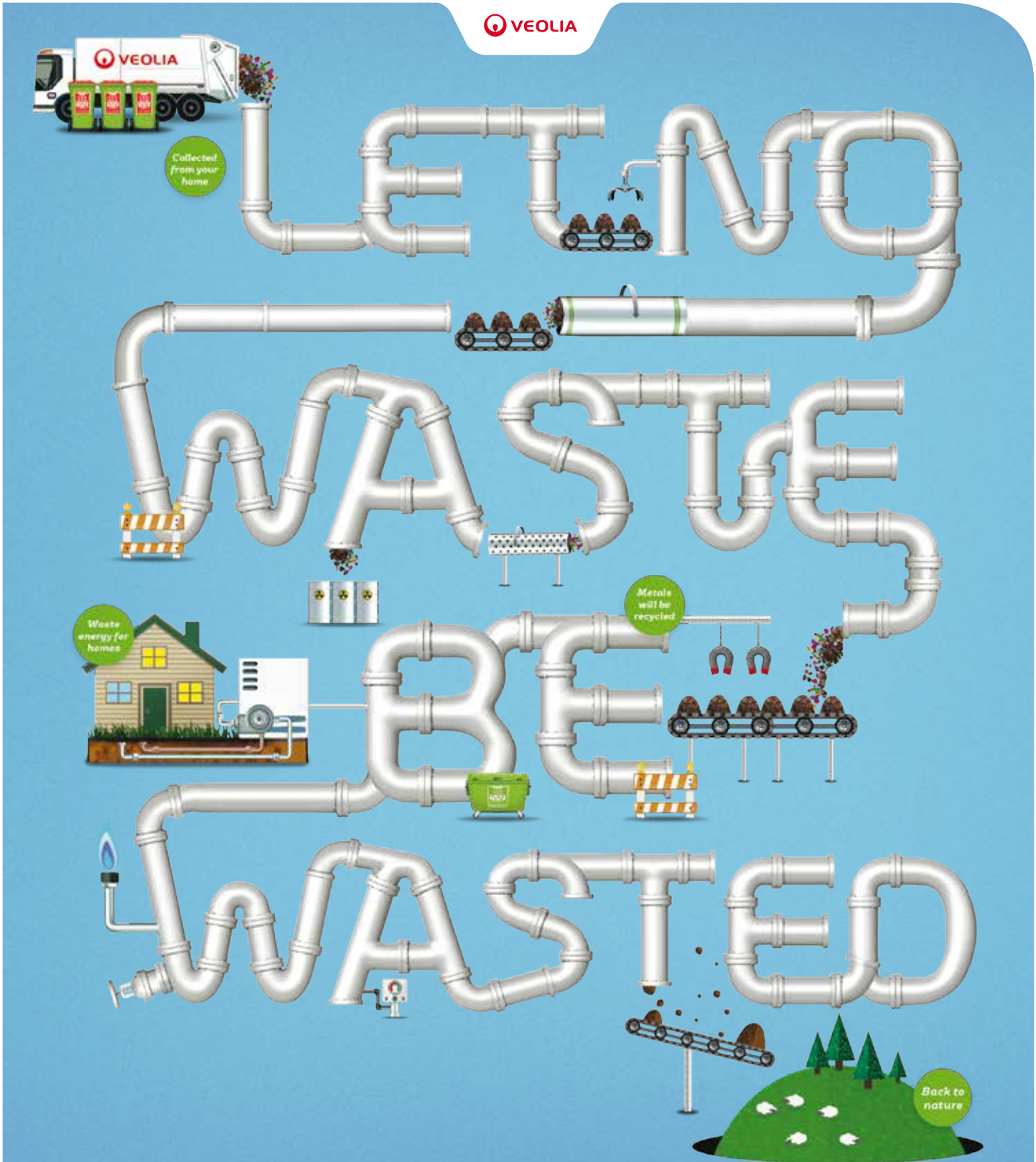

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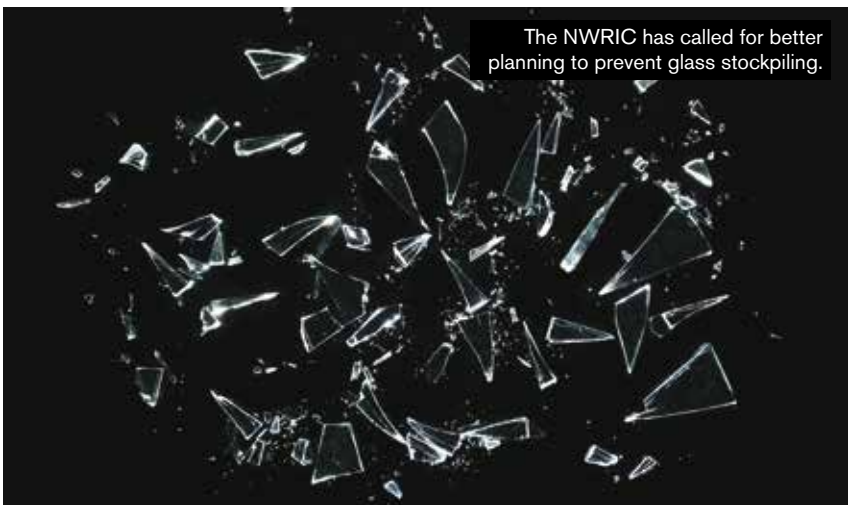
NWRIC releases Industry Roadmap

The National Waste and Recycling Industry Council (NWRIC) has released its Industry Roadmap document, a national plan for a circular economy to improve Australia's waste and recycling industry. The release of the NWRIC's latest document follows a *Four Corners* investigation into stockpiling, the illegal transportation of waste and numerous other issues.



The NWRIC has called for better planning to prevent glass stockpiling.

Interstate transport and stockpiling

The council said it has been actively advocating for a solution to the issue of interstate transport of waste materials between Sydney and south east Queensland. Media reports have focused on the cause of this as related to the landfill levy, which is non-existent in Queensland.

In July this year, the NWRIC wrote to both NSW Environment Minister, Gabrielle Upton, and Queensland Environment Minister, Steven Miles, asking for urgent government action to curb the problem. The NWRIC said this correspondence was a continuation of industry advocacy on this issue going back several years.

Council members have ratified a national position opposing the unnecessary interstate transport of waste.

The NWRIC says Australia's largest waste and recycling companies believe the inter-jurisdictional variation in landfill levies undermines new investment into resource recovery infrastructure, particularly in NSW. As a solution, the council has called for all states to recognise the portability of landfill levy liabilities and put in place regulations to collect these wherever waste is landfilled.

In response to the issue of glass and plastic stockpiling, the NWRIC's Roadmap calls for better planning to ensure commodities can be managed to accommodate market fluctuations. The roadmap calls on state governments to effectively re-invest landfill levy revenue to create and simulate markets for recycled materials and build new recycling infrastructure.

Odour, dust and noise

The NWRIC said a significant national effort has been made to consolidate Australia's landfills and recycling facilities into larger, more centralised sites. This work has considerably reduced public nuisance from odour, dust and noise. Improvements in facilities management has further reduced these emissions.

However, the nature of waste processing means that some emissions are inevitable. The industry is calling for state and territory government to undertake effective, whole of government planning initiatives to create landfill and recycling sites segregated from sensitive residential and commercial development.

Professional management

Australia's national resource recovery rate of more than 50 per cent puts us well ahead of many of our OECD counterparts, including the US and Canada. Despite some setbacks, Australia's overall recycling rates continue to improve.

The waste and recycling industry employs close to 30,000 people according to 2009 statistics by Access Economics, making it Australia's largest green collar employer and one of the nation's fastest growing manufacturing sectors.

The NWRIC believes that with improved planning, regulatory harmony and effective re-investment of landfill levy revenue, the economic, social and environmental performance of the industry will continue to improve.

Veolia secures deal with Farm Waste Recovery

Veolia has announced a three-year deal with Farm Waste Recovery (FWR), part of the Industry Waste Recovery (IWR) group.

The deal will see Veolia provide collection, transport and recycling services of polypropylene packaging for their closed-loop network across Australia.

Established in 2015, FWR is the flagship program supported by cornerstone businesses, Incitec Pivot Fertilisers and Impact Fertilisers, and helps industries and farmers recycle agricultural packaging and product waste in a sustainable manner.

Leveraging Veolia's waste collections and management expertise, IWR will work with industry stakeholders to significantly reduce the number of landfilled polypropylene bags, also known as flexible intermediate bulk container (FIBC) bags, many of which cause environmental damage by polluting fields, waterways and roads.

This initiative will allow businesses to pre-purchase the packaging, which can then be used and dropped off at collection sites, to be further transported and processed by Veolia.

Danny Conlon, Executive General Manager of Veolia Australia and New Zealand, said the new partnership demonstrated the company's commitment to providing sustainable waste management solutions, with a specific focus on environmental excellence.

"We saw an incredible opportunity in partnering with an industry leader that is tackling the challenge of packaging waste head on, in particular an issue as widespread as FIBC waste. IWR has ambitious recovery targets and together, we will deliver an environment-friendly solution to recycle an otherwise wasted resource," Mr Conlon said.

Mr Conlon added, "Our partnership with IWR is part of a wider, united targeted approach to waste management.

The significant rise in the use of polypropylene bags and its associated waste has prompted IWR to develop a solution that encourages the development of long-term collection and disposal practices.

Green Distillation Technologies sets date for tyre recycling plant

Green Distillation Technologies (GDT) has announced its extra-large tyre recycling plant will open in Perth, Western Australia, in June 2018.

The venture is a collaboration between the Tytec Group and Green Distillation Technologies. They have jointly established Perth-based Tytec Recycling Pty Ltd to undertake economic green recycling of large tyres. Referred to as off the road tyres (OTR), they are classified as those with rim sizes ranging from 25 to 63 inches and are used on the large mining dump trucks.

GDT has developed Australian technology that will recycle end-of-life tyres into oil, carbon and steel using their destructive distillation process. Transport of tyres from mine sites around Australia to the recycling plant will be undertaken by Tytec Logistics which has more than 75 per cent of the national OTR logistics market, as well as providing storage for the extra-large tyres. The plant, which will completely recycle the whole tyres and not cut or crumb the rubber, will be located at the Tytec facility in the Perth suburb of Welshpool. It will have a capacity of 5,000 tonnes of OTR tyres per year, which will amount to more than two million litres of oil, approximately 2,000 tonnes of carbon and 1,000 tonnes of steel.

The actual cost of the plant is based on engineering estimates of $8.5 million and will be quantified once the final engineering and construction contracts have been determined. The OTR plant differs from a conventional passenger/truck tyre recycling plant as the chamber will be ten times larger and consequently the material cost will be significantly higher.

The tyre recycling plant will open in June 2018.

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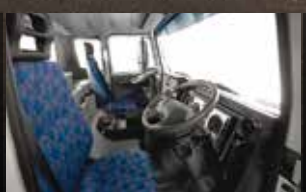

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New laws for recycled batteries proposed

Australia's Environment Ministers have resolved to consider new laws to require battery manufacturers to collect and recycle used batteries.

It comes after recommendations from the industry-led Australian Battery Recycling Initiative Industry Working Group, which proposed the establishment of a national recycling program for rechargeable batteries under 5 kgs.

State ministers agreed to consider stewardship approaches at their next meeting, with potential regulatory options to underpin a voluntary scheme and other options as states see fit.

Queensland Environment Minister Steven Miles welcomed the support of other states for Queensland's work towards increasing recycling rates.

"This is the first time ministers have agreed they may need to consider a legal response to low rates of battery recycling," Mr Miles said.

"Queensland has led separate the recycling trials for power tools and rechargeable batteries and partnered with Lighting Council Australia to pilot a program for emergency and exit lighting batteries."

Mr Miles said an estimated 400 million batteries (or 17,500 tonnes) are sold each year in Australia and about 14,750 tonnes reach their end-of-life every year.

"Many batteries are recyclable and for some such as lead acid car batteries the recycling rate is about 90 per cent. But the current recycling rate for the rest of the batteries is very low, with fewer than three per cent returned for recycling," he said.

"Queensland has led the national effort to increase recycling, but its increasingly clear a voluntary scheme may not be enough. The collection trials showed that people want to recycle their batteries they just need a way to do this.

"We want to start with rechargeable batteries such as those found in power tools and other products like laptops and mobile phones, as these are the ones that contain some of the harmful chemicals and are able to be more easily recycled."

The annual Meeting of Environment Ministers also discussed plastic bag bans, container refund schemes and climate change. Ministers endorsed the National Market Development Strategy for Used Tyres, which outlines actions for the next five years to increase the uptake of tyre-derived products in road, rail and civil engineering applications.

State and territory ministers also agreed to work with retailers to look at options to reduce thicker plastic shopping bags, possibly under a voluntary code of practice.

New recycling centre opens in Western Australia

The City of Swan's recycling centre has officially opened, using recycled products in the construction of its new facility.

Opening the Bullsbrook Recycling Centre last week, Western Australian Government Environment Minister, Stephen Dawson, praised the city for its environmentally sound design.

All the roads and hardstands within the recycling centre were built using recycled road base materials and on-site sheds have been re-used from the previous property owners.

The recycling centre, located between the Bullsbrook and Ellenbrook town centres, will provide the community with a year-round facility to sort, recycle and re-use unwanted bulk items and waste materials.

It forms the first stage of what will become a sustainable hub for the area, including a tip shop, community workshops, community gardens and education centre.

"This new facility will help reduce the amount of material picked up in verge bulk collections and reduce the amount of waste going to landfill," Environment Minister Stephen Dawson said.

"This facility is a great example of collaboration between the state and local governments, providing fit-for-purpose infrastructure to the community."

Lighting goes full circle

DOUG ROWE, CHIEF EXECUTIVE OFFICER OF CMA ECOCYCLE, DISCUSSES THE COMPANY'S EFFORTS IN KEEPING HAZARDOUS MERCURY WASTE OUT OF LANDFILL, AND THE CHALLENGES AHEAD AT A GOVERNMENT AND CORPORATE LEVEL.

The year was 1956, when a deadly disease struck the Japanese city of Minamata.

Located in the Kumamoto Prefecture on the island of Kyushu, the disease broke out in the Yatsushiro Sea coastal area. At first it was thought the disease was related to the nervous system, but an outbreak in May of 1956 prompted further investigation. The Study Group of Kumamoto University reported that the origin of the disease was intoxication, caused by eating fish and shellfish contaminated with a kind of metal. The contamination emerged through the release of the toxic chemical compound methylmercury in the industrial wastewater from the Chisso Corporation's chemical factory. At the end of the year, the number of identified patients reached 52, of which 17 had already died. By 1957, this unknown disease epidemic became known as Minamata disease. Boston University Sustainability estimates more than 2000 victims were recognised as having been poisoned with the disease as of March 2001.

The Japanese Ministry of the Environment's National Institute for Minamata Disease documented this history in the Minamata Disease Archives. More than six decades later in 2013, the United Nations has come together for a multilateral environmental agreement, Minamata Convention on Mercury, addressing mercury's adverse health affects. That same year, Australia signed the agreement, which seeks to ban new mercury mines, phase out existing ones, reduce and phase out mercury in a number of products, and a host of other measures. The convention also addresses the interim storage of mercury and its disposal once it becomes waste, and the management of sites contaminated by mercury. Australia has not yet ratified the agreement, but is considering it, according to the Australian Government Department of the Environment and Energy. If it does it will join more than 70 UN nations to ratify the agreement.

For experienced mercury recovery and recycler, CMA Ecocycle, the harsh lessons learned from the outbreak

has led to a multimillion dollar environmental operation. Doug Rowe, Chief Executive Officer, says that if Australia ratifies the agreement, the company will be able to increase its recycling rates to handle all the mercury waste in Australia.

"There's a lot more attention on mercury than there ever has been before. We feel that if Minamata is ratified, we should see an uptake in recycling," Doug says.

He estimates that out of the 60 million globes in the market, the company processes only 10 per cent annually, which equates to approximately six million globes.

"One of the issues we're struggling with at the moment is we have a plant that's capable of handling 100 per cent of the lighting waste. If we had all our states working to full capacity, we could handle more than what our states generate and still import from overseas countries such as New Zealand, Indonesia and Noumea," he explains.

THE BEGINNING

CMA Ecocycle's humble beginnings commenced as a silver recovery business from x-rays in 1996. Back then, it was known as Ecocycle Industries. But as digital technologies took over the imaging industry, the company needed to find something else to complement its business. As a result, CMA Ecocycle looked to other areas of the recycling sector. Mercury, which is considered hazardous waste, is found in fluorescent lighting, batteries, thermometers, dental amalgam and many industrial wastes. Doug says that the company's clients in the silver industry led to CMA's expansion into mercury. On two fronts, the company was able to ascertain technology that could separate silver and mercury from dental fillings and batteries, as well as hazardous lighting waste. Doug says its main foray ended up being the lighting market due to demand. In around 2000, CMA purchased mercury recycler ARA and invested in state-of-the-art equipment never seen in Australia before.

"Sixty to seventy million lights are brought into Australia each year and we saw an opportunity to keep mercury out of landfills across Australia," Doug says.

"In 2000, we were the only company in the market fully recycling and processing all lighting wastes. Environmental Protection Authority (EPA) got involved in the early stages and gave a grant to ARA. From there, it grew very slowly but there was not a lot of support.

"We looked at the older technology ARA had in play and we were concerned that while they were recovering the fluorescent tubes, glass, aluminium and powder, there was no way of getting the mercury out of the phosphor powder."

Lighting waste is crushed and separated to recover the mercury.

SYSTEMS AND PROCESSES

With the acquisition of ARA, CMA Ecocycle made an $8 million investment and set up a lighting recycling facility in almost every state and territory. The investment comprised recycling and mercury separation technologies, including CMA's LP600 lighting waste processing plant and batch process distillers.

"The European markets and the United States were well ahead in the mercury recovery space. We felt that there was an opportunity to give something back to the community as the return on investment wasn't at all viable at that stage," Doug says.

In 2007, The CMA Corporation bought Ecocycle Industries and changed the name to CMA Ecocycle. In 2013, metals recycling company Recycal took over CMA Ecocycle and optimised its operations. To make the mercury separation process more efficient, CMA invested an additional $4 million into plants in Perth, Queensland and Sydney. The glass, plastic, aluminium and other metals are all crushed and separated at all of CMA's Sydney, Brisbane and Perth facilities. The revamped older equipment from Melbourne and Sydney is being deployed to the Adelaide and Tasmania factories.

A lot of CMA's waste is in fluorescent tubes. As an example, the tubes and globes arrive in stillages, boxes and bins and these are processed at the company's interstate plants. It gets crushed under vacuum, separated out from the metals, and CMA recovers the mercury from the powder via its distilling process.

The process sees this material go through an aerated tumbler to clean the glass and make sure all of the powder comes off. Then, via a strong suction system and through a cyclonic vacuum separation process, the


Mercury is recovered from materials via the distilling process.

company separates the glass from the powder. The metals are separated and sold for recycling and the glass can be used in a number of areas, including insulation and as a silica-sand-based product. Recently, the company used around 200 tonnes of this material in the development of concrete boundary walls in the expansion of its Tasmanian facility.

Drums of powder are sent to CMA's Campbellfield facility, located in Melbourne's north, and the mercury is recovered by feeding the phosphor powder into CMA's batch process distiller. Doug explains the process in some cases allows the mercury to come full circle and end up back in the dental industry to be used in fillings.

"We put the mercury into a thick ceramic-type kiln under vacuum, and we purge it with nitrogen during this process. We raise it to about 450-500°C. The mercury is then evaporated and goes through a frozen-like chilling chamber to come back into a pure liquid mercury. That mercury is 99.99 per cent purity and it is then sold onto the likes of Southern Dental Industries and we use it for dental amalgam."

Doug says that CMA provides pre-paid collection boxes to waste generators and the major collection companies with small quantities of lighting waste. Boxes are provided for fluorescent tubes, as well as cartons for globes and lamps such as compact fluorescent lamps. For organisations producing larger amounts of lighting waste, CMA Ecocycle provides on-site wheelie bins or large stillages. It also offers general collection services where tubes and fittings might be loose.

OPPORTUNITY

While Minamata offers a significant opportunity to reduce the mercury footprint, Doug adds that the Victorian Government's proposed ban on e-waste to landfill, which includes hazardous lighting waste, could also play a role. At this stage, the government is working through the process of preparing a policy in how it will manage mercury going forward. Doug says the government has also done well to establish the Victorian Energy Efficiency Target (VEET), which subsidises the replacement of the old mercury lighting waste to the new energy efficient LED lights.

"People have been supported to change their fluorescent lights into new LED lights and that's a real positive. Anything to save power and having more efficient lighting can only be good news. Part of contributing to the scheme is the need to have a certificate of recycling," Doug says.

He adds that CMA Ecocycle is the only Australasian organisation fully licenced by the EPA to handle the entire process of recycling mercury-containing waste. Doug and his team work regularly with the EPA each year in its auditing of the Melbourne facility. CMA Ecocycle's prudent environmental management has seen it close to obtaining ISO 14001 accreditations, which sets itself a framework for a complete and effective environmental management system.

"We think the EPA should be commended for the way it is currently ensuring companies that say they can recycle mercury do have the capabilities. It hasn't always been that way, unfortunately."

"Every site has to have impervious coated floors with bunding in it. We have to test all our drains, our waterways, our air flows, odour and noise. We've got a trade certificate for our waste water from our waste water treatment plant."

With the appropriate infrastructure in place, Doug says that the only remaining piece of the puzzle is for a ban to landfill to be put in place, with government and industry to pave the way for additional lighting recycling. He says CMA could easily increase its lighting recycling rate from 10 per cent to 50 per cent within a few weeks. The current plants in each state are able to process about one tonne an hour and can run 24/7.

"We're ready. We've got all the necessary infrastructure in each of the states. We've got the transport, the trucks, the containers and the people and the capabilities. For us, there needs to be a campaign to the industry and public to make them aware that there are facilities in place, and there is the support from the waste companies."

"Our company is really all about recycling and keeping materials such as mercury out of landfill. We want to see all of the states, government, councils and EPAs get behind keeping lighting waste out of landfill, and put programs in place to ensure its handled and recycled correctly."

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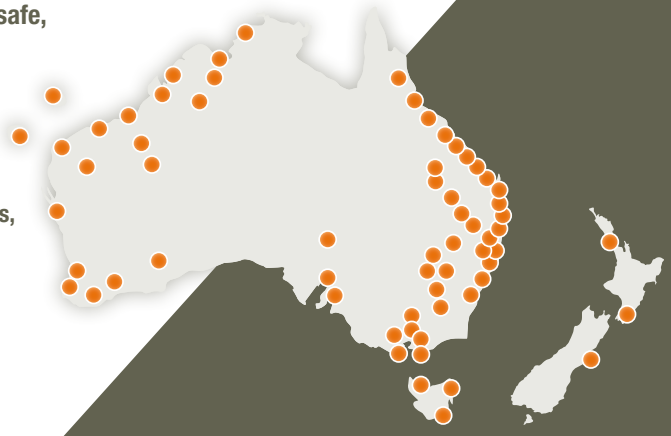

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Are you good to go FOGO?

FOOD AND GARDEN ORGANICS COLLECTION IS PROVING TO BE A COST-EFFECTIVE WAY FOR COUNCILS TO REDUCE THE AMOUNT OF WASTE TO LANDFILL, BUT WHY HAVE SO MANY BEEN SLOW TO THE PUNCH?

Influencing a community of just under 70,000 to change their behaviours was never going to be easy, but one council found the solution in a simple, yet effective catchphrase.

Are you good to go FOGO?

FOGO, which stands for food and garden organics collection services, involves councils taking those waste streams and introducing a composting operation to turn them into a nutrient-rich product. When done so safely, some local government bodies believe FOGO has significant potential to reduce the amount of food and organic waste going to landfill.

It almost took 10 years for the New South Wales' coastal community of Shellharbour to introduce FOGO, and the council is finally reaping the rewards. The journey began with an initial survey in 2007 and concluded late last year. Thanks to a grassroots campaign, Shellharbour now operates a weekly FOGO service.

For Shellharbour City Council, the process of introducing a FOGO service required input from industry experts and councils across the nation, in order to successfully instil behavioural change. As recycling requires residents to change their habits, Sue Fletcher, Technical Officer Waste Management, explains that repetition through the catchy term FOGO had a positive effect on influencing change, as it became entrenched in the vocabulary of community members.

A successful community campaign by Shellharbour Council has instilled change.

While the collection of garden organics is more commonplace in councils across Australia, Shellharbour saw potential for FOGO to significantly reduce waste to landfill, working hard to change community behaviours.

To achieve this, it conducted extensive surveys, free courses, television and radio advertisements, door knocks and barbecues, all with the goal of helping residents understand the benefits. They spoke to behavioural experts, industry experts and other councils from across the nation, implementing a strategic plan. The plan involved getting residents to voluntarily downsize their 240L to 140L residual waste bin and separating their food and organic waste into separate bins to prevent contamination.

The success story led to Shellharbour collecting more than 9000 tonnes of FOGO material at the kerbside between its launch in July 2016 and March 2017, an increase of more than 2200 tonnes compared to the same time last year. Its waste to landfill has already reduced by an additional 1616 tonnes, compared to the same time last year. The council has even managed to handle this alongside the municipality's population growth, with waste to landfill continuing on a downward trend despite the increase in generation. So what's stopping the rest of the nation from achieving a similar result?

HOW COMMON IS FOGO?

While Shellharbour's hard work shows that FOGO can be economically

New composting facility

Rob Niccol, Sales and Marketing Manager at Australian Native Landscapes, believes there is still greater potential in FOGO yet to be unlocked in the Sydney market.

He says as a horticultural manufacturing firm, Australian Native Landscapes is focused on achieving better outcomes in the city through its open-windrow composting facility.

The company has just completed the build of a new open windrow composting processing facility in the western Sydney suburb of Badgerys Creek, which will have the capacity to process 50,000 tonnes of food waste per annum.

"It links in with our composting facility in Blayney, central western Sydney. The compost will go through Badgerys Creek. It will have some decontamination and preliminary processing and be transferred out to Blaney for composting and sold onto predominantly agricultural markets."

Rob says that the regions of NSW have embraced FOGO streams, however, he's noticed less uptake in the Sydney market.

"There's a huge amount of food waste that could be pulled out of the waste stream into a green bin and composted. As a state, for NSW to actually achieve the waste recovery targets, our preference would be to see more councils embrace a FOGO system through composting."

Although the company has been around for 46 years, Rob says its first FOGO composting contract began 12 months ago, earning contracts for three regional councils in NSW.

"This new facility is our first major set up in Sydney. The new building is essentially an organics transfer station. Where we see ourselves as being different, is we don't see ourselves as a waste business, we recycle organic materials, but we're a horticultural supply company, so processing food and garden organics into a re-usable stream is our focus."

feasible and environmentally sound, the question remains how prevalent the service is. Data compiled by the Australian Government Department of the Environment and Energy (National Waste Reporting 2013) indicates that around 14 million tonnes (Mt) of organic waste was generated nationally in 2010–11, with 47 per cent of this disposed to landfill, 44 per cent recycled and 9 per cent used in energy recovery.

In Victoria for example, a spokesperson for statutory authority Sustainability Victoria says 13 out of 79 of Victoria's councils provide a FOGO service to households. Of this figure, 53 provide some form of organics collection service to residents.

"There is definitely potential for an organics service to be expanded to the remaining councils," the spokesperson says.

JustWaste Consulting director, Justin Jones, believes the slow progress of FOGO is due to the challenges of obtaining approval from the state's environmental protection agencies (EPAs), which are concerned with the stigma surrounding noxious odours emitted by a food composting service. Another challenge also falls with councils, as they are tasked with getting their residents to change their waste disposal habits. The third issue relates to scalability, as the cost of setting up a composting service may outweigh the benefits depending on the population and type of operation.

According to the Federal Government Department of Sustainability, Environment, Water, Population and Communities *Food and Garden Organics Best Practice Manual*, collecting source separated food and garden organics can help councils alleviate the costs of landfill disposal by avoiding levies, reducing the costs of public park and gardens (through composting) and assist the climate by preventing anaerobic decomposition in landfill.

HOW TO FOGO

A factsheet based on the former Federal Government's *Food and Garden Organics Best Practice Collection Manual* (2012) indicates there are various technologies used in a composting service, including; windrowing, aerated static pile, in-vessel composting and fully enclosed composting.

Open windrow composting is defined in the document as a low-cost option that is used in the majority of organics processing facilities in Australia and the world. Open windrow composting involves placing organic matter or biodegradable waste in long rows known as windrows. The windrows are turned regularly, either with front end loaders or dedicated windrow turners, screening for contamination which allows the organic matter to decompose.

Aerated static pile is a more expensive version of composting and involves mixing organic residues in one large pile, instead of rows. Piles are placed over a network of pipes that deliver air into, or draw out of, the pile, aerating the material to supply it with oxygen to grow and remove moisture and heat. This is known as forced aeration. Aerated static pile generally requires blowers, pipes and sensors to control the supply of air.

Forced aeration is also used in in-vessel composting, which involves feeding organic materials into a drum, silo, tunnel, box or similar container. The intensive composting process takes place in controlled environmental conditions, regulating the temperature, moisture and aeration. Materials are premixed before being loaded into a vessel, where they sit for about one to three weeks before further composting

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New composting facility

Philip Parekalam, Principal Design & Technology Consultant at NALG, is commissioning an in-vessel composting facility, located in the rural suburb of Dunmore, Wollongong, NSW. The commissioning is part of recycling company Re.Group's FOGO contract with Shellharbour Council. The facility is capable of processing green waste, food waste, bio solids and grease trap.

The intent of the design is to pasteurise, stabilise and mature food and green waste received on site, and convert it to a valuable end clean compost product. Philip says it can be managed remotely. Once fully operational in September, it will process more than 36,000 tonnes of food and organics per annum. Philip explains that the environmentally sound system will service the region in a safe manner and will satisfy the EPA requirements. He says winning the tender with Re.Group was a fairly straight forward process.

"Shellharbour had been asking Re.Group for an in-vessel composting system and the initial phase of the design involved collaboration with council to design the footprint."

The turnkey system of in-vessel composting works by placing the materials into a series of tunnels, regulating the process of composting by manipulating the temperature, oxygen level and moisture level. The system is designed to fully comply with odour regulations and has an efficient leachate management system.

"We let the input material work for itself using its own energy with dampers and fans. We utilise the air from the building itself to support our in-vessel tunnels through a central fresh air duct," Philip says.

The building is under constant negative pressure and the extracted air from the pre-treatment hall is transported to the tunnel systems. The processed air or the exhaust air is then transported to an acid and water scrubber, which get rids of the ammonia and dust and reduces the temperature prior to entering into a bio filter medium, and clean air is released into the atmosphere.

He says the total process time within the tunnel system takes two to three weeks. From there, the material is taken to a maturation pad and sits on a windrow for

another four weeks. After this, the material will be screened and sold onto market as a compost product. He says an advantage of in-vessel composting over open windrow systems is that the system is not vulnerable to outside weather changes.

"If the initial tunnel process is not performed accurately, and pasteurisation is not evenly managed, the chances of odour generation during the windrow maturation is very high, and this is one common problem in many sites in Australia and across the world," Philip explains.

Philip says that taking temperature alone during a pasteurisation process doesn't guarantee a successful batch, as homogenous distribution of air at right volume and pressure is critical for a good process.

"Our tunnel systems are designed and engineered for Australian climatic and waste conditions. Proper training, filling of tunnels, and pre-treatment is critical for a successful batch."

He says there is a significant difference in Australian waste when compared to its European counterparts.

"In-vessel composting systems are of a particular advantage in metropolitan areas where you want to reduce the environmental footprint.

"Our system is a closed system, and if managed well, can take care of all your waste treatment needs from bio drying to composting. NALG is also currently constructing similar projects in Queensland and Victoria and sees a great future in FOGO composting over the next 10 years."

and placement in static piles or aerated windrows.

Sue says as a result of the environmental impact statement and consultation with relevant agency bodies, Shellharbour used in-vessel composting due to the location of the facility to the surrounding receptors.

HOW FEASIBLE IS FOGO FOR COUNCILS?

While Shellharbour's experience has been successful, others have noted the potential for FOGO to reduce the national footprint of waste going to landfill.

JustWaste director Justin Jones says he sees huge potential for FOGO, particularly smaller operations. This is due to the ease of obtaining approval from the EPA for composting, as a key distance from municipal areas means less of an odour risk, while also being more financially viable due to their smaller scale.

"In metropolitan areas such as Melbourne, you're dealing with larger volumes as well as the perception of odour issues. Victoria has stringent guidelines in regards to how you can compost FOGO, so that could be the reason why they've been slow to embrace change."

Justin says operators in NSW utilise many differing technology and processes for the treatment of organics, especially FOGO. He says that as more sites become available to accept organics, more councils will make the switch. He says the perception that FOGO is a high-risk odour issue can be overcome by proper process control, technology choice and the fact that the food component is so low.

JustWaste conducted a study into a small-scale composting facility for Coolamon Shire Council in the Riverina region of NSW. The 2017 assessment found the construction of a small-scale windrow composting area could be put

Shellharbour Council's Dianne Tierney and Sue Fletcher discussed their efforts at waste2017.

together at a low cost and quick turnaround, particularly when attached to an existing landfill.

He estimates that open windrowing can cost up to $50,000, while forced aeration systems cost around $150,000 and an in-vessel system could cost anywhere between $500,000 to $1 million. Justin notes that the cost and benefits depend largely on the scalability of the project.

Coolamon Shire Council has seen significant cost savings from the process. Colby Farmer, Executive Manager of Development and Environmental Services, says the council uses open windrow composting to produce a compost used in the municipality's parks and gardens. Colby says councils across Australia could develop a business case for selling the compost back on to consumers.

BARRIERS

When it comes to obtaining EPA approvals, Justin believes the agency needs to take a more holistic approach in its approval of facilities.

"My experience is that you can easily get approval through the EPA if you're dealing with garden organics from the kerbside. But as soon as you mention food and garden organics, the regulatory controls increase ten-fold. All of my audits from around Australia show in food and garden kerbside organics, only five to 10 per cent of the material is food," Justin says.

"If you're in the NSW city of Wollongong for example, it's going to be a lot different to living in Coolamon, but the same regulations apply. And this happens in landfills where they have the same approach, especially in Victoria, where it's one policy for everyone. Sometimes it's difficult to comply with metro standards."

An EPA Victoria spokesperson told *Waste Management Review* the EPA considers FOGO a higher risk in comparison to other feedstock and they expect that the risks will be managed appropriately, including utilising a "higher order technology", such as in-vessel composting.

"The EPA recommends enclosed/covered technologies for medium-to-high-risk feedstock such as FOGO," the spokesperson said.

In regards to assessing each situation uniquely on its scale, location, and distance, the EPA says it assesses each application on its merits through the works approval process. This includes consideration of the proposed input materials, scale, location, and buffer distances, along with a range of other factors. The spokesperson says the EPA expects proponents to demonstrate how the associated risks will be mitigated. ■

Four Corners' portrayal of the waste industry

MIKE RITCHIE, DIRECTOR OF MRA CONSULTING GROUP, EXPLAINS WHY THE ISSUES OF STOCKPILING GLASS AND INTERSTATE WASTE TRANSPORT ARE MATTERS REQUIRING GOVERNMENT ACTION.

In August, an ABC report by investigative journalism program *Four Corners* brought attention to a range of long-standing issues in Australia's waste management industry. Titled *Trashed: the dirty truth about your rubbish*, the program focused on contentious problems ranging from the stockpiling of glass to the transportation of waste from Sydney to south east Queensland.

Through interviews with a range of major waste companies, the NSW EPA, councils and residents, *Trashed* claimed to reveal hidden practices occurring in areas of the waste industry and the lucrative trade that has attracted unscrupulous operators. The program suggested thousands of tonnes of glass are accumulating in recycling companies across Australia, namely in regional areas due to the cost of shipping. It tied this problem in with a range of issues, previously highlighted in the media, such as landfill levy avoidance and illegal dumping.

Mike Ritchie, Director of MRA Consulting Group (MRA), believes many of the issues portrayed in the program are outside the waste industry's control.

On the issue of glass stockpiling, Mike says the program should serve as a wake-up call for local, state and federal governments in understanding the impact of volatile commodity prices. He explains that glass represents about 30 per cent of material received by materials recovery facilities (MRFs), and historically these facilities were paid approximately $70 per tonne for glass.

Mike says that broken glass and glass fines are worth even less. Due to a persistent drop in commodity prices, it is now cheaper to import glass bottles from overseas countries than to recover glass from the MRF system in Australia, he says.

"While long-term contracts provide security for councils, they do leave MRF operators with constant supply, but variable sales volumes and revenues. With commodity prices falling, we're in a perfect storm at the moment," he says.

"There needs to be some relief for MRF operators, either through the EPA in allowing them to store materials for longer periods, or additional research and development by governments to allow glass to move into engineering products, including

road base, asphalt and concrete."

Mike says the fact that glass is being stockpiled rather than landfilled is a sign that industry takes the public trust in recycling seriously.

The NSW EPA argued in a statement following the program corrupt conduct was suggested or implied through its own inaction in response to notifications of illegal waste activities. The statement revealed it had referred these allegations to the NSW Government's Independent Commission Against Corruption.

"I can't comment on the validity of those issues, but the general principle that the EPA needs to be funded for enforcement is absolutely correct. The credible operators in the market are sick to death of being outcompeted by unregulated competitors flouting the law," Mike says.

One of the more widely discussed issues surrounds the issue of waste transporters avoiding the landfill levy by carting waste from NSW to south east Queensland. In 2012, the former Newman Queensland Government repealed the landfill levy, causing a flurry of waste being sent to the sunny state from NSW, where the levy is currently $138.20 a tonne in metropolitan areas. Mike says governments have the power to reign in this problem by introducing a landfill levy in Queensland, or amending the NSW levy so that it applies no matter where the waste is disposed.

"We also need to point out that transporting waste to Queensland is absolutely legal. It's a failure of government policy setting, particularly in the absence of a levy in Queensland."

"*Four Corners* suggesting that trucks come out at night to "surreptitiously" haul waste to Queensland was simply ridiculous," he says.

He says the criticism levelled at the NSW Government for not enforcing the proximity rule was justified. In 2014, the NSW EPA introduced the proximity rule to stop waste from being moved more than 150km from where it was generated. But as *Four Corners* outlined, loopholes were found in the law. It led to a major waste company challenging the proximity rule in an appeal, while the NSW Government chose not to proceed with the case.

"It is unclear why the NSW Government did not proceed with the proximity principle court case. It would have been better if they had proceeded with that case to give certainty to the industry.

"If the government had won the case, the issue of interstate transport would have been resolved. If they had lost the case, then it would have focused attention on the issue and all states could have responded quickly via other options, without the issue dragging out for years."

Mike also noted that EPA Director Steve Beaman was instrumental in establishing the proximity rule. He added that there are legislative barriers preventing the intervention of state governments in free trade. Section 92 of the Constitution of Australia stipulates that trade and commerce among the states shall be absolutely free.

While the program exposed some challenges facing the industry, Mike says some positives can be gleaned from it, particularly as the Queensland Government has announced a three-month investigation into the dumping of interstate waste.

NSW has extended its parliamentary inquiry into waste. The Federal Government is also conducting an inquiry into markets for recycled waste and its role, with the closing date for submission on October 20, 2017.

"Hopefully all the political attention on waste will finally address some of the key roadblocks to success."

He says the key issues that need to be resolved by government are inconsistent market price signals for recycling, insufficient enforcement of existing laws and planning approvals processes that take too long. He says the sector could employ another 30,000 people easily by achieving the stated target of 72 per cent national recovery. Mike says governments need to iron out these problems and set the framework for growth in recycling.

"The recycling industry recovers 26 million tonnes (or 52 per cent of all material generated) back into the productive economy every year. Stockpiles of glass in Australia represent less than one per cent of that. Recycling is overwhelmingly positive for the environment and for *Four Corners* to undermine public confidence in the system is very irresponsible. They provided no evidence that widespread landfilling of recyclables was occurring," Mike says.

"The idea that 50 per cent of recyclables placed in kerbside bins is landfilled is patent nonsense."

Waste Management Review put several questions to the ABC TV's *Four Corners* program, including why s92 of the constitution was not mentioned as playing a role in the prevention of state governments being unable to intervene in interstate waste trade. A spokesperson for ABC TV's Four Corners noted a prominent case mentioned in the program was settled, meaning that s92 was not put to the test.

"The EPA announced it was suspending the proximity

principle after settling the case. This hasn't actually happened as far as we are aware, and instead it is declining to enforce the rule," they said.

"With the lack of an outcome in the case it is difficult to make the assertion you make, and we chose not to. It is also nearly two years since the case, and all EPAs have failed to come up with a co-ordinated response."

Four Corners was also asked why a greater focus was not paid to the failure of government policy in preventing interstate waste transport, including the repeal of the landfill levy by the former Newman Government, rather than blaming the EPA NSW for not enforcing the proximity rule.

"The whole program was about the failure of government policy in multiple states. It highlighted the absurdity of the differing rules between states and the bizarre outcomes that follow. The NSW proximity principle and the failure to enforce it was part of that. We also pointed to Victoria's lack of stockpiling rules, and the repeal of the levy in Queensland by the Newman government. So no, we don't acknowledge that," they said.

Finally, we asked *Four Corners* whether they acknowledged that the stockpiling of glass only made up a small part of the 26 million tonnes of material recycled each year. We asked them to consider this in light of their portrayal of the recycling industry.

"Glass is a significant part of the waste stream, and accounts for roughly one third of kerbside recycling. It was a legitimate issue to tackle and one that the public was unaware of," they said.

"We also interviewed the head of the Australian Recyclers Association, Grant Musgrove, who told us that about 50 per cent of material recovered is actually recycled. In our view this is something the public is unaware of, and of public interest."

The EPA NSW was asked if it was concerned at all with its portrayal in the program. A spokesperson directed us to the EPA's statement on the show.

The statement mentions the proximity rule was introduced to address issues with interstate waste transport. The statement reads: "It has proven challenging to enforce so the NSW EPA is leading work with its interstate counterparts to discuss national approach to waste regulation." ■

You can read the EPA NSW's full statement here: http://www.epa.nsw.gov.au/epamedia/EPAMedia17080802.htm

The Queensland Government and NSW Government did not respond to comment on deadline.

Inner city **pressure**

THE CITY OF SYDNEY'S WASTE STRATEGY HAS LED TO IT ACHIEVING AN IMPRESSIVE DIVERSION RATE OF 69 PER CENT. *WASTE MANAGEMENT REVIEW* SPEAKS TO CHRIS DERKSEMA, DIRECTOR OF SUSTAINABILITY.

1 What are some of the challenges surrounding collection and recycling, particularly with Sydney's growing population?

The City of Sydney is in the midst of a population boom like we've never seen before. More than three quarters of our residents are living in apartments and that proportion will continue to rise. The challenge is to educate new residents on the range of city services available to them and how they can help us sustainably manage waste.

Another major challenge we face is the fact that our population is so transient compared to more suburban areas of Sydney. Approximately 50 per cent of our population changes every four years. While our more established residents are enthusiastic recyclers, a large proportion of our residents are students or travellers, who may not be so well versed in our recycling guidelines.

We need to continuously educate our residents, including those who don't speak english, if we are to reach the ambitious, yet achievable, targets of our waste strategy.

Our draft strategy and action plan – Leave Nothing to Waste – sets actions to tackle some of our biggest problem waste streams. Textiles and clothing account for six per cent of the average red general waste bin, while food waste accounts for a third. If the strategy is adopted, we'll be introducing separate waste collections for food waste and textiles over the coming years.

2. What do you look for in a successful tender and how do you go about it?

The city has stringent and specific tender guidelines, but when it comes to waste, we're looking for organisations that share our values and commitment to zero waste. The spotlight has been shone on the waste industry with the recent *Four Corners* investigation and you can be certain that councils across the country will be asking a lot more questions of waste contractors when tender time comes around again.

3. Which bin system do you use and why?

The majority of households in our area have a red general waste bin and a yellow recycling bin due to the fact that three quarters of our residents live in apartments. Green garden waste bins are available on request.

The city also has an annual chemical cleanout, quarterly e-waste collection days and free weekly bulky waste collection by appointment.

We're looking to greatly expand our collection services if our waste

strategy is adopted over the coming year. For example, e-waste, food organics and textiles would be collected separately from the home.

4. What has been working particularly well over recent years for the council in terms of waste management/ recycling services?
We have reached an impressive diversion from landfill rate of 69 per cent. This comes amid challenges we face with our transient population and the fact that most of our residents only have two bins.

Our new waste strategy aims to lift our diversion from landfill figure to 90 per cent by 2030.

The city also has a range of programs to support innovative new waste measures, such as environmental grants and knowledge exchange partnerships. Two recent grants focused on keeping waste out of landfill include investigating ways to recycle coffee cups, and research into transforming office furniture into new wood-plastic composites.

5. How do you ensure what is recyclable is clear to residents?
We're always looking at new education programs and campaigns to help make recycling more understandable to our residents and businesses. Residents can download the Garbage Guru app which tells them how they can recycle or dispose of everyday items. We label our garbage bins and also provide signage to apartment buildings. We also conduct various marketing and media campaigns.

6. Is there any modern technology the council is utilising and/or would like to use that would make collection more efficient?
The city is presently looking at the introduction of further technology enhancements to assist with collection. Bin tracking, weighing, video records, live on-line management systems and automated logging of services are all being considered. Many of these initiatives may not suit every council and the benefits of these technologies need to be carefully evaluated. We can be certain that technology will transform the way we deal with waste.

7. Can you explain some of the waste management roles that exist at the council and how they work with one another?
The city has a waste strategy manager who is responsible for setting our targets, actions and working with all stakeholders to ensure it is achieved. We also have a cleaning and waste manager, responsible for the 24-7 operational teams that work around the clock to ensure Sydney is clean. We have a zero-waste coordinator who is accountable for waste policy and the implementation of waste education programs. There are also key operational roles for waste collection and contract management of waste-related contracts. The city waste collection services are provided by both city staff and commercial contractors.

8. How effective has the move been by the City of Sydney to provide a single bin for all rubbish and recycling, sorted through alternative waste treatment?
The city continues to have source separation of putrescible waste and recycling for residential properties. Waste service charges are low when compared to other Sydney metro councils.

Council had previously had source separated waste bins in the public domain, but found that the levels of contamination were so high that it meant little opportunity for achieving a recycling outcome. Council has set new targets for public domain waste

Council's new waste strategy includes a drop off for e-waste.

(parks waste, public litter, illegally dumped waste, street sweepings, stormwater pit material) of 50 per cent by 2021. We advocated for the NSW Government to introduce a container deposit scheme and look forward to its implementation.

9. What are the main opportunities for the City of Sydney for increasing diversion of materials from landfill/ increased resource recovery?
We're looking to improve our own operation waste procedures – whether it's from our buildings, our parks, streetscapes or work sites.

Our waste strategy introduces some exciting new collection streams including kerbside e-waste collection, food waste collection, textiles collection and a drop-off centre for problem waste items. We believe it's the most comprehensive plan to tackle residential waste in Australia.

These opportunities, coupled with education and support to residents and businesses, will improve waste avoidance, and increase recycling and resource recovery performance.

10. How does the council manage to keep costs down while meeting waste management targets?
The city uses a competitive tender process and a collaborative approach with our contractors to ensure that costs are minimised without compromising on our commitment to sustainably dealing with our waste.

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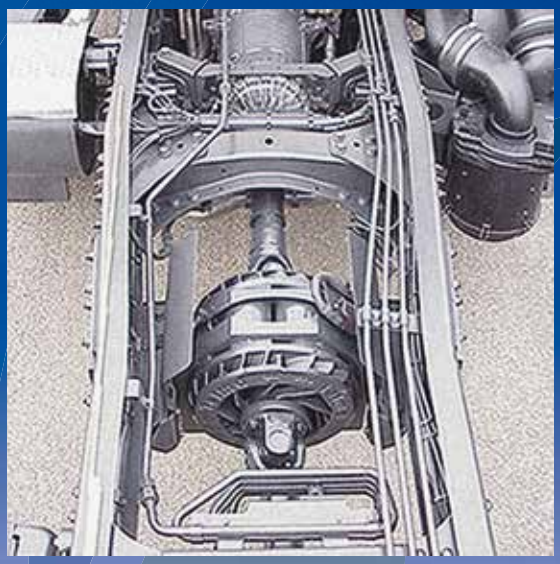

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Key Performance Indicators

NEWCASTLE CITY COUNCIL WASTE MANAGEMENT MANAGER, DARREN NORTH, IS CHAMPIONING DATA MANAGEMENT TECHNOLOGIES, LEADING TO GREATER ACCOUNTABILITY WITHIN ITS WASTE MANAGEMENT SECTION.

Darren North, Manager – Waste Management at Newcastle City Council, is poised to change the way the municipality's residents think about waste.

"Newcastle City Council's vision is to be one of the most agile technology-enabled local waste authorities in Australia. We will provide a superior economic, environmental and community service driven by smart data," Darren says.

In his 25 years of working in the waste industry, Darren has worked on a range of major initiatives, from London's first mechanical biological treatment (MBT) facility, to a first-of-its-kind plastics separation facility. His extensive experience, he says, has put him in good stead to handle the challenges of Australia's waste industry, which is moving towards greater resource recovery and environmental sustainability. His impressive portfolio includes working for Veolia UK on the design, construction and operation of London's first MBT worth more than £660 million (approximately $1.2 billion AUD) over a 25-year period.


Darren North has been a leader in digital technology at Newcastle City Council.


Big data will allow council to monitor its key performance indicators in real-time.

Over time, the versatile infrastructure manager has learned that change in the industry is ever-present.

He says the political landscape within a council can change rapidly, including its priorities and public policy.

At the same time, technology and pricing is constantly on the move, and for these reasons Darren is working with software company Mandalay Technologies, a leading provider of waste management technology. Mandalay recently supplied the council with its weighbridge software, in its first step towards tracking waste through an overarching system.

To live up to its vision of becoming an agile waste authority, Newcastle City Council plans to invest in the latest in digital technologies, including smart dashboards and route optimisation software for refuse vehicles and landfill compaction equipment. This will allow it to service its community in the collection of kerbside waste and help manage its significant landfill facility.

"Technology gives you information, but it's what you do with that data that makes it count. Smart dashboards will allow our operations staff to see a visual snapshot of how their section of the business is running overall," he says.

"In the longer term we can start putting that information out to the community, which will show how waste travels in their neighbourhood.

"We will be able to understand our demographic, discovering which areas create the most waste and make that available to the public."

One of the major challenges, he says, is negotiating a waste agenda to his

colleagues in the face of a myriad of other priority issues, from managing roads to pavements, parks and gardens.

"Waste is a unique business, it's very intrinsically linked to every aspect of itself as a sector. You change one aspect of it, such as collection day, and that affects the disposal.

"The issue is, as a council, how do you get that specialist data around waste and incorporate it with council's core business?

"The challenge is making that data accessible, and smart dashboards are the beginning for us for that data capture process."

The way he brings the message home to his colleagues, he explains, is through instilling an environmental agenda for social change.

"It comes back to that global approach to environmental issues and getting people to understand how unsustainable some practises can be. Once people see the end game for their actions it's easier to convince them to change their ways."

In 2014, Darren's hard work resulted in him securing four grants totalling $6.7 million through the NSW Waste Less, Recycle More initiative. These included the installation of a new materials recovery facility, composting facility and the expansion of its public drop off transfer station.

In an organisation with constantly changing priorities and frequent technological and social change, Darren says the ability to track data will keep his portfolio accountable.

By being able to monitor council's key performance indicators, the business case for implementing new waste management technologies is strengthened.

Darren says council budgets are reviewed usually two or three weeks after the end of the month. With a smart dashboard, the council will be able to identify how it's tracking towards that budget in real-time.

"One of the issues we're having is we lose sight of the value of waste. We're working with Mandalay to be able to track waste so we know how many tonnes of it are on its way and from where.

"For example, when we move materials from stockpiles, we will be able to have a visual dashboard of its movement and remaining stock," he says.

"One of the exciting long-term goals is to be able to share great information with our customers and residents. This will allow for developments such as knowing the stock of recycled aggregates on site before a driver leaves, or whether a garbage truck has been down a resident's street yet."


Community expectations are increasing around waste, Darren says.


Council has secured four grants through Waste Less, Recycle More.

Simon Kalinowski, Mandalay Technologies Managing Director, says one of the challenges facing local authorities is how they adapt to increasing community expectations for data and transparency, all while making that transition internally.

"Darren's team is investing early in the people development – to enhance the capability of the service to its community.

"It's not just software, it's a mindset shift in the people and the approach, and a discipline that needs to be adopted across the team. Councils need to be willing to invest in their people to expand their capability and achieve those outcomes," Simon explains.

He says dashboards help that discipline, as they provide the real-time visibility into all the key areas of the business across the whole team.

"Dashboards help businesses align themselves with common goals, understanding their performance and compliance expectations in real time, as opposed to seeing it at the end of the day, week or month.

"Community expectations are only going to grow in respect to waste services and the performance of local authorities will be scrutinised publicly. Technology is an integral component in helping bridge that service and information gap with the community."

Optimising fuel costs

ROUTE OPTIMISATION SOFTWARE HAS SOLVED AN INDUSTRY PROBLEM OF COUNTERACTING THE FLUCTUATING PRICE OF FUEL, SAYS GERARD KISSANE, HEAD OF ANZ REGION FOR AMCS GROUP.

The price of fuel is dependent on a number of factors, including the cost of shipping and its cost overseas.

According to the Australian Institute of Petroleum (AIP), around 20 per cent of petrol is imported from Singapore and South Korea. Around 95 per cent of the wholesale price of petrol is determined by the Singaporean price, plus shipping costs and Australian taxes. The remaining five per cent comes from insurance, terminal costs and a wholesale marketing margin.

AIP's data shows the wholesale price at the terminal (the Terminal Gate Fee) fluctuates frequently. On August 11, the Melbourne price sat at 110.4c a litre. Compare that with the beginning of August and the price sat at 108.5c, and 107.4c a week before.

Rather than waiting for the right time to fuel up, fleet managers are turning to advancements in technology to drive efficiencies in their assets. Route optimisation software is one technology that has the potential to reduce the amount of vehicles on the road and kilometres travelled, saving waste transporters money and time. These systems can be used to optimise distribution, pick-ups and collection routes through computerised 'what-if' simulations of trucks on the road and expected collection times.

Waste management software provider AMCS Group is one organisation leading the provision of route optimisation solutions in the waste industry.

In 2009, AMCS partnered with Transvision AB, an international provider of route optimisation software with more than 30 years' experience headquartered out of Copenhagen in Denmark. Gerard Kissane, Head of ANZ Region, says AMCS acquired Transvision in 2014 due to its ability to handle the complexities of waste collections, and most importantly, its fast speeds of the route optimisation algorithm.

"With municipal collections you have on average 1500-1600 stops per route and some of the other algorithms can struggle with that level of optimisation," Gerard explains.

A common problem impacting on driving time, AMCS finds, is the fact that side loader trucks can only handle waste bins angled on the left side of the road. Rear loader trucks capable of handling bins from both sides can cause safety issues if they are used in residential areas, Gerard says. To solve this issue, route optimisation technology can automatically calculate where the vehicles would be most safe to enter, including city centre laneways in the CBD.

"You can mix and match your fleet within the software to suit the area. AMCS Route Planner will provide a sequence of the most efficient way to drive from your depot to your disposal point and back.

"We can then send the information to an on-board computer or a handheld device so it can help the driver make the right decision."

AMCS data estimates that businesses using the route planner technology have allowed them to reduce up to 15 per cent of their vehicles on the road, and up to a 75 per cent decrease in the time spent on planning and administration.

"Three or four years ago, when oil was $150 a barrel, the main driving factor behind the technology's uptake was people wanted to reduce their drive time and ultimately their fuel bill. However, reducing the number of vehicles in your fleet is now the main reason," Gerard says.

"Over the years we've helped a lot of companies in their expansion by optimising their existing business to make sure they're using their fleet to maximum capacity before they go out and buy that new vehicle."

Tyre Stewardship Australia's journey to success

TYRE STEWARDSHIP AUSTRALIA'S DALE GIBSON EXPLAINS HOW THE ORGANISATION HAS BOOSTED THE UPTAKE OF TYRE-DERIVED PRODUCTS IN THE ROAD, RAIL AND CIVIL ENGINEERING SECTOR.

It's been just over four years since the formation of Tyre Stewardship Australia (TSA), an industry-backed, government supported association which promotes the development of viable markets for end-of-life tyres.

In that time, the organisation has accomplished many achievements. Through its Tyre Product Stewardship Scheme, it has helped fund a range of resource recovery projects, from increasing the use of recycled tyre-derived products for use in state roads, to assisting the development of sustainable and safer explosives used in mines and quarries.

"Our goal is to reduce the environmental impact of tyres through increasing the recycling rate of end-of-life tyres and promoting sustainable outcomes," says Chief Executive Officer Dale Gibson.

Dale took over the role in January. He says his background in the automotive industry has helped him engage with a wide network of organisations. His extensive industry experience includes CEO positions at the Society of Automotive Engineers – Australasia, Motorcycling Australia, Speedway Australia and Four Wheel Drive Victoria.

TSA has increased the proportion of tyre-derived products across a range of sectors.

HOW DID THE ORGANISATION COME ABOUT?

TSA was formed in 2014 after the Australian Tyre Industry Council applied to the Australian, Competition and Consumer Commission (ACCC) to establish a national Tyre Stewardship Scheme. The ACCC authorised the move in 2013 and agreed that it would be administered by a new association, known as Tyre Stewardship Australia. In January 2014, the association officially formed.

The scheme is funded through a levy of 25 cents per equivalent passenger units (standard passenger car tyres, known as EPUs) on the importation of new tyres by voluntary member companies of the scheme.

When TSA first commenced, a range of major tyre manufacturers backed its establishment, including Michelin, Goodyear-Dunlop, Pirelli, Yokohama, Toyo and Continental. Those brands were later joined by Bridgestone and Kumho.

A report by Hyder Consulting found that, in 2013-14, there were 51 million EPUs entering the waste stream and only five per cent were recycled domestically into new products. Of the total volume, 31 per cent were exported mainly for use as tyre-derived-fuel. Although such exports can be considered sustainable, higher value outcomes for domestic end use such as local manufacturing and industrial uses are preferred by the TSA. The total volume also showed 16 per cent of waste tyres still went to licenced landfills and two per cent were stockpiled for future recovery. TSA prioritises domestic recycling for higher

value applications in its measurement of tyre re-use, with efforts to increase the domestic utilisation of tyres its key priority. Dale notes the domestic recycling rate in the earlier 2010-11 Hyder Report was sitting at 16 per cent, as international demand and low oil prices can affect the take up of tyre-derived fuel.

TSA's aim is to increase both the Australian use of recycled material and sustainable use rate over five years with a broad target of more than 50 per cent sustainable end use within that initial period.

To aid increased local end use, the Tyre Stewardship Research Fund is investing millions of dollars to fund projects to increase the applications of recycled rubber content.

Since its humble beginnings in 2014, TSA's significant growth and industry participation has allowed the organisation to allocate funding to fifteen tyre reuse projects across Australia.

TSA HELPS DRIVE OUTCOMES

One of TSA's standout projects is a joint venture between Melbourne-based Polymeric Powders Company and Geelong-based manufacturers Austeng. The project, which kicked off in the 2016-17 financial year, has seen discarded tyres turned into a material to manufacture high-quality commercial pipes. Polymeric Powders mechanically and chemically treats rubber crumb from end-of-life tyres to create an activated rubber powder that can be chemically bonded with polyolefin plastics, creating a composite material for use in flexible pipes. It allows the recycled composite material to be used in a range of applications, including in building and construction sector, mining and irrigation and sewerage.

"They're looking at competing with traditional plastic piping which is a substantial market," says TSA Market Development Manager, Liam O'Keefe.

The utilisation of crumb rubber in roads is also a key priority for TSA. Although rubberised asphalt and spray seal have been used in Australia since the 1970s, TSA is aiming to increase the volume of recycled rubber on state roads. An important market development project for road building is a TSA-funded partnership with Sustainability Victoria and the Department of Environment and Heritage Protection Queensland. The partnership involves looking at reducing market barriers to increase the use of tyre-derived products in the repair and maintenance of Australian roads. This research was delivered via agencies including Queensland Transport and Main Roads, VicRoads, Main Roads WA, Australian Road Research Board, Australian Asphalt Pavement Association and other road agencies.

An initial positive outcome has been that VicRoads has increased the allowable proportion of rubber crumb used in high stress road surface spray seals from 5 to 10 per cent, with up to 18 per cent crumb rubber for other types of sprayed seals.

An ongoing TSA-funded project looks to investigate the barriers to using more crumb rubber in Australian roads. Through its relationship with the Australian Asphalt Pavement Association, Liam says conversations are positive. "We want to encourage more parties to come to us with ideas where we can support them financially to deliver projects."

PUBLIC AWARNESS

Building public awareness of the end-of-life tyre sustainable management challenge is also a key part of TSA's task. "The success of the scheme also depends on our ability to create public awareness on both the challenge and the role that consumers can play by supporting only TSA-accredited retailers," Dale says.

Dale says that public recognition provides the incentive for more tyre importers and other industry players to come on board, which in turn helps to provide the funds to help drive progress. Through its accreditation scheme, the organisation estimates 1,300 tyre dealers nationwide have become TSA accredited.

THE FUTURE OF TYRE-DERIVED PRODUCTS

As part of its focus on increasing local tyre recycling, TSA has co-funded a study into market development opportunities with the Victorian, NSW, Queensland and WA Governments. At the meeting of Australia's State and Territory Environment Ministers in July, Ministers endorsed the resulting National Market Development Strategy for Used Tyres.

The strategy outlines actions for the next five years to boost the uptake of tyre-derived products in road, rail and civil engineering applications.

Strategy participants, including TSA, are now in the process of setting up a collaborative working group to build a formative action plan which brings together the states and territories to work on opportunities.

Dale says that prior to the establishment of TSA, there was less of an integration between governments, the importers, recyclers and potential end users. In addition, the Federal Government is also reviewing its Product Stewardship Act 2011, with that review expected to conclude in the first half of 2018.

"I think that TSA is in a unique position as a national agency to bring together all aspects of the waste tyre supply chain and to begin a concentrated and cohesive conversation. "The importers are vital to what we do, but all players in the market, from the tyre supply chain right through to disposal have an important role to play in turning this environmental challenge into new products and jobs."

Changing the **game**

VEOLIA GROUP'S MECHANICAL BIOLOGICAL TREATMENT FACILITY IS HELPING SYDNEY COUNCILS ACHIEVE THE NEW SOUTH WALES GOVERNMENT'S DIVERSION TARGET OF 70 PER CENT BY 2021.

Approximately 240 kilometres from Sydney, NSW, lies the town of Tarago.

For two decades, Tarago was home to the adjoining Woodlawn Mine site. Men in high-vis jackets nestled deep within the Woodlawn open pit spent countless hours drilling for zinc, copper and lead until its closure in 1998.

Since 2004, global environmental services company, Veolia, has been working tirelessly to rehabilitate the site.

Veolia spent 10 years planning the international company's new Mechanical Biological Treatment (MBT) facility, which became fully operational in July of this year. The $100 million investment required extensive planning approvals, community consultation and council collaboration. It now allows Veolia to compost a significant amount of Sydney's waste for the mine site remediation.

But within this remediation project lies a greater environmental goal – to help the councils of Sydney meet their targets to divert 70 per cent of waste away from landfill by 2021.

Veolia's NSW Group General Manager, Ben Sullivan, worked with company stakeholders to get the state-of-the-art infrastructure off the ground.

Ben explains that Veolia received planning approval for the Woodlawn MBT in 2007. But it took some years to get the tender right. In 2012, Veolia submitted its proposal to the Southern Sydney Regional Organisation of Councils. The plan was to take more than 100,000 tonnes per annum of the council's waste, helping them meet their diversion targets.

The company submitted its design and solution for the MBT, and was awarded the contract by eight of the eleven SSROC councils (now six councils due to amalgamations) in 2013. The updated contract included plans for a second waste transfer station, before being separated and sent to the MBT facility. It also expanded the facility to receive waste from an additional consortium of five councils – the Northern Sydney Regional Organisation of Councils. This would allow the MBT to process around 144,000 tonnes per annum.

"Between 2007-12 it took an extensive amount of time to refine and really commercialise the solution. In parallel, the Environmental Protection Authority (EPA) and government targets were being modified around increasing the diversion rates, and the landfill levy was starting to increase," Ben explains.

"So with these changes in mind, the Sydney councils started to look forward to find a solution to its putrescible waste. We have a fairly established kerbside system in Sydney, but it was the red bin that was going to landfill. Approximately 50 per cent of the red bin is food, and the rest is plastics and other material," he says.

Ben says that by processing and separating the materials at the MBT, residents were able to keep their current recycling habits in place. He estimates Veolia is now responsible for processing 25 per cent of the putrescible waste in Sydney, which equates to about 750,000 tonnes per year. The new MBT will process 144,000 tonnes of the current volume and will divert approximately 50 to 55 per cent of the tonnes away from landfill, using the organic fraction as mine site rehabilitation adjacent to the Woodlawn Eco-precinct.

"This technology has formed the infrastructure part of Veolia's environmental solutions for the past 30 years in Europe. We were able to leverage and transfer our knowledge and experience to the Australian operations, which had a similar mass balance in the waste stream," Ben says.

The procurement process included the importation of four large rotating drums, of about 4.6m in diameter, which degrade the materials and prepare them for separation.

"The mining industry would be quite familiar with these drums but in the waste industry, it's quite unique."

Ben explains that Veolia transports the waste to the two waste transfer stations (located in Clyde and Banksmeadow, respectively) where they are stockpiled and compacted into a shipping container at a rate of 31.5 tonnes per container. From there, it is taken to Veolia's Woodlawn Eco-precinct by rail, located 30 km south of Goulburn and 240 km southwest of Sydney.

"Moving waste by rail is quite unique, it keeps trucks off the road and the trains include about 55 carriages. Two trains a day leave Sydney to our Woodlawn facility.

"We then truck the last seven km from a purpose-built train site we

constructed in a town called Crisps Creek up to the site," he says.

Once the waste reaches Woodlawn, it is loaded into a pit where the first screening is undertaken and any items are removed that cannot be processed. A crane grapple then loads the rotating drums.

"This step is the first opportunity to spot anything that shouldn't be there, such as a mattress or a tyre that won't be able to be processed. The crane actually removes that equipment and that goes back to landfill," he says.

Waste is then combined with air and water in the large rotating bio-drums to commence degradation and prepare for separation. Four drums, of about 4.6m in diameter, each process one tonne of waste at a time, which breaks down the waste over three to four days. It then undergoes anaerobic digestion within the drum, which breaks it down under heat before being placed into a series of conveyors and trommels to filter out any inorganic materials for recycling and recovery, including metals, plastic or paper.

Organic materials, which includes food and garden waste, is stockpiled in 45 rows in a 1.1 hectare shed for fermentation and maturation, preparing the compost for use in remediation on the old mine site.

"The materials sit there for four to five weeks and we pump air through that stockpile at around 70°C. This continues to accelerate that breakdown and degradation of the food and we make sure the heat and the moisture content is the right temperature.

"After four to five weeks through a front end loader, we then take that product outside onto a maturation pad, where it will again sit there for another 12 weeks. That produces a compost type product which is used within an adjacent company for the mine remediation."

Residual waste, which includes ash and other non-recyclables, heads to a bioreactor. The bioreactor enables Veolia to rapidly stabilise waste by accelerating the waste decomposition process, while maximising landfill gas recovery, which extracts methane gas to convert the waste into energy and heat. The energy is then used to power more than 30,000 homes. He says non-ferrous metals are separated and sold on for recycling.

Veolia spent 10 years planning the company's new MBT facility.

"We've effectively put in a series of gas wells and pipes as we lay the waste. When the waste breaks down in the bioreactor it produces methane and we extract that methane to power a total of 24 generators on site. Generally speaking, every tonne of biodegradable waste deposited will yield approximately 1.33MW of power."

While the bioreactor has been generating energy for years, Ben says the company has bigger plans to expand its residual waste recovery and shred it into refuse derived fuel.

"We're currently in discussions with Southern Sydney Regional Organisation of Councils and Northern Sydney Regional Organisation of Councils for an energy from waste project.

"We've got the concept design complete and we're just working on the business case commercials on that."

He says at present, the facility is diverting 50 to 55 per cent of its waste from landfill. If Veolia is able to recycle the residuals, Ben hopes this would increase the diversion rate by an additional 20 per cent.

As Stage 1 is complete, the team will be looking to complete Stage 2. The concept will see an additional four drums constructed, with the capacity to process 244,000 tonnes of waste, subject to additional contracts to be awarded to Veolia.

"Right now, we're in that phase of going from commissioning to operation for Stage 1.

"We're running about 70 to 75 per cent of our targeted throughput, which is not too bad in month two. But we want to ramp that up to full capacity by November, so we're getting that diversion requirement with our councils."

Ben says Veolia will continue to work with councils in refining contamination in the waste stream.

"Now that it's constructed, there's certain items we want to keep out of the waste stream that shouldn't have been there in the first place. You'll be surprised that in the red bin you still get car parts, hoses, batteries and electronic equipment. That education process through the councils is crucial."

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THE FUTURE OF SUPPLY CHAIN AND LOGISTICS

Smart machinery boosts **profitability**

GCM ENVIRO'S TANA SHARK WASTE SHREDDER HAS SAVED NORTH WYONG RECYCLING THOUSANDS OF DOLLARS IN TRANSPORT COSTS.

Moving recyclable material more than 800km from NSW to Queensland requires maximum payload to optimise fuel costs, which is why North Wyong Recycling recognised the benefit of investing in new technology.

In 2015, the medium-sized business, which specialises in construction and demolition (C&D) waste, spent four months carrying about 16 to 17 tonnes of waste from the town of Wyong, in the Central Coast region, to Veolia's recycling facility in Archerfield, Brisbane. Two vehicles of about 140 m^3 transported 34 tonnes of crushed, separated and recycled C&D waste to Archerfield four times a week collectively.

North Wyong's C&D waste consists of bricks, asphalt and timber. Its business specialises in separating materials such as steel from these materials for recycling. The materials come from building sites and home renovations across town, as well as major waste management collection companies.

But the small payload of 17 tonnes per vehicle was costing North Wyong Recycling thousands of dollars in transport, so the company's owner, Gerald Coster, looked to find a solution.

After some months of research, Gerald discovered GCM Enviro's TANA Shark 440DT waste shredder, doubling his payload to carry up to 40 tonnes of waste, and cutting his transport costs in half.

The TANA Shark is able to shred Gerald's C&D waste into tiny particles, allowing him to fit more waste onto the truck. It begins with him using a front end loader to load the materials into the TANA Shark, where they are then shredded.

"It significantly reduces the size of C&D materials. We process about 25,000 tonnes of C&D waste annually and about 15,000 tonnes of that travels to Archerfield each year," Gerald explains.

A key factor in Gerald's decision, he says, was the size of the machine and

its capacity to perform shredding in one pass.

The TANA Shark waste shredder enables full control over the particle size from 50mm to 500mm (2" to 20").

"I can change the grade of C&D materials. The TANA Shark shreds our materials, ranging from minus 50mm to 250mm."

In the primary shredding phase, Gerald is also able to separate out unwanted steel and other materials using an over-band magnet and other screens below the rotor. The end result allows Gerald to provide Veolia with separated materials ready for recycling.

Among the host of benefits is also the fact that Gerald no longer needs an excavator to push the materials into the truck.

He says the smaller particle size of C&D materials means he only needs a long reach wheel loader and grapple crane to move the materials onto the truck. The TANA Shark has tracks and can be transported with ease, in case he needs to separate materials elsewhere on site.

"We've halved our loading time from two hours to one.

"Previously we had to use an excavator to move the materials, but because it's of such a small size, we no longer need an excavator to compress the materials onto the truck."

GCM Enviro describes its TANA Shark 440DT shredder as a robust and well-engineered machine. GCM says its intuitive design results in efficient and reliable performance, with maximum up times.

GCM Enviro says the machine is robust and well-engineered.

The TANA Shark's versatility gives it the ability to remain relevant, regardless of the ever changing landscape of waste and recycling management. Easy adaptability makes the TANA Shark 440DT appropriate for waste to energy conversion and volume production. GCM Enviro's slow-speed multipurpose waste shredder can be conveniently implemented in a range of subsectors, from tyre and mattress recycling, to commercial and C&D waste processing.

Another important factor, Gerald says, was GCM Enviro's high standard of service.

The company gave a clear explanation of the product's capabilities and is always on hand to provide technical solutions and support. GCM Enviro is the exclusive distributor for TANA in Australia and New Zealand.

The TANA Shark has a hydrostatic power transmission aimed to increase the machine's reliability through reduced downtime. One of its unique smart features for daily operation is the opening sidewall. GCM Enviro says it provides quick, easy and safe access to clean and remove non-shreddable objects from the rotor shaft.

The opening sidewall also functions as a service hatch when changing or replacing rotor knives and counter knives. Adding or removing the rotor screen can also be done in an efficient 10 minutes.

GCM Enviro's goal of reducing downtime is also evident in its exceptional TANA service support and real-time electronic diagnostics system, which sees the company on hand to regularly discuss the technology with its customers, allowing GCM Enviro to detect early signs of possible malfunctions.

This means preventative actions can be taken immediately and downtime is minimised.

"We've been working with GCM Enviro for five years and in that time they've provided an excellent back up service should anything go wrong.

"We'll continue to work with the company when we require any new machinery," Gerald says.


The company's machinery is said to reduce the size of C&D materials.

Telematics and transport

GAVIN HILL, TCA GENERAL MANAGER STRATEGIC DEVELOPMENT, OUTLINES THE POTENTIAL FOR TELEMATICS IN WASTE MANAGEMENT.

With the rise in big data, global positioning systems and telecommunications, the ability to plan, monitor operations and mitigate risks in the supply chain is becoming more accessible.

That's according to Australian telematics body Transport Certification Australia (TCA), which helps manage information to reduce costs and increase safety for the transport industry.

The national government body provides advice, accreditation and administration services in the use of telematics and intelligent technologies, spanning hardware, services, providers, applications and programs.

TCA is responsible for the National Telematics Framework which provides a nationally agreed upon platform to support current and emerging needs of government, industry and end-users.

The National Telematics Framework – also known internationally as ISO15638 – houses a growing number of interoperable telematics applications, which are being leveraged by the broader transport sector. This includes national programs and applications such as its Intelligent Access Program, Intelligent Speed Compliance and On-Board Mass monitoring.

Telematics is the branch of information and communications technology that deals with the transmission of data, which can monitor the location, movements and status of vehicles.

Gavin Hill, TCA General Manager Strategic Development, says the government body plays a key role in ensuring end-users have choice.

"All too often we see procurement decisions made without consideration to current and emerging developments – including the growing use of telematics in legislative, regulatory and contractual frameworks," Gavin says.

Gavin says waste transporters are still making decisions which can unwittingly lock them into systems which don't anticipate emerging needs.

"Technology and digital systems have become ubiquitous and more integrated, and continue to move at an increasingly rapid pace. As a government organisation, our role is to manage outcomes through the use of telematics, and avoid unnecessary costs and duplication of equipment."

Gavin says the National Telematics Framework has an enabled market of certified services and type-approved hardware from multiple telematics providers. TCA encourages more competition, as Gavin says this means more choice for the transport sector, in addition to ongoing reductions in costs. He adds that as more operators turn to certified telematics to demonstrate compliance, the ability to use data from these systems is becoming crucial.

The Intelligent Access Program (IAP) is one of the agency's applications that it administers nationally for governments (states and federal), providing improved access to the Australian road network.

Since going live in 2009, more than 4200 heavy vehicles have been enrolled in the program by transport operators. But Gavin says this is the tip of the iceberg, with service providers informing TCA that there are 32,000 telematics units installed in heavy vehicles across the country that meet, or can meet, the requirements agreed upon by government and industry. He says these systems are integrated through a telematics hub, which can perform multiple functions.

TCA assesses its systems and service provisions against performance-based standards, including the level of risk expected on the road. In May, TCA commenced assessment On-Board Mass systems, which can allow operators to carry greater loads, use innovative vehicle combinations, and access the network and its infrastructure, which would otherwise be off limits.

One such example is the access arrangements in Victoria regarding high productivity freight vehicles. Service providers certified by TCA help operators increase their waste volumes between trips in a network of approved Victorian roads. Gavin says as government introduces new reforms, TCA ensures its advice and processes are up to date with the

TCA-approved telematics are assessed against performance-based standards.

minimum requirements.

Stakeholders across the entire supply chain will continue to work together on planning, implementing and controlling the flow and storage of goods and services. Compliance, performance-based standards and safety are hot topics set to be discussed at next year's inaugural MEGATRANS2018 event, and Gavin says he is looking forward to engaging with the waste sector as an exhibitor.

"We want to wave our flag to the waste sector: there are opportunities that they can be taking advantage of. It's a quid pro quo arrangement for government and the waste industry, and TCA manages that delicate balance.

"In fact, transport operators in the waste sector may already be fitted with type-approved telematics hardware, or even enrolled in certified programs administered by TCA for other regulatory purposes."

MEGATRANS2018 – an exciting new international trade event – will bridge the gaps between these industry segments that have previously been operating in isolation. The show makes its debut 10 to 12 May, 2018, at the Melbourne Convention and Exhibition Centre, based in the heart of one of Australia's major logistics hubs and one of the world's most livable cities – Melbourne. Connecting the Australian and international supply chain, the three-day expo, delivered in partnership with the Victorian Government, will bring 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.

A number of main sections comprise the show's 30,000 square metres of space – Logistics & Materials Handling / Warehousing & Storage; Road Transport, Air, Sea & Rail; and Infrastructure; with a strong emphasis on technology right throughout. Other features of MEGATRANS2018 include a Ministerial Breakfast delivered in partnership with the Victorian Government and Transport Certification Australia's (TCA) Technology Hub.

"We're working on having a technology hub at the international trade show. We'll be leveraging our relationships with state and federal governments to showcase the potential of telematics software and equipment."

"It's important to recognise that telematics in-vehicle units are now being utilised as a telematics 'hub' connecting multiple systems and performing multiple functions within a vehicle."

From cradle to grave

TOXFREE'S DANIEL MONTALTO DISCUSSES THE COMPANY'S NEWLY ESTABLISHED COLLECTION SERVICES IN NEW SOUTH WALES AND VICTORIA, PROVIDING A WHOLE-OF-LIFE SOLUTION TO WASTE MANAGEMENT IN AUSTRALIA.

With collection services now operating across the country, total waste management specialists Toxfree has officially closed the loop on its waste management service in Australia.

Over the next year, the company plans to roll out a new fleet of up to 20 hook lift and front lift trucks (predominantly Volvo FM11s), operating for the first time in New South Wales and Victoria. The decision cements the company's reputation as offering a whole-of-life solution to waste management in Australia, from collection to handling, recycling and recovery. The move strengthens Toxfree's achievement as the only company in Australia internationally recognised to safely handle next generation e-waste containing mercury.

Since its establishment on the Australian Securities Exchange in 2000, Toxfree has invested heavily in technologies, including its BluBox and HazPak systems, in order to safely handle hazardous waste in an environmentally responsible manner.

It's also focused its services on the industrial, health and commercial waste sectors, providing a solution to challenging waste streams, from liquid waste to aerosol recycling and gas destruction.

Since 2000, Toxfree has acquired more than 10 waste management

L-R: Glen Bourdon – Operations Manager
Daniel Montalto – Regional Manager Victoria
Jesse Orchard – Driver

businesses, opened up over 85 facilities nationally and employs in excess of 1500 people. The company commenced its collection service in NSW in November 2016, and Victoria in July of this year. As part of its bold expansion, more than a dozen jobs will be created in administration and operations, along with the establishment of a new role for experienced business managers, Daniel Montalto in Victoria and Dean Naudi in NSW.

With more than three decades experience in the waste industry, Daniel joined Toxfree two months ago in the newly created Victorian manager role.

Daniel manages the movement of all solid waste and recyclables across the state. He says Toxfree's state-of-the-art vehicles have been fitted with the latest recording systems and weighing devices. Daniel says that Toxfree's new vehicles will ensure all waste streams comply with environment and safety standards.

He says that Toxfree does not own or operate any landfills, which means its duty of care to recycling and recovery is a high priority.

"As a leading recycler and handler of hazardous materials in the commercial, industrial and medical waste sector, the last part of closing the loop is to provide the waste services and the transport," Daniel explains.

Increasing its involvement in the community is also part of the company's expansion strategy.

Daniel says over the coming year Toxfree plans to work with statutory authority Sustainability Victoria to develop specific depots for residents to drop off their hazardous waste. He says that Toxfree has the largest network of collection points in NSW to accept the materials and process it at its St Marys facility in western Sydney.

Daniel cites the company's HazPak systems and BluBox technologies as a key point of difference in its capacity to safely handle hazardous waste. Under the Hazardous Waste (Regulation of Exports and Imports) Act 1989, waste considered hazardous includes that which is explosive, poisonous and toxic, along with flammable liquids and a range of other considerations.

The company's HazPak 3000 is a densification system which shreds and separates residues from recyclable materials, such as paint tins, oil filters, carboys and aerosols.

Liquid or gaseous residues are recovered and reused or recycled depending on the waste stream. Waste streams are consolidated into bulk tanks to remove the gas and develop an alternative fuel to reuse the wastes, rather than disposing of it to landfill. Daniel says the fuel processed through HazPak powers the company's incinerators at its facilities across the state, which are used to burn off toxic chemicals within waste streams.

Daniel says Toxfree is the only company in Australia able to safely recycle display units containing mercury, and has done so through its BluBox Recycling Plant. The BluBox is a 40-foot container designed for next generation e-waste such as flat panel displays, smart phones, tablets and laptops. It can also process a wider variety of domestic e-waste, including toasters and hair dryers.

The BluBox process extracts mercury from LCD backlighting tubes, utilising a filtration system to collect mercury vapour and phosphor-contaminated mercury.

The process provides a fully automated solution to handle a variety of e-waste items, from desktop computers and laptops, to toasters and hair dryers.

Daniel says another point of difference for the company is a highly skilled and trained workforce, with a range of employees coming from chemistry and logistics backgrounds.

"Safety is of major importance to us, and we're able to handle the waste other companies don't want to get involved with. Whenever we have a company meeting, the first point we discuss is whether we are meeting our safety requirements."

Daniel says Toxfree's vision going forward will be about sustainable growth.

"We will continue to work with our partners in the industrial,healthcare resources and infrastructure markets. We want to offer those larger customers total waste management solutions, not just for their general waste, but also their hard to treat waste," he says.

"Unlike the traditional waste companies, we focus very strongly on diverting material from landfill and recycling the material, and we continue to remain at the forefront of that."

Braking to avoid pollution

ATECO EXPLAINS HOW TELMA EMISSION-FREE BRAKING IS HELPING THE WASTE INDUSTRY REDUCE THE DEADLY IMPACT OF AIR POLLUTION, WHILE SIMULTANEOUSLY REDUCING DRIVER MAINTENANCE AND FUEL COSTS.

Air pollution is estimated to contribute to about 3000 deaths in Australia each year, according to data by the Australian Institute of Health and Welfare.

The Organisation for Economic Co-operation and Development has researched the impact of air pollution in its 2012 research, which found that without new policies, by 2050, air pollution is slated to become the world's top environmental cause of premature mortality.

In the face of this ever-growing problem, automotive businesses have been championing technology which looks to reduce the carbon footprint. A major problem related to air pollution is airborne particles, which includes dust, smoke, dirt and liquid droplets. Motor vehicle emissions are just one cause of particles emitted directly into the air, according to the Department of the Environment and Heritage 2005 fact sheet.

Ateco Equipment is championing technology that reduces emissions.

Telma Emission-Free Braking, an international leader in friction-free braking systems, has considered the impact of airborne particles in the development of its Telma retarder, an induction break solution. Available through Australian distributor Ateco Automotive, the Telma induction brake system is said to significantly reduce fine air particles caused by braking through electromagnetic induction technology.

The Telma electromagnetic product was first developed by the company in 1954. According to Telma, the technology was envisioned when French public authorities required the use of a retarder on all vehicles transporting passengers of more than eight tonnes of gross vehicle weight in areas declared rugged. One year later, the first Telma retarder was developed.

Bruce Poole, National Sales Manager, Ateco Equipment, says that being frictionless, the system doesn't emit any fine particles.

"Telma induction brakes, which are also known as electrical or electromagnetic retarders, dissipate a large part of the braking friction, which causes air particles," Bruce explains.

Bruce says that Telma induction

braking systems dissipate this braking energy by generating eddy currents. Telma induction braking systems are made of a fixed stator, the stationary part of a rotary system, and a pair of rotors attached to the driveshaft to allow it to rotate. The stator and the rotors are mounted coaxially, opposite to one another, and are separated by a narrow air gap, avoiding any friction. The stator plays the role of the inductor, it is made of a pair of electromagnets, which generate electromagnetic fields when electricity continuously flows through the stator coils, producing eddy currents in the mass of the rotor.

"The generation of eddy currents in the mass of the rotor helps counteract the rotation of the rotor. The braking torque that is generated and applied to the transmission shaft slows the vehicle," Bruce explains.

"The eddy currents produce a gradual rise in rotor temperature and the heat is then released into the atmosphere through ventilation systems. Through this ventilation, Telma's system is effectively able to slow down a rotating shaft without friction, reducing the impact of particles in the environment."

Bruce says that this explanation is only one piece of the puzzle, as induction braking systems involve complex physics such as materials resistance principles, electromagnetism, thermodynamics and fluid mechanics.

Telma's research in Europe has found that the pollution reduction effect using induction brakes is particularly effective for vehicles travelling in urban areas. The company estimates the Telma retarder allows for an 85 per cent reduction in fine particle emissions, when compared to vehicles fitted without electromagnetic induction technologies. The modelling has been improved by years of practical experience and laboratory testing, Bruce says. It is for these reasons that Ateco has been the Australian sales agent for Telma since 1975.

Bruce adds that Telma induction braking systems require no periodic maintenance as they do not require any fluid change or wearing parts replacement. The lack of friction makes the technology silent under all conditions of use. For the waste industry, Telma has calculated that using its retarder significantly reduces break wear. Conventional braking systems undergo significant

Ateco has been working with the waste industry to help it reduce wear and tear.

heating due to friction, which accelerates wear. It has estimated that a Telma system can add an additional 100,000km to the life of waste collection vehicles. (http://www.telma.com/produits/avantage-economique)

Bruce adds that Telma retarders also reduce excessive fuel consumption during fast switches between deceleration and acceleration phases. Telma retarders can instantly stop producing braking torque upon the driver's request.

"Ateco has been working with the waste industry to help it reduce its emissions and wear and tear. This requirement is based on the need for safety and helping companies stay above board with the Environment Protection Authority, as we move towards a future where reducing emissions becomes a greater priority."

From coordination to collection

THE NEW SOUTH WALES GOVERNMENT'S CONTAINER DEPOSIT SCHEME OFFERS A SIGNIFICANT OPPORTUNITY TO EDUCATE THE COMMUNITY ABOUT THE VALUE OF RECYCLING. TOMRA-CLEANAWAY EXPLAIN THE CHALLENGES BEHIND ORCHESTRATING THE GAME-CHANGING SCHEME.

Coordinating New South Wales' largest litter reduction initiative in history was never going to be easy, but one of Australia's leading waste collection companies, Cleanaway, believes it has the winning edge.

In July, the NSW Government appointed the joint venture between Cleanaway and reverse-vending machine inventors, TOMRA, as the network operator for Return and Earn, the state's Container Deposit Scheme. The joint venture will be responsible for establishing a network of more than 500 collection points across the state.

TOMRA-Cleanaway will provide handling, transport, processing, recycling and data services as part of Return and Earn in NSW. In this partnership TOMRA will provide technology, software and carry the investment for the technology provided. Cleanaway will provide logistics, sorting of collected material and act as a broker for the recyclable commodities.

Since the announcement, TOMRA-Cleanaway has been working feverishly to ensure the community, recycling and corporate sectors are ready for the scheme's introduction in December.

L-R: David Clancy – Cleanaway GM NSW
Ken Donley – TOMRA-Cleanaway CEO
Markus Fraval – TOMRA Australia, Managing Director

WINNING THE TENDER

Ken Donley, Chief Executive Officer of TOMRA-Cleanaway, says the opportunity to combine Cleanaway's resource recovery experience with TOMRA, the international leaders in reverse vending technology, was a compelling offer. TOMRA's experience in other container deposit markets meant NSW would be getting a proven and reliable system.

"Cleanaway's local expertise and extensive footprint was unmatched in New South Wales," he says.

"TOMRA's research and development has made its sorting technologies the leaders in the field for recycling, sorting and reverse vending equipment."

The network will be a combination of manual and automated collection points. It has been designed to capture as many containers as possible.

"We are working with many partners, including social enterprises, to establish sites that are conveniently placed and are easy to use. With a large number of automated sites, the experience for consumers will be intuitive and consistent, and hopefully fun and rewarding."

With a track record of community engagement and education, Ken believes a key piece of the winning bid was Cleanaway's experience in bringing behavioural change to the community. "The CDS is foremost a litter reduction campaign, and Cleanaway is excited to be such a significant part of it.

"As Clean-Up Australia's national sponsor, we have an established commitment to addressing litter in the


TOMRA invented reverse vending machine technology.

> "Many of the collection locations will be in places that people are visiting already – such as supermarkets and shopping centre car parks."
>
> Ken Donley, Chief Executive Officer of TOMRA-Cleanaway

environment, and winning the CDS network operator role is another way we're delivering on our mission to make a sustainable future possible.

"Many of the collection locations will be in places that people are visiting already – such as supermarkets and shopping centre car parks. It means that it's just a small change to consumers' habits, and the 10 cent refund serves as a small incentive to make that change."

There's also a need to educate the community around the collection methodology. "It is quite a different scheme to kerbside," Ken says.

"We'll be working to explain what items are accepted within the scheme and where they can be taken for a refund. The form containers are recycled in is different, too. For example, you don't need to crush your bottles or cans, and in fact, they won't be accepted if they are crushed." he says.

THE SET UP

Return and Earn will commence on 1 December of this year and will allow NSW residents to return empty beverage containers for a 10c refund when presented at a network operator collection point.

Most containers in the 150ml to three litre range are included, although wine bottles, plain milk and some juice containers will not be. Collection point locations are still in the process of being confirmed, but TOMRA-Cleanaway is targeting shopping centres, charity partners, waste depot sites and existing recycling centres across the state.

Their location will be chosen based on convenience. Automated collection points and depots will use TOMRA's reverse vending machine technology to provide an electronic refund to consumers. Manual collection points will allow residents to deliver their bottles for a cash refund.

The state government's goal is to reduce litter volume by 40 per cent by 2020. *The NSW Government CDS discussion paper* (State of NSW, 2015) notes that similar schemes have reduced litter internationally. In New York, USA, after one year of implementing a scheme, the city reduced its drink container litter by more than 70 per cent. This result was replicated in seven states in the USA that introduced CDS' with a financial incentive.

COLLABORATION

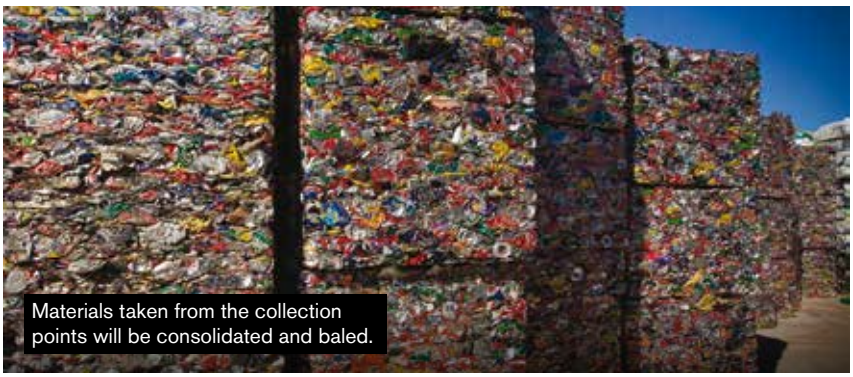
Return and Earn has three distinct components. The NSW Environment Protection Authority (EPA), representing the state government, has oversight of scheme.

The scheme coordinator, Exchange for Change, sits between the EPA and the network operator, TOMRA–Cleanaway. The scheme coordinator will collect the deposits from manufacturers and other suppliers and then pay the network operator, who will refund the deposit to consumers and take ownership of the redemption network.

The scheme coordinator and network operator are currently working together on verification and auditing to ensure system integrity.

Return and Earn will have checks and balances in place to help prevent fraud and to ensure the integrity of the scheme. Every single beverage container that is refunded will have to be individually counted and itemised at a collection point before a refund can be provided.

Reverse vending machines will be cashless and provide a refund through an app or a voucher to claim cash at



Materials taken from the collection points will be consolidated and baled.

a redemption partner site, such as a supermarket. Consumers who obtain their refund at a manual collection point may receive cash, or otherwise a similar cashless refund to that available at a reverse vending machine. Another feature of the reverse vending machines will be an option to donate the refund to registered charities, schools or local community groups.

OPTIMISING RECYCLING

Ken says material collected via the CDS is acknowledged as a clean and more highly prized commodity. By collecting higher volumes of better quality material, Return and Earn will spur investment in the recycling sector.

One of the unique aspects of the NSW scheme is that each item will be electronically scanned and counted, with material type recorded.

"Accepted materials such as glass, plastic, cans, and liquid paperboard will be single-filed through an identification unit that reads the material, type and shape, before sorting it at the back end," Ken says.

Materials collected from the collection points will be consolidated and baled, to be ready for domestic or export sale.

The sorting made possible by the reverse vending machines delivers a competitive commodity rate in the market. For instance, the glass collected will contain fewer contaminants than in kerbside recycling.

Return and Earn will optimise the recovery of the eligible materials, particularly glass, which has faced challenges in its recyclability in Australia. Ken believes it will increase commodity prices, which will open up new interest in recycling.

"The CDS is designed to complement kerbside recycling and will provide the opportunity to collect and recycle a really clean stream of material. The CDS process of scanning every container ensures contaminants do not find their way into the stream."

Modelling has shown that the commodity value of CDS materials is higher than the standard value. A 2016 report by consultancy firm AEC Group Ltd – *Implications of Container Deposit Scheme for Local Government* compared the CDS value of commodities to its standard commodity value.

The data was gathered by estimating the portion of eligible CDS containers within residential kerbside and public place recycling bins with 10 participating councils in Queensland.

Its modelling for the NSW market found that glass had a CDS value of $620/t, compared to its commodity value of $30/t. Liquid paperboard's CDS value was $3218 higher, while PET was $3559 higher. Of the 13.7 per cent of eligible CDS containers, glass and PET accounted for 91 per cent of the weight of total eligible CDS containers.

Ken adds that litter will be reduced by making it a valuable commodity.

"European studies have shown that beverage containers don't last more than 30 seconds on the ground once they have been littered. The value of the material means it is collected quickly," he says.

Schools will also be able to participate in collection challenges, competing against each other to collect and return the most beverage containers during a campaign period, supplementing existing parents and children fundraising activities.

"This is a really big win for the not-for-profit and community sector. School students, their friends and family will be encouraged to come to automated collection points and then recycle and donate to their local school."

"Charities will also be able to raise money through bottle drives and container drives."

CHALLENGES

TOMRA-Cleanaway are working towards 1 December to meet the EPA's requirements to have an adequate number of collection points established. Additional collection points will then be steadily rolled out over the following months.

"One of the challenges is that the commencement is during the peak Christmas retail period, so the timing will be difficult. However, we believe our experience in working with the NSW market will ensure a smooth transition."

"This is an opportunity to change the community perception behind waste. To demonstrate that the material that goes into a recycling bin is a resource, and has huge potential if it's correctly recycled for reuse. This is the start of a much larger conversation in the community about the value of waste and recycling." ■

Council's bold investment

TARPOMATIC'S ALTERNATIVE DAILY COVER SYSTEM IS SAVING VICTORIA'S SOUTH GIPPSLAND SHIRE COUNCIL ALMOST A MILLION DOLLARS WORTH OF LANDFILL AIRSPACE EACH YEAR.

When the waste management team at South Gippsland Shire Council presented a business case for an alternative landfill cover system, they were confident of council's support.

As a small rural municipality, the council services a population of under 30,000 residents. Geoff McKinnon, Coordinator Sustainability, says that this requires prudent financial management, and an alternative landfill cover system wasn't accounted for in the council's 2014/15 annual budget.

But Geoff and his colleague Peter Roberts, Waste Management Supervisor, knew that significant efficiencies were possible at the council's Koonwarra Landfill, provided an alternative to the traditional soil-based daily cover could be implemented.

The current stage of the Koonwarra Landfill was forecast to reach capacity in 2027/28. With this in mind, the forward-thinking council took a proactive step to look for ways to extend the life of the landfill for as long as possible into the future.

Once the landfill reaches capacity, one alternative disposal route would have been to send its waste to another facility, significantly impacting council's annual budget and ratepayers. The other option was to design and construct a new landfill or apply to extend Koonwarra's tipping capacity. In an industry where new landfill approvals are becoming difficult to obtain, Peter says that saving airspace and extending the life of its site was crucial for the small council.

Tarpomatic won the tender with the council due to its quality product.

He says that in 2014, the council's waste management team developed a master plan for the operation of Koonwarra Landfill, its only operational landfill. The option of exploring alternative daily cover options was one of the outcomes from the master plan.

"We looked at all the different options that were available at the time. This included tarpaulin-style covers, lift on/lift off covers and spray on cover. We determined the tarp-system was the best for our situation with a wet winter climate, suitable for undulating surfaces and low ongoing costs," Peter explains.

"We proposed the system to council and briefed them on its viability and the benefits it could provide. As a result, council approved a budget adjustment, allowing us to start the tender process immediately. The longer we delayed it, the longer it would have cost us valuable airspace."

Peter and Geoff met with the EPA with the knowledge that some Victorian landfills were trialling tarpaulin-based cover at their sites. They discussed the outcomes that council wanted to achieve, and the EPA indicated that the proposed system would be approved. The approval was conditional on the council's demonstration that tarpaulin-based cover would provide as good or better performance than the traditional

soil cover. A public tender process was undertaken for the supply of a landfill cover system, with the condition that EPA approval was obtained prior to purchase.

Peter says that Tarpomatic's Automatic Tarping Machine won the tender because of the quality of their product, competitive pricing and their demonstrated performance at other landfill facilities.

The successful tenderer not only had to supply and install the cover system, but also prepare the application for consideration by the EPA. Peter says the application prepared by Tarpomatic, with site-specific information provided by council, was approved by the EPA without the requirement of a trial period, a first for Victoria.

"Tarpomatic provided great assistance in getting this approval over the line. Tarpomatic's Managing Director Steve Brooks is highly knowledgeable about the technical details of his product, which made up a significant part of our application. We knew Tarpomatic had extensive experience in working with other state regulators," Peter says.

Council deployed the Tarpomatic at its Koonwarra Landfill in July 2015, saving landfill airspace valued at approximately $960,000 per year over the last two years. It is forecast that the introduction of the system will extend the life of its landfill by up to four years to 2031.

A self-contained unit, the Tarpomatic ATM attaches to the front of a landfill compactor or dozer, giving the operator the ability to effortlessly deploy or retrieve the specially designed heavy-duty tarpaulins over a landfill's working face each day.

"As a small landfill, daily cover material and the airspace it consumes has a major impact. At small landfill sites like ours, the ratio of cover material used, compared to waste received, is never as good as can be achieved at larger landfills.

"These facilities could be receiving more than 1000 tonnes of waste per day compared to our 60 to 70 tonnes. Despite this, we still had the same requirement of 300mm of soil cover material per day as the really big landfills." he says.

Even though Koonwarra is a small landfill, Peter says the change to an alternative daily cover method has been significant.

The improvement in compaction rate has led to a saving of almost 6500 m3 of airspace each year since the Tarpomatic system was installed. With compaction now running at close to one tonne per m3 of airspace, at council's current waste disposal fees, this airspace has a value of approximately $960,000 annually.

Another advantage to the Tarpomatic is the option for an odour control unit.

"Our Tarpomatic unit has a deodoriser unit installed which can spray a mist of deodoriser solution over the waste as you are deploying or retrieving your tarp," Peter says.

He adds that another quality of the technology is its durability. Tarpomatic's tarpaulins are constructed using a heavy-duty dual-layer laminated polyethylene fabric and each tarp has more than 150m of heavyweight chain built in so that they weigh 400kg each. The landfill's location is prone to strong winds, and in the two years of using Tarpomatic the tarps have never moved from where they were placed.

"Apart from landfill airspace, the system saves staff time on site, not only in the morning and at night when we're covering the working face, but also during the normal hours of operation, where we're not having to spend anywhere near as much time excavating soil for use as cover material. This saved time can be used for other duties around the site," Peter says.

For other landfills out there, Peter says this kind of investment is even more beneficial.

While South Gippsland Shire Council had sufficient soil-based cover, some other landfills have to import soil from external sources. In this situation, landfills are not only wasting airspace, but they have to pay a landfill levy on the imported soil.

"Changing to an alternative cover system was a brave decision for our councillors at the time with significant upfront costs, but it has paid dividends and will continue to do so into the future. We were fortunate that the council and our executive team recognised the achievable benefits."

Tarpomatic explains...

How does it work?

Tarpomatic replaces the traditional, and at times inefficient, method of applying a 150 to 300mm (depending on the state or territory) layer of soil on the working face with a reusable high-tech tarpaulin. The company has calculated that for an average landfill with a working face of around 500m2, the use of soil-based cover leads to about 500m³ of wasted airspace every week – plus additional costs for time, machine hours, fuel and labour invested.

On average, a site with a gate fee of $150 per tonne and a working face of 500m2, the value of the airspace that is filled up with soil cover in just one week is around $75,000. In Victoria, where the daily cover requirement is 300mm of soil, this is an astounding $150,000 per week.

What's more, many landfills do not have ready access to soil cover on site and thus rely on bringing in soil for daily cover. In some of these situations, landfill operators also have to pay the landfill levy on that soil when it goes over the weighbridge. Tarpomatic says its alternative daily cover does not require any resource management of that kind and dramatically reduces the time used for covering and machinery use.

Choosing the right Remotely Piloted Aircraft System

POSITION PARTNERS PROVIDES ADVICE FOR LANDFILL OPERATORS ON WHAT TO CONSIDER WHEN INVESTING IN A REMOTELY PILOTED AIRCRAFT SYSTEM.

Australian landfill operators are increasingly turning to Remotely Piloted Aircraft Systems (RPAS) to help monitor their sites remotely, according to Position Partners, a leading provider of surveying equipment.

Commonly referred to as drones, Gavin Docherty, Position Partners RPAS Product Manager, says RPAS greatly eliminates the need for surveyors to manually survey a site on foot.

"RPAS can be used in the waste industry for accurate volume calculations, progress reports and site management," Gavin says.

Landfill operators are increasing turning to Remotely Piloted Aircraft Systems to monitor their sites.

CHOOSING THE RIGHT RPAS

When it comes to selecting an RPAS, Gavin explains that there are a multitude of options to consider, from the quality of the camera to near-infrared to detect heat levels, and Light Detection and Ranging, used to measure the distance to a target. This is combined with investigating the ever-growing number of software systems for processing, analysing and presenting the data.

But out of all these considerations, Gavin says that for landfill operators, having accurate survey-grade data should be the priority. He says that many RPAS options require ground control points for accurate references. Ground control points are large, marked targets on the ground, spaced throughout an operator's area of interest. Gavin notes that setting these out on unstable and uneven terrain could be dangerous.

"Luckily, there are now options that don't require setting out ground control points, including the Sirius Pro by MAVinci. This fixed-wing RTK aircraft uses on-board and ground-based GNSS to effectively place ground control in the air, removing the need to physically set them out on the ground," he says.

Real time kinematic or play post processed kinematic systems also eliminate the need for ground control points. Similarly to the Sirius Pro, landfill operators can use these system to set up a safe location as a base station to deliver accuracy across the whole range of the site.

IT'S THE DATA THAT MATTERS

Gavin says that unlike traditional survey methods such as optical instruments and global navigation satellite systems, RPAS technology captures all data.

"As with all things computing, the ability to store and handle increasing sizes of data is expanding rapidly with more powerful processors and faster internet speeds. Yet software downloads and local storage of data continues to be a pain point for many, especially those working in large corporations or government agencies," he says.

He says new innovations such as Propeller Aero offer a web-based data processing, viewing and sharing portal that negates the need to download software. Propeller offers powerful visualisation tools that enable the user to view historical data sets layered on top of one another, giving an instant picture of how the landscape has changed over time. It offers comprehensive project records along with more efficient and collaborative surveying methods.

Gavin notes that in this rapidly changing world of RPAS technology solutions, it is a challenge for geospatial professionals to sort through the plethora of options available. However compelling some low costs solutions may be, it's important a product is tried and tested and offers solid technical support, which is why Position Partners is here to help. ■

Mobility in action

TWELVE MONTHS SINCE ITS RELEASE, LINCOM GROUP SAYS IT HAS RECEIVED EXTENSIVE INTEREST IN THE VERSATILE CRS MOBILE PICKING STATION.

Lincom Group, which provides recycling equipment to the quarry, mining and forestry industries, last year began investigating a picking station that could be easily moved on site.

Mark Malone, Lincom Group National Sales Manager, Forestry & Recycling, says the company partnered with CRS due to their experience in providing versatile, well built and engineered, static and mobile plants.

The CRS Mobile Picking Station can be fed by a screener or trommel and offers recyclers high throughput with a maximum of eight separate products.

What attracted Lincom Group to CRS's station, Mark says, is the fact that the station can be manoeuvred easily. In addition, it can be set up and operational within an hour or so of arriving on site.

"If you get a static plant engineered there is more lead time, but once the plant arrives on site it has to be assembled. So there is the added expense of crane hire and labour, not to mention lost production and interruption to business, as it could take several weeks before it is completed and ready for operation," Mark says.

Mark explains that hydraulic jacking legs allow the picking station to be set up easily on uneven site conditions, while a remote control allows the operator to remain at a safe distance during the set up procedure.

The mobile picking station can be manouvered easily on site.

The unit comes with double-sided walkways for easy access and variable speed control to cater to a wide range of recycling applications. Options available include an overband magnet, blower or a cabin. A Deutz or Cat Engine is available, giving recyclers a choice between two well-known engines.

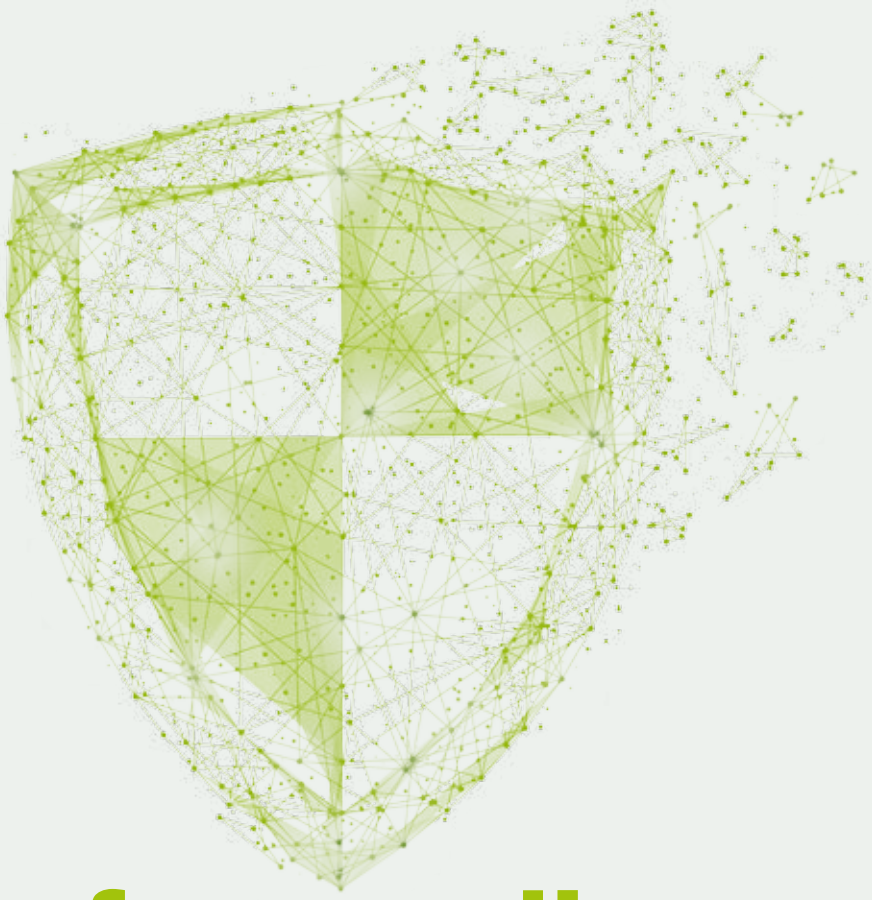
But above all else, Mark says the mobile picking station wouldn't be such a popular choice if it weren't for CRS's flexibility when it comes to meeting customer requirements. The mobile picking station offers a standard four bay picking station, three bay with a magnet or three bay with a magnet or blower. The choice depends on the recyclers needs.

"Lincom Group partnered with CRS to offer a range of Mobile and Static Recycling Equipment. We talk with, but more importantly listen to, our customers to understand exactly what their requirements are. We then work closely with them and CRS to ensure those requirements are met in an efficient and timely manner."

CRS Managing Director, Sean Conlon, adds that the company is excited about the future of CRS products in the Australian market.

Did you know...

Lincom Group is the parent company for a specialised range of businesses. Together they supply the quarry, mining and forestry industries with the sales, service and hire of screening, crushing and recycling equipment. The Lincom Group has operations throughout Australia, New Zealand, Papua New Guinea and Pacific Islands.



Safeguarding the waste industry

INSURANCE BROKER, ARTHUR J. GALLAGHER, EXPLAINS HOW UNDERSTANDING THE REGULATORY ENVIRONMENT CAN PROTECT A WASTE MANAGEMENT BUSINESS FROM REPUTATIONAL AND FINANCIAL DISASTER.

Risk comes in many forms, from reputational to financial.

In today's digital world, waste management insurance provider Arthur J. Gallagher notes that reputational risk and the resulting negative backlash from the media and general public has become an ever-present reality. Information sharing via social media means more transparency, authenticity and accountability is required.

Russell Boucher, Principal Broker at Arthur J. Gallagher, says that for Australia's waste management industry, the risk is higher than most sectors, as the potential damage inflicted to the environment and community increases the stakes.

In some cases, risk management involves statistical and mathematical modelling to determine the likelihood of a liability. When an insurance company assesses premiums, it takes into account the costs associated with property damage, injury, environmental degradation and in the worst of scenarios – death. For more than 12 years, Gallagher has worked closely with the waste industry to provide comprehensive insurance for landfill and materials recovery facility operators, waste collectors and transporters and recyclers.

Russell says that the company's relationships with industry associations

such as the Waste Management Association of Australia (WMAA) and the Waste Contractors & Recyclers Association (WCRA) of NSW has helped it understand the industry, including its expectations and requirements. Both WMAA and WCRA have called upon Arthur J. Gallagher when its members require assistance.

"We represent companies ranging from large garbage contractors, right down to smaller operations, including skip bin operators and compactor operators."

He says that the industry has faced numerous challenges over the past five years, with an increase in the incidence of waste management fires across the country. As a result, the insurance industry is treading more carefully when it comes to offering policies. Waste companies with up-to-date OH&S procedures and risk management procedures in place ultimately stand a better chance of obtaining insurance and or keeping their premiums to a minimum.

"The biggest difference between now and four or five years ago is the underwriters are asking for more risk management technologies," he explains.

"Hose reels, fire extinguishers and sprinkler systems are all standard technologies found in many waste facilities. But more recently, we are increasingly finding that the insurance companies are asking for more. Back-to-base alarm systems, smoke alarms, spark arrestors and LED lighting to replace fluorescent lighting are just a few technologies insurance companies are now asking for."

The biggest exposure, Russell says, is companies taking out inadequate levels of coverage.

"A number of organisations don't have risk management standards in place. Because they're not part of an industry association, they don't necessarily understand the complex regulatory environment they are working in," he says.

One of Gallagher's key points of difference, Russell explains, is covering pollution incidents or environmental damage.

"The impact a pollution or environmental incident can have on the public can be major, and litigation or even a class action lawsuit can result."

He says that in the worst of cases, small businesses could be forced to close down, while larger businesses pay a price financially.

"Reputational risk is also a major factor. The state's Environmental Protection Authorities (EPA) are keeping a watchful eye on the sector, and they're only going to put more and more emphasis on reducing the carbon footprint. It's a growing sector, particularly with a greater emphasis on sustainability by governments."

The EPA's risk mitigation procedure was actioned after a recent Melbourne waste fire. The Victorian EPA issued the owners of the company a notice to commence the removal of fire debris and fire-affected waste, and take it to a local government or EPA-approved facility. The EPA also asked the company to remove all contaminated water on the premises, including water used to fight the fire.

Russell says that as a global organisation, Gallagher is able to call on its overseas partners should they encounter any major obstacles. The main message: keep pace with the regulatory environment.

"The industry is forever being told that there's something new on the market or another way you can improve safety. The insurance companies are all over this, and in some cases are withholding insurance in the absence of adequate preventative measures."

"We would like to see our clients associate themselves with industry associations such as WCRA and WMAA as they do offer excellent advice and research."

Did you know...

Members of the Waste Management Association of Australia and the Waste Contractors & Recyclers Association NSW can access Arthur J. Gallagher by contacting either Chris Lynam or Russell Boucher. Through its partnership with Liberty International Underwriters, Arthur J. Gallagher can provide the waste industry with a tailored insurance solution.

- The policy provides members with financial protection in the event of an insurable loss and can cover you for:
- Environmental impairment liability
- Public and products liability
- Marine insurance
- Professional indemnity insurance
- A dedicated team of claims professionals, underwriters and risk managers

Securing planning approvals IN UNCERTAIN TIMES

SECURING ENVIRONMENTAL APPROVALS FOR RECYCLING FACILITIES HAS NEVER BEEN HARDER. MARK JACKSON, DIRECTOR, JACKSON ENVIRONMENT AND PLANNING, SHARES HIS TIPS ON WORKING WITH REGULATORS.

With recent fires ravaging material recycling facilities, planning approvals agencies have a right to be nervous.

Excessive stockpiling and poor environmental management at some recycling sites can lead to such incidents, with facilities shut down swiftly by regulatory authorities.

In NSW, in response to the excessive stockpiling of waste at some recycling facilities, poor environmental management, illegal dumping and a major fire incident at a recycling facility for construction and demolition waste, law reforms were introduced. Changes to the Protection of the Environment Operations (Waste) Regulation 2014 have had major impacts on the planning, approvals, licensing and operations of waste and recycling facilities.

Seeking planning approval and an EPA licence to operate is a complex and time-consuming exercise. NSW's environmental planning and environmental protection laws have evolved over time in response to these community concerns. In NSW, the state government has committed to implementing aggressive recycling targets, to be achieved by 2021, and has identified further recycling infrastructure investment to meet these. It is estimated that a further three million tonnes per annum needs to be diverted from landfill each year. The community expects that recycling facilities are designed, operated and managed according to international best practice, to protect and enhance the local environment. This makes the assessment and approvals process more rigorous nationwide.

Depending on the types of waste materials received, location of the facility, proximity to residential areas, distance to sensitive environmental areas or areas that experience flooding, the project may be assessed and determined by local council, a joint regional planning panel or the minister for planning in NSW. To minimise approval delays, it is crucial to understand development constraints, easements, covenants and compatibility of the proposed development with the current land use zoning under Local Environmental Plans. Proximity to residential dwellings and sensitive areas need to be carefully considered.

A pre-lodgement meeting with the local council is an excellent starting point to understand the planning and assessment requirements for a recycling project. Meetings with the Environment Protection Authority and other agencies (including the NSW Department of Planning and Environment, Roads and Maritime Services, NSW Office of Water) can also help to outline the key development constraints. Involving the community early to inform project planning is vital, as without their support, the chance of gaining approval is low. Following these good practice measures, our team is here to help.

T: 02 8056 1849
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Seeking an EPA licence and planning approval requires community support.

The feasibility of future projects

CAN THE FUTURE BE WASTE FREE? IF YOU TAKE INTO CONSIDERATION TODAY'S DIVERSION OPPORTUNITIES, IT IS A GOAL WORTH AIMING FOR, WRITES JUSTIN JONES, DIRECTOR OF JUSTWASTE CONSULTING.

The feasibility of future waste management projects in this country falls on the real-time data that is available and behaviours exhibited by the community and companies.

Diversion and separation at the source of the generation is critical to providing facilities with a clean product that can be value added or recycled for the best possible outcome. This is a trend that is occurring in organics. Being able to provide the cost benefit of depackaging and contamination cleaning organics provides both financial and environmental benefits through reduced disposal fees and diversion, from landfill fees to organic processing. The future is a clean, segregated material from any sector, including kerbside, commercial and construction waste, that will open our eyes that waste is a resource, and therefore the rate to process it long-term is significantly cheaper than landfill.

Food and garden organics collection (FOGO) is a growing sector with many councils looking at adjusting their current garden organics service or going straight to FOGO. This service complements council's kerbside services and reduction targets. JustWaste has been involved with many councils and regional waste group reviews of the organic stream and how it is used by residents. While these services are achieving well above expectations with regards to tonnes collected and diverted, it is increasingly obvious that the food component of household waste is not being placed in the correct bin. On average, based on our waste audit data, the food component ranges from one per cent to six per cent. If we look at this from another angle, is your FOGO really FOGO? Or is it a garden organics service with a three per cent contamination level which is food?

We all have a role to play in the education of residents to place their food organics directly into the FOGO bin. This behavioural change is critical to the success of diversion from landfill at the kerbside. The continual education of residents to reinforce the message is needed.

Not just when the new service is implemented or once every calendar year, but on a continual basis, reinforcing the message that food must go in the FOGO bin.

Do the industry or councils change with the times? Are we reactive or are we ahead? The waste profile is ever changing and this is prevalent in recycling. With the increase in

packaging in our everyday lives, the kerbside system has to adjust.

A pilot program with a regional facility has now begun trialing the inclusion of plastic film, polystyrene and rigid plastics into their kerbside recycling.

A simple adjustment to the sorting process, thinking outside the square and meeting the needs of today's consumer has turned a contaminant in the recycling stream into a commodity.

Can the future be waste free? If you take into consideration today's diversion opportunities we can certainly aim towards this.

There are many failed examples of zero waste to landfill programs or statements from government, however, the will and drive of this needs to come from bottom up, with support from government policy.

A 2017 project completed by JustWaste at a week-long food event has shown that this can be achieved. A rigorous, and more importantly, achievable waste management plan, followed by assessments of people's behaviour and a waste audit to gather the data, has now lead to the event in 2018 providing only organics and recycling bins.

Increased recycling can only be achieved with the support of the community, patrons and also the buy in from vendors who are now using compostable plates, bowls, cutlery and cups.

Other recycling systems include commingled, plastic film, cardboard and polystyrene along with reusable items such as metal cutlery and metal plates as a returnable item.

It's time to look outside the square and push the boundaries. ■

About JustWaste

JustWaste Consulting is a boutique waste consultancy with a passion for change and quality service. We work on a national level with local government and industry on the ever-changing policy of resource recovery, minimisation and management.

JustWaste Consulting provides client focused, outcome-driven projects that assist in decision making for the betterment of the future.

Transport's macroeconomic headwind

WHEN THE WORLD'S BIGGEST CONSUMER OF RAW MATERIALS DECIDED IT WOULD NO LONGER ACCEPT IMPORTS OF 24 CATEGORIES OF SOLID WASTE, IT SENT A SHOCK THROUGH AUSTRALIA'S TRANSPORT AND WASTE INDUSTRY.

In July of this year, China notified the World Trade Organization that it plans to ban the import of 24 different types of solid waste from Japan, USA, Australia and other source countries, in a bid to reduce pollution. The ban is expected to take full effect by the end of 2017.

When looking at plastic waste alone, in 2016, China imported 7.3 million metric tons of plastic waste worldwide worth $3.7 billion, accounting for more than half of global imports, according to figures from the Ministry of Environmental Protection. *The Economist* reported that China imported 45 million tonnes of scrap metal, waste paper and plastic from overseas countries in 2016, which together is worth more than $18 billion. Locally, the Australian Bureau of Statistics found in its 2013 Waste Account data that China received 32 per cent of the total value of Australia's waste exports in 2011-12. That same financial year, Australia's main export to China was metal, which account for 31 per cent of all materials, while China received 64 per cent of its Australian from paper and cardboard.

The decision to ban the 24 categories sparked concern from the Australian Peak Shippers Association (APSA), which is still grappling with the consequences as it collaborates with the federal government on trade issues. A report by the Freight & Trade Alliance indicates that the list

China received 32 per cent of the total value of Australia's waste exports in 2011-12.

> "We are pushing down the track of a circular economy and while we're doing that the main market for our commodities is slowly but surely closing up."
>
> Mike Haywood **Industry consultant**

of some of the affected products in Australia includes plastic waste from living sources, unsorted waste paper, vanadium and waste textile raw materials. China's Ministry of Environmental Protection has indicated it will still allow some kinds of steel and non-ferrous scrap, while items to be completely banned include tyres, textiles, plastic, glass and old medicines.

ASPA Secretariat Travis Brooks-Garrett says that although the ban does not extend to all waste products, it is the most severe move to date under China's anti-foreign garbage campaign. He says the ban could have significant consequences for the way Australia treats waste domestically, in increasing our landfill task, but may also signal further bans on imported waste products. Travis says that any such move would need to be closely scrutinised against China's World Trade Organisation (WTO) obligations.

He says APSA has been working closely with the Department of Foreign Affairs and Trade in response to the announcement, alongside the major waste industry bodies. Travis says that the Federal Government's Department of Foreign Affairs and Trade held a roundtable with industry representatives in August and will follow up with the relevant Chinese authorities to seek further information regarding the many questions raised.

"The response from both the office of Steve Ciobo (the Federal Minister for Trade) and from the Department of Foreign Affairs & Trade, was immediate and reflected the concerns of industry, and for that they should be commended," he notes.

Industry consultant, Mike Haywood, says he was able to foresee the ban. The writing was on the wall, he says, with previous crackdowns on plastic waste through policies such as National Sword 2017. The policy was launched earlier this year, as China's General Administration of Customs announced an intention

The ban is one of the most severe to date, according to stakeholders.

to reduce and eliminate the illegal smuggling of foreign waste. For years, China had already been clamping down on its inspection of secondary commodities. From February 2013 to November 2013, the national custom agency launched Operation Green Fence, a plan to prohibit the import of unwashed and contaminated materials from entering China.

"We are pushing down the track of a circular economy and while we're doing that the main market for our commodities is slowly but surely closing up," Mike says.

"China's decision to serve as a wake up call. There's a lot of money sitting in state government coffers. It's time we develop technology to better process the material so we're actually exporting the usable commodity. Instead of exporting a bale of plastic that needs further sorting shredding, washing and granulating. We need to be exporting a bulker bag of granules or sell a granulated plastic that only needs to be put into an extruder to produce a product."

He says metals, cardboard and paper are used locally and exported as marketable products, while inert and organic waste are largely used within the communities that produce them. He adds there is much work and value to be gained by developing better end-of-life outcomes for glass, plastic and tyres. ■

Reducing the risk

WASTE FIRES CONTINUE TO BE A PROBLEM AT RECYCLING FACILITIES ACROSS AUSTRALIA, BUT IS THERE A SOLUTION TO REDUCING THE HAZARD?

In July of this year, plumes of smoke and ash loomed over the Melbourne CBD, as a fire tore its way through a recycling plant in Melbourne's north.

The fire, which burned for 11 days, forced hundreds of residents to evacuate and prompted a state government taskforce to take action.

The taskforce plans to audit recycling facilities across Victoria and consult with the industry. The National Waste and Recycling Industry Council (NWRIC), which represents major industry organisations, now wants a clear set of guidelines established for the EPA and local government. The taskforce will run for at least 12 months. The NWRIC has suggested a similar model to the Heads of EPA (which represents state EPAs) to a structure used in the United Kingdom, which stipulates the width and height of stockpile rows – a key contributor to fires at recycling facilities. An EPA Victoria spokesperson says that as the amount of recyclable materials at a facility can fluctuate weekly, the taskforce will continue to watch these sites closely. The spokesperson says inspections are not one-offs and sites can expect to be monitored closely.

As further investigation could be imminent, one research report released last year by the University of Sydney, titled *Waste Fires in Australia: Cause for Concern,?* describes the issue of waste fires as "poorly understood". The report into the causes of waste fires in NSW finds that for a majority of

cases, the causes were unknown. The next biggest cause is said to be arson, followed by spontaneous combustion and the dumping of hot coal/ash. The source of combustible material includes used oils, tyres, batteries, green waste, wood waste, solvents and municipal solid waste.

While the ultimate cause of many fires remains ambiguous, the industry council notes that stockpiling is a major issue.

"The key point within the UK guidelines is that no stockpile on any given site should be greater than that which would burn for 24 hours. Right now, we're not sure that is the case in some facilities around Australia," says Max Spedding, the NWRIC's Chief Executive Officer.

Max notes that most of the recycling infrastructure in place was built 20 years ago.

As plant owners renovate their facilities, they lose production time, which increases the risk of fire.

In July, the council released its industry roadmap, taking a national position on stockpiling. The document calls for upfront landfill levy liabilities and for governments and the environmental regulator to discourage long-term stockpiling. Max adds that another related issue is that infrastructure planning is crucial to fire prevention, and that recycling facilities should have a backup should any facilities go down.

"If you've got four facilities and one goes down – you've lost 20 per cent of production. When you're processing up to a million tonnes a year, it can pile up pretty quickly," Max says.

"Fire insurance is getting very expensive so we need to take measures to protect both the community and the industry's bottom line."

Arthur J. Gallagher provides waste management insurance for members of the Waste Management Association of Australia, the Waste Contractors & Recyclers Association and the industry as a whole. Russell Boucher, Principal Broker at the company, says premiums are increasing as more claims are cropping up, and more insurance companies are underwriting and reclassifying their assets as a result.

"There are also other contributing factors in the mix, such as reinsurers demanding increased rates and a prevailing market where there are fewer specialist underwriters prepared to write policy wordings for the waste management industry," Russell explains.

Russell says that stockpiling occurs when there is an interruption in the production line and the pick up of waste. While most facilities have robust fire prevention management processes, an inherent risk of fire will always remain. Fire-fighting equipment, sprinkler systems, spark arrestors on plants and machinery, and staff regularly trained in fire management are just a few considerations the company assesses for premiums. It also looks at the type of material being recycled, the location of the business and the construction, type and age of the plant and machinery.

"Premiums depend on a number of variables, including a company's risk management program and prior claims history," Russell says.

"Broadly speaking, the recycling and overall waste industry is currently paying premium rates which are at the higher end of the industry classification."

Industry professionals such as Grant Musgrove, the Chief Executive of the not-for-profit group the Australian Council of Recycling, says that the recent Coolaroo fire will prompt tighter regulations by the state government and EPA. Grant says fires caused by stockpiling are further at

Stockpiling is considered to be a major cause of fires.

risk during times where recycling commodity prices are low.

According to the Victorian State Government's page on waste stockpiles, waste intended for reuse of recycling might be stored while commodity prices are low, until the value of the recovered materials rises. Commodities such as metal, steel or plastics are all affected by federal and state government policies and international developments in overseas countries such as China. Grant says an oversupply of overseas imports over the last few years has led to a slump in commodity prices, which leads to stockpiling by recyclers until prices return to normality. Over the past three years, the price of plastic, as an example, has gone from $200 a tonne to $10-20.

"These waste fires not only bring devastation to the community, but to the waste industry through reduced downtime and a lost commodity value. We've got to find a pathway towards more legislation and enforcement and that means the Victorian Government needs to take action and use some of the money from its landfill levy fund to better enforce stockpiling," Grant says.

"The government has been caught napping on this. Other states such as South Australia and New South Wales have much tighter and agile responses to stockpiles."

In NSW, an additional waste levy is incurred when waste is stockpiled at a facility for more than 12 months or above lawful limits.

One of the bigger issues surrounding stockpiling are tyres, which are said to be difficult to extinguish once on fire, according to UTS' report.

Victoria has specific regulations around the storage of waste tyres, with premises that store more than 40 tonnes or 5000 equivalent passenger units of whole tyres requiring an EPA works approval before they are built or modified, and an EPA licence to operate.

At the annual meeting of Australia's Environment Ministers, Ministers endorsed the National Market Development Strategy for Used Tyres, which outlines options to increase the uptake of recycled tyre in road, rail and civil engineering projects over the next five years.

"There has been discussion of having a return scheme similar to a container deposit return scheme where consumers are charged a fee for returning those tyres which will cover the cost of their proper disposal," Grant says.

Lithium batteries are also a key concern, which can over-heat and explode if they short-circuit. Spontaneous ignition occurs when products have been stored for a short period of time, the UTS report says, and a key issue related to that is also stockpiling. Re-chargeable batteries are also an issue, as they end up in the commingled recycling stream and are highly flammable. Grant says further state-based regulation may be required to curb the problem.

"There is, to my knowledge, limited research in this area, but from our observations in the recycling industry there is a direct correlation between the rechargeable battery market and fires across recycling facilities," Grant explains.

So where does the solution lie for reducing the risk of fire? While the risk of fire is ever-present, Grant says further best practice models will continue to be investigated by the industry.

"I'll be meeting with members of the insurance industry. We'll certainly be advocating some world-best practice models that may be applicable to Australia, it's really just about opening up the discussion.

"We've got to break the business model of stockpiling."

Read about the Victorian Government's response to stockpiling on page 70.

IVECO'S SPECIAL VEHICLE AUTHORISATIONS

To meet a customer's specifications, trucks may need to undergo costly and time-consuming post-production reworks or have additional work done at the body builders. Through its local manufacturing facility, IVECO Australia is able to address this situation by offering much greater customisation or 'Special Vehicle Authorisations' (SVA) on its Australian-manufactured ACCO, Powerstar and Stralis models.

IVECO Product Engineering Teams have been designing and building SVA vehicles at the company's Melbourne manufacturing facility for more than 55 years, commonly making modifications to areas such as chassis rail dimensions and layouts, drive axles, steer axles, wheels and tyres along with bodybuilder-specific requirements. Marco Quaranta, IVECO ANZ Product Manager, says its Engineering Team is on hand to offer expert advice and assistance throughout the process of owning an SVA vehicle.

Below is a list of the most common IVECO SVAs on Powerstar, ACCO and selected Stralis models:

Chassis Rail Dimensional Characteristics: Wheelbase, rear overhang and reinforcement type.

- Chassis Rail Layout (type, size/volume and location): Fuel tank(s), AdBlue tank, air tanks, exhausts, battery boxe(s) and cross member locations.
- Bodybuilder-specific requirements: Chassis rail packaging, extra drillings for bodybuilder-mounted components.
- Drive Axles: Axle model, suspension type, brake type, wheel ends, slack adjusters, Ackermann geometry.

Wheels: Steel or alloy, polished or non-polished, 285 or 335mm.

Tyres: Size, brand and tread pattern.

https://www.iveco.com.au

LEICA RCD30 AIRBORNE CAMERA

As technological changes advance the landfill industry, Landair Surveys, a leading surveying firm in Australia, has introduced a new generation of aerial surveying solutions for its landfill clients.

With the latest purchase of the ultra-modern Leica RCD30 airborne camera for photogrammetric and remote sensing applications, the surveyors at Landair Surveys say they have redesigned the whole end-to-end aerial surveying solution, slashing their turnaround time by more than 60 per cent and introducing a whole range of new services.

Ray Cox, a director at Landair Surveys, says some of the benefits for landfill operations include: higher quality and more geometrically accurate imagery; shorter processing time; near infrared imagery; reduction of site access risks; increased reliability and additional data deliverables.

"For better imagery, the aerial camera has a fully calibrated lens and is attached to a gyro-stabilised mount correcting level fluctuations and drift. Unlike drone imagery, camera distortions are isolated and removed from the images instead of being propagated throughout the final data," Ray says.

By integrating cloud-based IT solutions, Ray says Landair has slashed the processing time required between collecting data and processing it, and with highly-efficient software packages urgent projects can be completed the next day.

"In terms of near infrared imagery, the NIR band is collected at the same time as the normal colour imagery and can be used to monitor landfill vegetation health. This can be particularly useful in monitoring capped landfills for potential liner failures," Ray says.

Through the use of accurate real-time GPS measurements for each image capture, the need for on-site ground control points is also significantly reduced.

Ray adds that future flyovers will be less dependent on weather conditions. Thanks to the better camera sensor, imagery can be captured in less favourable lighting conditions. Finally additional data is on hand through large area point-cloud and textured mesh data sets, which can be generated allowing high-resolution 3D visualisation and measurements.

landair.com.au/aerial

TERRA SELECT W80 WINDSIFTER

Terra Select brings the latest in separation technology with its W80 Windsifter. The W80 is capable of separating some of the heaviest materials in a variety of applications, from biomass production to waste and recycling. It allows for the separation of stones from timber, fibro from timber/bricks in construction and demolition waste and plastics or paper contaminants from valuable recoverable materials.

This German engineered and built windsifter has a European 81kW drive, with Tier 4 fuel efficiency and a 45kW pressure fan. It is equipped with a metering roller for even continuous infeed of materials, coupled with a positive-fitting drive system. The W80 windsifter offers the ability to fine tune its configuration via taps and ducts and to optimise clean fractions. An optional light fraction discharge conveyor belt is also available.

With variable setting options, the Terra Select W80 windsifter can be used for heavy as well as lighter separating functions and has a production rate of up to 120 m3 per hour. This windsifter has an ample 5.5 m3 of feed hopper capacity and a 3700mm hopper width for easy loading. It weighs in at 15,400kg.

GCM Enviro is the exclusive distributor for Terra Select Windsifters and Trommel Screens in Australia.

http://www.gcmenviro.com

waste
MANAGEMENT REVIEW

PROMOTIONAL FEATURE SPECIALS:

LANDFILL EQUIPMENT :

With increasingly stringent environmental regulations, operators are under increasing pressure to preserve their airspace, reduce machine downtime and costs, and manage odours. *Waste Management Review's* December/January edition highlights how the latest technologies are maximising efficiency, while meeting Environment Protection Authority and safety requirements.

BINS:

A compact, yet spacious bin, holds the key to ensuring waste transporters spend less time picking up waste, while generators have more space to work with. *Waste Management Review's* December/January edition explains how the latest in bins, including smart systems, are making disposal easier.

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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WASTE EXPO AUSTRALIA
11-12 OCTOBER

Melbourne, VIC

Considered the premier event for the waste and resource recovery industry in Australia, this two-day expo offers a waste summit conference, jam packed with topical and informative sessions, and opportunities for businesses to showcase their achievements.

www.wasteexpoaustralia.com.au

WASTEQ 2017 CONFERENCE
11-13 OCTOBER

Mackay, Queensland

The focus of this event will be around the circular economy, shifting thinking towards practices that are restorative and support materials and components being reused or recycled. The themes of the event include: the date revolution, heavy vehicle reform, best practises, innovation and contracts/tendering.

www.wasteq.com.au

WOMEN OF WASTE – LEADERSHIP BREAKFAST
24 OCTOBER

Kirribilli Club, NSW

The event is designed to celebrate women who are driving change in waste and break down barriers, creating new career prospects for the next generation.

www.wmaa.asn.au

EUROPEAN CIRCULAR ECONOMY SUMMIT
14-16 NOVEMBER

Barcelona, Spain

The Circular Economy European Summit aims to promote a new economic model to redesign existing production processes based on the extraction-production-use-disposal scheme, and in doing so, commit to the reuse of materials and resources.

www.circulareconomysummit.com

MEGATRANS2018
10-12 MAY

Melbourne, Victoria

The three-day expo will bring 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.

www.megatrans2018.com.au

WORLD CONGRESS
AND EXPO ON RECYCLING
12-14 NOVEMBER 2018

Berlin, Germany

This 2018 international conference will focus on the theme "recycle today for a better tomorrow".

https://recycling.conferenceseries.com

waste management DIARY

If you are organising an event and would like it to appear in *Waste Management Review*, please email the Editor at **toli.papadopoulos@primecreative.com.au**

Victoria's latest waste plan

VICTORIAN ENVIRONMENT MINISTER LILY D'AMBROSIO PROVIDES AN UPDATE ON THE GOVERNMENT'S POSITION ON A RANGE OF TOPICS.

Q Programs such as the War on Waste have recently brought attention to a lack of a business model for coffee cup recycling and state-wide bans on plastic bags. What is the government's position on these issues?

We welcome any development that increases the recycling of disposable coffee cups. The packaging industry is already working to address this problem. The Australian Packaging Covenant (APC) Strategic Plan 2017-22 focuses on the diversion of 50 per cent of disposable coffee cups from landfill.

Accepting disposable coffee cups in recycling is one of a number of possible solutions, including investigating source solutions through improved packaging materials and promoting the use of reusable cups.

In regards to plastic bags, we're engaging with industry and the community to identify the most effective and appropriate approach to reduce their impact in Victoria. A ban on single-use, lightweight "supermarket style" plastic bags, consistent with other jurisdictions, is one of the options being considered.

Q. What action is the government taking to address the impact of pollution from recycling fires?

We're overhauling the Environment Protection Act to ensure that the independent regulator can protect the Victorian community and the environment from the impacts of pollution and waste.

We're putting a general preventative duty at the heart of the new act which will require everyone, including operators of sites like that at Coolaroo, to take reasonably practicable steps to minimise risks of harm from pollution and waste.

We are also significantly increasing penalties for those who don't properly manage their risks, and investing $162.5 million in the Environmental Protection Authority (EPA) to build its capabilities to prevent and reduce harm.

The Interim Waste Management Policy, announced on 29 August, outlines requirements for appropriate storage of stockpiled combustible waste materials, requiring risk assessment by operators and compliance with fire services guidelines.

Q: The Government recently completed long-term plans for waste and recovery. How do these plans align with the rest of its landfill reduction processes?

The Andrews Labor Government recently finalised the Victorian Waste and Resource Recovery Planning Framework, which sets out how we will safely manage our waste over the next 30 years.

The framework comprises a Statewide Waste and Resource Recovery Infrastructure Plan, seven regional waste plans and three priority strategies (organics, market development and education). The framework will ensure that waste infrastructure is in the right place at the right time. Some of the broad goals of the framework are to reduce the amount of waste that is disposed of to landfill, develop markets for recycled products and ensure that management and operation of waste facilities, including landfills, meet international best practice standards.

The Metropolitan Waste and Resource Recovery Implementation Plan sets out how we will deal with the waste created by Melbourne's growing population over the next 10 years.

Implementing the metropolitan plan will establish a suite of new, improved and expanded infrastructure by 2026. This will include new, advanced technology facilities to recover resources from Melbourne's residual municipal waste and new organics facilities to recover and process 600,000 tonnes of organic waste annually, such as household and commercial food waste. This also encompasses technologies (including waste to energy facilities) that manage waste near where it's produced. There will also be new and improved resource recovery centres and transfer stations across Melbourne.

The Andrews Labor Government is already delivering on these actions, announcing two major agreements with councils earlier this year that put us on track to meet the metropolitan plan's interim target of 400,000 tonnes per annum of organics processing capacity by 2021.

Development of the Andrews Labor Government's election commitment to ban e-waste from landfills is also on track to take effect in mid-2018.

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