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About the Cover

Mobile Smart Sinks - the Smart Aussie invention that SAVES TIME, SAVES WASTE, SAVES WATER and helps to deliver a COVID-SAFE CONSTRUCTION SITE!

► Turn to **Page 12** for the full story.

Reducing landfill waste will take more than just recycling...



Dear Readers,

While the majority of Australian councils and waste authorities have had significant success in diverting waste from landfill through residential recycling programs, and more recently, residential green organics collection and processing programs, the amount of waste still being disposed of in the nation's landfills provides a stark reminder of the challenges that lay ahead.

While changes in the global recyclables marketplace have significantly increased both the depth and complexity of this waste diversion challenge, they have spawned a range of new and innovative processes and brought a number of new players into the Australian resource recovery and recyclables market. However, it is clear we still have a long way to go... and it's not just about recycling.

Unfortunately, when it comes to the Municipal Solid Waste (MSW) stream, it seems that many councils and authorities are still reluctant to consider implementing large-scale 'Alternative Waste Technologies' (including waste-to-energy solutions) to reduce their landfill burden.

Put simply, although there has been an increase in the number of Australian councils and waste authorities utilising Alternative Waste Technologies in recent years, most councils still send the majority of their MSW to landfill - despite the fact that there are a number of proven AWT technologies available.

From Mechanical/Biological Stabilisation systems (which convert the waste stream into high calorific value Refuse Derived Fuels), through to 'Bioreactor/Digester' type systems (which focus on utilising the organic component of the MSW to produce compost-

type products and/or methane for power generation), the one common denominator among these technologies is their focus on maximising diversion of waste from landfill.

By separating any 'high-value' component materials (including ferrous and non-ferrous metals) for recycling, and then processing the majority of the remaining fraction into value-added product(s), a number of these technologies have proven their ability to reduce the amount of MSW being disposed of at landfill by over 90%.

For many, the major issue with the introduction of these technologies, has been that of cost. That's not to say that these processing technologies are necessarily over-priced, or for that matter, that there is a lack of commitment to reducing the amount of waste being disposed of at landfill. In many instances it is quite simply a reflection of the relative cost of AWT processing per tonne when compared to the comparatively low costs per tonne of landfill disposal in Australia.

Importantly, however, this equation is changing. Landfill costs are constantly increasing, and the cost of technology is reducing. Both of these factors work together to make AWT an increasingly attractive and affordable option.

That's not to say that these technologies are some sort of 'magic bullet' that will eliminate all of our waste-to-landfill, or that they should be considered as a solution in isolation - quite the contrary. AWT's are only part of the equation.

When one considers the true costs associated with the collection, processing and/or disposal of any waste stream, particularly MSW, together with the cost of providing high quality recycling and other waste management services, it is clear that

another major challenge facing Australian councils and waste authorities is that of waste minimisation. Waste minimisation is not only a major environmental imperative, it is also a financial imperative - the epitome of sustainability. Unfortunately, it may also prove to be the biggest waste management challenge yet.

The first major issue with developing an effective waste minimisation strategy is that it's no longer simply about educating the general public into changing their disposal habits - although that is a critical part of the process. They also need to be educated to change their purchasing habits. In fact, successful waste minimisation requires a fundamental change in thinking by individuals, businesses, and society as a whole.

Importantly, unlike many other waste management programs which are able to successfully function on a local and/or regional basis, for waste minimisation to be truly effective it must be approached on a national scale.

I have no doubt that Australia is capable of meeting the challenge of waste minimisation. One only has to look to the success of the many plastic bag and single-use plastics reduction programs to see what can be achieved.

We can do it - but it will require no less than the full co-operation of all levels of government and private industry if it is to stand any chance of success.

Anthony T Schmidt
Managing Editor

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Artist's impression of REMONDIS' planned \$9 million liquid waste management and recycling facility at Dandenong in Melbourne's south-east.

Remondis ramps up liquid waste management and recycling in Victoria

REMONDIS Australia is taking liquid waste management to a new level in Victoria, having acquired multiple leading businesses and being awarded a significant state government grant to boost solvent recycling. Victorian Minister for Energy, Environment and Climate Change Lily D'Ambrosio recently visited REMONDIS' industrial wastewater processing facility at Dandenong (trading as *Organic Environmental Solutions*), a precinct that will soon be expanded to include a highly specialised solvent recovery facility.

The Minister announced that REMONDIS has been awarded a \$1.34 million *Recycling Victoria Infrastructure Fund* grant to advance the solvent recovery facility. Costing nearly nine million dollars and creating multiple jobs, the facility will process many solvent-containing wastes such as used cleaning solvents, inks and solvent-based paints. The plant will recover the reusable solvents and convert them into wholesale solvents for reuse by other industries.

The new infrastructure is timely and provides Victoria with an excellent opportunity to create additional solvent recycling capacity at a time when such capacity is limited.

REMONDIS applied for the grant in August 2020 and the solvent recovery plant is scheduled to be operational in early 2024, subject to licencing and approvals.

"Being recognised by the Victorian Government this way is testimony to our abilities when it comes to liquid hazardous waste recycling," said Michael Sienz, Chief

Operating Officer, REMONDIS Industrial Services

"This facility will be a game-changer for solvent recycling in Victoria, turning what would normally be waste into something that can be reused in various products."

"This creates tremendous benefits for the Victorian economy and the environment," Mr Sienz added.

REMONDIS has also acquired *Waste2Water Technologies* and *Aquasoil Recycling*, which are both based at Somerton in Melbourne's outer north.

Waste2Water is a non-hazardous liquid waste processing facility and collection service specialising across many fields including the management of contaminated site water, contaminated storm water and car wash pit cleaning. *AquaSoil* specialises in the disposal of drilling and non-destructive digging mud.

These acquisitions give REMONDIS a strategic liquid waste management foothold in Melbourne's north, following the acquisitions of *Eastern Liquid Waste Services* and *Organic Environmental Solutions* in the city's east and south east in 2019.

The ramp-up in Melbourne complements REMONDIS liquid waste activity in other cities and states around Australia.

ABOUT REMONDIS

REMONDIS is one of the world's leading waste, water and environmental management organisations, employing more than 30,000 people in 800 locations across 30 countries.

Protecting soil biodiversity essential in adapting to climate change

Efforts to adapt to a rapidly changing climate are entirely dependent on protecting the life in our soils. These are among findings compiled by more than 300 researchers for the United Nation's Food and Agriculture Organisation (FAO). Lead author of the second chapter of the report, Professor Brajesh Singh and colleagues at the Global Centre for Land-Based Innovation at Western Sydney University have linked diverse soil flora and fauna, and a dramatically-changing global climate, to the sustainability of human civilisation and our natural world.

"Every one of us is standing upon the world's most important natural resource," said Professor Singh.

"Soil biodiversity drives the processes that humankind almost takes for granted – high-quality food, fresh clean water and healthy economies. There is extensive evidence that the world could make significant progress towards the United National Sustainable Development Goals just by protecting the life and health of our soils," Professor Singh said.

Rapid advances in DNA and genetic sequencing technologies are driving massive global research efforts to identify and adopt the most promising soil biodiversity practices.

Already, techniques such as no-till agriculture, carbon farming and satellite mapping are used to grow food and fibre with much more emphasis on keeping soils healthy and biologically-active, all of which originated from the adoption of science and research.

"What governments around the world must do immediately is include soil biodiversity as one of the main priorities to address climate change and ensure that the Australian agriculture industry can reach its stated goal of being a \$100 billion industry by 2030," Professor Singh said.

"We cannot keep treating our soils like dirt," said Professor Singh.

Western Sydney University scientists Dr Catriona Macdonald, Dr Eleonora Egidi and Associate Professor Uffe Nielsen also contributed to the report.

Melbourne's water supplies secure for 2021

Melbourne's *Water Outlook 2021* reports that water storage levels are secure for the next 12 months, but growing challenges mean that all Melburnians have a part to play in protecting the City's future supplies.

Melbourne's water storages are well placed for the summer after a year of higher than average rainfall and the contribution from the desalination plant in 2019. This means storage levels are at their highest since early 2015 and over 75 per cent full.

Speaking on behalf of Melbourne's water corporations, Yarra Valley Water Managing Director, Pat McCafferty, said that a resilient and flexible approach is important to safeguard and manage water supplies. "The impact of climate change means we face challenges like greater weather variability,

extended drought and dry conditions.

"We know from our experience with the Millennium Drought that these conditions can mean water storages fall quickly. So, it's important we use water wisely and continue to increase storages with contributions from the desalination plant, which helps us meet our water demand," Mr McCafferty said.

Melbourne's storages would be more than 14 per cent lower without the contribution of the desalination plant to build supplies over recent years. Since 2017, the plant has added more than 260 billion litres of desalinated water to our water supply.

The Water Outlook also shows that Melburnians have reduced household water use over the last year to an average of 157 litres per person per day. That is 5 litres lower than last year and the lowest water usage since 2011.

In line with the Victorian Government's Target 155 campaign, Melburnians continue to use water wisely.

While many people's water usage habits have changed with working and schooling

from home this year as a result of coronavirus (COVID-19), Melburnians are still being conscious of the water they use.

Pat McCafferty said "Melburnians have developed some great water saving habits and every drop counts when it comes to saving water. Taking actions like shaving a minute off your shower, washing full loads of clothes, fixing leaking taps, and going easy with your garden hose, make a real difference."

The Water Outlook reports that permanent water use rules will continue to apply in 2021. These common-sense rules help ensure Victorians use water more efficiently and encourage everyone to value our precious resource for the long term.

Melbourne's *Water Outlook 2021* is a collaboration between City West Water, Melbourne Water, South East Water and Yarra Valley Water. The organisations come together to assess and predict impacts to the city's water storages for the coming year and continue to secure water supplies.

To view the report, please visit the website: www.yvw.com.au/wateroutlook



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Set bigger climate goals in economic recovery: Business tells government in national survey

Australia's COVID-19 economic recovery plans don't do enough to integrate climate action and Australia should have a 2050 net-zero emissions target, say Australian business respondents in the *2020 Australian Climate Policy Survey*, released late last year.

Conducted by the Carbon Market Institute in the lead up to December's *7th Australasian Emissions Reduction Summit*, the survey finds **76%** of respondents think the Morrison government is not sufficiently integrating climate goals in its economic response to the pandemic.

John Connor, CEO of the CMI says: "Some of the 234 respondents to this survey are from Australia's biggest emitting companies. The others are investors, carbon project developers and carbon market experts.

"Driven by regulators, investors, consumers, concern about carbon border tariffs and their own strategic interests, business leaders are taking action but they clearly want the national government to assist with targets and policies, not just technology development support."

The survey found support is increasing among the business and investment community for a net zero emissions by 2050 target, with **88%** of respondents saying Australia should set a target, up from **83%** last year.

"This survey shows that even during a pandemic and a recession, corporate and investor concerns over climate action are undimmed, as realisation of the many opportunities for Australia in a low carbon economy brighten," says Mr Connor.

The survey further reflected growing corporate concern of climate change, finding that:



- **87%** report recognition at board and executive level of the material financial and strategic risks posed by climate change (up from 77% in 2019)
 - **57%** state that their organisation has faced increased shareholder action/resolutions regarding climate change (42% in 2019)
- "With **70%** of our trading partners setting net-zero emissions or carbon neutrality goals, and many of them openly discussing carbon border adjustments to penalise laggards, it's no surprise to also see carbon tariff concerns jump nine points to **79%**," says Mr Connor.

"Business concerns continue to rise, too, about Australia using its Kyoto carryover credits to achieve its 2030 reduction target, with **79%** of respondents disagreeing with that plan, up from 76% last year."

Other results from the survey include:

- **88%** of respondents are expecting Australia to have by 2030 at least an implicit carbon price of over \$20, 55% expect that price to be over \$30
- **75%** of those using internal carbon pricing now apply over \$20 (up from 63% in 2019)
- **84%** agree Australia should have mandatory reporting of carbon risks
- **83%** believe baselines allocated under the Safeguard Mechanism should be set to reduce over time in line with the trajectory of Australia's 2030 emissions reduction target

- **78%** believe Australia's current 2030 target of 26-28% reductions is an inadequate contribution towards the Paris Agreement goal and should be increased

"With abundant clean energy resources and likewise abundant opportunities for biological, industrial and geological carbon sequestration, Australian business leaders are aware of significant opportunities in a transition to net-zero emissions as well as the spiralling costs of climate inaction," says Mr Connor.

"While recent additional support for technology development is welcome, Australian business leaders are seeking targets, stronger policies and transition planning to manage risks and maximise opportunities," he concluded.

ABOUT THE SURVEY

The Carbon Market Institute is the independent industry association for business leading the transition to net-zero emissions. CMI has more than 90 corporate members.

Each year the CMI surveys the attitudes of Australian business and industry to climate and energy policy, corporate climate action and economic implications of international developments. The 2020 survey is the sixth in a series.

This survey was conducted from October to November 2020 and reflects a broad market perspective, with 234 respondents: 85% with C-suite and senior management roles; 39% report emissions under the National Greenhouse and Energy Reporting Scheme; and 30% represented individuals from the finance, consulting and advisory service industries.

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Climate policy supports WA's low-carbon future

The WA State Government recently released the *Western Australian Climate Policy*, outlining actions to create a low carbon future and create jobs in clean industries to support WA's economic recovery. The policy will help to ensure that the State's environment, economy and the community are more resilient and better prepared for the unavoidable impacts of climate change. It includes actions to drive our transition to net zero emissions by 2050.

The Policy focuses on six key areas - clean manufacturing and future industries; transforming energy generation and use; storing carbon and caring for our landscapes; lower carbon transport; resilient cities and regions; and government leadership.

The policy includes a significant investment in low carbon initiatives, including:

- \$21 million for an Electric Vehicle Strategy;
- more than \$100 million towards the 100 megawatt big battery;
- \$15 million for the WA Carbon Farming Strategy and Land Restoration Program;
- \$3.1 million for the Climate Science Program for improved climate change projections;
- Plan for a net zero transition across WA's public sector;
- \$15 million Renewable Hydrogen Fund, plus \$13 million funding to support the fledgling industry;
- \$60 million Green Jobs Plan;
- \$9.2 million Clean Energy Future Fund;
- Renewable Hydrogen Strategy; and
- The Future Battery Industry Strategy.

The Western Australian Climate Policy coincided with the release of the \$21 million Electric Vehicle Strategy, a new plan to support improved uptake of electric vehicles and facilitate a low emissions transport sector. The Strategy includes an action plan to support further uptake of electric vehicles, including a State-wide charging network and government investment in electric fleet vehicles.

Speaking about the Policy, Western Australian Premier, Mark McGowan said that it emphasises the importance of reducing greenhouse gas emissions in this State, increasing jobs and growing our economy as we continue our recovery from COVID-19.

"It ensures Western Australia uses the levers available to us as a State to reduce the impacts of climate change. The State Government will continue to advocate for national, uniform action to reduce emissions," the Premier said.

"The policy commits to tangible initiatives to enhance climate resilience, transition the State to a low carbon economy, and help the community to adapt to the impacts of climate change."

"It positions Western Australia to respond decisively to climate change and to capture opportunities of a low carbon future as we continue on the path to recovery," Premier McGowan added. "It will also leverage our State's enormous natural advantages to build clean industries, and jobs that come with it, and transition existing industries to low carbon operations."

The Climate Policy also includes a commitment for a *WA Carbon Farming Strategy* to enhance participation in carbon farming, empower traditional owners and deliver regional jobs across the State.

Carbon farming will be a key part of the State's commitment to work with all sectors of the economy to achieve net zero greenhouse gas emissions by 2050, and the strategy will significantly increase the supply of WA carbon offsets and capitalise on the growing local and international demand for carbon credits.

The policy also includes a \$15 million *Carbon Farming and Land Restoration Program* to support carbon farming projects on freehold land, develop new agricultural management techniques, restore natural landscapes, and support sustainability of the regions.

It also includes a suite of initiatives to support adaptation planning and climate resilience, including a \$3.1 million Climate Science Program to develop improved climate change projections.

The Western Australian Government has allocated more than \$100 million towards the 100 megawatt big battery to support

integration of more renewable energy and improve grid security. The 100 megawatt big battery will have the capacity to power 160,000 homes for two hours, and will be housed at the decommissioned Kwinana Power Station. It's expected a contract will be awarded by May 2021 and the battery could be operational by September 2022.

Other commitments include a net zero transition across the public sector, scenario modelling for a zero-emissions electricity sector and the development of sectoral strategies to guide the transition across the State's key economic sectors.

Western Australian Environment Minister, Stephen Dawson, commented:

"This policy demonstrates the State Government's commitment to work with all sectors of the economy to achieve net zero greenhouse gas emissions by 2050. It enhances Western Australia's climate resilience and capacity to thrive in a low-carbon future."

"These actions accelerate the energy and technology transformations already underway and assist in building a cleaner, greener economy," Minister Dawson added.

"A co-ordinated approach to climate change will ensure we contribute to national emissions reductions and leverage our competitive advantages as an emerging clean energy superpower."

The policy builds on existing initiatives over the last two years including a *Renewable Hydrogen Strategy*, \$15 million *Renewable Hydrogen Fund*, \$60 million *Green Jobs Plan*, *Future Battery Industry Strategy* and \$9.2 million *Clean Energy Future Fund* which received an additional \$10 million as part of the *WA Recovery Plan*.



New fleet of fountains helps SA's fight against plastic

South Australians will tap in to around 80 new SA Water drinking water fountains across the state over the next four years, further contributing to the South Australian Government's efforts to reduce the impact of single-use plastics on the environment.

More than 50 of SA Water's intelligent drinking water fountains already provide free access to safe clean drinking water across the state, with another 15 going in the ground in metropolitan and regional South Australia by July this year.

Minister for Environment and Water David Speirs said the wave of new fountains will help the community embrace a sustainable substitute for bottled water.

"By making simple changes to our daily habits like carrying a reusable bottle, we can eliminate the need for unnecessary single-use plastic and drastically reduce their impact on our environment," Minister Speirs said.

"I have seen the positive benefits recently in my own local community of Brighton, where more than 10,000 litres of clean, safe drinking water has been consumed at the Bindarra Reserve's Bring Your Own Bottle (BYOB) drinking fountain since it was installed last year, saving an estimated 17,000 plastic drinking bottles that would normally head to landfill.

"With around 370 million single-use plastic water bottles making their way to landfill each year in Australia, public drinking fountains are vital assets operating in parks, ovals and community hubs that can help stem the impact of plastics and inspire sustainable behaviours.

"The Government's new legislation to ban single-use plastics as of March this year has cemented South Australia as a national leader, and this batch of brand-new bubblers only demonstrates this further."

SA Water's drinking fountains have a low-lying arm bubbler on the side to ensure they are accessible for children and wheelchair users and many have in-ground, foot-operated dog bowls. Smart technology enables their water use to be remotely monitored and maintenance scheduled.

"I encourage everyone to track down their closest drinking fountain through SA Water's BYOB mobile phone app, which uses an interactive map to display more than 1000 drinking water fountains operating across South Australia," Minister Speirs said.

"It's as easy as remembering to bring your own reusable bottle when you leave the house for exercise or a day out with the family, and filling-up is free."

SA Water is working with metropolitan and regional councils to install the new drinking fountains at various sites over the coming months, including locations recently selected in Littlehampton, West Beach, Two Wells and the newly opened Hope Valley Reservoir Reserve. SA Water is also inviting feedback from the community on where they would like drinking fountains installed in their local area, with people encouraged to contact the utility via Facebook @sawatercorp.



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International recognition for University's green initiatives

The University of Newcastle has been awarded three of the eight 2020 Australasian 'Green Gown Awards' in the categories of Climate Action, Benefiting Society and Student Engagement.

The institution's efforts to become a carbon-neutral university, improve physical and mental wellbeing of girls and create better spaces for disadvantaged women and children have all been recognised by the Awards organiser, *Australasian Campuses Towards Sustainability* (ACTS).

The winning entries from the University of Newcastle were:

- 'Sustainability Reimagined' by the Infrastructure and Facilities Services team in the 2030 Climate Action category
- 'Daughters and Dads Active and Empowered' by the School of Education in the Benefiting Society category
- 'out(fit)' by the School of Architecture and Built Environment in the Student Engagement category

Both the 'Daughters and Dads Active and Empowered' and 'out(fit)' entries were winners in international categories and will go on to be considered for the International Awards to be held later this year.

Two other programs from the University of Newcastle were shortlisted as Finalists:

- 'Hunter Water Story' by the School of Education in the Benefiting Society category
- 'Germinate – May Contain Seeds' by the School of Architecture in the Creating Impact category

The full list of winners and highly commended is available on the Green Gown Awards website: www.greengownawards.org

WINNERS + SHORTLISTED FINALISTS

Sustainability Reimagined

Addressing climate change is critically important for our students, staff and partners. Through 2019 we achieved a major milestone on our journey towards becoming carbon neutral. Our first-of-its-kind *Energy Supply*

Agreement with Red Energy meant from January 2020 we are powered by 100% renewable electricity, reducing our CO₂-e emissions by 70%.

Complementing this we rolled out 534kW_s of rooftop PV solar, switched over 6,000 lights to LED, and commenced installation of four dual electric vehicle charging stations (with infrastructure to future-proof for an additional 20).

We enhanced the biodiversity of over 30ha of dedicated bushland zones including planting 2,500 endemic native seedlings to sequester approximately 230 tonnes of CO₂-e. We contributed to a circular economy through soft plastics and disposable coffee cup recycling programs, and significantly scaling up our rainwater harvesting capacity.

Guided by our sector-leading *Environmental Sustainability Plan 2019-2025* we are reimagining sustainability now and for the future.

The Awabakal and Worimi Hunter Water Story project

Sustainability through Care, Reconciliation Creation and Culture: The Awabakal and Worimi Hunter Water Story project was initiated by Hunter Water Corporation in the Lower Hunter as a school community program to align with their Reconciliation Action Plan. Hunter Water worked with the University of Newcastle and the Awabakal and Worimi communities to create a storybook with 10 Aboriginal students from Newcastle High School. The students worked together to create a contemporary Aboriginal story about the conservation of water for primary schools, their communities and the Awabakal and Worimi families and community that is called *Where's Our Water?*

The story was illustrated and designed by Newcastle University Creative Industry students in a Work Integrated Learning assessment task. The story was facilitated by Aboriginal educators Emeritus Professor John Lester, Paul Myers, University Aboriginal educator Deirdre Heitmeyer and Aboriginal artist, Saretta Fielding.

Daughters and Dads Active and Empowered

Daughters and Dads Active and Empowered is a community-based education program targeting fathers/father-figures to improve their daughters' physical activity levels and social-emotional wellbeing. Importantly, this innovative program also addresses and challenges the culture of gender prejudice existing in girls' lives.



Out(fit) Team Winners in the Green Gown Awards Student Engagement category. Pictured L to R: Shellie Smith, dArcy Newberry-Dupre, and Miranda Cunningham

Using innovative collaborations with local schools and industry partners, results have been overwhelmingly positive with significant long-term health improvements achieved.

Since its development in 2014, the program has led to \$4.1 million in research funding and seen delivery to 790 daughters and 678 fathers in various sports across NSW and in the UK.

In addition, a highly innovative University course has taught over 190 preservice and in-service teachers to deliver the program; creating wide-ranging education and community benefits through improved teaching practices and holistic outcomes for children and the wider community.

out(fit)

out(fit) is a community engagement initiative of the University of Newcastle, through which female students from the built environment discipline volunteer their specialised skills to benefit the community of Newcastle and the Hunter Region. We do this by engaging in hands-on design and build projects, primarily for underrepresented communities, with a focus on creating spaces for disadvantaged women and children. By providing access to design services for those who would not ordinarily benefit from this professional assistance, we can have a tremendous impact on daily lives.

Germinate – May Contain Seeds

This project sought to explore a playful, socially-engaged, and an environmentally kind response to the challenge of mosquitos. The student and staff researchers approached this challenge by creating a shared habitat for mosquitoes and humans to peacefully coexist.

Certain aromatic plants repel mosquitos by confounding their sense of smell. The aromatic plant seeds are crafted into 'seed bombs' and placed into a repurposed gumball machine. Students, staff and visitors can purchase the bombs for a nominal donation and then they throw them into the adjacent environments. The project is extended into the community through workshops and an open-source website.

Flatlining Sales?

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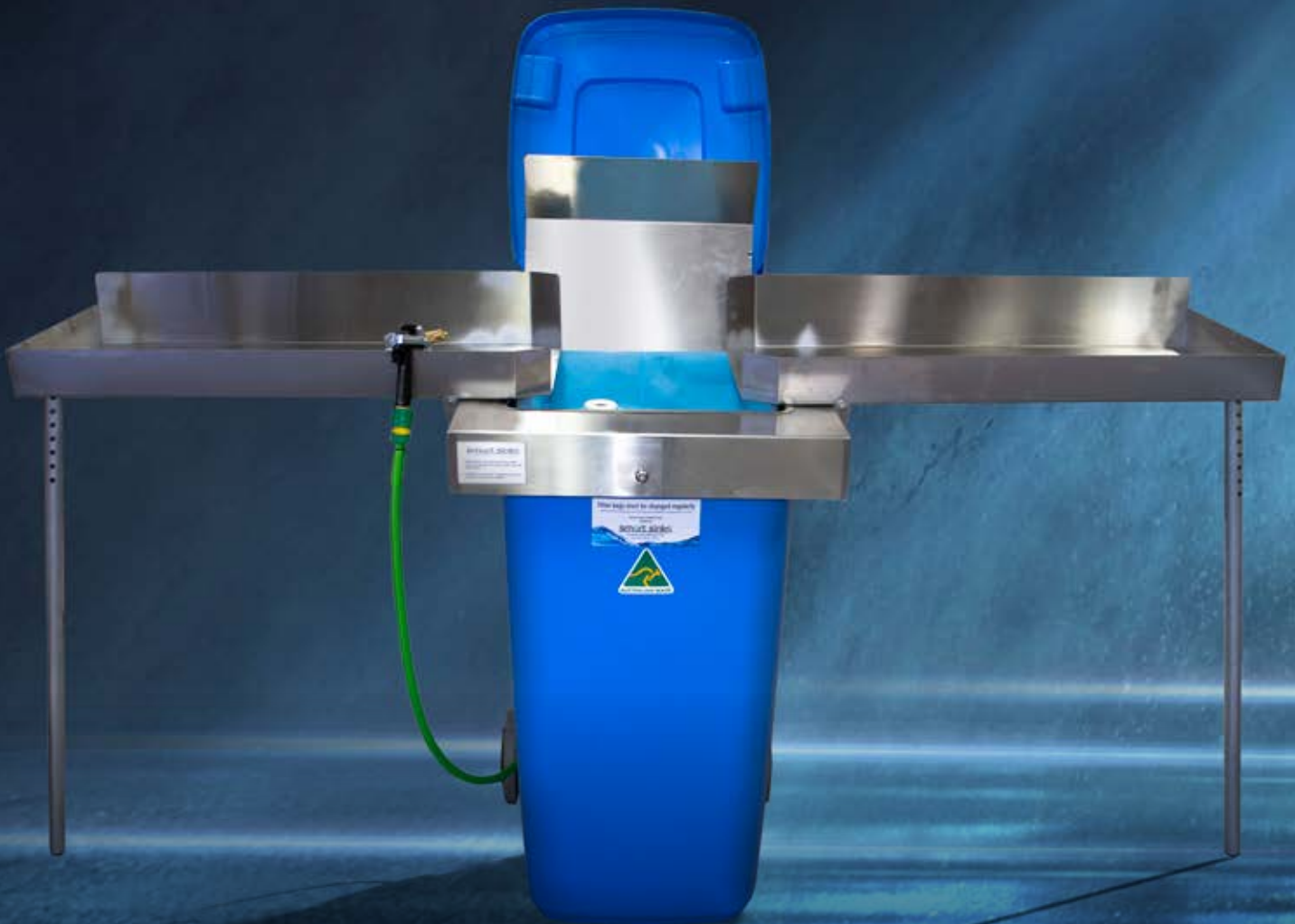


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Waste Water Filtration & Recycling Systems

SMART THINKING

**The Smart Aussie invention that SAVES TIME, SAVES WASTE, SAVES WATER
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.



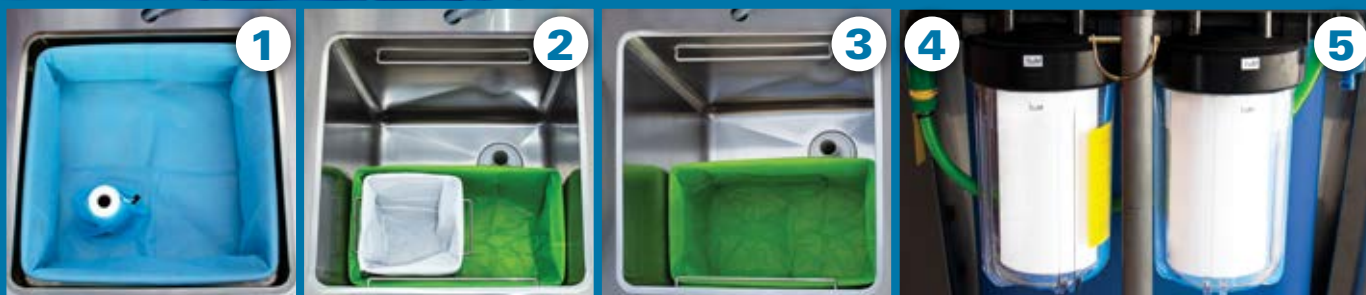
100% MOBILE

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!"

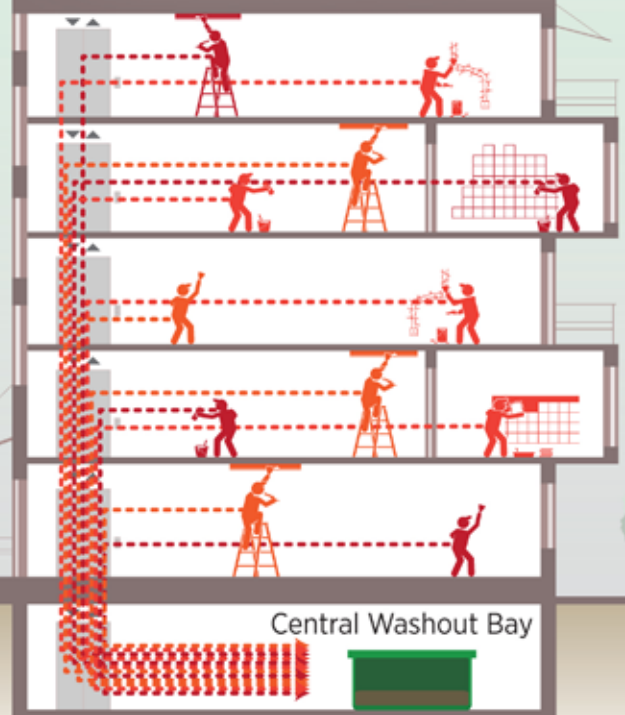


'TRADITIONAL' CENTRALISED WASHOUT FACILITY

- ✗ 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 SITE



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

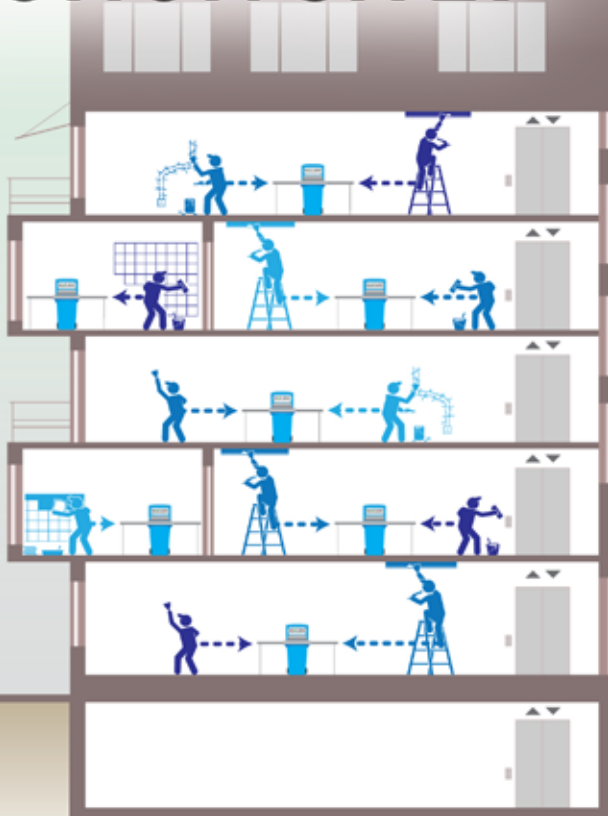
While there can be no doubt that Mobile Smart Sinks have set a new benchmark in waste sediment control, water saving and productivity gains for tilers and plasterers, they have also, quite unintentionally, proven to be a critical front-line tool in establishing COVID-SAFE construction sites.

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



'COVID SAFE' IS CONSTRUCTION SITE?



smart sinks®
Waste Water Filtration & Recycling Systems

- ✓ REDUCES movement of personnel around the site - washout facility at the work face
- ✓ REDUCES lift use
- ✓ IMPROVES social distancing & hygiene
- ✓ NO LOST TIME travelling to and from central washout facility
- ✓ REDUCES water use through recycling
- ✓ ELIMINATES waste management issues
- ✓ NO sediment in drains/tradewaste

Iggesund Paperboard's new Inverform™ for ready-made food packaging trays ticks all the boxes for sustainability and performance.



Inverform™ – a new, sustainable paperboard alternative to plastic food trays

Made from pure cellulose fibres, Inverform has been specifically developed for pressed and folded trays used in food packaging. Inverform has an exceptional formability and is the ideal replacement for traditional solutions, such as plastic trays.

"Iggesund Paperboard has a long tradition of working sustainably and producing material that won't harm the environment. Inverform was developed largely in response to the plastic pollution problem," says Stefan Söderberg, Sales Manager, Iggesund Paperboard.

The extensive use of plastic materials is linked to many serious problems, including:

- The large climate impact caused by the fossil fuels required to make plastic
- Plastic collecting in the oceans and elsewhere, due to the lack of biodegradability
- Excess waste due to a low level (less than 40 per cent) of recycling

"We were determined to come up with a renewable and recyclable material for food trays that would be more environmentally friendly than plastic, while maintaining the same high packaging performance throughout the value chain," says Stefan Söderberg.

Food and retail companies that are looking for more ways for their products to support a sustainable future can now ask

for trays made of Inverform. Trays made of Inverform with a plastic barrier have a substantially lower carbon footprint than the common plastic tray and can be recycled in existing paper packaging recycling schemes. And, in addition to helping to lower the climate impact, Inverform packaging meets the highest standards for food hygiene and protection, ensuring longer life and less food waste.

"Inverform is the first of a new product application and we are in the process of developing the next generation of barriers since there is an increasing demand for sustainable packaging solutions and the requirements are becoming tougher each year. We are continuously improving our products to help our customers with their challenges now and in the future," says Stefan Söderberg.

Inverform is a Solid Bleached Board (SBB) made of pure cellulose fibres sourced from sustainably managed forests. A polymer barrier is added to Inverform making it ideal for tray forming and heat sealing.

Inverform is a food grade material, without added optical brightening agents and it has all the required food safety certificates, including being safe for use in microwaves and conventional ovens.



ABOUT IGGESUND PAPERBOARD

Iggesund Paperboard is part of the Swedish forest industry group Holmen, one of the world's 100 most sustainable companies listed on the United Nations Global Compact Index. Iggesund's turnover is just over €500 million and its flagship product Invercote is sold in more than 100 countries.

The company has two brand families, Invercote and Incada, both positioned at the high end of their respective segments.

Since 2010 Iggesund has invested more than €380 million to increase its energy efficiency and reduce the fossil emissions from its production.

Iggesund and the Holmen Group report all their fossil carbon emissions to the Carbon Disclosure Project. The environmental data form an integral part of an annual report that complies with the Global Reporting Initiative's highest level of sustainability reporting.

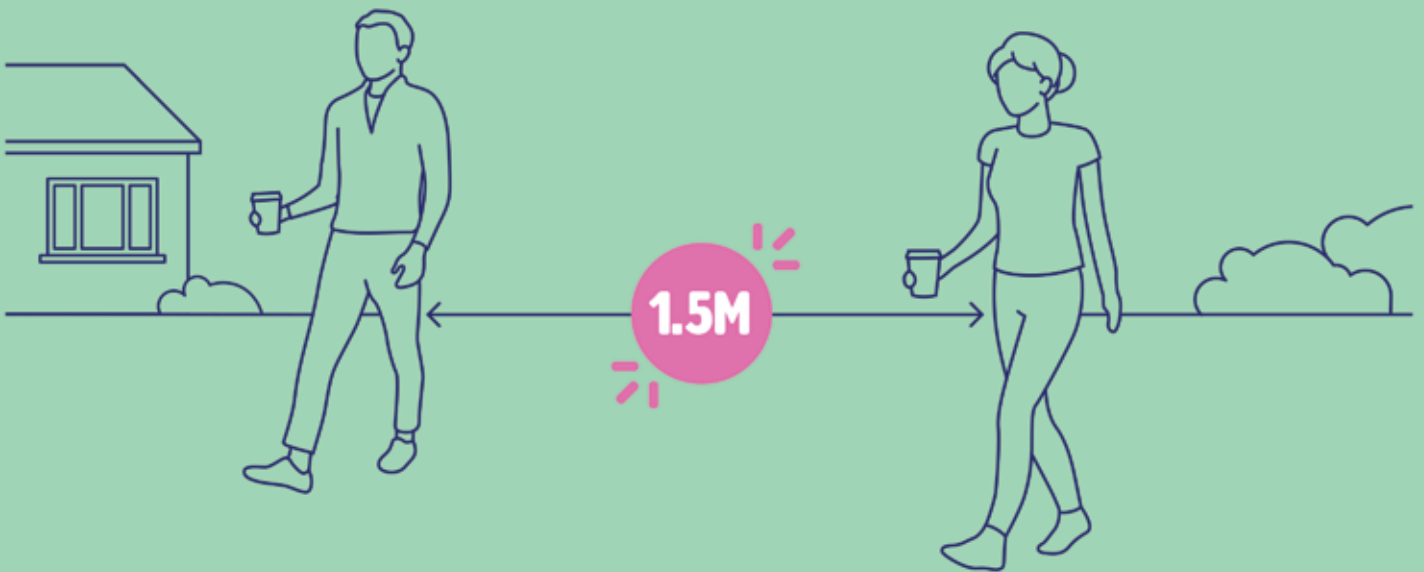
Iggesund was founded as an iron mill in 1685, but has been making paperboard for more than 50 years. The two mills, in northern Sweden and northern England employ 1500 people.

Keep physical distancing and **BE COVIDSAFE**



Physical distancing is working to help keep us all COVIDSafe. Remember, whenever you go out, stay 1.5 metres apart and avoid physical greetings. Follow guidelines in shops and businesses and always practise good hygiene. This will help stop the spread of coronavirus.

Together, let's **BE COVIDSAFE**.
Visit **health.gov.au** for more information.



Australian Government



LEFT: Aussie Pumps' Production Manager, Mal Patel demonstrates the correct use of the safety plate to cover the drain, thereby avoiding the possibility of the hose coming out 'live' during jetting operations. Aussie Pumps provides free safety plates with every machine.

The early machines were all trolley mounted, with the concept being that plumbers would wheel it off the back of their ute and move it close to the choke.

The next development was an Aussie portable Mini Reel, the "Viper", which enables 60 metres of lightweight, portable jetter hose with a nozzle to be mounted on a stainless steel frame which can be easily carried by one man. The Viper mini reel allows the operator to connect to the main 60m hose from the "mother ship" machine for a total operating reach of 120 metres. In other words, there is no longer a need to take the machine off the back of the ute for most jobs.

"It was a huge breakthrough", said Patel. "You can imagine the ease of carrying a mini reel into the job, instead of unloading a 100-kilogram machine, wheeling it into the job and then loading it back onto the ute again when the job is done," Patel said.

After the introduction of the Viper Mini Reel, Australian Pump quickly saw plumbers taking the wheels off their Jetters and hard mounting them to the deck of their ute. Some were even roping them down.

At that point, Australian Pump came up with the 'Cube' concept. It's easy to secure and takes up less room on the deck of the ute, providing more room for tools and other plumbing equipment. The new Aussie Cube design has the same capability as the 4,000 psi and 5,000 psi models, whilst saving around 25% of the space required by a normal drain cleaning jetter.

Safety standards... beware

New safety standards were introduced that mandate strict guidelines for pressure cleaners and Jetters. The Standards divide machines into Class A and Class B categories.

The Jetter Revolution

In this second "Year of Corona", it's not only councils and water authorities that are having to deal with increased blockages and sewer lines. Plumbers are also being faced with blocked sewer and stormwater drains.

One Australian company, working with plumbers, pioneered the idea of using high pressure water jetting equipment to clear drains fast and efficiently. Australian Pump Industries were already making pressure cleaners at that point and quickly realised the message from plumbers about safety and efficiency advantages of going with the relatively advanced technology being used for a whole new application.

"When we built the first Aussie Cobra drain cleaning jetter 20 years ago, we had no idea it was the beginning of a major product development program," said Aussie Pumps' Production Manager, Mal Patel. "The result was the evolution of a range of advanced designed Jetters."

They have proven themselves to be faster, safer and more efficient than conventional "Eels" or other electro-mechanical drain cleaning equipment," he said.

The company started with 4,000 psi, 20 litre machines, driven by Honda twin cylinder, electric start petrol engines. The machines were in powder coated frames with a top mounted reel and fuel tank with a surge tank built into the system.

Over the years, the company has evolved big-flow 4,000 psi machines and 5,000 psi jetters to deal with the demand created by the need to clear bigger diameters.

"It was a huge breakthrough... You can imagine the ease of carrying a mini reel into the job, instead of unloading a 100-kilogram machine, wheeling it into the job and then loading it back onto the ute again when the job is done."

For Class B machines (those bigger than 4,000 psi / 20 lpm) the operators must be trained and certified by a Registered Training Organisation (RTO), and certificates must be renewed every two years at the cost of the operator not the employer.

The safety standards also dictate that two operators must be on site for Class B machines - one operator standing by the machine in the event of an issue requiring the need to operate the Emergency Stop, the other operator clearing the blockage. There are a number of major issues that can occur when using bigger Class B machines, and that's why safety training and certification is so important for operators.

Aussie Pumps has done a lot of work to produce documentation detailing the differences between Class A and B machines and critical safe operating procedures. Not surprisingly, the company's high performance Class A units - which require no certification for the operator and lead to a less complicated life for plumbers - are rapidly becoming Aussie Pumps' biggest sellers.

Aussie Pumps develop, design and build machines on their 2½ acre Castle Hills premises in suburban Sydney. The company's philosophy is simple:

"We produce the right equipment, the right price and even offer free delivery on our most popular models anywhere in Australia," Patel said. "Plumbers, government departments, councils and other users tell us that our jetters are safer, cleaner and more efficient than conventional drain cleaning equipment. And for us, that's really what it's all about - equipment that is safe, efficient and easy to use."

"Even something as relatively straightforward as being able to extend the jetter operating range from 60 metres out to 120 metres from the machine is a huge advantage over any Eel-type unit," Patel added. "The Aussie Viper Mini Reel is a huge benefit in terms of both convenience and safety."

For local governments and water authorities, Aussie Pumps produces a range of trailer mounted versions, including diesel-powered options which are preferred by most water authorities in country areas.

"Even though the majority of those machines are Class B, we know that councils will always get their operators certified," Patel said. However, it's important to remember the certification applies to the operator, not to the council, so it's critical to check that all operators' certification is complete and current."

Not ones to 'rest on their laurels' Australian Pump Industries are continually looking to enhance the safety and productivity of their machines, and have added some additional safety features to the new models. For example, all Aussie jetters now come with a safety plate that protects the operator when withdrawing the hose from the drain. Class B machines now also come with hose restraints and E-stop as well.

The company is also now working on a free safety training program. While it is not developed as a substitute for the required RTO certification, it will make even Class A operators more conscious of the need for safe operation of a jetter. The course will be delivered online, and will be available to councils, water authorities, plumbers and any other interested parties.

Further information is available from the Australian Pump Industries website:

www.aussiepumps.com.au

BELOW: Mal Patel with the Jetter production team at Aussie Pumps' Castle Hills premises in suburban Sydney. With 2021 proving to be 'The Year of the Jetter' the company plans to dramatically increase production to meet the increase in demand for this great Aussie innovation.



Known as The Bandit, STG Global's new side loader incorporates a range of features including iPad technology controls, fully automated bin-scanning and pick-up technology, and a patented modular design.



STG Global introduces new garbage and sweeper truck range

Australia's waste management industry is set for a shake-up, with leading specialised equipment manufacturer STG Global announcing its entrance into the market with the release of its tech-savvy garbage trucks, and exclusive rights to bring world-class Aebi Schmidt sweepers to Australia. Renowned in the construction industry for its innovative line of water, vacuum, service and tilt tray trucks, STG Global is now extending its ingenuity to waste management solutions with the introduction of its garbage truck range.

The Bandit side loader, *The Claw* rear loader, and *The Tusks* front loader designs bring added safety, automation and efficiency to waste collection, and are already being trialled by one of Australia's largest municipal waste collection services.

Features within the range include iPad technology controls, outstanding collection arm reach, fully automated bin-scanning and pick-up technology, and a patented modular design to reduce maintenance and repair downtime.

STG Global Managing Director Ross Yendle said the STG Global team was thrilled to be entering an industry that was evolving.

"Australia's population continues to grow, bringing greater demand on collection services, and the market has been looking for someone new to modernise and streamline

the industry processes," he said.

"We've seen COVID-19 destroy many industries, but waste management is stable - no matter what, your bin gets picked up once a week."

"We're happy to bring automation, reliability, and customer-first after-sales service and support that will benefit everyone in the industry, right down to the ratepayer putting their bins out on the curb," he added.

Mr Yendle said having expert engineers with extensive experience in waste management on the team underpinned STG's entry into the market.

"We were lucky to find a young and inventive team who knew the industry, and were looking for a change," he said.

"They had the ideas, the concepts and had listened to the customers to find out what they wanted," Mr Yendle added. "We were eager to come into the market and bring that change, so it just made the perfect match."

Engineering Director of Corematic, Scott Hansen, who led development of the new garbage truck range, said early-stage feedback from operators had been incredibly positive and encouraging.

"Existing waste collection trucks do the job, but in some units some of the technology is quite old. We wanted to bring new life into the industry," he said.

"Rubbish collection is a critical part of our daily lives, and we wanted to be able to act on feedback from within the industry to build a better truck," he said.



STG Global's Ross Yendle and Ashley Joseph.

"Our focus is on the end-user, and because of that, we believe that STG Global's new range of garbage trucks will set the standard of what people will be asking for in waste collection," he added. "They truly are trucks for the future."

STG Global has also won exclusive rights to distribute the Aebi Schmidt Group's latest technology for airport equipment and special sweeping technology for road cleaning, the *Street King 660* and *Airport Sweeper 990*.

Aebi Schmidt Group Area Sales Manager, Nehmetallah Abi Saber, said Australians now had access to sales and support from a world-leader in smart product systems.

"Aebi Schmidt has a long history and experience in services for the treatment of mission-critical infrastructure, after first entering the sweeper market back in 1954," he said.

"The Street King and Airport Sweeper are produced in Germany to the highest standard and feature a continuously-improved design."

"Australians will now have access to this technology and the unparalleled after-sales service from our highly qualified technicians direct from our factories," Abi Saber added.

ABOUT STG GLOBAL

STG Global is a world-class company providing plant equipment such as water trucks, vacuum excavation trucks, tilt tray trucks, jetter trucks and service vehicles for sale to the construction industry, and garbage trucks and sweepers to the waste management industry. Their range of specialised and innovative designed products enhance functionality, increase efficiency and productivity, while the modulated designs are suitable for fitment to the chassis of medium to heavy vehicles.

The STG Global team is located throughout Australia including its head office in Brisbane, and depots in Melbourne and Sydney, and can easily relocate vehicles all across the country.



Powering a Sustainable Future

informit

Did you know you can access the latest issue of *Waste + Water Management Australia* via Informit?

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The Red Sea Development Company awards contract for sustainable transport consultancy

Mott MacDonald to deliver plan for ambitious sustainable transport requirements at The Red Sea Project tourism development in Saudi Arabia

The Red Sea Development Company (TRSDC), the developer of the world's most ambitious regenerative tourism project, has awarded a contract to global engineering firm Mott MacDonald to provide consultancy services to determine the optimal sustainable vehicle and fleet configuration at the destination.

Mott MacDonald will deliver a comprehensive and robust analysis of the total land, sea and air transport needs for the development and operation of the 28,000km² site, from its opening in 2022 to its completion in 2030. This will involve a strategy for destination-wide clean mobility using electric and hydrogen vehicles, boats and aircrafts.

"We believe that environmental regeneration and commercial development do not have to be mutually exclusive. Our destination is one of extraordinary natural beauty, which we have a responsibility to protect and enhance for future generations," said John Pagano, CEO of TRSDC.

"We're looking forward to working with Mott MacDonald, who are well aligned with our strong sustainability ambitions to deliver a green mobility plan and will support us with our commitment to become a carbon neutral destination," he added.

The company will also be required to identify the most appropriate supporting

infrastructure, such as electric and hydrogen vehicle charging stations, in line with TRSDC's ambitions to power the destination with 100 percent renewable energy.

The appointment is a key development in the roll out of Phase One, which is well underway. Vehicle fleet to be assessed includes e-bikes, golf buggies, cars, vans, trucks, buses, seaplanes, helicopters, VTOL, passenger ferries, boats, maintenance vehicles, airside vehicles and even off-road leisure pursuit vehicles. Mott MacDonald will also propose the best fleet propulsion systems from a range of available sustainable options.

Chris Seymour, Middle East Managing Director at Mott MacDonald, said: "At Mott MacDonald, we embed the key aspects of sustainable development into all our projects and business activities. Sustainable development is a matter of making choices and decisions that satisfy all relevant social, economic and environmental concerns, and is an area where TRSDC is setting new standards. We're looking forward to being part of shaping this beautiful destination and supporting TRSDC's progressive sustainability initiatives."

As part of TRSDC's commitment to go beyond sustainability to actively enhance

the destination, the project will be powered with 100 percent renewable energy, 24 hours a day via solar and wind power, an accomplishment which has never been achieved on a project of this scale before.

TRSDC is investing in a number of innovative nature-based solutions throughout the construction process, to not just prevent environmental damage, but positively contribute to the area's delicate ecosystems. A central part of this approach is the aim to increase the project's net conservation benefit by 30 percent by 2040.

In line with the development of the sustainable management plan, TRSDC will be partnering with leading vendors who demonstrate a proven track record and commitment to innovation and sustainability.

Considerable progress has been made on The Red Sea Project, despite Covid-19 related disruptions in 2020. Approximately 500 contracts have been awarded so far at a value of SAR 12 billion (nearly \$3.2 billion) – set to rise to nearly SAR 15 billion by the end of 2020.

The project has surpassed significant milestones and work remains on track to welcome the first guests by the end of 2022, when the international airport and the first four hotels will open. The remaining 12 hotels scheduled for completion in Phase One will open in 2023, delivering a total of 3,000 rooms across five islands and two inland resorts.

Upon completion in 2030, the Destination will include 50 hotels offering up to 8,000 hotel rooms and 1,300 residential properties across 22 islands and six inland sites.

ABOUT TRSDC

The Red Sea Development Company (TRSDC) is a closed joint-stock company wholly owned by the Public Investment Fund (PIF) of Saudi Arabia. TRSDC was established to drive the development of The Red Sea Project, a luxury tourism destination that will set new standards in sustainable development and position Saudi Arabia on the global tourism map.

The project will be developed over 28,000 km² of pristine lands and waters along Saudi Arabia's west coast and includes a vast archipelago of more than 90 islands. The destination also features mountain canyons, dormant volcanoes, and ancient cultural and heritage sites. The destination will include hotels, residential properties, leisure, commercial and entertainment amenities, as well as supporting infrastructure that emphasizes renewable energy and water conservation and re-use.

Activity for the first phase of development, which focuses on enabling the infrastructure to support future work, is well underway. A marine infrastructure contract awarded in July 2019 includes the construction of a 3.3 km crossing to Shurayrah (the main hub) and development has begun at the Coastal Village, which will be home to around 14,000 people who will work at the destination.

For further information, please visit: www.theredsea.sa



LED lighting finds business opportunities in smart city growth and energy efficiency initiatives

Frost & Sullivan's recent analysis, 2020 *Annual Update of Global LED Lighting Market*, finds that the increasing demand for energy-efficient lighting, the rising number of smart city projects and overall infrastructure development are driving the LED lighting market across the globe. The market is estimated to reach \$82.0 billion by 2026 from \$67.7 billion in 2019, at a compound annual growth rate (CAGR) of 2.8%. However, with the COVID-19 pandemic, the industry is likely to experience varied impacts across regions due to discrepancies in containment measures and lockdown implementation. Even with the partial ease in lockdowns and a resumption of manufacturing, the market will need a couple of years to recover and

reach the same level as before the crisis.

"Smart buildings will accelerate the adoption of smart lighting more than any other segment. The revitalization of cities will also provide the much-needed impetus for the installation of smart lighting," said Dennis Marcell Victor, Energy & Environment Research Analyst at Frost & Sullivan.

"Government rebates, savings on disposal costs, improved performance of workers, and limitless Internet of Things (IoT) applications for LED lighting present a good business case for LEDs to be adopted across applications."

Victor added: "Lighting-as-a-Service (LaaS) will see higher adoption and usher in a new business model while driving other applications such as connected lighting and facility management. It is expected to reduce the capital expenditure of the consumer, with service providers bearing upfront costs.

Additionally, from a regional perspective, Asia-Pacific (APAC) continues to be the key growth area, drawing \$35.4 billion in revenues by 2026, with India and China contributing the maximum revenue. Similarly, after APAC, Europe and North America will contribute significantly to the market due to developments in advanced lighting applications related to the healthcare, industrial, office, and hospitality verticals in

both regions. Each respectively witnessing growth of 4.0% and 4.1% throughout the forecast period.

Latin America will experience the highest growth over the forecast period at 5.1% because of its focus on office and street lighting as part of smart city solutions.

The increasing adoption of LED lighting across healthcare, automotive, industrial, and office segments presents immense growth prospects for market participants, including:

- **LaaS business model:** Companies need to take a pragmatic approach toward monetizing LaaS to improve revenue.
- **Digital LED lights for automobiles:** Autonomous vehicles need to implement digital LED lights technology to enhance safety features.
- **Circular economy for LED lighting:** Circular economy measures should start from the design phase. Designing modular, upgradeable, and reusable products will help reduce waste from used LED light sources.
- **UVC-LEDs for disinfection:** UV-C lights should be used to disinfect workplaces, healthcare centres, and public transport. Proper guidelines should be outlined for handling UV-C lights for widespread usage.

Gothenburg Green City Zone leads the way towards zero-emissions transportation

Currently in development, *Gothenburg Green City Zone* is a world first: an initiative by a number of major stakeholders including Volvo Cars to build a climate-neutral transportation system in a large geographical area of Gothenburg. New technology will be tested here to allow this part of Gothenburg to have 100% emission-free transport modes by 2030. And everyone is welcome to join in.

Gothenburg and the Gothenburg region are growing, and the number of tourists and other visitors is set to double by 2030. This will bring a steady increase in demand for transportation. At the same time Gothenburg has committed to reducing its climate footprint to close to zero by 2030.

In order to solve that equation, we have to begin large-scale testing of future technologies already.

That's the background to *Gothenburg Green City Zone*, a fully climate-neutral and zero-emissions transportation system now

being developed for a large area of central Gothenburg and surrounding districts.

The zone can be likened to a vast testbed and demonstration area where companies, social stakeholders, academia and institutions can collaborate on testing new technologies and scaling up their operations, products and services in transportation, infrastructure, energy and other areas related to the environment.

The goal is for all vehicles travelling in or from *Gothenburg Green City Zone* to run with zero emissions by 2030, in a functioning infrastructure that enables climate-neutral transportation choices and facilitates everyday life for businesses as well as residents and visitors, in an attractive urban environment.

A zone of possibilities, not of bans or restrictions

Gothenburg Green City Zone is not a zone of bans or restrictions, where we stop certain types of transports and send them elsewhere. Instead, it's a zone of

possibilities, for making use of each other's specialities and skills so that we can achieve our goal faster and with more vigour. As a result, entirely new business opportunities are opening up for national as well as international companies.

The initiative was taken jointly by the City of Gothenburg (through Business Region Göteborg), Volvo Cars, and RISE Research Institutes of Sweden.

Interest and involvement in Gothenburg Green City Zone has been great, with Chalmers University of Technology, the School of Business, Economics and Law at the University of Gothenburg, the Swedish Exhibition and Congress Centre, the City of Mölndal and Johanneberg Science Park on board so far. And there will be many more of us – *Gothenburg Green City Zone* is an inclusive venture that welcomes everyone who wants to take part, in whatever way, in creating sustainable solutions for the Gothenburg region, and in spreading them to the wider world.



ACRS 2021 CERTIFICATES ARE ONLINE WITH SOME IMPORTANT CHANGES

Philip Sanders, Executive Director, ACRS



While 2020 has been a year we would all like to move on from, the effects of the last year have created some perverse effects we all need to be aware of and manage. Together with the pain and disruption to all our lives from the pandemic, most businesses have been severely impacted - few more so than steel traders and suppliers, and steel certifiers due to highly globalised supply chains and associated implications for continued effective verification of product conformance in Australia and New Zealand.

As many of you would have read in previous ACRS features, a number of new Standards were released during 2019 and 2020, some suppliers left the local market whilst others entered, and numerous projects have found that their basic assumption that materials specified and purchased would consistently meet the required standards and specifications have been severely challenged - including that materials would be supplied to projects under ACRS certification, as required.

Additionally, and separately, the ACRS traceability scheme supports and enhances ACRS product scheme certification, but care still needs to be taken in a more volatile and changeable supply environment.

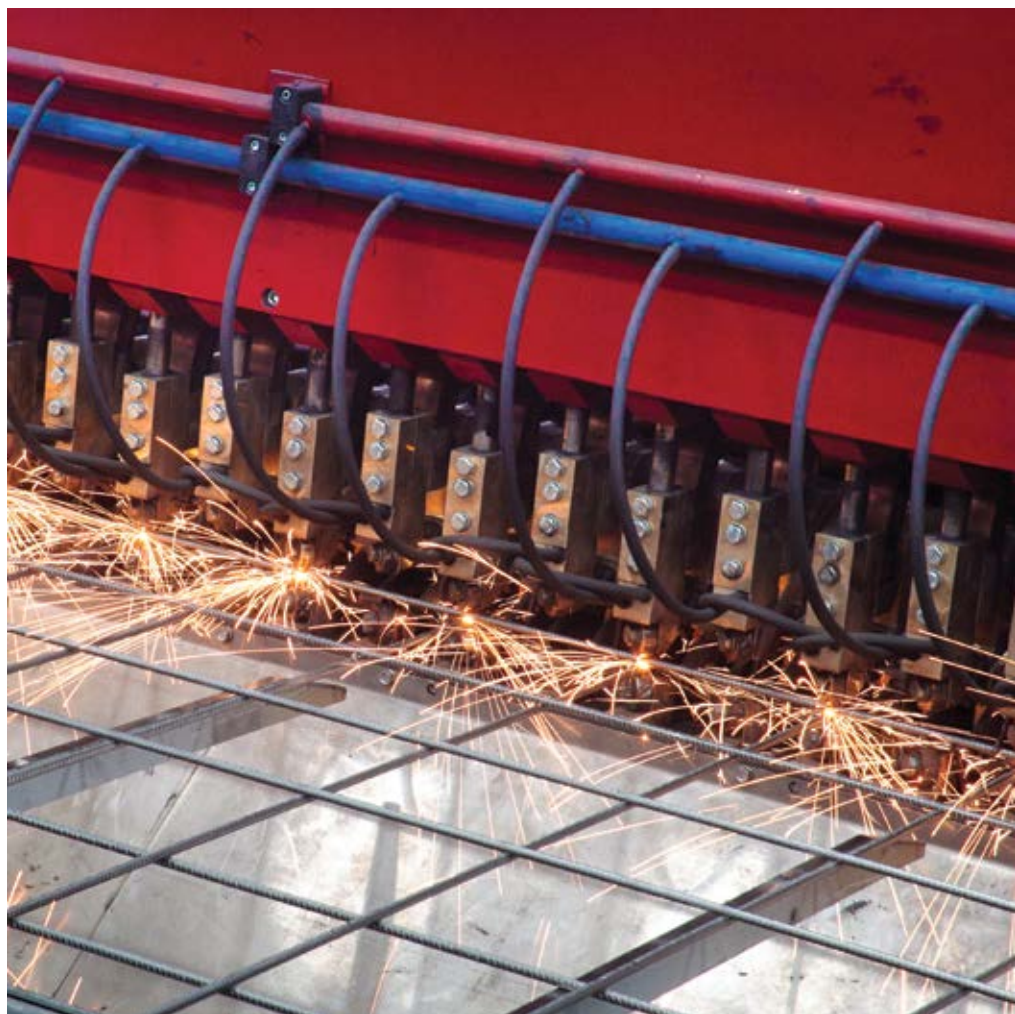
This article covers some important recent developments in construction steels and steel supply, and some adjustments and additions to ACRS certification to reflect the new realities and provide continued confidence that materials supplied meet Standards, including:

- Further developments in the certification of AS 4671:2019 for steel reinforcing materials;
- ACRS accreditation to AS 4100:2020 Steel Structures complementing ACRS longstanding JAS-ANZ accredited certification of welded sections to AS/NZS 3679.2 2016 *Welded I-Sections* and AS/NZS 5131: 2016 *Steelwork Fabrication*;
- Traceability concerns and use of ACRS certification to effectively manage materials traceability (and awareness of misstatements regarding ACRS certification to avoid effective scrutiny of supply of affected materials), and resultingly;
- Changes to ACRS certification and practice (particularly rebar processing and structural welded sections fabrication) to assist steel customers easily confirm the unbroken chain of ACRS certification required to verify only ACRS certified materials have been supplied.

ACRS Certified Steel Reinforcing Materials – Manufacture and Processing

The recent release of AS/NZS 4671:2019 and its product requirements initially caused some confusion in the marketplace - particularly whether the 2001 edition of AS/NZS 4671 remains valid, or whether the 2019 edition must apply to any supply delivered under ACRS certification. A transition period of 2 years is currently operating, and suppliers are progressively moving to the new Edition.

ACRS early JAS-ANZ accreditation to certify to both AS/NZS 4671:2001 and AS/NZS 4671:2019 has continued to assist suppliers, building surveyors, government departments and consumers retain confidence in the uninterrupted supply of compliant materials. ACRS is continuing to issue certificates to AS/NZS 4671:2001 and seamlessly update suppliers to AS/NZS 4671:2019 as they complete their transition.





ACRS Certified Structural Steel – Manufacture and Fabrication: An Integrated 2-Stage System

AS 4100:2020 *Steel Structures* was released in August 2020 with ACRS JAS-ANZ accredited to include this new edition in certification from November, providing an important link with ACRS existing JAS-ANZ accredited certification of structural welded sections to AS/NZS 5131:2016 *Structural Steelwork Fabrication*.

With this latest extension to our accreditation, ACRS provides certification across all the necessary standards and government specifications forcibly ending the false claims by some parties that ACRS certification of structural welded fabricated sections does not cover AS/NZS 5131, leaving customers and government departments without their expected coverage by ACRS certification, with consequent contract problems when this was discovered.

As with steel reinforcing materials manufacture and any subsequent processing or fabrication, ACRS certification of both **Stage 1 - Manufactured Product** and **Stage 2 - Fabricated Product** (structural welded sections) remains a requirement. Any break in the chain of certification renders the materials uncertified, and materials conformity and compliance to regulations must be demonstrated by other means and approved by the appropriate decisions making body. If you have any questions about:

- a) the ACRS integrated 2-stage process, or
- b) questions about the ACRS chain of certification, or
- c) where ACRS certification is required and you are told that ACRS does not certify structural welded sections to AS/NZS 5131,

please contact ACRS directly on T: +61 (0)2 9965 7216 or E: info@steelcertification.com

ACRS Certified Traceability

ACRS certification covers traceability between *Stage 1 (Manufactured Product)* certificate holders and *Stage 2 (Fabricated Product, e.g. processed rebar, steel mesh, and welded structural sections)* certificate holders.

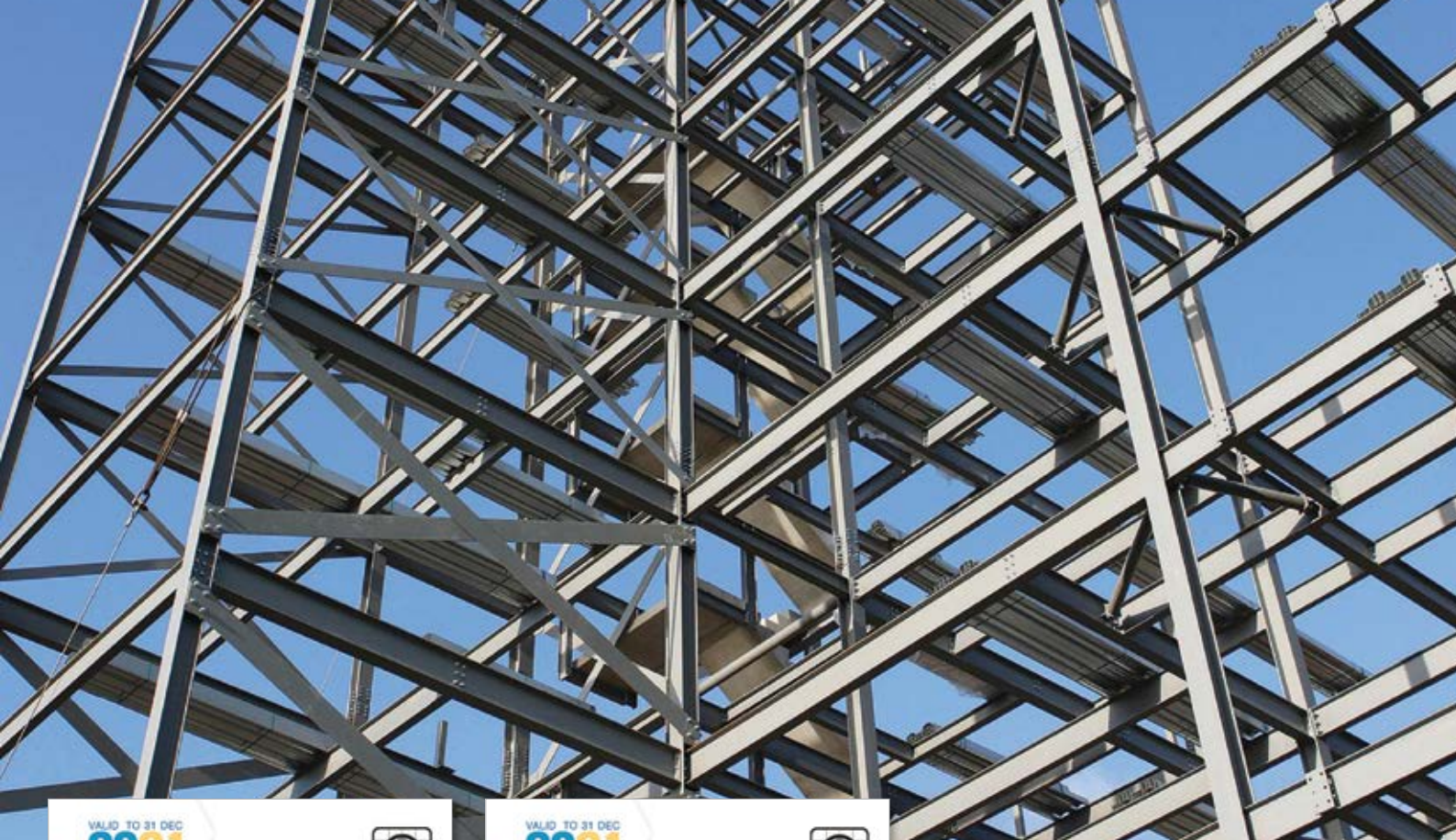
Separately, the standalone ACRS traceability scheme provides an additional, complementary assessment and verification system for non-producers and intermediaries in the increasingly complex steel supply chain.

ACRS Traceability Certification, derived from long-established European best practice, showed its value in both prestressing strand and structural sections supply in Australia and New Zealand during 2020. For example, in prestressing supply, ACRS certification and associated

ACRS services to stakeholders assisted a longstanding and valued international supplier maintain its supply to both infrastructure and commercial projects.

In other cases, the break in ACRS chain of certification between *ACRS Stage 1* and *ACRS Stage 2* or *ACRS Traceability Certification* alerted engineers, builders and government authorities to structural steels supply breaching purchase and supply conditions. Whilst ACRS has worked with affected parties on several such incidences, regrettably from January 2021 - due to the sheer increase in these incidences during 2020 and the resulting demand on ACRS resources - ACRS will be unable to provide comment and assistance for parties not holding the necessary ACRS certifications.





Important ACRS Certificate Wording Updates: January 2021

To assist users of ACRS certificates more clearly understand the scope of each certificate there have been some significant wording changes this year that you should be aware of.

For the various Manufactured Product categories, wording will be similar to:

"Products listed on this Manufactured Product certificate may be relied upon as having the benefit of ACRS Product Scheme certification after any subsequent processing only where cut, or bent, or welded by an ACRS certified processor. For Approval of processed reinforcing bar, refer to the bar processor's ACRS Fabricated Product certificate."

For the various Fabricated Product categories, the new certificate wording will be similar to:

"Products listed on this ACRS Fabricated Product certificate may only be relied upon as having the benefit of ACRS Product Scheme certification where fabricated from appropriate Approved Materials manufactured by an ACRS certified Manufacturer with the appropriate Scope of Certification."

It is therefore a very important part of your risk management process that you ensure you receive an unbroken chain of certification for both the steel manufacturer(s) and the steel processor(s) or fabricator(s).

For further information or enquires please contact ACRS at: info@steelcertification.com or phone: +61 (0)2 9965 7216

Takeaways:

- 1) Always obtain the ACRS certification from all the sources of steel supply, both manufactured steels and processed/fabricated steels. Where necessary, also demand the **ACRS Traceability Scheme Certification** from your trader or steel stockist to ensure the steel is traceable to origin and the correct standard of supply;
- 2) Check the scope of each certificate to be sure that what you have ordered is what you have received, and importantly;
- 3) Remember, "ACRS certification" of fabricated materials has always covered more than the just the mill of manufacture: **You need an unbroken chain of ACRS certification from source to site.** Therefore, you must have the appropriate ACRS Stage 2 certification from the rebar processor, mesh manufacturer, or structural welded section fabricator, for those materials to be ACRS certified – not just the ACRS certificate of the mill of origin from which the processor or fabricator sourced their basic steel.

If you don't confirm this, you could be in trouble – as so many projects unfortunately discovered during 2020.



Birmingham-led research promises water boost for farmers in India

University of Birmingham water experts have designed a low-energy, high-efficiency means of purifying water in India's rural farming communities, which could allow farmers to safely use high-saline groundwater and wastewater to grow crops.

Working in the Gujarat region of India, scientists in the Birmingham-led *INDIA-H2O* project have used emerging membrane technologies that allow saline groundwater and domestic/industrial wastewaters to be safely and efficiently recycled.

Based on field work in the village of Lodhwa, which confirmed the poor quality and availability of water in the region, scientists have now designed a system that can recover 80% of the unusable groundwater fed into it - producing usable water with low energy consumption.

They are also developing ways of growing special crops using the brine solution produced as a result of desalination, as well as progressing plant-based treatments to recycle domestic wastewater and developing solar-energy to break down pollutants in industrial wastewater.

Groundwater is the major source of water across India, with 85% of the population dependent on it. Much of this groundwater, however, is of poor quality and water below

60% of India's countryside is too saline for human consumption or conventional agriculture. Over-extraction and pollution of groundwater are also making it more difficult to access clean water.

Philip Davies, Professor of Water Technology at the University of Birmingham, commented:

"INDIA-H2O is developing, designing and demonstrating low-cost water treatment systems for saline groundwater and for domestic and industrial wastewaters in Gujarat, where over-extraction and pollution of groundwater makes it more and more difficult to access clean water."

"Combining novel engineering solutions with new reverse- and forward-osmosis membrane technologies should substantially reduce energy consumption - allowing efficient operation of these systems in rural India using solar energy. They should increase the amount of drinking water extracted from groundwater by 50%," Professor Davies added.

The new technology should also enable cultivation of halophytic crops - salt-tolerant plants usually found in areas such as in saline semi-deserts, mangrove swamps, marshes and sloughs and seashores. Some species are high yield and nutritious, with important potential to supplement diet.

"Novel use of halophytic plants in an integrated water management system to eliminate harmful brine discharges and produce commercial crops will represent significant progress in water management in India," commented Professor Davies. "Such crops are rarely commercialised in India and little is known about the native species and their potential for use with desalination brines."

Over the next decade, the number of people affected by severe water shortages is expected to increase fourfold. Of the 2,700 billion cubic metre hike in water demand forecast for 2030, some 468 billion cubic metres (17%) is expected to occur in India.

Desalination of brackish water and recycling of wastewater hold potential to fill the widening gap, but the cost of energy and the investment in equipment required for desalination and recycling has limited implementation of these technologies so far.

ABOUT INDIA-H2O

The INDIA-H2O consortium comprises 18 participating organisations from across EU and India, including universities, research institutes, industries and NGOs. Consortium members have been working in teams, each dedicated to a specific work package - for example groundwater desalination, phytoremediation, industrial systems, control systems, water governance, and business development.



Accurate Legionella detection in hours rather than days

Thermo Fisher Scientific recently announced availability of a new qualyfast® DNA Extraction kit, a fast DNA extraction kit designed to detect Legionella in clear water samples. Extracted DNA can be directly used in downstream applications, including PCR and qPCR, without the need for further purification.

The COVID-19 pandemic has caused worldwide disruption, but SARS-CoV-2, the virus that causes COVID-19, isn't the only concerning microorganism as businesses re-open or scale up operations. Consequently, organizations are turning to environmental testing laboratories to ensure water systems are free of dangerous Legionella bacteria.

Commercial operations that have been closed for several weeks or even months are at a heightened risk of the waterborne pathogen, Legionella. Slow moving or stagnant water allows the bacteria, which can cause the highly contagious, atypical pneumonia Legionnaire's disease, to multiply. Unused air-conditioning and cooling tower systems, many of which have been idle in recent months, pose a particular public health risk.

Thermo Fisher is now distributing the qualyfast Legionella range of sample preparation and qPCR detection kits which have been developed and manufactured by Bioside.

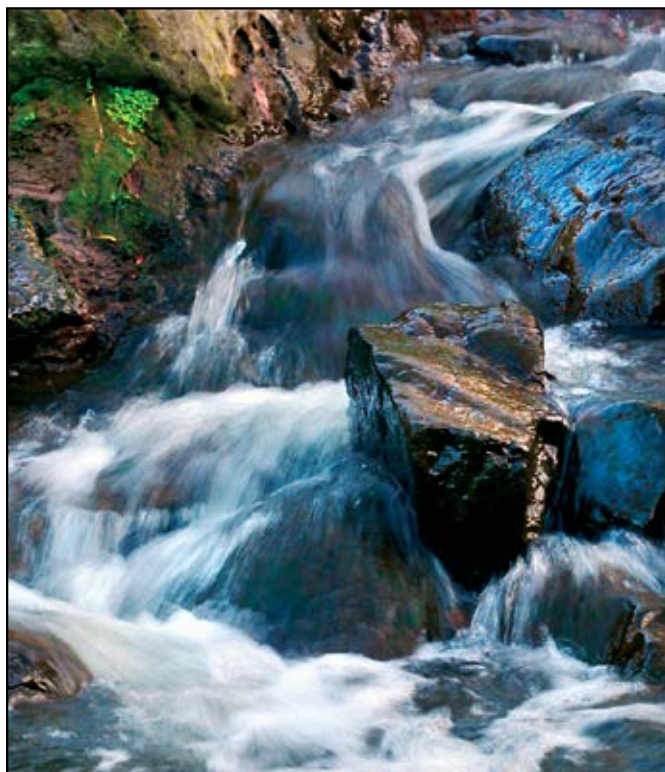
The qualyfast Legionella PCR range offers environmental testing laboratories a complete sample-to-answer workflow that can deliver accurate results in hours rather than days, when compared to more conventional culture media-based methods. This enables laboratories to give businesses the all-clear for Legionella and help them to get back to work in record time.

The kits, which are stable at room temperature, offer a simple and easy-to-use workflow including:

- water sample preparation to eliminate common environmental contaminant-driven false negatives;
- rapid and sensitive qPCR detection technology provided as pre-dosed and lyophilized reagents to enable confident identification or exclusion of Legionella species and Legionella pneumophila in samples; and
- quantification standards for accurate and reproducible test results.

Bernd Hofmann, vice president of global marketing at Thermo Fisher, said: "The addition of qPCR Legionella detection kits to our range significantly enhances our ability to meet the needs of laboratories testing for Legionella in water. It provides our customers with rapid and sensitive testing solutions for managing the risk to human health posed by Legionella bacteria," Mr Hofmann added.

Bioside co-founders, Francesca Piemonti, CEO, and Michela Savoldi Boles, CTO, said: "Our mission is to develop and manufacture innovative, ready-to-use diagnostic products that truly tackle unmet need. With the qualyfast Legionella PCR range, laboratories can easily and conveniently work with organizations affected by COVID-related shutdowns to re-open their doors quickly and safely."



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Engineers devise new method to remove harmful E. coli from water

Engineers at Monash University in Melbourne have come up with an improved method to remove potentially deadly bacteria, such as E. coli, from water using graphitic carbon nitride and sunlight. The international team, led by Professor Xiwang Zhang in Monash University's Department of Chemical Engineering, combined graphitic carbon nitride with polyethylenimine (PEI) to destroy harmful pathogens E. coli and Enterococcus faecalis from water within 45 minutes and 60 minutes respectively.

This new photocatalyst method is low cost and metal-free, which prevents secondary pollution of leached metal ions during the filtration process.

If upscaled, this solar-driven method could significantly improve the treatment of large volumes of water. It also has the potential to be integrated into current solar water disinfection technology in countries with limited access to fresh water.

Published in the journal *Applied Catalysis B: Environmental*, Professor Zhang says integrating their photocatalyst into solar water disinfection technology could nearly ensure complete and rapid disinfection in a more sustainable way.

"Infectious diseases caused by waterborne pathogens threaten the health of people worldwide," said Professor Zhang, who is also the Director of the ARC Research Hub for Energy-efficient Separation.

"Graphitic carbon nitride has gained broad attention as a metal-free

photocatalyst for water disinfection. However, it has limits in its capacity to remove pathogens completely using photocatalysis.

"What we've been able to do is fuse graphitic carbon nitride with PEI to boost photocatalytic properties of this material and test it on waterborne bacteria.

"We discovered the PEI functionalisation can, in effect, tune the photochemical reactions on graphitic carbon nitride. We found that the positively charged PEI on graphitic carbon nitride could promote the contact between photocatalyst and bacteria cells (negatively charged surface) via electrostatic adhesion, which can enable reactive oxygen species to kill the trapped bacteria cells."

A previous study published by the research team in *ACS Catalysis* found PEI on graphitic carbon nitride provided a trap site for photoinduced holes. Through this, PEI can tune the photochemical reactions to generate more reactive oxygen species for bacteria inactivation.

Through this process, PEI changes the surface charge of the composite photocatalyst to be positive; in nature, the surface of bacteria cells is negatively charged due to the specific moieties of their cell structure.

As such, the positively charged PEI on graphitic carbon nitrate can promote contact between photocatalyst and bacteria cells via electrostatic adhesion.

In this way, PEI traps the bacteria cells in water. The trapped cells are then killed by the generated reactive oxygen species through photocatalysis.

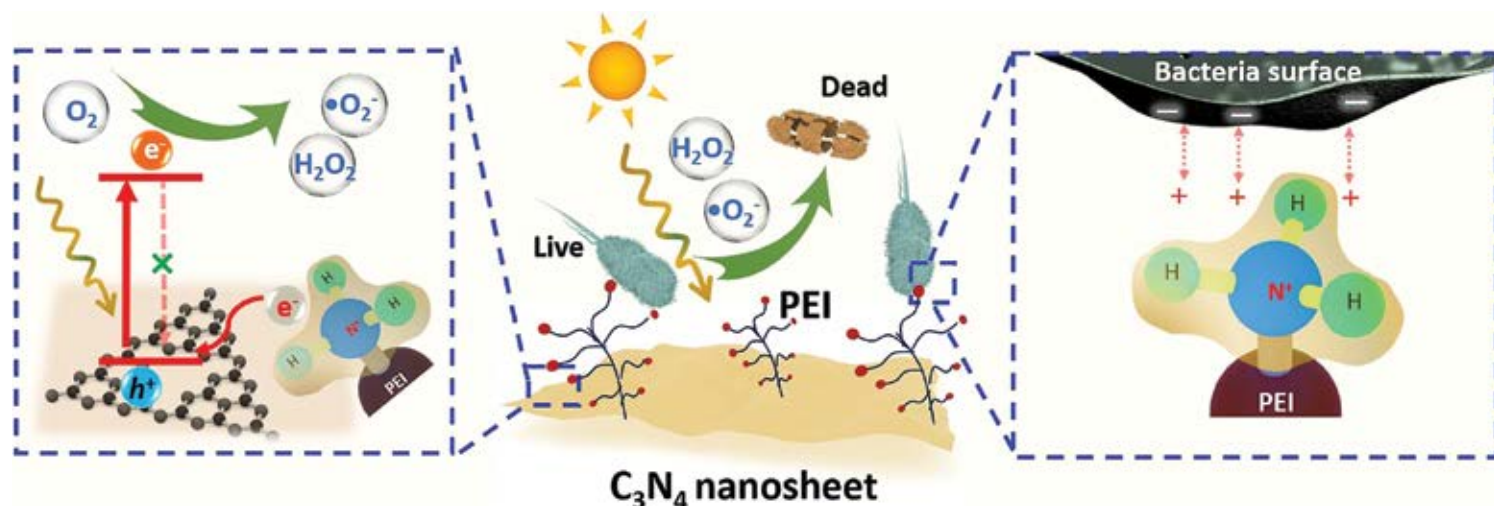
Through this process, under solar light irradiation, the research team was able to remove 99.99 per cent of E.coli from water in 45 minutes, and the same percentage of Enterococcus faecalis within 60 minutes.

"This PEI functionalisation process is simple. It can be shared with desperate communities across the world after further research is conducted on the development of photocatalysis devices," Professor Zhang said.

Professor Xiwang Zhang (Monash University, Chemical Engineering) led the study titled: *'Cooperatively modulating reactive oxygen species generation and bacteria-photocatalyst contact over graphene carbon nitrate by polyethylenimine for rapid water disinfection'*.

He was supported by Xiangkang Zeng, Yue Liu and Yun Xia (Monash University, Chemical Engineering); Md Hemayet Uddin (The Melbourne Centre for Nanofabrication); Dehua Xia (Sun Yat-sen University); Associate Professor David McCarthy (Monash University, Civil Engineering); Ana Deletic (Water Research Centre, University of New South Wales); and Jiaguo Yu (Wuhan University of Technology).

The research was funded by the Australian Research Council.



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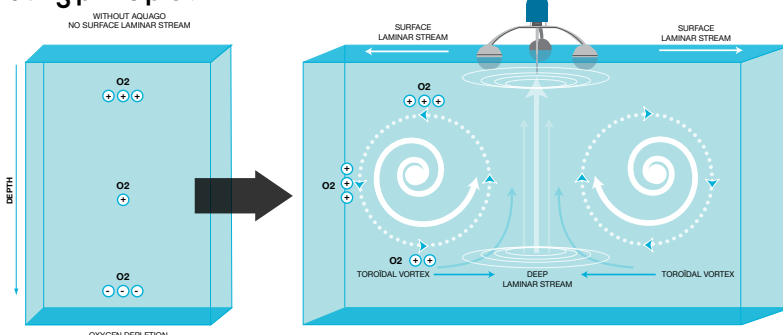
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Smart Water Networks Able to Detect a Looming Crisis, Reports IDTechEx

It is possible with technology to better predict how people use water and monitor its quality. This technology currently exists. For example, manufacturing industries such as semi-conductor manufacturing monitor water for trace metals. The same sensors can be used in a water network pipe. Furthermore, these methods of sensor detection have been shown to work.

Companies such as Suez have implemented smart water meters to track users' water consumption in some locations in France, providing them with a better understanding of how the users consume water, and more importantly, when.

IDTechEx research predicts that in the water pipe network alone, the industry of sensors will grow to over \$3.5Bn by 2030 (Source: *"Sensors in the Water and Wastewater Treatment Industries 2020-2030"*). This area is a growing industry, and it is at the forefront of the Smart Cities and IoT technology areas.

What are the benefits of sensors in pipes?

Data brings understanding, and understanding brings better management of a system. Collecting data on the flow in water pipes allows companies to quickly identify regions where there is an increase in demand, and as a result, lower pressure in the pipes.

Utility companies can correlate their usage data with current events. They can then answer questions such as: On average, how

much water is used per day in a heatwave? Who uses the most water? What times of the day is the network strained?

Which sensors can be in water network pipes?

There are many different properties and measurements recorded in a water supply or a wastewater network, including:

- Pressure Measurements (static, stagnation, head)
- Flow levels (depth, pressure, velocity)
- Flow meters (velocity)
- Acoustic emission (leakage)
- Temperature measurements
- Chemical measurements (Ph, trace metals e.t.c)

IDTechEx research has covered and analysed all these different types of measurement sensors in the report, *"Sensors in the Water and Wastewater Treatment Industries 2020-2030"*.

When will it happen?

The need is, therefore, creating a smart water network, but it will only happen with investment. IDTechEx Research predicts there will be a change in regulation in 5-10 years. This change will push for smarter sensor-based networks. Moreover, the benefits of these systems will pay off any investment, providing a more efficient, safe, and monitored network.

As an emerging technology, digitizing and adding sensors to the water and

wastewater networks may have both benefits and hindrances. Hindrance, as companies may not wish to spend large sums on new sensors, pipes, or technology, and the barriers for entry into the water and wastewater networks are already high.

The benefit of adopting sensors into the networks outweigh these barriers. There is a real need for remote monitoring. Monitoring removes the need for maintenance staff to check pipes as regularly or to collect samples for lab monitoring. It speeds up the identification of pollution events and reduces fines incurred by the water companies. It improves the efficiency of the treatment plants. It provides a better service for customers. A steep investment, but the dividends pay off for many years to come.

Comprehensive report

"Sensors in the Water and Wastewater Treatment Industries 2020-2030" provides a comprehensive overview of this industry includes market forecasts, player profiles, investments, and comprehensive company lists. This report is an essential read for those looking for a deep understanding of the use of sensors in the water and wastewater industries.

For more information on this report, please visit: www.IDTechEx.com/digitalwater or for the full portfolio of Smart Cities research available from IDTechEx please visit: www.IDTechEx.com/Research/SmartCities

Gippsland Water shores up Coongulla and Glenmaggie's water supply

Gippsland Water will secure Coongulla and Glenmaggie's water supply for the future as part of a multi-million dollar project.

Managing director Sarah Cumming said this project was all about ensuring Coongulla and Glenmaggie communities had security in their water supply even when Lake Glenmaggie is low.

"At the moment, the water supply for both towns is sourced from Lake Glenmaggie and treated at the Coongulla water treatment plant," Ms Cumming said.

"Lake Glenmaggie's water levels aren't reliable. There have been times when the

lake has reached such low levels that water needed to be trucked into the towns from Heyfield.

"Meanwhile, Heyfield's water is sourced from the Thomson River which is a lot more reliable and has plenty of capacity to supply Coongulla and Glenmaggie as well."

Ms Cumming said construction of a distribution water main to connect the area's water supply with the Heyfield network would help to shore up supply.

"Once the interconnecting pipeline is completed in 2022, we will be able to more efficiently and cost-effectively supply Coongulla and Glenmaggie with water."

Ms Cumming said a lot of work had gone into getting the project to this stage.

"We completed field surveys with Traditional Owners to ensure we understand where there is significant cultural heritage and work together to preserve Aboriginal artefacts.

"We also made sure our chosen route had the least impact on the environment possible. Any vegetation we need to remove will be offset."

For more information and to keep up-to-date on the project's progress, please visit: www.gippswater.com.au/heyfield-coongulla-interconnect



Gippsland Water completed cultural heritage surveys as part of the project planning phase.

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Siemens Energy will deliver 114 low-loss 66kV distribution transformers for the Seagreen Offshore Wind Farm in Scotland. The solution has been specifically designed to pass through the opening in the tower base without disassembly. Earlier Siemens Energy's compact transformers also helped to enable the Deutsche Bucht offshore wind farm (pictured) in the German North Sea, together with MHI Vestas Offshore Wind. Photo courtesy MHI Vestas Offshore Wind ©2021

Siemens Energy to deliver transformers to Scotland's largest offshore wind farm

Siemens Energy has been selected by MHI Vestas Offshore Wind (MHI Vestas) to deliver 114 low-loss 66kV distribution transformers for the *Seagreen Offshore Wind Farm* in Scotland. With an installed capacity of 1,075 megawatts (MW), the wind farm will be Scotland's single largest source of renewable energy and is forecast to provide low carbon energy for around 1.3 million homes.

Siemens Energy to deliver transformers to Scotland's largest offshore wind farm

The fluid immersed distribution transformers will complement 114 MHI Vestas' 10MW turbines that the company will deliver to the wind farm located 27 km from the Angus coastline in Scotland. The low-loss distribution transformers were designed to meet high efficiency requirements. The transformer voltage class of up to 72.5 kilovolts (kV) will enable larger power capacities, such as provided by MHI Vestas' 10MW offshore wind turbines, while keeping energy losses low.

After commissioning, the distribution transformers will transform the voltage from the low voltage of produced electricity to the medium voltage level of 66kV needed to feed the offshore transmission substation before going to mainland with an even higher voltage. It is anticipated that the Seagreen Offshore Wind Farm will be operational by 2022/2023.

"Siemens Energy worked closely together with us to develop a customized design transformer that perfectly fits our demands for an energy efficient solution with minimum footprint," said Robert Slettenhaar, Vice President, Head of Procurement and Category Management at MHI Vestas Offshore Wind.

"The transformers represent a critical component in our wind turbines and I am glad that with Siemens Energy we found a reliable and experienced partner for this significant project."

Beatrix Natter, Executive Vice President Transmission at Siemens Energy, said: "I am delighted that we have been chosen to deliver our state-of-the-art distribution transformers for the Seagreen Offshore Wind Farm – a project that is forecast to offset 1.6 million tonnes of carbon emissions per year and will significantly contribute to reach the UK's net zero emissions targets."

"We drive energy transition by innovation and customer dedication. Our team is enabling the efficient use of offshore wind energy, building on our 128 years of experience in transformers," said Eduardo Terzi, Senior Vice President for Non-Switching Products at Siemens Energy.

"Cleaner energy systems around the world is what we aim for, so implementing our lightweight and energy-efficient

distribution transformers in Seagreen Offshore Wind Farm is an important milestone on this journey."

The solution has been specifically designed to meet MHI Vestas' needs for a lightweight and compact solution that passes through the opening in the tower base without disassembly. To combine the compactness with challenging and diverging efficiency requirements, a newly developed core design, an innovative cooling solution, and a highly efficient winding arrangement were implemented.

The transformers will be filled with safe and biodegradable ester insulation fluid as an environmentally friendly and operationally safe alternative to conventional mineral oil.

The transformers have been vibration tested to ensure they reliably cope with the highly demanding service conditions and strong vibration typical for wind power applications. In addition, a short circuit test was conducted to ensure the transformers can withstand potential short circuits.

About 10,000 fluid immersed transformer units built for wind farms in Siemens Energy's transformer factory Weiz (Austria) in the last 10 years are affirming the company's position as a leading supplier for special transformers for wind turbines.

For further information on wind energy, please visit: www.siemens-energy.com



LONGi supplies 70 MW modules to the largest floating PV plant cluster in Vietnam

In a significant development marking the end of 2020, two large-scale floating solar projects in Vietnam were commissioned in December. They were the 35 MWp Ho Tam Bo floating solar power plant and the 35 MWp Ho Gia Hoet 1 floating PV plant. The two projects have been set up on Gia Hoet 1 and Tam Bo irrigation lakes, in Quang Thanh commune, Chau Duc district.

LONGi supplied the high efficiency PV modules for both projects. Despite the challenges arising from COVID-19, the China-based module manufacturer completed module deliveries ahead of schedule, ensuring the timely completion of the projects that together comprise the largest floating PV plant cluster not just in Vietnam but entire Southeast Asia region, with a combined capacity of 70 MWp. The only other operational floating solar power project in the country is Da Mi Plant by EVN.

The 35-MWp Ho Tam Bo Floating Solar Power Plant and the 35-MWp Ho Gia Hoet 1 floating PV plant together form the largest floating PV cluster in Southeast Asia. Both projects were developed by Vietnam's TOJI Group.

Construction of the Ho Tam Bo Floating Solar Power Project started on August 8, 2020. Despite the challenging rainy and stormy conditions made more difficult with COVID-19 related issues, TOJI Group was able to complete the 110 kV substation installation, 10.8 km of transmission line development and grid integration in just 4 months. The plant received final commissioning on December 12, 2020.

Similarly, the Ho Gia Hoet 1 plant included the solar power station of 35 MWp, 22/110 kV step-up transformer substation and 1.86 km of transmission line running from Gia Hoet 1 to Tam Bo 22/110 kV step-up transformer substation. This plant also received final commissioning on December 12, 2020.

LONGi supplied 74,469 panels of 470 Wp power for these landmark projects.

"The market for floating photovoltaic projects has witnessed increasing growth over the past few years, with the installed capacities of individual projects rising year on year," said Dennis She, Senior Vice President, LONGi Solar.

"LONGi has been supplying to several floating solar power projects across the world and we are proud to be associated with the TOJI Group in setting up their first floating solar plant in Vietnam," he added.

After the commissioning of the projects, Chairman of Toji Group, Ho Minh Tien said:

"On behalf of our investors, the Toji Group would like to thank the People's Committee of BRVT, Vietnam Electricity EVN, Vietnam Rubber Group, People's Committee of Chau Duc District, People's Committee of Quang Thanh Commune, and affiliates of EVN A0, A2, SPC, PC BRVT and its subcontractors partner units that supported, facilitated and accompanied Toji Group in this project." "We would also like to thank all the suppliers of Ho Tam Bo and Ho Gia Hoet 35+35 MWp floating solar farm that was commissioned on December 12, 2020."

Wind farm and sleep disruption

New research builds on inconsistent prior studies

As wind power generation becomes more important, experts at Flinders University are examining whether wind 'farm' turbine noise in the environment can affect sleep and wellbeing of nearby residents. In a review of existing literature on wind turbine noise effects on sleep, the Flinders sleep researchers have weighed up the results of five prior studies. While previous studies showed no systemic effects on common sleep markers such as time taken to fall asleep and total sleep time – they did reveal some more subtle effect on sleep such as shifts in sleep stages and less time in deep sleep.

"Comparing wind turbine noise to quiet background noise conditions showed no systematic effects on the most widely used objective markers of sleep, including time taken to fall asleep, total sleep time, time spent awake during the night and time spent asleep relative to overall time in bed," lead author Tessa Liebich says of a new review paper published in the international *Journal of Sleep Research*.

"However, some more subtle effects on sleep in some objective studies were established including shifts in sleep stages, less time spent in deep sleep and more time spent in light sleep."

Through Australian NHMRC funding, the *Adelaide Institute for Sleep Health* study at Flinders is studying sleep patterns in more than 70 volunteers in a carefully controlled in-laboratory experimental study to investigate potential wind turbine noise impacts on sleep and daytime outcomes. Their final results are expected to be available around mid-2021.

Senior author Dr Gorica Micic says limited knowledge and data in this area emphasises a need for further well-controlled experimental studies to provide more conclusive evidence regarding wind turbine noise effects on sleep.

"Environmental noises, such as traffic noise, are well known to impact sleep," she says. "Given wind power generation is connected with low frequency noise that can travel long distances and more readily into buildings, it is important to better understand the potential impacts of wind turbine noise on sleep."

This study aimed to comprehensively review published evidence regarding the impact of wind turbine noise on the most widely accepted objective and subjective measures of sleep time and quality.

Subjective sleep outcomes were not sufficiently uniform for combining data or comparisons between studies, researchers explain.

"Nevertheless, the available self-report data appeared to support that insomnia severity, sleep quality and daytime sleepiness can be impacted by wind turbine noise exposure in comparison to quiet background noise.

"However, firm conclusions were difficult to draw from the available studies given inconsistent study methods, variable outcome measures and limited sample sizes," researchers conclude.

The new research paper, *A systematic review and meta-analysis of wind turbine noise effects on sleep using validated objective and subjective sleep assessments* (2020) by T Liebich, L Lack, K Hansen K, B Zajamšek, N Lovato, P Catchside and G Micic (Flinders University) has been published in the *Journal of Sleep Research*. DOI: 10.1111/jsr.13228



Lack of collection infrastructure blights European plastic bottle recycling

Europe is falling behind on its race to meet the European Union (EU) target of 90 per cent collection of plastic bottles by 2030 according to new research by ICIS. Results of the ICIS survey of the European RPET (recycled polyethylene terephthalate) industry in 2019 show that progress has been made, but this progress is being threatened by inadequate collection strategies and high contamination levels when it comes PET bottles.

Overall, the region saw a recycling rate of 46 per cent a rise of two per cent on the rate in 2018.

"This is a marginal improvement, but still less than half of the bottles put into the market are recycled," Helen McGeough, Senior Analyst of Plastic Recycling at ICIS said.

"Given that PET is one of the most recyclable polymers in the market and the recycling infrastructure is more mature than other polymers, the question remains as to why this is not advancing to higher recycling rates."

"This reflects the wider issues facing the sector in terms of a collection and sorting infrastructure managed principally by national governments that have not invested in systems to manage the proliferation in waste composition and consequently can produce poor quality recyclables. The recycling sector inherits materials with reducing yields while end-users demand even higher quality R-PET output" added McGeough.

Failings of the collection strategy

Collection volumes of post-consumer PET bottles reached 2.2m tonnes in 2019, an increase of five per cent on 2018, which is the highest growth rate in several years. However, the overall collection rate across the region increased just one per cent to 64 per cent in 2019, so over a third of post-consumer bottles remain uncollected.

The PET recycling industry responded to the boom in demand for R-PET supply during 2018 by increasing its capacity by 11 per cent. However, not only did collection rates not match this growth in capacity but nor did the availability of the highest quality colourless bales. Deposit return scheme (DRS) bales represented 31.6 per cent of the total supply compared to 33 per cent in 2017.

Although the feedstock supply may have increased in volume, so too did contamination levels. The average yield across the region was 69.5 per cent in 2019, down from 71 per cent in 2018.

According to McGeough this was "...unsurprising given the reduction of PET waste exports to China, due to the waste import ban, and pushback from other Asian markets unable and, or, unwilling to accept shipments and become a dumping ground for the rest of the world. These typically lower-quality materials have since been absorbed into the domestic waste stream and contribute to the overall reduction in yield."



Key market players struggling to meet recycling targets

The key drivers to the R-PET market are brand pledges and legislation, mainly the SUP Directive which mandates the use of recycled content in bottles, pushing the supply increasingly towards the bottle market.

The bottle industry must achieve 25 per cent recycled content in PET bottles by 2025 (under SUP Directive), and the study shows growth in the R-PET penetration of the food contact bottle market at 14.5 per cent, rising from 10.7 per cent in 2018. However, this is still over 10 per cent below the mandated target and way below the ambitions of influential brands going way beyond these levels, up to 100 per cent for segments of their portfolios.

The ICIS report showed that in 2019 the share of R-PET supply absorbed by the food contact bottle market rose to 32 per cent compared with 25 per cent in 2018, reflecting this trend and pull through the supply chain from significant beverage brands ambition to offer more sustainable packaging for their product as consumer pressure continued to build after the extremely high profile of plastics pollution in the natural environment – often cited as the Blue Planet effect.

"The 2019 survey shows improvement in many aspects of the R-PET supply into the market," McGeough concluded. "However, there are still challenges to overcome, mainly at the front end of the chain. These include the improved collection in terms of quality as well as quantity, improved design for recycling and sorting to reduce waste rates, and growth in the supply of highest quality R-PET to meet the frantic demand of bottlers."

ABOUT THE SURVEY

The 2020 ICIS European RPET survey was conducted across 28 countries in West Europe, over the period April to November 2020. Those countries include the 28 EU member states, excluding Malta and Cyprus, plus Norway and Switzerland. The primary focus of the study was the RPET industry in 2019 with detail on each of the main elements of the supply chain: collection, recycling and end use. The report is a collaborative effort including national authorities, compliance agencies, deposit return schemes and recyclers.

ABOUT ICIS

ICIS is a trusted source of intelligence for the global energy, chemical and fertilizer industries. It is a division of RELX, a FTSE 15 company with a market cap of £34.8 billion and an employee base of over 30,000 experts across 40 countries.

ABOUT RELX

RELX is a global provider of information and analytics for professional and business customers across industries. The Group serves customers in more than 180 countries and has offices in about 40 countries. It employs approximately 30,000 people of whom almost half are in North America.

WA's Containers for Change program sees 120+ million returns in first 100 days

Western Australians returned more than 120 million containers and donated over half a million dollars for community groups and charities in 2020-21 as part of the WA State Government's container deposit scheme, *Containers for Change*.

Launched on October 1, 2020, *Containers for Change* gives Western Australian's an opportunity to return eligible drink containers for a 10-cent refund.

Since its introduction more than 120 million containers have been returned to Western Australia's 212 refund points. All those containers lined up would go from Albany to Kununurra and back.

More than 4,100 tonnes of glass, 600 tonnes of aluminium and 400 tonnes of PET plastic will be recycled from containers collected during the first 100 days of the scheme's operation.

"*Containers for Change* has been widely supported since it was introduced 100 days ago and West Australians really do deserve praise for ensuring the success of this new recycling scheme," said Western Australian Environment Minister, Stephen Dawson.

"However, we are still seeing containers end up in litter and landfill, so we all need to do our bit to recycle them through the scheme," he said.

"We need to change our thinking about what we do with waste. Drink containers made from glass, aluminium, plastic and liquid paperboard are resources that can be turned into new products, they do not belong in the bin," the Minister added.

Containers for Change has also seen more than \$500,000 donated via scheme ID for 3,000 community groups and charities. This includes WA charity *Wheelchairs for Kids*, which has raised almost \$10,000.

The volunteer-based not-for-profit organisation provides wheelchairs to children with disabilities in impoverished and under-resourced communities in Australia and around the world.

"Containers for Change gives Western Australians an opportunity to be involved in a community-focused recycling scheme that offers community groups and charities another fundraising avenue," Minister Dawson said.

"With half a million dollars already donated through the scheme, I encourage charities and community groups to use their scheme IDs and get involved," he added.

More than 680 local jobs have been created at Containers for Change refund points, with many filled by people with disability, the long-term unemployed, and Aboriginal people.

Over the next 20 years, it is estimated the scheme will recycle an additional 6.6 billion containers, keeping about 5.9 billion of those containers out of landfill and 706 million containers from being littered.

Further information about *Containers for Change* can be found at:

www.containersforchange.com.au



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International Aluminium Institute publishes global recycling data

The International Aluminium Institute (IAI) recently released global aluminium recycling data, and it makes a strong case for recycling. According to figures from the IAI, recycling just one aluminium can conserves enough energy to recharge up to 20 mobile phones, while global aluminium recycling saves enough energy every year to power the whole of France.

Commenting on the recycling data, Marlen Bertram, IAI's Director - Product Stewardship said:

"Aluminium is one of the most recycled materials on earth. Today, the global recycling efficiency rate is 76%. High recycling rates in all regions underline the economic and environmental value of aluminium scrap."

Over the last 40 years, the IAI has provided the most credible, representative and authoritative data for the global aluminium industry and continues to provide reliable statistics and rigorous analytical expertise.

Ms Bertram noted: "With comprehensive statistical data and pioneering material flow analysis, the IAI can track scrap aluminium globally from source to consumer by product, quality, form and region."

According to the IAI, every year, more than 30 million tonnes of aluminium scrap is recycled globally, ensuring its status as one of the most recycled materials on the planet.

"Aluminium is central to a sustainable future, because of its unique combination of properties, including lightness, strength, durability, and recyclability," Ms Bertram said.

"Rapid population and economic growth over the coming decade mean that global demand for aluminium will double through to 2050, and this will be met by 50% to 60% recycled metal. To ensure a sustainable circular economy, especially post-COVID, we need to improve and maintain high recycling rates across the world," Ms Bertram added.

Aluminium can be remelted and reused without any impact on its unique properties. This means that aluminium products can be recycled repeatedly.

According to the IAI, Europe has the highest Recycling Efficiency Rate (RER) in the world, recovering 81 per cent of aluminium scrap available in the region.

North America has the world's highest Recycling Input Rate (RIR) with 57 per cent of the metal produced in the region originating from scrap.

China, which is the largest consumer of both primary and recycled aluminium, also produces more than 10 million tonnes of scrap aluminium each year, accounting for a third of the annual global total.

KEY FACTS:

- Recycling one tonne of aluminium saves greenhouse gas emissions equivalent to driving 64,000 kilometres in an average passenger vehicle.
- Recycling aluminium requires 95 per cent less energy than production from ore.
- Almost 75 per cent of the 1.5 billion tonnes of aluminium ever produced is still in use today.
- Almost 70 per cent of all drinks can are recycled – making it the most recycled drinks container on earth.

ABOUT THE IAI

The International Aluminium Institute (IAI) is the only body representing the global primary aluminium industry. The Institute has the most comprehensive global data on aluminium with more than 40 years of analysis on production, consumption, energy use and environmental impact.

For more information, please visit:
www.world-aluminium.org

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CSIRO's circular economy roadmap charts path to triple job creation

A new roadmap released by Australia's national science agency, CSIRO, has developed key strategies for creating jobs and reclaiming billions in economic value from plastic, glass, paper and tyres currently going into landfill.

The *National Circular Economy Roadmap* found innovation is crucial to realising Australia's largest economic gains, which will come from designing new products and materials, including through advanced manufacturing, and in embracing new business models that will create domestic and export markets for waste streams.

This could more than triple job creation from resource recovery in Australia, where the recycling sector currently generates 9.2 jobs per 10,000 tonnes of waste, compared with only 2.8 jobs for the same amount of waste sent to landfill.

Increasing Australia's recovery rate by just 5 per cent would add an estimated \$1 billion to GDP. The Australian Government's ban on the export of waste last year creates an opportunity for a new circular economy strategy that turns landfill into economic returns.

CSIRO Chief Executive, Dr Larry Marshall, said science and technology can drive Australia's next wave of economic opportunities.

"Australia is among the world's best in advanced manufacturing and environmental research, and that unique science can turn industry and environment into partners by making sustainability profitable," Dr Marshall said.

"Science can transform our economy into a circular one that renews and reuses what we previously discarded, and indeed a virtuous circle that creates higher paid jobs, advances new Australian technology, and protects our environment.

"We're on a mission to make it real. The practical path laid out in this roadmap is part of CSIRO's mission-led focus on using science to solve our greatest challenges while driving our economic recovery and building future resilience."

The roadmap aligns with a number of circular economy missions being developed by CSIRO and partners in industry, universities and government, including a mission to end plastic waste, a mission to transform Australian mineral commodities into higher-value products, and a mission to transition to net zero emissions.

Project leader Dr Heinz Schandl said the roadmap was commissioned by the Federal Department of Industry, Science, Energy and Resources and developed in collaboration with 83 industry, research and government partners to shape a circular economy strategy for Australia to address fundamental environmental issues and foster regional employment.

"Our traditional 'take-make-dispose' consumption pattern is hitting two walls: ever-more-expensive primary materials, and ever-more-unacceptable ways of dealing with waste," Dr Schandl said.

"The global pandemic has disrupted global supply chains which challenges

Australia to be self-sufficient with sovereign manufacturing capability."

The roadmap identifies six elements for moving towards a circular economy of plastics, paper, glass and tyres:

- Retain material through use and collection
- Upscale and innovate recycling technologies
- Innovate and collaborate in design and manufacture
- Develop markets for secondary materials and the products that use them
- Streamline nationally consistent governance
- Secure a national zero waste culture

LOST TO LANDFILL: The hidden gems in our waste

- Plastic – \$419M: Australia loses \$419 million every year by not recycling PET and HDPE plastics.
- Paper – \$115M: Cost savings from sending paper fibre to landfill is around \$70 per tonne. With 1,642 kilotonnes sent to landfill each year, that's \$115 million.
- Lithium – \$2.5B: Sending lithium from batteries to landfill results in a lost economic opportunity of up to \$2.5 billion by 2036.
- Litter – \$70M: Australia spent \$70 million cleaning up dumped waste in 2016–17.

The full report '*A circular economy roadmap for plastics, tyres, glass and paper in Australia – CSIRO*' and summary can be downloaded from: <https://www.csiro.au/en/Research/Environment/Circular-Economy/Circular-Economy-individual-products>

Coles cements Australian-first soft plastics recycling technology

Coles has partnered with Victorian recycling organisations RED Group and Replas to pioneer and install a concrete slab carpark made partly out of recycled soft plastics.

Under installation at Coles Horsham, the carpark is the first commercial construction project in Australia to make use of *Polyrok* – a sustainable alternative to aggregate minerals used in concrete, such as stone.

Made from plastic bags and soft plastic packaging recovered from the REDcycle program, Polyrok has the potential to divert 105,000 tonnes of soft plastics from landfill each year, if used in commercial concrete projects across Australia.

Coles State Construction Manager Victoria Fiona Lloyd said this was the first time the product had been used in a commercial environment.



“As one of Australia’s largest food retailers, we know how important it is to support initiatives that help to close the loop with soft plastics,” she said.

“This project alone will help repurpose approximately 900,000 pieces of soft plastic, to be used in the carpark at the soon-to-be-completed Coles Horsham redevelopment.

“We’ve worked with RED Group, Replas and RMIT University throughout the whole development process and we’re excited to see how we can use this technology in more of our stores.”

Replas Joint Managing Director Mark Jacobsen said: “Coles, Replas and RED Group are leading the way on recycling the soft plastics that are returned to Coles supermarkets. This new carpark will be built using Polyrok, a sustainable alternative to mineral aggregate in concrete, made from the soft plastic packaging returned to REDcycle bins at Coles.

“Polyrok reduces the carbon footprint due to the reduced thermal mass it provides. This tackles the plastic problem and climate change all while being fit for purpose. If innovative products like this were adopted in all buildings and car parks, the collective reduction in greenhouse gasses would be enormous.”

Assistant Minister for Waste Reduction and Environmental Management, Trevor Evans welcomed the collaboration to find innovative and practical ways to reuse soft plastics.

“There is huge potential and opportunity for infrastructure projects to help us build a more circular economy,” Assistant Minister Evans said.

“This is why the Federal Government has prioritised the development of new national standards and guidelines to encourage the use of recycled content in roads and other projects.”

Coles has worked with REDcycle since 2011, becoming the first major Australian supermarket to have REDcycle bins in every supermarket. Since the partnership began, Coles and its customers have diverted over 1.3 billion pieces of soft plastic from landfill.



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Accelerating Water and Wastewater Digitization

Faced with tightening budgets and aging infrastructure, utilities need to make smart investments to increase efficiency and maintain assets. As demand increases and new regulations are passed, water utility managers face the challenge of both modernizing infrastructure and digitizing operations at the same time.

Tech-savvy managers understand that a comprehensive water data management solution can streamline operations, promote data-driven decision making, and boost long-term depreciable asset performance.

It's now possible to easily create, automate and integrate customized water utility management applications that streamline processes and boost productivity without any complex programming or compromising on functionality.

Here are some key considerations every utility manager should make when evaluating custom workflow and data management systems.

Digitize Data Collection

Digitizing data collection is the first step in transforming your field, facility, or lab operations and offers immediate efficiency gains. Moving from paper forms or spreadsheets to digital data collection applications reduces errors and omissions while removing information bottlenecks.

Off-the-shelf solutions exist. However, these often lack the flexibility and functionality needed to meet unique operational and reporting needs.

As a result, forward-thinking utility professionals are now creating their own custom data collection apps using no-code tools.

Data capture and dashboard reporting apps can now be quickly created with fully custom form fields and once deployed, can be amended instantly when operational or regulatory requirements change.

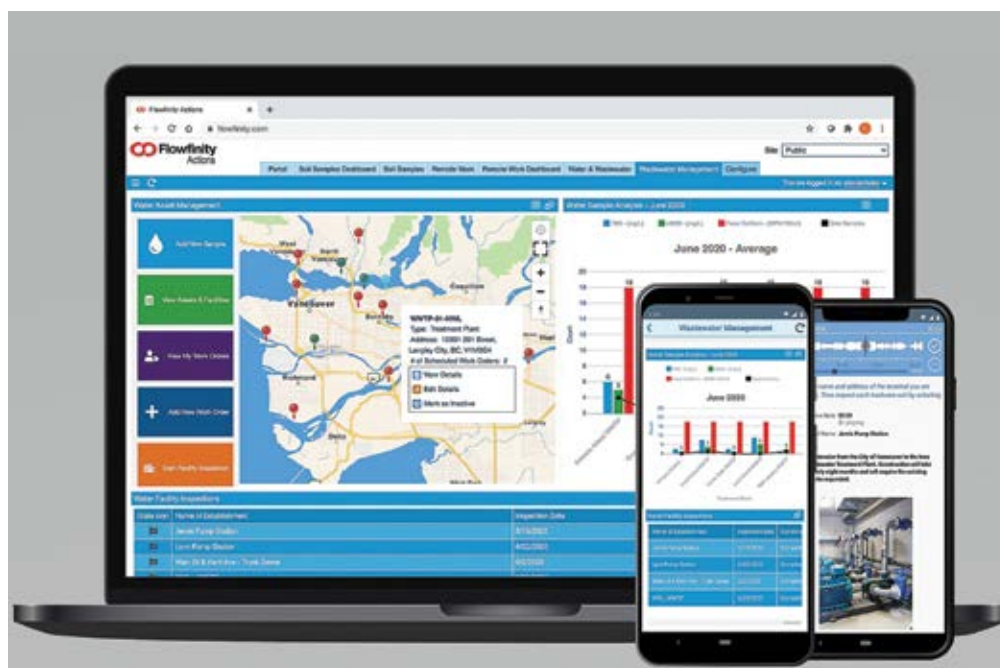
Essential functionality to look for includes:

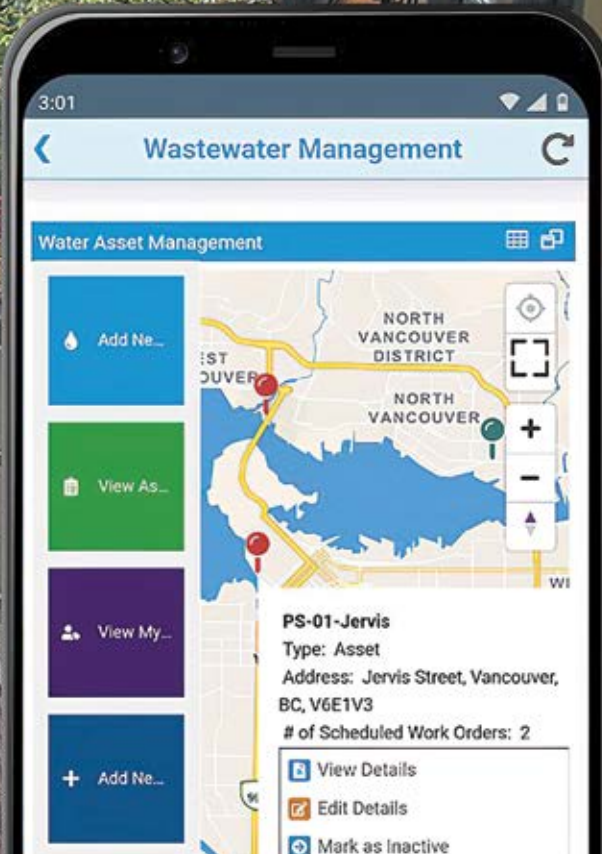
- High-precision GPS;
- Photo and document upload;
- Offline capabilities;
- On-device calculations; and
- IoT and SCADA compatibility

Configure data validation rules and workflow logic to guide technicians through the data collection process, providing an intuitive user experience while ensuring records are accurate and error-free.

Leverage a Centralized SQL Database

The next step in digitization is to invest in effective data management. A centralized relational database is a significant improvement over paper inspection forms or spreadsheet-based data management. Data is available in real-time to anyone who needs it, from any connected device.





This allows field or facility staff instant real-time access for better-informed decision making.

Using a database means the ability to view or enter data is two-way, field users and managers can both update records from anywhere. No waiting on paper forms to be physically delivered or transcribed, delaying operations.

Finally, database-driven applications ensure data integrity by reducing the opportunity for data to become lost or duplicated, which can occur when information is siloed in disparate systems or spreadsheets.

Innovate with Integrations

Integrating data collection and management applications with SCADA, CRM, and ERP software can provide significant productivity gains. This gives utilities unprecedented insight into operations by bringing asset management and customer data together into one unified system.

Without reliable integrations, data must be manually transferred between systems, risking valuable data becoming duplicated, omitted, or corrupted, not to mention the cost in time and effort.

By using no-code tools to integrate applications into one unified system, delays and errors associated with manual data entry are reduced while opportunities are created for new data visualizations and process automations.

Improve Reporting with Dashboards

Once core software is integrated, dashboards can be configured to improve insight into operations and decision making. Interactive dashboards are fully customizable data visualizations that display key performance indicators intuitively in real-time, allowing users to act on operational data instantly.

Utility managers can use dashboards to oversee their operations and monitor SCADA systems. Dashboards also act as a central hub for assigning work orders and can host basemaps from popular GIS providers to improve operations by showing records in real-time maps.

Reimagine & Automate Workflows

Utilities sometimes suffer from inefficiencies because they are unable to re-engineer core operational processes due to the rigidity of legacy systems.

This can be solved by building a flexible core business system using no-code tools that allow you to update and reengineer and automate workflows at will without expensive programming.

In our customers' experience, common workflow automation use cases include:

- Field crew and facility management;
- Sampling management;
- Proactive and reactive maintenance;
- Compliance and safety management and reporting;
- SCADA management; and
- Industrial Internet of Things (IIoT) and OT convergence.

No-code application configuration toolsets also allow for increased automation via software robots that automate data management tasks or for IIoT deployments that augment existing OT systems.

Conclusion

The renewal of equipment and infrastructure represents a major challenge to utilities. It is essential to develop an effective asset management plan as spiraling maintenance costs can quickly consume available operating budgets.

A custom data management solution allows managers to connect operational data with maintenance and monitoring workflows to break down information silos. By combining digital data collection, process automations, centralized databases, and integrations with specialist software, it is possible to use no-code tools to configure a system that meets the needs of any utility and drives digital transformation.

Sean King is a Marketing Communications Specialist and app builder with Flowfinity.

ABOUT FLOWFINITY

Flowfinity has twenty years of experience helping utilities, municipalities, and environmental consultancies digitize data collection and transform their business processes.

For further information, please email: wastewater@flowfinity.com or visit: <https://www.flowfinity.com>

Schneider Electric delivers connected solution for Shoalhaven Water



Covering an area of approximately 5,000km², Shoalhaven Water is a large regional utility on the New South Wales South Coast. Tied to the Shoalhaven City Council, the utility is responsible for the delivery of potable water from two large water treatment plants in both the north and the south, as well as numerous water reservoirs, water pumping stations, valves and dosing systems. Overall, they treat and distribute approximately 45 million litres of potable water each day.

The Challenge

Looking to upgrade their existing SCADA system, Shoalhaven Water began a lengthy Expressions of Interest process, asking the industry for their best options for the upgrade. They were looking for a solution that would modernise their systems, as well as give them a more standardised and uniformed interface to enable operators to more easily carry out maintenance and troubleshoot problems across all assets.

Part of the EOI process included splitting the project into three areas: System Integration of hardware and SCADA upgrade; Supply of hardware; and Installation. SAFEGroup Automation, a Schneider Electric Master Integrator, was awarded the System Integration and Supply portions of the project, with Installation awarded to Downer EDI.

The Solution

Working closely with SAFEGroup Automation system integrators, Shoalhaven Water mapped out a clear plan to bring quick delivery of Schneider Electric telemetry hardware and SCADA software enhancements to remote sites. The plan involved the use of Schneider Electric's EcoStruxure architecture, bringing connected products into an overarching software umbrella to provide better efficiencies and an easier to use and understand interface.

SAFEGroup Automation recommended an upgrade of the SCADA system to Schneider Electric's Geo SCADA Expert software. Geo SCADA Expert (formerly known as Clear SCADA) is an open, flexible and scalable software for telemetry and remote SCADA solutions. It is optimised for managing remote assets spread across geographically dispersed infrastructure - perfect for Shoalhaven Water's needs.

The system allows users to build templates for devices, such as a Standard Pump Station template, and then create instances of these templates for deployment. This methodology reduces engineering time and effort and can reduce workloads by 90%, compared to a traditional HMI/SCADA system deployment.

As a result of using this methodology, the installation was able to move

quickly, with 2-3 sites being rolled out each day, and well over 60% of the telemetry installation completed in the first year of the three-year project. This standardisation also meant that configuring new telemetry hardware in preparation for installations was significantly streamlined.

An upgrade of the telemetry radio network saw the roll out of more than 350 Schneider Electric Trio QR Radios, which provide both Ethernet and serial communications for complex and demanding applications in point-to-point and point-to-multiple-point telemetry and remote SCADA systems. These work in conjunction with 15 Schneider Electric Trio QB radios which are ideal for deployment at base and repeater sites.

The connected radios alert Shoalhaven Water to problems in the system such as incorrect water pressure, water levels, flows, pump activity and more. This allows them to better manage their assets and offer better services for their customers.

Proactive maintenance

Previously, Shoalhaven Water had to rely on their customers to call them if they heard a fault alarm going off for their Low-Pressure Sewer Systems. With over 1,100 of these pumping systems located in the region, this notification often took place after business hours when residents returned home after work. In areas where

a large portion of the homes are holiday rentals, and therefore people aren't around as much, the delay could often be much longer.

The new remote access system means that Shoalhaven Water receive notifications immediately. As well as being able to offer a better service to their customers as a result (who sometimes may not even be aware of the fault), having access to these alerts means the work is able to be completed during normal office hours, which saves the company money.

For the team, being able to access the system remotely, including on their mobile devices, means they can respond more quickly to any fault events as they occur. This has been particularly helpful during the pandemic, with team members having the ability to work from home easily and productively, even during shutdowns and with social distancing requirements.

Emergency management and additional reporting

Geo SCADA Expert provides Shoalhaven Water with mapping functions and can overlay Geographic Information System (GIS) Mapping, as well as weather data from the Bureau of Meteorology (BoM).

This works particularly well for storm events where localised flooding may occur. This emergency management piece is also displayed at the Shoalhaven local Emergency Management Centre, so that people can see where potential problems may occur.

At the treatment plants, operators also have the option to input their own data, so a complete picture of the system is available in one interface. Having all this information in one place means that when Shoalhaven Water need to do their yearly reporting for the EPA, for example, they can now simply generate that report directly through Geo SCADA Expert. Previously this reporting would have been a manual process, requiring someone to collate details from several spreadsheets in a time-consuming process.

Outcome

The rollout of the Shoalhaven Water upgrade is progressing well, with Schneider Electric Geo SCADA Expert significantly improving day to day operations for field staff, emergency response, as well as management decision-making and forecasting.

Adam Drenoyanis from Shoalhaven Water says he can't fault the work of Master System Integrators SAFEgroup Automation.

"SAFEgroup Automation have consistently come in ahead of time, and we are around 20% under budget," Adam says. "This has meant we have also been able to implement many more innovations which were not in the original scope."

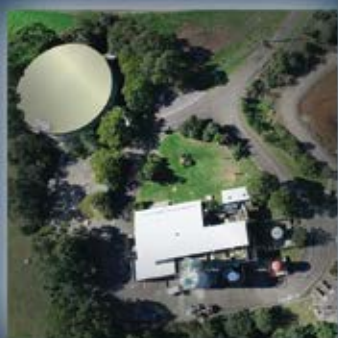
Adam says he is also very pleased with the Schneider Electric solution – particularly Geo SCADA Expert.

"It is efficient, reliable and its capabilities are outstanding," Adam says. "It has really increased our work flexibility, as well as opening the door for us to operate in more efficient and streamlined ways."

"Bringing everything into the one system is so helpful, and particularly for our emergency response. Being able to see everything on the one screen allows us to manage what is happening and where any potential problems may be," he added.

The success of the project has meant that Shoalhaven Water is investigating the other areas where upgrading to Schneider Electric hardware will let them seamlessly tap into the Geo SCADA Expert software.

For more information about Schneider Electric's EcoStruxure solution for Water, please visit: www.se.com/au



A pure polyurea coating was applied to the internal surfaces of a 4.55 megalitre drinking water reservoir in Far North Queensland, where active leaks had been detected.



Why paying attention to specialised resins and coatings is vital for protecting Australia's water infrastructure

by Matt McLean, Operations Manager, Specialised Resins & Coatings, Mainmark

Water supply systems such as dams, tanks and sewage treatment plants provide essential services for Australian communities. And while these marvels of engineering undertake important functions, we must also acknowledge that their quality and longevity play a vital role in maintaining the comforts of modern society. It is why specialised resins, gels and coatings for asset preservation can be just as important – if not more – as the water infrastructure they serve.

Waterproofing products come in many forms including acrylic based hydro-structural resin, chemical injections and cementitious grouting options. These products are designed to bear high pressure levels and prevent water from causing infrastructure damage that is

often too slow and gradual to notice until costly repairs are needed.

Resins, gels and coatings designed to keep water at bay must also be versatile and resistant to properties other than H₂O. For example, water stopping measures utilised for sewage treatment plants and water recycling tanks must contain anti-corrosive properties to withstand the various chemicals associated with these types of infrastructure.

What can go wrong? The ramifications of taking infrastructure protection for granted

No matter how big or structurally solid an infrastructure asset may seem at first, water, chemicals and geological profiles are capable of causing serious structural issues or degradation over time. The

effects are costly and often require repairs that affect an untold number of assets.

Large pipes and underground tanks, for example, can be subject to water ingress which can cause ground movement and cracking. The resulting effects can create water permeation that weakens the ground around the structure, accelerating structural degradation.

Chemicals commonly used in water treatment and sewerage plants can quickly degrade concrete linings. Chemicals start eating away at the concrete fines which in turn speeds up the ageing process. Even infrastructure with reinforced steel is not immune. Without proper protection, the presence of water allows carbon dioxide to enter the concrete and cause a chemical reaction that affects water quality and infrastructure integrity. This is known as 'concrete cancer'.

“Without proper protection, the presence of water allows carbon dioxide to enter the concrete and cause a chemical reaction that affects water quality and infrastructure integrity. This is known as ‘concrete cancer’.”

Large-scale infrastructure projects that involve tunnelling and drilling are also at risk without proper protection solutions. The geological landscape of a tunnelling project, for example, may feature soil structures including large fissures, clay seams, soft shale and wet sandstone.

Issues that impact the soil substrate, such as water seepage, can lead to ground instability that in turn can affect the long-term structural integrity of the

asset. Some areas of inner Sydney contain soft sediment deep in the ground where water easily passes through, becoming the catalyst for water ingress into a tunnel cavity or ventilation shaft.

These ever-present risks must all be considered especially after the recent announcement by Deputy Prime Minister and Minister for Infrastructure, Transport and Regional Development Michael McCormack, who committed an additional \$2 billion investment into the *National Water Infrastructure Development Fund*.

Reportedly spurred by ongoing drought, floods, bushfires and COVID-19, McCormack is determined to make it a \$100 billion industry by 2030.

For the longevity of Australian infrastructure, it means that it is more important than ever to consider asset longevity using new types of resins, gels and coatings a priority.

Keeping Australia running with the right approach to water protection

A crucial and often overlooked step to infrastructure protection is surface preparation, where it is important to analyse the bond between the original substrate and coating. This can be the difference between quality protection and issues like water leaks or delamination.

Mainmark worked closely with Glen Innes Severn Council to re-line the filter ponds and clarifier tank at the Glen Innes Water Treatment Plant in Northern NSW. A pure polyurea coating was applied to the three filter ponds and clarifier tank which were first primed with a two-part epoxy solution that is specifically designed to improve the adhesion of the polyurea. The new linings are expected to extend the life of the asset for at least another 20 years.



Mainmark worked closely with Glen Innes Severn Council to re-line the filter ponds and clarifier tank at the Glen Innes Water Treatment Plant in Northern NSW. The new linings are expected to extend the life of the asset for at least another 20 years.



After priming with special a two-part epoxy solution, a pure polyurea coating was applied to three filter ponds and a clarifier tank at Glen Innes WTP.

ABOUT MAINMARK

Mainmark provides a range of specialist ground engineering and asset preservation solutions for residential, commercial, industrial, civil infrastructure and mining sectors.

Committed to excellence, Mainmark's state-of-the-art solutions are backed by more than 25 years of engineering expertise.

Mainmark has 15 sites across Australia, New Zealand, Japan and the UK. Mainmark products and services include solutions for ground stabilisation, void filling, stopping water ingress, raising and levelling on-ground and in-ground structures, fixing anchors into rock faces and embankments, and other related ground engineering processes.

For more information visit: www.mainmark.com

Mainmark also assisted in rejuvenating the external and internal surfaces of a 4.55 megalitre drinking water reservoir in Far North Queensland, where active leaks had been detected. A pure polyurea coating was applied to the internal space and then the external surface was coated with a high grade, graffiti proof, epoxy coating that was selected for its ability to withstand very harsh environments.

The critical factor in protecting infrastructure is selecting the right water stop material that is fit for purpose. The most effective solutions – ones that maximise longevity and performance quality – respond to what the structure is made of and the chemicals that it is exposed to. Selecting the wrong product is likely to result in failure.

About the Author

Matt McLean is the operations manager for specialised resins and coatings at Mainmark. He is a concrete remediation, coatings, resins and waterstop injection specialist with a long history of working with ground stabilisation and grouting technologies.

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