PROUDLY SUPPORTED BY

WASTE + WATER MANAGEMENT AUSTRALIA

NOVEMBER 2019

V46.3

ADELAIDE'S WESTERN COUNCILS JOIN FORCES IN THE WAR ON WASTE

ENVIRONMENT
SUSTAINABILITY
PUBLIC HEALTH
SINCE 1973

PRINT POST APPROVED - 100001890

INNOVATION
NOT IMITATION

INNOVATION

Garwood International has been at the forefront of specialised waste collection & compaction equipment design and manufacture for over 42 years, providing high quality, innovative equipment solutions to meet the needs of even the most challenging operating environments.

- **Rear, Side & Front Loading compaction units**
- **Single and split-body collection vehicles from 4m² to 33.5m²**
- **VWS Enviroweigh bin weighing equipment for refuse vehicles**

Never afraid to 'think outside the square', Garwood International has built its reputation on innovation - with ground-breaking designs and smart solutions that can change the way you think about your collection services.

AVAILABLE EXCLUSIVELY FROM: Garwood International **www.garwoodinternational.com.au**

NSW, ACT & WA
Tony Miller 0429 444 451
tony@garwoodinternational.com.au

VIC, TAS & SA
Ian Pinney 0409 905 451
ian@garwoodinternational.com.au

QLD & NT
Gavin Kirk 0407 789 370
gavin@garwoodinternational.com.au

NEW ZEALAND
Reece McCrystal 0413 751 292
reece@garwoodinternational.com.au

contents

November 2019
Volume 46 Number 3

Published by:
Editorial and Publishing Consultants Pty Ltd
ABN 85 007 693 138
PO Box 510, Broadford
Victoria 3658 Australia
Phone: 1300 EPCGROUP (1300 372 476)
Int'l: +61 3 5784 3438 **Fax:** +61 3 5784 2210
www.epcgroup.com

Publisher and Managing Editor
Anthony T Schmidt
Phone: 1300 EPCGROUP (1300 372 476)
Mobile: 0414 788 900
Email: ats@epcgroup.com

Business Development Manager
Lawrence Whiter
Mobile: 0418 543 821
Email: lawrencewhiter@bigpond.com

National Advertising Sales Manager
Yuri Mamistvalov
Phone: 1300 EPCGROUP (1300 372 476)
Mobile: 0419 339 865
Email: yuri@epcgroup.com

Advertising Sales - SA
Jodie Gaffney - AmAgo
Mobile: 0439 749 993
Email: jodie@amago.com.au

Advertising Sales - WA
Licia Salomone - OKeeffe Media
Mobile: 0412 080 600
Email: licia@okm.com.au

Graphic Design
Annette Epifanidis
Mobile: 0416 087 412

Registered by Australia Post
Publication No. 100001890
ISSN 1838-7098

2


15


26


42

About the Cover

In keeping with their focus on maximising recycling, minimising waste, and growing the circular economy, the Cities of Charles Sturt and Port Adelaide Enfield in suburban Adelaide will establish and operate their own Local Government-owned Materials Recovery Facility (MRF) to process kerbside recyclables from across their municipalities.

▶ Turn to **Page 10** for the full story.

Talk is Cheap...
Action, Not So Much

Dear Readers,

With the ever-increasing number of disruptive activities being carried out by protest groups both nationally and internationally - including the recent week of highly disruptive 'actions' in our major capital cities – it seems that all that has been achieved is a massive polarisation of the populous.

Importantly, but perhaps not surprisingly, it seems this polarisation doesn't run along the lines of whether or not we need to do more to save the environment. I have always maintained - and still believe - that the greater majority of Australians are happy to support environmental initiatives, and thankfully, that still appears to be the case. Rather, the division runs along the lines of whether or not people should be able to go about their daily business without being disrupted or delayed.

In short, it appears that despite the publicity, disruptions and 'self-reported' success of these actions, what has actually been achieved could at best be described as a 'zero net gain' for the environment, and in all reality, a massive step backwards in support by the general populous. And then there's the enormous additional environmental impact and financial cost of these actions.

Incidentally, as those of you who are regular, long-time readers of WWM magazine would no doubt be aware, while I have a tendency to avoid commentary on some of the more contentious/divisive issues, as a genuinely committed 'environmentalist' I felt obliged to comment. Indeed, I am genuinely alarmed that these actions risk undoing literally decades of good work… especially in terms of gaining the support and trust of the general populous. And while I recognise everyone's right to their opinions and methods (as long as they're legal), I too am entitled to my opinion.

Here's the thing, you don't HAVE to agree with me – but I'm also not going to make you sit in traffic for two hours while you're trying to get to work (and yes, I'm expecting a barrage of 'hate' emails).

Perhaps most importantly, the fact that I disagree with the protesters' methods and some of their demands - some of which I believe are just not realistic - DOES NOT MAKE ME A 'CLIMATE DENIER' (one of my least favourite terms).

Now, back to the point of the editorial!

While there has been an almost never-ending stream of self-congratulatory media sessions, press releases and social media activity on behalf of various protesting organisations and individuals as to their amazing success in raising awareness of the 'climate emergency', the fact of the matter is that these disruptive actions have also put a lot of people completely off-side. So much in fact, that there have been widespread suggestions that these 'actions' have done much more harm than good.

Put simply, no matter how serious, committed, concerned or terrified you may be of the impending 'climate crisis' (a term which in itself is going to put a lot of people immediately off-side), without the support of the general populous, the critical message, and sadly, the intentions, will tend to be lost in a sea of argument and opinion about the methods of trying to get the message out. One just has to look at recent social media commentary during and following the 'week of actions' to see what I mean.

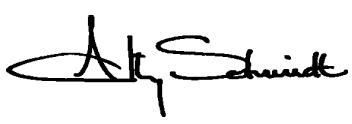
The term 'winning the hearts and minds' was coined a long time ago – and for good reason. When it comes to wholesale change, success or failure revolves around your ability to 'bring the people with you'. Angry, accusing tones, finger pointing, table thumping attitudes and massively disruptive activities do nothing to further that end.

And then there are the solutions proposed by some of these groups.

Hence the title of this editorial: *Talk is cheap… action, not so much.* It's very easy to suggest zero emissions by 2025. Working out how achieve that without putting half of the planet out of work and at risk of starvation is quite another matter.

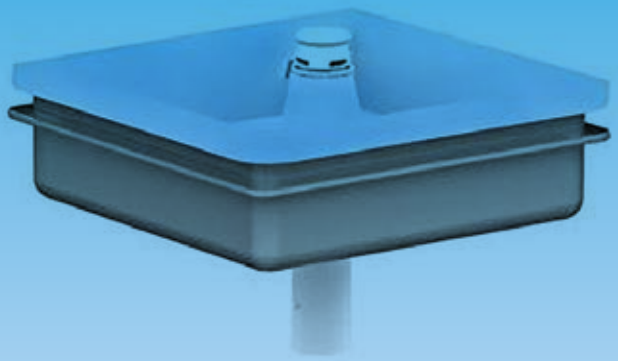
That's not to say that we shouldn't strive to achieve zero emissions at some stage in the future (hopefully sooner, rather than later). I agree whole-heartedly that we need to improve, we need to reduce emissions and we need to work together to reduce our impact, and we need to do it now.

In short, ignoring the need for change is simply not an option… However, neither is shutting down the planet.



Anthony T Schmidt
Managing Editor

GET SMART!



KEEP SEDIMENT & SUSPENDED SOLIDS OUT OF DRAINS, TRADE WASTE AND GUTTERS

From plaster sediment and non-toxic laboratory sediments and residues, through to sands, soils and even concrete washout sediments, the award-winning, Australian-designed Smart Sinks™ provide a highly-effective, affordable and easy-to-use method of preventing sediments and suspended solids from being washed into drains or disposed of on-site in gutters and stormwater side entry pits.

IN THE SURGERY

IN THE LAB

ON THE WORKSITE

- Prevents Blocked Drains
- Reduces Drain Odours
- Eliminates The Need For Traditional Plaster Traps
- Easy To Use
- Heavy-duty Performance
- Ideal For Dental And Medical Surgeries
- Mobile Smart Sinks™ Include Integrated Sink Unit And In-built Water Recycling System
- A Must For Every Construction Site And Maintenance Department

Avoid costly drain blockages and the risk of penalties for non-compliant disposal of liquids and sediments with Patented Smart Sinks™ technology.

For further information on the Smart Sinks™ range, CALL US TODAY on 07 5488 4154 or visit: www.smartsinks.com.au for a full video demonstrations of Smart Sinks™ in action.

smart sinks®

Waste Water Filtration & Recycling Systems

www.smartsinks.com.au

Plan unveiled to make Perth a leading waterwise city by 2030

Perth is set to become a leading waterwise city by 2030 with the Western Australian State Government recently launching the *Waterwise Perth Action Plan.*

In launching the Plan, WA Minister for Water, Hon. Dave Kelly MLA spoke about the impact of climate change.

"Climate Change has made our winters drier and our summers hotter and, combined with urban and population growth, has dramatically affected Perth's water resources," the Minister said. "The Waterwise Perth Action Plan sets targets to respond to the major impacts of climate change on water resources and liveability to support the 3.5 million population anticipated to reside in Perth by 2050."

The plan outlines a range of actions, from saving water, to improving how water is managed in the city's urban environments in a manner that provides for healthy waterways and wetlands, attractive green spaces and water security beyond 2030.

The plan includes:

- Assistance for households to be more waterwise and reduce annual per person use to 110kL;
- Improved water management of sporting ovals and green spaces;
- All government-led urban development projects in Perth and Peel to be 100 per cent waterwise;
- METRONET precincts designed to consider all elements of the water cycle;
- Increased use of recycled water; and
- Increasing the urban tree canopy to reduce the urban heat island effect.

"Climate change has dramatically affected Perth's urban water cycle," the Minister said.

"We used to get 420 billion litres of water running into these dams each year but, with a significant decline in rainfall since the mid-1970s from climate change, we can now expect just 25 billion litres. Declining rainfall has also reduced groundwater levels by 1.8 metres since 1998."

"The Government's plan brings the whole community on board to become a leading waterwise city by 2030, with State Government, local government, industry, community and households all playing a role," he said. "It adopts a 'water sensitive cities' approach to urban development that reduces consumption and captures, transports, cleans and stores water in the landscape for multiple social, economic and environmental health benefits."

"To ensure Perth can remain a beautiful, green and liveable city we must act now to be more waterwise," Minister Kelly concluded.

More than 200 stakeholders provided their knowledge and insight into the plan. The Waterwise Perth Action Plan is available at: **www.dwer.wa.gov.au/waterwise**

Council to phase out glyphosate weed products

Moreland Council in inner-suburban Melbourne has committed to phasing out glyphosate products, commonly used for weed management, by August 2021.

Council's previous use of Glyphosate products – historically used in-line with the Victorian State Government's safety guidelines – will be replaced by more sustainable weed management methods such as weed steaming and other chemical-free solutions.

Council's Director City Infrastructure, Greg Gale said that chemical-free weed management will play an important role in Council's vision for a sustainable future.

"Weed management in Moreland is critical for the protection and enhancement of biodiversity and the protection and encouragement of indigenous flora and fauna," Gale said.

"We have undertaken trials of environmentally sustainable alternatives and know the transition will not be easy, and we continue to trial these more sustainable products, so along with steaming and mechanical methods we are confident that glyphosate can successfully be phased out by August 2021.

"In 2016, Council sought community feedback prior to adopting its *Pest and Weed Management Policy (2016-2026),* and recognised community's preference for a reduction in chemical-free weed management," Mr Gale added.

Following the community feedback, Council voted meeting to take a phased approach to stopping the use of Glyphosate products, to spread the impact on budget over time and allow further testing and monitoring of costs of alternate products and methods.

Further community consultation will also inform service standards and Council will carefully consider current contracts relating to weed management.

To find out more, please visit: **www.moreland.vic.gov.au**

Sustainability Victoria welcomes new Chief Executive Officer

Following a comprehensive search, the Board of Sustainability Victoria recently announced that Claire Ferres Miles has been appointed as Chief Executive Officer of Sustainability Victoria. Ms Ferres Miles commenced her appointment on 25 November 2019.

Recognised as a 'Top 50 Woman in the Victorian Public Sector' in 2017, Ms Ferres Miles's previous work in local government, state government and the private sector has led to breakthroughs in affordable housing, sustainability, transport and planning.

Ms Ferres Miles brings a wealth of knowledge and experience which will complement the current talented team at Sustainability Victoria delivering positive outcomes in the resource recovery, energy efficiency and climate change spaces across the state.

Welcoming Ms Ferres Miles's appointment on behalf of the Board, Heather Campbell, Chair said, "We are looking forward to continuing our journey under Ms Ferres Miles's leadership to deliver tangible outcomes to Victorians."

Ms Ferres Miles is passionate about the public service and always puts the community first in everything she does. Until recently, Ms Ferres Miles was Director City Strategy and Place at City of Melbourne.

On her appointment, Ms Ferres Miles said, "All Victorians are seeking advice and action in response to the challenges of our changing climate, resource recovery and energy efficiency. I look forward to working collaboratively with all stakeholders to ensure Victoria's future is one of social, economic and environmental prosperity."

The Board of Sustainability Victoria thanked and acknowledged Interim CEO, Carl Muller, for his dedicated leadership over the past six months.

"His continued commitment during this time has enabled the great work of the Sustainability Victoria team and helped to advance Victoria's emerging opportunities within the circular economy, in particular," Ms Campbell added.

Sweden takes the lead in measuring diverse environmental impacts of consumption

New accounting method could strengthen Sustainable Development Goals follow-up

A government-commission study shows how countries can measure progress on sustainable consumption, a priority under the 17 Sustainable Development Goals (SDGs). A series of papers present the method, headline findings for Sweden, and a wealth of other consumption-related research carried out under the PRINCE project.

Official statistics on the greenhouse gas emissions associated with Swedish consumption will shortly be updated to capture emissions all along the country's global supply chains. This will be done using a new approach developed in the PRINCE project and written up in a new special section of the *Journal of Cleaner Production*.

"It is very satisfying to see our research being adopted so quickly as official statistics and becoming a part of Sweden's statistical system. I hope other countries will take up the challenge," said Viveka Palm of Statistics Sweden (the national statistical bureau), who led the PRINCE project.

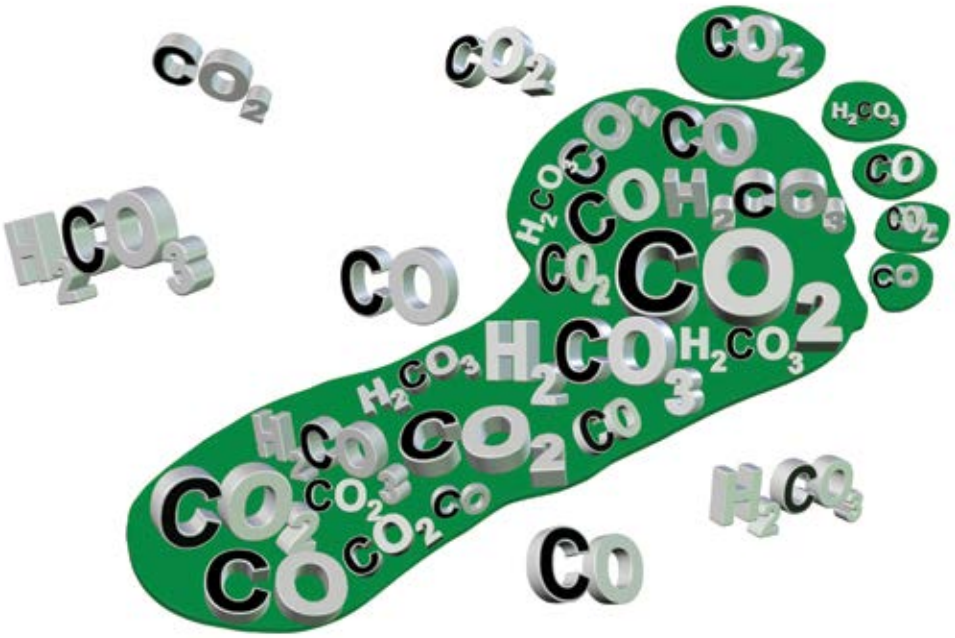
"The PRINCE model allows us to measure a range of global environmental pressures linked to the goods and services consumed in Sweden, and to do it at high enough quality to be used in national statistics," said Elena Dawkins of Stockholm Environment Institute, who worked on developing the model as part of the PRINCE project.

A new SDG indicator for sustainable consumption?

Viveka Palm is also a co-chair of the Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs), which is tasked with developing global indicators to monitor progress on the SDGs.

The tenth meeting of the IAEG-SDGs was held in Addis Ababa, Ethiopia in late October. The meeting discussed how to improve the measurement and global follow up of the SDGs.

The sustainable development agenda calls on countries to ensure sustainable consumption and production. However, on the whole, the consumption-based perspective is missing from the global SDG indicators proposed by the UN.



"In a globalized world, measures of sustainable consumption must take into account environmental pressures linked to imported goods and services," said Viveka Palm. "The approach we developed in PRINCE can measure how big some of these global impacts are for an individual country, and whether they are rising or falling.

"It would be relatively easy for countries to implement and to update. It is worth exploring as a way to complement the other SDG indicators," said Palm.

Hotspots

The PRINCE model can also offer rich detail on were impacts are happening along the supply chain, and which consumed product groups they are linked to. For example, it shows that producing the textiles consumed in Sweden in 2014 led to greenhouse gas emissions equivalent to just 4 tonnes of CO_2 (4 tCO_2e) in Sweden – but to 815,000 tCO_2e in China, 363,000 tCO_2e across the EU and 290,000 tCO_2e in India, along with at least 10,000 tCO_2e in another 27 countries or regions.

"The data underlines the fact that for wealthier countries, simply reducing your domestic greenhouse gas emissions is not enough; to ease pressure on the climate the whole world needs to get off fossil fuels, and that could mean working with producer countries to transform their energy systems too," said Viveka Palm.

The PRINCE project also made methodological advances in the area of consumption-based accounting. A new special section of the *Journal of Cleaner Production* includes articles presenting the approach in detail along with headline findings and other research under the project.

To access publications by the PRINCE project, please visit: **www.prince-project.se/publications**

ABOUT PRINCE

PRINCE was a three-year project supported under a research grant from the *Swedish Environmental Protection Agency* and the *Swedish Agency for Water and Marine Management*. It involved a consortium of Swedish and European research institutes: Stockholm Environment Institute, KTH Royal Institute of Technology, Chalmers University, the Norwegian University of Science and Technology (NTNU), TNO and CML, led by Viveka Palm of Statistics Sweden.

The website **www.prince-project.se** presents the research and visualizations of results.

Swedish consumption data generated by the PRINCE project for 2008–2014 is also available for download.

CHANGING THE FACE OF WASTE MANAGEMENT

Whatever your waste management needs, GCM Enviro can provide you with the equipment and expertise that you need.

From landfill compactors, shedders and compost windrow turners, through to state-of-the-art crushing and screening equipment, GCM Enviro has it all.

Top quality equipment from world-renowned manufacturers.

TANA
From Waste to Value

Landfill Compactor

- The most productive compactor on the market
- A minimum of 10% better compaction than any other compactor
- Extends the landfill's life expectancy by several years
- Increases revenue with better airspace management

TANA
From Waste to Value

Shark Shredder

- The most versatile waste shredder on the market
- Applicable even for the most challenging materials
- Produce anything from 50 to 500mm particle size
- Mobile diesel and stationary electric models available

Speak to us today!

Ph: 02 9457 9399

Email: info@gcmenviro.com.au

www.gcmenviro.com

GCM enviro

Is vital freshwater hidden beneath the sea?

Solutions to escalating global water supply issues are demanding innovative scientific investigation, such as Flinders University's Professor Adrian Werner making important advances in assessing freshwater reservoirs that exist beneath the ocean.

These and many more disclosers from researchers were discussed at the recent Australasian Groundwater Conference in Brisbane supported by *National Centre for Groundwater Research and Training* based at Flinders University.

The international conference highlighted the expertise of groundwater experts such as Professor Adrian Werner, who spoke about analysis of water sources near the Carmichael coal mine, but - as a Professor of Hydrogeology at Flinders University who holds an ARC Future Fellowship – he is also engaged with crucial research across a range of groundwater projects.

He recently completed an ARC Linkage project with the SA Government to look at the groundwater in floodplains adjacent to the River Murray. "We made some remarkable discoveries about freshwater next to the river in otherwise saline aquifers that defies accepted knowledge on aquifer-river interactions," says Professor Werner, who was recently identified by The Australian newspaper as Australia's research field leader in Hydrology and Water Resources.

"I've also been studying the extent of freshwater under the sea, through my Australian Research Council Future Fellowship, and have made significant inroads into our current knowledge of offshore freshwater."

The work involving offshore aquifers has led to the recent publication of seven significant papers that cover a range of issues - from improving methods of obtaining offshore freshwater estimates, to better understanding how onshore events influence and affect subsea freshwater aquifers.

"Since the late 1960s, groundwater scientists have been intrigued by evidence of freshwater beneath the sea, and in the following decades, understanding subsea fresh groundwater has advanced and is now understood to be a global phenomenon," says Professor Werner.

Several severe recent water shortages in coastal cities around the globe – including Cape Town during 2018 - raised the possibility of accessing offshore freshwater, even if only as an emergency measure. However, Professor Werner warns that current knowledge of the extent of offshore freshwater is limited, and questions already exist whether humans are drawing on offshore freshwater reserves while pumping fresh groundwater from coastal aquifers.

"Our research is addressing whether we are already accessing offshore freshwater or whether this is a largely untapped resource that is yet to be exploited," he says.

Two papers have focused on offshore freshwater in key Australian coastal aquifer systems – in Perth and the lower southeast of South Australia. "These are the first two attempts to study Australian offshore aquifers, and we found considerable offshore freshwater resources in both cases. These are ancient bodies of freshwater that are either in balance with onshore aquifer conditions or are in the process of depleting," explains Professor Werner.

He says another exciting area of research has been studying delicate freshwater resources on small islands, including Pacific nations where sea-level rise threatens their water supplies. "We uncovered major revelations about Kiribati's freshwater resources that have implications for groundwater management more generally."

Background:

The following papers have been mentioned in this article:

1. Knight AC, Werner AD, Irvine DJ (2019) Combined geophysical and analytical methods to improve estimations of offshore freshwater extent, Journal of Hydrology 576: 529-540, doi: 10.1016/j.jhydrol.2019.06.059.
2. Solórzano-Rivas SC, Werner AD, Irvine DJ (2019) Dispersion effects on the freshwater-seawater interface in subsea aquifers, Advances in Water Resources 130: 184-197, doi: 10.1016/j.advwatres.2019.05.022.
3. Morgan LK, Werner AD, Patterson AE (2018) A conceptual study of offshore fresh groundwater behaviour in the Perth Basin (Australia): Modern salinity trends in a prehistoric context, Journal of Hydrology: Regional Studies 19: 318-334, doi: 10.1016/j.ejrh.2018.10.002.

Monash Business School joins forces with Clean Energy Council to develop female leaders

The Clean Energy Council is delighted to continue its collaboration with Monash Business School to offer a grant for a female professional as part of the ongoing efforts to close the gender gap in senior leadership positions across the renewable energy industry.

The *Your Leadership Voice: Women in Focus* grant is targeted at women in leadership roles, aiming to give their careers a boost by enhancing skills such as negotiation and public speaking. The successful applicant will be funded to complete the week-long Executive Education program.

Clean Energy Council Chief Executive Kane Thornton said his organisation's Women in Renewables initiative had been successful in building a network of female professionals across the industry to support each other and provide access to a range of opportunities.

"I am delighted to work with Monash Business School to offer this grant for the second year, which provides a fantastic opportunity for one of our emerging female leaders," Mr Thornton said.

"We are proud to support and promote the role of women at our events, on the Clean Energy Council's board and across the industry more generally. We all benefit from having a diverse group of leaders which are all motivated to make a strong contribution to our shared success."

Professor Michelle Russell, Director of Executive Education at Monash Business School, said the Your Leadership Voice: Women in Focus provides participants with the tools and techniques to support their leadership ascension.

"We are proud of our success in helping talented women leaders reach the next level of their career. The professionals we see tend to have amazing business skills, and it is a pleasure to help them expand their range, increase their influence and identify new opportunities to develop, Professor Russell said.

The winner of the inaugural grant in 2018 was Heidi Sick, who is now Client Director, Energy – Australia and New Zealand at engineering consultancy Aurecon.

As well as covering the cost of the course, the Clean Energy Council will cover travel and accommodation if the successful applicant is based interstate.

For more information about the *Your Leadership Voice: Women in Focus* please visit: **www.cleanenergycouncil.org.au/women**

JOINING FORCES ON THE WAR ON WASTE

New initiative for Cities of Charles Sturt and Port Adelaide Enfield to process their kerbside recyclables

(L-R): Mr Paul Sutton, Chief Executive Officer City of Charles Sturt; Mayor Angela Evans, City of Charles Sturt; Mayor Claire Boan, City of Port Adelaide Enfield; and Mr Mark Withers, Chief Executive Officer, City of Port Adelaide Enfield inspect the site where both Councils are set to establish their new MRF. The move to establish the MRF will enable the Councils to take control of management of the processing and disposal of their recyclable material, while adding value to the circular economy.

Australia's ongoing recycling crisis has proven disastrous for many councils and contractors around the country. But as is often the case with large-scale 'industry-wide' challenges such as those currently being faced by the recycling sector, for some, the recycling crisis has also become a catalyst for change and improvement.

In short, the fact that a significant proportion of Australia's existing 'operational model' for residential recycling – including a large number of contractual arrangements – were brought to a sudden and premature end, left many councils and contractors with no option other than to completely reassess their recycling operations. And while few would question the seriousness of the situation, it is also clear that the age-old adage "from crisis comes opportunity" carries more than its fair share of weight – particularly amongst Adelaide's metropolitan councils!

For example, when faced with the commercial failure of one of SA's two major MRF operators, and the resulting sudden loss of competition for MRF processing in South Australia, two of metropolitan Adelaide's largest councils – the City of Charles Sturt and the City of Port Adelaide Enfield – took the decision to establish and operate their own Local Government-owned Materials Recovery Facility (MRF) to process kerbside recyclables from across their municipalities.

The move to establish the MRF will enable the two Councils to take control of management of the processing and disposal of their recyclable material, while adding value to the circular economy.

SECURING THE FUTURE OF RECYCLING

With an estimated cost of $12.8 million to build, the new MRF will be located in Kilburn, in Adelaide's inner North-West, on land which is currently owned by the City of Port Adelaide Enfield. Both Councils voted unanimously to establish the MRF, with the cost to be shared equally between the two councils. The two Councils will also explore grant opportunities to offset the construction of the MRF, which is not only expected to create local jobs during the building phase, but also provide up to 20 ongoing jobs to operate the facility once it is completed.

The MRF will be jointly owned by both Councils and operated through the new Central Adelaide Waste and Recycling Authority (CAWRA), established specifically for that purpose. The new state-of-the-art MRF facility will be completed in early 2021, and will provide a continuous, affordable, stable and sustainable service for residents of the Cities of Charles Sturt and Port Adelaide Enfield.

As is the case with many councils across Australia, both the City of Charles Sturt and the City of Port Adelaide Enfield currently outsource their recyclables processing to the private sector. Unfortunately, this not only limits the Councils' input into managing their waste, it also severely limits their ability to effectively address significant fluctuations and uncertainty in the market in a timely manner.

Not surprisingly, this became a major issue following the introduction of the Chinese *National Sword Policy*, which had a direct and significant impact on how recyclables are sorted, processed, and sold into the commodities market - not only in China, but also throughout India, Vietnam, Malaysia and Indonesia.

The challenges resulting from the introduction of the tighter international controls on recyclables were further compounded by increases to the SA State Government's *Solid Waste Levy* (which has resulted in significant cost increases to Councils) and the commercial failure of SKM Recycling. In combination, these events have had a significant negative impact on public confidence in the recycling sector.

As a result, both Councils were faced with the dual challenges of re-establishing stability for their future recyclables processing , while at the same time, rebuilding public confidence in recycling as a sustainable and 'worthwhile' activity.

TAKING CONTROL OF RECYCLABLES

With that in mind, the Councils undertook a detailed assessment of the proposed MRF option, and this was carefully weighed against the alternative of continuing to rely on the private sector to process recyclable materials. Both Councils were very clear in their support for the establishment of the new MRF, which will be owned on a 50:50 basis by the two organisations.

While for some, the decision to establish a 'council-owned and operated MRF' may appear to be a case of 'Back to the Future' (many councils around Australia owned and operated their own MRF's when kerbside recyclables collections were first established over 30 years ago), the decision to 'take back control' has been widely lauded by residents and ratepayers as a significant step in the right direction.

"Our community is incredibly supportive and overwhelmingly positive about this initiative," said City of Charles Sturt Mayor Angela Evans.

"With so much focus on the impact we all have on the future of the planet, being able to lead the charge in recycling, is so important for our communities."

"Our residents and ratepayers want to know where their recyclables go. The integrity of the kerbside recycling process is critically important to them and to us," Mayor Evans continued.

"The decision to establish our own MRF sends an important message to our residents; that we are serious about providing leadership in waste management and ensuring their waste is being recycled as it should be."

"This new MRF will enable both Councils to directly demonstrate to our ratepayers how we process and sell our recyclable materials, so we can be more accountable to them about how their rates are spent, and where their recycling goes," Mayor Evans added.

The comments were echoed by City of Port Adelaide Enfield Mayor Claire Boan, who also spoke about the strong community support for recycling.

"Kerbside recycling is our most visible and valued service to our communities. There are significant reputational, environmental and economic benefits through managing our recycling in our local area," Mayor Boan said.

"Our residents have been incredibly supportive. They want their Councils working hard to improve social and environmental outcomes from the kerbside recycling process."

Growing the Circular Economy was a strong motivating factor for both Councils, especially in terms of the positive impact and opportunities that the MRF can have on the local economy – including opportunities to partner with local businesses to buy locally made recycled products.

"Both Councils have a strong commitment to being more sustainable and accountable with our recycling - including promoting and growing the circular economy," Mayor Boan said.

"Through ownership and operation of the MRF, the Councils can direct materials to local recyclers. This will, for example, enable us to sort and process our recyclable waste streams so they can be used in asphalt for local roads, and as the decking planks on some of our accessibility ramps."

Importantly, the shift in focus from a 'sort and export' to an on-shore circular economy not only looks set to deliver significant economic benefits, it will also help to reduce the overall environmental footprint of the recycling operations.

"We will move as quickly as we can towards a fully on-shore model, while supporting local businesses and local jobs in the recycling industry," Mayor Boan said.

"Both Councils will be continuing to explore opportunities to work with local recycling businesses, to grow the circular economy by turning waste into usable commodities."

CO-OPERATIVE APPROACH TO DEVELOPMENT

Rather than simply considering the MRF as a 'stand-alone' recyclables processing facility, the Councils' MRF development project takes an 'holistic' approach to the entire recycling / resource recovery process.

With that in mind, the Councils have established a project leadership team which brings together expertise from both Local Government and the private sector. The team, which is being led by industry-stalwart Geoff Webster, will not only help guide the design, development and delivery of the MRF facility, it will also play a critical role in securing markets for the recovered resources.

"We have appointed Geoff Webster as Waste Industry Lead for this project," Mayor Evans said. "With the internal project management experience at both Councils, and Geoff's extensive background and networks in the waste sector, we have an ideal team to deliver the project."

With over 20 years experience in the engineering and waste management sectors, both as the General Manager of Transpacific Industries' Post-Collections division and in his current roles as Managing Director of specialist waste industry consultancy Waste and Management Services, Treasurer of not-for-profit entity KESAB environmental solutions, and as a Waste Management Association of Australia board member, Geoff Webster brings a wealth of experience to the project.

"I'm pleased to be taking on the role of Waste Industry Lead for the new MRF, and building those critical working relationships with the waste sector over the coming 18 months," Geoff Webster said.

"It's an exciting project, and I'm looking forward to working closely with the two Councils as they move forward to full operation," he added.

Mike Haywood of Sustainable Resource Solutions has also been engaged to work on the project. With his extensive experience as a specialist waste, recycling and resources consultant – as well as more than 11 years as General Manager of ResourceCo – Mike also brings a wealth of experience to the project.

Geoff Webster from Waste and Management Services has been appointed as Waste Industry Lead for MRF project

In keeping with the Council's focus on developing the circular economy, Mike's work will focus in particular on investigating market opportunities for commodities produced by the new facility.

Work on detailed design, planning and environmental approvals for the MRF is now underway, with the facility expected to be operational in early 2021.

WHAT GOES AROUND...

Practical applications of Recycled Materials highlight the benefits of a Circular Economy

Establishing the new MRF represents the latest step in what has been a long-term commitment by both the City of Charles Sturt and the City of Port Adelaide Enfield to maximising recycling, resource recovery and reuse. Indeed, both Councils' commitment to securing the future of recycling and growing the circular economy are clearly evidenced in numerous projects across the cities.

RECYCLED ROADS

As an example, in 2019 alone, the City of Charles Sturt used a total of 4,130 tonnes of Reconophalt™ Asphalt with greater than 30% total recycled material content in a number of road rehabilitation projects across the City.

Developed by Australian resource recovery company Close the Loop in conjunction with road infrastructure specialists Downer, Reconophalt incorporates a mix of recycled soft plastics and waste toner from printer cartridges. The asphalt mixes used on the City of Charles Sturt road rehabilitation projects also used 30% RAP (Reclaimed Asphalt Pavement) content, together with a mix of recycled glass and crumbed rubber.

As well as helping to divert a significant amount of waste from landfill and reduce the overall environmental impact of the City's road pavement maintenance operations, the 'recycled road' projects deliver the added benefit of producing an extremely high quality finished pavement with excellent mechanical properties and longevity.

Reconophalt™ incorporates a mix of recycled soft plastics and waste toner from printer cartridges.

RECYCLED MATERIALS USED IN ROAD REPAIRS - 2019

- 3,306,000 plastic bag and packaging equivalents
- 1,240 tonnes reclaimed road (asphalt)
- 1,041,390 glass bottle equivalents
- Toner from 74,385 used printer cartridges

RECYCLED PLASTIC BOLLARDS & DECK PLANKS

With the strong national global focus on recyclable plastics, both the City of Charles Sturt and the City of Port Adelaide Enfield are utilising a range of recycled plastic products on projects across their cities.

From extruded traffic and pedestrian protection bollards manufactured from recycled mixed plastics, through to street furniture, signs and even the decking planks used on a number of access ramps for public facilities, these recycled plastic products are proving to be as versatile as they are robust. Extremely hard wearing and able to withstand prolonged exposure to the elements, these recycled plastic products combine attractive aesthetics and outstanding longevity with the added benefit of reducing the amount of plastic being sent to landfill.

Manufactured from extruded recycled plastic, this access ramp combines attractive aesthetics and outstanding longevity, while also diverting plastic from landfill.

City of Charles Sturt used a total of 4,130 tonnes of Reconophalt™ Asphalt with greater than 30% total recycled material content for road rehabilitation projects in 2019.

RECYCLED BUILDING MATERIALS

With Construction & Demolition (C&D) waste representing such a significant proportion of the total waste stream, over the past few years, both the City of Charles Sturt and the City of Port Adelaide Enfield have placed a significant emphasis on reducing the amount of C&D waste being sent to landfill.

Interestingly, this focus recycling and reuse of C&D materials has also delivered a number of other benefits. For example, in one recent project, reclaimed timber from an old demolished wharf structure was used to construct a new pergola outside the Maritime Museum in Port Adelaide – providing an attractive and practical link with the area's heritage, whilst also preventing the timbers from being scrapped.

Back row: Andrew Aitken, CEO, Adelaide Hills Council; Ann Ferguson, Mayor, Mount Barker District Council; Barry Cant, Acting CEO, City of Burnside; Mario Barone, CEO, City of Norwood, Payneham & St Peters; Matt Pinnegar, CEO, Local Government Association; Joost den Hartog, Councillor, City of Port Adelaide Enfield; Brenton Lewis, Mayor, Rural City of Murray Bridge.
Front row: David O'Loughlin, Mayor, City of Prospect; Angela Evans, Mayor, City of Charles Sturt; Sam Telfer, President, Local Government Association; Erin Thompson, Mayor, City of Onkaparinga

#buyingitback

The Cities of Port Adelaide Enfield and Charles Sturt are 2 of the 9 Councils that have made a public commitment with the SA Local Government Association to *#buyingitback* as a key pillar in their response to the current recycling process.

Waste management is one of the largest expenses for South Australian councils, with more than $198 million spent in 2017/2018 alone. Councils are also answerable to their residents about how this money is spent, and to ensure Councils' decisions are sustainable in both a local and a global context

Another important role played by councils is educating residents, businesses and schools about waste and recycling.

All of these services are provided by local government under the umbrella of state government legislation including the Environment Protection Act 1993 and the Green Industries SA Act 2004.

The Local Government Association (LGA) takes an active interest in waste and recycling and has made this a particular focus in recent years. By supporting councils and working cooperatively with the South Australia State Government - including both Green Industries SA and the EPA - the LGA is making a significant contribution to positive reforms currently taking place in South Australia.

Councils participating in the *Buying it Back LGA Circular Procurement Pilot Project* are seeking to use their combined buying-power to significantly increase demand for recyclable materials in South Australia.

The aim of this project is to improve the sustainability of waste management practices, ensure the ongoing viability of the recycling system and, over time, reduce councils' waste management costs. The project represents a significant step towards developing local markets and on-shore processing for recyclable materials within Australia and establishing a truly circular economy.

Buying back recyclables
LGA Circular Procurement Pilot Project

Councils taking part in the pilot project will, through a Memorandum of Understanding (MOU), establish systems and processes to:

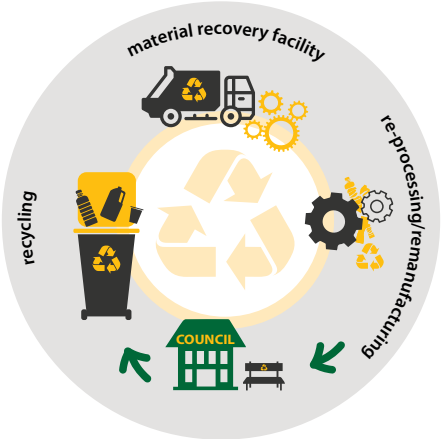
- Prioritise recycled-content through the procurement process;
- Track the recycled-content purchased by weight; and
- At the end of the 2019/20 year and subsequent years, publicly report on the amount (number of tonnes) of recycled-content products and materials they have purchased under the MOU.

Whilst councils will seek to increase their purchasing of many products and

9 participating councils have made the commitment to "buying it back" through the LGA Circular Procurement Pilot Project

COUNCIL buying back

Adelaide Hills Council · City of Burnside · City of Charles Sturt · Mount Barker District Council · The Rural City of Murray Bridge · City of Norwood Payneham & St Peters · City of Onkaparinga · City of Port Adelaide Enfield



materials with recycled content, most councils have elected to adopt a target in relation to plastic materials in particular. It is envisaged that following a successful initial set up in 2019/20, the participating councils will adopt rolling targets until they are buying-back recycled plastic materials equivalent to 50% of the weight of plastics collected in their council area.

Recycled products regularly purchased by local government bodies, that participating councils might consider procuring as part of the pilot project, include:

- Office stationary/paper;
- Fixtures (eg. street furniture, drinking fountains, bollards, fencing, decking, garden edging, planter boxes, fitness equipment, wheel stops, speed humps, bins, pipes, signage);
- Construction materials (recycled-content includes recycled asphalt, glass fines, plastic, rubber, toner); and
- Compost.

A total of nine South Australian Councils – both metropolitan and regional - have committed to the 'Buying it Back' Pilot Project. The participating councils are:

- Adelaide Hills Council
- City of Burnside
- City of Charles Sturt
- Mount Barker District Council
- The Rural City of Murray Bridge
- City of Norwood Payneham and St Peters
- City of Onkaparinga
- City of Port Adelaide Enfield
- City of Prospect

Speaking about the 'Buying it Back' Circular Procurement Pilot Project, City of Charles Sturt Mayor Angela Evans highlighted the importance of 'closing the loop' on recycling by prioritising the purchase of materials and products with recycled content.

"We strongly believe that recycling only becomes truly sustainable when we start buying it back, through the purchasing of recycled products. The LGA pilot project offers us the opportunity to further 'close the loop' on the contents of the yellow bin," Mayor Evans said.

"Through this project we are sending a clear message to industry that we serious about buying back the material in the yellow bin. We have committed publicly to measure our purchasing of recycled product, and will be introducing targets in 2020/21 to progressively increase this purchasing year-on-year."

"The project will help to develop strong local markets for recyclable materials and will allow us to directly demonstrate to our ratepayers that are taking responsibility for what happens to the contents of their yellow bin," the Mayor added. "And with our combined purchasing power, local government can offer industry some level of certainty to significantly increase the level of demand for recycled content products which will to help drive investment and innovation."

Not surprisingly, the nine Councils involved in the Pilot Program have highlighted plastics as a priority material in the first few years of the program – a critical focus, given the level of international concern about the fate of recyclable plastics, and the looming export bans. The project has identified a range of target products capable of being made from plastic, including bollards, street furniture, fencing, signs, decking planks and materials used in road construction.

Export Ban Timelines Unrealistic Without Mandated Recycled Content In Packaging

According to the National Waste Recycling Industry Council (NWRIC) the recent Meeting of Environment Ministers' export ban announcement is in need of urgent adjustment to ensure the timelines are realistic.

The NWRIC is concerned the COAG proposed waste export bans will fail unless markets for recovered plastics and paper are developed rapidly. Its intent is noteworthy however its achievability is seriously constrained unless markets and infrastructure are established in parallel. Perverse impacts from the ban must be avoided as Australia seeks to address its waste and recycling challenges.

The NWRIC, which represents commercial waste and recycling operators across Australia welcomes federal and state governments commitment to ramp-up the resource recovery industry locally.

"Our members are keen to work with all agencies and the packaging and manufacturing industry to make this happen", CEO NWRIC Ms Rose Read said. "However, we are very concerned that the regulatory focus is being crudely placed at the end-of-pipe and not at the source of the issue i.e. brands and producers."

Ms Read added "it is unrealistic to have export bans enforced for plastics by July 2021 and paper by June 2022, when the packaging industry and manufacturers are only working to achieve 30% recycled content and 100% recyclable, reusable or compostable by 2025.

"Currently, there is no regulation requiring manufacturers or the packaging industry to achieve these targets or penalties if they don't. This is far from being equitable.

"It also seems counterintuitive for MEM to give more time for the banning of waste tyres (December 2021) than plastics (June 2021). Especially as the volume of waste tyres affected is relatively small, there are local and overseas markets and there is plenty of processing capacity in Australia.

"You really have to question the performance of the industry led voluntary National Tyre Product Stewardship Scheme established six years ago in 2013 specifically set up to promote the development of viable markets for end-of-life tyres," she added

The NWRIC applauds federal, state and local government commitment to put more crushed glass into roads. "This will go a long way towards addressing the current crushed glass stockpiles and future excess recovered glass that won't be taken up by local glass manufacturers, Ms Read said.

"The key to success will be government procurement contracts specifying crushed glass and finalising as a matter of urgency national and local guidelines for recovered materials into roads and pavements.

"This will incentivise industry to build infrastructure to meet demand and create jobs in regions as councils commit to reuse locally produced crushed glass."

The Environment Ministers have also committed to further test the proposed export ban timetable with industry and local government prior to finalising them to present to First Ministers early in 2020 which is welcomed.

The NWRIC is calling on the federal Environment Minister, to bring together as soon as practical a round table of industry leaders from the manufacturing, packaging, waste and resource recovery sectors to commit to both minimum recycled content levels in plastic and paper packaging and scaling up reprocessing capacity within mutually agreed and realistic timeframes.

If the Environment Ministers do not prioritise minimum recycled content levels in plastic and paper packaging, there will be no markets for recovered plastic and paper, stockpiles will grow increasing fire risk, resources will be sent to landfill, people may lose their jobs and currently viable businesses will cease.

"The proposed export bans have the potential to address Australia's packaging waste and recycling challenges, but only if supported by appropriately targeted product stewardship regulation and effective government procurement policies that create new home markets for used packaging", Ms Read said.

ABOUT THE NWRIC

The National Waste Recycling Industry Council (NWRIC) is the national peak body representing waste and recycling businesses priorities to government. We work to improve waste and recycling services for all Australians.

The NWRIC members work together and cooperatively share a vision for a fair, safe, innovative and sustainable waste and recycling industry. The NWRIC members do this by:

- transforming waste into resources for reuse or energy;
- ensuring the safe handling, disposal and treatment of non-recyclable and hazardous waste; and
- providing a safe and clean environment for the community.

Our national members and state and territory affiliates, service most households and businesses across every State and Territory. The NWRIC's 450 plus members range from small family-owned businesses to multi-billion-dollar global companies. They collectively own and operate nearly every private waste and recycling asset in Australia for collecting, recycling, processing and treating waste.

Sump Pump Self Control

Reducing running expenses as well as cutting installation and maintenance costs is top of the selection criteria for smart operators of small effluent plants. Plumbers servicing this industry can now offer a simple automated, duplex pump system that reduces energy consumption and removes the need for external control boxes.

The Tsurumi PU series of automatic effluent pumps, available from Australian Pump, can be set up as a simple alternation system. Using two automatic pumps, the system can be set for the pumps to run alternately or together depending on demand.

The PU pumps use robust float switches rather than expensive external control panels. This means they are not only simple to fit but offer significant cost savings on installations.

The pump floats are adjusted to regulate the water level. When the level rises one pump is activated and runs until the level drops again to the shut-off point. The pair of pumps can be set to run alternately but if the water continues to rise both pumps will work simultaneously until the level drops to a pre-set height.

These super tough, lightweight, pumps have a proven track record for long life in both continuous and intermittent sump applications. The pumps are controlled by robust float switches which are simply adjusted to the required activation height.

"Tsurumi PU pumps are very versatile. You can set a pair up in tandem to share the load or to operate alternately depending on the water level," said Albie Bester, Aussie Pumps product manager.

"Simply by setting the heights of the automatic float switches any plumber can control when the pumps start, stop, whether they work together or alternate," he said.

The PU series of submersible pumps is manufactured in Tsurumi's Kyoto plant. Tsurumi is the world's largest submersible pump manufacturer with the capacity to build up to 1.5 million units per year.

The pumps in the PU series produce flows of up to 950 litres per minute, with vertical heads of 24 metres. The series includes both three-phase and single-phase options with two pole motors up to 3.7kW. They are available with 1 ½", 2" and 3" discharge bores

The PU pumps are made from FRP resin and stainless steel and are therefore not only lightweight but corrosion resistant. The pump's vortex impeller is made of fibreglass reinforced resin. This type of impeller passes small solids in suspension through the pump without causing damage or the risk of clogging.

"Tsurumi pumps are loaded with features aimed to extend working life," said Bester. "This means that you can really 'set and forget' these little beauties."

A unique double silicon carbide mechanical seal, operates within an oil chamber to provide maximum seal life. Tsurumi's patented "Oil Lifter" ensures the mechanical seal is continually lubricated even if the lubricant level falls.

The motors feature a self-resetting thermal protection device that reacts to the heat generated by an over current or dry run conditions. That means that when the motor cools down to a safe operating temperature, the motor automatically restarts.

The Tsurumi PU series are designed for tough applications in construction and plumbing industry. The pumps are particularly suited to pumping wastewater, sewage and even rainwater that may contain solids.

Further information on the complete range of Tsurumi submersible pumps is available from Aussie Pump Distributors throughout Australia and on the Australian Pump website: **www.aussiepumps.com.au**

Tsurumi PU series submersible sumps pumps are simple to set up, efficient to run and do not require expensive external control box.

ANZRP and Shred-X launch tailored business e-waste service

ANZRP has partnered with Shred-X to provide Australian businesses with a simple to use e-waste collection and recycling service.

Driven by the knowledge that e-waste is the fastest-growing component of the solid waste stream, organisations will have access to an extensive national footprint offering a simple 'one-stop-shop' e-waste collection and recycling solution.

Annually, 50 million tonnes of e-waste is generated around the world, with 700,000 tonnes of this arising from Australia. In a recent report by the United Nations University, it was estimated that global e-waste will more than double by 2050 to reach approximately 111 million tonnes per year.

A UN and World Economic Forum report also predicted that by 2020, the number of devices connected to the Internet is expected to reach between 25 and 50 billion.

This of course does not include electrical items such as toasters and hairdryers, though as the Internet of Things (IoT) takes rise, such items will become Internet-enabled.

In addition, items that never encompassed an electronic aspect before such as clothes and furniture, will increasingly have complex gadgets inserted, making the recycling process ever more complicated and begging for smart, innovative and circular systems and supply chains.

To prevent e-waste from going to landfill, ANZRP and Shred-X's e-waste collection service will provide participating businesses with a 240 litre or 660 litre container that can be filled and picked up to have its contents appropriately recycled.

Based on a fee-for-service model that covers transportation and container hire, the service makes it easy for businesses wanting to be environmentally responsible by providing a single touch point to facilitate their recycling needs.

Businesses will have the option to rent a container on an ongoing basis and request collections when full, or book a one-off collection.

ANZRP expects the service will be particularly popular in Victoria where a state-wide ban on e-waste to landfill was imposed in July this year, meaning businesses and households can no longer dispose of e-waste in general waste.

Shred-X's extensive footprint across the country and established logistical capabilities will allow for a smooth and simple pickup service at an affordable cost to business.

The service is backed by ANZRP's trusted standards-based systems – its Quality, Safety and Environment Management System is certified to ISO 9001:2015, ISO 14001:2015 and AS/NZS 4801:2001, ensuring the safeguard of workers, communities and the environment and providing businesses with peace of mind.

Since inception in 2012, ANZRP has collected and recycled over 160,000 tonnes of e-waste through its dedicated program *TechCollect*. From an energy usage perspective, this has saved more than 2.7 million Gigajoules of energy, equivalent to the annual energy consumption of 19,000 Australian homes. The carbon emissions avoided equate to planting more than 2.8 million trees.

An effective business-focused recycling service can encourage organisations large and small to incorporate electronic recycling into their sustainability strategy and stay ahead of changing consumer attitudes and demands.

The service is currently available in the Melbourne metro region and will be available across the country next year.

To find out more, please visit: **www.shred-x.com.au/techcollect-business** or to register your interest call 1300 734 511 or email techcollect@shred-x.com.au

ANZRP. THE PRODUCT STEWARD TRUSTED BY THE WORLD'S BIGGEST BRANDS.

OVER **150,000** TONNES

DIVERTED FROM LANDFILL

COLLECTION ◀ END TO END CAPABILITIES ▶ **RECOVERY**

250+
COLLECTION SITES

BEST PRACTICE
SYSTEMS & STANDARDS

RUN BY INDUSTRY
FOR INDUSTRY

MINIMUM 90%
RESOURCE RECOVERY

LOCAL COLLECTION.

NATIONAL PLATFORM.

GLOBAL STANDARDS.

If you are looking for a partner to solve your organisation's end-of-life product management challenges, ANZRP is well qualified to help. We have a track record of achievement, and we are a recognised authority in this field.

Working in partnership, we will capitalise on our expertise, capabilities and relationships to help your organisation meet its objectives and obligations.

For more information, please visit anzrp.com.au/about/product-stewardship
To contact us, phone 03 9020 2222 or email ps@anzrp.com.au

ANZRP
AUSTRALIA NEW ZEALAND RECYCLING PLATFORM

AWRE Wraps Up Successful 2019 Exhibition

The *Australasian Waste & Recycling Expo* (AWRE) at Sydney's Darling Harbour is over for another year and at the end of the two days, visitors and exhibitors left with an increased level of optimism about the future. Event Manager, Andrew Lawson, said the past 12 months have been eventful for the industry and many appreciated the opportunity to re-group and reflect at AWRE.

"There have been many challenges for the industry this year and we are thrilled to be able to provide a place for the industry to take time to reflect on the opportunities ahead," said Mr Lawson.

This year saw record attendance at the Speaker Series which provided timely discussions on the latest challenges, developments, strategies and policies which are shaping Australasia's waste and recycling industry.

Opening the speaker series on Day 1 was KarMei Tang, Acting Executive Director, Waste Strategy and Policy NSW Department of Planning, Industry and Environment, who presented opportunities and examples of the circular economy in NSW.

Day 1 continued with an open and candid panel discussion between James Hay Deputy Secretary Energy, Climate Change & Sustainability, Cr Linda Scott, President of Local Government NSW, Rose Read, CEO of the National Waste and Recycling Industry Council, Vic Bansal, CEO of Cleanaway, Charlie Emery, Director of Australian Organics Recycling Association and Tanya Barden, CEO of the Australian Food and Grocery Council.

The first ever AWRE Leadership Breakfast on Thursday was a sell out, with Matt Kean MP Minister for Energy and Environment in attendance, who addressed guests just before the opening of the show.

Mr Kean's speech was shortly followed by a lively and candid panel discussion on the State of Waste, 18 months post *China Sword*. Panelist Mike Ritchie opened by saying he looks forward to "…creating a conversation about recycling in Australia, how we will deal with waste in the future and how we can create a closed loop economy within Australia". David Baggs from Global Greentag provided interesting comments, highlighting that there are still substantial barriers in to a combined industrial and industry response, one being that "…the public still believes that recycled produces are seen as second grade".

Kate Harris from Good Environmental Choice Australia sees *China Sword* as "…an incredibly exciting opportunity for Australia and Australian manufacturing, which will drive creative opportunity". Pete Schmigel from ACOR gave a magnificent speech, commanding that we "…look at

kerbside recycling in a broader way" he was pleased to acknowledge that the waste industry is seeing "…political engagement like never before" but that this is an "unfunded system", claiming that it would be beneficial to make kerbside either recycling contestable or standardised.

Later in the morning saw a presentation from Trevor Evans MP, Assistant Minister for Waste Reduction and Environmental Management. As the first ever Minister with specific responsibility for waste reduction and recycling, Trevor spoke about the Federal Government's $167m *Australian Recycling Investment Plan.* He highlighted the "…increasing need for leadership in this area" but that he wants to "…protect our environment, which generating exciting economic outcomes in this area". He sees the opportunity to "…create many jobs in the places that need them most", such as regional and outer areas.

He highlighted that 9 jobs are created for every 10,000 tonnes of plastic that is recycled, compared to only 3 jobs created if the same waste were sent to landfill, and he "sees this as a huge opportunity". He closed by saying that "All Australians have a role to play in the 'Recycling Revolution'", and that there is a tremendous opportunity to have a positive impact on our environment and our economy."

Other key topics covered over the two days included current and newsworthy subjects such as "Old Roads, New Glass", and "E-Waste - the Fastest Growing Waste Stream in the World".

On the show floor there was a full circle of innovative products and sustainable solutions to collect, process and recycle waste more smartly. Future critical areas included Machinery & Equipment, Software & Services, Bins, Vehicles and Food & Organics.

For the first time the show also included a dedicated Food Waste section showcasing the latest products and developments in the growing food waste servicing industry. This proved to be an extremely popular section of the show with positive feedback from both visitors and exhibitors.

Congratulations to Christmas Hills Brigade, and the girls (L to R) Dianne Simmons (Captain), Deirdre Lucas (Secretary) & Veronica Holland (fire fighter).

In the Line of Fire

Every year, thousands of volunteer fire fighters give up their free time and risk their lives to help their follow citizens. Australia's leading specialist bushfire fighting pump company, Australian Pump Industries, decided to find out what makes a fire fighting volunteer tick!

The company launched a program to pull entries from volunteer brigades in Victoria with a view to letting them have their say about what makes these folk put themselves in the line of fire!

According to the *"State of the Climate 2018"* report, there has been a long-term increase in Australian fire conditions and the length of bushfire seasons. This has been a constant trend since the 1950's and there's no denying the fact, even if the cause is open to question.

The concept of volunteer fire fighting appears to be almost unique to Australia. The idea that citizens, most of who already have a full time job, give up their leisure time with family and friends, to train and educate people and raise funds. Then in emergency situations, they don their gear and report for duty within community that needs them most!

CFA Volunteers Respond

"We started with the CFA in Victoria because we know they have 50,000 volunteers and that is a mighty force," said Aussie Pumps' Brad Farrugia.

Aussie Pumps builds high pressure fire fighting pumps used by farmers and home owners to protect their property. They've supplied hundreds of pumps to the National Parks and Wildlife Service and to the Rural Fire Service in NSW.

The company believes if the volunteers are going to have to put themselves at risk they should have the best equipment, and get the credit they deserve!

"The more we get to understand the volunteers and the people, who give up their free time, the more we realise what a huge debt we have. We appreciate the over selfless men and women who protect the lives and properties of others," said Farrugia.

Here are some samples of the great responses the company received.
This is from Craig Warren from Wallington Fire Station. He said a lot with his short sharp comment about volunteers giving up their time.

Our question was: *what motivates a volunteer to join?*

Craig's answer: "The only reward is feeling good about you by helping others".

Carol Brislane from Anakie Fire Brigade also came up with a good short sharp point.

"I hope that I may inspire others to join".

The company was flooded with entries but eventually Christmas Hills Fire Brigade won the prize of an Aussie Fire Red Brigade Fire Captain high pressure fire fighting pump based on this very lyrical entry from Liz Mildenhall.

"Motivated to learn about fire behaviour and suppression after the devastating Black Saturday bushfires, we women joined the Christmas Hills Brigade. Ten years later with more knowledge and skills under our belts we feel our efforts are valued, enjoy the team work and feel safer living in our beautiful bush."

Christmas Hills typically has a history of active women fire fighters going back to the 1970's. Several of the female members are officers and hold important roles within the brigade. The brigade often fields and all female crew!

Aussie Pump distributors around the country are getting behind this *"APPRECIATE THE FIRIE VOLUNTEERS"* campaign and doing their bit to help out as well.

Bushfire Survival Guide

Tens of thousands of Aussie's Bushfire Survival Guide are going out into the market, free of charge to help people prepare for the worst. The guide helps to protect property, livestock, crops and human life!

For more info on the Aussie Pumps' product range, contact Australian Pump Industries, or dealers throughout Australia. To download a copy of Aussie Pumps' Bushfire Survival Guide, please visit: **www.aussiepumps.com.au**

THE WORLDWIDE LEADER
IN VIBRATION TECHNOLOGY

WHEN YOU NEED IT, WHERE YOU NEED IT.

EX-STOCK DELIVERY

2 YEAR WARRANTY

MOTOVIBRATORS

FLOW AIDS

OLI VIBRATORS
7 Jellico Drive - Scoresby Vic 3179 - Australia
www.olivibrators.com.au
Tel: +61 3 9764 9988 - info@olivibrators.com.au

MVE Standard

Efficient solution, in stock
Conveying, screening, feeding, hopper emptying.

MVE-E Increased Safety

Safety in hazardous environments
Screening, feeding, hopper emptying.

SV

Long vibrator
Screening applications - Quarry, mining, oil.
Acts as a structural member of the machine, the centrifugal force acts directly on the screen walls.

Flanged

The best for circular vibrating machines
Deburring, polishing, brightening, drying.
Ceramics and all other industrial sectors.

MVE-DC Direct Current

IP66 protection, resistant to accidental shocks
Concrete pumps.

MVE-MICRO

Seal-proof monolithic body frame
Hopper emptying, compaction.

MVE-D Explosion Proof

Safety in extremely hazardous environments
Conveying, screening, feeding, hopper emptying.

AERATORS

Vibro-Aerators: VB
Dry powders.
The fastest loadout speed.

Aeration Pads: I100
Cement, lime.
External mounting kit.

Aeration Nozzles: U
Cement, lime.
low air consumption.

LINEAR PNEUMATIC VIBRATORS

Single Impact: MARTSHOCK PS
Dry and wet powders.
Integrated solenoid valve.

Continuous Impact: P
Hygroscopic, sticky and humid powders.
High temperature.

Cushioned: K
Hygroscopic, dusty powders and granular materials.
Clean, silent.

Adjustable Cushioned: F
Hygroscopic, dusty powders and granular materials.
Adjustable force and vibration frequencies.

AIR JET

Air Cannons: GUNJET PG
Irregular shapes and fibrous light materials.
The fastest loadout speed.

Combined Hammer Blasts: PICJET PJ
The best solution for dry, fine powders.

ROTARY PNEUMATIC VIBRATORS

Turbine: OT

Food environment.
Oil-free.
High performance.

Roller: OR

Hygroscopic powders.
High temp.

Ball: S

Dry powders and granular materials.
Generic use.

Maintenance-free; Anodized aluminium body.
High performance; Low air consumption.

HYDRAULIC VIBRATORS

Hydraulic: MVO
Wet, sticky powders and granular materials.
High force and performance.

It's the Vibe of the thing...

(actually, it's really more about longevity and performance in harsh conditions!)

Specialist vibratory equipment plays a key role in moving, sorting and processing materials in MRF's (Materials Recovery Facilities), waste processing facilities and wastewater treatment plants across Australia and around the world. And while it would be easy to suggest that making these processes work is simply a case of attaching a vibratory motor to a piece of equipment and switching it on, nothing could be further from the truth!
In fact, to paraphrase lawyer Dennis Denuto's character from the classic Aussie film 'The Castle' it's about much more than just *"…the VIBE of the thing!"*

Using vibratory equipment as part of a materials handling, sorting or processing system not only requires an in-depth knowledge of the physical attributes of the materials being moved or sorted, and an intricate knowledge of the process itself (as well as some fairly advanced physics!) – it also requires specifically designed, purpose-built equipment that is able to operate – and keep operating - in some of the harshest conditions around.

From loading pits and conveyors through to sorting, separation and processing equipment, and even the collection vehicles themselves, OLI Vibrators design and manufacture specialist vibration equipment for the full range of waste management, recycling and wastewater treatment applications. Indeed, OLI Vibrators is a world leader in the field, working closely with engineers, designers and equipment manufacturers across Australia and around the world to provide bespoke vibratory solutions for all manner of materials handling and processing requirements.

"When it comes to designing vibratory solutions for equipment and processes, it's definitely not a 'one size fits all' equipment solution," explained OLI Vibrators Australia General Manager, Mark Thompson.

"Specific materials respond differently to different frequencies, and different frequencies and vibration strengths have different ranges of influence on the materials. What's more, factors such as moisture content, and even the operating temperature, can significantly alter the range of influence for certain material streams," he added.

"With that in mind, when it comes to waste, recycling and wastewater treatment processes, we provide bespoke vibratory solutions which have been specifically designed for each application."

"For example, in waste management and recycling plants, we often engineer a number of different solutions for the one facility, with each solution specifically designed to suit the material streams being processed - from heavy and dense materials such as soils, composts, construction and demolition wastes and recycled asphalt pavement materials, through to lighter materials such as plastics, glass cullet and everything in between," Mark Thompson said.

The worldwide leader in vibration technology, the name OLI® has been synonymous with expertise in vibration technology for over 55 years. Together with their reputation for working with clients to develop bespoke solutions to meet their needs, another key factor in the company's ongoing global success and growth, is the quality and reliability of its equipment.

Built tough to withstand even the harshest operating conditions, OLI equipment has been specifically engineered to deliver stable, reliable performance - maximising productivity and minimising downtown.

"Waste and wastewater facilities represent some of the harshest operating conditions around," Mark Thompson said. "Constant exposure to dust, dirt and any number of other contaminants, together with the risk of impact damage from heavy materials and, of course, the wear and tare that results from long operating shifts – in many instances 7 days a week / 365 days a year – can really takes its toll on equipment."

"Needless to say, in those conditions, heavy-duty performance and reliability is of paramount importance," Mark added. "Put simply, if the equipment hasn't been specifically designed for that kind of daily punishment, it simply won't last."

"Whether it's a vehicle or trailer mounted unit, or a unit installed on a hopper, along a conveyor, or as part of a processing system in a MRF, treatment plant or other facility, our customers need to be confident that our vibratory equipment will be working as it should, when they need it," he said. "After all, if the equipment fails and they can't move or sort materials or unload hoppers, it can bring the entire process - or in many instances, the entire facility - to a stop."

"That's why we work with our clients to engineer purpose designed and built solutions to meet their specific needs," Mark Thompson concluded.

For further information, please visit: **www.olivibrators.com.au**

ABOUT OLI VIBRATORS AUSTRALIA

Part of the global WAMGROUP & WOLONG MOTOR COMPANY, OLI Vibrators Australia is a leading supplier of specialist vibrators for a range of Australian industry sectors, including waste management and recycling, wastewater treatment, concrete construction and bulk materials handling.

Founded in Cassina de' Pecchi near Milan, Italy in 1961, the company built its reputation supplying immersion vibrators (pokers) to construction contractors across Italy. Needless to say, the products' outstanding quality and performance in the field saw a strong growth in demand not only from the construction sector, but from a range of other industries, and before long OLI had become one of the world's premier suppliers of high frequency electric, pneumatic and shaft vibrators.

Knox Recycling takes delivery of Australia's first UNTHA XR

The first UNTHA XR shredder is now operational in Melbourne, Australia, following a 15,000km journey from the world-renowned engineering facility where it was manufactured in Austria.

The 37-tonne mobile machine has been shipped to Knox Recycling (KTS), a long-standing client of waste equipment specialist FOCUS Enviro. Here the UNTHA XR3000C mobil-e will handle up to 30 tonnes of commercial, industrial and wood waste per hour, to manufacture the increasingly popular Energy from Waste resource – Process Engineered Fuel (PEF).

Previously unable to produce this high-specification fuel with only one machine, the Knox team accompanied FOCUS Enviro on several site visits across Europe, to see the UNTHA shredder in action. Impressed by the single pass shredding capabilities of this robust technology, FOCUS Enviro then set about configuring a solution that could achieve Knox's refined output particle requirements, with ease.

Commenting on the project, FOCUS Enviro's director Robbie McKernan said: "We have seen what the XR mobil-e is capable of, as it has continued to transform the throughputs, fuel quality and energy efficiency of facilities worldwide. We've therefore worked hard to bring this pioneering UNTHA innovation to Australia, so that it can start to revolutionise the alternative fuel production market here."

"No other single machine can produce such a homogenous fuel in a single pass, so I think the Knox operation is going to be a leading light in this fast-growing future resource for Australia," Mr McKernan said.

Mark Jeffs, owner of Knox, added: "Alternative fuel production is becoming more and more important in Australia, and as a progressive environmental company we want to be ahead of the curve."

"We acknowledged that by investing in world class PEF production technology, we could produce a high-quality resource, efficiently, and hopefully really drive the market for this crucial energy source."

Gary Moore, UNTHA's director for global business development concluded: "We know how to process a plethora of waste materials effectively, and whether the resulting fuel is going to a local cement kiln or the export market, we always work with the client to optimise throughputs, minimise impurities and maximise margins."

"Australia is one of the world's most exciting countries when it comes to Energy from Waste potential, and it's great to now be a part of it," Mr Moore added.

FOCUS hit the headlines earlier this year when it was announced that the team had become the exclusive distributor of UNTHA's shredding technology, for the whole of Australia.

Over 9,000 UNTHA shredders are now installed worldwide.

Inlon launches first hybrid drive slope mower

Inlon has launched Australia's first hybrid drive slope mower with the Civiline Light-Track LT9600. Made in Germany, this new remote-controlled mulching mower will tackle slopes up to 50 degrees with high grass or vegetation.

The Civiline range of clearing, mowing and grounds-care machinery already includes brushcutters, verge mowers, wheeled slope mowers and a 'heavy tracked' slope mower. The new 'light tracked' mowers can handle rougher slope work than a wheeled mower but don't cause the level of ground damage or disturbance typically found with tracked mowers. This is because the Civiline Light-Track LT9600 is lighter and faster than a heavy tracked mower. Importantly, it also cuts in both forward and reverse, reducing the need to spin the mower.

Designed for uneven terrain with high grass or vegetation, the Civiline Light-Track LT9600 mulching mowers are available in 80cm or 112cm cutting widths with rubber tracks suited to slopes up to 50 degrees. They have a low centre of gravity, balanced weight distribution and zero turn circle to keep them mowing productively while the operator stands safely up to 300 metres away with the remote control. The LT9600 can work at an impressive 10km/hour.

Dual jerry can fuel tanks add to the safety and productivity benefits of this machine. The tanks can be removed, replaced and reconnected for fast and safe refuelling.

Hybrid drive is low maintenance and environmentally friendly

The LT9600 is Australia's first hybrid drive slope mower. The innovative hybrid drive runs a machine that is remarkably simple in construction offering reduced maintenance due to no hydraulics, gearboxes or complex mechanical drive systems. As a result, most lubricants and grease are eliminated, ideal for working in environmentally sensitive areas.

The cutting deck belt drive comes directly from the engine crankshaft output to get the maximum cutting power from the 18hp or 24hp engine.

The heavy-duty deck construction with its unique underbody deck design is the backbone of the entire machine. Don't be fooled by the word heavy; this mower treads so lightly that it imparts less ground pressure than a human. In addition, other tracked mowers have out-front flail cutting heads and require the mower to be turned around with each cutting pass, often damaging the ground as they turn. The LT9600 cuts in forward and reverse, which means less turning.

The deck's two offset spindles ensure cut overlap for a quality finish. The swing back blades tolerate the tough jobs, with each of the four sets consisting of a flat cutting blade and a lifting mulch blade.

For further information, please visit: **www.civiline.com.au**

FLIR ONE Pro: a smart thermal sensor solution

For those seeking a thermal imaging camera solution to identify heat spots, measure temperature, identify water leaks or damage, FLIR ONE Pro provides a cost-effective, compact and easy-to-use solution to identify problems quickly.

Suitable for almost all industries and applications, the FLIR ONE Pro converts a user's smart phone into a high-resolution thermography sensor and can measure temperatures up to 400 degrees Celsius, while providing powerful measurement and reporting tools.

The latest FLIR ONE Pro has an improved design including a OneFit™ connector, which allows an Apple or Android mobile phone with protective case to seamlessly connect to the FLIR ONE pro using the adjustable connector. This allows users to use their mobile phone to test and measure, without compromising damage protection.

VividIR™ image processing technology allows users to detect problems with precision, while providing customers with documented fixes and solutions. With 160 x 120 thermal resolution FLIR ONE Pro creates sharper, easier to understand images.

With the FLIR ONE app, users can access advanced capabilities for more professional problem solving and advanced functionalities. The app also allows the use of an Apple or Android smart watch to see around corners and awkward spaces. Other app functionality includes multiple real-time spot meters and regions of interest, real time thermal tips and tricks, and reporting through FLIR Tools.

With a compact pocket design, the FLIR ONE Pro provides a lightweight, portable thermal sensor solution providing quick, reliable diagnosis.

For product enquiries, please visit: **www.ipd.com.au**

Zero Emissions Mini So Quiet It Gives JCB Something To Shout About

JCB has made company history with the unveiling of its first ever electric excavator – the quietest digger in its range and one delivering zero emissions. The brand new JCB 19C-1 E-TEC mini excavator has been developed in top secret at JCB's World HQ in Staffordshire.

With the drive towards lower emissions, the zero-emission JCB 19C-1 E-TEC will allow contractors to work inside buildings and in emissions-sensitive inner-city environments and indoor facilities such as MRF's and organics processing facilities. It will also allow rail contractors to operate in tunnels and underground, without having to install costly exhaust extraction equipment.

Another huge advantage of the new electric mini is that the external noise, at 7dBA lower, is a massive five times quieter than its traditional diesel-powered counterpart. This means contractors can work after normal hours in urban streets without disturbing residents, as well operating in other noise sensitive environments including hospitals and schools.

On digging there is no compromise on performance with the fully charged electric machine capable of putting in a full shift in normal operation. And with no daily checks of coolant and engine oil levels required, the machine is off to work quicker than its diesel counterpart.

JCB Chairman Lord Bamford said: "JCB has been at the forefront of developing innovative, low emission construction equipment for many years. In producing an electric JCB mini excavator, we are offering our customers a practical and affordable solution for applications that demand zero emissions and quiet operation."

JCB Chief Innovation and Growth Officer Tim Burnhope said: "By replacing the diesel engine with an efficient, 48V electrical driveline, with the latest generation automotive battery cells, JCB has once again moved the mini excavator market forwards.

"The 19C-1 E-TEC will provide contractors with a zero-emission, low-noise solution. It points the way to a new zero emission future for JCB mini excavators."

Initially, the mini excavator will be available with the ROPS/TOPS and FOGS certified canopy. As the electric excavator is based on the premium specification 19C-1, the excavator comes with proportional rocker switches for auxiliary functions and boom offset swing. The premium model also has a membrane switch pad to the right of the operator for all additional controls, while the fuel gauge has been replaced by an easy to read charge level readout.

The 19C-1 E-TEC benefits from a new box section main boom and dipper arm, with all hoses routed through the boom structure for added protection. The boom pins and dozer pivot points come with sealed graphite-impregnated bushings, allowing 500-hour greasing intervals. All grease points are located on one side of the machine to reduce downtime and there are fewer daily checks, as the 19C-1 E-TEC has no engine oil, coolant or fuel tank.

ONLY WHAT YOU WANT...

and nothing that you don't!

When it comes to digital subscriptions, **WHAT YOU DON'T GET** is as important as what you do get!

When you subscribe to Waste + Water Management Australia online **YOU DON'T GET:**

- JUNK EMAIL
- SPAM ADVERTISING
- UNWANTED EDM'S
- 3RD PARTY EMAILS

WHAT YOU DO GET:
A single email notification, 6 times per year, to let you know your new issue is ready to download or view online... **THAT'S ALL!**

What's more, our digital subscriptions are **100% FREE!**

All of data is managed in-house and **WE NEVER** sell, rent, borrow or distribute any subscriber data - including email addresses - to anyone... **EVER!**

UNWANTED EDM'S

SPAM

THIRD PARTY EMAIL

WASTE + WATER MANAGEMENT AUSTRALIA
wwm
SINCE 1973

SUBSCRIBE TODAY! www.epcgroup.com/subscribe

Work Progressing on Huge Australian Rooftop Solar Array

The 7,400 panels are being fitted to the 5-hectare roof of the Tonsley Innovation District in Adelaide south. When complete, the solar array will have a total installed capacity of 2.34MW.

By Andrew Spence

Work is well underway on one of Australia's largest rooftop solar arrays in Adelaide, with installation of the array's 7,400 progressing well. The panels are being fitted to the 5-hectare roof of the Tonsley Innovation District, which will have a total installed capacity of 2.34MW.

There are plans to increase the solar capacity at the site to as much as 6MW and over 20,000 solar panels as the district grows over time. The solar installation will work in conjunction with on-site battery storage and smart technologies as part of Enwave Australia's Tonsley District Energy Scheme. The panels are being installed by Tonsley-based ZEN Energy on behalf of Enwave Australia, the owner and operator of the scheme.

The District Energy Scheme will generate at least 30 per cent of Tonsley's energy demand, including business and residential, from renewable sources. Businesses at Tonsley will have the choice to buy their electricity from Enwave Australia at competitive market rates and support the site's shift to cleaner energy, or buy from the energy retailer of their choice.

Enwave Australia will invest approximately $40 million over a 50-year period for battery storage, photovoltaics, smart technologies and electrical assets.

The scheme will later expand to include the provision of recycled water for non-drinking purposes and natural gas for residences in Tonsley Village.

Enwave Australia Chief Executive Officer Cameron Evans said the scheme had been designed to ensure customers within the district benefited from the reliable, cost effective and renewable supply of energy.

"The rooftop solar installation is a key component of this system, which will be integrated into the wider scheme to ensure all customers benefit from the installation," he said.

"We are proud to be part of this scheme as another key step in the establishment of Tonsley as a leading innovation district."

Tonsley is on the site of a former Mitsubishi car manufacturing plant in Adelaide's southern suburbs. It is Australia's first innovation hub and brings together advanced manufacturing companies, university STEM programs, renewable energy leaders and hi-tech pacesetters in the one precinct.

South Australian Minister for Energy and Mining Dan van Holst Pellekaan (left) overlooking the Tonsley roof with Enwave Australia Chief Executive Officer Cameron Evans and ZEN Energy Chief Executive Officer Marc Barrington (right).

South Australian Minister for Energy and Mining Dan van Holst Pellekaan said the District Energy Scheme demonstrated South Australia's leadership in the renewable energy sector.

"The solar energy installation will offset as much as 3500 tonnes of carbon dioxide emissions every year over its lifetime and is part of Tonsley's commitment to sustainability and innovation, as well as its Six Star Green Star Communities Rating.

"The system will optimise solar energy generation for the energy demands of the entire Tonsley precinct, enhancing security of energy supply and providing competitive energy pricing to all customer classes, including commercial and residential."

ZEN Energy is a division of SIMEC Energy Australia, which is part of Sanjeev Gupta's GFG Alliance.

ZEN Energy Chief Executive Officer Marc Barrington said the solar array was a national landmark energy project.

"The array will work hand in hand with a range of other technologies in the Tonsley District Energy Scheme to showcase how the benefits of renewable energy can be integrated across an entire community, which we're really excited about," he said.

The scheme will later expand to include the provision of recycled water for non-drinking purposes and natural gas for residences in Tonsley Village.

An $11.4 million hydrogen park is also being developed at Tonsley as part of South Australia's Hydrogen Action Plan. It will utilise a 1.25MW Siemens electrolyser to produce 100 per cent hydrogen from electricity as the first Australian demonstration project of its scale and size. By mid-2020 small quantities of renewable hydrogen will be produced and blended into the local gas distribution network.

South Australia already leads the nation in the uptake of wind energy and roof-top solar with renewable sources accounting for more than 50 per cent of the electricity generated in the state.

Veolia Australia and New Zealand project wins Global District Energy Climate Award

Veolia and the University of the Sunshine Coast's (USC) renewables district cooling and storage project has received global recognition at the *2019 Global District Energy Climate Awards* in Iceland. Supported by United Nations Environment Programme, the awards recognise world class environmentally sustainable and innovative District Energy schemes.

The awarded category, *"Out of the Box",* sought initiatives demonstrating significant innovation in the District Energy sector. The winning project reduces the carbon footprint of the Sunshine Coast campus by 42 percent by integrating an 8.2 megawatt cooling plant, 2.1 megawatt of rooftop and car park solar with a 4.5 megalitre chilled water storage tank and sophisticated controls.

The system is expected to save the University more than $100 million in energy costs and 100,000 tonnes of carbon emissions over the coming 25 years.

Veolia Regional Energy Services Manager Andrew Darr said winning this award on a global stage reaffirms how innovative the project is, and how the two organisations are truly challenging the current state of energy consumption and carbon emissions from large buildings and precincts.

"The partnership exemplifies the sustainable and innovative cultures of both organisations, but more importantly, shows others the transition to a sustainable future can be done in an economically viable way when the power of collaborative partnerships is harnessed," he said.

"The renewables district cooling and storage project at USC has been so successful we are certainly looking to roll out similar schemes in future."

USC Chief Operating Officer Dr Scott Snyder added USC has a plan to be completely carbon neutral by 2025, which is a challenge to any budget because it requires significant changes to the way energy is captured and consumed.

"So, we really did have to think out of the box, and by forming a partnership with Veolia, we were able to negotiate a 10-year plan that suited us both and delivered major energy savings to the University," Dr Snyder said.

The award was received in Iceland by Veolia's Global Key Offer Manager, Angel Andreu.

More about the award and the project is available via the District Energy website at: **www.districtenergyaward.org/category/awards/19gdeca**

Growatt Launches XH Battery Ready Inverter

Solar storage is becoming the hot topic in Australia's transition to renewable energy. However, many people are still hesitant about whether to install PV system with battery storage due to expensive batteries and large investments. According to solar technology company Growatt, the now claim to have the ideal solution to the situation.

"This newly launched XH battery ready inverter MIN 2500-6000TL-XH is the future-proof PV solution for users!" said Growatt Vice General Manager Frank Qiao at the product launch event.

"It has a battery interface that can be easily extended later to a storage system without extra retrofit cost. This is ideal for homeowners who want to convert their rooftop PV systems into solar storage systems in the future."

The XH inverter ha a range of up-to-date features that make it more appealing to customers. At first glance, its compact design with OLED display and touch button is very elegant and modern.\

"We use light and flame-retardant materials for the case, lower power consumption OLED display and much more durable touch button. Installers and end users will have better experience," said Qiao.

Taking a closer look at the inside of the inverter, Growatt's advanced PV technologies were revealed.

It has invisible cable routing and patented inductance technology, which optimise heat dissipation for the inverter. This makes the XH inverter ideal for use in harsh operating conditions, such as salty air, humidity, high and low temperature etc.

"The reliability and quality of XH inverter are ensured by Growatt's Five Quality Engineering System: design engineering, component engineering, test engineering, reliability engineering and manufacturing engineering," Qiao continued.

"Looking ahead, there's no doubt that the market of solar + storage has large potential in Australia. With the development of battery technology and the continued reduction in cost, more Australian households will install PV storage systems. And our XH inverter provides the best solution for them to get ready for the future," Qiao concluded.

Renewable hydrogen could power Moranbah ammonia facility

The world's largest green ammonia plant powered by renewable hydrogen could be built in Queensland, thanks to support from the Australian Renewable Energy Agency (ARENA). On behalf of the Australian Government, ARENA recently announced $980,000 for Dyno Nobel Moranbah Pty Ltd (Dyno Nobel), a business of Incitec Pivot Limited, to conduct and assess the feasibility of building a renewable ammonia facility at its existing Moranbah ammonia plant.

This project is aligned with ARENA's new investment priorities focused on accelerating hydrogen in Australia and helping industry to reduce their emissions, which are geared towards future proofing our energy system and economy and helping to further unlock the vast renewable resources Australia has on offer.

If feasible, the proposed green ammonia facility would include up to a 160 MW electrolyser and 210 MW solar farm co-located at Moranbah. Dyno Nobel's Moranbah facility currently operates a modern ammonia plant employing 50 people and manufactures more than 360,000 tonnes of ammonium nitrate annually for supply to mining customers.

The company currently uses natural gas as its feedstock to make hydrogen for ammonia.

The $2.7 million feasibility study will look at the potential to use renewable hydrogen produced via electrolysis to increase ammonia production at its facility to meet increased demand in the region for ammonium nitrate.

Ammonia production is the largest use of hydrogen, consuming half of total global hydrogen supplied production.

This is the second ARENA-funded feasibility study looking at how renewable hydrogen could produce ammonia, after it was also announced today that Queensland Nitrates would also investigate building a renewable hydrogen ammonia plant at their existing facility in Moura.

ARENA CEO Darren Miller said this was the first step to decarbonising the ammonia sector, and would also help to progress the commercialisation of renewable hydrogen for domestic and international use.

"Hydrogen is a huge opportunity for Australia, both for domestic use and as an export opportunity - and we believe that you cannot realise the export potential without a domestic market, which is why ARENA is looking to fund renewable ammonia and other domestic applications."

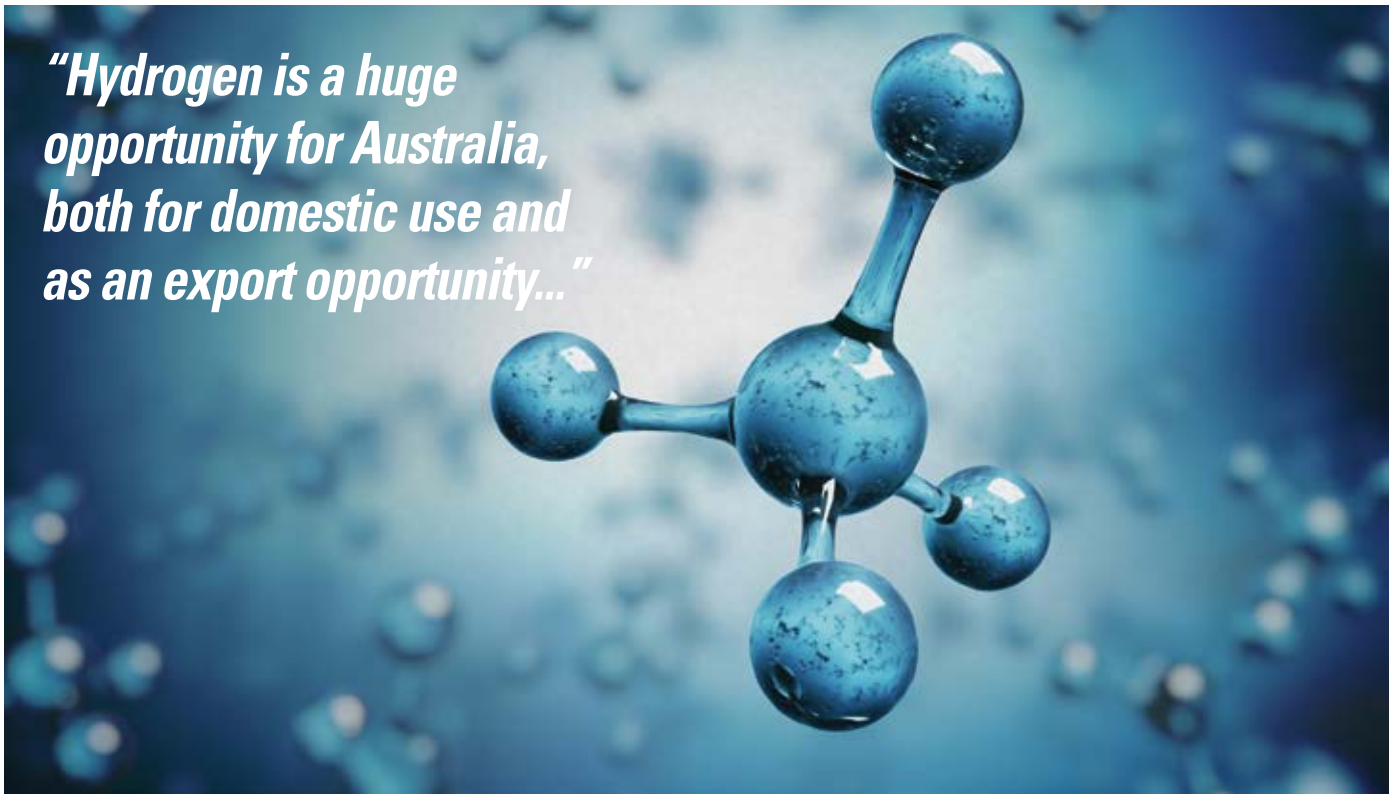
Mr Miller said ARENA has identified ammonia sector as a key user of hydrogen and one that represents a significant opportunity to deploy renewable hydrogen technologies.

"As ammonia already uses hydrogen, ammonia production at large scale is an ideal opportunity for us to begin exploring the pathway to lowering emissions through the use of renewable hydrogen as it already uses hydrogen in an industrial application, and has existing supply chains and end users," he said.

"Given ammonia production is an energy-intensive industry that accounts for one per cent of global emissions, this project could also help the ammonia industry to reduce its emissions by switching to renewable hydrogen," he said.

Tim Wall, President Global Manufacturing Incitec Pivot Limited said: "The aim of the feasibility study is to determine whether renewable hydrogen can be produced in a way that makes commercial sense to support expanding our Morandbah manufacturing facility in central Queensland.

"We are pleased to be working with ARENA to determine whether we can lower the cost of producing renewable hydrogen at industrial scale, which would support local industry and jobs, and reduce our carbon footprint."



Renewables Cover Nearly 43 Percent of Electricity Consumption in Germany

Renewable energies collectively covered 42.9 percent of gross electricity consumption in Germany during the first three quarters of 2019. An increase of nearly five percentage points over the same period last year (38.1 percent), this is a new record. Notably, renewables' share climbed as high as 52 percent during an unusually windy March. The Centre for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW) and the German Association of Energy and Water Management (BDEW) arrived at these figures in an initial assessment. If wind and solar energy yields in the fourth quarter are in line with the last few years' average, renewables' share could amount to a good 42 percent in 2019.

"It is very gratifying to see renewables growing so strongly and the use of conventional energy sources steadily declining. However, the record figures stand in sharp contrast to the dramatic situation in the expansion of wind energy. We are sliding into a real recession for a lack of land and increasingly prohibitive distance regulations. If politicians don't ease off the brakes on the expansion of wind farms, we are going to fall well short of the 65 percent target," says Stefan Kapferer, Chairman of BDEW's General Executive Management Board.

"Achieving that 65 percent target will require more than just wind power; we also need photovoltaics as a second pillar," says Prof. Dr. Frithjof Staiß, Managing Director of ZSW. "If the photovoltaic expansion doesn't start picking up speed soon, we are only going to make it halfway to the recently set goal of doubling the installed capacity to 98 gigawatts in eleven years. This is why we also need effective measures to drive the expansion of solar power."

Renewables eclipse coal

Solar, wind and other renewable sources generated around 183 billion kilowatt hours (kWh) of electricity in the first three quarters of 2019 (Q1-3 2018: 166.5 billion kWh). Renewables accounted for nearly 50 percent more energy production than lignite and bituminous coal, which contributed 125 billion kWh (Q1-3 2018: 171.1 billion kWh) to the total. During this period last year, renewables and coal accounted for close to the same share. By contrast, natural gas-fired electricity production rose by more than 11 percentage points to 66 billion kWh, which is mainly attributable to the higher price of CO2 (Q1-3 2018: 59.4 billion kWh).

Onshore wind power remained the leading source of renewable energy in the period under review with nearly 72 billion kWh (Q1-3 2018: 61.4 billion kWh). Photovoltaics came in second with around 41 billion kWh (Q1-3 2018: 39.2 billion kWh). The amount of electricity generated from biomass remained unchanged at just over 33 billion kWh (Q1-3 2018: 33.4 billion kWh). Offshore wind posted the steepest growth, rising 31 percent and contributing nearly 17 billion kWh to electrical power generation in the first three quarters of the year (Q1-3 2018: 12.9 billion kWh). Another prolonged dry period left the hydropower share low at around 16 billion kWh (Q1-3 2018: 14.8 billion kWh).

Sensei masters in-situ groundwater monitoring

A new groundwater sensor system developed by Australia's national science agency, CSIRO, will make environmental monitoring faster, more reliable and less labour intensive for the resources industry.

SENSEI is an advanced in-situ sensor system that gives mining operators and water managers real-time data to monitor and manage groundwater impacts efficiently and faster than ever before.

Replacing labour-intensive manual monitoring techniques, SENSEI is a multi-sensor system capable of simultaneously collecting data on pH, reduction potential, temperature and conductivity.

CSIRO Research Leader, Dr Kathie McGregor, said the SENSEI system offers a revolutionary solution to groundwater monitoring methods currently used.

"SENSEI is an automated system which delivers reliable groundwater data in real time saving companies time and money on labour from traditional manual monitoring approaches," Dr McGregor said.

The solid-state multi-sensor array features CSIRO's patented pH sensor and reference electrode innovation based on advanced sensor chemistry and materials. The robust sensor unit can be embedded into groundwater wells and aquifers and deliver continuous data for months without the need for manual calibration or maintenance. Third-party sensors can also be integrated into the systems attached to the solid-state multi-sensor array.

With real-time analytical capability, SENSEI can provide early alerts so companies can mitigate environmental issues arising in groundwater management.

"Because data can be accessed immediately on-site or remotely via the cloud, the user has the ability to detect any anomalies quickly and take action as soon as possible," Dr McGregor said.

SENSEI has been built to withstand extreme environments and has already been successfully trialled at Heathgate Resources' Four Mile West mine in South Australia.

"We've been able to test SENSEI's performance in a real-world setting and are pleased to report the system is still operational after almost 12 months of testing in the field," Dr McGregor said.

SENSEI has been designed and tested for use in groundwater monitoring but could be adapted for other applications which need chemical and physical monitoring in extreme environments.

SENSEI helps solve challenges associated with environmental monitoring and resource performance through innovative science and technology.

CSIRO is now looking for partners to bring the technology to market.

SENSEI is an autonomous off-grid system which delivers continuous data streams from remote locations. Powered by a solar panel, the data is transmitted via an internet connection direct from the source and into the digital cloud, giving user the ability to access and analyse the information on-site or from farther afield.

Climate change is this year's main driver of tariff changes

The global price of water rose by 3.3% to $2.19 last year according to Global Water Intelligence's *2019 Water Tariff Survey,* sponsored by engineers Arup and Black & Veatch. Behind the headline increase there were a number of cities that chose not to change their tariffs and a handful of alarming increases.

The benchmark tariff in South Tarawa (Kiribati) increased by 394% to $5.72/m³ to help pay for a new desalination plant on the island which has become necessary because its natural freshwater resources are threatened by climate change and growing urban populations. The need to finance climate change adaptation is an underlying driver of tariff increases in many parts of the world including Australia – which is battling a long drought – and Germany where utilities are needing to finance stormwater investment.

In Windhoek (Namibia), NamWater increased combined rates by 9.9% to cover the cost of buying bulk water, as the area struggled through a period of drought. Water shortages have led to utilities unable to provide water in India, particularly Chennai and Bangalore, which led to tariff increases for private water tankers.

The Tariff Survey calculates changes to the price of urban water, wastewater and stormwater in 558 cities across 184 countries, based on a benchmark of an urban household of four living on a property with a 200 m2 impervious area and using 15 m3/month.

The price of water is typically a function of the operational cost of providing it, the capital cost of investment programmes and the level of taxpayer subsidy offered to keep rates low. South Asia has the most heavily subsidised water in the world, while tariffs in North America and Northern Europe typically cover both capital and operating costs. A reduction in the subsidy available to Egyptian utilities explains the tariff hikes in Alexandria and Cairo.

"Climate change is starting to be felt in water tariffs. That reflects the fact that its first and most significant impact is on the world's water systems through the growing intensity of droughts and floods," commented Christopher Gasson, GWI's Publisher.

"Water utilities are at therefore the front line of adaptation, and they are starting to pass those costs on to their customers. We are seeing a fair amount of creativity in the way they do that, with special scarcity pricing being used to reduce demand during droughts, and new stormwater management tariffs being introduced to address the wet side of climate change."

High pesticide concentrations continue to enter Great Barrier Reef

The combined toxicity of 22 of the most common pesticides found in waterways flowing into the Great Barrier Reef is in many cases not meeting pollution reduction targets. University of Queensland researchers, along with the Queensland Department of Environment and Science, reached the conclusion after devising a new method to estimate the percentage of species protected in waterways that discharge to the Great Barrier Reef.

School of Earth and Environmental Sciences' Associate Professor Michael Warne said research looking at cumulative impacts and multiple stressors was critical for the reef's health.

"We've known for a while that rivers and creeks that discharge to the reef usually contain multiple pesticides," Dr Warne said.

"Different pesticides affect different organisms, for example, herbicides will affect organisms that photosynthesise – such as seagrass, corals, mangroves and algae – while insecticides affect insect larvae in freshwater and crustaceans – including crabs, prawns and lobsters.

"Previously, assessments of the risk posed by pesticides have only examined pesticides individually, or estimated the toxicity of a couple of pesticides during a single day.

"As part of this project we have developed a method that allows us to estimate the combined toxicity of up to 22 of the most common pesticides found in waterways that discharge to the Great Barrier Reef, and to do this for the entire wet season."

The team applied this method to all pesticide monitoring data for rivers and creeks discharging into the reef.

"We then obtained data on land-use, spatial and hydrological variables for each catchment where we had pesticide monitoring data," Dr Warne said.

"From there, we estimated pesticide mixture toxicity and the percent of species protected for the entire Great Barrier Reef catchment area (GBRCA), the six natural resource management (NRM) regions that make up the GBRCA and individual waterways."

The research revealed that the pesticide reduction target in the Reef 2050 Water Quality Improvement Plan is not being met, with 97 per cent of species being protected across the entire GBRCA, compared to the plan's 99 per cent target.

There were marked differences in the risk that pesticides posed between the six NRM regions. Dr Warne said it was estimated that only the Cape York region met the target.

"The estimated per cent of protected species for individual waterways was highly variable, going from greater than 99 per cent to as low as 71 per cent, again emphasizing the need for ongoing work to reduce the risk posed by pesticides."

By having estimates of the risk posed by pesticides for NRM regions and individual waterways, governments, farmers and conservationists can recognise which areas pose the greatest risk and where to maximise efforts.

"More work is needed across the entire GBRCA to reduce the risk that pesticides pose," Dr Warne said. "All stakeholders need to come together to reduce pesticide concentrations in waterways through better management practices or by using less toxic pesticides."

The research has been published in two reports available on the Reef Water Quality Improvement Plan website: **www.vision6.com.au**

OPEC systems PFAS remediation technology takes out top award at Australian technologies competition

OPEC Systems' innovative SAFF multi-stage PFAS remediation system is a game changer for PFAS remediation and has been acclaimed for its all-round global potential.

OPEC Systems received the *'Australian Advanced Manufacturing'* Award, before taking out the overall 2019 *'Australian Technology Company of the Year'* award for its innovation in environmental remediation at the Australian Technologies Competition held at the MCG on 29 October.

"Like a lot of the small business success stories, OPEC Systems is an overnight success that's been twenty years in the making," said Managing Director, Pete Murphy, after receiving the award from presenter and radio personality James O'Loghlin.

"While we have been working on this technology for several years, it's an interesting alignment that we were recognised for our innovation in PFAS remediation on the same day that the largest class action in Australia's history for PFAS contamination was announced," he said.

OPEC's *Surface Active Foam Fractionation technology* (SAFF) is a game changer for PFAS remediation and has been acclaimed for its all-round global potential by award organisers.

"PFAS contamination is a problem worldwide, but Australia has emerged as a leader in this space, and the rest of the world is looking on with interest," he said.

"SAFF is the only physical separation process for PFAS remediation which has proven successful on a commercial scale anywhere in the world," he said.

"Our objective has always been to create a simple, replicable and low-cost solution that produces a miniscule amount of waste with zero environmental harm. SAFF leverages the natural physiochemistry of PFAS molecules to bond to the surface of air bubbles and is an efficient, sustainable and rapid system in comparison to other technologies."

The heart of SAFF technology is its use of fine air bubbles to collect and remove PFAS. Using air, the priority PFAS compounds are floated to the surface and 'foamed' out, with water purified to below drinking water guidelines and target PFAS compounds removed to below detectable limits. The modular and scalable properties of SAFF mean that it can be easily transported and upsized for large volume remediation.

OPEC's PFAS remediation technology was one of only three selected from hundreds of applicants to construct a full-scale water treatment plant at Army

OPEC Systems Managing Director, Pete Murphy with presenter James O'Loghlin.

Aviation Centre, Oakey. This site became operational in April 2019 and is capable of processing over 250,000 litres of PFAS impacted groundwater daily.

Pete Murphy said that simply making the final sixteen from more than 200 original entries at the Australian Technology Competition was an honour given the inventiveness on show in areas such as software development and both medical and agricultural technology.

"These latest awards come hot on the heels of our recent award as Defence Innovator of the Year at the Australian Defence Industry Awards in early October," he said, "so our profile is gathering serious momentum on the world stage."

"While awards of this nature are enormously gratifying, they also acknowledge the commitment of our entire team. We've had to back ourselves through some lean times and retain faith in the concept. Aside from the obvious commercial reasons, we've stuck at it as we recognise the extent of global PFAS contamination, and that our efforts offer real hope for communities living near PFAS plumes."

PFAS is an international problem. The EPA has identified more than 1,000 sites in NSW alone, and there are thousands of hot spot sites across Australia, and hundreds of thousands worldwide. Its presence relates primarily to sustained and concentrated use of aqueous film forming foam (AFFF) at fire training sites between the 1960's and the early 2,000's.

The Australian Technologies Competition is sponsored by the Department of Industry, Innovation and Science. The process of entering the awards involved presentations and attendance at training, mentoring and networking events. The award ceremony was preceded by a 'pitch' event where finalists battled it out in front of judges, the investment community and a live audience.

ABOUT OPEC SYSTEMS

OPEC Systems is a privately-owned Australian environmental engineering company specialising in site remediation, disaster response, and commission and supply of specialist equipment. The business is centred on provision of specialist services within hazardous and complex contaminated environments.

OPEC Systems was first established in Australia in Sydney in 1992, and currently employs over 90 staff. It operates in all Australian States and Territories with workshop and warehouse capabilities to support major projects.

FACT SHEET

THE SAFF PROCESS

SAFF is a multi-stage PFAS remediation process which broadly includes:

- pre-treatment – the installation of groundwater extraction wells, adjustment of water chemistry to optimise PFAS extraction efficiencies and the removal of cross contaminants and dissolved and suspended solids;
- a multi-stage, foam fractionation procedure to rapidly remove 100 per cent of target PFAS contaminants from the influent;
- application of vacuum and solar heat processes to create a PFAS rich hyper-concentrate semi-solid;
- use of final ion exchange resin technologies to remove any remaining PFAS in the treated water;
- safe return of clean water to the environment following final analysis to confirm contaminants are below the drinking water guidelines.

WHAT IS PFAS?

PFAS is a group of manufactured chemicals used worldwide since the 1950's to make products that resist heat, stains, oil/grease and water. Until around 2004, PFAS compounds were present in aqueous film forming foam (AFFF) which is a fire fighting foam used worldwide and at many sites within Australia to extinguish fires.

PFAS chemicals are also used in non-stick cookware; fabric, furniture and carpet stain protection applications; food packaging and many industrial processes.

Over decades, PFAS chemicals work their way through soil to reach the groundwater beneath. PFAS compounds are generally very stable and do not break down in the environment.

PFAS chemicals are known as an 'emerging contaminant', and their specific impact on the environment and humans is still being reviewed. PFOS is one of two chemicals listed in Annex B of the Stockholm convention on Persistent Organic Pollutants – the other being DDT[1] . Concerns relate to their characteristics of persistence, bio-accumulation and toxicity. Within the human body, PFAS substances bind to fat proteins and are retained for a prolonged period. Some studies in humans have suggested that PFAS may affect the development of foetuses and young children leading to possible growth, learning or behaviour problems[2]. Other studies have pointed to possible links to cancer[3], immune system disorders[4] , thyroid dysfunction and fertility problems.

According to NSW Health, people living in PFAS affected regions are advised to:

- avoid using groundwater or surface water for drinking or cooking;
- avoid swallowing ground or surface water when swimming/bathing; and
- avoid eating home grown food such as vegetables, fruits, home slaughtered meat and poultry, eggs and milk cultivated from contaminated water; and modify their intake of fish and seafood from contaminated areas.

In April 2017, Food Standards Australia and New Zealand updated their standard on safe levels of PFOS in drinking water from 0.5 micrograms per litre to 0.07.

Within Australia, PFAS contaminants have been identified at hundreds of sites around the country where fire training has been undertaken. Locations include defence bases, airports and industrial sites.

REFERENCES

1. The New POP's under the Stockholme Convention <http://chm.pops.int/TheConvention/ThePOPs/TheNewPOPs/tabid/2511/Default.aspx>
2. Associations of Perfluoroalkyl Substances (PFAS) with Lower Birth Weight: An Evaluation of Potential Confounding by Glomerular Filtration Rate Using a Physiologically Based Pharmacokinetic Model (PBPK). Environ Health Perspect. 2015 Dec; 123(12): 1317–1324.
3. Serum levels of environmental pollutants is a risk factor for breast cancer in Inuit: a case control study. BiomedCentral. Environmental Health 2017. www.ehjournal.biomedcentral.com/articles/10.1186/s12940-017-0269-6
4. Pre-natal exposure to perfluoroalkyl substances may be associated with altered vaccine antibody levels and immune-related health outcomes in early childhood. Journal of Immunotoxicology , Volume 10, 2013 - Issue 4: 373-379.

Climate change drives new focus on Tank top protection

As Australia's drought deepens and the UN warns of the worsening effects of climate change, local industries are moving to protect their water and process fluid tanks from heat stresses, high winds, evaporation, airborne pollution and wastage.

"Tanks now are being built to hold their contents more safely and securely than ever before, and protect it for longer and in more challenging operating environments," says tank bearing engineer and manufacturer Mr David Booty, Manager, Hercules Engineering (a division of Cut To Size Plastics).

Steel, concrete and fibreglass water and industrial fluid tanks need secure roofs that can withstand expansion and contraction caused by factors such as increasing climatic and load variations, says Mr Booty, whose company is currently supplying bearings for roofs to protect tanks with surface areas as large as 10,000m2 (100m x 100m, holding 90ML of water - the equivalent of 36 Olympic pools).

He says such protection is needed for even larger tanks used by industry for applications as diverse as potable, process and firefighting water.

"They can hold upwards of 10, 20 or even 30,000 tons of liquid that must be protected from the elements and from pollution to safeguard it for use in water, wastewater, emergency fire protection and high purity industrial processing applications."

A challenge facing developers and operators of buildings and processing plants for industrial and municipal uses is ensuring their top structures can flexibly cope with internal movement from climatically induced expansion, contraction and wind and rain forces. They also must cope with stresses caused by heavy and changing loads, vibration and other factors encountered within diverse industries – as well as dust, bird droppings, rain-borne impurities and other airborne pollutants that can affect tanks used by industries in remote, rural and grimy urban settings, including industries such as agriculture and primary production, energy, oil and gas, ports and infrastructure, food and beverage, manufacturing, materials handling, water and waste water utility and emergency services.

"Light but strong and flexible tank tops are now widely employed to protect tanks and their contents from external pollution. The bearings used under these tops must not only support the structure, but also prevent it from cracking and breaking and becoming part of the pollution problem."

One cost-efficient solution to many such issues is offered by Hercules Engineering through its range of *Herculon* Type D Tank Top Bearings (HLD/TT), which are custom designed for easy installation under roof beams of tank tops and other lighter structures, including some building roofs.

"These low-friction easy-slip bearings are particularly useful where loads are relatively small but both lateral and uplift forces need to be accommodated," says Mr Booty.

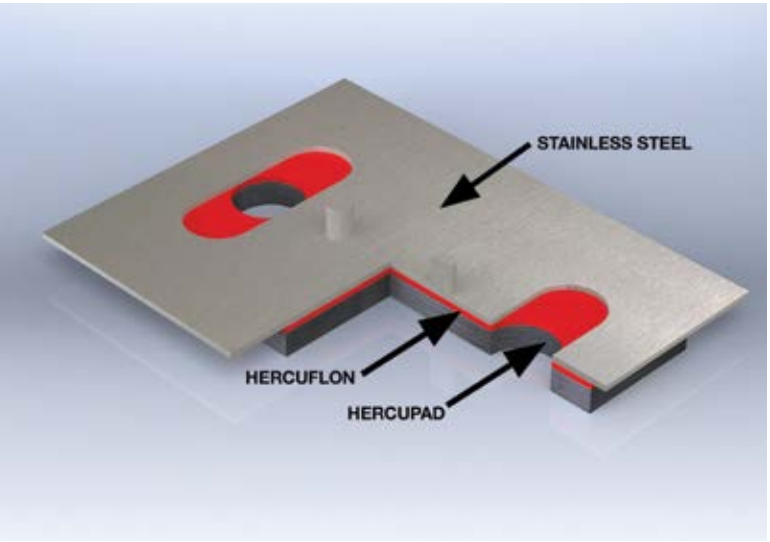
"Light but strong and flexible tank tops are now widely employed to protect tanks and their contents from external pollution. The bearings used under these tops must not only support the structure, but also prevent it from cracking and breaking and becoming part of the pollution problem."

HLD/TT bearings are part of a proven range of Hercules composite slip joints and structural bearings for a wide variety of structures and weights incorporating engineered high-performance combinations of engineered thermoplastics and metal facing surfaces. Complementary Type D Herculon Bearings HLD/SG are designed to accept a lateral load of 30 per cent of the vertical rated load, which can be up to 600 kN per bearing in stock sizes, with higher capacity available custom-engineered for particular applications.

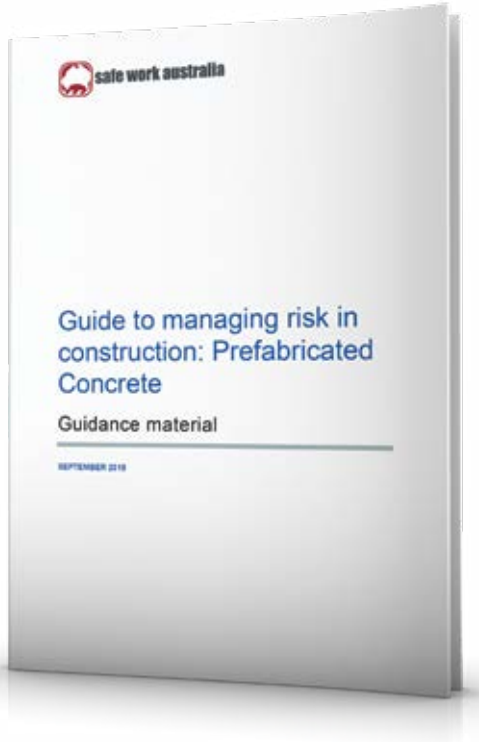
HLD/TT bearings consist of a thin stainless steel slide plate with two stainless steel studs flash welded to the upper face. The lower face is highly polished, and the plate is provided with two slotted holes for uplift through-bolts. This plate slides against a Herculon-coated Hercupad, which has two clearance holes drilled into it. Characteristics include:

- Five stock sizes in working loads from 50-70 kN. Larger capacities and different dimensions can be custom engineered.
- Co-efficient of friction 0.05-0.08, depending on stress
- Expansion capacity up to ± 20mm (can be custom designed for larger movements)
- Maximum rotation up to 0.01 radians
- Maximum temperature 80 deg C

For further information, please contact Mr David Booty, Manager, Hercules Engineering (a division of Cut To Size Plastics), Phone: +61 (0)2 9681 0400 or Email: davidb@cuttosize.com.au



Herculon Type D Tank Top Bearings (HLD/TT) Bearings featuring stainless steel top, with Hercuflon centre and Hercupad base.



CONSTRUCTION OF DRAINAGE AND WATER MANAGEMENT SOLUTIONS COVERED BY NEW SAFETY GUIDE

Australia's peak safety authority Safe Work Australia, has released a new *Guide to managing risk in construction: Prefabricated Concrete. The Guide* will assist duty holders to understand their responsibilities when using precast concrete elements on civil sites.

National Precast Concrete Association - the national industry body for precast concrete - has welcomed the document's release. The development of the Guide, along with Part 3 of AS 3850:2015 *Prefabricated concrete elements* (which is currently being finalised by Standards Australia's BD 066 committee), were prompted by a tragic fatality several years ago involving a soakwell lid.

"There is never an excuse for incidents on construction sites that cause fatalities," according to National Precast's CEO Sarah Bachmann. "We all deserve to go home to our loved ones after a day's work".

She explains that Robert Sarjeant, a rigger working on a building site in Karratha WA, was tragically killed in July 2013 when an 800kg soakwell lid fell 2 metres as it was being lifted.

The industry body assisted the Coroner in understanding industry lifting processes at the time.

The Coroner found that Mr Sarjeant wrongly attached 2.5 tonne lifting clutches to 1.3 tonne anchor pins on an unstable load and then did not ensure that he was out of the fall zone. That resulted in the load rotating, causing the clutches to slip off the anchor pins and allowing the load to fall onto the deceased.

"The best we can hope for when tragedies like this occur, is for everyone to learn from them and for practices to change," Ms Bachmann adds.

"We were delighted when the Coroner supported our recommendations to extend AS 3850:2015 to civil construction and to update the National Code and extend it as well to the civil space," she says.

"That prompted us to initiate a project proposal for Standards Australia to extend AS 3850:2015 and to push for the Code to be updated.

"The proposal was accepted. Part 3, which will apply to the use of prefabricated elements in civil construction, is almost complete, and Safe Work has now released the Guide to replace the Code. It is good to see progress in the right direction, although it always seems to take longer than it should. We are hoping for speedy action to finalise Part 3," Ms Bachmann adds.

"These two documents will fill the void of information to assist with the safe use of precast on civil construction sites," Ms Bachmann comments.

"The new Safe Work Guide is one step closer to helping everyone in civil construction understand their responsibilities in so far as safety is concerned," she says.

Anyone who works with precast concrete is the main target of the new Guide, and Ms Bachmann says that all stakeholders should familiarise themselves with the document and understand their responsibilities.

The Guide provides national guidance material for duty holders in the construction industry and applies to both building and civil projects. It provides information on managing risks and work health and safety (WHS) duties associated with working with prefabricated concrete. All prefabricated concrete elements are covered by the Guide – both factory-manufactured precast and site-cast tilt-up – with the exception of small products like concrete blocks, pavers, fence posts and the like.

Guidance on planning, design and documentation, as well as the safe handling, transport, storage and erection of elements, is also included. There is also a series of Appendices which provide practical templates to assist with assigning roles and manage qualifications of stakeholders. A manufacture certificate of compliance and a useful pre-erection checklist are there as well.

The Guide is available for free download from the National Precast website: **www.nationalprecast.com.au**

"There is never an excuse for incidents on construction sites that cause fatalities. We all deserve to go home to our loved ones after a day's work."

National Precast CEO, Sarah Bachmann

AQUAGO TECHSUB ®

www.aquago.fr

Cost-effective and environmentally responsible solutions for the management and the rehabilitation of dysfunctionnal lagoons

GET 25 YEARS FREE ENERGY with every SUNGO

AQUAGO FIXES THE PROBLEMS OF DYSFUNCTIONAL LAGOONS

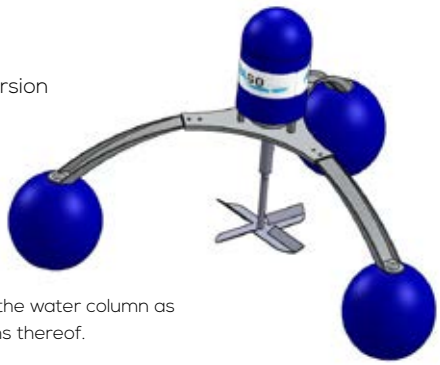
- Duckweed
- Odour Pollution
- Purifying Yield
- Purple Bacteria
- Lagoon in under-load
- Lagoon in over-load
- Anoxia
- Bacteriological thresholds exceeded

Certified ISO 9001 / ISO 14001 /OHSAS 18001 / MASE

We now are present and available in Australia !

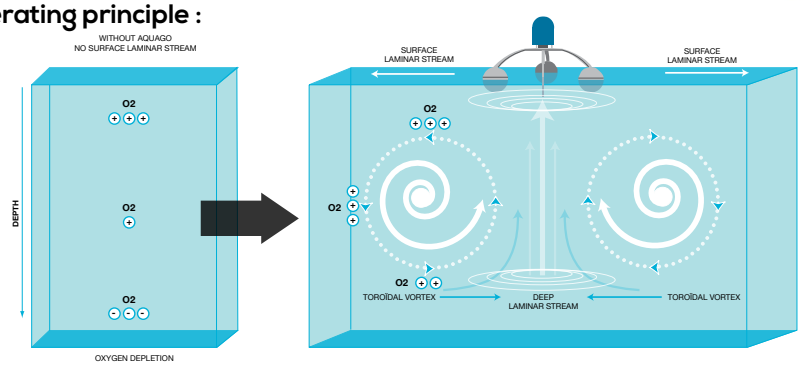
The AQUAGO® team has designed and developed the SUNGO® and SUBMIX® known as the most efficient and least costly solutions to treat and rectify lagoon dysfunctions while improving their purifying capabilities.

- Reduced maintenance
- No connexion to the grid
- Total autonomy in solar version
- Low energy consumption in electrical version
- Optimal mixing capacity
- Easy to install on all sites
- Robustness and durability
- Non resuspension
- Non additional mud production
- Up to 50% COD / BOD treatment



SUNGO is a vertical mixer which allows it to mobilize all of the water column as opposed to a conventional system which mobilizes portions thereof.

Operating principle :



SUNGO®
SYSTEM
Autonomous Solar Mixer
100% renewable energy

SUBMIX®
SYSTEM
Electric Mixer
Energy efficient

AQUAGO is a
TECHSUB INDUSTRIE ENVIRONNEMENT company

Xavier Delattre - Mobile: +61(0)449 851 971
australia@aquago.fr
Melbourne - Australia

Precast box culverts and link slabs play a major role in the series of roads that run over the waterways and wetlands to connect the Harpley community with the surrounding areas.

CULVERTS BENEFIT COMMUNITY AND WETLANDS

Project: Ison Road Culverts
Precast manufacturer: Reinforced Concrete Pipes Australia
Project location: Harpley Estate, Werribee, Victoria
Client: Lend Lease
Engineer: SMEC
Civil Contractor: Excell Gray Bruni

Located just under an hour's drive south-west of Melbourne between Werribee and Wyndham Vale, Harpley is a Lend Lease Communities development that is set to become an exciting destination for both its residents and the wider community.

Bordered by 60 ha of dedicated waterways and wetlands, the new Harpley Estate is part of a $250 million major upgrade to the area which will see Werribee as the 'Capital of Melbourne's New West'.

Designed to accommodate 4,000 homes and around 12,000 residents, the Harpley master plan stretches over 435ha and will comprise multiple facilities to suit. A retail neighbourhood shopping centre, schools, multiple waterfront cafés and restaurants, a community centre and flexible commercial sites will transform the area into a vibrant escape from the city, offering easy and direct access via the Princes Freeway.

To form a multi-cell culvert crossing over the wetland area, the box culverts were installed on link slabs measuring 1.8 x 1.8m.

Surrounded by sparkling waterways, Harpley Town Centre will offer a range of amenities including a major supermarket, convenient shopping, a primary school and a dining precinct with vibrant cafés and eateries. In addition, dedicated areas are proposed to include a health and wellbeing precinct, employment hub and a myriad of speciality services. *Image courtesy: Harpley / Lendlease*

PRECAST BEST ACCESS SOLUTION

Precast box culverts and link slabs play a major role in the series of roads that run over the waterways and wetlands connecting the Harpley community with the surrounding areas.

National Precast member Reinforced Concrete Pipes Australia (RCPA) were brought in as a part of the team in June 2019 during the early stages of the development plan.

According to RCPA management, precast concrete was chosen for the project for its safety and ease of construction, as well as its cost efficiency. The client was confident that the factory-controlled manufacturing environment would ensure a high quality product that would deliver outstanding durability and offer fast site installation.

"We supplied 95 reinforced box culverts and 57 reinforced link slabs for the Ison Road causeway that passes over wetlands, connecting commuters from Bulban Road on the southern edge of the development to the estate," Michael Faulisi, RCPA State Sales Manager, commented.

Measuring an enormous 1.8 x 1.8 x 2.4m, the box culverts were installed at the top of the link slabs to form a multi-cell culvert crossing. The link slabs measured 1.8 x 1.8m.

"RCPA was proud to play a part in developing this area, knowing we will be helping to bring benefits to the local community, while having a minimal impact on the wetlands that surround it," he adds.

The project will be constructed in multiple stages, with the completion of the overall development to be in 2023/2024.

MINIMISING ENVIRONMENTAL HARM

Reinforced concrete box culverts allow water to pass under a road or other structure and are recognised to cause minimal environmental harm to natural wetlands and their habitats. With their size and location designed to withstand high flows, they generally preserve the form of the stream bed and the channel width. They offer impressive durability and concrete mix designs can be tailored to suit harsh environments. They will not emit chemicals into their surrounding environment – critical when preserving vegetation and wildlife.

JJ Richards' food waste initiative delivers national potential for environmental advances

JJ Richards and Sons NSW/ACT Operations Manager Benjamin Martis, right, discusses the plant's waste management 28-ton receiving tanks and processing tanks with CST Wastewater Solutions Engineer Peter Bambridge.

Leading Australian waste management company JJ Richards & Sons is proving an environmental initiative in Sydney that eliminates landfill dumping of commercial and retail food waste by transforming it into valuable green energy and fertiliser. The company's custom-engineered waste reception centre at Seven Hills in Sydney's west - which its designers say has demonstrated potential to become a model for national use - processes pulped waste from its partner Pulpmaster's collection tankers into an easily handled and valuable resource for use in agriculture, horticulture and fossil fuel replacement.

The plant - which already handles bulk waste from major customers including supermarkets, food shops, hospitals, schools and catering facilities - uses CST Wastewater Solutions' KDS multi-disc fine screening and compaction technology as part of its automated process that turns the pulped waste collected into a cake form that is more than 50 per cent lighter and dryer than the pulp and which can be transported to users for half the cost of heavier and less hygienic output.

Waste producers using the system get monthly reports on how much they are saving on disposal costs, while simultaneously reducing their environmental impact. The material is used by farms and other agricultural enterprises as high potency fertiliser, and for the production of biogas to reduce their environment footprints, whilst simultaneously boosting their output with natural fertilisers and fossil fuel replacement green energy.

"The system has been brilliantly received by community-minded customers who are reducing their environmental impact, as well as by users of the cleaner greener energy and fertiliser coming out of it," says JJ Richards & Sons Pty Ltd NSW/ACT Operations Manager, Liquids, Mr Ben Martis.

"The system not only disposes of an environmental headache and cost for responsible businesses - including high landfill costs and the high cost of transporting waste to somewhere remote, secure and non-harmful - but turns the problem into an environmental asset – and a cost saver."

Heavy, sloppy food waste pulp going into the KDS solid-liquid separator (right) emerges as lighter, drier, more hygienic and more easily transportable waste cake (left).

"Businesses love getting the reports on the environmental benefits of their waste disposal and recycling, because they can demonstrate benefits to the community, while also saving themselves substantial measurable costs," says Mr Martis, who has been deeply involved in the design and proving of the Seven Hills plant.

The plant features twin 28-ton filtrate receival tanks and similarly large vessels to process waste to the pH levels most ideal for recycling uses and injection into the ground as fertiliser. The automated and highly reliable receival, processing and dispatch facility at Seven Hills features high speed drive-in pulp receival bays and treatment tanks for the thousands of tonnes of throughput delivered by Pulpmaster tankers. The system provides an environmentally friendly and cost-effective method of converting the collected mixed waste into pulp slurry for further processing into organic fertiliser and biogas.

This slurry passes from the Seven Hills treatment tanks through ultra-fine (1mm) screening from CST Wastewater Solutions, before passing through the KDS dewatering and liquid separation process, which transforms the sloppy pulp waste into a hygienic, compact and much lighter dewatered output. As well as being much easier to handle, the dewatered output costs around 50 per cent less than heavier wet waste to transport onwards to the end-users. This lighter and compacted output is automatically fed into 35-ton slide-out waste handling bins for loading onto JJ Richards onward delivery vehicles.

The KDS system is extremely reliable, and can be run continuously, with low energy consumption, to optimise output from the Seven Hills plant.

"There is a lot to like about the KDS system," says Mr Martis. "It has very few moving parts, high-efficiency dewatering operation, uses little energy and doesn't break down. It is a quality system."

CST Wastewater Solutions Engineer Peter Bambridge, who worked with Mr Martis in installing, commissioning and optimising the KDS technology at Seven Hills, says transport and handling of non-processed mixed food waste can be a killer cost for business.

"Not only do you have the OH&S and environmental issues of handling and disposing of heavy, sloppy waste, but also just transporting such material to dumps can cost $150 a tonne for the specialised transport involved."

"Whats more, the majority of the disposal facilities for wet waste, by their very nature, have to be established a significant distance from the urban source of the waste, so there are big costs involved," Mr Bambridge added.

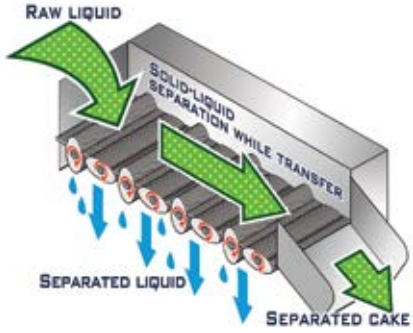
"The Pulpmaster system, combined with KDS processing, is such an intelligent alternative from JJ Richards."

Mr Martis says the fact that the JJ Richards system has now been proven in NSW – which has some of the strictest waste handling regulations in Australia – suggests that it is also eminently suitable to other areas of the country.

"This is a proven system now. We are handling huge amounts of food waste already, and the potential beyond that is far huger still. We are proud of the engineering that has gone into this system and want to see its benefits spread wider and wider," he concluded.

JJ Richards tankers based at Seven Hills in Sydney's west, transport the waste for processing through the Pulpmaster system.

In addition to custom-engineered applications such as JJ Richards', the KDS system can also be skid-mounted to manage separation and compaction needs on remote sites, saving waste transport disposal costs.



The unique self-cleaning action of the KDS separator, which is available in hydraulic capacities from 264-4092 gal/hr with input solids content of 2 per cent.

KDS Applications

The KDS separator provides an ideal solution for a wide range of applications, including:

- Food processing waste, including snackfoods, kitchen and restaurant waste, raw wastewater (primary screening) and sludge;
- Sewage treatment, including raw wastewater (primary screening) and sludge to landfill;
- Abattoir, feedlots, and dairy farm wastewater and sludge (Cattle manure cake dryness of 25-35 per cent is typically achieved);
- Pig farm raw manure and sludge, with cake dryness of 20-30 per cent;
- Barrel polishing water, water-based paint wastewater, grease trap waste, dyeing wastewater, waste oil, and plastic recycling;
- Seafood processing.

For further information in Australia or New Zealand, please contact Mr Michael Bambridge, Managing Director, CST Wastewater Solutions, T: +61 2 9417 3611, email: info@cstwastewater.com or visit: **www.cstwastewater.com**

ABOUT JJ RICHARDS

Evac is the world's leading provider of integrated water J.J. Richards & Sons Pty Ltd is a proudly Australian owned and operated family business that has been providing innovative waste management solutions throughout Australia since 1932.The Company has grown through its philosophy of safety, reliability and excellence in customer service.

Our commitment to establish and maintain a close, productive working relationship with our customers ensures we provide the most efficient and cost-effective service possible.

JJ Richards and Sons Pty Ltd is committed to minimising the amount of waste disposed in landfills and has developed several pioneering techniques in waste management systems. Our partner in food waste management, Pulpmaster Australia, helps us achieve this environmental commitment.

ABOUT PULPMASTER AUSTRALIA

The Pulpmaster Australia solution has been to introduce Pulpmaster 5000, an environmentally-friendly and cost-effective system which eliminates huge quantities of food waste from commercial establishments by converting the waste into pulp. The pulp slurry is then collected and processed into an organic fertiliser and biogas.

Pulpmaster Australia helps its customers save money by:

- Being a cheaper alternative to traditional waste removal in skip bins
- Helping staff improve their efficiency in food waste handling
- Enhancing kitchen space savings with fewer waste bins
- Reducing costs in the purchase of plastic bin liners

ACRS - The Australasian Certification Authority for Reinforcing and Structural Steels Ltd

When performance under pressure is critical, why take the risk?

When it comes to pipelines and pressure vessels, you need to be confident that your steel and bolts are up to the task.

ACRS provides **expert** and **independent** certification of steel and bolts to:

- AS/NZS 1252.1:2016 - High-strength steel fastener assemblies for structural engineering - Bolts, nuts and washers Technical requirements
- AS/NZS 1594:2002 - Hot-rolled steel flat products
- AS/NZS 3678:2016 - Structural steel - Hot-rolled plates, floor plates and slabs
- AS/NZS 5100.6:2017 - Bridge design - Steel and composite construction
- AS/NZS 5131:2016 - Structural steelwork - Fabrication and erection
- AS 3597-2008 - Structural and pressure vessel steel - Quenched and tempered plate

ACRS certification provides you with confidence that the steel and bolts you choose meet the Standards and are up to the task.

ACRS

JAS-ANZ

www.steelcertification.com

Ph: (02) 9965 7216 | E: info@steelcertification.com

ABN: 40 096 692 545

ACRS - Independent, Expert Third Party Certification & Verification of Reinforcing, Prestressing and Structural Steels for Compliance with Australian and New Zealand Standards

MADE IN AUSTRALIA

FOR TOUGH AUSTRALIAN CONDITIONS

MASTEC®

Because There is a Difference

www.mastec.com.au **info@mastec.com.au**

Head Office - Adelaide
6 Creswell Road
Largs North SA 5016
Ph: +61 8 8259 9700

Melbourne Branch
22 - 26 Ventura Place
Dandenong Vic 3175
Ph: +61 3 9798 0888

Perth Branch
3/6 Chullora Bend
Jandakot WA 6164
Ph: +61 8 9414 1827

New Zealand Branch
6C Lorien Place
East Tamaki, Auckland 2013, New Zealand
Ph: +64 21 878 334