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MANAGEMENT REVIEW

JUNE/JULY 2017

Renewed energy

Simon Tori on Australia's potential in the energy from waste space

FEATURES

JustWaste homes in on regional waste barriers
Hazelmere's nation-leading timber recycling operation
Baw Baw Shire Council's landfill rehabilitation
Medical plastic recycling success

REPORTS

Environment Minister Josh Frydenberg's plan for waste
E-waste in review
Potential savings for landfill operators
MRA Consulting on the national waste data

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FREIGHT & TRADE ALLIANCE

2018 MEGA MELBOURNE TRANS

THE FUTURE OF SUPPLY CHAIN AND LOGISTICS

48

COVER STORY 14

RENEWED INTEREST IN WASTE TO ENERGY

From bioenergy to landfill gas, the gamut of energy from waste projects knows no bounds. Veolia ANZ's State Group Manager Victoria and Tasmania Simon Tori explains that increasing disposal costs and an environmental agenda to divert waste from landfill has spurred an interest in the sector.

"GOVERNMENT, AT ITS VARIOUS LEVELS, NEEDS TO SHOW COMMITMENT AND LEADERSHIP IN TERMS OF STRATEGY, POLICY AND THE PLANNING FRAMEWORK AND PROVIDE CERTAINTY OVER THE LEGISLATIVE ENVIRONMENT GOVERNING THE INDUSTRY."

Veolia ANZ State Group Manager Victoria and Tasmania Simon Tori

In this issue

Features

Regulars

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From the new Editor

Waste 2.0

POSITIVE TRENDS are emerging in the recycling industry with the growth of resource recovery facilities across Australia.

We've placed this development front and centre in our latest edition, which brings us to our new magazine sections. In this edition of *Waste Management Review*, you'll find a host of highly focused sections catering to our core audience of councils, manufacturers, suppliers and waste management consultants. A key component of this is our new Waste Management in Action section, which allows the movers and shakers of industry to showcase the application of their technologies. We've also launched Up Front, which speaks to the latest issues making waves in waste. Our International section has also been rebooted with a greater focus on how overseas trends relate to the local market.

In the Cover Story we speak to waste, water and energy company Veolia about the feasibility of energy from waste projects in Victoria. Veolia says these projects have seen new interest off the back of dwindling landfill capacity and rising disposal costs.

Turn to page 32 and you'll find our new Council in Focus section – where we speak with the Toowoomba Regional Council. I had the pleasure of chatting with the Council's Manager Waste Services, Troy Uren, at this year's Australian Landfill and Transfer Stations Conference. We spoke at length about the Council's innovative automated transfer station network, for which the council won an award.

The accumulation of e-waste, despite being a state issue, is one facilitated by strong product stewardship legislation. On page 56, Professor Graciela Metternicht, of the University of New South Wales, argues an opportunity exists for the Federal Government to set a national standard through its upcoming review of the Act. On page 60, Josh Frydenberg, Federal Government Minister for the Environment and Energy, reflects on the work being undertaken by the Government to ensure any new changes deliver the best outcomes for businesses and the environment.

We include news of the latest developments on these issues and more on our website – www.wastemanagementreview.com.au – with a weekly round-up available in our free e-Update newsletter, which you can sign up for via the website.

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

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National Waste and Recycling Industry Council sets agenda

The National Waste and Recycling Industry Council held its inaugural meeting with waste and recycling leaders in Melbourne.

The council, which formed earlier in the year, aims to represent and canvass the views of some of Australia's largest waste management companies, and is working to create a cohesive vision to inform legislation.

The meeting brought together companies representing the majority of the waste management and recycling industry from across Australia.

Attending the meeting were senior representatives from Alex Fraser Group, Cleanaway, J. J. Richards and Sons, Solo Resource Recovery, Sims Metals Management, Suez, Toxfree, Remondis, ResourceCo and Veolia. Delegates from state affiliates also attended, representing industry bodies in Queensland, South Australia, Victoria and the Northern Territory.

"The purpose of this Council is to create a single voice for the industry at a national level," said Phil Richards, Chair of the Council.

"At the first Council meeting, we debated a number of key policy challenges, which we believe are holding back the development of improved waste and recycling services for all Australians."

The first Council meeting resolved a shared commitment to move Australia towards a circular economy, where industry is encouraged to invest in new technology, improved infrastructure and new employee skills.

The Council also discussed the need for national harmonisation in relation to the laws and regulations governing the industry.

"The current variation in the rules and regulations governing waste management between jurisdictions creates a cost to business with no environmental, social or economic dividend," said Max Spedding, CEO of the National Waste and Recycling Industry Council.

Max said the Council discussed the need for improved infrastructure planning, in order to encourage private investment and innovation in the circular economy.

This first Council meeting resolved a shared commitment to move Australia towards a circular economy.

At future meetings members and delegates will be working to further refine Council policy positions.

The next meeting of the National Waste and Recycling Industry Council is scheduled for 13 June in Sydney.

Bingo Industries float pays off for the company

NSW waste and recycling company Bingo Industries has floated onto the stock market – with the CEO Daniel Tartak said to collect $420 million from the move.

The *Australian Financial Review* reported that the Sydney-based company has become a $628 million company over a period of 12 years, after the Tartak family purchased a small skip bin firm more than a decade ago.

The company now runs 158 collection trucks and nine recycling centres in Sydney. They will reportedly maintain 30 per cent in a holding valued at $188 million.

Daniel Tartak has been CEO since June 2015, but he has been with the business for 12 years.

The four-truck skip bin company that helped define Bingo was acquired in 2005 for less than $1 million by Tony Tartak, Daniel's father.

Daniel Tartak told the *Australian Financial Review* in April the family saw a gap in the market and had the courage to back itself.

"We saw there was a big opportunity in offering a more innovative service in waste management and we really just went for it," he said.

Bingo chairman Michael Coleman, who is a director of Macquarie Group, said in a letter to potential investors that the company was a leader in building and demolition waste collection in Sydney and its presence

in waste collection in the commercial and industrial market was growing strongly, largely through “market share gains”.

The commercial and industrial waste collection service commenced in 2013-14, but is expected to produce revenue of $31.7 million in 2016-17.

Mr Coleman said the broad dynamics of the sector were working for Bingo, with strong investment in infrastructure and population growth driving demand, while there was a “clear preference” for diversion of waste from landfill by governments, corporations and consumers. This bolstered the importance of recycling.

The prospectus said the entire Australian waste management sector grew at a compound annual growth rate of 7.2 per cent between 2007 and 2015.

Bingo Industries runs 158 collection trucks and nine recycling centres in Sydney.

Dial A Dump Industries seeks world's largest energy from waste plant

Australian waste management firm Dial A Dump Industries is reportedly looking to obtain approval from the Planning Assessment Commission for the "world's largest" waste to energy facility at NSW's Eastern Creek industrial estate.

The company told *Waste Management World* in April it was confident it will gain permission for the proposed facility, to be located next to its Genesis recycling facility.

"There is not one solution to waste. Genesis is already playing an important role in recycling and re-using Sydney's building and demolition waste and our sophisticated and environmentally responsible clean energy from waste facility will operate alongside the current operations," said Dial A Dump Industries' chief executive, Ian Malouf.

Fairfax Media reported the $700 million facility received some opposition from the NSW Greens, as well as some surrounding councils, having written to the Western Sydney Regional Organisation of Councils expressing their concern.

The proposal includes the construction and operation of an energy-from-waste facility, thermal treatment of up to a million tonnes of waste per year, a boiler house and an electronically powered feed-stock conveyor from the existing Genesis waste management facility.

"We will use residue building and demolition wastes that would otherwise be landfilled to generate electricity for 200,000 homes across Sydney, providing a secure, long-term supplement to western Sydney's energy demands," he said.

The company said the Next Generation facility will be built to the latest European and Australian engineering and environmental standards. This would include technology that captures any particulate matter and adsorbs heavy metals and dioxins, while cleaning any gases before they reach the atmosphere.

The company noted that this would mean that outputs would be below the limits set out by the New South Wales Environmental Protection Agency (EPA) and very strict European directives, and in many cases would not be detectable. The facility's pollution controls will be monitored by the EPA 24 hours a day, seven days a week.

"Emissions from the facility will have less impact than a person holding a burning sparkler at a birthday party, emitting less chloride, dust and nitrous oxides," Mr Malouf said.

"By converting residual waste into power, the facility will prevent the release of three million tonnes of greenhouse gases into the atmosphere and divert over one million tonnes of waste from landfill each year."

Waste Management World reported the site will also include an educational centre where the company intends to give tours of the existing and proposed facilities, educating schools and community groups on the importance of sustainability, recycling and energy-from-waste technology.

The site is expected to include an educational facility for schools and community groups on the importance of sustainability and recycling.

ResourceCo receives loan to build alternative fuel plant

The Clean Energy Finance Corporation (CEFC) is lending $30 million to resource recovery company ResourceCo to deliver an alternative fuel plant in NSW.

The money will be used to build two new plants that will transform selected non-recyclable waste streams into solid fuel, known as processed engineered fuel (PEF). The first plant will be built at Wetherill Park in Sydney and the second to be in another Australian state yet to be announced.

PEF is used in cement kilns, reducing the reliance on coal and other fossil fuels.

The fuel will initially be used locally, but will also be exported as an alternative to coal and gas for cement kilns in Asia.

Henry Anning, CEFC Bioenergy and Energy from Waste Sector lead, said PEF demonstrated the incredible potential to transform waste, that would otherwise go into landfill, into a baseload energy source as part of Australia's future clean energy mix, while lowering emissions.

The CEFC finance will enable ResourceCo to accelerate the development of the Wetherill Park plant.

Simon Brown, ResourceCo Managing Director, said: "Our business operates across both Australia and South-East Asia, which places us in a prime position to drive this new initiative forward and make a real difference in the way in which these communities view and deal with waste."

When operational, the Wetherill Park plant will process around 150,000 tonnes of waste a year to produce PEF and recover other commodities such as metal, clean timber and inert materials.

South Australian recycler plans to take on e-waste

South Australian Port Pirie-based recycler Nyrstar could become Australia's first e-waste recycling facility.

Nyrstar will soon accept a range of electronic products, including printed computer circuit boards, cathode ray tubes, mobile phones and related devices.

It will also accept photovoltaic cells from roof solar panels, alkaline batteries and potentially other batteries such as lead acid and nickel cadmium.

Currently e-waste generated in Australia is either landfilled or exported.

If sent offshore, it can end up in countries without stringent environmental or health and safety regulations, leading to environmental contamination and hazards for workers recovering e-waste components.

The waste and resource recovery industry employs up to 5000 South Australians. The sector turns over $1 billion each year and contributes more than $500 million to Gross State Product.

South Australia is the only state in Australia that has legislated to ban e-waste from landfill.

The state has also implemented Container Deposit Legislation and a ban on single-use plastic bags.

"While waste and materials management is a key environment issue, it presents an opportunity to contribute to the State's economic growth and competitive advantage," said South Australian Regional Development Minister Geoff Brock.

"The planned expansion of facilities like Nyrstar mean that we can recapture valuable resources that would otherwise have been sent offshore or landfilled, and create jobs here in South Australia."

"The transformation of the Nyrstar Port Pirie smelter to a multi-metals processing and recovery facility will also provide the technology to process e-waste, including printed circuit boards, television screens, mobile phones and alkaline batteries," said Nyrstar Vice President, Metals Refining, Bertus de Villiers.

"Featuring proven state-of-the-art technology available in Europe, Asia and North America, the site will be Australia's first e-waste treatment facility, helping to reduce landfill and recover valuable metal to reuse in consumer products," Mr de Villiers added.

"The expected treatment rates of e-waste from 2018 is expected to be less than 3000 tonnes per annum, increasing to more than 20,000 tonnes per annum as the facility ramps up, with a recovery of 98 per cent of metal content."

South Australia is the only state in Australia that has legislated to ban e-waste from landfill.

An update to South Australia's construction and demolition (C&D) waste: the latest Recycling Activity Survey estimates C&D waste contributes to about 33 per cent (Green Industries SA) of the state's landfill waste. In addition, the National Waste Report 2013 shows a national figure for the 2010-11 data of 34 per cent. The unreleased NWR for 2016 gives SA's C&D waste to landfill as 28 per cent on supplied 2014-15 data.

Did you know...

E-waste can contain hazardous materials, such as heavy metals and glass. If broken or damaged these pose an unacceptable environmental hazard. Around 90 per cent of what is used to make televisions and computers can be recycled.

Whitegoods have been banned from direct landfill disposal in South Australia (SA) since 2011 and computers, televisions and fluorescent lighting from metropolitan Adelaide have been banned from being disposed of directly to landfill since 2012. Source: Environmental Protection Authority SA

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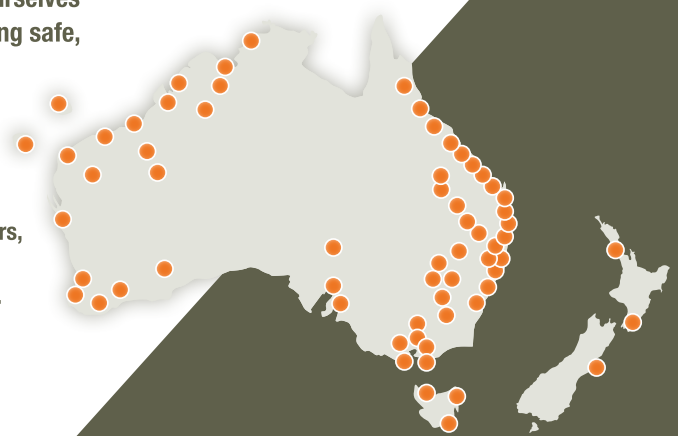

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Renewed interest in waste to energy

Veolia ANZ's State Group General Manager Victoria and Tasmania Simon Tori believes there is fresh interest in energy from waste projects.

AS RESIDUAL WASTE GROWTH CONTINUES TO OUTSTRIP AVAILABLE LANDFILL AVAILABILITY, ALTERNATIVE WASTE MANAGEMENT SOLUTIONS SUCH AS ENERGY FROM WASTE ARE BECOMING INCREASINGLY ATTRACTIVE FOR BOTH GOVERNMENTS AND INDUSTRY.

Over the past decade, Melbourne's waste management industry has benefited from ample landfill capacity, relatively low disposal costs and low energy prices. But over the past few years, things have started to change.

As part of the effort to reduce waste in the region, the Victorian Government continues to increase the cost of disposal year on year in the form of the landfill levy.

According to the Victorian Environmental Protection Authority (EPA), from 2011-12 to 2014-15, the landfill levy for industrial waste disposal jumped from $44 to $58.50 a tonne – a 33 per cent increase.

Amplifying the problem is the imminent risk of a landfill capacity bottleneck, as new facility approvals can take up to five years to be processed.

Sustainability Victoria's Statewide Waste and Resource Recovery Infrastructure Plan (SWRRIP) notes that operators need to consider the rate at which their remaining airspace will be depleted – in light of the EPA's approvals process for new facilities.

Energy prices have also continued to rise, according to the Australian Energy Market Operator. The historical data on Victoria show the average annual price of electricity has risen from 27.09 per cent in 2011 to 55.47 per cent in 2017.

As a result, waste management in the state has hit a roadblock – more waste is facing less landfill capacity and increasing disposal and energy costs. But there is one solution that may just make a virtue out of necessity.

Waste, water and energy company Veolia Australia and New Zealand (ANZ) is at the forefront of the developing sector, and sees potential for energy from waste (EfW) in the near future.

Veolia's EfW scorecard

Veolia ANZ's State Group General Manager Victoria and Tasmania Simon Tori says that due to landfill capacity availability, relatively low disposal costs and low energy prices, conditions were historically considered unfavourable for EfW projects.

But population growth that has resulted in higher quantities of waste being generated, increasing landfill disposal costs and an environmental agenda to divert waste from landfill have spurred an interest in EfW.

Types of EfW

Veolia breaks down EfW into four different forms, including landfill gas, anaerobic digestion, refuse-derived fuels and thermal treatment.

Landfill gas is an existing fuel source derived from most medium and large landfills in Australia. This involves the decomposition of organic material within landfills under anaerobic conditions (oxygen free), which produces landfill gas, comprising approximately 50 per cent methane – a potent greenhouse gas. The landfill gas can be recovered and used to generate electricity or displace an alternative fuel, such as natural gas.

"We ensure all of the landfill sites under our mandate operate to 'best practice' principles, which include the management and capture of landfill gas which is, where economically

Mechanical biological treatment can involve anaerobic digestion.

Veolia General Manager Resource Recovery Tom Wetherill has developed feasibility criteria for waste from energy in Victoria.

practical, then used to generate electricity or is used to displace natural gas," Simon says.

Anaerobic digestion involves segregated collection and anaerobic digestion of organic waste to produce a compost product along with renewable electricity generation.

Veolia operates a number of anaerobic digestion plants, processing food/organic waste to create compost and bioenergy, as well as many biomass EfW plants, which produce electricity and heat from wood waste.

Refuse-derived fuels, although limited in Australia, is where alternative fuels are derived from waste. Many biogenic waste materials, including non-biodegradable plastics and textiles, can be extracted and converted into a fuel to replace fossil fuels in industrial applications.

Veolia operate a number of recycling facilities globally, which process commercial and industrial (C&I) waste to recover materials and produce a waste derived fuel. This fuel predominately comprises of plastics waste and is used to replace coal in the cement industry.

The fourth form of EfW, which currently also has a significant focus by industry, is direct combustion of waste by incineration – or thermal treatment. Large-scale facilities are designed specifically to treat mixed waste and release the inherent heat energy of waste to generate electricity.

With this in mind, Veolia General Manager Resource Recovery Tom Wetherill developed a set of criteria to assess the feasibility of new EfW projects in Australia. Tom says there are no such facilities operating in Australia, and estimates it could take up to eight to 10 years before a large-scale facility could be established in Victoria.

With more than 30 years' experience in the field of solid waste management, Tom says the results provide an industry point of view on the feasibility of developing a large-scale EfW project from scratch. He works closely with Simon, who looks after all of the regions' sales and operations across waste, water and energy management.

Tom says the methodology includes nine feasibility criteria, and the scoring ranges from 0 to 10. A score of 10 indicates that the criteria has been met (i.e. it exists) and has previously been completed in Australia. A score of 0 means that the criteria has not been met, does not exist or there is no opportunity and indicates a fatal flaw in the feasibility of a project. Scores

between 1 and 9 can be allocated based on the status or degree of progress in achieving a specific goal. The score will give an indication of the situation or challenge and timeframe ahead.

Veolia's feasibility criteria include regulatory barriers, the waste stream, site physical conditions, site community support, technology, product sales, residues management, environmental approvals, economics and financing and then averages the numbers for an overall score.

Doing the numbers

Institutional framework

The institutional framework includes all levels of government and the EPA. While ranked positive in Victoria, it varies from state to state. With this in mind, Simon says the waste management industry needs to take a leadership role with local, state and federal governments to guide EfW providers towards sustainable and cost-effective solutions.

"Government, at its various levels, needs to show commitment and leadership in terms of strategy, policy, and the planning framework and provide certainty over the legislative environment governing the industry. This will create the certainty required by the industry to invest in what are significant long-term infrastructure projects."

He notes that some of the barriers include commercial incentives, reliability and risk management and government policy.

"The commercial environment needs to provide the right incentives to make EfW competitive with the alternative disposal option for residual waste being landfill.

"High landfill costs through scarcity of supply (determined by state planning policy) or through taxation (i.e. levies) need to exist to allow EfW solutions to be cost comparative."

Federal Government policy can also be a barrier, Simon adds, and a well-established policy framework on renewables is recommended to provide an incentive for projects.

Waste stream

EfW projects require a guaranteed supply of waste for a fuel. For a large scale facility, this will require long-term, 20 to 30-year contracts with multiple municipalities.

"Based on the strategy outlined in the SWRRIP and Victoria's energy situation, there is increased interest in having EfW as part of its future solution in Melbourne," Simon says.

"Available information for both Melbourne and Sydney indicate that they will have sufficient landfill capacity to provide an affordable and sustainable disposal solution for all of the residual waste being generated over the next 10 to 15 years. However, during this timeframe we believe EfW will become part of an overall solution for waste management for these and the other large metropolitan areas in Australia."

Site – Physical conditions

Suitable sites, both greenfield and brownfield, are available for EfW facilities. The requirements include suitable size and shape, good transportation access, suitable geo-technical conditions, availability of utilities and appropriate buffers. Potential barriers by utility service providers range from network capacity to interconnection costs.

Site – Community support

When it comes to the overall feasibility of EfW, Simon says community consultation is fundamental. "Western Australia appears to be leading the way with already having three WtE facilities approved, while both Victoria and New South Wales have been proactive in the

Did you know...

Veolia's EfW footprint

Veolia operates 63 EfW facilities around the world. Located predominantly in Western Europe, the company's facilities have been built in partnership with local government, under long-term contracts processing household, municipal solid waste, C&I and in some cases, sewage sludge. All have energy recovery options, such as the production of electricity, steam and co-generation.

Veolia breaks down energy from waste into four different forms.

publishing of the Energy from Waste Policy or Guideline. The other states can benefit from the lessons that are being learnt in Western Australia."

Tom notes that site community support can be unpredictable, and education and engagement with stakeholders is essential.

"When a project location has been specifically identified, that's when these issues start to come up. Recently, in Sydney, there has been an attempt to legislate stopping a project."

Technology

Simon says that in terms of risk management, commercially proven technologies have limited risk. If the technology isn't operated elsewhere using similar waste, it will be inherently more difficult to implement, he says. Costs vary significantly depending on the scale and type of technology or waste being treated, but these investments are in the hundreds of millions of dollars.

Product sales

While not necessarily critical for energy security, EfW provides an ideal outlet to manage and reduce residual waste, Simon says, a lesson the company has learnt from European markets who are more advanced in waste management. "EfW is recognised as being able to provide approximately 2 to 4 per cent of a country's energy needs. "Therefore, a significant enough portion of the revenue stream of a project ends up being the electricity revenue, which ideally needs to be secured under a long-term power purchase agreement with known incentives or subsidies for renewable generation."

He notes that the recent closure of the Hazelwood power station, which supplied approximately a quarter of Victoria's electricity, has already driven interest in new markets. In line with this idea, Simon notes the overall objective for the future of sustainability will be reducing waste generation and encouraging recycling of material streams.

Residuals management

Simon adds that one of the major uncertainties in proving a deliverable costed solution for EfW is the regulation of residual waste, including incinerator bottom ash (IBA) and Air Pollution Control residuals, which account for approximately 20 to 25 per cent and 2 to 3 per cent of the inputs by weight to an EfW facility, respectively.

"Looking to Europe where EfW is widespread, IBA is permitted to be reprocessed further into a secondary

Did you know...

The feasibility of large-scale EfW in Victoria as seen by Veolia

Institutional framework – 6/10: Positive outlook
Waste stream – 5/10: Work in progress
Site physical conditions: 6/10: Work in progress/positive outlook
Site community support: 2/10: Challenges accepted
Technology: Equipment: 9/10
Delivery: 5/10 **Total**: 7/10: Technology exists (overseas) but the delivery in Australia is untested
Product sales: 5/10
Residues management: 4/10
Environmental approvals: 3/10
Economics/financing: 4/10
Overall score: 42/90: 47 per cent

Presented at the 2017 Australian Waste to Energy Forum, Tom says the scorecard received positive feedback from attendees.

Melbourne has historically benefited from ample landfill space, Veolia says.

aggregate for use in construction, primarily for roadways.

However, this requires a regulatory framework to operate within, and this does not currently exist in Australia which means landfill is our region's most valid choice," Simon says.

Environmental approvals

When reviewing the scores, Tom notes environmental approvals scored a 3/10 as to date there have been no applications or approvals for large-scale EfW facilities in Victoria.

"The EPA and regulatory bodies have not yet been through the review and approval process for EfW projects that's why it ranks so low. The staff have to be trained, they have to hire other experts to advise and that's what makes it harder to get the first project approved," Tom says.

Economics and financing

When considering the economics and financing 4/10 score, Tom explains one of the challenges for developers looking at EfW projects would be finding capital to finance a facility.

"One of the key things is that projects have to be economically viable. Maybe within a five-year time frame, both the disposal costs and the power prices will provide that sort of incentive, but right now there's a shortfall.

"Melbourne, considering its current metropolitan landfill levy of over $60 a tonne, the total costs of landfilling is in the range of approximately $120 to $150 tonne. It is estimated that, subject to scale, an EfW facility will require a gate fee in the range of $250 to $350 a tonne to be commercially viable."

"Generally speaking, an increase in the landfill levy is not absolutely necessary to deliver a facility that can service the needs of the local government, as long as local councils are prepared to pay more than the current cost of landfill."

In order to obtain financing, the feasibility of a project must first be assessed by an independent entity. Simon says that proven technological solutions which meet the criteria and experience are not difficult to finance. However, that long-term certainty of waste supply and regulation governing their operations is essential.

"Where landfill is abundant and relatively inexpensive, taking a step towards change to EfW can appear expensive based only upon financial cost," Simon says.

"The other countries where plants are in operation, typically have high landfill costs, levies and bans or simply have no available space and therefore, have to implement this solution.

"The public, of course, then pay these costs through local council rates, and the industry meets these additional costs out of necessity."

Regional recycling opportunity

LIVING IN A REGIONAL AREA POSES CHALLENGES WHEN MANAGING WASTE, BUT WITH THOSE CHALLENGES ALSO COME OPPORTUNITY, ACCORDING TO JUSTWASTE CONSULTANT ISABEL AXIO.

JustWaste consultant Isabel Axio conducts an audit at a facility in Goulburn Valley.

In 2007, Isabel Axio left Sweden in search of new challenges. A sense of familiarity eventually drew her to the island state of Tasmania, and it wasn't long before she found an exciting role.

Since 2015, Isabel has engaged in audits, site assessments and Environmental Protection Authority (EPA) approvals, employed as a waste consultant and environmental manager for JustWaste, based in Launceston.

She says it offers her an opportunity to solve many of the problems facing regional communities.

With a background in environmental management, Isabel says she quickly picked up an understanding of the local issues facing waste management in regional communities nationwide, including transportation costs and the substantial price of environmental compliance.

According to the Australian Bureau of Statistics, 71 per cent of Australia's population lives in a highly urbanised area, while 27 per cent of the population live regionally.

Isabel says that the ratio of urban to regional population has resulted in many business-led management solutions, which are less applicable to regional landscapes due to the reduced level of waste generation, sparse density and low population. As a result, this leads to higher transportation costs.

A distance from key markets reduces the viability of mainstream recycling options, Isabel says, prompting the need for alternative solutions.

Isabel notes that a key aspect driving alternative solutions is that current requirements set by the nation's EPA bodies would likely be unviable for regional councils or private sector operators entering into new arrangements.

These include EPA regulations covering the design, operation and post-closure of landfills, and that a number of landfills in the state operate under licences granted prior to much of the existing environmental legislation.

"Currently landfilling is cheap. But when the existing operational licences and approved sites expire, the new environmental ones will make that service less viable," Isabel says.

Isabel explains that in Tasmania it can take up to 10 years to set up a new landfill site from idea to conception.

One option, she says, is incineration, which offers a relatively inexpensive way of disposing of residual waste in the event of exorbitant transportation and construction costs.

"JustWaste conducted a study into the feasibility of small-scale incineration for a small island council in Tasmania. We compared this option to the cost of off-island transportation and building a new landfill, in line with predicted environmental compliance and with consideration for future capping. Out of those options, we found that small-scale incineration was by far

Did you know...

JustWaste's feasibility study found that an incinerator could process 120kg/h of waste in Tasmania at a cost of $550,000.

Per tonne comparison:

Incineration: $195

Putrescible landfill: $348

Off-island transportation: $756

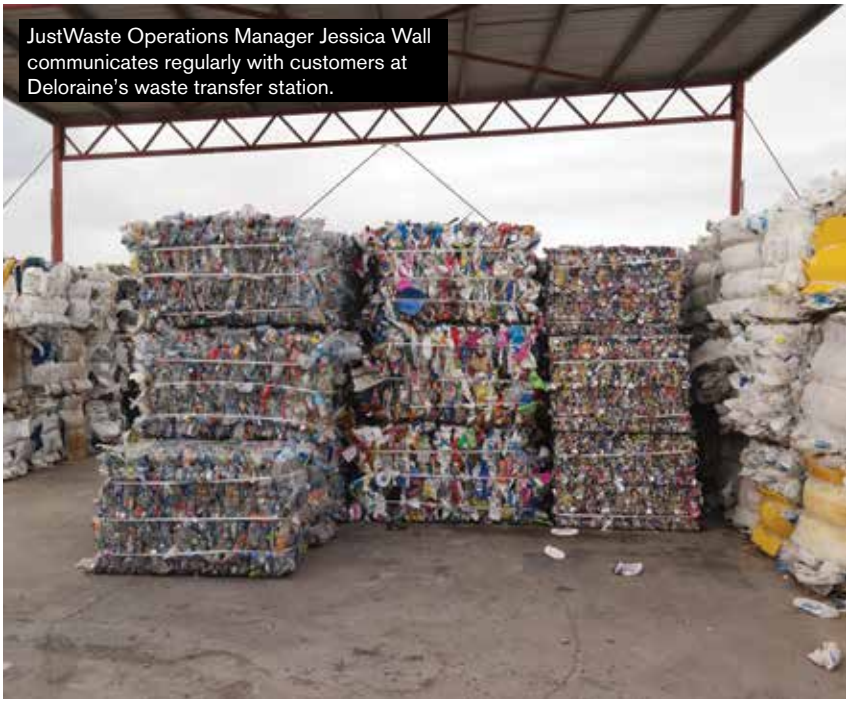
the cheapest option. Of course, the cost is dependent on each individual scenario.

"The small scale incinerator has an upfront cost which is quite significant, but after that the council owns that operation. They're independent from contractors fees and any potential landfill levies. So, having that independence and reliability proved to be the most cost effective."

Isabel explains the facility would be operated in conjunction with an existing landfill to dispose of ash left from the processing, which may be inert or toxic depending on the input. She adds that an incinerator would be able to process putrescible waste from households and commercial and industrial premises.

She anticipates small-scale incineration would take at least six years to receive environmental approvals due to the risk of ash and emissions.

"In New South Wales there's certainly a few players in the market looking into it. But for Tasmania, there is still a lot of landfill space available, so until that starts to dry up, we need to review our options, and small-scale incinerations is one of them. Another regional priority is organics processing. Whether that's composting or anaerobic digestion, those things need to be looked at," Isabell adds.



JustWaste Operations Manager Jessica Wall communicates regularly with customers at Deloraine's waste transfer station.

Isabel explains that organics is a higher priority than incineration, as more than half of household and commercial waste could be diverted into composting.

"JustWaste has observed several cases where a regional introduction of a food and garden organics bin and a small-scale composting facility can be financially, operationally and practically put into practice.

"While we're a small community, the volumes of waste steams continue to increase even through big projects of diversion. The major changes are looking at those streams as they come in."

JustWaste believes smaller volumes of waste presents transfer station operators with an opportunity to improve customer service.

Fortunately, identifying the problem early enough provides Isabel with the opportunity to find a solution.

She says that a regional specific advantage is that lower amounts of waste provide more time for regional facilities to process the materials to a higher quality, as well as more space to stockpile it for longer, which ensures transportation costs are minimal and the product value maximised.

"Another key resource of regional areas that we've identified is the people. It's quite different from urbanised areas in that you have passionate staff and leaders who are closely linked to the community and wants to do the best for their region. Not only this, but often they are on a first name basis with customers. Interacting and assisting costumers has proved to significantly change people's behaviours and successfully divert materials.

"As a manager and operator of sites we have seen that increased diversion results can be achieved where staff are shown respect, and provided with more opportunities for training and upskilling."

With seven waste transfer station and two landfills in regional Tasmania, the focus for JustWaste is on maximising the years left in existing approved landfills.

"I think there's still a good bit of lifetime in the landfills of Deloraine and Westbury. What we're working on with the councils is focusing on diversion really hard and making sure that the landfill life that we have is as long as possible. It gives us a longer lead time to adjust to a waste management future where we're thinking about diversion, reduction and salvageable materials. Hopefully we can extend the lifespan, but eventually it will become a transfer station."

Isabel says that by opening the lines of communication, regional transfer stations have an opportunity to sort their recyclables into detailed categories, reducing the need to pay a contractor to remove and separate the recyclable materials to the closest materials recycling facility and rather selling a premium product.

This success has been achieved by JustWaste's Jessica Wall, an Operations Manager of two regional landfills and one regional transfer station in Northern Tasmania, who agrees that relationships are crucial to increasing community education around recycling.

"The more you talk and communicate with people, the more they try harder. The community I live in isn't used to change, but they've surprised me recently. Communicating to them that the changes we're making are better for the community has improved results dramatically."

Western Australia's timber recycling plan

THE HAZELMERE RESOURCE RECOVERY PARK HAS PLANNED TO SAVE THE WASTE INDUSTRY THOUSANDS OF DOLLARS THROUGH ITS RECYCLING OPERATIONS – WITH A STRATEGY TO TAKE IT TO THE NEXT LEVEL.

In 2007, a consortium of Perth's eastern councils, known as the Eastern Metropolitan Regional Council (EMRC), opened Western Australia's very first timber recycling facility in Perth's suburb of Hazelmere.

This project was two years in the making and was initiated after a request by the City of Swan, a member council of the EMRC.

Prior to this, thousands of tonnes of wood waste, which included pallets, packaging, crates and off-cuts, had been going to landfill or were being stockpiled.

After consulting with businesses and markets, the EMRC came up with a solution to build the Hazelmere Timber Recycling Centre (now known as Hazelmere Resource Recovery Park), which would see businesses deposit their wood waste for recycling.

By 2009, the EMRC had opened the state's first mattress recycling centre at Hazelmere, dismantling used mattresses for reuse of timber and recovered steel.

But the EMRC had a much grander plan than just timber recycling, with plans to develop a Commercial and Industrial Waste Sorting Facility and a Wood Waste to Energy Plant.

Stephen Fitzpatrick, Director Waste Services at the Hazelmere Resource Recovery Park, explains that the concept for the site was developed by Envision in New Zealand who had completed similar projects in New Zealand and abroad.

The facility recycles an average of 20,000 tonnes of timber waste per annum.

"We have owned the Hazelmere site since 1997 and have investigated future use of the site for waste management purposes. It was only around 2005 that we started looking at waste timber recycling and recycling of mattresses which are problematic in landfill," Stephen explains.

He says more than 18,000 tonnes of timber waste were recycled at Hazelmere Resource Recovery Park in the last financial year, while the organisation recycles an average of 20,000 tonnes per annum.

He says some woodchip is supplied to WA Meat & Livestock, who run stockyards just out of Perth, using the product for bedding for animals on their way to market. Woodchip fines are sold to established markets in the broiler grower industries, including the Western Australian Broiler Growers Association for similar use.

"We also colour some of the wood chip for the landscaping market. The rest of it, we are currently stockpiling, and that will be used as feedstock for our wood waste to energy plant, which is under construction."

Stephen says the process of recycling the timber begins by having businesses and waste collection companies bring the materials from their operations or building sites or demolition projects, having separated it prior to arrival. He says demolition timber, packaging from industrial areas, scrap timber from furniture manufacturers and single use pallets from various businesses are delivered to site.

"We have a central weighbridge where the waste passes through and then it's sent to the timber recycling operation or the Commercial and Industrial Waste Sorting Facility."

Loads of wood waste are received directly on site where operators assess the load and content.

"Some timber product materials we don't accept.

"For example, we don't accept MDF or CCA treated as this affects our product quality and doesn't meet

Businesses bring their separated timber waste to the Hazelmere site for recycling.

customer specifications. We have acceptance criteria, and depending on the degree of contamination, that can have an effect on the gate fee charged."

After the contents are assessed, the materials are tipped into a deck, and the operators feed the raw timber material into a timber grinder, which was sourced from Germany.

"We use a 23-tonne excavator fitted with a heavy duty grab attachment to reduce the size of the timber and break up large material before it's fed into the grinder using a wheeled material handler," Stephen adds.

In a two-stage operation, Stephen says a slow speed grinder breaks the timber down to about 150mm in size.

An electromagnet pulls out any hazardous materials such as nails, brackets and scrap metal.

The coarsely crushed timber is fed automatically into a high-speed hammermill, which breaks the timber down into woodchip.

From the hammermill, the woodchip is again passed by a electromagnet to remove remaining nails and then an eddy current separator to remove any non-ferrous metals such as aluminium. The woodchip is then screened over a triple deck vibrating screen.

"The screen separates off the coarse fraction, which we call a chip, and the fines fraction, which we call the woodchip fines. So we end up with two streams – the fines and the chip."

Stephen says woodchip fines go into one stockpile and the woodchip into another for sampling and analysis. Finally, it is loaded by a front end loader into customer trucks.

"From the experience we've acquired, we have modified the operation of the grinder to make sure we get a consistent, efficient and a reliable operation."

Modifications to the Hazelmere Resource Recovery Park's methods have been made over the past four years, Stephen says, enhancing the product quality in line with the customer's expectations.

"It's involved a bit of expenditure on the plant and looking at our method of operation.

"We've had to look at the feedstock coming in from time to time, because we don't want painted timbers, which can contain high amounts of lead. We've adjusted the screen sizes to vary the sizing of the product to suit the customer."

The EMRC's Commercial and Industrial Waste Sorting Facility, which opened in December 2016, recovers resources from commercial and industrial waste streams, diverting waste from landfill, with a goal of recovering 50 to 55 per cent of material presented to the facility. It complements the existing recycling centre by having the ability to sort timber that can be processed into wood fines and wood chip for sale.

Stephen says the Commercial and Industrial Waste Sorting Facility focuses on bulk council verge waste and dry commercial waste, recovering materials which include ferrous metals, non-ferrous metals, cardboard/paper, plastic and timber.

Prior to the development of the facility, only timber and mattresses could be accepted at the site.

While distributors benefit from the facility, the Hazelmere Resource Recovery Park's new Commercial and Industrial Waste Sorting Facility is already setting itself environmental targets.

At full capacity, the facility aims to recover 50,000 tonnes of material per annum, equating to around 25,000 tonnes of material reduced from going to landfill.

"It was always part of the concept plan we developed for the site, there's a variety of different processes with the objective of recovering valuable resources and reducing waste to landfill."

Materials that can't be recycled travel to the EMRC's Waste Management Facility in the Perth suburb of Red Hill.

Hazelmere maintains strict acceptance criteria to prevent contamination.

Raw timber material is fed into the timber grinder at the Hazelmere site.

"There's a bit of an education process with the member councils and commercial customers. If we can improve resource recovery, then we have an option to enhance sorting operations at the park."

Stephen says once the load is assessed, the materials at the sorting facility are fed into EMRC's waste sorting plant, which includes a picking station where four staff members sort the waste into the different categories of timber, metal, cardboard/paper and plastics.

He explains the new plant was provided by a local supplier of crushing, screening and sorting equipment.

"We had a competitive tender process for the sorting plant and also the building, with the building being designed and built by a local construction company.

"The tenders were evaluated on a range of qualitative criteria including their experience in those sorts of plants, the reference sites that they nominated, the quality of the plant and the simplicity of the operation that matched our expectations and the value for money."

And it's all part of a plan to develop a sustainable resource recovery solution that will serve the region into the future, Stephen says, as the organisation is currently constructing its wood waste to energy plant, which began in June last year, and is expected to be completed in August this year.

The electricity generated will be used onsite with excess electricity exported. The process of converting wood waste into biochar involves heating woodchip to about 900 degrees Celsius in the absence of air, Stephen says.

"It produces a gas, called synthesis gas, and it contains a mixture of hydrogen and carbon monoxide and after cleaning to remove tars and particulates is metered directly to gas engines which convert it into electrical energy."

"We're going to use the surplus woodchip we produce from the timber recycling operation by converting the woodchip into synthesis gas which is cleaned and powers gas engines and generates sets to produce electrical power. Biochar is the byproduct – it's like charcoal, and it's the product you get when you pyrolysise timber or any organic matter."

He says the EMRC is building a dedicated power cable to supply approximately 3 MW of electricity to Perth Airport.

"It will only be a relatively small part of the electricity requirements of Perth Airport but they recognised it as renewable energy and part of the mix they would like to have. The plant has the potential to be expanded." ■

Did you know...

Timber and mattress processing at Hazelmere Resource Recovery Park in 2015/2016 included:

- 18,358 tonnes of wood waste was received during the year and converted into woodchip fines, woodchip and coloured woodchip
- 16,230 tonnes of woodchip fines was supplied to broiler growers for animal bedding
- 714 tonnes of woodchip was supplied to WA Meat and Livestock for animal bedding.
- 90 tonnes of coloured woodchip was supplied to landscapers
- 8,250 mattresses was received and processed on site

Woodchip fines are stockpiled for sampling and analysis.

Landfill's costly legacy

ENVIRONMENTAL REGULATIONS MEAN THAT MANY OF AUSTRALIA'S OLD-STYLE TIPS ARE NOT UP TO SCRATCH. SHEKAR ATLA, OF THE BAW BAW SHIRE COUNCIL, EXPLAINS THE LESSONS HE LEARNT FROM REHABILITATING THE COUNCIL'S LANDFILL.

Rehabilitating a legacy landfill can be an arduous task for many councils.

Dozens of old Victorian landfills were last year suspected of leaking potentially toxic materials into soil and waterways.

The risk emerged from unlined landfills.

According to the Environment Protection Authority Victoria (EPA), engineered landfill liners of a certain standard were not compulsory until 2004, when a new EPA policy came into effect. Although, the EPA notes, the standards were previously well documented.

EPA Executive Director, Regional Services, Damian Wells says the EPA has been gathering location data from several sources on closed landfills in Victoria.

"While the EPA is unable to provide the number of closed landfills at risk of leaking, we know that site

setting and context provide a strong indication of the likelihood based on geology, depth, meteorology, topography, base engineering/ lining (if any), capping quality and maintenance, and leachate and gas management," Damian says.

"In preparing the location list, EPA is consulting with the metropolitan and regional waste and resource recovery groups who work with local councils and the private sector."

Damian explains that if a site is not capped and rehabilitated as soon as practicable it may result in large volumes of leachate being generated, risks of contaminating groundwater and local creeks and rivers, migration of landfill gas, stability risks, erosion issues and potential odours – which can be costly to manage.

"These problems can be minimised, controlled or managed if a site is capped and rehabilitated as soon as practicable. Capping material and construction costs, including design consultancy, materials, labour and machinery hire, may also increase over time so it's preferable to rehabilitate sites as soon as possible," Damian adds.

"EPA is requiring that landfills undertake progressive rehabilitation work. This means that once a landfill cell is filled with waste, the operator needs to commence rehabilitation work while operating new landfill cells."

A landfill liner is an impermeable engineered layer of heavy plastic and clay with a gravel layer that protects against groundwater contamination through downward or lateral escape of leachate, and allows for the drainage, collection and extraction of leachate.

The Baw Baw Shire Council, in Victoria's east, is just one local government forced to grapple with the repercussions of having to rehabilitate an old-style tip.

The Trafalgar landfill was not lined, providing only a hole in the ground where the waste was tipped.

Environmental concerns and the price of transporting leachate from the site led to Baw Baw Shire Council closing its tip in 2011, investing in a $5.4 million rehabilitation of the 4.35 ha site.

Landfill rehabilitation, which involves returning the land to its former state, involves capping and revegetation, the installation and ongoing maintenance of gas and leachate collection systems and decommissioning infrastructure no longer required. Ongoing monitoring and maintenance of

the above continues during the long aftercare period.

Shekar Atla, Coordinator Waste and Major Projects at Baw Baw Shire Council, says the council's landfill commenced operations in the 60s and closed in 2011 – transforming the site into a transfer station.

He says the council experienced challenges managing the leachate and asbestos.

With an insufficient leachate collection system, the team had to transport the leachate to EPA-approved disposal sites.

From 1964 to 2011, the site accepted a range of waste products, such as domestic garbage and commercial waste.

It was an inexpensive landfill option for the council. That was until leachate began overflowing the council's retaining wall and crossing the landfill boundary, posing a risk of contamination to the local waterways.

Since 1964, about 500,000 tonnes of waste is estimated to have been landfilled at the site.

"There were issues leading to the closure and rehabilitation of our landfill which came all of a sudden. As a regional council, we still had three years of landfill life left for kerbside garbage disposal on site," Shekar says.

Landfill capping, which involves placing a barrier over the filled landfill, includes the option of using compacted clay, geosynthetic clay liners, polyvinyl chloride and high density polyethylene.

To achieve the best results for the environment, the council decided to choose the EPA Victoria's Best Practice Environmental Management publication (BPEM) cap instead of the EPA's licence cap design.

"There was huge difference in cost between the existing EPA approved final cap design – less than a million dollars versus the landfill BPEM cap design, which turned out to be more than five million dollars.

"Due to the issues surrounding the leachate and odours leading up to the closure of the landfill in November of 2011, council knew that getting EPA approval for the existing approved final cap design would be an uphill battle. And so, we proactively decided to go with the BPEM landfill guidelines recommended Type 2 design. In coming to this decision, council also considered the on-going costs involved in leachate carting which were huge and also the uncertainty around the long-term issues by not adopting the best practice in the final cap construction."

He says while it was a difficult decision politically, the result would

Did you know...

A timeline of events

November 2011 – The Trafalgar Landfill closes

March 2015 – A final construction of the landfill cap is complete

June 2016 – Gas extraction works are complete

Landfill rehabillitation often involves ongoing maintenance.

Murray Cook, Joe Gauci, Mark Koller, Helen Anstis, Shekar Atla, Russell Clarke, Thilina Wanasingha, Levent Hilmi and Phil Cantillon.

have long-term benefits for the environment and the budget.

Rehabilitation of the landfill was factored into the council budget. However, the council had only factored in the money for the approved EPA landfill cap, and not the costs for the BPEM Type 2 landfill 2 cap.

From 2015, Baw Baw Shire Council began the 12-month process of capping the site.

Contractors begun by capping the site with a 300mm layer of compacted clay, followed by a 600mm layer, until finally a 800mm of subsoil mixed with clay was added along with a 200mm layer of topsoil.

Mark Kellar, Principal Environment Engineer at GHD consultants, designed the cap construction and gas extraction system, avoiding contamination from the site.

Shekar says that GHD Consultants was appointed due to regional experience.

"In Gippsland they had done some work on a landfill there, so they had an advantage over the other candidates that did not have any local experience.

"Having said that, GHD had a wide range of experience in both civil works and waste."

Shekar says that the high rainfall area restricted construction activities and truck safety.

Delays were also attributed to continuous rainfall in the region during 2011/12 to 2015/16.

"Considering the leachate on the surface water and heavy rainfall, we had to capture water falling on the land. Council had to capture all the water on the 4.37 ha during the construction and pump it to the leachate dam on south and cart the leachate away," Shekar adds.

The gas extraction facility extracts landfill gas from the site and flares the gases in order to minimise greenhouse gas emissions. Shekar says the council conducted a feasibility to generate electricity on site, but was informed the site was too small.

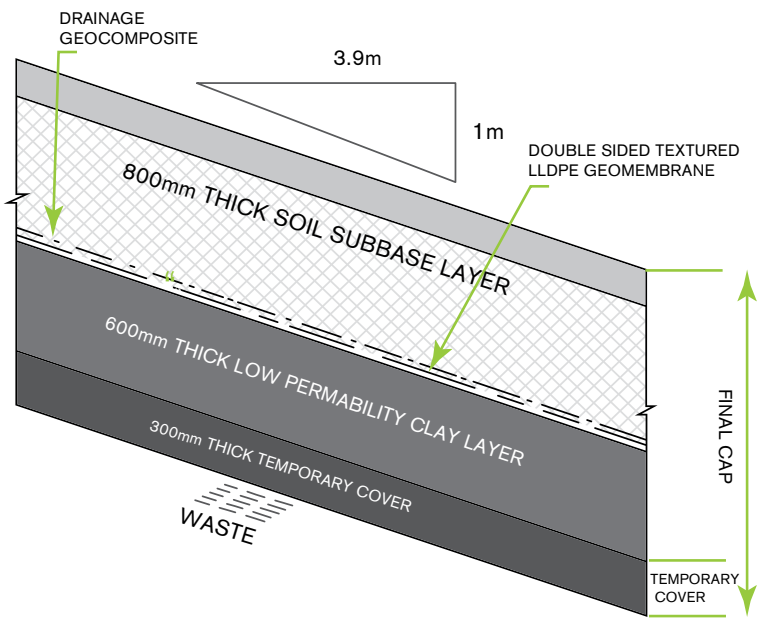
However, Shekar says the council may in future use the extracted gas to generate the power for its own usage on site.

Mark says there were considerations as to when the team would install the landfill gas system, either before or after capping.

"We weighed up the pros and cons. I'm not necessarily recommending it for all landfills, but in this instance we chose to install the landfill gas infrastructure following the completion of the cap. From a contract management perspective, it was just cleaner.

"A contractor gets in, does all the shaping of the waste, provides the cap and the new contractor comes in and installs the landfill gas infrastructure. Of course, at the end, we need to consider the management of landfill gas during the construction and the potential risks and challenges that may present to the contractor."

Council will continue to monitor the site for the next 30 years or until the landfill no longer poses a risk to human health or the environment.



Toowoomba's technological transformation

WE SPOKE WITH TROY UREN, TOOOWOOMBA REGIONAL COUNCIL MANAGER WASTE SERVICES, ABOUT THEIR REVOLUTIONARY AUTOMATED TRANSFER STATION NETWORK AND OVERALL WASTE MANAGEMENT STRATEGY.

We understand you recently won an award for innovation. Can you explain what makes your transfer stations unique?
The key initiatives for which we won the 2017 Innovation Award at this year's Australian Landfill and Transfer Stations Conference relates to the integration of technology at our new Greater Toowoomba Waste Management Facility. We have a number of uses for technology which are focused on improving how we manage the site and how we can deliver better customer service.

There are three types of cameras on site, including CCTV, thermal and licence plate cameras.

Digital CCTV provides security, with motion sensor and infrared ability.

But our digital CCTV also includes analytics which help us manage queuing by sounding an alarm when a car sits stationary at a given location. The analytics allow us to search imagery and to run heat maps to see where people go and how they use the facility.

What is the purpose of all this advanced technology?
Our aim is to be able to use this to analyse the effectiveness of the facility and our flat floor design allows us to make changes in how we operate cost-effectively. There are three thermal cameras on site at key risk areas which are integrated into our emergency management systems. These have the aim of picking up heat sources before they pose a fire hazard.

Did you know...

Tooowoomba Regional Council is a local government area in the Darling Downs region of Queensland, Australia. Troy says they were the first council in Queensland to introduce a kerbside green waste bin, in 2005. The council currently has a 240L weekly garbage, 240L fortnightly recycling and 240L fortnightly green waste bin. Troy says it is looking at options for 140L garbage and 360L recycling, but these have not been rolled out. He says they have commenced investigations into their next waste collection contract. The contract expires in 2020, so they are in the early planning phases of procurement.

Licence plate cameras are at the entry and exit to all our key operating areas. These cameras are linked to our transaction management software and tell us where people go and how long they are there. These are key pieces of information required in the planning of new facilities and will also allow us to operate with cashless toll road type transaction management in the future.

We also have the conduit in the ground for up to 16 digital signs which will be integrated with our electronic gates. This will allow us to manage the site at the push of a button, eliminating the need for staff on the ground.

For example, an incident in an area might require us to close certain gates and direct customers to a given area. This would normally require the mobilisation of a number of staff, all then removing the resources away from dealing with the actual incident. We will be able to close gates, change the messages on digital signs and therefore change the operation of the facility with the push of a button.

Our focus is to be able to manage our customers on the fly and to use the data we gather to learn how to operate better in the future. We believe that the easier it is for our customers to use our facility, the more likely they are to achieve our goal of recovering resources, which has proven successful to date.

Can you explain some of the waste management roles that exist at the council and how they work with one another?

Council operates its facilities and delivers its services through a range of delivery models, including in-house and outsourcing. Our kerbside collection services are an example. Our gatehouse and resource recovery functions are outsourced and we are going through the process of preparing new contract documents for these services. We are planning to make some significant changes to how these services interact.


The Council is rolling out a network of 23 facilities.

We deliver a number of functions in-house, including our landfill and transport operations and our front line customer service. Our contractors are a fundamental part of the service we deliver to our customer. Often we have contractors in the front line of customer service. It is therefore important that we take a partnering role and expect a high standard. Ultimately we look at ourselves like Apple. Many people may (or may not) know that Apple doesn't make iPhones. They are made by another company in China. Apple however, designs and markets the iPhone. We see our services in a similar manner. We design a service to our customer and then work with partners to deliver those services to the customer under the Toowoomba Regional Council brand.

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

Emulating the success of others helps in developing a successful tender document. However, tender documentation requires an understanding of the business in which you are procuring. Many of our most successful tenders arise when we actively do the opposite of what everyone else has done. This is not simply being a contrarian, but it is knowing the business in which you are procuring and considering the key criteria, which assists in understanding how you can effectively evaluate.

Knowing the business also helps us to appropriately allocate risk and prepare a deal and cost structure which the industry in our experience appreciates. An example of where Toowoomba did this was the procurement of our most recent collection contracts. In this procurement, we actively did the opposite of what previous consultants had advised. We were able to take this approach by doing our homework and understanding the market and therefore allocating risk appropriately. This resulted in a 30 per cent reduction in our business as usual spend for these services with no haggling over price.

What are some of the challenges surrounding collection and recycling?

In Queensland, a major unknown relates to the government's introduction of a Container Refund Scheme.


The Council designs a service for its customers and works with its partners.

The potential impacts on the service delivered at the kerbside will be interesting. There are many views on how the introduction of this new scheme will impact on an existing, mature and working system. We will be watching this closely.

Another approach of which we are proud of is how we consider the Chain of Responsibility in our tender evaluation and contract structures, which is a requirement under the National Heavy Vehicle Law in Australia. Under the Chain of Responsibility, it is an offence for council to enter into a contract where they know (or ought to know) that the contractor may be required to break the law in delivering the service.

In our experience this is a major area of risk to councils and I don't think many are across their potential liability when it comes to transport and the National Heavy Vehicle Law. We place a significant amount of effort into consideration of a contractors fleet and pricing in making decisions.

Tell us a bit about the Toowoomba network of waste transfer stations, are there difficulties in managing numerous facilities of different sizes?
Council is rolling out a network of 23 facilities across an area of nearly 14,000 km2. This will represent a relatively high level of service which locks cost in to the fundamental network and its operations. It is therefore important that we remain focused on the core drivers of cost in our business and that we do not lose sight of these.

We've determined that ongoing transport and operational costs will far outweigh our capital costs. We are therefore focused on capital which results in operational savings, particularly in transport, rather than reducing capital as we have so many facilities to develop. We may actually have to increase capital spend in some cases in order to realise much greater transport benefits.

There are challenges in delivering a large number of facilities with a significant difference in the populations they serve.

Our facilities must cater for catchments of say 150 people, up to almost 400,000 people in their design life. It is therefore important to take a long-term view and ensure we do not create artificial constraints through poor site selection for example. We also challenge ourselves to consider how we integrate our operations, but most importantly we focus on making it easier for the customer to use our facilities, and on ensuring we have designed efficient operations based on key cost drivers.

What equipment do you use regularly?
At the Greater Toowoomba Waste Management Facility (GTWMF), we have a number of pieces of equipment which we use which are new to this facility.

We have a 20-tonne JCB material handler to load our Azmeb 85 m^3 side tipping semi trailers hauled by Mercedes Benz prime movers. We also have a high lift JCB loader which acts as a redundancy for our materials handler should it go down.

How do you educate the general public on reducing waste?
Over the recent past, we have been focused on network planning for the delivery of our infrastructure program. We strongly believe in an evidence-based approach with regard to education and have been gathering data on our performance and the composition and spatial elements of our waste streams.

We have also conducted a number of exercises where we have gathered targeted information from the community which we build into our decision making. Our aim is to gather data from multiple sources. We then use this information to assist us in decision making, and to then measure the performance of our intervention.

An example of this is the way in which we have designed the new GTWMF. We knew customers had a strong desire to do the right thing. We also had waste composition information and information on how our customers used our facilities. We brought all this together and focused our design efforts on making the Resource Recovery Area easy to use for customers with minimal need for intervention from us (passive

operations). Our new facility has increased the rate of diversion from landfill up to 79 per cent up from around 30 per cent at the previous facility with no additional staff or programs. Our focus moving forward will be on how we better educate our customers to achieve even better outcomes.

What are the main opportunities for Toowoomba Region for increasing diversion of materials from landfill/ increased resource recovery?
Our focus at the moment is on value adding to both organics and aggregates streams. We are investigating mattress recycling among other programs. We are also focused on changing our view from looking at waste as a problem, to looking at various material streams as individual resources and as opportunities. Each material stream will be analysed and considered on its own but also as part of an overall service.

How will this affect your operations?
We are looking at our operations from many different perspectives with the aim of understanding the business or material we are managing. We are considering various business models and seeking to understand how we add value and how we can identify partners who together can add more value. This involves challenging mindsets and investigating different industries and how they operate.

For example, a department store does not have one manager. It will have category managers in various parts of the store who are focused on that business. We are considering these type of approaches where people manage material flows, not facilities. This may allow us to focus on where we add value in the future. For example, we can perhaps take a longer term view, we can acquire land and move through a development application process sometimes with different drivers than a commercial business. But this does not necessarily mean we have to run every part of a new facility. So we may look to partners who can better manage a particular material flow while still delivering an overall customer service that meets our customer's needs.

How does the council manage to keep costs down while meeting waste management targets?
The key here is to do the work. So many times as a consultant and as a contractor I have seen councils lock in costs for long periods simply because they did not have the money or time to investigate and look at their future life cycle costs. So often we simply copy what someone else has done blindly, locking in the same mistake they have made.

We know at least 70 per cent of our life cycle costs will be operational. Of these operational costs, the majority will be in transport. Therefore, we are not focused on reducing capital cost.

People get so hung up on the type of infrastructure (say a transfer station) they are delivering. The cost of delivering a given facility is almost identical for any given type of facility with a common capacity. But the operating costs can be vastly different. I have often seen people try to save a bit on capital, or a bit on labour by putting in place a saw tooth customer loaded RORO transfer station for example, which is a very common type of transfer station, particularly in regional Australia. All the while, they've locked in an extremely inefficient mode of transport for over 30 years.

At Toowoomba, we analysed what would happen if we were to long haul our waste in multiple different transport modes, including RORO and B-Double for example. The difference in cost over a 30-year period was in the billions of dollars! We keep costs down by knowing where and what our key cost drivers are. We then focus on them and forget about all the other noise. ■

A JCB material handler is used to load waste.

The price of recycling

IS THE CURRENT LANDFILL LEVY SYSTEM SUPERCHARGING OR STYMYING RECYCLING? INDUSTRY CONSULTANTS PRESENT THEIR VIEWS ON THE SOMEWHAT POLARISING ISSUE.

Between 1996 and 2015, waste grew at a compound rate of 7.8 per cent per annum, according to estimations by MRA Consulting Group based on the Federal Government's National Waste Policy 2010 and more recent data.

The government's report into the nation's waste generation and resource recovery found that Australians generated 2.2 tonnes of waste per capita on average in 2010-11, with 60 per cent of this recycled or recovered for embodied energy.

With landfill being the cheapest option, recycling incentives have been put in place in various states and territories in the form of a landfill levy. The levies require landfill licence holders to pay a fee for each tonne of waste deposited onto land at licenced premises.

But numerous issues have emerged out of the policy.

These include stockpiling to avoid paying the levy and a lack of harmony among the states, which is believed to disincentivise recycling projects.

New South Wales, Victoria, South Australia and Western Australia have all implemented levies, while Queensland, the Northern Territory and Tasmania have not.

According to the Environmental Protection Authority (EPA) Victoria's *Calculating the landfill levy and recycling rebates* document, the levies act as an incentive to minimise the generation of waste and to promote investment in developing alternatives to disposal to landfill.

Mike Ritchie, Director of MRA Consulting Group, notes in his research that the landfill levy has encouraged recycling.

He argues that after the Queensland Government removed its landfill levy in 2014, recycling rates were immediately reduced by 15 per cent.

Mike's research shows that over the same 18-month period, recycling rates in NSW increased by 16 per cent.

At the same time, Mike notes that most state governments have set landfill diversion targets for various waste streams, ranging between 60 to 90 per cent by 2021.

"We are still a long way from achieving each state government's recycling targets.

"Further intervention via levies or other instruments such as bans, grants and regulation is required," wrote Mike.

"One of the main frustrations of the waste sector is that plenty of new recycling/recovery technology is available and the sector has the appetite for capital investment, but the main barrier remains government willingness to shift market economics."

Max Spedding, CEO of the National Waste and Recycling Industry Council, told *Waste Management Review* that landfill levies need to be appropriately priced to ensure outcomes.

"We've got the situation where we've got no levy in Queensland and a very high levy in Sydney and that's resulting in waste being carted from Sydney and disposed of in Queensland," Max says.

"When the levy was removed in Queensland by Newman's government the recycling industry collapsed overnight. Numerous facilities were

Did you know...

Landfill levy rates:

NSW: $135.70 per tonne (metro)

Victoria: Varies depending on industrial waste, $70 for low hazard from manufacturing waste

South Australia: $76 per tonne up to June 30, 2017 (metro) – set to increase to $100 by 2019

Western Australia: $60 per tonne for putrescible waste until June 30, 2017. Rising annually

closed within the change of legislation."

Max says that a high levy also could also be counterproductive, adding that generators could avoid recycling all together.

"If you've got a particular stream that has high residuals, such as shredder floc from vehicle recycling, the cost of the disposal of the residual waste doesn't make economic sense. If you're selling into the international market, you're competitors are from other countries, especially Asia and America, where there are no levies, you're put at a disadvantage.

"It means they won't recycle that material and give preference to another that doesn't have that high degree of residual in it. That makes it more difficult to dispose of different waste streams that have the residual waste," Max explains.

"We're looking to create a levy structure which encourages industry to invest into recycling. Currently, the NSW EPA applies a 50 per cent reduction on the metal industry, which we welcome."

Former ResourceCo executive and independent industry consultant Mike Haywood argues the current practice of passing on levies to governments has led to stockpiling and even illegal dumping to avoid paying the levy.

"It's pretty hard to argue that levies haven't been successful at diverting waste from landfill. But have we just achieved the diversion of landfill part? Have we actually really achieved the beneficial reuse and recovery aspect of it?" Mike asks.

"Due to the way the levy is applied and collected by the landfill operator or depot it is not in their interest to transfer to the landfill as that will trigger the payment of the levy. Therefore if you stockpile waste you get to keep the cash, so the current system goes towards encouraging stockpiling."

Mike says that state governments should collect the levy instead of the private sector and local government.

"What should happen is that the levy is paid direct to treasury and the recycler has to recycle the material in an EPA-approved process and distribute the commodities or products to either processing facilities or produce products to be able to claim back the levies from treasury."

A South Australian EPA spokesperson said the Government's reform to the waste and resource recovery sector, including changes to the waste levy, was designed and independently modelled to grow the sector.

"There is no evidence to suggest

Queensland rolled back its landfill levy under the Newman Government.

Landfill levies have been put in place to encourage resourve recovery projects.

illegal dumping is related to people wanting to avoid a waste levy. In Queensland for instance, there is no waste levy for householders, and yet they report cases of illegal dumping in their community."

Max argues that the levy is working effectively, though it varies depending on the price and the waste stream.

"If you go to Adelaide, the view in South Australia is that they need a $100 levy going forward and that's how the government has set the levy for 2019, because their biggest recycling initiative is the recycling of fuel for Adelaide Brighton Cement.

"If it's lower than the Victorian level, it will be enough to encourage recycling of construction and demolition material, but it probably won't be enough to encourage some of the other material such as tyres or soft plastics."

Max adds that waste education is just as powerful at increasing recycling rates.

He notes $60 levies have spurred metal recycling in Western Australia.

"Northstar has just put in a new shredder in Laverton and Sims Group Australia has just spent $85 million on a best practice facility in Kwinana. Metal recyclers are investing to supply in the international market."

And until a unifying policy exists at a national level, it seems the issue is likely to remain a hot topic among the waste management industry.

The state of the waste data

GOVERNMENTS ARE WORKING WITH WASTE MANAGEMENT DATA THAT IS UP TO FIVE YEARS OLD. MIKE RITCHIE, DIRECTOR OF MRA CONSULTING GROUP EXPLAINS WHY AN UPDATE IS NECESSARY.

The Australian State of the Environment (SoE) 2016 Overview was tabled in Parliament on 7 March 2017, providing a five-year comparison with the 2011 SoE. The 2016 SoE concluded that:

"Despite an overall increase in waste generation, Australia's total disposal tonnage decreased from about 21.5 megatonnes to about 19.5 megatonnes (about 9.5 per cent) between 2006/07 and 2010/11. During this period, the resource recovery rate in Australia increased from 51 to 60 per cent. The quantity of material recycled increased significantly from 21.4 to 27.3 megatonnes per year, or by about 27 per cent."

This is a good outcome. In the space of four years, tonnes of waste recycled have leapt up. All of which means that, in the face of increasing waste generation, the total tonnes of waste to landfill have dropped.

What is disconcerting, however, is the data used. The SoE 2016 is drawing its waste conclusions from data that is now more than six years old from the National Waste Report 2013, which despite its name, is built on data from 2010/11.

Now six years is a long time in this world. Six years ago, Julia Gillard was our Prime Minister, Fukushima melted down, Steve Jobs died and Kate married William. It's a lifetime ago.

Consider the waste data from the *National Waste Report 2013*:

In this age of Big Data, we should be able to expect a State and National Waste Account within six months of the end of each financial year.

We should have the systems in place to enable almost real-time monitoring of just what is happening, letting our policy makers, generators, collectors and processes all respond to real feedback. To improve as they see the system at work.

We should also push benchmarking hard, especially for local government. NSW does it well. It reports on waste data for each council, extensively analysing each. Councils know who

State	Year	Landfilled	Recycled	% diversion	Years old	Source
ACT	2010/11	200,000	730,000	78%	5	Source: National Waste Report 2013
NSW	2012/13	6,300,000	10,500,000	63%	3	Source: State of the Environment 2015
NT	2010/11	280,000	20,000	7%	5	Source: National Waste Report 2013
Qld	2014/15	4,765,854	3,673,189	44%	1	Source: State of Waste and Recycling in Queensland Report 2014-15
SA	2013/14	914,000	3,588,000	80%	2	Source: Zero Waste SA – SA 2013-14 Recycling Activity Report
Tas	2010/11	410,000	240,000	37%	5	Source: National Waste Report 2013
Vic	2014/15	4,125,479	8,409,714	67%	1	Source: Victorian Recycling Industry Annual Report 2014-15
WA	2014/15	3,613,310	2,621,540	42%	1	Source: Recycling Activity in Western Australian 2014-15
Total		**20,608,643**	**29,782,443**	**59%**		

the leaders are and who to talk to for tips. This should be standard across the board. Let peer pressure drive improvements.

It's time Australia got serious on its waste accounts. It's simply not good enough to release a State of the Environment Report 2016 that is relying upon data that is ancient history.

The good news is that this can be fixed. MRA offers to do a simple data consolidation for all states and Commonwealth governments. If governments commit to supplying high level data within six months of the end of year reporting period, MRA will establish and host this national database for free.

As always, I welcome your feedback on this, or any other topic. Feel free to contact MRA at **info@mraconsulting.com.au**

National Waste Report 2013

State	Year	Landfilled	Recycled	% diversion
ACT	2010/11	200,000	730,000	78%
NSW	2010/11	5,940,000	11,180,000	65%
NT	2010/11	280,000	20,000	7%
Qld	2010/11	3,580,000	3,960,000	53%
SA	2010/11	880,000	2,940,000	77%
Tas	2010/11	410,000	240,000	37%
Vic	2010/11	4,560,000	7,700,000	63%
WA	2010/11	3,660,000	2,260,000	38%
Total		**19,510,000**	**29,030,000**	**60%**

With more than 25 years' experience in waste and recycling, Mike Ritchie has built and operated materials recovery facilities, plants, run operational recycling business lines and marketed waste services. He has also been a buyer of waste services, with two stints as a senior manager in local government. As director of MRA, he brings operational waste experience as well as government procurement knowledge to the role.
MRA Consulting Group is a leader in recycling, waste and carbon, providing services to large and small business and all levels of government. The MRA team includes engineers, planners, economists, lawyers and scientists.

Fine separation

A PARTNERSHIP BETWEEN INTERNATIONAL RECYCLING COMPANY GALLOO AND EQUIPMENT MANUFACTURER STEINERT HAS LED TO A MORE EFFECTIVE WAY OF SEPARATING NON-FERROUS METALS FOR REUSE.

In 2013, Belgium recycling giant Galloo moved to expand its operations.

The leading firm needed an efficient way of extracting non-ferrous metals, so they turned to family-owned international manufacturer STEINERT for a solution.

After extensive studies, STEINERT engineers developed a flexible machine concept for three different input materials, including automobile shredder residue, incinerator bottom ash and electronic scrap. This year, STEINERT launched their EddyC Fines separator – boasting increased separation and a 10-minute belt change system without lifting equipment.

Galloo R&D Officer Luc Wagnein says the company is impressed by the machine's reliability, having worked with Steinert equipment since 1985.

"Ten years ago, you could only obtain standardised devices on the market. It was impossible for us to adapt them to our specific needs. That's why we are extremely happy that we and STEINERT have been able to jointly develop a system that precisely meets our requirements," Ms Wagnein says.

STEINERT explains it was challenging developing a non-ferrous metals separator that could handle extremely fine input materials, with grain sizes of 0.5-10mm. The company says the goal was to enable the three different materials to be to run through the system flexibly without any drop in the separation rate.

"Engineers wanted to further optimise the separation of non-ferrous metals out of the fine-grain fraction and, at the same time, simplify the machine's operation and maintenance," STEINERT says.

STEINERT adapted the output of the machine's requirements and developed a splitter that could handle the three different types of fine grain material. As a result, fine gearbox adjustments can be made to the splitter to enable it to get within a few millimetres of the material, separating even the tiniest particles.

The machines now run at Galloo facilities in two shifts for a total of 16 hours a day. Luc says the new systems allows the team at Galloo to improve its separation rate of incinerator bottom ash – a key focus of its recycling strategy.

"We mainly recycle aluminium, copper, zinc and brass, as well as a few precious metals such as gold and silver," Luc says.

The new system's splitter plate ensures finer separation of materials by adjusting it specifically to separate materials.

"A gearbox enables users to set it with millimetre precision along three different axes and adjusts it even more accurately to the trajectories of a wide variety of materials. In addition, the machine has a program-controlled system, which hones in on predefined points of the trajectory of the metal," says STEINERT Technical Director Nico Schmalbein.


STEINERT has developed a flexible machine concept for three materials.

The STEINERT EddyC FINES has a rapidly rotating magnetic pole system that induces eddy currents in the non-ferrous metals transported on the conveyor belt. The resulting opposing magnetic field creates repulsion effects, which enables the non-ferrous product to be ejected from the stream of material. The splitter plate within the materials trajectory separates the non-ferrous product from the remaining stream of material.

"There is nothing comparable on the market for conveyor belt widths of up to two metres. The extremely high pole frequency activates even tiny particles measuring less than a millimetre so they can be separated."

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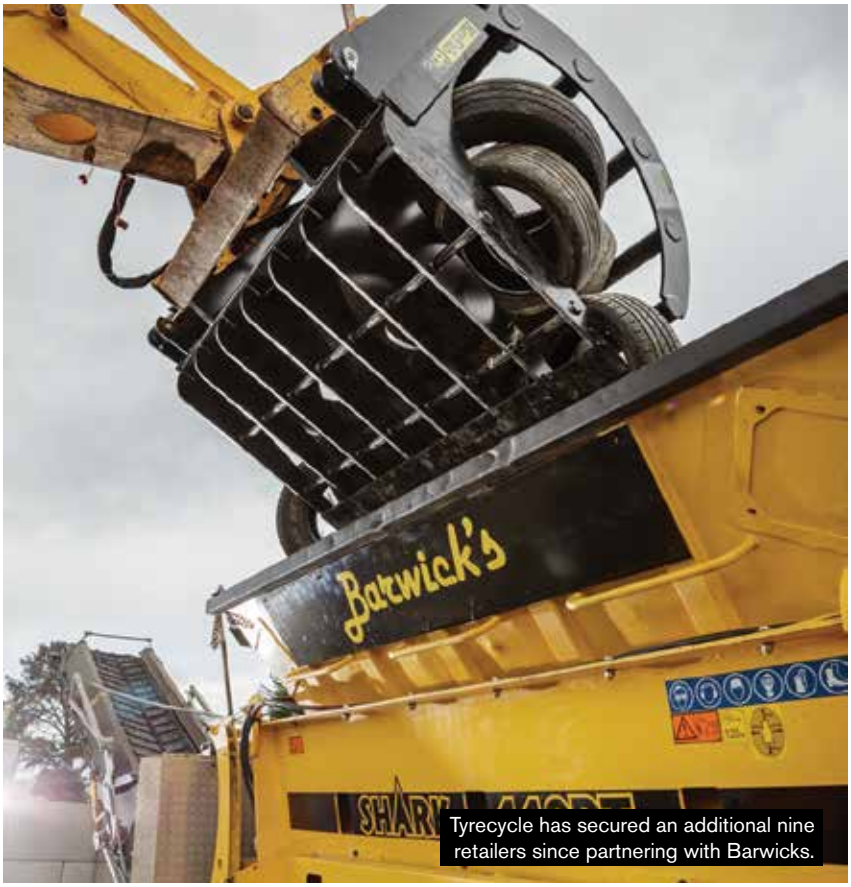
Tyre recycling on a growth trajectory

A SUCCESSFUL PARTNERSHIP HAS ALLOWED AUSTRALIA'S LARGEST TYRE RECYCLER TO DOUBLE ITS RECYCLING OPERATION, THE COMPANY SAYS.

Australia's largest and oldest recycler of tyres continues to expand its operations across Australia off the back of strong support from retailers, Tyrecycle says.

The company, which began in 1992, has doubled its recycling operation since partnering with Tasmanian horticulture firm Barwicks seven months ago.

Jim Fairweather, Tyrecycle CEO, says since the partnership launched last year, the percentage of tyres being recycled has grown from 30 per cent to 60 per cent.



Tyrecycle has secured an additional nine retailers since partnering with Barwicks.

"This equates to around 24,000 tyres per month or around 288,000 per year," Jim says.

"In the last few months we've had another nine retailers come on board, taking our total in Tasmania to 25, which represents a significant win for the environment."

Tyres previously going to landfill or stockpiled are now being processed through a purpose-built plant near Hobart.

From there, the tyres are transported to Tyrecycle's state-of-the art recycling plant in Melbourne, where they are re-purposed for such uses as replacing fossil fuels as an alternate source of energy.

"The majority of used passenger and truck tyres are converted into tyre-derived fuel (TDF), with around 145,000 tonnes exported out of Australia every year.

"The extremely high calorific value of TDF makes it an attractive alternative fuel on an international scale."

A recent report by the Australian Tyre Recyclers Association (ATRA) identified that end-of-life tyre by-product produces significantly lower

volumes of carbon dioxide (CO_2) than coal. The report stated that replacing one tonne of black coal with one tonne of TDF can save emissions of up to 1.05 tonnes of CO_2 into the atmosphere.

Jim explains that TDF addresses the challenging waste problem many industries face as well as providing a cheaper rate than coal.

He adds that recycled tyres are also used for building insulation, road surfacing, brake pads, playgrounds, athletic tracks and other rubber surfaces.

He says that key to the organisation's success is a strict auditing process and "chain of custody" guarantee, which allows the organisation to track the waste product and ensures it reaches the intended destination.

"We're committed to responsibly managing end-of-life tyres across our national network, with a focus on delivering an industry-led zero waste to landfill solution for waste tyres across the country.

"To that end, we're heartened by the take-up in Tasmania which, unlike most other Australian states and territories, it yet to introduce state-led regulations on stockpile limits and landfill levies. Without those disincentives, it's incumbent on customers to ask retailers whether their old tyres are going to landfill or being recycled and support those doing the right thing."

Tyres are being re-purposed into fuels.

Tyrecycle receives 13.5 million tyres annually or about 25 per cent of the 500,000 tyres replaced in Australia each year.

The company notes the majority of these are processed within 24 hours of reaching one of its facilities.

Other members of the ATRA collect and process a further 15 per cent of the waste tyres generated annually in Australia.

The remainder are generally stockpiled or exported as whole-baled tyres, potentially causing biosecurity and environmental risks for receiving countries, while end-of-life mine tyres and conveyor belts are almost universally buried onsite.

With a national network of collection and processing capabilities, the company continues to be a market leader of tyre recycling, including Australia's largest crumbing plant based at Somerton in Melbourne.

Tyrecycle operates five secure processing facilities, 12 specialised rubber shredders, five granulators, and three large scale mills and says it is the only company in the industry to have a processing plant in each state of Australia.


Tyrecycle receives 13.5 million tyres annually.

Six steps to reducing waste

APPLYING A FEW SIMPLE STRATEGIES CAN ALLOW RECYCLERS TO SIGNIFICANTLY REDUCE THEIR WASTE ON SITE, SAYS PAUL SMITH, PRODUCT DEVELOPMENT MANAGER FOR KPI-JCI AND ASTEC MOBILE SCREENS.

Glass, asphalt and concrete can be recycled back into materials suitable for infrastructure building and road projects. But recycling also comes with added waste, which is why equipment supplier Astec Australia has developed a strategy to identify and eliminate this on site.

Paul Smith, Product Development Manager for KPI-JCI and Astec Mobile Screens, believes that applying lean principles can eliminate waste during aggregate processing operations.

He says that this involves a systematic and top-down approach. While this approach does not add value to a business, it can go a long way to reducing waste during recycling.

"As an example of non-value added activities to eliminate waste, let's envision the process of scraping barnacles off the bottom of a cruise ship. While a critical task, the cost associated with this activity adds no value to the ticketed customer who bought a state room on the cruise ship and is sailing his family to Bora Bora," Paul says.

"Chances are, your aggregate processing facility has pockets of barnacles within it as well. In fact, research indicates that 95 percent of all operating costs/activity are non-value added."

Paul says a few examples of non-value added activities include maintaining attachments, dust suppression, drilling and basting, crusher liners

Non-value added activities could help reduce waste for businesses.

and consumables, screening media, electricity and energy consumption and more.

"While all of these tasks are extremely critical, they really do not add any value to the end user or the customer of your products and services," Paul adds.

What can businesses do to reduce their waste?

Appoint a value stream team

Paul says identifying employees from various aspects of the organisation can help to develop quick and easy ideas as opposed to groundbreaking solutions. These can include all areas of the recycling team, including production, management, accounting, safety or other non-production areas of the company.

"The idea is to find cross-functional associates who have fresh ideas that are willing to work without bias or pre-disposed ideas. The mindset should be about continuous improvement."

Apply the five S's

Once the team has selected its first workstation, Paul recommends they sort, straighten, standardise, shine and sustain the workstation.

Identify and analyse the system

Paul says businesses need to identify individual components of their systems and how they function together.

"Recognise that each component may work at a different rate, and ensure optimum production is achieved by analysing the system holistically. For example, what is the role, capacity and performance of the secondary crusher as it applies to the entire circuit? How is it performing? Where are the issues? How much is it costing to operate? Is it a bottleneck? If the five S process was thoroughly performed in step two, it should help identify the above."

Team members from other departments could provide a fresh approach.

Identify a focus area

Paul says the status of the five S system and identification of bottlenecks should help provide good indicators of where to find opportunities to rapidly improve a specific area of the system. Some common opportunities include crusher configurations, screen configuration, waste water, conveyor flashing, transfer chutes and liners, safety and inspection reports and calibration, controls and connections.

Count and reduce the number of pieces

Paul explains that during the past 15 years, stationary plants grew to support unprecedented growth in residential and commercial construction.
As a result of the global financial crisis, many plants became underutilised with excess processing equipment needed to fulfill their core material demand.

"This might create an opportunity to reduce waste by decommissioning unnecessary equipment from the plant. Ask yourself, do you really need that chip screen, coarse material washer and additional material handling equipment that was installed for the runway project more than a decade ago?"

Accelerate flow

Accelerating flow is one of the main objectives to creating a lean operation due to the many benefits it provides, Paul says. These benefits range from improved lead time to delivery, better quality, higher production capacity, reduced work in progress inventory, less wasted motion, fewer interruptions, greater space utilisation and more.

"Ultimately, what we are really talking about here is identifying and relieving production bottlenecks. This systematic approach may sound complicated, but all it really takes is a group of people who are dedicated to making small, incremental changes on a daily basis in pursuit of a better workplace.

"While we all dream of making the large groundbreaking change that makes everything better overnight, we have found that dozens of small, quick and easy ideas tend have a viral effect on an organisation and provide even greater rewards over time through a stronger culture, improved safety and increased profits."

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- Astec AMS Prosizer Track Mounted RAP Plant

Clearing the air

TOXFREE IS THE ONLY COMPANY IN AUSTRALIA OPERATING INTERNATIONALLY RECOGNISED TECHNOLOGY TO SAFELY HANDLE NEXT GENERATION E-WASTE CONTAINING MERCURY, THE COMPANY SAYS. THE WASTE SERVICE PROVIDER EXPLAINS THE KEY TO ITS SUCCESS.

As one of Australia's leading waste service providers, Toxfree continues to invest in state-of-the-art technologies to recycle waste in an environmentally responsible and safe manner.

One growing area of waste the company is active in is e-waste. Toxfree says it is the only company operating in Australia internationally recognised to safely handle next generation e-waste containing mercury, including LCD TVs, monitors, laptops, phones and other LCD display technologies.

But it's just one of many services covered by the organisation, as it continues to provide services ranging from general waste and recycling, technical and environmental services, solid waste management, healthcare waste solutions, plastic and gas industrial front lift bins, chemical spill management and more.

According to 2013 data by the Australian Bureau of Statistics, Australians are among the highest users of technology, and e-waste is one of the fastest growing types of waste.

Toxfree says all e-waste is destroyed in Australia by the company as it ensures no whole items are taken offshore for recycling.

"We pride ourselves on destroying all physical data. Old generation e-waste such as CRT Monitors, as well as large items are recycled through our semi-automated recycling system, which incorporates a combination of crushing, density separation and x-sorting technologies to separate the e-waste into its major recycling components," Toxfree says.

"Next generation e-waste is increasingly becoming a challenge of the modern age. These items contain mercury and when traditional recycling practices such as manual dismantling are applied it can lead to dangerous exposures of mercury to employees and the environment due to the fragile nature of components."

To solve this problem, in 2015, Toxfree purchased the internationally recognised BluBox plant. Toxfree says

Toxfree says it ensures no e-waste items are taken offshore for recycling.

BluBox's technology eliminates the risk of exposure by breaking down the material under negative pressure, as well as extracting mercury vapour and mercury fluorescent dust.

"An optical sorter separates the BluBox outputs into its major recycling components. The BluBox is the only shredding process in Australia that recovers fluorescent dust as required by AS5377 standards. The BluBox also handles other types of domestic e-waste such as hair dryers, irons and coffee machines."

The successful strategy has allowed Toxfree to achieve an average recovery rate of greater than 90 per cent. The company overall says it's important to ensure environmental outcomes are met, while also focusing on recovery, recycling and responsible treatment or disposal that meets both their clients business objectives and the challenges of increasingly stringent legislation.

"To help clients achieve these aims, we've recently developed Wastefree, which provides a web-based tracking and resource management system. The system tracks the entire process from waste collection to the arrival and management at Toxfree treatment and disposal facilities."

Toxfree says this assists organisations in the timely reporting of waste management services, which allows them to report environmental objectives to their respective boards and stakeholders.

Did you know...

Established and listed on the Australian Securities Exchange (ASX) in 2000, Toxfree has experienced substantial growth during this time, achieved through acquisitions, new green-field developments and the organic growth of their existing businesses. Back in 2000, Toxfree employed 20 people, and operated from two locations in Kwinana and Port Hedland. Today, the organisation employs more than 1600 people and provides national services from over 85 locations across the country. The company says its ideals of safety, reliability and sustainability guides them in delivering a tailor-made solution. With more than 85 facilities nationwide, Toxfree regards itself as a leader in waste recovery and industrial services.

Lighting recycling made easy

AS AUSTRALIA'S LARGEST AND ONLY MERCURY RECYCLER, CMA ECOCYCLE WORKS WITH CLIENTS TO REDUCE HAZARDOUS LIGHTING WASTE GOING TO LANDFILL.

Lighting makes up a significant amount of Australia's waste, but many people are unaware of where it ends up after disposal.

Waste fluorescent lighting contains mercury and is therefore considered hazardous waste. As a result, it must be kept out of general waste and disposed of safely.

The safest way to dispose of mercury is to send it for recycling and one company appears to be leading the charge in this area.

CMA Ecocycle says it is the only Australian organisation fully licensed by the Environmental Protection Agencies when it comes to handling the entire process of recycling mercury containing waste. It adds that it is the largest and only mercury recycler in Australia.

The company doesn't just focus on recovering mercury from lighting waste but also ensures glass, aluminium, other metals from lighting ballasts, troffers and fittings are also recycled into new products, reducing the nation's overall lighting waste.

The company estimates that millions of lamps are discarded each year, and if not recycled correctly make up the largest source of mercury going to Australian landfill.

Many types of lighting can be recycled, including fluorescent tubes, compact fluorescent lamps and sodium vapour and high-intensity discharge (HID) lamps – each of which contain toxic mercury metal.

CMA Ecocycle General Manager Nick Dodd explains the process of lamp recycling begins with separating and isolating the components of waste fluorescent tubes and HID lamps.

"A state-of-the-art lighting waste processing plant separates the components extracting the aluminium and other metals, plastics, glass and phosphor powder. The phosphor powder is then fed into a mercury distiller which safely recovers the mercury. All the other material streams are then recycled into other products."

As a major end of life recycling company, CMA Ecocycle has focused its efforts on educating the community so that wherever possible, no lighting is landfilled.

Key to its success is simplifying the logistics and Nick says this allows Australia to become a leader in diverting lighting waste from landfill.

"When it comes to lighting recycling, Australia is well placed to meet the challenge," Nick says.

"We recognise that every business is unique, which is why we work to tailor a solution to meet each businesses' individual needs. Our lighting waste specialists can work closely with clients to develop the best lamp disposal and recycling solution for their business."

For small quantities of lighting waste, Nick says CMA Ecocycle offers pre-paid collection boxes.

"We have boxes for fluorescent tubes, as well as cartons for globes and lamps such as compact fluorescent lamps, which are common forms of lighting found in just about all types of buildings," he says.

"For organisations producing larger amounts of lighting waste we can provide on-site wheelie bins or large stillages – the sky is the limit. We also offer general collection services where tubes and fittings might be loose."

waste
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AUSTRALIA'S SPECIALIST WASTE MANAGEMENT MAGAZINE

Australian recycling program inspires international schemes

A PRODUCT STEWARDSHIP PROGRAM IN AUSTRALIA HAS PREVENTED HUNDREDS OF TONNES OF POLYVINYL CHLORIDE PLASTICS FROM GOING TO LANDFILL. SOPHI MACMILLAN, OF THE VINYL COUNCIL OF AUSTRALIA, EXPLAINS HOW IT GAINED TRACTION.

In 2009, the Vinyl Council of Australia commenced a pilot program into a unique hospital recycling initiative.

The council had a clear goal in mind – to reduce quality polyvinyl chloride plastics (PVC) going to landfill.

Now almost 10 years down the track, the PVC Recycling in Hospitals program has become an international success, operating in more than 90 hospitals and healthcare facilities across Australia and New Zealand.

The product stewardship program has been such a hit that it inspired similar initiatives in the United Kingdom and South Africa with several hospitals adopting the program.

The council has also received enquiries about its program from Canada, the US, Malaysia, Brazil and Turkey, and continues to give presentations at international conferences about the program.

Sophi MacMillan, CEO of the Vinyl Council of Australia, believes that about 50 million IV bags are used annually in Australia alone.

Together with oxygen face masks and tubing, at least 2500 tonnes of locally recyclable material are available for collection and reprocessing.

She says feasibility studies were conducted over two years with Melbourne's Western Health, before launching it to other healthcare facilities across Australia.

The program operates in more than 90 hospitals in Australia and New Zealand.

This revealed which areas of the hospitals the program worked best in, who needed to be consulted, engaged and trained and the process of collecting and moving the material to Australian recyclers.

"This program is unusual as it is a specific material that we are collecting, not cardboard or commingled materials. The collectors are under contract to collect the vinyl and deliver it to a specific destination," Sophi says.

"We have grown gradually through word of mouth. It's been quite organic where those nurses and staff who are keen to recycle contact us to participate in the program."

Sophi says that after engaging with hospital staff, the council helps them determine the number of bins, as well as the frequency of collection and cost of the recycling program, which depends upon size and location.

One of the partners, Baxter Healthcare, assists hospitals in its network through this process.

Once hospital management approves participation in the program, the local collector delivers the bins and stickers.

The plastics are shredded, granulated and sold to manufacturers.

"Through the support of our partners we aim for the program to be cost-neutral to healthcare facilities.

"It is cost-effective for them to participate in the PVC recycling program rather than send the material to landfill."

Aces Medical Waste collects the materials from Victoria, while State Waste Services collects in NSW, Baxter in Queensland, Stateline in Tasmania, SUEZ in WA and Veolia in SA.

Sophi says the program can collect from most metropolitan hospitals in Australia.

"In NZ the material is collected by Baxter and delivered to Matta Products in Auckland. In Australia, all the material is consolidated and delivered to Welvic in Victoria, where it is shredded, washed and granulated.

"The separation wash yields clean, high quality PVC and Welvic then reprocess that into granulate or compound pellets and sell it onto manufacturers to use in place of virgin materials.

"From there, the plastics go on to make safety mats, garden hoses and industrial hoses."

One of the benefits of this recyclate is that colour can be added to it, Sophi says, offering a wider range of potential end uses as volumes grow.

Sophi explains that Welvic has processed up to 100 tonnes of PVC plastics in 2016 and looks forward to considerable expansion in the coming years.

She notes that a bulk of waste in hospitals poses challenges for both hospitals and recyclers.

"A lot of time was spent in the initial phase working out what could be handled at the hospital and what could be handled by the reprocessor and we identified those three items – IV bags, oxygen masks and tubing – during that pilot testing phase.

"These are readily identifiable PVC items at the hospitals and reprocessors can relatively easily and cost effectively handle the materials."

Sophi explains that the process successfully enables a circular economy in Australia, where quality materials are captured for re-use.

"The significance of this project is unlike many other product stewardship schemes. The material is used in Australia, reprocessed and made into new product in Australia.

"There is no recycling if there's no end-market. So if we didn't have a manufacturer to receive the material, all we would be doing is buying it in, using it and either sending it to landfill or offshore.

"With that system ultimately you end up killing off your own manufacturing and recycling base, so it's important we maintain our recycling capability and viability, by establishing local systems with scale."


The program has seen strong support from numerous healthcare facilities.

Binning the old landfill approach

MANAGING A LANDFILL PAST ITS EXPECTED LIFESPAN CAN RESULT IN SOME UNEXPECTED COSTS. ERIC MEAD, OF HDR INC, EXPLAINS HOW COUNCILS AND PRIVATE SECTOR COMPANIES CAN BETTER PLAN FOR THE FUTURE.

An MSE wall at the Live Oak Landfill in Atlanta.

In response to increased environmental regulations, landfill operators have had to change the way they do business.

The changes align with new restrictions placed on councils and private sector operators in managing their landfill after its expected lifespan in a bid to reduce emissions.

The state of New South Wales is one example of where the regulations have been enforced by the Environmental Protection Authority (EPA).

According to the New South Wales EPA's *Environment Guidelines: Solid waste landfills 2016* document, when sufficient evidence can be provided that a landfill is stable and non-polluting, an occupier may seek to complete all obligations and retrieve any financial obligations.

This can arise after submitting a certified statement of completion to the EPA certifying that further environmental management of the premises is not required – which cannot be reached until 30 years after the site stops receiving waste.

US-based HDR INC senior waste engineer Eric Mead believes that meeting the new demands require foresight from landfill owners and operators, as well as the ability to carefully manage their most precious resource – airspace.

Landfill airspace can be defined as the volume of space on a landfill site that allows for the disposal of municipal solid waste.

"A landfill's 30-year post closure care costs can easily run into the millions of dollars," Eric says.

"Airspace represents the essential source of revenue for the landfill from which the operator covers all of their obligations, so developing, using and caring for it is of utmost importance."

With the modern landfill in mind, Eric developed a strategy to increase efficiencies for councils and private sector landfill operators.

Over the past two years, the consultancy firm has launched an Australian office to investigate new services for the local waste management market.

Since then, Eric developed the MOM strategy, which stands for; maximising a landfills permitted airspace, optimising day-to-day operations and minimising expenditure and generating revenue.

At the 7th Australian Landfill and Transfers Conference in Sydney, Eric presented his new strategy, outlining various products and services which could facilitate the MOM strategy.

Eric says that due to stricter environmental regulations over recent years, there is now a range of costs associated with managing a landfill, including increased post-closure care responsibilities.

"In the US, we've closed sites about 20 or 30 years ago due to the implementation of more stringent

Eric says the waffle top design at Sarasota County, Florida is an example of maximising permitted airspace.

landfill regulations and these sites are now coming up on a 30-year post closure care mark, when in theory you're supposed to be able to turn the keys and say 'I'm done'," Eric says.

"I don't think many people are going to be able to do that, so you're almost faced with perpetual care of these sites.

"If you were an efficient operator you may have planned for 30 years of post-closure care because that is what the regulations require. And now as you near the 30-year mark, the environmental authority is saying that the landfill is not stable enough to exit post-closure care."

Eric believes that councils and private sector operators will need to prolong the life of their active landfill, reduce costs and generate post-closure revenue to accommodate for increased landfill obligations including extended care after closure.

He says one way to maximise a landfill's permitted airspace is through the implementation of mechanically stabilised earth (MSE) walls.

This involves constructing a retaining wall around the outside/perimeter of a landfill using soil through artificial reinforcing to increase the airspace of a landfill and reduce pollution.

The use of a MSE wall can add around 50 per cent more airspace over a similar conventional landfill footprint, Eric believes.

However, he adds that the value of the additional airspace would need to be balanced against the cost of constructing the wall.

"If you can apply it across the whole site, you can pick up a lot of extra capacity. We've instituted several across the US states of Georgia and Pennsylvania.

"By taking actions to improve your density, the pace of the movement of your garbage slows down. So you're using less cover dirt, there are fewer haul roads to construct, so your costs go down."

To optimise day-to-day operations, Eric suggests the use of intelligent compaction and drones to regularly measure a landfill's compaction efforts.

One such intelligent compaction method is Caterpillar's Computer Aided Earthmoving System, which can also be used to identify site specific storage areas for materials that require special handling, such as asbestos containing waste.

"Unmanned aerial vehicles or drones are advancing and improving landfill operations. Drones can offer a fast and cost effective way of surveying, assist in bird control measures and help complete closed landfill inspections," Eric says.

Today's landfills can generate additional revenue through the use of solar panels, while costs can be reduced through alternative capping systems, he adds.

He says he sees tremendous potential for landfill solar panels to enter the Australian market, similar to those which have been used at a landfill in the US, powering up to 225 homes in the state of Georgia and resulting in increased revenue for the operator.

"Operators can put a geomembrane on the outside slope of the landfill which can serve as your final capping system and a base for solar panels.

"The solar panels are really thin

laminates that you stick onto the geomembrane and tie together through electric cabling and send the direct current voltage through an inverter and put into the power grid. So you end up selling your power to customers.

"Some of these systems can be pretty sizeable and serve the equivalent of hundreds of homes."

Eric says HDR INC has already commenced investigations for several landfills in Australia.

He adds that he remains confident HDR INC solar landfill programs will receive EPA approval.

Alternative capping systems such as artificial turf also have potential to reduce costs, Eric believes, greatly reducing post-closure care maintenance.

"Artificial turf products can be placed on top of the geomembrane product instead of the traditionally used soil and grass products.

"So you end up in a situation where your maintenance costs such as mowing grass and repairing eroded areas are reduced and in some cases you may receive additional airspace, allowing you to fill your landfill with more garbage.

"Some of the major sponsors of geosynthetics in Australia are aware of the product and would be well suited to try to bring this to Australia."

Hickory Ridge Landfill has applied a solar cover which has minimised costs and provided post closure care revenue.

A wasted opportunity?

PROFESSOR **GRACIELA METTERNICHT** OF THE UNIVERSITY OF NEW SOUTH WALES ARGUES AN OPPORTUNITY EXISTS TO SET A NATIONAL STANDARD FOR PROPER DISPOSAL AND RECYCLING OF E-WASTE.

With the proliferation of digital technologies, the recycling of e-waste continues to pose challenges.

A report by Clean Up Australia in 2015 found that 88 per cent of the four million computers and three million TVs bought in Australia every year will end up in landfill. It also showed that fewer than one per cent of TVs and around 10 per cent of PCs and laptops used in Australia are recycled nationwide. Electronic waste is responsible for 70 per cent of the toxic chemicals, including lead, cadmium and mercury found in landfill, the figures noted.

Professor Graciela Metternicht, of the School of Biological Earth and Environmental Sciences at the University of New South Wales, supervised research in 2016 that found Australia lags behind other nations such as Japan and Switzerland in e-waste management.

Graciela's team found that both Switzerland and Japan have multiple levels of independent controls to ensure recycling companies have high environmental and quality standards as well as auditing companies that refuse to comply with recycling standards.

She says that in order to begin to rectify the problem, the Federal Government needs to boost its targets sooner in its Product Stewardship (Televisions and Computers) Regulations 2011, as well as increasing the scope of products featured in the Product Stewardship Act 2011, currently under review. While waste management standards are determined by local and state governments, Graciela believes stronger product stewardship schemes are needed to set a national standard for recycling in Australia.

Furthermore, tighter recycling laws are necessary to cover the full scope of e-waste, alongside stricter auditing and compliance measures and increased funding for local government in the collection, recycling and recovery of e-waste.

"If councils had more power to enforce some of the targets then that would open up new avenues for e-waste technologies. For instance, the SMaRT Centre at UNSW is developing a prototype portable micro-factory, roughly the size of a shipping container. If successful, this kind of technology could be deployed

Photos by Graciela Metternicht

at collection sites in suburbs to recycle e-waste and recover valuable metals. Such portable micro-factories could be distributed among councils, eliminating the need for long distance transportation of e-waste. Most recycling could be done within the council's facilities or closer to the areas where the waste is generated," Graciela explains.

She says that councils could work with businesses to create financially viable e-waste recycling and recovery opportunities.

She argues the scheme targets set by the Product Stewardship (Televisions and Computers) Regulations 2011 do not accurately reflect the growing influx of e-waste. The scheme target takes an estimate of the total television, computer and computer product waste expected to enter the waste stream in that year and sets a target for the overall amount of e-waste to be recycled that year. In 2015-16, the scheme target was 50 per cent, while it rises incrementally to 80 per cent in 2026-27. The scheme supplements state, territory and local government e-waste management by providing Australian householders and small business with access to industry-funded collection and recycling services for television and computers.

"We are talking about a period of 10 years. With the level of turnaround of technology, we will be swamped by e-waste in 10 years' time," Graciela says.

> "With the level of turnaround of technology, we will be swamped by e-waste in 10 years' time."
>
> Graciela Metternicht, **University of New South Wales**

She points to South Australia as a shining example of e-waste management. The South Australian Government is the first and only state which has implemented a ban on sending televisions and computers to landfills. Statutory authority Green Industries SA works with councils to support free e-waste drop-off events and aid electronic waste recycling by providing grants for infrastructure. Victoria is currently preparing a new waste management policy that describes how it must be managed in the state.

"From a national perspective we need a more synergistic approach towards state-based cooperation to deal with this issue. If I go to the basic definitions of the National Television and Computer Recycling Scheme, it includes smartphones and laptops but everything that is battery operated, or you can plug in, covers electronics. What about air conditioners or irons? So the legislation needs to widen its scope to improve recycling education and encourage businesses to do the right thing."

Graciela adds that product stewardship is stronger in Japan and Switzerland.

"In Switzerland, when you buy a product, you pay what is effectively a tax on recycling. From a national perspective, you can have mechanisms for auditing private enterprise's disposal of e-waste to ensure it is done accordingly to what the legislation mandates, preventing illegal shipping or dumping it into a landfill."

Shipping illegally threatens to undermine Australia's obligations under the Basel Convention, which prevents the unauthorised international shipping of hazardous waste.

"Many of the materials being used for electronics equipment are rare materials, so they are significant. Many of these metals are therefore finite resources and there are only a handful of these around. There are many cases in Africa where conflicts arise because the materials are scarce and some countries try to take advantage. There are not just environmental and health-related consequences, but also economic consequences for improper disposal. A million mobile phones contain an estimated 15-16 tonnes of copper, 340-350 kilograms of silver and 24-34 kilograms of gold. Wasted opportunities!"

Researchers say e-waste legislation needs updating.

In each edition, we feature a selection of the latest products or updated models to be launched to waste management businesses.

CAT 836K LANDFILL COMPACTOR

The new 562 gross horsepower (419 kW) Cat® 836K landfill compactor delivers on more than 20 years of durable reliability and ease of service by ensuring the operator's health, productivity and safety are all standard features.

The 836K advances the solid engineering of its predecessors with new wheel and tip configurations and enhanced safety and serviceability. The 836K comes equipped with one of three new wheel and tip configurations available to meet the operator's desired application.

A standard rear-view camera enhances overall visibility for the operator while a new instrument pod features membrane switch panels and automatic temperature control – improving operator comfort. Interior and bystander sound levels are reduced, with optional sound-suppression packages available.

To protect key components and systems from damage, the 836K uses specialised guarding, including hydraulically actuated engine and power-train shields and front-frame guards to prevent trash build-up inside the frame. Axle-seal guarding stops material from binding around the axles.

The 836K's Auto-Blade feature automatically raises the blade when the machine reverses and lowers the blade to a pre-set height when it moves forward. The STIC™ steering controller uses a single lever for steering and transmission control, allowing the operator to sit comfortably back in the seat, reducing fatigue.

For optimum efficiency, the 836K can be fitted with the Cat Compaction Technology. Using a Global Navigation Satellite System and digital terrain files, the system delivers real-time information via an in-cab display to assist the operator in determining the appropriate number of passes for the level of compaction required.

www.cat.com/en_AU

COMPOST REVOLUTION

Food waste accounts for nearly half of average household waste and keeping this out of landfill can significantly reduce costs.

It is for these reasons that Compost Revolution has spent the past five years engaging more than 18,000 households across Australia to help scale organics recovery for councils. During this time, they say they've also managed to divert more than 4000 tonnes of food waste from landfill while saving councils more than $1 million in landfill costs.

Designed with councils for councils, the Compost Revolution is an all-in-one education, infrastructure logistics and marketing program to scale home composting and worm farming in local government areas across Australia, helping councils achieve their waste and emissions targets while cutting costs.

Compost Revolution works with local government to tailor-make a program suited to their area. The organisation provides councils with real-time quantitative data, resident behavioural information and integrated social media platforms, allowing them to increase public education around composting. Real-time quantitative data uses industry-tested methodology to calculate the total kilograms of waste from landfills, carbon dioxide-equivalent greenhouse gas emissions avoided, waste collection cost savings and the total number of households engaged.

The organisation's online educational platform and home deliver service allows councils to run their own Compost Revolution. Residents can complete a quick online tutorial and quiz to learn about composting, worm farming or bokashi bins, then order and pay for their kit through an integrated e-commerce platform.

www.compostrevolution.com.au

SENNEBOGEN 818 E-SERIES

The Sennebogen 818 E-series builds on more than 60 years of experience in the design and construction of purpose-built materials handling machines.

To maximise performance, the 818 E-series has improved fuel efficiency, operating comfort, maintenance and service and a range of other areas.

The diesel engine features an automatic idle reduction, shut down and performance optimisation aimed at reducing fuel consumption. Eco Mode intends to increase fuel savings by up to 20 per cent during operation.

The operating comfort of the 818 E-series has been improved through a hydraulically elevated cabin, offering an operator eye level of approximately 5600mm. Meanwhile joystick steering control offers maximum visibility and a clutter-free cabin. The safety of the materials handler has been bolstered through a sliding door for cabin entry, an emergency cabin lowering function accessible at both ground level and inside the cabin and two 115° cameras to the right and rear of the machine.

Maintenance and service has also been maximised through all daily service checks easily accessed from ground level on the machine, a straight forward and clearly labelled electrical system and a low percentage of proprietary parts.

Sennebogen National Business Development Manager Neil Adlam says the 818 E-series offers an uncompromised high performance in all critical areas of material handling excellence.

"The total Sennebogen package is supported locally by the dedicated team at Pacific Materials Handling, with national branches and local technicians to support any requirements."

www.sennebogen-na.com

Active in the waste space

JOSH FRYDENBERG, FEDERAL GOVERNMENT MINISTER FOR THE ENVIRONMENT AND ENERGY, TALKS ABOUT THE GOVERNMENT'S CHANGES TO THE WASTE AND PRODUCT STEWARDSHIP LEGISLATION.

Growing populations and increasing consumption means that managing waste in today's world presents some challenges.

As the complexities around waste management grow, there are significant opportunities to develop and deploy new technologies, manage waste as a resource and better integrate waste management in supply chains.

As the Australian Government's Minister for the Environment and Energy, I am committed not only to reducing the impact of hazardous waste on the environment, but supporting those who are working to improve the social and economic outcomes of all wastes.

This includes supporting approaches that consider how we design, manufacture, dispose of and recycle products and reuse their materials so they don't end up in landfill.

I am also deeply committed to supporting your industry where possible by removing regulation that makes it difficult to put into practice new innovations and increases the costs of doing business.

Making the most of the nation's food waste

I recently met with industry, academia and the not-for-profit sector representatives to discuss the Turnbull Government's commitment to develop a National Food Waste Strategy to reduce Australia's food waste by 50 per cent by 2030.

This meeting was an important precursor to the National Food Waste Summit to be held in November.

The cost of food waste to the economy is around $20 billion each year, which is one reason the Government is committed to addressing this problem.

In the commercial and industrial sector, around three million tonnes is wasted costing $10.5 billion in waste disposal charges and lost product, while food rescue organisations and community groups turn away more than 43,000 people seeking assistance every month.

There are substantial opportunities to rethink how we can prevent food waste or use lost or wasted food for other purposes.

The aim of the National Food Waste Strategy is not to impede important work already happening on this issue, but to encourage all those engaged in this space to undertake meaningful action.

Reducing the burden of hazardous waste

In February, the Australian Government passed two bills in Parliament to reduce the burden of managing hazardous waste.

The Hazardous Waste (Regulation of Exports and Imports) Amendment Bill 2016 and Hazardous Waste (Regulation of Exports and Imports) Levy Bill 2016 will allow the Government to better administer the legislation while maintaining the Act's high standards on human health and environmental protection.

The reforms are an important step to modernising Australia's hazardous waste legislation. They remove unnecessary permit processes which will reduce delays and costs for both business and government.

The introduction of cost recovery will also see a levy applied to applications. This will ensure those who use the permit scheme pay for its administration, reducing the burden on the Australian public. The legislation was introduced this year to provide industry with time to transition to the new cost recovery

The Government is reviewing the Product Stewardship Act 2011.

arrangements by 1 July 2017. This will allow us to better fulfil our obligations as a party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes.

These sensible reforms will cut the regulatory burden on industry while ensuring Australia will continue to fulfil its duty to protect people and the environment from the risks associated with hazardous waste.

Reviewing the Act that is changing the way we think about waste

In March, I announced the Government's intention to review the Product Stewardship Act 2011.

This important piece of legislation is all about supporting those who are best placed to reduce the environmental and health impacts of products, whether they are manufacturers, importers, distributers or users.

Input from industry, governments and the public will be essential to ensure the Act delivers the best outcomes for business and the environment. We have some good examples to test the Act's performance. The highly successful National Television and Computer Recycling Scheme has recycled more than 184,000 tonnes of electronic waste since 2012, supporting investment and increased employment in the e-waste recycling sector. Also accredited under the Act is MobileMuster, a world-leading, industry-led mobile phone recycling program.

The Act also establishes the Minister's Product List, which has catalysed the establishment of successful schemes dealing with waste tyres and paint, and is now supporting work on emerging waste streams such as lithium batteries and photovoltaic systems.

From focusing on the lifecycle of a product to the management of hazardous substances, the work being undertaken by the Australian Government in waste management is, at its heart, focused on providing a safer, cleaner future for the Australian public.

VICTORIAN WASTE MANAGEMENT ASSOCIATION SEMINAR 2017

20 JUNE

Healesville, VIC

The association will join leaders from waste, sustainability, government and industrial relations for this year's seminar. The event features local government viewpoints and Victoria's waste and recovery priorities.

www.vwma.com.au

ENVIRO'17 CONVENTION

23-24 AUGUST

Melbourne, VIC

ENVIRO'17 is set to challenge thinking around what is waste in Australia, how we reduce its generation and how we see it as the resource it is. The current linear make-take-waste approach is no longer viable. ENVIRO'17 will provide an opportunity to not only hear about the principles of the circular economy, but learn from successful local and international early adaptors as well as view innovation and technologies.

www.wmaa.asn.au

AUSTRALASIAN WASTE & RECYCLING EXPO (AWRE)

23-24 AUGUST

Melbourne, VIC

This commercial event is dedicated to the waste and recycling space, bringing together the industry to discover the latest trends. AWRE attracts exhibitors and industry professionals from across Australia, New Zealand, the United Kingdom and North America.

www.awre.com.au

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

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

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

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

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

AUSTRALIA'S SPECIALIST WASTE MANAGEMENT MAGAZINE

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Did you know that composting can actually save you money?
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