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Contents

June/July 2021
Volume 47 Number 5



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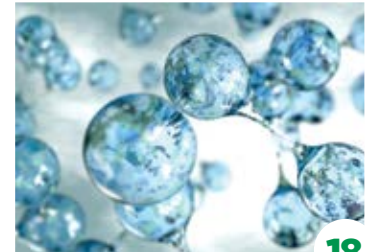
Registered by Australia Post
Publication No. 100001890
ISSN 1838-7098



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About the Cover

Scheduled to open in September 2021, the new CAWRA MRF at Kilburn in Adelaide's inner-north will enable CAWRA's councils to take back control of their recyclables. It also represents a significant leap forward in their efforts to maximise resource recovery and recycling, minimise waste-to-landfill and, most importantly, grow the local circular economy.

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



Finding the Right Balance for a Sustainable Future

Dear Readers,

While it is clear that the majority of Australians are now taking more of an active interest in their 'environmental performance' than ever before, it's perhaps not surprising to hear that many are confused about what impact Emission Reduction Targets, Renewable Energy Targets, Emissions Trading and even Carbon Levies will have on their lives – especially given the massive increase in energy costs that have occurred in recent years.

Put simply, many people are not only concerned about the impact of their activities on the planet, but also about the financial impact of the sustainability measures required to reduce this impact.

While few would question the importance attached to the rapid introduction of widespread and effective emissions reduction initiatives, there can be no doubt that one of the most difficult challenges will be that of finding the 'right balance' between environmental protection and fiscal responsibility. By that, I'm not only referring to the fiscal impact that emission reduction targets have on business operations and the impact that removing or lowering targets has on the renewables industry, but also, importantly, the direct impact that these initiatives have on the household budget of every Australian family.

Not surprisingly, for the average Australian, things are made even more confusing thanks to the constant flow of conflicting information and expert analysis as to the 'true cost and effectiveness' of renewables, including the ever-present arguments of 'reliability of supply'.

Environmental sustainability has always predominantly been about balancing the needs of the environment with the needs of human beings. Whether this balance relates to managing the amount of waste we generate and how we handle that waste, or to the amount of water and/or other natural resources we use and the pollution and by-products that we produce – one thing is clear - without balance, the effects and consequences can be both significant and far reaching, and in many instances, extremely difficult to overcome.

Importantly, this sense of balance must also be maintained when it comes to researching, developing and implementing methods and systems which are designed to improve our environmental performance and reduce our carbon footprint. We cannot simply 'cease to exist' in order to benefit the environment. No more than we can afford to ignore issues of environmental degradation simply because finding a solution to the problem(s) will be complex and/or expensive and/or will require a change in thinking and methods.

Finding the right balance for a sustainable future requires a holistic approach that considers all aspects of all activities (including the consequences) and, dare I say, takes into account the 'interconnectedness of all things' – including human beings.

With that in mind, it's also important to remember that 'shutting down the planet' is also not an option. Neither is taking an 'at any cost' mentality or, for that matter, ignoring the issue all together, or setting targets goals so low that they will, for all intents, have very little, or even no impact whatsoever.

Setting Australia's (and the world's) carbon reduction targets is a serious commitment that will undoubtedly impact each and every one of us on many levels. But it's not only about setting targets... we also have to work out (preferably in advance) how we intend to meet these targets.

There is, however, a limit to what people are willing to do and/or pay! And if the 'cost' is too high – either financially or in terms of 'inconvenience' we not only run the risk of losing critical public support for environmental reform, we also risk undoing much of the good work that has already been done.



Anthony T Schmidt
Managing Editor

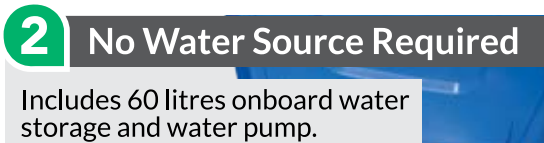
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Victorian EPA calls for a statewide asbestos register to stop regional dumping

Regional dumping of hazardous and toxic waste is on the increase in Victoria with high profile sites such as Lara and Lillimur at the forefront of the deadly practice.

The illegal dump at Lillimur in Western Victoria is under Environmental Protection Authority (EPA) investigation after it caught fire back in May and sent plumes of toxic smoke across the region. The site is located 15 Kilometres from the South Australian border and the dumping of such material in remote geographical areas is becoming more common across Victoria.

The EPA also managed the clean-up of an illegal dump in Lara. That left 192,000m³ of contaminated construction and demolition waste, containing small pieces of non-friable asbestos.

Newly appointed Environment Protection Authority Victoria (EPA) CEO, Lee Mieziis, said waste crime was one of his priorities for the north east of Victoria on his first visit to the region following his appointment.

Mr Mieziis said the Authority's regional presence will be strengthened as new regulatory powers and systems improve EPA's ability to detect and prevent pollution and prosecute offenders where pollution occurred or even had the potential to occur.

"From 1 July, the new Environment Protection Act will come into force giving EPA far greater powers but also making it

everyone's responsibility to prevent pollution before it occurs. This is a major step forward for all Victorians," said Mr Mieziis.

"EPA has invested in a new EPA Waste Crimes Prevention Directorate to coordinate our efforts against waste crime across the state, and the community can expect to see more strong regulatory action," Mr Mieziis added. "Victoria's environment will be better protected in the future."

"We have seen examples of waste being illegally dumped with the potential to do great environmental harm. I believe the community has no tolerance for such actions and rightly expect EPA to take action wherever it is detected," said Mr Mieziis when visiting the EPA Wangaratta office.

The EPA says regional areas are hotspots for waste crime in Victoria as they are isolated and harder to police.

Expert asbestos removalists believe an Asbestos register managed by the state or a system offering businesses tax breaks to properly dispose of hazardous material, is the only way to stop the mass dumping seen at places like Lillimur and Lara.

Grounds Maintenance Australia is one of the businesses in the running to help manage the removal of the tainted material at Lillimur. Stephen Marett, the Managing Director, says more needs to be done to encourage people to do the right thing with toxic waste.

"At the moment we are seeing tonnes of toxic material and tainted waste being dumped in some of the most beautiful parts of the state. It's going to continue to happen unless the state or federal government provides some incentive for people to do the right thing, apart from being caught and prosecuted criminally, this will continue to happen," said Mr Marett.

"I would like to see a small cash incentive of \$5,000 dollars for businesses or anyone who has waste containing Asbestos or similar hazardous materials to contact professionals like us to help them remove it rather than have people dumping it."

"People panic when they hear the word Asbestos and worry that they can't afford to remove it in a cost effective way. Businesses like us are able to help but if this continued illegal dumping happens, we could see people unnecessarily exposed to these substances," added Mr Marett.

"Another positive step would be to see the introduction of a statewide Asbestos register, so we can keep track of where it is stockpiled or might be present. This will allow the state to coordinate removal and disposal of such materials, if there is a cash incentive to declare its presence it might help people do the right thing," Mr Marett concluded.

The amended *Environment Protection Act 2017* came into effect in Victoria on 1 July 2021.

Victorian man penalised for plumbing work without licence

A Sunbury man has been ordered by the Sunshine Magistrate's Court to pay more than \$5,500 for performing plumbing work without a licence and providing false information.

As part of an adjourned undertaking to the court, Ryan Barnes has been required to pay the VBA \$4000, pay compensation of \$1000 and \$950 to his respective victims for money they had to spend to fix the work he did at their properties and to be of good behaviour for 12 months.

Mr Barnes was found to have breached the Building Act 1993 with two counts of undertaking plumbing work without a licence or registration, as well as one count of providing false information.

The VBA's Executive Director of Operations, Lynda McAlary-Smith, said Mr Barnes' actions caused considerable stress to his victims and had the potential to cause harm.

"Mr Barnes deceived his clients and performed work where there was a risk of serious injury or death," Ms McAlary-Smith said.

"If you don't follow the rules you will be caught, the VBA is ready to take action to protect Victorian consumers, especially the most vulnerable."

In 2017 Mr Barnes, who was working at the time for company PremiAir Flow, altered air conditioning ducts and installed zone monitors at a home in Taylors Lakes, north-west of Melbourne.

The property owners experienced subsequent ongoing issues with the heating and cooling in the house, including during the hot summer months.

In 2019 Mr Barnes, operating heating and cooling business Vortex, took it upon himself to install a gas heater and flue at the home of a 91-year-old resident in Airport West, also in Melbourne's north-west.

The flue was installed in a less than competent manner, with the flue not being adequately separated from a wooden truss, which had the potential to cause a fire.

In both matters, Mr Barnes performed plumbing work without a licence or registration.



When questioned by the VBA, Mr Barnes said that he was a licensed plumber and provided false licence and registration information.

The Court said the payments Mr Barnes was ordered to make as part of the adjourned undertaking were to send a signal to the wider plumbing industry.

"It is unfair to someone who has done an apprenticeship, done a course, who has paid the fees, that they can have (Mr Barnes) go and do the work that only they should be entitled to carry out."

Victorians wanting to engage a builder or plumber can visit: vba.vic.gov.au/find

The VBA has an online consumer resource portal with information for anyone who is experiencing issues with builders or plumbers. Visit: <https://www.vba.vic.gov.au/consumers/complaints>

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Delivering a greener and more resilient Melbourne

The City of Melbourne will invest more than \$60 million on expanding public open space, maintaining parks and gardens and water management as part of the draft Budget for 2021-22.

Lord Mayor Sally Capp said investing in parks, gardens and open spaces will create jobs now and help to build a better community into the future.

“We have set aside \$20 million for green space in Southbank because we’ve listened to the community and we know how critical it is in our most densely populated suburb,” the Lord Mayor said.

“We’ve also just completed a two year upgrade to one of the city’s most popular tourist attractions, the conservatory at Fitzroy Gardens. The \$800,000 upgrade has delivered 100 jobs and the conservatory will re-open next month with a tropical flower display.”

The Lord Mayor said there has been a huge increase in visitors to city parks, as people reconnect and gather outside after months of COVID-19 lockdowns.

“During the pandemic, we saw many more Melburnians rolling out their picnic blankets in our world-class parks and gardens. I hope people will continue to take advantage of our lush lawns and recreational facilities as the buzz comes back to our city,” the Lord Mayor said.

Environment portfolio lead, Councillor Rohan Leppert, said the City of Melbourne was investing heavily in new open space as well as taking care of our prized parks and gardens.

“Over the coming year we will invest \$27.5 million to keep our 480 hectares of parks and gardens flourishing, from Royal Park to Birrarung Marr,” Cr Leppert said.

“As well as the \$20 million Southbank Open Space reserve, we are publishing detailed capital works forward estimates for the first time. We’re allocating \$10 million for urban renewal area open space expansion in each of the next four years, showing our appetite to acquire land or improve existing land for public open space in places like Macaulay,” Cr Leppert said.

“We’re showing that we can deliver Greenline – the City’s flagship open space project – on top of our open space commitments for new local and neighbourhood parks in our urban renewal areas,” he said.

The draft Budget 2021–22 includes \$1.7 million for the annual tree planting program, which has planted than 30,000 trees across the municipality since 2012.

“Up to 10 jobs will be created planting a variety of trees until September. Our expert green thumbs will roll up their sleeves to deliver a more sustainable Melbourne,” Cr Leppert said.

This year’s planting program includes:

- 40 trees along Southbank Boulevard
- 14 large elms along Hotham Walk in Fitzroy Gardens
- 13 sweet gums on Exhibition Street as part of bike lane upgrades
- 11 new hackberry trees on Leveson Street in North Melbourne.

Cr Leppert said the city is planning to deliver another innovative sustainability project using renewable energy and batteries.

“There will be \$300,000 included in the Budget to deliver a pilot program to store renewable energy on a Council-owned site,” Cr Leppert said.

“We are immensely proud to be the first Australian capital city council powered by 100 per cent renewable energy, through our leadership on the Melbourne Renewable Energy Project,” Cr Leppert said.

“Every light on our streets, every treadmill in our gyms and every barbecue in our parks is powered by renewable energy.”

“We’re now looking at the feasibility of rolling battery storage sites out across the municipality, which could reduce the strain on our electricity distribution network and ultimately lower electricity costs for ratepayers.”

A further \$8 million will be invested to conserve stormwater and mitigate flooding.



Alcoa to investigate low emissions alumina

On behalf of the Australian Government, the Australian Renewable Energy Agency (ARENA) recently announced \$11.3 million in funding to Alcoa of Australia Limited (Alcoa) to demonstrate technology that can electrify the production of steam in its alumina refining process using renewable energy.

Australia is the world's largest exporter of bauxite and one of the largest exporters of alumina accounting for 15% of global alumina refining capacity. Alumina refining is an energy intensive process that uses high pressure steam to produce the heat required to process bauxite into alumina. Alumina can then be converted to aluminium in a smelting process. In 2019, alumina refining accounted for over 14 million tonnes of carbon dioxide in Australia, which represents approximately 24% of Australia's scope 1 manufacturing emissions.

The first-of-its-kind deployment in Australia is planned to be undertaken at Alcoa's existing alumina refining facility at Wagerup, Western Australia.

Approximately 70 per cent of the total fossil fuels consumed in alumina refining relates to the production of steam in boilers. Mechanical Vapour Recompression (MVR) is a potential alternative to produce steam using renewable electricity. MVR recompresses waste steam that would otherwise be exhausted to the atmosphere and recycles it in the refining process. This technology has the potential to improve efficiency, reduce costs and reduce emissions.

Alcoa's main objective for the project, the total cost of which is \$28.2 million, is to demonstrate the technical and commercial feasibility of using MVR powered by renewable energy to produce process heat. Stage 1 of the project will investigate the feasibility of integrating MVR at the refinery. If proven feasible, for Stage 2 of the project, Alcoa will deliver a 3 MW MVR module, powered using renewable energy at the Wagerup Alumina Refinery.

The Australian Government's first Low Emissions Technology Statement highlights the importance of developing a low emissions steel and aluminium industry to help reduce emissions and stimulate economic activity. Innovation in metals refining can improve the competitiveness and emissions intensity of Australia's steel and aluminium production.

ARENA CEO Darren Miller said this exciting project was a significant step towards making low emissions alumina, and an important step towards decarbonising metals production.

"It's great to see companies like Alcoa take the initiative to create a pathway to reduce their emissions in what is an energy-intensive hard to abate process."

"This technology represents an opportunity to electrify a refining process that is currently powered by fossil fuels using a renewable solution which addresses our investment priority of helping industry to reduce emissions, as well as the Government's Technology Investment Roadmap. This is an important step on the pathway towards green aluminium in Australia."

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University builds next generation of sustainable engineers

Technology and construction are important parts of any society – but they often come with a hidden toll. As the population continues to grow, so too does the issue of waste, which is passed down through the generations.

The University of Southern Queensland's Engineering faculty is taking steps to combat the rising tide of refuse by adding a sustainability component to its courses.

Senior Engineering Lecturer Andreas Helwig said in order to create a circular economy, where resources were continually reused, it was important to consider a product's life cycle before the start of its construction.

"At the end of a product's life, there are often costs related to its disposal, whether that be monetary, environmental or other," Mr Helwig said.

"Every government in Australia wants zero landfill by 2025, and, in some cases, we don't even know how to dispose of the items we are creating.

"What we are trying to do here is help our students consider the design for a

product's end of life, which can be fed into the circular economies to at least be cost-neutral, or better still to make a profit."

The word waste often conjures up pictures of single-use plastics and local rubbish tips. However, most fields are creating their fair share of scrap material.

"At the moment we are researching how to recycle solar panels," Mr Helwig said.

"Top grade solar panels use borosilicate glass, which can withstand impact more than normal glass, however the EVA glue that forms the air-tight seal between the glass to the solar cells below makes it difficult to recycle.

"Further, when borosilicate glass is mixed with waste glass during the recycling process, it changes the viscosity of the new glass, causing significant manufacturing problems.

"If the crushed borosilicate glass and boron/phosphorous solar cells are buried in landfill, the boron leakage is an insecticide which has an environmental impact.

"This is where original design, not just life-cycle analysis but also end-of-life upcycling, could come into play."

Mr Helwig said sustainability design would be an essential skill for future engineers.

"This is one of the big challenges facing our engineers this century," he said.

"We have added the sustainability component to our Master of Engineering Practice industry project course and are now working to spread it to all of our programs by 2024.

"We want to give our students the edge and many of them are leaders in the industry," Mr Helwig added.

From high-rise buildings to revolutionary modern aircraft and motor vehicles, engineers are the driving force behind many of modern society's greatest creations. Whether you want to become a leader in cutting edge technology or construction or respond to the growing pressures on the environment by providing innovative solutions that help sustainable development, the University of Southern Queensland has a degree to get you there

Find out more about studying Engineering at the University of Southern Queensland at: <https://www.usq.edu.au/study/degrees/engineering>

University of Southern Queensland Senior Engineering Lecturer, Andreas Helwig, talks on the importance of sustainable engineering.



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BUILDING FOR THE CIRCULAR ECONOMY

CAWRA's new state-of-the-art MRF (Material Recovery Facility) allows CAWRA's councils to take back control of their recyclables and focus on building the circular economy.

Scheduled to open in September 2021, the new CAWRA (Central Adelaide Waste and Recycling Authority) MRF at Kilburn in Adelaide's inner-north will enable CAWRA's councils to take back control of their recyclables. It also represents a significant leap forward in their efforts to maximise resource recovery and recycling, minimise waste-to-landfill and, most importantly, grow the local circular economy.

Not surprisingly, the initial discussions and planning for the new CAWRA MRF occurred in 2019, in the wake of increased international market controls - including the *Chinese National Sword Policy* - which had a direct and significant impact on how recyclables could be sorted, processed, and sold into key commodities markets including China, India, Vietnam, Malaysia and Indonesia. These changes in the global recyclables market, together with a number of other factors - including the commercial failure of one of South Australia's two major recycling companies - left both the City of Charles Sturt and the City of Port Adelaide Enfield without a suitable solution for their collected kerbside recyclables.

In response to this challenge, both councils took the decision to join forces to establish and operate their own Local Government-owned MRF to process kerbside recyclables from across their municipalities. The MRF not only provides a high quality and reliable processing solution for the collected recyclables, it also enables the councils to take back control of their recyclables streams - deciding where and how their material will be recycled once it leaves the MRF to maximise the reuse of sorted materials and add value to the local circular economy.

In doing so, CAWRA aims to rebuild ratepayer confidence in recycling.

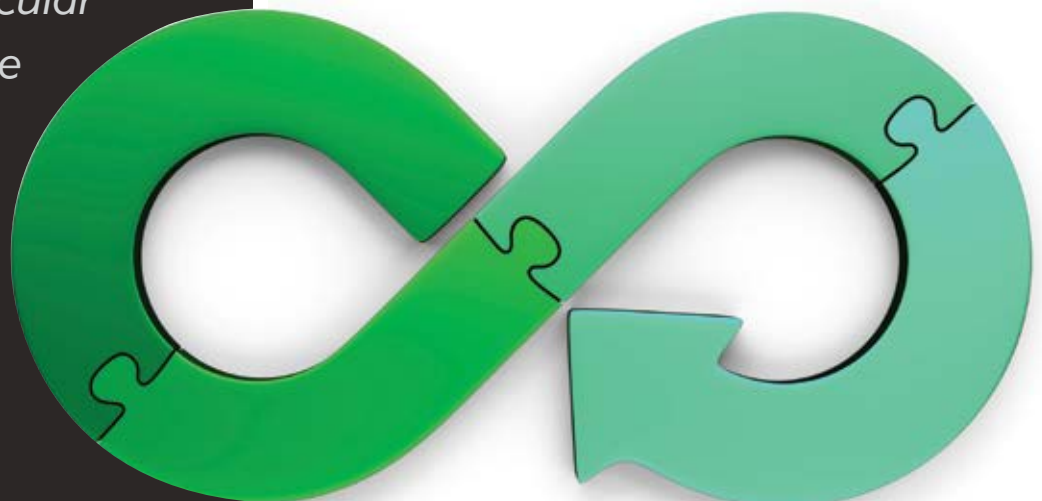
"CAWRA's primary goal is to grow the local Circular Economy, and we believe the best way for us to achieve that is to first and foremost, take back control of our recyclables," explained CAWRA Executive Officer, Rebekah Schubert.

"The new MRF will enable us to produce a range of 'clean' commodities streams which can be directed locally to assist with the development of emerging local markets. This, in turn, will help to boost local employment and local recycling businesses," she said.

There can be no doubt that many of the issues and challenges facing the recycling sector over recent years - both in South Australia and nationally - have seen recycling take a massive hit in terms of public confidence. Indeed, issues including falling commodity prices, export bans, stockpiling of processed materials, fires, cancelled contracts, failed businesses and recyclables being disposed of in landfills, have even seen some question whether recycling was 'worth the effort'.

"This new MRF will enable both councils to directly demonstrate to residents 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," Mrs Schubert added.

"CAWRA's primary goal is to grow the local Circular Economy, and we believe the best way for us to achieve that is to first and foremost, take back control of our recyclables."





CAWRA's new MRF in Kilburn is scheduled to open in September 2021.

"...we wanted to ensure that the CAWRA facility truly is a 'world's best-practice' MRF – both in terms of the design of the facility and processing equipment and methodologies used"



"Maintaining ownership and control of the MRF not only provides us with the ability to ensure the ongoing future integrity of our kerbside recycling services across both cities, it also clearly demonstrates to our residents and ratepayers that their recycling efforts are not going to waste, and that we're not just 'recycling for recycling's sake'."

State-of-the-Art MRF

With a total project value of some \$23.2 million, the new CAWRA MRF represents the latest in state-of-the-art MRF design, in terms of both processing efficiency and safety. Majority funded through CAWRA on a 50:50 basis by the City of Charles Sturt and the City of Port Adelaide Enfield, establishment of the new MRF was also assisted by a \$4,110,000 grant from the Australian Government through its *Recycling Modernisation Fund*. An additional \$250,000 in grant funding has also been provided by Green Industries SA.

CAWRA partnered with the private sector for the design and construction of the MRF and is in the final stages of negotiations with an experienced MRF operator to run the facility when it opens later this year.

The contract for construction of the CAWRA MRF was awarded to local award-winning company Pascale Construction, while the contract for the design and installation of the MRF's plant and equipment was awarded to waste and recycling equipment specialists Wastech. The CAWRA MRF construction project is being managed by Adelaide-based boutique independent project advisory and management consultancy Moto Projects.

The CAWRA MRF has been designed with a processing capacity of up to 50,000 tonnes of residential recyclables per annum. The facility processes a full range of key recyclables streams, including:

- Mixed paper
- Cardboard
- PET
- HDPE
- LDPE
- PP

- Glass
- Aluminium
- Steel

Designed with a focus placed squarely on maximum sort quality and the prevention of cross-contamination of the sorted recyclables streams, the CAWRA MRF incorporates a range of high performance, purpose-designed sorting technologies, including the latest in high-tech optical sorting.

"From the outset, our focus has been on maximising recovery and recycling while minimising the amount of waste being disposed of to landfill," Rebekah Schubert said.

"We're also acutely aware that recycling needs to be market-driven, and for that to occur, the sorted recyclable streams have to be of the highest quality and with the lowest possible levels of contamination."

"With that in mind, we wanted to ensure that the CAWRA facility truly is a 'world's best-practice' MRF - both in terms of the design of the facility and processing equipment and methodologies used," Mrs Schubert added. "Features such as the high-tech optical sorting line will help to ensure that the MRF is able to consistently produce high quality, clean commodities which meet the needs of the local markets."

While CAWRA's MRF in Kilburn will initially process collected residential kerbside recyclables from across the Cities of Charles Sturt and Port Adelaide Enfield, discussions are already underway with a number of other metropolitan councils about also utilising the new MRF.

CAWRA's MRF operator has been selected based on substantial experience and proven capacity and performance in existing MRF operations within Australia. CAWRA will announce their chosen private sector operator shortly.

PICTURED BELOW (L-R): Paul Waning – Project Manager, Pascale Construction; Barry Forrest – Director, Moto projects; and Rebekah Schubert – Executive Officer, CAWRA inspect construction progress at the CAWRA MRF site in June 2021.



LEADING BY EXAMPLE

While the ability to incorporate recycled materials into the construction of a new industrial facility such as a MRF may be somewhat limited, CAWRA is leading by example, with the use of recycled materials in a number of key areas, including:

- The use of 'Green Pipe' – a high performance pipe manufactured from 100% recycled plastic. Specifically designed for civil, agricultural and forestry applications, Green Pipe is being utilised across the CAWRA site for drainage and stormwater applications.
- Soft Furnishings – where practical, soft furnishings for the office and administration section of the building, as well as the MRF's education centre, will incorporate recycled fibre content.
- Fitout + Furniture – again, where practical, materials and furniture used for the fitout of the office and administration section and education centre, will incorporate recycled content.

FOCUS ON FIRE SAFETY

Given Adelaide's hot and dry summer climate, and the suburban location of the MRF, fire safety was a major consideration for all aspects of CAWRA's MRF design and operation.

With that in mind, the CAWRA team visited a number of MRF operations across Australia to talk through their experiences with fire in their facilities, and capture key learnings following some of the major fire events experienced across Australia in recent years.

Based on that input and the advice of J Squared fire management consultants and Australian Fire Services, CAWRA's design was upgraded to substantially exceed regulatory requirements for fire safety.

This includes the addition of:

- Separated storage of flammable baled product away from the MRF shed, with incidental storage only under the main roof (this required the purchase of some additional land adjacent the rear of CAWRA's site)
 - Automated water/foam induction cannon in tip floor area (which has been identified as a key area of risk within MRF facilities)
 - Extensive firewater and ring mains to service both the MRF shed and the rear storage block
 - Overhead sprinklers throughout the MRF shed
 - Ember guards on external gutters and over doorways
- These measures will be further supplemented by a number of fire safety operational procedures, including minimising stockpiling of any sorted materials on site.





Artist's impression courtesy of:
Davidson Architecture

EDUCATING FOR THE FUTURE

The new MRF will also incorporate an education centre for tours and school groups. Located above the offices in the administration building, the education centre looks out over the entirety of the MRF operation. It also provides access to a secure elevated walkway from where students and other visitors to the education centre can gain a bird's eye view of the MRF operations below.

"We believe that education plays a critical role in encouraging good environmental choices – from product and packaging choices, through to disposal and recycling habits. This is especially true for younger students, where this type of education can play a critical role in forming good long-term environmental choices," Rebekah Schubert explained.

"With that in mind, we wanted to ensure that the facility included a

dedicated education centre with views out to the MRF space, and elongated viewing platforms that allow safe first-hand observation of the recycling process in action," she added.

Thanks to its central location, the CAWRA MRF looks certain to become a 'destination of choice' for school visits and community group tours.



Artist's impression courtesy of:
Davidson Architecture

About CAWRA

A joint initiative of the Cities of Charles Sturt and Port Adelaide Enfield, the Central Adelaide Waste and Recycling Authority (CAWRA) is a local government regional subsidiary formed with the primary goal of taking back control of recycling and resource recovery across the two cities. Bringing together two of metropolitan Adelaide's most populous councils, CAWRA's catchment takes in over 250,000 permanent residents, providing it with the economies of scale required to the long-term viability of its resource recovery and recycling operations.

CAWRA aims to restore confidence in kerbside recycling for residents by enabling councils to work more effectively with local recycling businesses, to recycle more materials in South Australia. CAWRA also aims to increase transparency and reporting of the processing of materials, and further support the circular economy through the sale of commodities and purchasing decisions.

CAWRA's goal is to build the local circular economy by prioritising local markets for collected materials and, where possible, directing them locally to help create jobs in SA's recycling sector and boost local business.





(R-L) Aussie Pumps' Managing Director, Warwick Lorenz showing NSW Minister for Police, and Emergency Services, David Elliott around the company's new production line at Castle Hill.

Innovative Aussie goes global

Australian Pump is fast becoming the choice of professional users of pressure cleaners and heavy duty trash pump type equipment. The machines are built on a 2 ½ acre facility in Sydney's Norwest Business District. The company focuses on the development of professional high pressure cleaners and are largely responsible for the development of high pressure jetting equipment for drain cleaning in Australia and South East Asia.

In the pump range, they build what is claimed to be the best lightweight, portable fire pump in the world and a complete range of transfer and trash pumps, all the way up to products designed for mines and quarries.

The company is a "start-up" that only began trading some 25 years ago. Over that time, they developed a product range that is considered first rate and aimed always at customers who want quality and value for money.

"That's our key priority", said Aussie Pumps' Managing Director, Warwick Lorenz. "Because we're lean in the way we do things, we're able to produce top quality products and put them on the market

against competitors that aren't designed for Australian conditions."

"Understanding our markets' requirements, whether it's for contractors, miners, local government or even farmers and tradesmen, is key for us. We know that they'd want what we want if we were in their place," he added.

The company recently got the opportunity to show the New South Wales Minister for Police, and Emergency Services, David Elliott the major progress the company has made in the doubling of its production facilities.

Minister Elliott, whose portfolio includes the NSW Rural Fire Service, was impressed to see that the company ships its products all over the world.

Lorenz explains that the company's success is based on research.

"First, we understand what it is Australian consumers need - even for some of the roughest and most demanding applications on the planet. Then, we looked for opportunities around the world where we know there must be similar circumstances."

"For example, Australian mining engineers are working all over the globe... and many of them are familiar with our products."

"Most importantly, they know our products are well built, extremely reliable, and are able to withstand even the harshest operating conditions," he added.

"Needless to say, having that reputation has played a major role in helping us to establish ourselves in markets around the world."

Together with its success in the mining and batch plant sectors, other major Aussie Pumps success stories include significant sales of high performance Honda-powered fire pumps to the US market for their fire season, as well as drain cleaning Jetters to Israel.

"This local company has enjoyed a 25 percent increase in turnover in the last year and are exporting to the world," the Minister said. "It's a great Australian story."

Further information on the Aussie Pumps range is available from Australian Pump Industries T: 02 8865 3500 or from the website: www.aussiepumps.com.au

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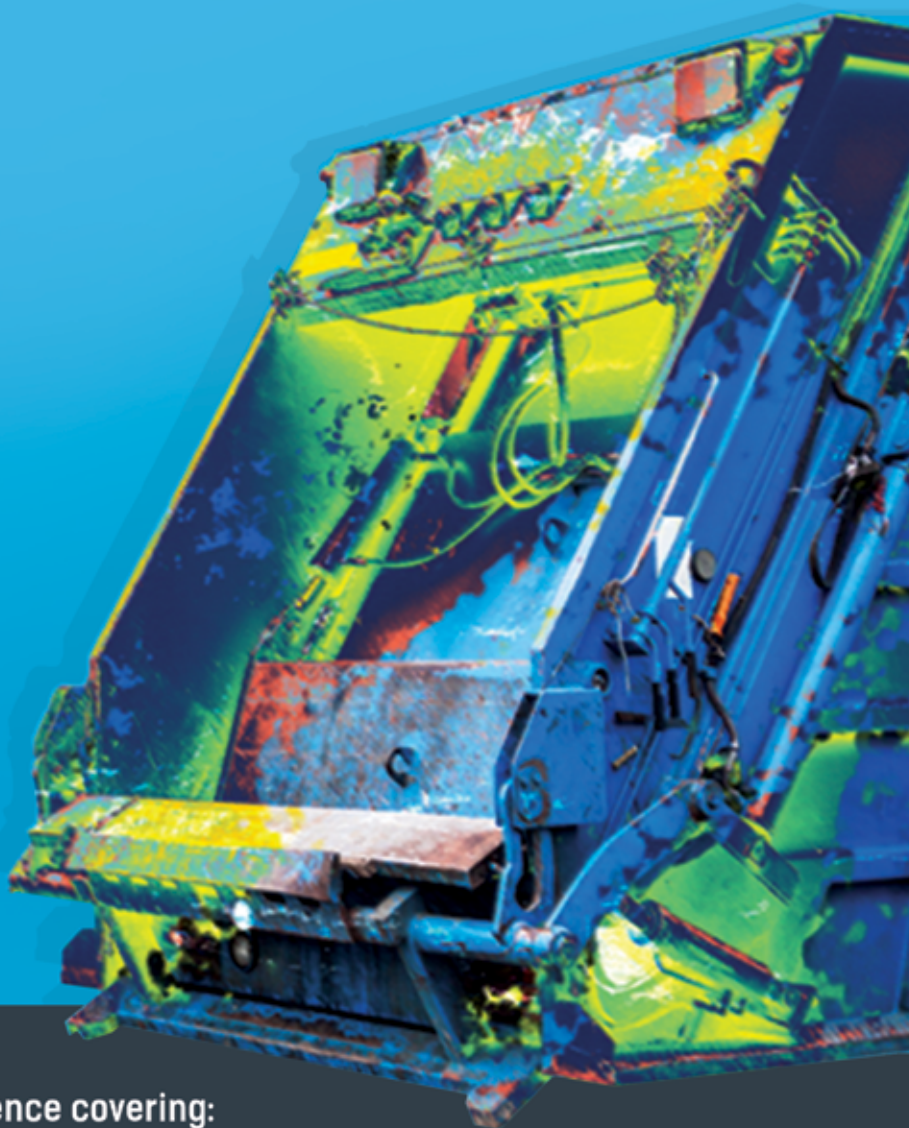


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Water industry gives green light for hydrogen

Green hydrogen - and how the water sector can engage with this 'green, clean fuel source' - was the focus of the latest *Water Action Platform* webinar – a forum for water sector collaboration across international boundaries, which took place during May.

Hosted by Isle chairman Piers Clark, the webinar featured Dr Jenifer Baxter, director for innovation and policy at Protium Green Solutions, who gave a rundown of key insights into hydrogen for the water sector. The presentation also featured emerging hydrogen technologies from the UK and Australia.

"We see hydrogen as an opportunity to decarbonise key pillars of our society – including things that form part of our critical infrastructure like water and waste," said Dr Baxter.

"This is about sustainable development and making our industries much more sustainable by being able to understand exactly what feedstocks and wastes we have and how we can use them more effectively. It is a circular economy of energy and waste."

Baxter explained how historically hydrogen has been reliant on the exploitation of fossil fuels, but that there are 'clean' ways of producing it and trials and feasibility studies are taking place at water utilities globally exploring cleaner, greener ways of producing hydrogen.

Capturing carbon

New resource recovery opportunities were explored during the technology showcase, both of which have the potential to simultaneously improve the wastewater treatment process while generating clean hydrogen.

The first was from Hazer Group, an Australian company which produces fuel-cell

Viega launches Viptool Software for drinking water calculations

New digital toolbox eliminates errors and increases efficiency for hydraulic industry.

German brand Viega, a global market leader in press-fit technology, has launched its renowned Viptool software solution into the Australian market, which allows specialist planners to accurately design and calculate water networks. Instead of manually storing flow rate data in spreadsheets, Viega Viptool software uses the latest German standards and regulations to automatically simulate and calculate complex water distribution networks.

"With up-to-date simultaneous factors proven from real life measurements in pilot projects, Viega Viptool makes it possible to be energy-efficient, economical and, in the case of drinking water installations, hygienic," says Viega Viptool Specialist, Sven Lemme.

Special features of Viega Viptool Software include:

- Individually tailored to the needs of skilled craftsmen and planners with coordinated solutions
- Economical and reliable planning through exact and reliable calculations
- Detailed bills of materials for quotations and tenders
- Comprehensive service, such as free ongoing support
- Cost-effective to purchase

With Viptool engineering, you can safely and reliably calculate drinking water networks using schematic or 2D and 3D floor plan

designs. These include:

- Viptool CAD-Module — streamlines building services planning and creates smooth data exchange between architects, planners and contractors
- Viptool Piping — all calculations of pipe networks are carried across, allowing you to plan in 2D floor and schematic or 3D Isometric floor plans
- Viptool Software Maintenance — yearly updates tailored to your needs

"All Viega product data is available from the planning stage in the program libraries and are also used to create calculations," Lemme explains. "With Viptool, you can plan holistically and accurately down to the smallest detail of a small-detached house or a large commercial project."

For further information, please visit:

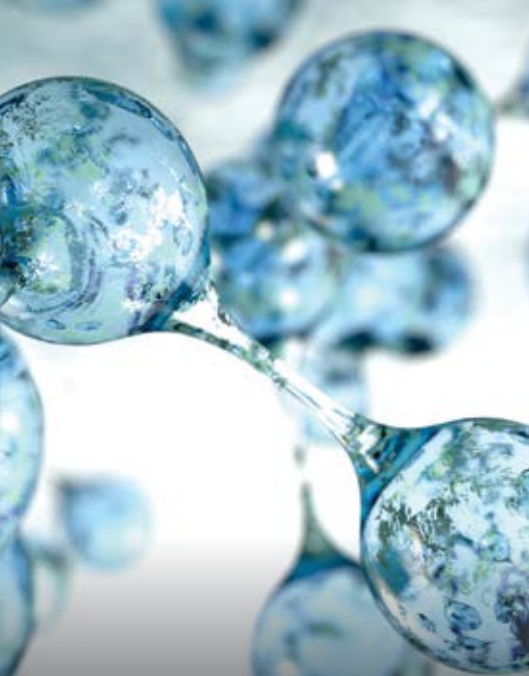
www.viega.com.au

ABOUT VIEGA

Worldwide, more than 4700 people are employed by the Viega Group, which is among the leading manufacturers of installation technology. Viega is working to continue its long-term success at nine locations. While production is concentrated at its four main sites in Germany, the McPherson/USA group manufactures solutions specially designed for the North American market.

Installation technology as a core skill drives growth forward. Pre-wall and drainage technology belong to the product range alongside piping systems. The range consists of approximately 17,000 articles, which are used nearly everywhere: in building services installations, in utilities or in industrial plant construction and shipbuilding.

The family-owned business was founded in Attendorf, Germany, in 1899. In the 1960s, the course was set for the internationalisation of the group, with Viega brand products now used all over the world.



grade hydrogen and high-quality graphite from methane, with low CO₂ emissions.

“Rather than typical gas-based hydrogen production which produces CO₂ as a by-product, we produce graphite – a solid, capturable and usable product,” said chief executive Geoff Ward.

“It’s a clean and cost-effective technology and, when paired with renewable biogas,

has the lowest emissions profile of any available technology - going beyond where solar and electrolysis can reach and taking methane originated from waste out of the atmosphere and capturing all the carbon associated with the feedstock.”

UK-based Organics operates globally and is focused on renewable energy, ammonia recovery and anaerobic digestion. Commercial director Keith Richardson explained how the company’s patented system recovers ammonia from high-strength wastewater and turns it into a range of saleable ammonia products, along with hydrogen.

Organics already has a well-established thermal ammonia stripper which is used to remove ammonia from, for example, watering liquors and landfill leachates. The recovered ammonia can be used as a fertiliser, a raw material for industrial processes or as a feedstock for ammonia-cracking processes that could generate green hydrogen.

Global update

In addition to the focus on hydrogen, the webinar also included updates on global water stories, including the rollout of wastewater-based epidemiology and progress on diversity and inclusion in the water sector.

Water Action Platform participants were also invited to take part in a Digital Twin Tour from Idrica, a Spanish-headquartered company specialising in services and solutions for global water utilities. The free event, which took place during June was moderated by Piers Clark and featured a keynote address by Idrica chief executive Jaime Barba.

The demonstration showed how a digital twin - a virtual model that replicates real system behaviour and allows it to simulate its response under any condition - works.

For further information, please visit: www.wateractionplatform.com

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Collaborative leakage project recognised by water sector



A game-changing UK partnership that is bringing significant improvements to leak detection rates globally has been recognised by the water industry. Technology specialist Ovarro and UK utility Anglian Water Services collaborated on the development of remote leak detection device *Enigma3hyQ* and cloud-based analytics platform *PrimeWeb*.

Between April 2018 and January 2021, the system found 6,783 leaks on Anglian Water Services' network, with a 1:1 ratio of leaks found to points of interest issued. The sensors are effective in finding leaks over long distances and inside plastic pipes and have gone onto be rolled out globally, including in Malaysia, Singapore, Australia and across Europe.

The achievements of the collaboration were recognised by the *Water Industry Achievement Awards* during May 2021, which named it *Alliancing and Partnership Initiative of the Year*.

The WIAA Judges commented: "This project stood out from a list of high-quality entries with a clear demonstration of the benefits of approaching a major regulatory and customer issue in an innovative way.

The collaborative nature of this initiative and the open sharing of knowledge has delivered significant improvements in Anglian Water's leakage detection rates."

Leakage remains one of the biggest concerns for the water industry and Ofwat is expecting companies to adopt new techniques to tackle it in AMP7. In collaborating on the *Enigma3hyQ* project, Ovarro and Anglian Water wanted to develop technology to increase efficiency when compared with traditional acoustic detection, save time, free-up staff and improve leak detection on plastic pipes.

The utility approached Ovarro in 2017 with an idea to adapt existing technology by combining two products – a correlating noise logger and a site-based hydrophone. A development team was established with experts from both organisations to create the *Enigma3hyQ* system's hardware and software elements, including a workflow management app and *PrimeWeb*.

The team refined processes around performance reporting, target outcome delivery, training and integration with business-as-usual leakage operations.

Following a trial on 40km of mains in Louth, Lincolnshire, Anglian Water Services began fully embedding the technology.

Anglian Water Service's smart water strategy manager Andy Smith said: "We very much created the *Enigma3hyQ* technology together. We didn't want to just accept what was on offer, we wanted to collaborate to drive for the best solution for the challenge we faced."

Josh Britton, Ovarro global product line manager, said: "We are thrilled our collaboration with Anglian Water to develop the *Enigma3hyQ* system has been recognised by our sector peers at the Water Industry Achievement Awards."

"The project's success shows how much can be achieved when suppliers work in partnership with utilities, place high value on feedback and take their ideas forward to develop new solutions," Mr Britton added.

In 2021, the technology was updated further, resulting in the launch of the *Enigma3-BB*, a remote leak detection device which uses the *Enigma3hyQ* technology, but which is installed directly into an operational meter box chamber – a first for the industry with this type of technology.

Water Deficiency Declarations revoked in six WA shires



Recent rainfall across Western Australia's south has provided great relief to many of WA's farmers.

Improved water availability also allowed for nine Water Deficiency Declarations to be revoked in WA six shires from the end of May, with the carting of water for emergency livestock purposes no longer required.

A 'water deficiency declaration' is a Government response to provide water to farmers for emergency animal welfare needs during very dry periods.

The revocations apply to the Esperance Shire (Cascade), Lake Grace Shire (Mallee Hill and Ardler Road), Jerramungup Shire (Jerramungup North), Ravensthorpe Shire (Fitzgerald and Mount Short), Dumbleyung Shire (Kukerin) and the Kent Shire (Hollands Rock and Hamilton).

The southern and south-eastern agricultural regions have been experiencing reduced rainfalls and dry conditions for multiple years now, with water deficiency arrangements in place in some areas since May 2019.

In response, the Western Australian Government has spent more than \$3.7 million on direct water carting to central locations to support emergency livestock needs, \$2.2 million on the development and upgrading of strategic community water supplies and government-owned water sources since June 2018, and \$1.5 million partnering with local government to upgrade existing and develop new community water supplies. This has resulted in increased off-farm water availability in many areas and has helped to make these revocations possible.

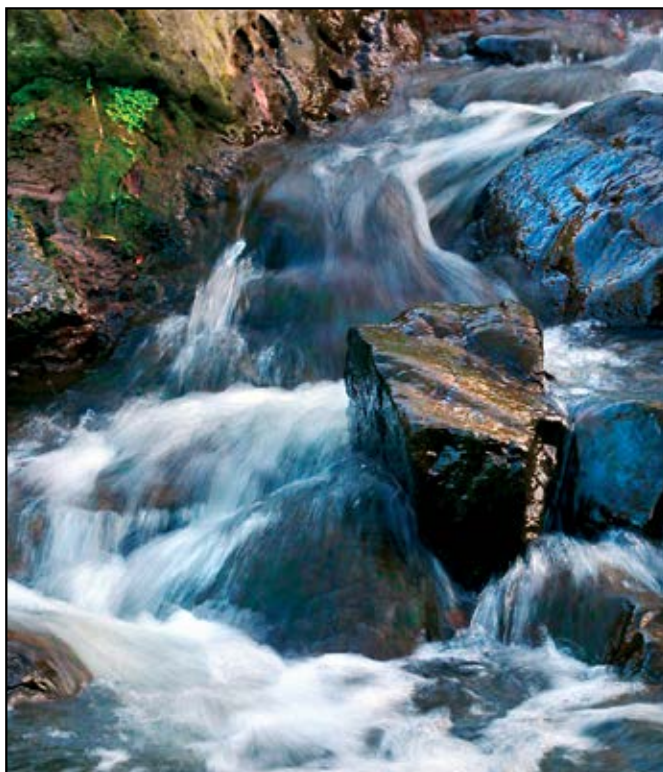
"The recent rainfall and ability to revoke the water deficiency declarations in these areas has been a relief for local farmers across the region who have been dealing first-hand with the impacts of climate change and reduced rainfall over recent years," said WA Water Minister Dave Kelly.

"The Government's investment in farming communities is paying dividends. By enlarging and desilting dams and improving catchments, many of the on-farm dams and off farm strategic community supplies have filled with recent rains, which provides for improved water security into the future."

"Climate change is having a significant impact on this region, which is why the McGowan Government is working closely with local governments and farmers to bring new water sources online and maintain access to existing supplies," the Minister added.

Only two water deficiency declarations remain in place, those being in Salmon Gums and Grass Patch in the Esperance Shire. Rainfall in these areas has been variable and while sufficient to allow for the temporary suspension of emergency water carting, the availability of water in on-farm dams and off-farm strategic supplies is still limited.

The WA Department of Water and Environmental Regulation will continue to liaise with local farmers and shires, and monitor the situation over coming months.



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and helps to deliver A COVID-SAFE CONSTRUCTION SITE!



Together with its enviable reputation for saving thousands of litres of water per week through recycling, preventing waste sediments being flushed into pipes or stormwater, and saving plasterers and tilers an average of over one hour, per person, per day in time spent moving between the work face and washout facilities,

the remarkable Australian-designed and internationally patented Mobile Smart Sinks unit has also become an invaluable front-line tool in helping to establish COVID-SAFE construction sites.

By providing tool washing/washout facilities at the work face rather than at a centralised location, Mobile Smart Sinks

units not only save time, save waste and save water – they help to significantly reduce movement around the construction site while also eliminating issues associated with social distancing and maximum density requirements at centralised tool wash/washout locations.

Since its launch in 2015, the Australia-designed Smart Sinks technology has gained an enviable reputation for its ability to keep waste sediments out of drains.

Originally developed as a built-in unit for use in dental and medical facilities as an effective, affordable, and easy-to-use method of preventing plaster residues from washing into drains (an extremely common and expensive problem for the dental and medical sectors), Smart Sinks inventor Craig Hanson soon realised that the technology could also provide an ideal solution for the construction sector - particularly when it came to plasterers' and tilers' washout and tool washing needs.

Introduced to the Australian market in 2016, Mobile Smart Sinks incorporate the patented Smart Sinks filtration technology, together with additional water recycling capabilities and foldable stainless steel trays, to deliver a 100% mobile tool washing/washout facility that is easy to use, highly affordable, keeps washout and tool

washing residues out of pipes and drains, uses filtered recycled water, and doesn't even require a nearby water source to operate.

Interestingly, while Mobile Smart Sinks rapidly gained popularity with construction companies and tradies around the country for their outstanding environmental performance and convenience, it's only with the advent of the COVID-19 pandemic and subsequent workplace controls, that Mobile Smart Sinks are now also widely considered to be an ideal solution to workplace OH&S, social distancing and density requirements on construction sites large and small. Craig Hansen explained:

"When we designed and developed the Mobile Smart Sinks, our focus was purely and simply on the environmental benefits – helping plasterers and tilers to keep plaster residues out of pipes and drains, while also helping them to significantly reduce the amount of water being used for tool washing and washouts."

"After the first couple of units had been out working in the field for a couple of months, we were also starting to hear about how much time it was saving the plaster and tiling teams by having the washout facilities right there at the workface, rather than having to travel to a central washout facility, which on most sites, is located in the basement," he said.

"Then, with the advent COVID-19, and the introduction of strict workplace density limits and controls on movement around building sites, it became clear that Mobile Smart Sinks also provide the ideal solution to these challenges."

"Each team can have their own Mobile Smart Sinks unit, right there with them. As they move between locations or floors, they simply take it with them, plug it in to the power and start working – no need for a nearby water source, and no need for a central washout facility," Craig added.

PATENTED FILTRATION TECHNOLOGY

Designed and developed in Australia, Smart Sinks' unique filtration design has been awarded a total of nine Australian and international patents – including two US Patents. Smart Sinks use a series of interlocking sinks and disposable filter bags to remove particulates from the washout water.

Based around a 240 litre MGB, Mobile Smart Sinks incorporate two additional filtration stages (5uM and 1uM) as part of the water recycling system. The filtered recycled water is used for the tool washing/washout activities, after which it passes through the filtration system again ready for reuse.



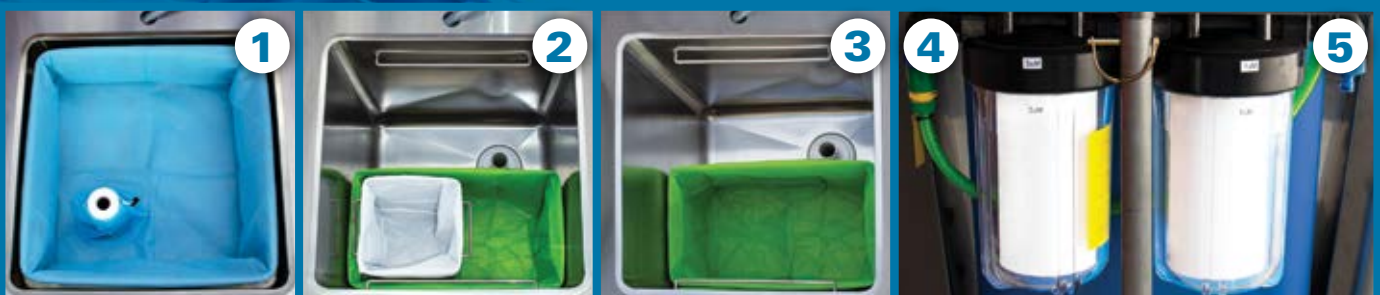
100% MOBILE

Mobile Smart Sinks are extremely easy to move and manoeuvre around the construction site.

Once positioned near the work face, all that remains is for the foldable trays to be lifted into position and secured with the support legs, and for the unit to be plugged in to a standard 240v power outlet.

The fact that the Mobile Smart Sinks unit filters and recycles the water as part of the tool washing process, means that it doesn't need to be connected to a water source to operate.

5-STAGE FILTRATION SYSTEM



Mobile Smart Sinks' unique 5-stage filtration system filters the wash water down to 1 micron, removing particulates and allowing you to reuse the water, or dispose of it down the drain when you're done.

SIGNIFICANT WATER SAVINGS

As well as eliminating the issues of particulate waste from tool washing/washout being disposed of down sinks, in drains or stormwater side-entry pits, Mobile Smart Sinks result in a significant reduction in water use.

For example, using an average minimum flow rate of 18 litres per minute from a standard domestic water supply, the average 5-minute tool washing/wash out process uses around 90 litres of water. Based on an average of five plaster box & tool wash outs per day, one plasterer can use around 450 litres of water per day, or 2250 litres per week for washout water.

The Mobile Smart Sinks unit only requires 60 litres of water to operate, and that water is filtered and recycled every time the unit is used, for up to a week – that’s a saving of almost 2200 litres of water, per person, per week. That can equate to tens of thousands of litres of water saved on every job.

What’s more, as a Trade Waste Approved unit, at the end of each week the clean filtered recycled water can be disposed of down a drain.

MASSIVE PRODUCTIVITY BOOST

One of the biggest responses to come from users of the Mobile Smart Sinks, is how much time it saves compared to using traditional ‘centralised’ tool washing/washout facilities.

Perry Richardson, Managing Director of Pro Plaster, exclusive Australian distributors of Mobile Smart Sinks, commented:

“The feedback we’ve had from our customers has been amazing. They can’t believe how much time and money the Mobile Smart Sinks units are saving them.”

“Whereas in the past, tool washing/washout was taking an average of 15-20 minutes by the time they travelled to and from the basement and used the shared central washout facility, by having the washout facility right there with them at the work face, they’re able to complete the process in around 5 minutes,” Perry said.

“Even working on an average of only 5 box wash outs per day, that’s a saving of around 60-75 minutes per day, per person, which is not only a massive boost in productivity, it’s

also a huge cost saving,” Perry added. “In fact, we’ve had a number of customers say that the Mobile Smart Sinks units have paid for themselves after only the first job!”

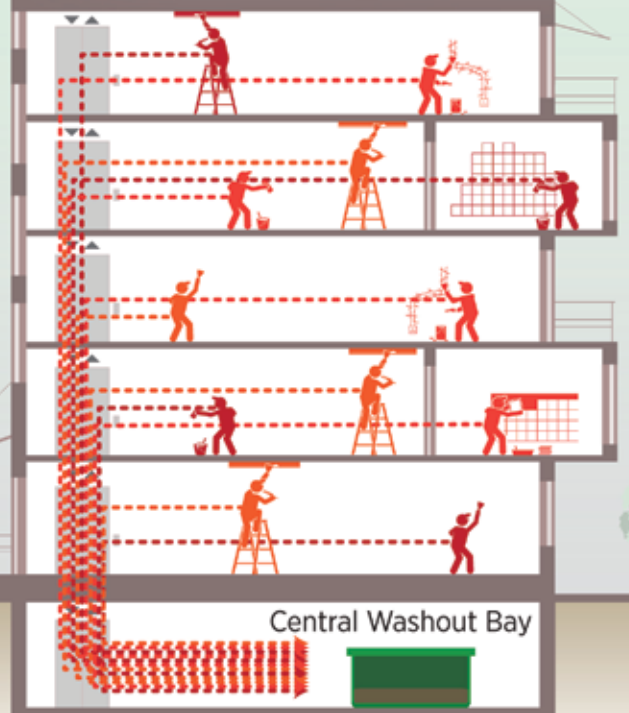


‘TRADITIONAL’ CENTRALISED WASHOUT FACILITY

- ✗ Multiple movements between worksite and washout facility
- ✗ Excess use of lifts
- ✗ Social distancing & hygiene challenges
- ✗ Lost time & productivity travelling to and from central washout facility
- ✗ Increased water use
- ✗ Waste management challenges including sediment in drains/tradewaste



HOW ‘COVER YOUR CONSTRUCTION



COST-EFFECTIVE SOLUTION

With an average weekly operating cost of around \$60 per unit (based on recommended daily replacement of the top filter bag, weekly replacement of the middle filter bag and fortnightly replacement of the lower filter bag), Mobile Smart Sinks are also an extremely cost-effective solution. Indeed, Mobile Smart Sinks can work out to be as little as 1/10th of the cost of some centralised tool washing/washout solutions.



COVID-SAFE CONSTRUCTION SITES

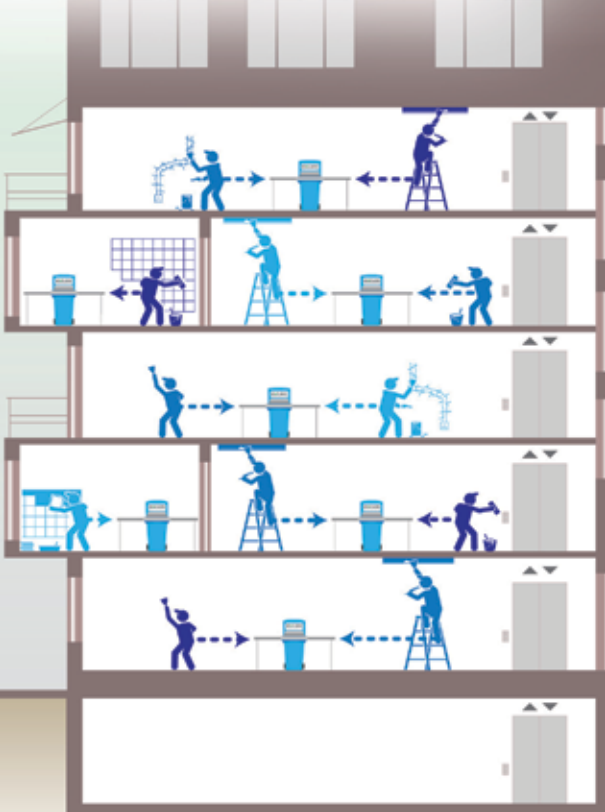
While there can be no doubt that Mobile Smart Sinks have set a new benchmark in waste sediment control, water saving and productivity gains for tilers and plasterers, they have also, quite unintentionally, proven to be a critical front-line tool in establishing COVID-SAFE construction sites.

By providing a tool washing/washout facility at the work face rather than at a traditional centralised location (usually in the basement), Mobile Smart Sinks significantly reduce movement around the construction site, including lift usage. They also eliminate issues associated with social distancing and maximum density requirements at centralised tool washing/washout locations.

For further information, please contact the exclusive Australian distributor, Pro Plaster, Phone: 1800 652 267, email: sales@proplaster.com.au or visit: www.smartsinks.com.au



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- ✓ IMPROVES social distancing & hygiene
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- ✓ REDUCES water use through recycling
- ✓ ELIMINATES waste management issues
- ✓ NO sediment in drains/tradewaste





Improving the Behaviours of Expansive Soils Using Recycled Tyres

A. Taheri and M. Saadat - The University of Adelaide, South Australia; A. Soltani - Federation University, Victoria; and N. Dastoor - City of Charles Stuart, South Australia.

Finding solutions for the use of ‘end of life’ tyres presents significant challenges Australia-wide, with a range of organisations looking closely into how we can increase the use of locally derived tyre products in public works, including in road construction.

A field trial was recently conducted by the City of Charles Sturt in South Australia, the University of Adelaide, and the Downer Group. The trial investigated the benefits of using a soil and ground rubber mix as road sub-grade, to reduce swelling and the resulting cracking and failure on reactive clay soils.

Trial results showed that ground rubber inclusions were able to control the soil’s swelling potential, and that the higher the ground rubber content, the higher the reduction in swelling. Coarse crumbed rubber consistently outperformed medium or fine crumbed rubber, but strength reduced beyond 5% ground rubber content. This indicates optimal benefits from the use of 5% coarse ground rubber in a soil mix for this purpose.

The trial concluded that soil/ground rubber blend can be used as a reliable subgrade material in road construction projects.

The following is an excerpt from the study which reports the results of an experimental investigation into the use of ground rubber (GR) products, at varying contents and sizes/gradations, as a sustainable solution towards improving the inferior geotechnical attributes of a subgrade clay deposit located in Adelaide, South Australia.

INTRODUCTION

In arid and semi-arid climates, the design and construction of infrastructure are often adversely affected by the presence of expansive/reactive soil deposits. A notable fraction of expansive soils consists of active clay minerals, such as montmorillonite, which are highly susceptible to seasonal fluctuations, and undergo significant expansion or contraction upon the addition or removal of water (Soltani et al. 2019a).

The consequent cyclic increase and decrease in soil volume results in foundation distortion and wall cracking, and in the case of road infrastructure, undulating and cracking of pavements and embankment slumping. These issues are costly to maintain and repair, and also compromise road safety (Jones and Jefferson 2012). Accordingly, these adversities demand engineering solutions to mitigate the associated socio-economic impacts on human life.

The geotechnical engineer can either complete the design within the limitations imposed by the expansive soil or preferably alleviate the soil’s adverse behaviours employing soil stabilisation techniques. The term “stabilisation” refers to any physical, chemical, biological or combined practice of altering the soil fabric to meet the intended design criteria (Winterkorn and Pamukcu 1991; Soltani et al. 2017).

Conventional stabilisation practices often suffer from sustainability issues, attributed to high manufacturing and/or transportation costs, as well as environmental concerns due to greenhouse gas emissions. A sustainable soil stabilisation scheme can

be characterised as one that maintains a perfect balance between infrastructure performance and the social, economic and ecological processes required to maintain human equity, diversity, and the functionality of natural systems.

The transition to sustainable stabilisation warrants incorporating solid waste materials as an “additive” or “reinforcement” to expansive soils, while opting for non-conventional, environmentally-friendly chemical binders for further enhancements.

Discarded tyres are among the most significant and problematic sources of solid waste, owing to extensive production and their durability over time; for instance, annually, around 0.5 million tons of scrap tyres are stockpiled in Australia, annually (Li et al. 2018). Quite clearly, discarded tyre rubber materials are not desired at landfills, owing to their low mass to-volume ratio, resilience, and the fact that they are rarely “flat-packed”.

These adverse characteristics, from a landfill perspective, also make them one of the most reusable waste materials for soil stabilisation practices. This is because, the rubber is resilient, lightweight, and possesses a rough surface texture. The latter, its rough surface texture, may potentially promote adhesion and/or induce frictional resistance at the soil rubber interface, and thus alter the soil fabric into a unitary mass of enhanced strength resistance.

The use of recycled tyre rubbers in geotechnical engineering dates back to the early 1990s, where theoretical concepts

governing the mechanical performance of soil–rubber blends were put into perspective.

Much like fibre-reinforced soils, the rubber particles randomly distributed in the soil matrix and when optimised in content and geometry (i.e., size/gradation and shape), enhance the inferior engineering characteristics of the host soil. The literature from this era, however, was mainly geared towards coarse-grained soils. As such, the rubber’s capacity of improving the adverse behaviours of fine-grained soils, and expansive clays, in particular, remained rather vague.

Ever since, several studies have documented the effects of rubber reinforcement, with and without cementitious binders, on the physical and mechanical behaviours of expansive clays. The clay–rubber amending mechanisms can be attributed to the rubber content, with higher contents often producing a more pronounced reduction in the swelling capacity. Moreover, the rubber’s geometrical features may also play an important role, and thus demands further investigation.

This study reports the results of a comprehensive experimental investigation, as well as a subsequent field trial, into the use of ground rubber (GR) products, at varying contents and sizes/gradations, as a sustainable solution towards amending the inferior geotechnical attributes of a subgrade clay deposit from a local road located in Adelaide, South Australia.

TESTING PROGRAM

The experimental program was carried out in two phases:

- The first phase involved investigating the soil’s physical and mechanical properties by means of conventional laboratory tests — namely, Atterberg limits (i.e., liquid and plastic limits, and plasticity index), grain-size distribution (i.e., sieve and hydrometer analyses), standard Proctor compaction, and sediment volume (to measure the free swell ratio) tests. The results obtained from this phase were analysed to classify the soil in terms of its plasticity, mineralogy and degree of expansivity.
- The second phase involved investigating the effects of GR inclusion, in terms of both content and size, on the soil’s compactability, shear strength and volume change behaviours. A total of seven soil–GR mix designs, consisting of one control (i.e., natural soil) and six GR-blended cases (at two GR contents and three GR sizes/gradations), were examined. This phase consisted of standard Proctor compaction, unconfined compressive strength (UCS) and oedometer swell tests. The results obtained from these three tests were then carefully analysed, and cross-checked with each other, to arrive at the optimum GR content and size.

EXPERIMENTAL RESULTS

Effect of GR on Soil Compactability

Figures 1a and 1b illustrate the variations of optimum moisture content and maximum

dry unit weight, obtained in accordance with the standard Proctor compaction test (ASTM D698–12), against GR content for the natural soil and various GR-blended samples, respectively. For any given GR size/gradation, the greater the GR content, the lower the optimum moisture content and the maximum dry unit weight, both following a monotonically decreasing trend with respect to GR content. Similarly, for any given GR content, an increase in GR size led to a further, yet slightly less pronounced, decrease in the soil’s compaction characteristics.

EFFECT OF GR ON MECHANICAL PROPERTIES

Effect of GR on Soil Compactability

Figure 2a (shown on the following page) illustrates the variations of UCS, obtained as per ASTM D2166–16, against GR content for the natural soil and various GR-blended samples. For any given GR size, the greater the GR content, the higher the developed UCS up to 5% GR, beyond which the GR material was found to adversely influence strength development in the matrix while still maintaining a notable advantage over the natural soil. The only exception was 10% GR A (the fine rubber), which exhibited a lower UCS value compared with that of the natural soil.

In terms of GR size, the addition of GR C, the coarse rubber, was found to consistently outperform the medium and fine rubber variants. The samples blended with 5% and 10% GR C resulted in UCS values of 248.5 kPa and 193.7 kPa, respectively. In other words,

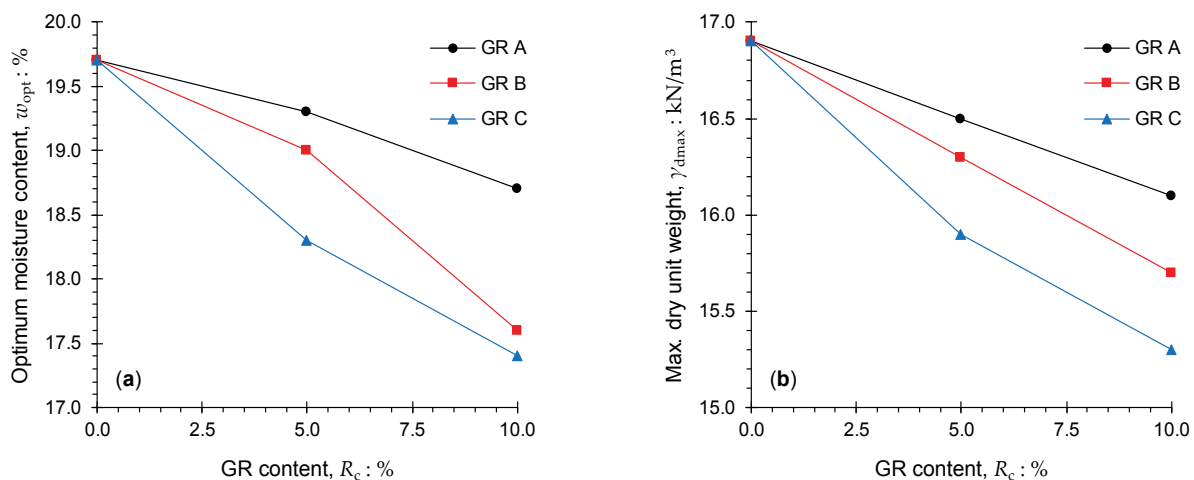


Figure 1. Variations of (a) optimum moisture content w_{opt} , and (b) maximum dry unit weight γ_{dmax} against GR content for the tested samples.

the soil's strength is improved, respectively, by almost 100% and 50% when mixed with 5% and 10% GR C.

Figure 2b illustrates the variations of axial strain at failure ϵ_u , a measure of the material's ductility, against GR content for the natural soil and various GR-blended samples. For any given GR size, the greater the GR content, the higher the axial strain at failure and hence the more ductile the sample's response to unconfined compression, attributed to GR's higher deformability compared with that of the soil grains. Similarly, the larger the GR size, the more ductile the sample's response to unconfined compression.

The elastic Young's modulus, denoted as E_s , is a measure of the material's stiffness in the elastic compression domain (Iyengar et al. 2013). In general, the variations of E_s , as shown in Figure 2c, exhibited a trend similar to that observed for the axial strain at failure; however, in an adverse manner. The greater the GR content and/or GR size, the lower the developed stiffness, attributed to GR's inherent lower stiffness compared with that of the soil grains.

Effect of GR on Swelling Potential

Figure 2d illustrates the variations of swelling potential SP, obtained as per ASTM D4546-14 under a nominal overburden stress of 7 kPa, against GR content for the natural soil

and various GR-blended samples. For any given GR size, the greater the GR content, the lower the swelling potential, following a monotonically decreasing trend. Similarly, for any given GR content, an increase in GR size led to a further, but marginal, decrease in the swelling potential. In addition to the two amending mechanisms "interfacial frictional resistance" and "mechanical interlocking", the swelling potential is also a function of the soil's expansive clay content, with lower contents exhibiting a lower tendency for swelling.

Consequently, an increase in GR content substitutes a larger portion of the expansive clay content with non-plastic, hydrophobic GR particles, thereby leading to a further decrease in the swelling potential.

The swelling potential can be employed to specify the soil's degree of expansivity. The natural soil can be classified as "highly expansive" based on the classification framework suggested by Seed et al. (1962). The use of 10% GR A, B and C led to an improved "moderately expansive" classification.

FIELD TRAILS

The optimum soil-GR mix design was applied to stabilise a subgrade clay deposit from a local road located in Adelaide, South Australia. The total length of the project area was 210 m, and it was divided into



three different zones, each having a length of approximately 70 m. The GR stabilisation technique was implemented in two zones using a GR content of 5% (i.e., Zones A and C). The third zone, Zone B, in the middle of the road, was repaired by changing the asphalt layer. Zone B served as a control area for short- and long-term comparisons.

The main objective of this field practice was to assess the feasibility of the GR stabilisation solution in terms of field implementation - that is, to understand the possible issues that may be encountered when mixing GR with the soil subgrade. It was observed that by implementing common paving practices, the GR particles can be mixed with the soil in a uniform manner - that is, potential mixing issues such as segregation and its adverse effects on compaction were not observed.

Dynamic cone penetration (DCP) and field density tests were also performed on the base material. The results of field investigations demonstrated that the soil-GR could be used as a reliable subgrade material for road construction projects.

CONCLUSIONS

1. As a result of GR inclusion, both the maximum dry unit weight and the optimum moisture content exhibited a monotonically-decreasing trend with

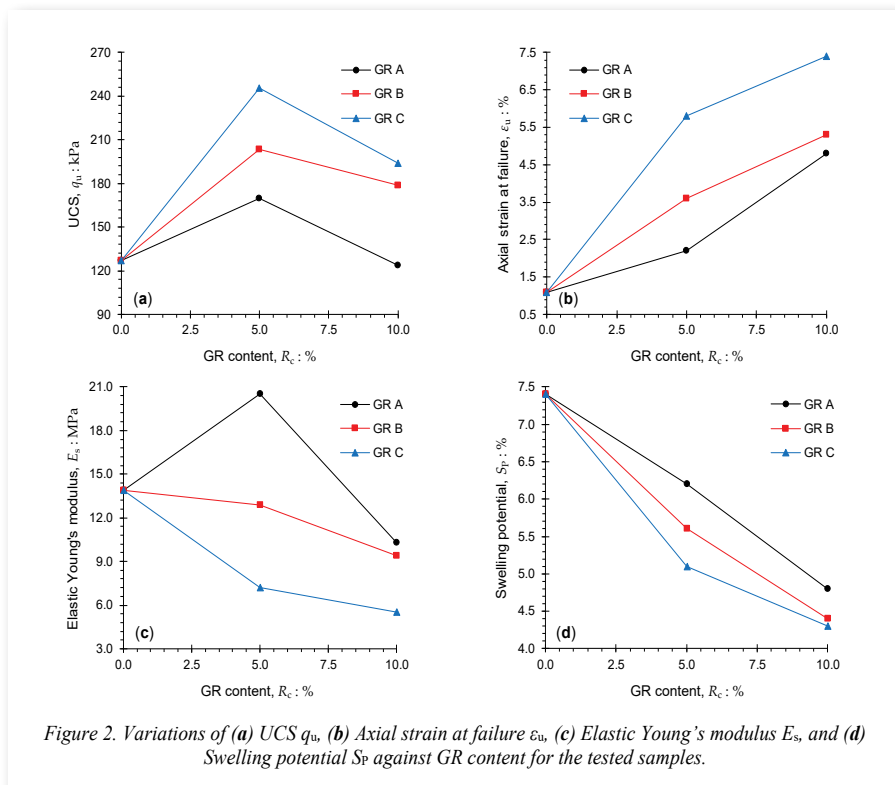


Figure 2. Variations of (a) UCS q_u , (b) Axial strain at failure ϵ_u , (c) Elastic Young's modulus E_s , and (d) Swelling potential S_p against GR content for the tested samples.



Field application of GR: (a) Spreading GR on the existing soil; (b) Mixing GR and the existing soil; (c) Adding lime to the soil-GR mixture; (d) Multi-wheel roller operating after completing the mixing process; (e) Vibrating drum roller operating at a high frequency and a low amplitude; (f) Smooth-drum roller operating at a high wheel pressure; (g) Spreading the PM2 material on the soil-GR-lime layer using a grader machine; (h) Compacting the base with a vibrating drum roller; (i) The road view after compaction of the base; and (j) Laying the asphalt layer on the road.

increasing the GR content. Similarly, for any given GR content, an increase in GR size led to a further decrease in the soil's compaction characteristics.

2. For any given GR size, the greater the GR content, the higher the developed UCS up to 5% GR, beyond which the dominant GR-to-GR interaction (i.e., rubber-clustering) adversely influenced the blended samples' UCS while still maintaining a notable advantage over the natural soil. The sample stiffness, however, manifested a monotonically-decreasing trend with GR content. Similarly, for any given GR content, an increase in GR size promoted a notable increase in the UCS and a decrease in stiffness.

3. As a result of GR inclusion, the swelling potential exhibited a monotonically decreasing trend with increasing the GR content. Similarly, for any given GR content, an increase in GR size led to a further, yet less pronounced, a decrease in the soil's swelling capacity.

4. The GR material, at its optimum 5% content, was used to stabilise a subgrade clay deposit from a local road located in Adelaide, South Australia. It was concluded that by following standard paving practices, the GR particles can be mixed with the soil in a uniform manner, and potential mixing issues such as segregation and its adverse effects on compaction were not observed. This field

application demonstrated that the soil-GR blend can be used as a reliable subgrade material in road construction projects.

ACKNOWLEDGMENTS

The authors would like to acknowledge Green Industries SA for funding this project. The authors also wish to thank Paul Morgan from Pavement Asset Services Pty Ltd and Downer Group for their assistance in collecting soil samples, providing rubber samples and also for supporting the field work, as well the South Australian EPA and the SA Department for Infrastructure and Transport for their technical input and assistance with the project. Finally, the aid of PhD students Victor Zhao and Masoud Manafi in undertaking the experimental work is acknowledged.

Sydney's new buildings soar towards net zero

Sydney's new buildings will be more energy efficient, use more renewable energy and support the transition to net-zero emissions under an Australia-first plan to include energy targets in development applications.

Under the City of Sydney's proposal, DAs for new office buildings, hotels and shopping centres and major redevelopments of existing buildings must comply with minimum energy ratings from January 2023, and achieve net-zero energy output by 2026.

The measures are expected to save more than \$1.3 billion on energy bills for investors, businesses and occupants from 2023 to 2040, and help the City meet its target of net-zero emissions by 2035.

"Energy use in buildings is a significant contributor to greenhouse gas emissions," Lord Mayor Clover Moore said.

"Commercial office space, hotels and apartment buildings contribute 68% of total emissions in our LGA. If we're to meet our target of net-zero emissions by 2035, we need to ensure this sector is contributing to emissions reduction through increased energy efficiency, on-site renewable energy production and off-site renewable energy procurement."

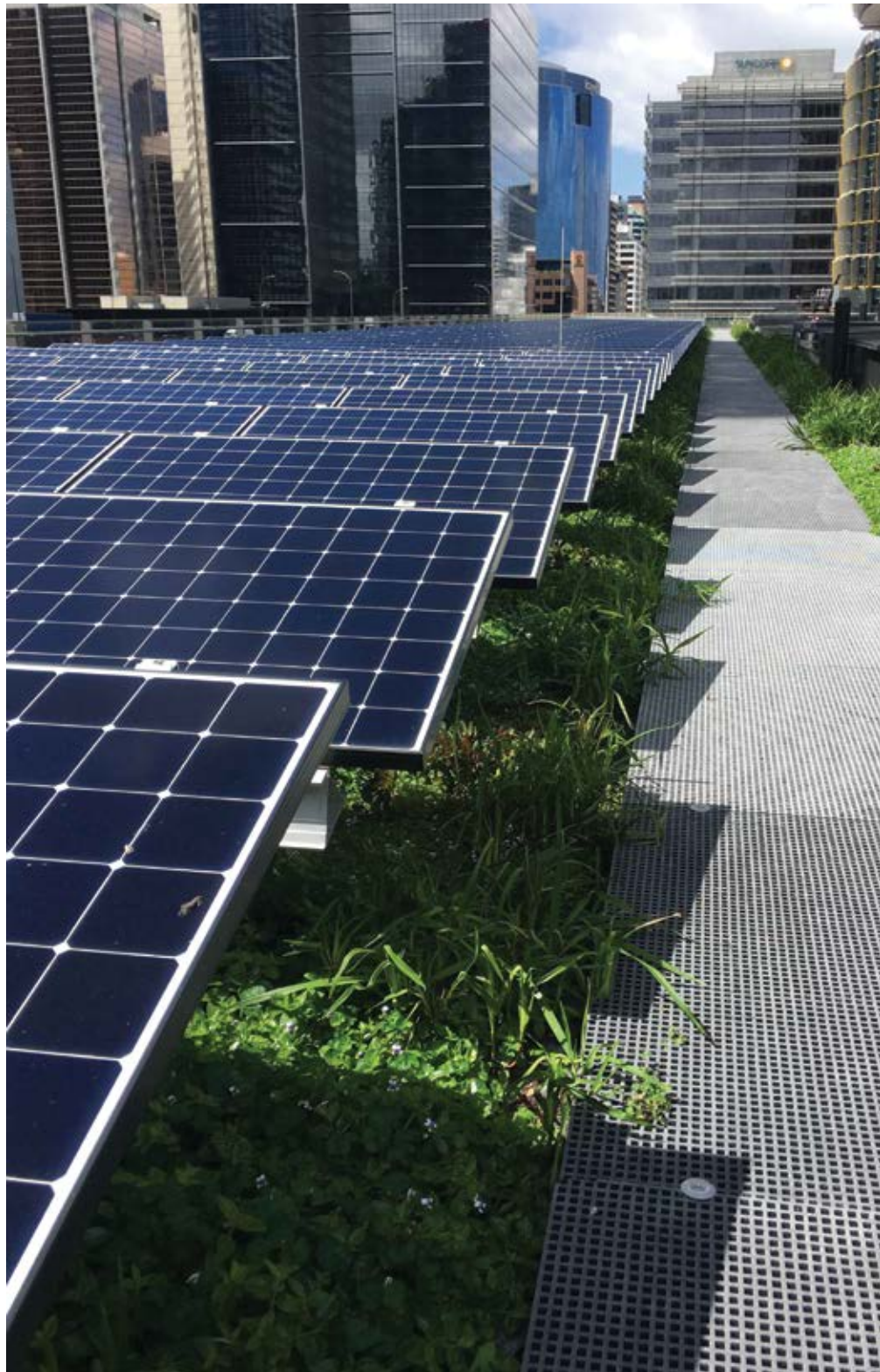
"We have worked with industry and government to develop performance standard step changes that are ambitious, but achievable. We're providing a clear pathway and time for developers to improve energy performance and transition to net zero buildings," she said.

"Not only will this program help us reach our target of net-zero emissions by 2035, it will provide energy savings of more than \$1.3 billion for investors, businesses and occupants across Greater Sydney. As we emerge from the impacts of the pandemic, we're helping ensure sustainability and resilience is at the core of business recovery," the Lord Mayor said.

The City's new planning controls will combine energy efficiency and the use of onsite and offsite renewables to move buildings towards net zero energy use.

Including the option to use offsite renewable energy purchases is another first for local planning controls in Australia.

Lord Mayor Clover Moore said the ambitious green building performance standards – a first for any Australian local council – have been created with support



Part of Sydney's Barangaroo South precinct - Australia's first carbon neutral precinct – Daramu House is one of Lendlease's most sustainable buildings to date and sets a new benchmark for sustainable developments. The Tzannes-designed building is the first large-scale project of its kind to include integrated solar photovoltaic panels on a rooftop that is home to a 'bee hotel' and almost 10,000 plants, capturing and harvesting rainwater while supporting local urban biodiversity.
Photo: Lucy Sharman

from developers, industry bodies, consultants and government agencies.

“The action we take locally will help reduce emissions and contribute to a positive Covid-19 business recovery for Greater Sydney,” the Lord Mayor said.

“The performance standards and evidence base can be used by all councils across Greater Sydney and will support investment in renewable energy and create jobs in regional areas – as we have already done through our investment in wind farms and solar farms in Inverell, Nowra and Wagga Wagga.

“The climate challenge is one that we can only meet with concerted action. The more we can work together and exchange information, knowledge and experiences, the greater our ability to meet the NSW Government net-zero emissions target and allow us to continue to create truly liveable cities.”

The new energy targets have the backing of leading developers, property owners and industry groups.

Greater Sydney Commission environment commissioner Emma Herd said we must accelerate industry and government action to combat global warming.

“Across Greater Sydney, the changing climate is a shared problem. These performance standards will help us meet our shared goal of net zero emissions and deliver progress against the Greater Sydney region plan low carbon city objective,” Ms Herd said.

“I would encourage councils across the Greater Sydney region to look at these performance standards as a useful tool for achieving environmental targets of net zero emissions and sustainability actions in their local strategic planning statements.”

Neil Arkless, Lendlease executive development director, said his organisation supported the ambitious performance standards.

“At Lendlease we recently set our own pathway to net zero carbon by 2025 and absolute zero by 2040. We are always pushing the boundaries to innovate in sustainability and welcome the City of Sydney leading the way in the development of these performance standards. I’m confident we can all rise to the challenge,” Mr Arkless said.

Stockland CEO Commercial Property Louise Mason said the company strongly endorsed the City’s net-zero energy buildings performance standards.

“We have brought forward our target to achieve net zero carbon emissions to 2028 and extended the commitment across our entire portfolio, covering close to 170 active assets and projects Australia-wide,” Ms Mason said.

The measures are expected to deliver substantial financial benefits. Annually office owners will save \$2,750 per 1,000 square metres of floor area and hotel owners \$170 per hotel room.

There are also additional public benefits and savings in health, energy network and emissions costs, worth around \$1.8 billion. The planning controls also support the NSW Government’s renewable energy zones through investment, and create demand for jobs and new skills in energy efficiency.

The performance standards address requirements in the Greater Sydney region plan and respond to local, state and industry goals, including the NSW net zero plan and electricity strategy, district plans to reduce carbon emissions and sustainability actions in local planning.

Further details of the of the proposal can be found on the City of Sydney’s website: cityofsydney.nsw.gov.au/policy-planning-changes/strategic-review-net-zero-energy-development

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Green Steel, first successful test with 30% gas-hydrogen blend



The world's first test of a 30% natural gas/hydrogen blend in the forging processes used in industrial steelmaking was held in Rho (province of Milan), at the Forgiatura A. Vienna plant.

The trial involved the use of the hydrogen/gas mix to heat the furnaces of the Forgiatura A. Vienna plant and was successfully carried out on site after a series of studies and laboratory tests lasting about a year. The companies involved in the initiative were: Snam, one of the world's leading energy infrastructure companies and developer and promoter of the project; RINA, a multinational inspection, certification and engineering consultancy, which handled the engineering analyses and laboratory phase; and GIVA Group, a global leader in steelmaking, which made Forgiatura Vienna available for the field test. The blend of methane and hydrogen was supplied by Sapio, an Italian company specialising in the production and marketing of industrial and medical gases.

Marco Alverà, CEO of Snam, commented: "In the medium to long term, hydrogen is in a position to become the solution for decarbonising steelmaking as well as all hard-to-abate industrial sectors that have a fundamental role in our economy. This trial is a preparatory step to the gradual introduction of zero-emission hydrogen, initially blended with natural gas and then in pure form, in certain steelmaking production processes."

"Snam intends to make its infrastructure, research and expertise available to contribute to the creation of a national hydrogen supply chain and to the achievement of domestic and European climate targets."

Ugo Salerno, Chairman and CEO of Rina added: "This test is the concrete proof that Italy's hydrogen production chain can significantly contribute to decarbonising complex and energy-intensive industries such as steelmaking. At Rina we are proud to play an active role in the ongoing energy transition, more specifically in such events where we can share our energy and industrial know-how."

Jacopo Longhi Vienna, from the Giva Group said: "Hydrogen can be a great ally to our Group. On one side, increasingly stringent measures on CO₂ emissions coupled with our willingness to reduce the environmental impact from our production processes, move us towards finding a solution."

"On the other, the use of hydrogen could create a driving market for valves and actuators produced by Group's subsidiaries. This project only marks the beginning of a path we will be involved in for years to come."

The use of the hydrogen and natural gas blend did not require any plant modifications and had no impact either on the equipment used (industrial burners) or on the characteristics of the final heat-treated product.

The project's potential in terms of environmental sustainability and economic competitiveness is significant. It is estimated that the permanent use of a 30% green hydrogen blend, fuelled by renewables, on the total gas consumed by the three GIVA Group's steel forging plants for its industrial processes would lead to a significant reduction in CO₂ emissions in the order of 15,000 tonnes per year, equivalent to

removing some fossil fuel powered 7,500 cars from the road. It would consequently result into CO₂ emissions savings amounting to approx. 800,000 euros per year (calculated on the current purchase of certificates) while ensuring the value and integrity of the steel forging manufacturing process and its long-term environmental sustainability.

Steel is also the material through which pipelines are made; these pipes will play a fundamental role in transporting hydrogen whereby supplying final customers.

The use of hydrogen in hard-to-abate industrial applications such as steelmaking will play a key role in achieving domestic and EU climate neutrality targets by 2050.

Looking ahead, green hydrogen is the ideal solution for CO₂-free steelmaking and processing. Snam is committed to having its infrastructure hydrogen-ready for transporting increasing amounts of hydrogen and to promoting its use in high-potential industrial sectors, including the iron and steel industry.

ABOUT SNAM

Snam is one of the world's leading energy infrastructure companies and one of Italy's largest listed companies by market capitalisation.

Number one in Europe in terms of the size of its transport network (over 41,000 km, including international activities) and natural gas storage capacity (about 20 billion cubic metres, including international activities), Snam is also one of the main continental regasification operators, through the Panigaglia terminal (GNL Italia) and the shares in the Livorno (OLT) and Rovigo (Adriatic LNG) facilities in Italy and the Revithoussa (DESFA) facilities in Greece.

The company is committed to the energy transition with investments in biomethane, energy efficiency, sustainable mobility and hydrogen. Snam also operates in forestation and has set itself the goal of achieving carbon neutrality (Scope 1 and Scope 2) by 2040.

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CSIRO report confirms renewables still cheapest new-build power in Australia

Solar photovoltaics (PV) and wind continue to be the cheapest sources of new electricity generation capacity in Australia, even when the integration costs of renewables are included, according to the final 2020-21 *GenCost Report*, released during June.

Each year Australia's national science agency, CSIRO, and the Australian Energy Market Operator (AEMO) consult with industry stakeholders to estimate the cost to generate electricity for new power plants in Australia through their *GenCost* report.

This year's report used a new, more accurate approach for analysing the cost of renewables like solar and wind, to include additional 'integration' costs such as storage and new transmission infrastructure, and still found solar and wind continue to be the cheapest sources of new-build electricity generation.

CSIRO Chief Energy Economist Paul Graham said an early draft of the report, released to stakeholders in December 2020, had been improved to reflect feedback about the impact of weather variability on driving up these integration costs.

"The final report addresses this feedback: our analysis of renewable integration costs now includes greater recognition of this year to year weather variability and the impact it has on electricity demand and supply," Mr Graham said.

"We took the integration costs from the highest of nine historical weather years."

Stakeholders asked that the analysis recognise batteries are achieving longer

lives before they need to be replaced and costing less, meaning the costs of storage from batteries is lower than previously thought.

This report concludes that:

- Solar and wind continue to be the cheapest sources of new-build electricity.
- Battery costs fell the most in 2020-21 compared to any other generation or storage technology and are projected to continue to fall. Lower battery storage costs underpin the long-term competitiveness of renewables.
- Pumped hydro is also important and is more competitive when longer durations of storage (above eight hours) are required.
- The new approach is a model of the electricity system that optimises the amount of storage needed, and also includes additional transmission expenditure. Previous reports added arbitrary amounts of storage costs and did not include transmission or other costs.

This report includes hydrogen electrolyzers for the first time and finds that hydrogen is following a similar trajectory to more established renewables. With increased interest in global deployment, and many demonstration projects worldwide, substantial cost reductions in hydrogen technologies are expected over the next decades.

This is the third *GenCost* report, following the inaugural report in 2018. The full report is available online at: https://www.csiro.au/-/media/EF/Files/GenCost2020-21_FinalReport.pdf



Jemena Calls for Renewable Gas Target

Leading energy infrastructure company, Jemena, has called for a Renewable Gas Target as a crucial next step towards achieving net-zero emissions in Australia by 2050. Jemena's Managing Director, Frank Tudor, said a Renewable Gas Target would likely replicate the success of the Renewable Energy Target (RET) which helped to spur the development of renewable technologies in the electricity sector.

"This is the jump-start the gas sector needs to truly commercialise zero-emission gases such as hydrogen and biomethane and make them available to Australian homes and businesses at scale," said Mr Tudor.

Mr Tudor said that by deploying renewable gas using existing infrastructure to achieve net-zero emissions by 2050, Australian energy consumers would also avoid costly, and unnecessary, upgrades to the energy sector.

"By decarbonising our existing gas infrastructure, we can avoid unnecessarily building new alternative forms of energy infrastructure, which will have a significant impact on customer bills.

"In the short-term this will make the transition to a low-carbon future seamless and means Australian homes and businesses can continue to use their gas stoves, heaters, and other appliances.

"From 2050, conservative estimates suggest Australian energy consumers can save anywhere between \$12 to \$14 billion per annum by simply utilising existing gas infrastructure to decarbonise our economy."

Mr Tudor said a subsidy in the order of \$3-15/GJ could facilitate the entry of



Together with solar, wind continues to be the cheapest source of new-build energy

significant amounts of renewable gas into Australia's gas networks, and is much less than the subsidy offered under the RET to the electricity sector, which was the equivalent of \$22/GJ.

"We believe a Renewable Gas Target could see up to 9PJ's of zero-carbon gas injected into Jemena's New South Wales gas distribution network by 2030. This would remove around 464,000 tonnes of carbon from the atmosphere each year, the equivalent of over 200,000 cars, and help New South Wales achieve a 10% renewable gas target. Our initial analysis has found that this can be done at an estimated cost of around \$15 for a typical NSW household.

"A Renewable Gas Target will also give confidence to those hard to abate sectors – such as the manufacturing sector – which rely on gas as a fuel stock, that they will be able to continue operating in Australia while decarbonising their supply chains. Renewable gases can also be used in the transport sector, particularly by larger vehicles such as buses and haulage vehicles. At the same time, we believe renewable gas will also provide firming power to intermittent renewable generation, particularly as hydrogen-fuelled power stations are developed."

Jemena's call for a Renewable Gas Target follow the company's call for a *Green Gas Certification Scheme* which would enable customers to purchase verified green gas from their energy retailers in the same way they purchase renewable electricity.

Jemena is currently investing over \$30 million in partnership with the *Australian Renewable Energy Agency* (ARENA) in projects designed to test the application of hydrogen and biomethane in residential, transport, storage, and commercial settings.

ABOUT JEMENA

Jemena is an \$11.5 billion company that owns and manages some of Australia's most significant gas and electricity assets. Jemena also part-owns the ActewAGL electricity and gas distribution networks in the ACT and United Energy, which supplies electricity to more than 600,000 customers across south-eastern Melbourne and the Mornington Peninsula.

For more information on Jemena, please visit: www.jemena.com.au

FRV to carry out its first hybrid solar battery Project near Dalby

Fotowatio Renewable Ventures (FRV), a global leading provider of sustainable energy solutions has started construction on its first 5 MWac Solar-Storage Hybrid Power Plant in Australia.

Located in the Dalby region of Queensland, the Battery Energy Storage System (BESS) facility will feature 2.4 MWac of solar photovoltaic (PV) generation panels and a 2.5 MWac/5 MWh energy storage system which, once completed, will be one of the first co-located PV and BESS system greenfield developments in Australia.

The plant's output will be connected to Ergon's distribution network, allowing the hybrid power plant to supply and take electricity from the grid and trade in the National Electricity Market.

The plant is designed to be operated as a predictable and dispatchable generation plant, to provide a reliable energy output to QLD customers. The system will have the ability to access the maximum number of markets and revenue streams, including arbitrage and Frequency Control Ancillary Services (FCAS) services.

FCAS is a process used by the energy operators to maintain the system frequency within the normal operating band. FCAS provides a fast injection of energy, or fast reduction of energy, effectively helping to manage market supply and demand.

Carlo Frigerio, Managing Director of FRV Australia, stated:

"Battery Energy Storage Systems are needed to support further investment in Queensland renewables and help maintain system security and reliability. This project will be critical to Queensland's future energy supply and security as renewable energy capacity increases, with storage supporting solar and wind power coming into the market when it is most needed."

"The inclusion of PV as part of the project shows the importance of integrating solar

and batteries in order to deliver dispatchable power," Mr Frigerio said.

Felipe Hernandez, Global Managing Director of FRV-X, added: "FRV is already collaborating with governments, regulators, and partners around the world to lay the foundations for a new energy model. Energy storage will play a central and critical role to fully realise the power of renewable energy, and FRV acknowledges the value of this technology as a key element to achieve a decarbonised society."

This project is FRV's ninth project in Australia becoming part of a total of approximately 640MWdc owned projects' portfolio. Only last year, FRV reached three financial closes in Australia alone, clearly demonstrating its continuing strong commitment to grow and consolidate its unique portfolio of solar and storage assets in the country.

The Dalby project also continues FRV's global expansion in utility-scale storage systems. The company is aiming to further grow its pipeline of energy storage capacity and already has two battery projects in the UK; Holes Bay in Dorset, a 7.5 MW/15 MWh battery plant that has been operating since June 2020, and Contego, a 34MW/68 MWh battery project in West Sussex, that once completed in 2021, will be one of the most advanced and innovative energy storage systems in the UK. In addition to this, FRV has developed an advanced pipeline of battery projects in different countries.

The Dalby Hybrid Facility is expected to create job opportunities during construction and operations. FRV requires all construction partners working on its solar farm developments to hire local contractors and utilise local suppliers wherever possible.

Construction is expected to be completed in December 2021 and the facility has an operating life of around 30 years.

For more information, visit: www.frv.com



More than 180km of LAPP Olflex solar cable was used in the establishment of Austria's largest solar power plant at Schonkirchen-Reyersdorf near Vienna. The 11.5MW facility covers an area of 13.3-hectares - equivalent to 18 football pitches or six MCGs.

LAPP signposts the future of photovoltaics with 11.5MW green energy in Austria

Anyone who doubts that solar power is about to make a major contribution to the planet's clean-green energy output might pause to consider some statistics provided by LAPP Australia about one of the LAPP Group's recent eco-friendly projects.

The new system, which began operation in Schonkirchen-Reyersdorf near Vienna, Austria late last year combines 34,600 solar modules to generate 11.5 megawatts, or almost 11 gigawatt-hours of electrical energy a year. The facility produces enough energy to satisfy the consumption of 3,400 households, saving some 8,000 tons of CO₂(e) emissions annually.

The new solar facility – Austria's largest – is still being developed to provide even greater capacity on a site covering 13.3 hectares, which is equivalent to 18 football fields, or six times the playing surface of the largest sporting stadium in the Southern Hemisphere, the Melbourne Cricket Ground.

LAPP Australia General Manager, Simon Pullinger, says the project – for which the global parent company supplied 180km of its Olflex® solar cables for the DC section of the photo voltaic modules alone – also absorbed a wide range of other products available in Australia to withstand the rigours of outdoor operations at solar and wind farms and clean-green water plants.

The global LAPP organisation – with 4,650 employees and turnover well exceeding a billion Euros (\$A1.62 billion) – established

LAPP Australia in 2018 to serve future-focused industries Down Under. These include energy, rail, mobility organisations, manufacturing and plant engineering (including automation, robotics and process engineering systems), electrical engineering systems and energy systems, including wind and solar green energy; machine building and machine tools; food and beverage; automotive, intelligent buildings and infrastructure; and resources industry, including mining and oil and gas process engineering.

Mr Pullinger says the family-owned LAPP company prides itself on its far-sighted ethos of outstanding innovation, quality, range and service, which has won it many customers across Australia, to the point that LAPP Australia now has more than 20,000 products available online. Live real-time stock checking on both the local and German HQ warehouses gives customers greater access to products and rapid lead times for better planning of future-focused automation initiatives, including those taking place locally as a result of Industry 4.0 digital integration and in response to global major trends such as clean, green energy and water.

Service and precise on-time delivery capabilities were a major factor in the global company winning the latest solar energy contracts in Austria, where the market for solar for photovoltaics is growing by 50 per

cent every year, says Mr Pullinger. LAPP Australia has equipped itself to cater for rapid expansion of this field in Australia, given our abundant natural energy resources and need to achieve world's best standards of sustainability and environmental protection vital to industry's future.

ABOUT LAPP

Headquartered in Stuttgart, Germany, LAPP is a leading supplier of integrated solutions and branded products in the field of cable and connection technology. The company's portfolio includes standard and highly flexible cables, industrial connectors and cable entry systems, customized system solutions, automation technology and robotics solutions for the intelligent factory of the future, as well as technical accessories. LAPP's core market is in the industrial machinery and plant engineering sector. Other key markets are in the food industry as well as the energy and the mobility sector.

LAPP has remained in continuous family ownership since it was founded in 1959. In the 2018/19 business year, it generated consolidated revenue of 1,222 million euros. LAPP currently employs approximately 4,650 people across the world, has 18 production sites and around 44 sales companies.

ABOUT LAPP AUSTRALIA

LAPP Australia offers a one-stop shop for highly integrated, efficient and reliable systems which comply with the leading Australian, European and American compliance and quality standards.

In addition to major LAPP brands of product – such as OLFLEX®, UNITRONIC®, HITRONIC®, SKINTOP®, SILVIN®, EPIC, FLEXIMARK®, and ETHERLINE® – LAPP Australia focuses strongly on world-class total solutions incorporating highly compatible components from the one source.

For Information visit: www.lappaustralia.com.au



Palestine's first Waste-to-Energy plant to reduce 400,000 tonnes of greenhouse gases each year

Amsterdam Waste Environmental Consultancy & Technology B.V. (AWECT), a member of the Northern Consortium, wins the international tender to Design, Build, Own and Operate (DBOO) the first Waste-to-Energy (WtE) plant in Palestine and in the wider region. The Northern Consortium will deploy its state-of-the-art High Efficiency (HE) technology that will bring USD 150 million as private investment to Palestine.

The Palestinian Ministry of Local Government (MoLG) issued a non-binding letter that the tender to develop a WtE facility has been initially awarded to the Northern Consortium consisting of AWECT (consortium leader), Koblenz Renewable Energy Amsterdam Renewable Energy, China Western Power Corp, ITEC, and MOSECO Group. The facility, planned to be built at the current Zahrat Al Finjan landfill near Jenin, will convert 1,200 tons of residual municipal solid waste per day into clean energy and resources.

The MoLG evaluated the bidders to guarantee maximum benefits to the Palestinian people in terms of job creation, investment to the country while safeguarding environment and public health. Negotiations between the Government and the consortium will be the next step towards the definitive agreement.

The HE WtE plant will eliminate the need for additional landfill space while providing around 40MW of baseload electricity, ~3 per cent of the territories' consumption. In addition, waste diverted from the landfill to this new facility will lead to a reduction of more than 400,000 tonnes of greenhouse gas (GHG) emissions annually.

Additional benefits of this facility to the local community include reduction of air pollution, odour, littering and lower risk of water contamination, as well as the creation of hundreds of direct and indirect local jobs.

Construction of the plant is expected to start within 2022 and the project benefits from a 25-year power purchase agreement (PPA) and a 25-year waste concession.

"There is scope for significant GHG reduction in Palestine through the use of WtE technology," Evert Lichtenbelt, CEO at AWECT, explained.

"As the first plant of this type in the region, the new facility will reduce emissions by a colossal 400,000 tonnes each year, following its completion."

To develop the facility, AWECT will deploy the same expertise used to build the AEB Amsterdam facility, which is the most efficient and cleanest in the world. The plant in Amsterdam can generate 900kWh of electricity from each ton of waste and has processed over 5.5 million tons of waste since its commissioning in 2008. AWECT expects similar success from its Palestine facility.

More information on AWECT can be found at: www.awect.com

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Third Party Accreditation: the May, the Has, the Does and the Verified

Andrew Wheeler, ABES Australia

Traditionally when purchasing a manufactured item or product the “Brand” has been a significant indication of the quality as the two tend to be related. However, today with greater globalisation and the emphasis on costs there has been a significant move towards the manufacture of “commodities”. Consequently, when purchasing a product, we have a wider range of producers with significantly varying and competitive costs. Can we have confidence that they all meet the required standards?

It is normal for these products to have markings and guarantees indicating that they meet the relevant codes and standards. This these may be the provision of manufacturer test certificates or the provision of printed warranties. While test certificates do provide some confidence, it is recognised that falsified test certificates are on the rise. Recently there have been cases of internationally well-known manufacturers with the reputation for high quality admitting to falsifying test records

for numerous years. This raises the question then are manufacturers warranties and manufacturers test certificates a guarantee of the desired quality? And how does third party accreditation assist in ensuring quality?

Non-conforming products being introduced into the Australian and the New Zealand building construction industries have increased significantly in recent years. There have been some notability high profile cases demonstrating significant risks to the general public, coupled with high corrective action costs that are primarily born by the owners. It is evident that self-regulation in its current form is not the appropriate tool to ensure that “conforming” and “fit for purpose” products are being provided to the construction industry. In response to these events recent moves by regulators has seen legislation introduced that places the responsibility of nonconforming products on supply chain participants. This goes beyond the supplier to include the builders, the designers and the specifiers.

In the construction industry, systems, products and materials being utilised are becoming more and more complex, resulting in the certifier relying on certificates supplied by the builder, sub-contractors or in some cases from third party product certifiers to ensure quality standards are met. While the builders and sub- contractors are in the best place to certify compliance to the various standards for their works, they are generally at a loss to certify prefabricated components and ensure the quality of materials being supplied. Hence, the use of and specification of third-party assessments are becoming more prevalent.

In the marketplace today, there are numerous certifying companies and various certifying schemes. This raises the questions. Whom are these third-party assessors? What are they certifying? What standard are they using in their assessment? Do they have the required expertise to assess the quality of the product/process? Do they all assure the same quality outcomes? How can we be

assured that the product being provided is equivalent to what was specified?

In this article we will look at third party certification, identifying that there are differing levels of third-party certification and that it is important the specifier/designer/builder understand what they require from certification: and what scheme their product is being certified to. A certification scheme may be managed by statutory boards or developed within the individual companies/organisations. In evaluating the appropriateness of a third party certificate, it is important to understand how the scheme operates, including to what are they certifying to (is it to a standard or is it performance based), ongoing requirements (is it a compliance check at the time of certification only or are there ongoing checks carried out), whom is carrying out certification and do they have the required technical expertise.

“In evaluating the appropriateness of a third party certificate, it is important to understand how the scheme operates, including to what are they certifying to (is it to a standard or is it performance based), ongoing requirements (is it a compliance check at the time of certification only or are there ongoing checks carried out), whom is carrying out certification and do they have the required technical expertise.”

When looking at the schemes currently available in the Australian/New Zealand marketplace, they fall into one of the following four categories of quality compliance:

Four Levels of compliance:

1. **May** comply - the processes and operation of the facility mean that it can produce the product to the required level, but no checks have been carried out on the final product.
2. **Has** produced - the processes and operations of the facility produced the product to the desired quality verified at the time of certification inspection.
3. **Does** produce - the processes and operations of the facility and procedures result in a product of the desired quality which was verified at the time of certification, with regular audits and internal testing to ensure quality systems maintained.



4. **Verified production** - the processes and operations of the facility produces the product to the desired quality verified at the time of certification with ongoing reporting and regular independent audits to verify and ensure quality of product.

It should be stressed that all four levels of compliance are legitimate and have a role to play in the wider building and construction industry. It is however critical that those whom are specifying, installing or certifying building products have a good understanding of differences in compliance levels and the associated level of risk that they may be exposing to themselves, their clients, building owners, insurers and the public.

To enable a better understanding into these various compliance levels, a description for each follows.

Level 1

May comply - in this case the manufacturing facility has been assessed as being capable of producing the product to the level required. The facility being assessed as capable of producing is the key component in this system. There is no supporting evidence to say that they do actually produce to the standard, they have simply demonstrated that they have the equipment and associated procedures to do so. Cost to obtain this type of certification is generally low as the assessment typically involves a one-off assessment and does not require any technical assessment.

A limitation of this certification is there is no independent verification that the product actually meets desired quality and there is no requirement for ongoing assessments or verification.

Level 2

Has produced - in this case the compliance assessment has verified that the process and operations undertaken to produce the product has resulted in the quality required by the specification at the time of the assessment. The keyword here is produced. While certificates are typically dated with an expiry date, there is no expectation of ongoing external or internal audits to maintain this quality, only an assumption that the process and systems will remain unchanged. So while the assessment has demonstrated that the processes and operations are able to produce the quality required, it could be argued there is no guarantee that the quality will be retained with changes in the system. Similar to the previous level of certification, the costs are relatively low due to the minimal involvement of the certifying authority.

It would be considered that both the Level 1 and Level 2 certifications are acceptable where risks and costs associated with a failure are manageable. Examples of these would be items that could be replaced with relative ease if the standard of quality was not appropriate.

Level 3 and Level 4 are different to Level 1 and 2 in that they provide not just an initial verification of the quality produced by the processes and systems, but an ongoing check on the quality. The primary difference between these two levels is the rigour and the independence of the quality audits.

Level 3

Does Produce - the assessment is generally carried out with some input from a technical expert, looking at the systems and the end product ensuring that the specified quality is obtained. This assessment is generally based on internal verification methods that are provided at the time of assessment. It should be noted that this level of certification may also require some ongoing audits from the certifying body, such as annual quality audits and possibly review of internal test results. This level of certification generally provides a good level of confidence that the product does meet the required standards. It does however require a fair degree of self-regulation, as the ongoing assessments are based on results provided by the manufacturer. In such a system there is a significant reliance is on the manufacturer self-regulating that the product does meet the quality requirements.

Level 4

Verified Production - the certifying authority utilises external audits and other verification systems. While the extent and expertise of the external audits may vary depending on the product, they will all include regular audits conducted by technical experts looking at the technical aspects of the product and reviewing the internal quality systems. Additionally, verification that quality is being maintained is achieved through sampling and independent testing. This type of system also typically has full traceability of the product being delivered, enabling the purchaser to determine the source of all materials and identification of the facilities that the product has passed through. In this case the confidence in this product meeting the specified requirements under this certification scheme are excellent and the quality has also been verified by regular third-party testing.

To understand the applications for each compliance level let look at a few examples from the construction industry.

An example of a Level 1 certification would be a lighting fixture. The manufacturer may hold a third-party certification obtained by providing the third-party certifier with manufacture procedures outlining the materials and configurations used along with any testing and compliance requirements the manufacturer may have also undertaken internally. The assessor will have reviewed this information to the relevant standards (typically a desk-based audit), and if appropriate a compliance certificate will have been issued stating that if fabricated in

“It is recognised that the levels of certification do have cost implications, and these need to be weighed up against the exposure to risk.”





accordance with the installation manuals and using the specified materials the components comply with the relevant standards. Under this arrangement reliance is on the manufacturer to ensure quality. A lighting fixture would be considered not to be a critical element and could be easily replaced in the effect that the fitting was shown not to be compliant with the specification, hence the associated cost/risk with non-compliance is low and this type of certification is appropriate.

An example of a Level 2 certification would be a waterproofing system. In this case the manufacturer may obtain third party certification by providing the installation procedures configurations, and materials to be used along with any testing for compliance. The manufacturer would carry out the required type testing to validate the systems works and submit this as part of the certification. When reviewed the certifier can issue the certificate that the system if applied as documented it should meet the required standards. In this case there is no requirement for ongoing checking that the system works. It is noted that as a rule the installers will carry out testing (checked by builders) but the certifier of the system would not carry out the inspection. So for this system there is verification that the system can work, but the final check to ensure that the quality is maintained is on the builder, and failure can be rectified at minimal costs.

Structural components would typically fall under a Level 3 and Level 4 compliance where standards require initial and ongoing compliance checks of the products. In these cases, the certifying authority would be undertaking audits to ensure that the procedures and testing as outlined in the standards have been met. Typically, the testing requirements for compliance are carried out by the manufacturer to ensure that the quality is maintained. One of the key additional requirements of this level of

certification is the requirement for ongoing checks on the quality standards through both internal audit and external audits. The regularity and extent of these audits either internal or external is a measure of the assurance of the quality.

An example of a Level 3 certification would be an accessible fastener, in this case there is an assumed performance specification that needs to be guaranteed to ensure the overall system is fit for purpose. The associated cost/risk of non-conformance is high and so a level of confidence in the behaviour of the fasteners is required, however in this case as the fasteners are accessible if non-compliant, they could be replaced thus Level 3 certification would be considered appropriate.

The Level 4 certification of this system would involve additional quality assessments carried out by independent experts in the field and external testing. Hence, not only would the company be ensuring compliance throughout their systems on a continuing basis, but an external expert is also reviewing compliance of the products and compliance to the systems being managed by the company. The significant advantage of the Level 4 over the Level 3 certification is that by utilising the independent parties for testing and assessments, systemic problems that affect the quality are identified and resolved through the auditing procedure.

As an example, if we take the previous example of a fastener, but position it so that it is inaccessible (i.e. encased in concrete or within the structure). Then non-conformance may render the structure not fit for purpose, hence all measures possible should be taken to ensure that the produce meets the requirements and the compliance is independently verified.

It is recognised that the levels of certification do have cost implications, and these need to be weighed up against the exposure to risk. Hence some question the

specifier, builder, owner should be asking are:-

- what are the implications if the quality standards are not achieved?
- how critical is component to operations and structural integrity?
- what level of third-party certification is required?
- is independent testing required?

Once the level of certification has been identified, it is then critical during the specification and procurement process to review the proposed third-party certification and ensure that it meets the requirements to ensure that the quality specified is achieved.

ABOUT THE AUTHOR

Andrew is currently the Acting Executive Director of the Australasian Certification Authority for Reinforcing and Structural Steels (ACRS), a chartered professional engineer working in the building construction industry for over 25 years as a consultant, a researcher and senior project manager. Andrew has been involved in design and construction of steel, reinforced concrete and composite structures, and has been involved in both short term and long term monitoring of these structures. Andrew has been involved with the development of several building standards, with his technical expertise and understanding of standards and understanding, Andrew has been involved with the technical assessment of numerous products for use in the Australian and international construction industries. Andrew has an extensive research background in structural engineering with over 60 technical publications. He is actively involved in the dissemination of new research to the engineering community and has been involved in the implementation of quality systems within the building industry. He has extensive practical knowledge in the set up operating and auditing of Quality Assurance systems and has been involved with the quality audits for NATA and SAI Global. His experience in the construction industry has led involvement in a number of international research projects and engagement as technical expert within Australia and abroad.



The COVID pandemic has seen a significant increase in the number of people relocating to regional Australia.

Will Corona drive the rise of regional Australia?

by Warwick Lorenz, Managing Director, Australian Pump Industries

This story is contributed by Warwick Lorenz, Managing Director of Australian Pump Industries. Warwick is a keen watcher of the economy and Australian politics. He is also a strong advocate for national water reform – including the expansion and modernisation of Australia’s water supply network.

Warwick is passionate about the country, particularly about agriculture which he believes could rival our iron ore earning with production levels of up to 300 billion, if encouraged by governments prepared to put the money into the engineering and infrastructure development that will bring more people to the inland.

Here, he looks into how we just may be seeing the beginnings of a population shift that has the potential to bring regional Australia to life!

As we continue to battle with Corona not just in Australia but around the world, and we wait for the opportunity to get our first jab, we look at our country with a fresh perspective. What we thought was impossible before, working from home and getting the same results, has become a reality.

We are not suggesting that everyone can start working from home. Factory workers would have a problem, likewise Police, Ambulance, doctors and so on.

If we believe the information produced by Infrastructure Australia, we are seeing a 200% increase in nett migration to country areas as a result of the Covid 19 crisis. One survey carried out by the Regional Australia Institute is quoted as showing that more than 1 in 5 Australians are now actively considering moving to a region... driven by the obvious advantages of regional Australia.

So, we see that a bi-product of the Coronavirus – and more specifically, the change to many people working from

home – has led to a widespread realisation that there is a life outside the big smoke!

Many Australians have found they can work just as effectively from regional centres than in the big cities. At the same time, coinciding with this migration, we are seeing the comparative values of real estate in the cities and country areas in a more dramatic contrast than ever before. Every day, it gets more expensive to live in the cities... while country living remains largely more affordable. There are also major lifestyle advantages.

Why go bush?

Now that our six-year drought has broken, we tend to look on regional Australia as being far more attractive. The trends that are being reported now show Millennials ages 25 to 40 are a major part of the shift to the country.

The interesting thing is that most are not heading for Byron Bay, the Mornington Peninsula or Margaret River, but rather more genuine productive

country towns where there are real economic strengths – as well as significant opportunities. Tamworth, Toowoomba, Wagga Wagga, Shepparton, Mildura: the list goes on. All are attractive, cosmopolitan cities with an abundance of facilities and services and, perhaps most importantly, where the living is totally different to the frantic pace of inner-city life. Maybe we weren't all designed to live in high rise apartments!

Kim Houghton, the Regional Australian Institutes' Chief Economist commented:

“With younger people, you expect their regional destinations of choice to be one of the flash regional coastal towns with strong retail, entertainment and tourism elements, and of course great beaches.”

More and more, however, this is simply not the case.

Houghton goes on to point out that these younger people are now inclined to go to less known inland towns and bring their own element of colour and life to those regions.

The challenge of rural Australia

Politicians all know that the votes are in the cities. Elections are won and lost based what our political parties can pull out of appealing to urban over country dwellers. That's the driver for the huge multi-billion dollar urban transit systems designed so we keep our cars and still get from one side of the city to the other in reasonable time.

What a contrast that is to a town like Tamworth where new sub-divisions are springing up almost on the doorstep of the huge Equestrian centre that makes that town a horse lovers paradise. There are lots of other benefits as well. The pace is slower. There is time to think. You can get around town in a matter of minutes.

Most country towns are located on a river with access to water sports and all of the other possible hobbies from bird watching to fishing. It's a modern lifestyle that in many ways harks back to a 'simpler time'. It is a culture that has its very real attractions.

But, not surprisingly, regional Australia also has it's needs – especial in terms of water.

It is good for the country

We saw devastation hit hundreds of country towns when their water ran out during the drought. Paddocks and crops were ruined, many farmers walked off the land and lost their farms. Sadly, many took even more tragic and permanent action. Indeed, as with previous droughts, the last drought brought with it literally thousands of tragic stories.

Imagine a farmer seeing his stock, sheep, cattle or horses dying in the paddocks and feeling helpless to do anything about it. The author of this story has seen farmers so beaten that they don't even have the energy or the ability

to put their animals out of their misery.

With that in mind, if we seriously wish to help drive and sustain this current COVID-driven regional boom, there are a few critical things we need to do.

Surely, it is a good thing to have Australians, young and old populate the inland and reap the benefits of the jobs, the lifestyle and lower cost of living. All that, and we haven't even mentioned the absence of pollution and the pleasure of looking at a night sky full of stars!

What can go wrong?

The answer to that is very simple. Right now, farmers are hiring anybody they can get, not just for seasonal fruit picking but for all of the extra work that is generated by last year's record agricultural production. What's more, we are now projecting another bumper harvest with wall-to-wall planting in northern and central New South Wales for a start.

Sales of tractors and agricultural machinery are also running at a record high as a continuing mechanisation is employed to combat the lack of labour and build more efficiency. In short, much of regional Australia is once again booming.

The reality is that we have once again proved that all we needed to turn this country into an agricultural powerhouse was rain. The fly in the ointment is that when it comes to rain, there are no guarantees.



While the end of the drought has delivered a much needed boost for much of regional Australia, investment in drought-proofing infrastructure is critical for future water security.



A drought-proofed Australia could play a major role in sustaining the rapidly increasing global population

Unfortunately, this is where we come to the political reality that in spite of the lessons of the recent drought – and the many that have come before it – no major efforts have been made to drought-proof the country.

Bringing water to the regions

We all saw stories (some readers may even have had first-hand experience) of “Towns Without Water, Farmers Without Hope”. The same farmers who are having a brilliant time now, are just as likely to suffer the same lack of water within a decade, maybe even substantially sooner.

Climatologists tell us that we can expect more bushfires, more floods and more droughts – only more severe, and on more regular cycles. Many politicians don’t seem to genuinely understand the benefits a massive programme to drought-proof the country, including the ability of such programs to provide us with a more reliable and sustainable economic future.

One thing for sure if the world’s population continues to increase at anything like the current rate – bearing in mind that in 1945 it was 3 billion and is now running close to 8 billion – a drought-proofed Australia could play a major role in sustaining the global population. Indeed, a drought-proofed Australia has the potential to be one of the world’s major food producers – fulfilling a critical role in feeding the masses.

If we accept that all of this is a fairly sound proposition, then you can see why we should encourage people to go bush. All the opportunities and lifestyle benefits without the pain of a massive mortgage.

An excellent investment in the nation’s future

What political party, if they are sincere, couldn’t sell the idea of taking all the water from recent floods and the monsoons from the north and putting it to work where it needs to be? Will it cost money? Sure.

Is it worth it? Absolutely!

When the idea of harnessing monsoon flood waters for use across eastern Australia was last floated by Tony Abbot and Barnaby Joyce, it had a price tag of 30 billion dollars.

Even if we assume that inflation has driven that cost up to 50 or 60 billion dollars, comparing that to what the COVID pandemic has cost us, and the so far unformalized negative effects of the drought (measured in dollars instead of just heartache) makes it clear that such a drought proofing plan is not only an excellent investment in our Nation’s future – it’s also a political no-brainer!

ABS data shows that in the last (September) quarter of 2020, no fewer than 7,782 people left the greater Sydney region, with 3 in 5 moving to regional New South Wales. The pattern was repeated in Victoria where Melbourne lost some 7,445 residents.

The story is there for us to see. Surely our political masters can see where this is heading and where it should be “driven”. Let our Millennials go West! (or East for our Western Australian cousins). Let them rebel from their suburban parents and head to the bush, bringing new life and inspired intelligence to our agricultural pursuits and the wider regional economy. After all, that’s what Australians do best!

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Five Top Tips for Submitting an EOI or Tender

By Ian Hudson, Executive Director, Industry Capability Network NSW

Being busy isn't always being productive. If you or your business development team are busily preparing expressions of interest (EOI) or submitting tenders without really considering the worthiness of it, you could all be wasting your time.

Here are some tips for people who want to make sure that their time is well spent with a reasonable chance of success, rather than having a shotgun approach of trying to hit anything. Of course, the first step is to understand your own business, but once you know this then you're in a much better position to make the right choices and present the business in the right light.

1. Know the buyer

The number one tip is to know the buyer even before the EOI is called for, if that's possible. The more you know about the buyer, the better the chance that you'll be able to highlight the aspects

of your business that the buyer is going to be interested in. So, try to meet the buyer, get on the mailing list, review the company's annual reports and get into the management's heads to fully understand where the company is now and where it's trying to go.

If the buyer is really of long-term interest to your company, then maybe you should consider also modifying your business to better match the requirements of the buyer or similar buyers. This could involve employing additional aboriginal companies or employees, if that is part of their direction. You might also consider ISO 9001 or other certifications to support your refined approach.

When you actually start writing your EOI (or responding to questions if it takes that form), you'll find that the request makes more sense if you know the buyer. This means when you respond you can take

the context of the question and use that in framing your response so it appeals to the buyer's needs.

2. Ask if the opportunity is a good one for your company

I remember clearly the moment when I realised that before charging down the road of responding to a tender or an EOI that I should stop and consider if the opportunity is really relevant for my company. You need to know if it's a good fit, because chances are that if it's not, then there are plenty of other companies that can provide the same solution, but would have a much stronger case to present. If there are hundreds of companies that can do it better than you, you are probably considering the wrong opportunities.

You need to get your business into a limited field so that you have a one in five



or one and 10 chance of being considered. This might also just take geography into account. In some cases where you are located in relation to the requirement can be an important factor. So, if geography is relevant, will this favour your business over others or will it actually disadvantage you?

Also, in considering whether an opportunity right for your company, you need to consider the track record that you can present as part of your EOI or tender response. If you don't have a track record in an area where other people will, you will be at a severe disadvantage.

With an EOI where price is not even being considered yet, you can't even use low price to offset your lack of experience in the required area. Because price is not relevant in an EOI, your capability and your professionalism are the key elements that need to shine.

3. Answer questions clearly and tailor your response

The third tip is getting the words right. The last thing a procurement person wants to do when they have a pile of EOIs or tenders to go through is to have to wade through words upon words to try and find your answer to a question. Keep your answers within the space or word count provided. And, of course, never ask the procurement person to look at external sources - they are not going to visit your website to find the additional information to support your response.

Sometimes you might have a capability that is not specifically requested, but it could strengthen your response. It's a good idea to include this in your EOI or tender, but you need to build a bridge from that capability to the buyer's needs and spell

out how this is relevant and will benefit them. If you don't make this connection, all you have done is added more words.

Yes, there might be a lot of questions in an expression of interest, but each one has been prepared by the buyer for a reason. Savour each question, answer it fully, answer simply and let it stand alone as a description of your company's response to that question. It is true that sometimes a buyer will add questions or a prequalification form just to test your mettle. However, if you are not willing to cooperate at the EOI stage, how good a supplier partner will you be? No matter how difficult it is, if the work is right for you, you must answer and be totally cooperative with the buyer's requirements.

You should always tell the truth in your tenders or EOIs. While you always want to present your business in the best possible light, if you oversell to the point of contorting the truth, you're wasting the buyer's time. (And wasting your time.)

If you are submitting an EOI through a portal, such as the ICN Gateway, keep in mind that your capability profile will form part of your response. So, it's important to revise your profile each time you are submitting an EOI so that you understand how your capability profile will be seen from the buyer's perspective. You should make sure that your capability profile is up-to-date and reflects your business in the best possible light in the eyes of the buyer.

4. Ask for feedback

The fourth tip you've probably heard before. However, many people don't do it. You should always seek feedback from the buyer, even though sometimes the buyer is unable to give it.

If you do manage to receive feedback: listen carefully, don't be defensive and consider modifying your future responses to reflect the feedback. If you find the buyer is giving you responses that are vague and full of platitudes, try to probe deeper and give the buyer an opportunity to revisit your EOI without losing face.

You won't believe it, but sometimes they might try to give you an answer without having fully considered your submission.

5. Keep on submitting

My final tip is don't submit just one EOI and then give up. This is a long-term game. Each time you prepare an EOI or a tender, you better understand your company, know how to present it in the best light and to how to write more succinctly. Most of all, you will find that you have certain answers to questions ready to go in future EOIs. You'll also get better at providing responses and delegating requirements to your team early, so that you don't leave things to the last minute.

Overall, if you know your business strategy, your markets and where you sit relative to the rest of your competitors, you can choose the right opportunities and shape your business to best suit those specific opportunities and create targeted responses for your most desirable customers.

About the Author

Ian Hudson is the Executive Director of Industry Capability Network NSW (ICN NSW). ICN NSW bring suppliers and project owners together by giving exclusive access to ICN Gateway, our powerful online database, and our extensive network of Industry Consultants. Our consultants actively work with project owners and suppliers behind the scenes to build the right procurement partnerships.



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