CONFERENCE EDITION

Smart Energy

AN OFFICIAL **SMART ENERGY COUNCIL** PUBLICATION

100 PER CENT BY 2035: ACCELERATING AMBITIONS FOR RENEWABLE ENERGY

The impact of carbon border levies
Decarbonising heavy industry
Hydrogen Australia's Zero Carbon Certification
Developing a voice: Women in solar energy
Energy from waste abating carbon emissions
Commercial energy storage and battery innovation

VOLUME 41. ISSUE 161. AUTUMN 2021

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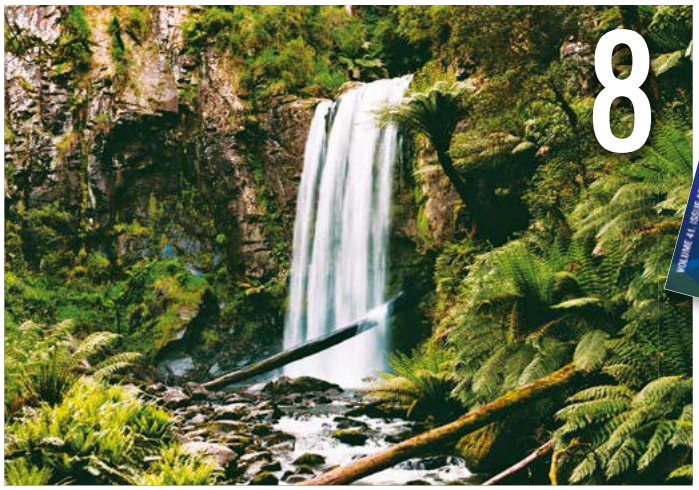

PHOTO: SOPHIE LOWDEN

Front cover:
100 per cent by 2035: accelerating ambitions for renewable energy

Welcome

John Grimes, Chief Executive Smart Energy Council

Renewables will slash economy wide emissions

UNTIL NOW, the question has been "how quickly and to what extent will renewables replace fossil fuels in the electricity sector?"

Cost has been the key driver, and will be in the future. But it turns out that was just the start. Today we see a virtuous spiral emerging, where zero carbon energy is being pushed to such low costs that the whole economy is about to be reshaped.

Project developers are finding that renewables aren't just cheaper than fossil fuels, but also that investing 20 per cent more in a project build delivers dividends, yielding 50 per cent more energy.

Building renewables at scale just gets cheaper and cheaper. And the marginal cost of building more renewables is falling quickly. Therefore the extra energy is free or almost free on a marginal basis.

From here on in we have an increasingly delicious problem to solve. What to do with all the extra low-cost carbon free energy? And it turns out the answer to that question will seriously change the world.

At our recent COP26 webinar, Vincent Dwyer from Energy Estate showed how zero carbon hydrogen will become the feedstock decarbonising the explosives, fertiliser, plastics and other industries. Indeed, the waste products in these processes are massively valuable in their own right.

Many industries are going to have emissions pulled out of them, all linked back to the striking success of the renewables industry.

Cheap renewable energy, directly or indirectly, will also pull emissions from steel, aluminium and zinc production, and displace non energy methane gas and oil.

On stationary energy the low carbon future is now locked in. On the emissions from chemicals, plastics, food production, metal processing, cement, transport and much, much more – tick, job started.

In my view

AS WE TACKLE THE ONGOING PANDEMIC, we must not neglect our most severe intergenerational challenge: climate change. As President of the UN's next global climate conference COP26, the UK is committed to urgently scaling up action to respond to the threat climate change poses on so many fronts – the impact on our biodiversity, on people and livelihoods, on health and our economies, the risk it engenders to peace and stability. We have no choice but to deliver on the goals of the Paris Agreement.

Vicki Treadell is High Commissioner of the UK to Australia

To meet these goals, we need to dramatically increase the speed – by four to six times – of our global transition to clean power. Clean, resilient and smart energy underpins our decarbonisation journey so we need to seize the opportunity offered by the rapidly falling cost of renewables and energy storage.

This will unlock decarbonisation of transport systems and industrial processes, while boosting energy affordability, job creation and growth. The economic prize is clear. Over US$11 trillion is expected to flow into zero-emissions power generation by 2050. This is why clean energy is at the heart of the UK's pandemic recovery plan as we seek to build back better and stronger.

UK Prime Minister Johnson's Ten Point Plan for a green industrial revolution has ambitious clean energy objectives, including installing 40GW of offshore wind and developing 5GW capacity for low carbon hydrogen production by 2030.

The Ten Point Plan will leverage £12 billion ($22 billion) in government investment to create up to 250,000 green collar jobs and mobilise £36 billion ($65 billion) in private investment by 2030.

Australia has a unique opportunity to be a renewable energy superpower. It has world leading renewable resources, deep technical expertise, strong trade ties, and a zest for technological innovation.

Australia is fertile ground for the development, production and trade of the clean energy resources needed to tackle climate change and grow our global economy.

As the UK continues its global climate leadership in the run up to COP26 we look forward to continuing to work with Australia to drive forward these important changes including the delivery of Australia's Technology Roadmap.

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INDUSTRY DEVELOPMENTS

SMART ENERGY COUNCIL'S ZERO CARBON CERTIFICATION SCHEME

Through its division Hydrogen Australia, the Smart Energy Council is developing a national, industry-led certification scheme for renewable hydrogen, renewable ammonia, renewable metals and other derivatives. The industry-led Guarantee of Origin Zero Carbon Certification Scheme will help accelerate the development and deployment of renewables. *Read more on page 18.*

UNSW chemical engineers have demonstrated how to make **'GREEN' AMMONIA** from air, water and renewable electricity. The laboratory-based proof of concept does not require the high temperatures, high pressure and infrastructure generally needed which produces more carbon emissions than any other chemical-making reaction.

IMAGE COURTESY UNSW

ON THE MOVE The ACT Government has commenced its Zero-Emission Transition Plan for Transport Canberra involving 90 zero-emission battery electric buses and associated charging infrastructure, maintenance and energy supply. *www.tenders.act.gov.au*

The move follows the ACT government's 2019 pledge to transition its own vehicle fleet; by mid-year half its 600 passenger vehicles will be fully electric. Compared to the ACT (and Europe) the rest of Australia is lagging in EV uptake with a snail-paced increase in EV sales from 0.6 per cent to 0.75 per cent from 2019 to 2020.

IMAGE COURTESY ACT GOVERNMENT

MELBOURNE WATER'S EASTERN TREATMENT PLANT

is destined to become one of the largest behind-the-meter solar installations in the nation as its 19MW solar farm takes shape and on completion generates about 65 per cent of ETP's power needs from renewable energy. Melbourne-based Beon Energy Solutions has been contracted to build the solar farm that is due to be up and running by mid-2022.

IMAGE COURTESY MELBOURNE WATER

BATTLE (OF A GOOD KIND) OVER THE BIGGEST BATTERY

CEP.Energy is building what it claims is the world's biggest battery, the 1,200MW at Kurri Kurri in the Hunter Valley Economic Zone which is in proximity of the Liddell Power Station. The first stage will be delivered by 2023 but the supplier is yet to be nominated.

Meantime Hornsdale Power Reserve owner Neoen is building "the biggest lithium-ion battery in Australia": a 300MW/450MWh big battery near Geelong. That's treble the initial size of the Tesla big battery at Hornsdale. Neoen has secured $160 million in finance from the Clean Energy Finance Corporation for the Geelong project that is scheduled for delivery before summer.

This adds to the already strong pipeline of projects by French developer Neoen: the 900MW/1800MWh battery at Goyder South in South Australia and the 500MW/1,000MWh big battery west of Sydney.

Origin Energy is planning a 700MW battery at the Eraring coal-fired power plant in NSW, and AGL is rolling out 1000MW of batteries across several sites including the Loy Yang A coal plant in Victoria and the Torrens gas generator in South Australia.

A fundamental storage shift is underway.

IMAGE COURTESY NEOEN

MARKET EVOLUTION According to industry analysts Rystad Energy battery storage and hydrogen electrolyser projects in Australia spiralled to 19.2GW during 2020, matching that of the solar PV and wind energy capacity pipeline.

Utility scale solar added 17.5GW of new projects and wind energy 21GW.

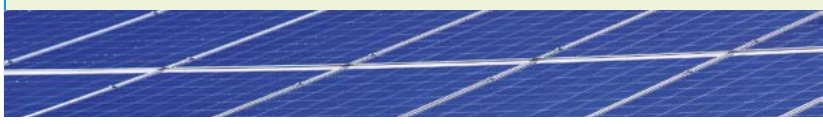
The Australian Energy Market Operator's recent *State of the Systems* report revealed 12 new wind and solar generators with a total capacity of 1,560MW came into commercial operation in 2020, and 32 more generators, 3,301MW all up, are ready to flick the switch. Fifteen more projects, capacity 3,004MW, are committed and 342 are proposed.

In total, there is a pipeline of **225GW of renewable and storage projects**, which pragmatists would state marks the end for coal-fired power generation.

Rooftop PV now comes in at 11GW and that will double to 22GW by 2025 according to Tristan Edis of Green Energy Markets; almost equalling the capacity of all of Australia's coal-fired power plants.

GEM and the Institute for Energy Economics and Financial Analysis (IEEFA) estimate renewable energy will comprise between 40 per cent and 50 per cent of electricity by 2025, forcing output from coal-fired power stations to fall by 28 per cent and gas-fired by 78 per cent over the seven years.

Further, they estimate falling revenues for individual coal plants on the wholesale spot market between 44 per cent and 67 per cent by 2025.



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CLEANER AIR Greenhouse gas emissions in Australia dropped 4.4 per cent in the 12 months to September 2020, the lowest levels in the country since 1995. Coronavirus restrictions that all but halted domestic flights and drastically cut road travel resulted in a 10.2 per cent decrease in emissions from Australia's transport sector in the year to September.

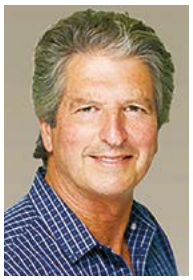
Global emissions plummeted 2.4 billion tonnes last year but, with restrictions easing are now on the rise.

The uptick in rooftop PV and wind generation also helped the decline in emissions in the year to September.

The federal government is yet to formalise a commitment to net zero emissions by 2050 and will be under pressure to do so at the G7 meeting in England in June where Australia has been granted observer status and will be hearing more about moves by the UK and EU to impose carbon import tariffs.

PHOTO: SOPHIE LOWDEN

PROF MARTIN GREEN has been announced as the 2021 Japan Prize Laureate in the field of Resources, Energy, the Environment and Social Infrastructure. Outpacing 142 contenders, Prof Green was honoured for his work in developing high-efficiency silicon photovoltaic devices.



Join with the Smart Energy Council at the May Conference as we hear from Martin Green and help celebrate his achievements. *(More on page16)*

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RECYCLED CONTENT RENEWABLE ENERGY FOREST MANAGEMENT CHLORINE FREE MANAGEMENT SYSTEMS CARBON NEUTRAL CERTIFICATION AUSTRALIAN MADE

Opposition climate spokesman **MARK BUTLER**, a long-term and staunch supporter of the growth of renewables and reduction of carbon emissions, has been replaced by Chris Bowen.

Mark Butler

John Grimes paid homage to Mark Butler for his unerring support, passion and commitment to the renewables industry and steadfast efforts to tackle climate change over the past eight years. In that time Mark Butler has shared his aspirations for the greening of the complex energy industry at numerous Smart Energy Council events.

The Council now welcomes **CHRIS BOWEN** to the energy portfolio, pictured here getting to grips with innovative renewables technologies on offer at One Stop Warehouse in Sydney.

Newly appointed Shadow Minister for Climate Change and Energy Chris Bowen visits One Stop Warehouse (Photo Wayne Smith)

UK-based Australian expat **DANIEL WESTERMAN** takes over the reins of **AEMO** in mid May, replacing the void left by Audrey Zibelman. Westerman who rose from the ranks of senior engineer with Ford in Melbourne to take on the US National Grid's unregulated renewable energy business is presently UK National Grid's chief transformation officer and president of renewable energy. Over the years he has led development of utility-scale renewables, distributed energy, storage and electric vehicle charging solutions.

Daniel Westerman

MOVING PICTURES George Clooney's shooting of apocalyptic movie *The Midnight Sky* in which earth is no longer habitable took an unexpected turn when the original set location on a glacier in Iceland had to shift to firmer footing as said glacier had fallen victim to warmer air caused by rising temperatures. Melted. As Clooney said, "There is no argument about the science in a place like that because they're living it. [They all] know exactly what global warming means to them. It would be a good lesson to all of us in terms of taking this seriously."

That theme is echoed throughout the David Attenborough Netflix hit *A life on our Planet* in which the key takeaway message is the urgent need to phase out fossil fuels quickly and ratchet up renewable energy – solar and wind power – to cleanse the earth's atmosphere.

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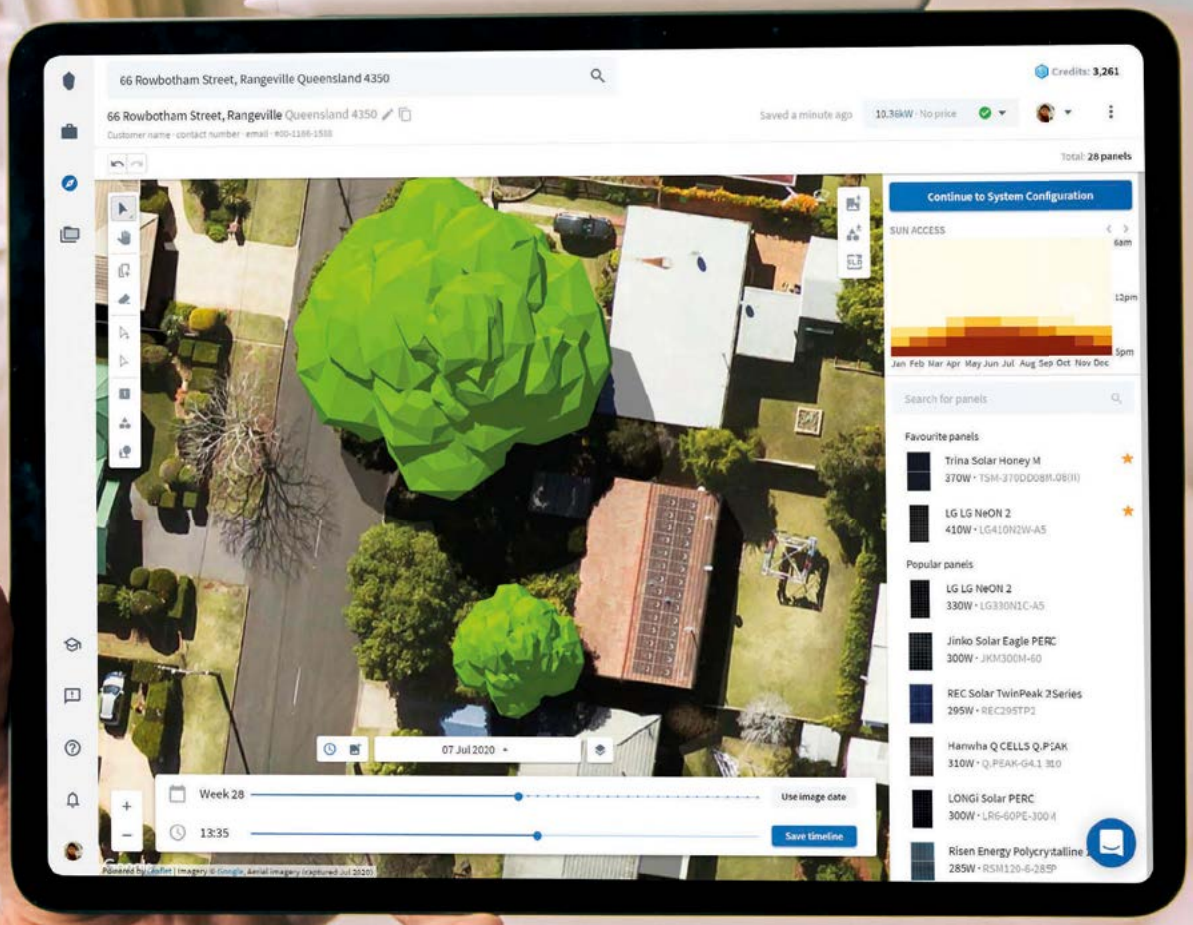

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Lifting emissions targets and ambitions for renewables

The year 2021 promises to be a watershed, delivering genuine and concerted action to curb greenhouse gas emissions. Overseas, verbal commitments on emissions reductions are now turning into actions driven by policies. At the same time the world is closing in on Australia with its lack lustre emissions controls and climate action.

IMAGINE BEING AN INVITED OBSERVER at an international gathering where leading nations the UK, Canada, France, Germany, Italy, Japan and the US are detailing their commitments to net zero carbon emissions set amid tight timeframes.

This June Australia, which is condemned for its lack of formal commitment to net zero emissions and absence of renewable energy targets while nurturing coal and gas through billion dollar subsidies, will be very much on the sidelines nibbling cucumber sandwiches and eating humble pie at the Group of Seven (G7) meeting.

Rubbery numbers and spurious claims are not cutting the mustard. Australia, which now sits in a cabal alongside Brazil, Russia and Saudi Arabia, yet to set or commit to net-zero carbon targets, is being called out for its disingenuous approach to climate action. And the heat is being turned up.

Moves are afoot with the US, UK and EU, followed by Canada and possibly China on top of their pathways to zero carbon emissions introducing border carbon taxes on imports from countries lacking climate targets.

Carbon taxes

The EU's Carbon Border Adjustment Mechanism (CBAM) which recently took a step forward obliges exporters to pay levies on carbon used in making as well as transporting products, and Australian companies will have to develop systems to measure carbon-intensity of operations.

The move has been pre-empted by the Smart Energy Council which has established the Zero Carbon Certification scheme for heavy industrial processes including hydrogen, ammonia and steel *(as detailed on page 18)* aimed at helping Australia to secure its position in the nascent highly lucrative green hydrogen market.

SEC's John Grimes says until such a time as we adopt greener manufacturing processes we will be penalised for our carbon emissions intensive exports of steel and aluminium. "Before long our major exports will be destined for nations with carbon import taxes and net-zero policies and it does not take much to realise we will suffer economic fallout if we don't get up to speed with emissions abatement and controls," he warned.

The green hydrogen industry alone is slated to add $11 billion each year to Australian GDP to 2050.

It's time we capitalised on our rich green resources and reaped greater economic benefits by electrifying heavy industry and agriculture by progressing innovative projects and products, he says.

"And our emissions-heavy transport sector needs a complete overhaul, we need strong policies to support the uptake of electric vehicles in the passenger and heavy goods vehicle markets."

A green industrial revolution

SEC recently hosted *The UK-Australia Journey to Net Zero Emissions* webinar in collaboration with the British High Commission in Canberra to highlight technologies and reforms that will be central to building strong, zero emissions economies.

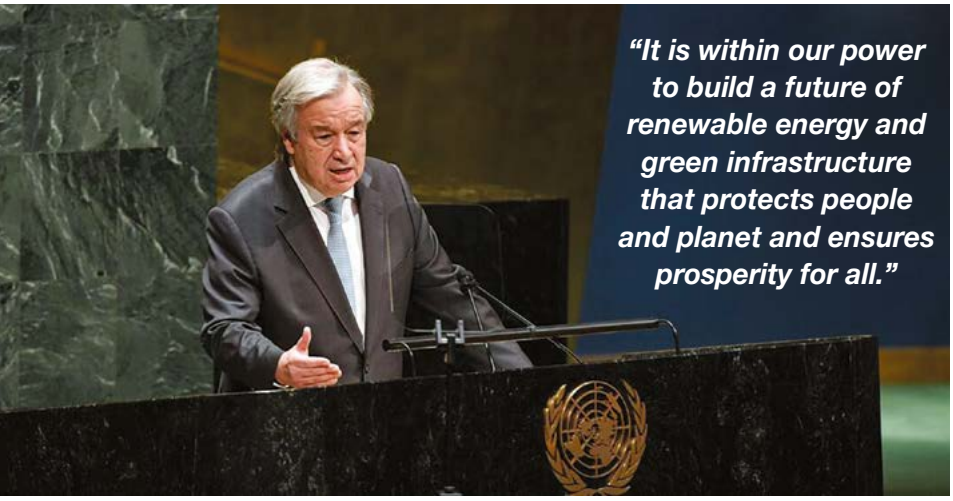
During the webinar large scale developer Energy Estate demonstrated how zero carbon hydrogen will become the feedstock that decarbonises the explosives, fertiliser, plastics and other industries. Low-cost renewable energy will also reduce emissions from the aforementioned steel, aluminium and zinc production, placing Australia on a firmer footing with trading partners clamping down on carbon-laden product exports/imports.

Opportunities abound in other industrial processes, including the untapped potential in waste materials.

John Falzon of Adelaide landfill management company LMS has taken the lead in curbing carbon emission at landfill through biogas capture that he says offers a proven and cost-effective means to generate renewable energy.

"Significant opportunities exist too for biomethane, other renewable gases (including green hydrogen) and renewable fuels that can be derived from landfill biogas to help achieve decarbonisation of the gas network and transport sector.

"Well managed landfills are key to further reducing carbon emissions from residual wastes, but we need our regulators to pursue energy and waste policies that will maximise gas capture. The key challenge for a bright future lies in having the right policy settings," he says.



UN's António Guterres has issued a stern warning for nations dragging the chain on emissions reductions

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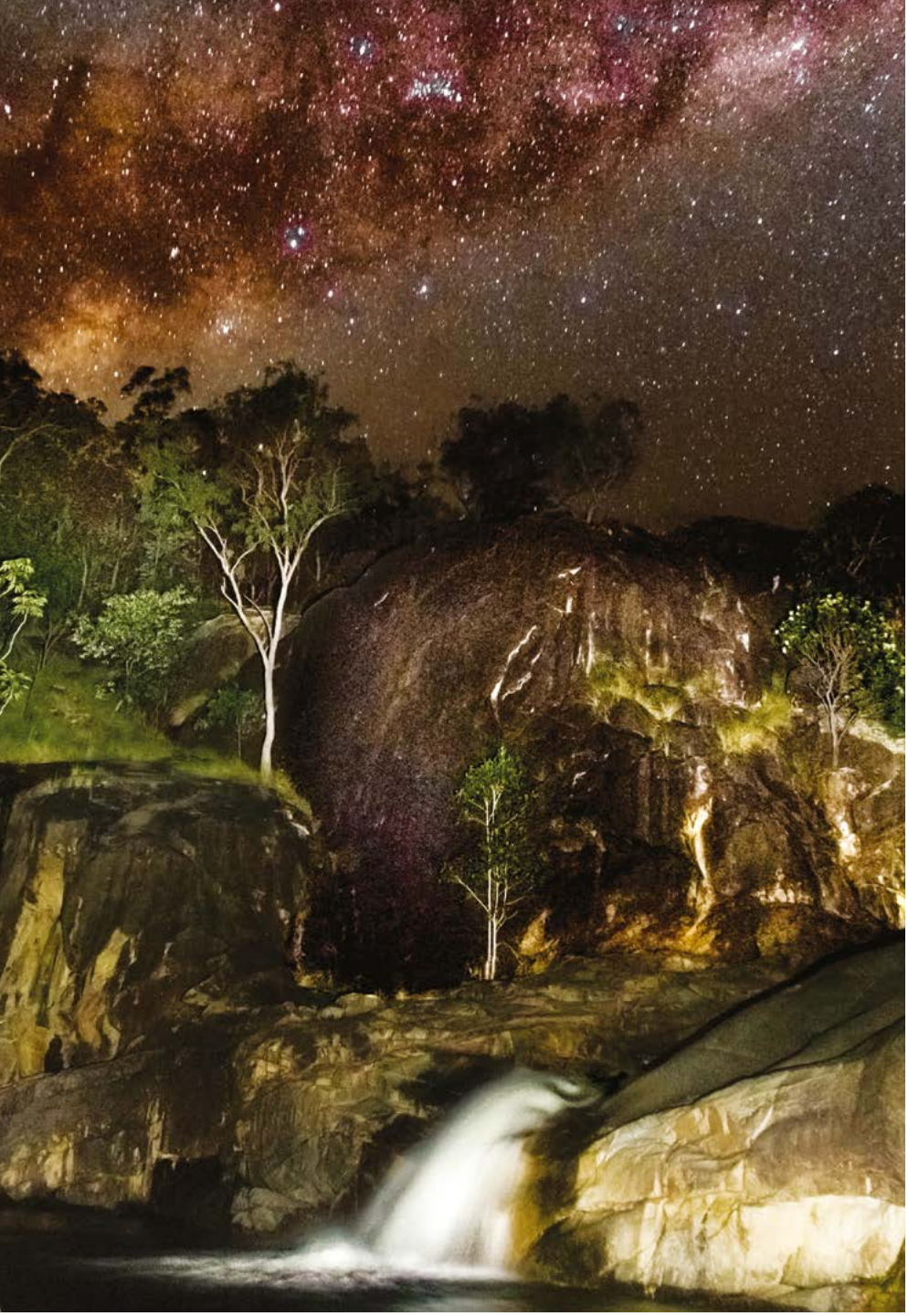


More than star gazing: preserving the beauty of life on earth.
Photo: Sophie Lowden

The consensus is that while many unique Australian innovators are forging ahead we could generate thousands more jobs if we had strong climate action and renewable energy policies.

John Grimes is calling for Australia to step up its ambitions for 100 per cent renewable energy by 2035 and a tighter timeframe for net zero reductions target by 2040 to shore up the climate and economy. "We can generate export revenue greater than fossil fuel by 2035, that is replace that gas and coal with products and value-added energy exported by 2035," he said.

Greater opportunities lie immediately in front of us and we can build great new industries and be more prosperous at the same time, it's a case of transitioning the economy and sharing clear messages around this.

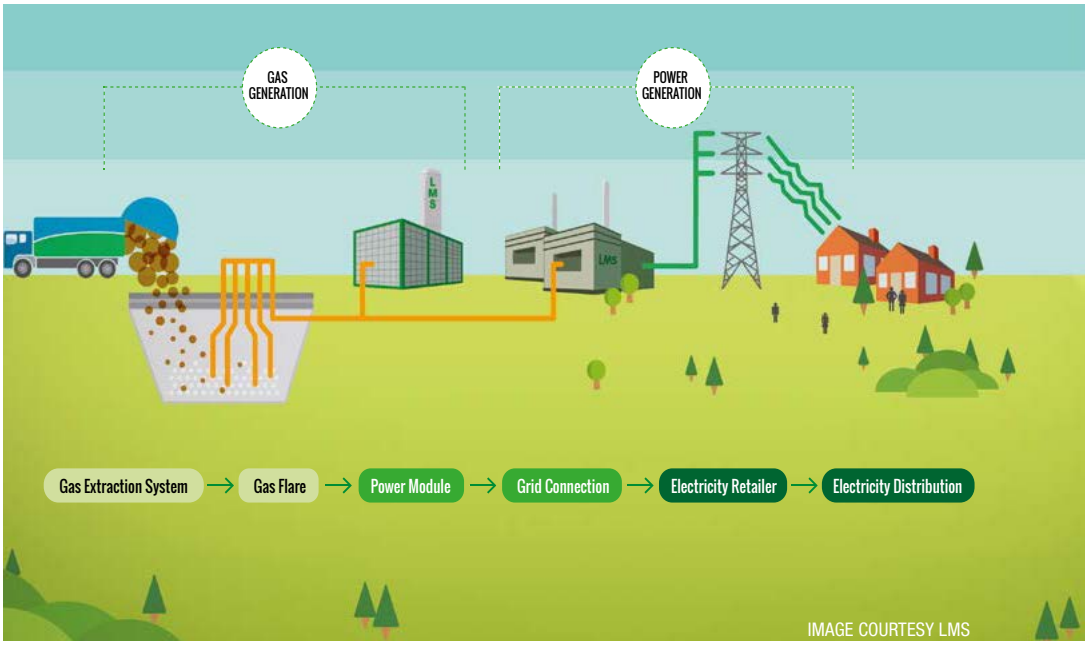
Communicating the right messages

The transition from fossil fuels needs to be better communicated with the key message that smart twenty first century technologies that are planet friendly will deliver prosperity and longevity.

"It's a case of changing energy as well as perceptions but there are some hurdles, for example narratives about green steel production, 'green' cement and glass can be mind-bogglingly boring, but the main thing to comprehend is that some of these emission-intensive production processes can be swapped out to contain emissions."

In a similar vein Electrical Trades Union national secretary Allen Hicks says Australian workers should be manufacturing wind turbines out of Australian steel, but "local factories are getting squeezed out of contracts because the government doesn't have any policies that encourage investment in local manufacturing.

"With the right policy settings, the shift to renewable energy will create a jobs bonanza for Australian energy, electrical, manufacturing and research workers."



LMS has taken the lead in curbing carbon emission at landfills through biogas capture that offers a cost-effective means to generate renewable energy and stop the greenhouse gas methane leaching into the atmosphere

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"Reduce our emissions, boost private sector investment and watch GDP rise. Australia an energy powerhouse. Job done. But our potential as an energy powerhouse of the twenty first century can only take shape if we have the formal frameworks." JOHN GRIMES

Thanks in part to mining magnate Andrew 'Twiggy' Forrest, word is spreading on how to fix the climate *and* the economy.

He's publicly hammering home the message that the ubiquitous nature of steel which is "fundamental to everything you see around you, from your home, to your car, the roads you drive on" actually generates about 9 per cent of global emissions in the carbon emissions heavy iron ore smelting process.

The answer lies in green iron ore and steel produced using zero-emissions energy.

"The solution is green hydrogen which gives Australia an opportunity to slash our emissions. If we get this right, the impact could be nothing short of nation-building" he says, mindful of the projected annual rise of 1.4 per cent and 3.3 per cent in demand for steel.

Reality checks and balances

Actions over the next decade are now recognised as more critical than ever to avoid the 'tipping point' beyond which there is runaway change in global temperatures and the trend becomes irreversible.

November's COP26 meeting promises the emergence of a global reset with 2021 going down as a breakthrough year, a turning point delivering more concrete actions, mostly elsewhere.

The United Nations has again implored recalcitrant wealthy countries, including Australia, to ratchet up actions to curb greenhouse gas emissions. Secretary-General António Guterres delivered the stern warning "Stop investing in fossil fuel projects that ruin people's health, destroy biodiversity and contribute to the climate catastrophe. Shift the tax burden from income to carbon; from consumers to polluters."

Leading nations have listened and are leaving Australia in the slipstream.

It's time the Australian government got up to speed. For now, COP26 will expose the schism in Australia's path as world leading nations transition to a low carbon economy. These days vague references to ambitions unsubstantiated by policies and active targets just don't pass muster.

One thing is for sure: 2021 promises to be a year of reckoning for Australia.

OVERSEAS CLIMATE ACTIONS

- **China** aspires to net zero carbon emissions by 2060.
- **The EU** has pledged one trillion Euros ($1.55 trillion) to reach zero emissions by 2050; the US is committing $US2 trillion ($2.57 trillion) to its green recovery.
- **The UK and EU** have lifted 2030 emissions reduction targets to 68 per cent and 55 per cent respectively (on 1990 levels). The EU's CBAM penalises carbon laden goods.
- **The US** plans to replace the entire US federal fleet of around 650,000 with US made electric vehicles and in the process add one million new jobs.
- **The UK's Ten Point Plan** for a green industrial revolution will see 40GW of offshore wind and 5GW capacity for low carbon hydrogen production by 2030, leverage $22 billion in government investment and create a quarter of a million 'green collar' jobs and $65 billion in private investment.
- **Major businesses, banks and investors** around the world have committed to net zero emissions by 2050.

VS. THE LAND OF PLENTY (of inaction and emissions)

- By **2030** Australia's thermal coal exports are expected to be responsible for up to **17.4 per cent** of global carbon emissions.
- Australia needs to cut emissions by at least 50 per cent and as much as **74 per cent by 2030** to meet Paris goals to contain global heating to 2°C and 1.5°C respectively, according to the Climate Targets Panel's **John Hewson** who is also SEC Patron. It's a far cry from Australia's current target of a 26-28 per cent cut (on 2005 levels).
- Australia's transport sector generates around 18 per cent of the nation's emissions, by 2030 that accelerates to **21 per cent**. Australia's electric vehicle strategy is notable for its lack of targets for market share or incentives for uptake.

AUSTRALIAN COMPANIES MARCHING AHEAD OF GOVERNMENT

The big end of town is marching forward, **Rio Tinto** and **BHP** are setting carbon neutrality deadlines, **RE100** continues to gather strength with more local and global corporations setting renewables targets.

Prominent RE100 member the **Commonwealth Bank** is launching a new low-interest 'CommBank Green Loan' for CommBank customers who can borrow up to $20,000 against their home loan over a 10-year period at a fixed interest rate of 0.99 per cent for investment in renewable technologies. Annual interest repayments on a loan of $20,000 for items such as solar panels and electric vehicle charging stations would be $198.

And finally, but not before time, Twiggy's green epiphany: "If the world's renewable energy resources were a power station, the plant would be millions of gigawatts in size… [currently] Australia produces all of its electricity from just 70 gigawatts.

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SHAPING A RATIONAL, LOW CARBON FUTURE

"I believe that the pandemic has presented such an existential crisis – such a stark reminder of our fragility – that it has driven us to confront the global threat of climate change more forcefully and to consider how, like the pandemic, it will alter our lives."

BlackRock chief executive LARRY FINK

"When I think of climate change, I think of jobs… millions of Americans will be able to get jobs modernising our water systems, transportation, our energy infrastructure - to withstand the impacts of extreme climate".

Democrat US President JOE BIDEN whose administration is identifying new opportunities to spur innovation, commercialisation, and deployment of clean energy technologies and infrastructure

"There needs to be a wholesale transformation of the global economy if the world is to reach net zero carbon dioxide emissions by 2050, it is necessary for coal to be phased out five times faster than recent trends… renewable energy to be ramped up six times faster and a transition to electric vehicles to be 22 times faster than present. A zero-emissions future offers huge opportunity for business, for clean, green jobs and economic growth and to 'build back better' from the global economic crisis."

US Climate Envoy JOHN KERRY who underscores the falling cost of solar energy and record investments in clean energy technology and associated jobs

"We can create thousands of jobs [in renewable energy] right across the country by getting emissions down, having a pro-investment, pro-jobs climate change policy… When you get the policy settings right then the private sector can invest in all sorts of opportunities right across the country. We [Labor] have a very clear commitment to net zero by 2050 and we will have a very clear, scientific and evidence-based climate change policy [that] is also focused on economic security and investment, and a pro-jobs policy… everybody in the Labor Party accepts that climate change is real and we need a policy to deal with that."

Shadow Climate Change and Energy Minister CHRIS BOWEN, who says policy certainty is necessary for investment in renewables

"The art of the possible… in the post-pandemic economy, stimulus measures for zero-emissions technologies could provide a 'triple dividend' – address climate change, strengthen the economy and create jobs"

ANNA SKARBEK and ANNA MALOS writing in *The Conversation*

"With the right policy settings, the shift to renewable energy will create a jobs bonanza for Australian energy, electrical, manufacturing, and research workers."

Electrical Trades Union national secretary ALLEN HICKS

"Green hydrogen gives Australia an opportunity to slash our emissions — and if we get this right, the impact could be nothing short of nation-building… There's enough pollution-free, renewable energy out there to power humanity for the entire Anthropocene. That's the age of humans, just as the Mesozoic was the age of dinosaurs. We have no idea how long the Anthropocene will last. But if we don't stop warming our planet, it will be geological history's shortest era. Hydrogen offers us a colossal opportunity The solution is green hydrogen, the purest source of energy in the world — and one that could replace up to three quarters of our emissions, if we improve the technology and had the scale."

Extract from ANDREW 'TWIGGY' FORREST speaking at ABC Boyer Lecture 'Rebooting Australia'

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SMART ENERGY & HYDROGEN ON SHOW 2021

POSITIONING AUSTRALIA AS A RENEWABLE ENERGY POWERHOUSE AND EXPORTING SUPERPOWER

PLATINUM PERFORMANCE: Despite the disruptions of 2020, Australia recorded a phenomenal 7GW of new renewable capacity, hitting an unprecedented 37 per cent market share.

SMASHING RECORDS: Renewable energy projects generated 53TWh in 2020 with Australia investing $7.7 billion in renewable energy.

ON THE CREST OF A WAVE: The outlook for 2021 is stronger than ever in the build-up to 2030 when another **24GW of rooftop solar** will be added. And by 2040 renewable energy will supply **94 per cent** of the grid.

There is lots to celebrate!

The Smart Energy Council now invites everyone involved in the industry to reunite and celebrate the powerful performance of the industry and prepare for the decade ahead.

Hear from thought leaders and policy makers; view leading manufacturers' cutting edge designs and developments and hear about advances in innovative technologies in solar and storage, VPPs, green hydrogen, electric vehicles.

Gain resources and insights that help position you at the forefront of industry by unlocking opportunities that deliver ongoing value to you and your business.

WE'RE COVID SAFE

The Smart Energy Council has registered a COVID Safe Plan with the NSW Government. In line with our COVID-19 safe guidelines, all visitors at Smart Energy Conference & Exhibition 2021 must use the Service NSW app to scan the COVID Safe QR code when checking into the event.

AMONG THE 130 ESTEEMED PRESENTERS:

MATT KEAN
NSW Minister for Energy and Environment*

KERRY SCHOTT
Energy Security Board

TRISTAN EDIS
Green Energy Markets

VICKI TREADELL
British High Commissioner

KOBAD BHAVNAGRI
Bloomberg New Energy Finance

DR CATHY FOLEY
Chief Scientist*

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ZERO CARBON CERTIFICATION SCHEME FOR HEAVY INDUSTRY

Australia is one step closer to gaining a firm foothold in the lucrative green hydrogen market with a scheme that provides an authentic stamp of approval for zero carbon products.

Zero Carbon Certification: the five-step strategy

1. Specification of the all-renewable production of hydrogen (followed by metals, ammonia other derivatives)
2. Uniqueness of certificates to prevent double batching
3. Transparency to gauge production levels, backed by full documentation available to the developer, and the creation of a renewable hydrogen project registry
4. Exclusive certificates for account holder (eg project owner), and
5. Demonstrated proof of net-zero emissions production.

A Zero Carbon Certification scheme will help Australia realise its ambitions as a global industrial powerhouse

AUSTRALIA'S POTENTIAL as a leading producer and exporter of renewable hydrogen to burgeoning markets such as Germany, Japan and South Korea is indisputable. Australian industry would welcome protocols that help unlock renewable hydrogen supply chain investment opportunities and international trade.

To help set the train in motion, the Australian Smart Energy Council (SEC) has joined forces with the German Energy Agency (dena) to develop the Zero Carbon Certification Scheme with a Guarantee of Origin; a mechanism to assess embedded carbon ratings.

Max Hewitt of SEC Division, Hydrogen Australia, which is delivering the scheme, explained a tracking system will assess product quality and the greenhouse gas emissions, if any, associated with production in participating hydrogen, ammonia and metals projects.

"An auditor or technically proficient person will evaluate the participating site and assess it according to our particular criteria for what constitutes green hydrogen, that is hydrogen with no embedded carbon.

"This enables consumers to identify and purchase green hydrogen or ammonia, rather than fossil fuel generated commodities," he said.

Finer details such as scope three emissions generated via product transport are yet to be determined, he said of the Zero Carbon Certification initiative led and funded by industry and a philanthropic funding body committed to tackling climate change.

Responding to industry and climate

Max revealed that industry has been crying out for a zero-carbon certification scheme and that Hydrogen Australia has drawn up a list of key renewables projects, in particular export focused ones, eager to become certified and ready for international markets.

Among these are CWP which is developing the 26GW Asian Renewables Energy Hub in the Pilbara, and H2U, the Hydrogen Utility which acknowledges customers want to know how much carbon is embedded in the products they are buying, and how and where they are produced.

Global Alliance Powerfuels, the international partner network furthering the development of carbon neutral powerfuels is a key global collaborator in the Zero Carbon Scheme that also complements the work of SEC with partners ANU and Evoenergy on the ACT renewable hydrogen cluster. *(See following pages.)*

"Our aim is to be as consistent and collaborative as possible by developing more strong local and international ties, especially with those regions that will have a surge in demand for hydrogen," said Max.

"And we want to move quickly. The Zero Carbon Certification pilot scheme is scheduled for launch around Easter. Timing is important to industry; people are becoming frustrated by lack of any signs of substantial progress or developments on the government's hydrogen certification scheme which is supposed to be key to the national hydrogen strategy."

Other strong forces are at play.

External pressures

Overseas there is growing momentum for stringent carbon emission controls, notably the EU's introduction of carbon (tax) emissions border adjustments. Canada and the US are following suit and others will follow in the bid to ramp up decarbonisation of industrial manufacturing processes.

"If you are concerned about climate change you cannot be technology neutral," SEC Government Relations Manager Wayne Smith said. "Countries exporting products with embedded carbon will suffer economically.

"Australia cannot achieve net zero emissions without decarbonising heavy industry. More broadly the future of energy is 100 per cent renewables but increasingly people are looking to 500 per cent and that means building a really strong and with it prosperous export industry for aluminium, steel, ammonia and more, and again certification is fundamental to that.

"The Zero Carbon Certification scheme will make that happen. It will be critical in building a net zero carbon future."

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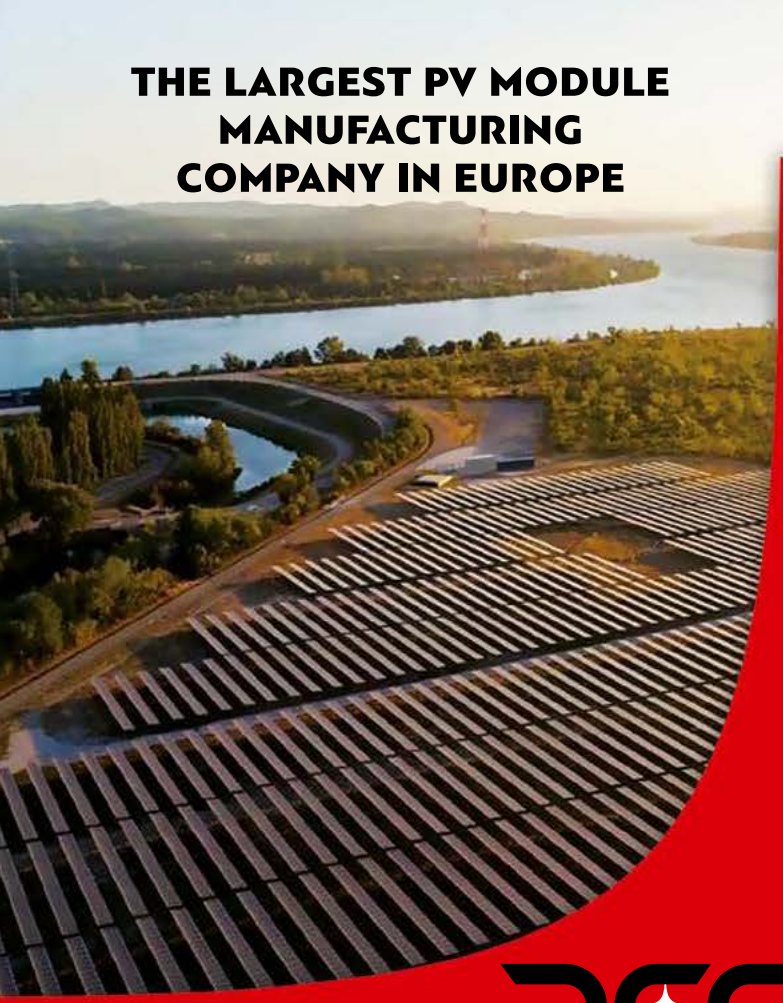

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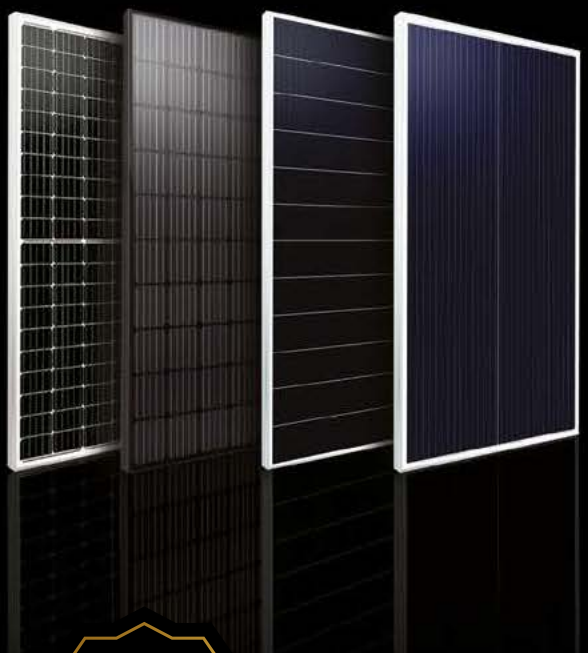

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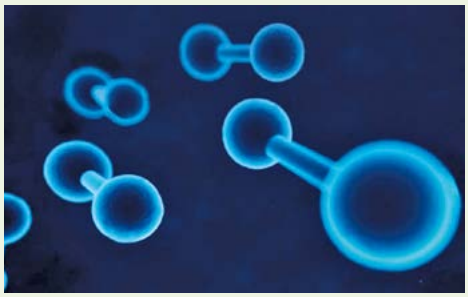
GREEN HYDROGEN



Up to $1.75m is being invested in **13 HYDROGEN TECHNOLOGY CLUSTERS** across all states and territories in a bid to accelerate a globally competitive hydrogen industry and unlock as much as $26 billion in exports.

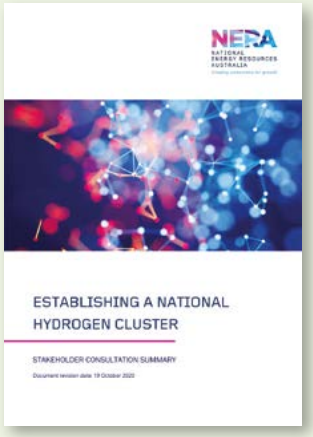
Operating as a virtual network the development spearheaded by National Energy Resources Australia will focus on the hydrogen supply chain, reduce overlaps and identify gaps in the development, deployment, and commercialisation of new hydrogen focused technologies.

The national cluster will effectively establish a global identity and a recognised brand for Australian hydrogen technology and expertise.

The Smart Energy Council is partnering with Evoenergy and the Australian National University on the establishment of the ACT Renewable Hydrogen Cluster.

The move complements the SEC's development of the Zero Carbon Certification Scheme in conjunction with the German Energy Agency, dena (see previous page) for renewable hydrogen, renewable ammonia and renewable metals.

John Grimes emphasised the importance of ramping up Australia's domestic industry to become a global hydrogen competitor and said the ACT which is powered 100 per cent renewable energy is firmly positioned to be a knowledge hub and international catalyst for the development and deployment of renewable hydrogen across Australia.



AUSTRALIAN HYDROGEN ENERGY STORAGE SOLUTIONS PROVIDER LAVO

in collaboration with UNSW has developed a world's first commercially available line of hydrogen-powered domestic products, including a barbecue, a bicycle and a unit that creates and stores hydrogen power.

The LAVO battery, which is about the size of a large fridge, can be hooked up to an existing array of solar panels. The internal electrolysers use the power to convert water into oxygen and hydrogen which is stored in a patented hydride in canisters inside the unit for use as needed.

LAVO chief executive Alan Yu says the unit can store three times as much power as the largest popular commercially available wall-mounted batteries, allowing it to power the average household for two to three days on a single charge.

Unlike lithium batteries, it can also constantly recharge itself rather than waiting until it has been fully discharged.

He said the system, which costs around $34,000, has a lifespan around three times longer than current lithium batteries and should last users around 30 years.

Energy storage and clean fuel company **ITM POWER** has received a purchase order from Optimal for the provision of its 0.7MW 'HGas' electrolyser system for use in a hydrogen microgrid project in Tasmania, supported by the federal government's Blue Economy CRC program.

PHOTO COURTESY BLUE ECONOMY CRC

The first deployment with Optimal would be a platform for training through ITM Power's 'Hydrogen Academy'.

ITM Power is the name behind the 220kW electrolyser producing up to 2400 kilograms of renewable hydrogen monthly from renewable energy at the BOC Bulwer Island gas facility in Brisbane that features a 100kW solar array.

A weather monitoring system has been installed at **INFINITE BLUE ENERGY'S (IBE) ARROWSMITH GREEN HYDROGEN PROJECT** near Perth planned for launch by late 2022.

IBE can now track live solar and wind data and finding will help determine final optimal design of wind turbines and solar panels for the anticipated 25 tonnes daily of zero carbon green hydrogen. The plant may be scaled up in future to fulfil the prospect of export of liquid hydrogen to Asia Pacific. Positive spin-offs include significant opportunities for jobs, energy security and a reduction in state carbon emissions.

HYZON MOTORS IS COLLABORATING WITH VIVA ENERGY

to provide zero-emission vehicles coupled with hydrogen refuelling solutions to customers, delivering a complete hydrogen transport solution.

Hyzon Motors chief executive Craig Knight (pictured) said: "As a pioneer of heavy vehicle fuel cell technology, Hyzon is delivering some of the world's most powerful yet cleanest heavy vehicles to serve the global appetite for zero-emission driving with Australia a priority market.

"Hydrogen mobility for the Australian commercial vehicle sector holds enormous potential as fleets look to smoothly transition from fossil fuels to clean energy solutions that decarbonise their operations. Developing a hydrogen supply chain with strategic partners will be central to this transition. The alliance helps Viva Energy accelerate its Geelong Energy Hub vision through the development of hydrogen for transport and the prospect of generating solar-powered green hydrogen.

In related news, Australia's Pure Hydrogen has partnered with US-based Hyzon Motors to develop a chain of hydrogen refuelling stations in Australia.

Hyzon's next-generation Gen-3 automotive fuel cell technology has been described the highest power density fuel cell stack in the world and "ideally suited to power trucks and buses over long distances on Australian roads".

Commenting on the development, Max Hewitt of Hydrogen Australia said "There is a real future for hydrogen buses and other larger vehicles powered by fuel cells, this is a significant step forward by Hyzon and its partners and many will be closely watching the sector."

In January China's HGV maker Foton Motors partnered with TrueGreen Mobility Group to deliver hydrogen buses in Australia. Foton Mobility will then be ready to deliver Australia's first high-quality hydrogen-powered buses.

A COLOSSAL OPPORTUNITY

Mining magnate Andrew Forrest is leading the call for an urgent move to green hydrogen "on a global scale" saying green hydrogen is the purest source of energy in the world and could replace up to three quarters of emissions, if we improve the technology and develop the scale.

He says if Australia were to capture just 10 per cent of the world's steel market, we could generate well over 40,000 jobs, more than what's required to replace every job in the coal industry.

He advocates the move to 'green' zero-carbon steel in Australia.

"Steel is fundamental — and it can be green. Blast furnaces, where most steel is made, generate 8 per cent of global emissions, because coal is used in the process. Instead, coal can be replaced in the furnace with green hydrogen.

"Instead of emitting vast clouds of CO_2, you produce nothing more than pure water vapour. [Alternately] the more radical approach is to scrap the blast furnace altogether and just zap the iron ore with renewable electricity."

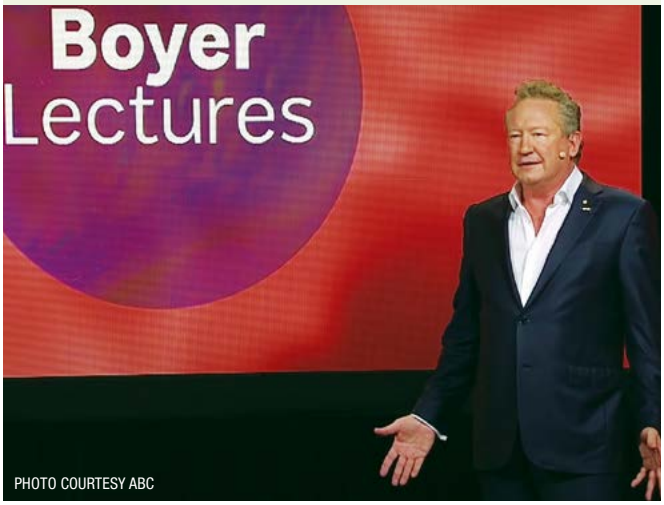


PHOTO COURTESY ABC

JIMBOOMBA RENEWABLE HYDROGEN PLANT

Energy Estate is developing a renewable hydrogen plant that includes a solar PV system and renewable hydrogen production and storage facility to power the Hills Education Foundation, Hills Golf Club and other businesses, enabling campus coaches to run on hydrogen fuel.

Energy Estate under its HydrogenGrowth platform focuses on developing a range of large and small scale "green hydrogen" opportunities throughout Australia and internationally, including a number of large-scale plants in Queensland.

International renewable energy developer Elecseed, together with leading Korean government-owned utility KOMIPO (Korea Midland Power Co), are supporting the project through their investment to expand the existing solar farm.

Elecseed and KOMIPO are also developing the Kumbarilla Renewable Energy Park (K-REP), a 200MW solar farm with green hydrogen facilities in the Western Downs region of Queensland.

Queensland utility **CS ENERGY AND JAPAN'S IHI CORPORATION** are assessing the feasibility of establishing a renewable hydrogen demonstration plant adjacent to the CS Energy Kogan Creek Power Station near Chinchilla, north west of Toowoomba. Plans for the Hydrogen Demonstration Plant include a solar farm, battery, hydrogen electrolyser and a hydrogen fuel cell at the power station. At a later date the plant may also provide Frequency Control Ancillary Services for grid stability.


PHOTO COURTESY CS ENERGY

GEV AND PACIFIC HYDRO have signed an MoU to explore opportunities for the production, storage, loading, ground and marine transportation of green hydrogen produced by Pacific Hydro's Ord Hydrogen Project at Lake Argyle. The Western Australia project has the capacity to supply 30MW of renewable power to the local market.

The parties will also progress development of an export market and associated marine transport solution for green hydrogen utilising GEV's proprietary C-H2 ship and supply chain.

Strong local and global interest is brewing in the prospect of renewable hydrogen production and export at the strategically positioned **1.5GW RENEWABLE HYDROGEN HUB** at the Oakajee Strategic Industrial area north of Geraldton in WA, with as many as 65 expressions of interest 10 of which are multi-billion dollar entities. The Oakajee SIA is estimated capable of hosting up to 1.25GW of wind power and up 270MW of large scale solar at globally competitive prices.

Staying in the west, fertiliser manufacturer **YARA AND GLOBAL ENERGY COMPANY ENGIE** have secured $2m in Western Australia government funding to support the YURI Green Ammonia Project in Pilbara. The site will tap into solar energy to produce renewable hydrogen for the production of green ammonia for export. The duo plan to install a 10MW renewable hydrogen plant and scale up to 500MW in future.

DID YOU KNOW? Yara's Pilbara site alone is said to account for 5 per cent of the world's ammonia production.

TASGAS AND WOODSIDE ENERGY are joining forces to examine technicalities of blending green hydrogen into Tasmania's 837 km gas network that supplies 13,700 customers. Under the agreement the blend would include up to 10 per cent hydrogen, including that produced at the proposed H2TAS project, a 10MW pilot project producing 4.5 tonnes of hydrogen daily, If all goes to plan green hydrogen production could commence in the first half of 2023.

OVERSEAS DEVELOPMENTS

Concerned by the level of greenhouse gases generated by commercial flights? **UK BASED GKN AEROSPACE** is leading the £54m (AU$100m) UK collaboration program H2Gear, to develop a hydrogen propulsion system for a sub-regional aircraft in a bid to accelerate aerospace decarbonisation to zero emissions. They believe the hydrogen-powered aircraft could enter service as early as 2026.

Fuel cell engineering company Intelligent Energy will develop and manufacture its lightweight and compact fuel cells for H2Gear and is planning to increase manufacturing capability with a new state-of-the-art gigafactory facility in the region that could become the centre of hydrogen fuel cell manufacturing in the UK.

SIEMENS GAMESA AND SIEMENS ENERGY are investing €120 million (AU$184 million) to develop a commercial offshore 14MW wind turbine that produces hydrogen via electrolysis, effectively a breakthrough for the mass production of renewable hydrogen.

In a bid to gain pole position on Vestas and General Electric, Siemens Energy and Siemens Gamesa will target large industrial customers including steelmakers, refineries and chemical firms.

Investments in green hydrogen in Europe are slated to reach €470 billion by 2050 and create up to one million jobs.

HYDROGEN FUELING STATIONS, 2021 According to market researcher Information Trends nearly 600 hydrogen stations had been deployed in 33 countries as of late 2020.

Asia-Pacific (APAC) holds the leading share of 52 per cent of hydrogen stations. Europe, the Middle East and Africa (EMEA) 36 per cent and the Americas 12 per cent, but the latter is forecast to double the share by 2035. EMEA 33% and APAC 44% in 2035.

"The deployments are a positive sign for the uptake of hydrogen fuel cell vehicles from Hyundai, Toyota and Honda," said Naqi Jaffery of Information Trends. "As hydrogen fuel cell buses and trucks gain greater market acceptance, hydrogen stations for heavy-duty transportation are increasingly being deployed.

"In the next few years, hydrogen fuel cells will be widely used to drive trains, aircraft, and maritime vessels."

Japan leads with around 150 hydrogen stations, but China is showing fastest growth.

DRIVING DEVELOPMENTS The market for hydrogen fuel cell electric vehicles (FCEVs) is accelerating,. Energy market tracker SNE Research estimates 2,594 hydrogen-powered vehicles were sold worldwide in Q3, 2020, a rise of 27.3 per cent on the same period in, 2019.

According to industry insiders FCEVs are more geared up than EVs for carrying heavier loads and travelling long distances.

Major vehicle makers including Toyota, Renault, Daimler, are in a race to secure a major share of the market and are securing joint ventures with fuel cell system makers and hydrogen-related services to spur development.

Runaway FCEV global market leader is Hyundai Motor Group with 73.8 per cent of the 6,664 fuel cell vehicles sold worldwide in the first nine months of 2020 on the back of its fuel cell SUV, Nexo.

FORECASTS AND HOPES FOR HYDROGEN

- Bank of America's Haim Israel believes that hydrogen will displace 25 per cent of all oil demand by 2050, spurred on by cheaper renewable energy, regulation and the electrification of cars.
- The EU has laid out plans to install 40 gigawatts of renewable hydrogen electrolysers and produce as much as 10 million metric tons of renewable hydrogen by 2030.
- A subsidiary of German industrial giant Thyssenkrupp had been awarded an engineering contract to carry out the installation of an 88 megawatt water electrolysis plant for Hydro-Québec. The electricity for this project will come from hydropower. Currently less than 0.1 per cent of global hydrogen production comes from water electrolysis.
- Danish energy firm Orsted is developing a demonstration project to harness offshore wind energy to produce green hydrogen.
- With its new 2GW factory Norwegian electrolyser maker Nel plans to slash the cost of its electrolysers by about three quarters and subsequently reduce the price of green hydrogen to $1.50 per kg by 2025. That figure is the holy grail for green hydrogen as it would equal the cost of fossil fuel generated hydrogen.
- Although most projects across the continent are at pilot stage, the EU estimates investments in green hydrogen in Europe could reach 470 billion euros by 2050 and create up to one million jobs.
- One of Nel's biggest competitors, ITM Power, has begun operations at its new 1GW PEM electrolyser factory in Sheffield, England, starting with a production line of 350MW, which will be scaled up as orders come in. ITM is also planning to build a second gigawatt-scale factory up to 2GW.

Spreading sunshine

By all accounts the PV market in 2020 was spectacular, records tumbled as rooftop installations rose. Just what was achieved last year and what's in store this year and beyond?

ACCORDING TO THE CLEAN ENERGY REGULATOR Australia notched up an additional 7GW of new renewable (solar and wind) capacity in 2020, a very healthy rise of 11 per cent on 2019's figure of 6.3GW, and thanks predominantly to record investments in rooftop PV.

Green Energy Markets reported that year-to-date installed capacity at end December was 2,952MW; 40 per cent above the same time the previous year (2,111MW) and 88 per cent above 2018 (1,570MW).

In all during 2020 renewables generated a mighty 53TWh and rooftop PV capacity came in at 13GW.

Australia is in a leading role, deploying new renewable energy ten times faster per capita than global averages and four times faster than households in US, Europe, China or Japan. Such momentum has sharpened the focus of global suppliers, an increasing number of whom are justifiably choosing Australia as the ideal launch pad for their latest products and services.

Keeping a close watch on all developments is Warwick Johnston of SunWiz, aptly dubbed the solar 'Woracle' for his insights and projections that he generously shares with Smart Energy Council members during Market Intelligence webinars.

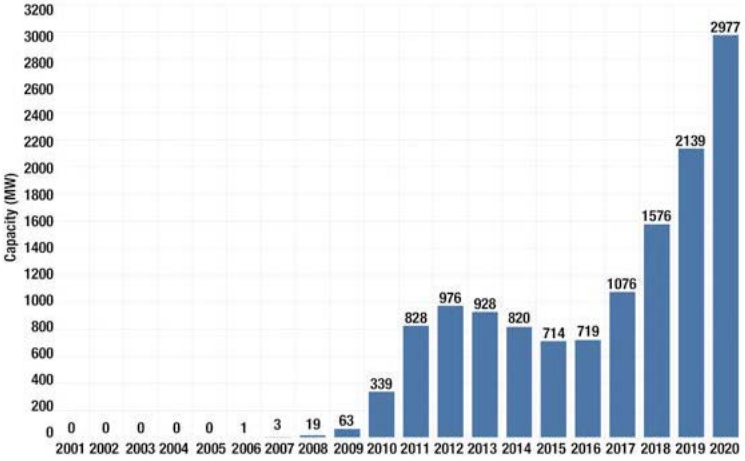
He recently reported that all up a record 5GW of solar PV was installed in 2020, 3GW of which was in the small-scale <100kW (STC) PV market and the balance in the commercial, industrial and utility sector. This lifted the cumulative tally by one-third to 20GW and brought Australia's solar capacity to 25 per cent. All the more remarkable in the pandemic year.

"But we are just getting started" Warwick enthused, crediting the entire industry for their contributions to the impressive tally.

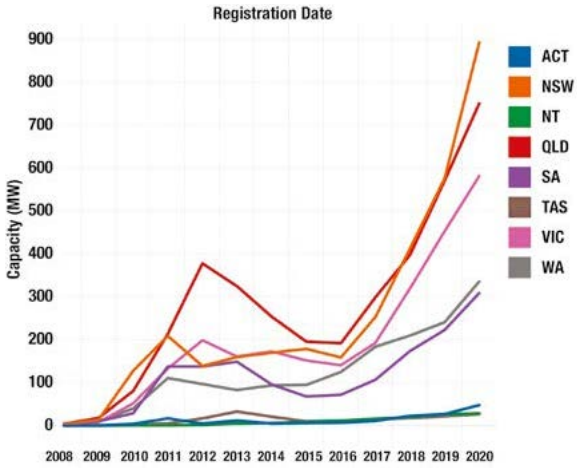
The year ended particularly well, December 2020 was a record month. All states produced record volumes but NSW pipped all, in a single month installing more rooftop PV than that of the entire country back in 2008. After a few fraught months Victoria experienced a healthy post-lockdown rebound with pent up demand from households kicking in.

As illustrated in the SunWiz charts below, rooftop PV showed outstanding growth of 39 per cent in a single year. That's on the back of already impressive growth of 33 per cent over the four preceding years.

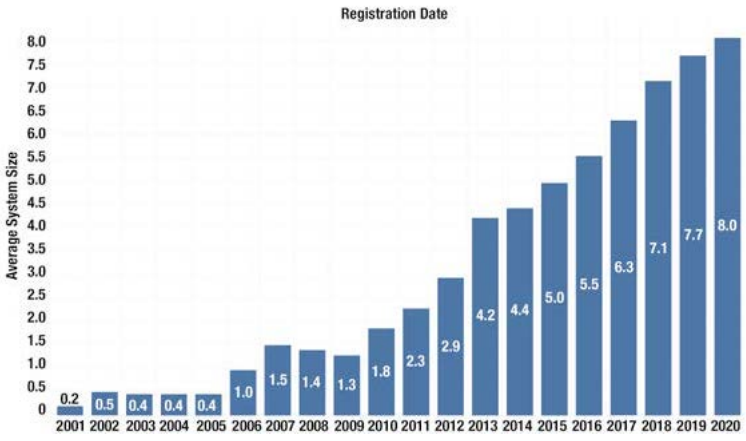
Should Australia maintain the recent pace of growth, renewables could reach 100 per cent by the end of the



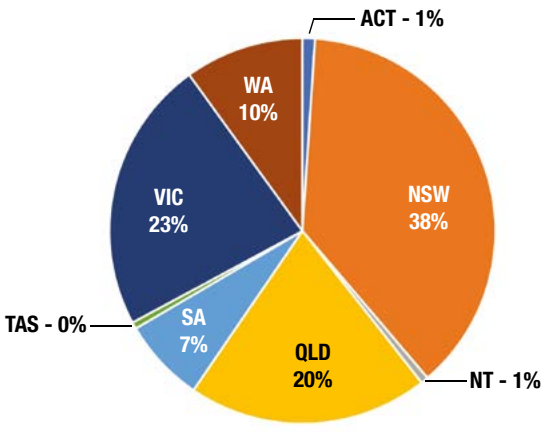
2020 End of Year Tally (STC) (Courtesy SunWiz)



States (STC) - Volume (Courtesy SunWiz)



Average System Size (STC) (Courtesy SunWiz)



Combined STC & LGC Solar Market by State - 2020 Registered/Commissioned (Courtesy SunWiz)

SMART ENERGY COUNCIL

decade with capacity sitting at a colossal 60GW. And a warning: "If you think you are busy now you need to get moving, we need all businesses to be operating at peak velocity!"

Developments are somewhat tempered by the contraction in the commercial and industrial sector partly due to COVID's impact upon the broader economy; however in the post-pandemic era as workers return to energy-hungry offices momentum is tipped to kick back in.

What does the future hold?

For its part the Australian Energy Market Operator forecasts an extra 24GW of rooftop solar by 2030, treble that of today. Therefore renewable energy which currently commands 37 per cent market share is on track to supply 94 per cent of the grid by 2040, AEMO states.

In the more imminent future, SunWiz's best estimate is for a 3.35GW STC market in 2021, however a 'continued growth' scenario would see another 40 per cent growth in the STC market to 4.2GW.

"We see this as optimistic as residential PV deployment will face headwinds from lower feed-in tariffs and increased hurdles to network connection," he commented. "And a 'contraction' could follow reductions in feed-in tariffs, hurdles to network connection, or COVID having 'pulled forward' sales."

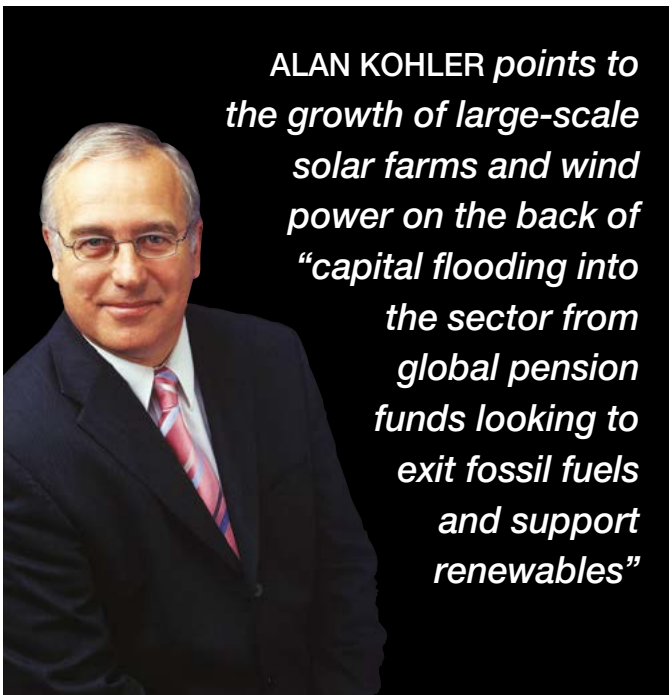
However worst-case estimates put the contraction at just 10 per cent on 2020 levels.

Turning to large scale >10MW developments, a reasonable guess would be 1.5GW of projects with a best-case guesstimate at 5.1GW for 2021.

A series of significant government and corporation projects and initiatives have been announced: SA's plans for 500 per cent renewable energy by 2050 and Tasmania 200 per cent 2040; NSW, Queensland and Victoria are stepping up with REZs with multi GW on the horizon.

Corporate PPAs and hydrogen also provided optimism for the future, with some impressive mega-projects on the horizon, Warwick said, and utility-scale batteries becoming commonplace. Not to be forgotten too are the state government plans for Renewable Energy Zones, PPA and subsidies.

Added to this are progressive developments in other quarters and corporate PPAs setting new records in 2020 with almost 3.5GW of wind and solar projects among Aldi, CSIRO, BHP, Coles, Weir Minerals, CS Energy, Shell, Transurban, Amazon, universities and local governments.



ALAN KOHLER *points to the growth of large-scale solar farms and wind power on the back of "capital flooding into the sector from global pension funds looking to exit fossil fuels and support renewables"*

"It's an exceptional time to be reporting on the Australian rooftop solar, and an outstanding time to be working anywhere in the supply chain."

WARWICK JOHNSTON

SunWiz presents a dizzying summary of just what's in store.

There's lots of reasons to be optimistic. Excited too.

In Warwick's words: "It's an exceptional time to be reporting on Australian rooftop solar, and an outstanding time to be working anywhere in the supply chain."

Contact warwick@sunwiz.com.au for more information or visit www.sunwiz.com.au

Coal plants on shaky ground

Prominent financial analyst Alan Kohler observes the transition to renewables is occurring much faster than anticipated thanks to the popularity of household rooftop PV, and this inevitably spells the end for coal-fired power plants.

The 11GW of rooftop solar in Australia, he notes, is equivalent to four Eraring power stations or five Loy Yang As coal power stations.

Recent findings by the Institute for Energy Economics and Financial Analysis in collaboration with Green Energy Markets reveal that by 2025 solar PV will reach 22GW which approximates the maximum capacity of all of Australia's coal-fired power stations in Australia.

Report authors Tristan Edis and Johanna Bowyer say as renewable energy surges coal plant closures are imminent with many likely to be financially unviable by 2025.

Their estimates put new wind and solar plants adding 70,000GWh supply by 2025 (from 2018), with installed renewables capacity to include 8GW of utility scale solar, 12GW of wind, and 22GW of rooftop solar.

That's more than a third of the entire demand in the NEM, and more than eight times the annual generation of the Liddell coal-fired power plant, leading to a collapse in output from many of the existing fossil fuel generators.

"We predict that gas power station output will fall by 78 per cent and coal output by 28 per cent by 2025 compared to 2018 levels," Bowyer said, with three to five of the remaining 15 coal power stations in the NEM under financial stress by 2025.

"Solar and wind power are here to stay, and coal plants just aren't flexible enough to manage around them," Tristan Edis said. "Efforts to keep inflexible coal plants afloat, let alone build new coal power plants, are likely to be counter-productive."

Alan Kohler also points to the growth of large-scale solar farms and wind power on the back of "capital flooding into the sector from global pension funds looking to exit fossil fuels and support renewables".

He commented on the need for billions of dollars to be spent upgrading the transmission network.

A vexed issue that is being thrashed out in many boardrooms.

SOLAR'S STELLAR YEAR

Global pandemic fails to deter the power of PV

7GW = new renewable energy capacity in Australia 2020 *versus*

6.3GW = new renewable energy capacity in Australia 2019

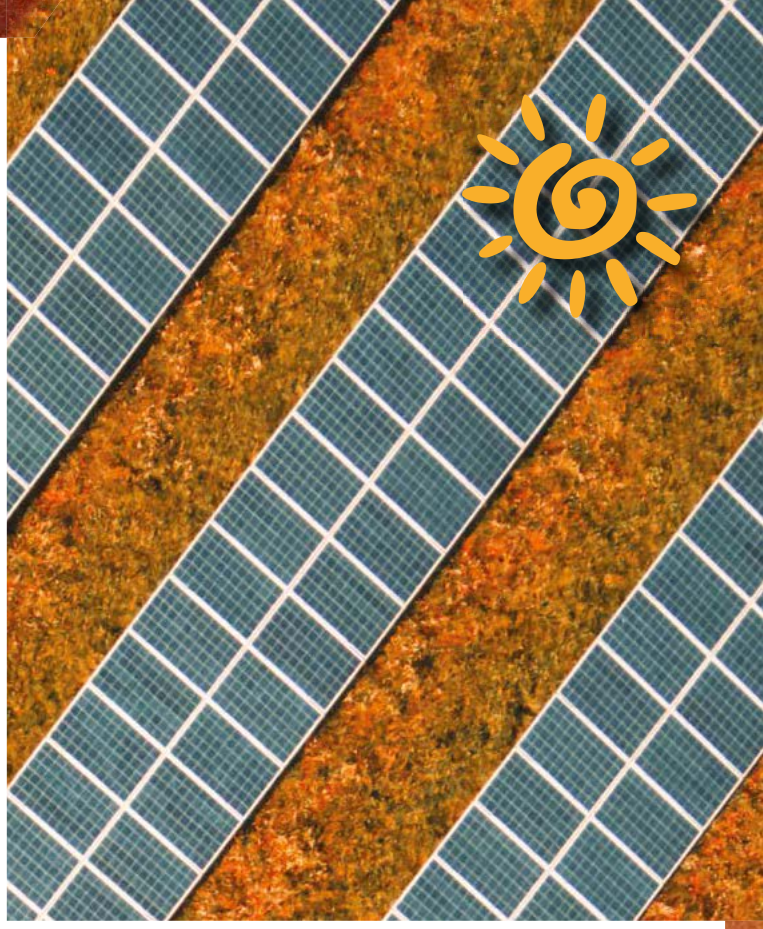
10 x faster per capita = rate of new renewable energy deployment in Australia compared to world average

4 x faster per capita than Europe, China, Japan and the US.

>30% = share of renewables in the National Electricity Market 2020

53TWh generated from renewable projects in 2020.

Source: Clean Energy Regulator



SMASHING RECORDS IN 2020

5GW of PV installed

20GW = Australia's cumulative tally

>33% = annual growth rate past 4 years

2.9GW = record annual volume for STC Market (<100kW PV)

8.8 x the volume installed 10 years ago

8.0kW = record average system size in a year

8.7kW = record average system size in month (December)

540MW = record commercial volume in a year

70MW = record commercial volume in a month (December)

STC and LGC markets 2020, state breakup of capacity installed/commissioned

NSW – **38%**

VIC – **23%**

QLD – **20%**

WA – **10%**

SA – **7%**

Source: www.SunWiz.com.au, 2020 Solar Year in Review - Comprehensive Report of Australian Solar PV 2020, warwick@sunwiz.com.au, info@sunwiz.com.au, 1300 786 949

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GROWTH SPURT PROJECTIONS

Additional **24GW** of rooftop PV by 2030

x3 (trebling) national small-scale solar generating capacity

Renewable energy is on track to

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Up from **37%** today

Current Australian investment in renewable energy = **$7.7** billion, ie **$299** per person

Source: Australian Energy Market Operator

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Mr MORRISON, PLEASE DON'T MAKE EMPTY PROMISES

Enshrine our climate targets in law

By Tim Stephens

IN THE LEAD-UP to this year's United Nations climate conference in Glasgow, the Morrison government is inching towards adopting a net-zero emissions target for 2050. If Prime Minister Scott Morrison can resist internal party pressure to exempt some sectors from the commitment, the target would be welcome.

It would also bring Australia into line with its international peers. More than 120 other governments have made similar pledges, including China, the European Union and the United States.

However, Morrison is reportedly considering making the target voluntary, rather than legally binding. That would mean the policy could circumvent parliament and Coalition backbenchers averse to climate action could not vote against it.

But if that happens, the commitment is likely to be meaningless. As recent political history shows, emissions reduction targets must be enshrined in law if we're to have any hope of reaching them.

The value of a good law

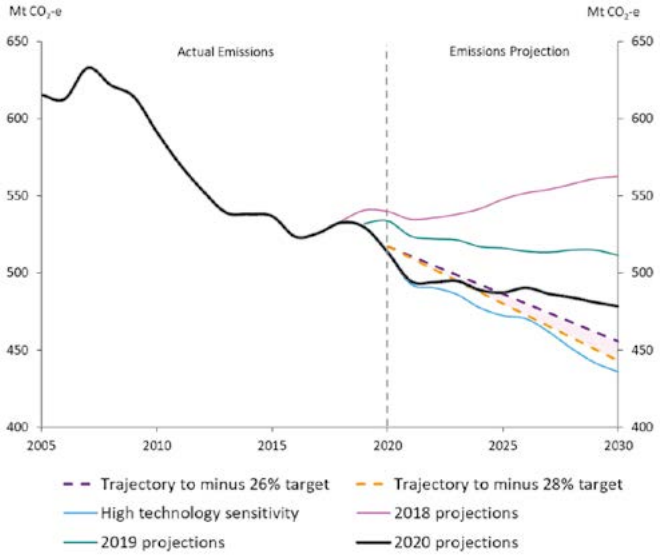
A well-designed climate law can achieve two main goals: ensuring Australia meets and beats its emissions targets, and that those targets are consistent with the best available science.

In 2012, the Gillard Labor government passed a comprehensive climate law known as the *Clean Energy Act*. The legislation underpinned Labor's carbon price scheme, which was famously repealed by the Abbott government in 2014. The law was unusual in setting a fixed carbon price rather than an emissions target, but over time the policy would have met the goals set out above.

The laws were only in place for a few years, but quickly began working to bring down emissions. This is because businesses, in particular the electricity sector, faced mandatory financial costs if they failed to comply.

When the law was abolished, Australia also lost much of the institutional infrastructure needed to drive emissions down. For example, the Climate Change Authority – while surviving the Abbott government's effort to scrap it – lost its central role in advising on carbon budgets and emissions targets.

Australia now has no national mechanism to put a legally binding cap on emissions. Instead, we have a hodgepodge of voluntary schemes and incentive mechanisms. These include the Climate Solutions Fund (formerly the Emissions Reduction Fund), under which the government pays polluters to cut their emissions, and the Technology Investment Roadmap.



Australia's Emissions Projections, December 2020 (Department of Industry, Science, Energy and Resources.)

The Emissions Reduction Fund has had modest impact. But as Australian National University environmental economist Frank Jotzo has noted, it's "vastly less effective and efficient" than the carbon pricing mechanism it replaced.

Without a legally binding target, climate action becomes voluntary. The federal government cannot compel industry and others to reduce their emissions, and itself is not held to account.

As the Australian experience over the past 15 years has shown, the lack of a legal imperative means climate policy goes nowhere. Arguments about emissions reduction become mired in internal party bickering and parliamentary paralysis, and vested fossil fuel interests continue to profit while damaging the planet.

Emissions reduction, if not set into law, can get bogged down in internal party politics.

Steggall on the right track

Independent Warringah MP Zali Steggall recently stepped into the climate policy vacuum. Her Climate Change Bill, currently the subject of a parliamentary inquiry, is supported by both the business sector and environment groups.

"As recent political history shows, emissions reduction targets must be enshrined in law if we're to have any hope of reaching them."

IMAGE: SOPHIE LOWDEN

Both Steggall's Bill and the Gillard government's legislation drew inspiration from the UK *Climate Change Act*. That law passed in 2008 with bipartisan support, and has done much to decarbonise Britain's economy.

The UK's CO_2 emissions reportedly fell by 2.9 per cent in 2019. Over the decade to 2020, as the economy grew by one-fifth, emissions fell by 29 per cent.

Key features of both the UK legislation and Steggall's Bill include:

- a legally binding, economy-wide, 2050 net zero emissions target
- an independent expert body to advise the government on emissions targets and emissions budgets
- a requirement for the government to set five-year emissions "budgets" and adopt emissions-reduction plans to meet them.

This approach is not policy-prescriptive. Unlike the Gillard government's law, it does not mandate the adoption of an emissions trading scheme. Instead, the government determines how to stay within the carbon budget.

Nonetheless, such a law imposes a legal obligation on the government to follow it.

Why this matters

The Morrison government's own projections show Australia is not on track to meet its 2030 emissions target.

And even if it did hit the target – a 26 per cent emissions reduction between 2005 and 2030 – the goal is widely regarded as inadequate. Recently, an expert panel concluded a target of 50 per cent below 2005 levels would be consistent with limiting global warming to well below 2°C this century.

As for the target of net-zero by 2050, the Labor opposition says government projections show it will take Australia 146 years to reach that goal.

Clearly, Australia is off track, and legally binding targets are needed.

National legislation exists to tackle other environmental and pollution issues. For example, laws have successfully reduced ozone-depleting substances and synthetic greenhouse gases.

This shows the value of mandatory regulation, set in law, to address a global pollution challenge.

Learn from the past

Under the Paris Agreement, Australia must scale up emissions-reduction targets every five years. Unless our national commitment is backed by legislation, it will not be seen as credible in the eyes of the international community.

While states and territories such as Victoria and the ACT have enacted strong climate change laws, this is no substitute for a national approach.

In Australia and internationally, climate lawmaking has been going on for more than a decade. The evidence is clear: well designed, binding climate laws do effectively tackle the climate crisis. Anything less may well turn out be an empty promise.

Tim Stephens is Professor of International Law, University of Sydney.
This article first appeared in 'The Conversation' and is republished under Creative Commons licence.

SHINING THE LIGHT ON WOMEN IN SOLAR ENERGY

AWISE – that's Australian Women in Solar Energy – is a recently established industry group that has fast gained traction and is transforming stereotypes.

ESTABLISHING A SPECIALIST GROUP in the middle of a pandemic might not sound ideal but that is exactly what Bobbi McKibbin, Sophie Wright and Sam Craft agreed to do in mid-2020 when they founded AWISE.

Despite the strict lockdown laws preventing gatherings, in less than five months AWISE had attracted more than 200 members across Australia, mostly thanks to Solar Cutters, Facebook and other networking channels. And that is just the start says the small but dedicated committee of six who have set the wheels in motion to accelerate the reach and growth of AWISE.

As Sam and Bobbi remarked "If we can achieve a foothold without holding face to face meetings and events during a pandemic then once things ease we'll be better able to raise our profile and reach more women."

According to Bobbi women are very underrepresented in the solar industry and number just one per cent of installers nationally.

"We would like to see more joining the (electrical) trade. And anyone who's had the pleasure of employing female electricians raves about their quality of work, their passion for what they do, their work ethic, attention to detail and ability to learn and adapt quickly and level of skill and knowledge. They are highly sought after so we need more to join the industry," Bobbi told *Smart Energy*.

"Women in hi-vis vests and a ladder knocking on your door, that needs to be the norm. We need to create that picture.

"We also need to raise awareness of other aspects in the industry – admin, sales, owners and operators, engineers; there are many opportunities. And let's not forget this is one of the fastest growing industries in the country.

"It's pretty exciting."

Co-founder Sophie Wright added the group aims to help those starting out in the renewables industry and make them feel supported, in general help them overcome some of the obstacles they may face.

The goal of Australian Women in Solar Energy (AWISE) which promotes diversity and progressive business practices is to encourage more women to participate in all aspects of the solar energy industry and help advance their skills

"We want females to jump on board, to not be scared about joining what is currently a male dominated industry and instead learn how many great opportunities there are," said Sophie who is addressing 'Industry Cowboys' at this year's Smart Energy conference.

"I myself did not realise the career path from installation to management. The more women we have represented the more they can share their skills and keep raising industry standards."

Charting a path

Hence the mission to offer a supportive and inclusive environment for women while growing a community that encourages skilled women to join and be successful in the industry through education, capacity building, advocacy, strategic partnerships, networking and events.

Likewise to engage with more women in the industry to build knowledge and expertise; identify and develop champions; work collaboratively with industry and government stakeholders; and develop mentorships, networking and training opportunities.

It will do much to empower women in general and, says Sophie, bring it on. The Geelong-based former accountant who is now a solar sales manager and accredited designer conducts on-site proposals for PV gets understandably frustrated when customers ask for her credentials, which is frequent.

"They express surprise and I feel I have to validate that by stating I'm an accredited designer whereas a male colleague is rarely asked. Some specifically request that a man manages the job; it happens all the time."

Sydney-based installer Lily Pejkic who occasionally receives the same raw treatment has posted a series of articles on social media channels about the barriers encountered by women in industry in a bid to highlight the divide.

She's also in demand to address industry groups to help "lead the charge" and recast perceptions. It's beginning to have the desired effect with a slow but steady shift underway, and change in mindsets among men who are keen to see more females thrive in the industry.

Establishing gender balance

Today, some larger organisations are setting targets for greater female representation and striking a gender balance with more women seated in boardrooms.

"The Smart Energy Council is a good example with its four women including Sam Craft on the nine-person board and we are seeing some great leaders emerge. This really is making a difference," said Bobbi who revealed sentiments expressed in the book *Becoming* by Michelle Obama helped inspire her and Sophie to lay the group's foundations.

The duo had met through participation on a Solar Victoria reference group went about gathering kindred spirits in Sam, Keisha, Lily and Christine and from there

creating partnerships or links with key organisations including Master Electricians, NECA, Solar Victoria and the Smart Energy Council.

Showcasing industry opportunities awaiting females

"We are happy to collaborate with other groups and keen to work with schools' Careers Days. We also want to establish AWISE sub-groups in each state, capital city or regions and run side gatherings at trade events or shows, all things are on the table; education, professional development and training and installation projects."

To help cover running costs the committee will explore sponsorships and is considering means of generating income to help fund special projects.

Various solar companies and directors are now approaching AWISE for guidance on how to attract and retain women from different industries into renewables, and to establish mentors.

"AWISE will become a good hub for our forward-thinking industry that is undergoing a lot of progress and in which we can open up to talent and take to the next level," said Sam who is steering group strategy and connections while generating awareness.

"We are definitely looking to grow and break down stigmas within our diverse industry and despite the name men too are welcome, it is all about inclusiveness and breaking down obstacles.

"It's all about making the solar industry a better place to work."

The AWISE convening committee which is spread across Victoria and NSW is yet to meet in person: AWISE founders Bobbi McKibbin of Solar Integrity and Sam Craft of National Renewable Group have both received the top Solar Cutters Annual Award; Christine Kennedy, Total Solar Solutions Australia (the creative talent of AWISE, designing the website and its images and creating logos and content and Facebook entries); Keshia Noronho, Fronius Australia; Lily Pejkic, Sydney Solar and Batteries; and Sophie Wright, Velocity Solar.

Keen to know more and sign up for AWISE?

Meet the team at the Smart Energy Conference & Exhibition in May at the Sydney ICC – all welcome! Join the Facebook group: https://www.facebook.com/groups/awisegroup, www.awise.com.au

FOX *SPRINTS AHEAD* IN THE YEAR OF THE OX

All-in-one battery storage manufacturer Fox is keen to gain a foothold in Australia's booming energy storage market says Vice President and co-founder Cody Hua who is building up company presence down under.

IT'S THE YEAR OF THE OX and according to Chinese lore that means it's down to business. A year in which the focus is on hard work and dedication to the task at hand. More effort, more motivation to achieve greater success.

That bearing is more relevant than ever for battery storage manufacturer Fox which is adopting an aggressive market strategy to lift its market share in Australia and across the globe.

The entire team is pumped, said Fox Vice President and co-founder Cody Hua who considers himself lucky to be in the renewables industry, stating solar energy is pivotal to containing emissions and creating a more benevolent climate.

"Renewable energy needs to be even stronger, there is a fair way to go, we human beings have done so much damage to the planet and that is manifest in climate change causing extreme weather conditions and major difficulties, but we can turn things around," he said. "All of this accentuates the need to accelerate renewable energy and battery storage systems."

Fox is poised for action with its all-in-one inverter and battery system; the Elite and Ultra models that come in 2.3kWh, 2.6kWh and 2.9kWh variants.

Each is available as both a hybrid with DC inverter, charge controller and in-built batteries; and as an AC-coupled solution for a retrofit installation alongside an existing string inverter.

Equipped with such technology, Fox is determined to become an inverter and ESS powerhouse, initially focusing on the residential sector before expanding into commercial and industrial applications.

In May Fox is launching an all-in-one battery storage system for hybrids and AC two series and a three phase and large single 8kW and 10kW system to help guarantee a strong presence in the market.

"We aspire to a 15 per cent share of the residential battery storage market in Australia by next financial year and want to claim the top spot for batteries suppliers within five years," Cody Hua told *Smart Energy*.

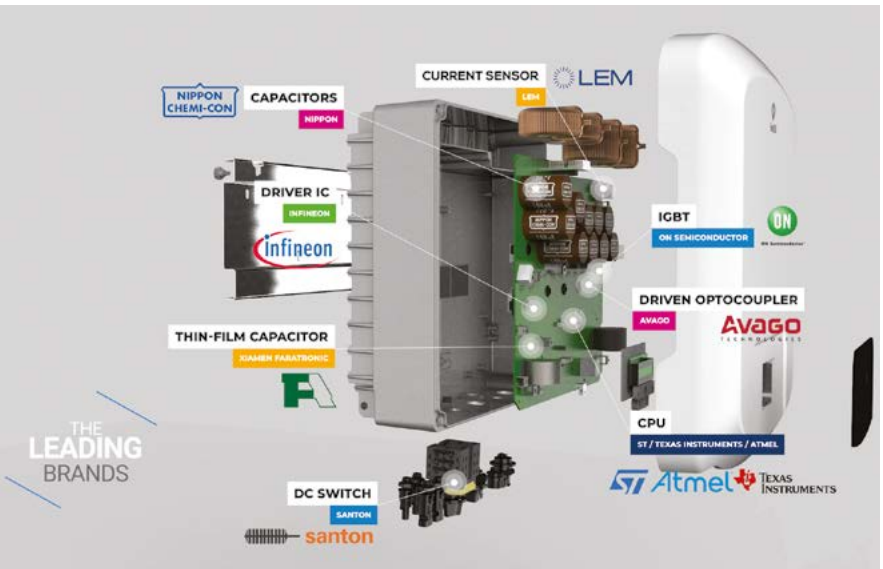
"We are first targeting the residential market but later this year going into small commercial systems and small solar farms and eventually battery storage at the utility-scale but it is going to take time."

He commented on Fox's competitive offering in what is a very competitive market and a team which brings versatile experience that will especially suit the virtual power plant market.

"I really feel the VPP market will take off, quite likely from later this year, and our fast response systems are tailored for this, we are in discussions with VPP vendors."

Fox has many key strengths, he said, referring to the all-important backing of the multi-billion dollar nickel conglomerate Tsingshan Group.

"All of these strands when brought together will help us achieve our targets, hence our confidence."



Extending the reach

"Our broad marketing strategy includes close collaboration and information sharing with then Smart Energy Council through its exhibition, shows, webinars and publications," Cody explained.

This is backed up though rigorous formal team product training for all dealers to familiarise them with the brand's battery storage systems and installation, service and certification.

Fox is embarking on a recruitment drive for product engineers and trainers as part of its plan to double staff levels in Australia by the end of the year to meet growing demand.

Branch offices will open in other states.

All at a time that others in the space are scaling back.

What's the thinking? "Last year was a very tough year for many manufacturers, they were heavily affected by the pandemic and chose to cut staff but we are aggressively growing our brand. Our staffing numbers tripled in China during COVID," Cody said.

"Last year was the best time to recruit, we spent lots of time and resources on this and ramped up our R&D efforts to build a strong foundation for future earnings."

There are two reasons for this, he said: "We have a strong financial backing and that is key to growth. To gain profits, you either have to cut costs or invest more. We chose the latter path which has led to us hiring and training more people.

"We know our time will come. We are thinking long term regardless of the virus, we will expand in all areas and develop teams in all states so we can reach more customers."

Visit the Fox team at stand 34 at the Smart Energy Conference & Exhibition. Fox is also sponsoring the Applied Energy Storage conference stream.
www.fox-ess.com

"I really feel the VPP market will take off, quite likely from later this year, and our fast response systems are tailored and designed for this."

Michael Zhu is tapping into the strength of nickel conglomerate Tsingshan Group to build up battery energy storage company Fox

Fox was founded by Michael Zhu in August 2019 as a subsidiary of Tsingshan Group, the world's largest stainless-steel manufacturer and operator of the world's biggest nickel mining and production hub in Indonesia. During 2020 the Fortune 500 company recorded annual sales revenues of $US38 billion.

The Fox production plant and R&D Centre in Wuxi, China, has a monthly inverter production capacity of 10,000 units and 3,000 lithium battery energy storage systems. The R&D team is more than 100 strong, accounting for >30 per cent of the total number of company employees.

The photovoltaic inverter and energy storage divisions of Fox based in Wenzhou can produce one million photovoltaic inverters and 200,000 sets of lithium batteries annually. The annual total production capacity of the Wenzhou production base is up to 10GW.

Currently product exports to Australia comprise about 15 per cent of Fox market volume, Europe accounts for up to 60 per cent and demand is strong in SE Asia including Thailand and the Philippines. A move into the US market is on the cards for later this year.

ACT HUB KICK-STARTS THE YEAR IN STYLE

At the ACT Hub's first event of the year industry innovators mingled with Ministers and manufacturers in a convivial gathering that was all the more special after the isolation of lockdown.

ACT Renewables HUB

Connecting industry, sharing knowledge, and building business opportunities through collaboration.

THE IMAGES ON THIS PAGE convey the story of how fun can be mixed with business while generating new connections and spreading influence.

Hub Manager Alethia Barceinas who arranged the popular ACT Hub networking event that created a high level of interest remarked that the arrival of 2021 brought with it new opportunities in the renewables space.

In her words the aim was to put a spotlight on the ACT's no-interest loans for residential solar and battery storage and progressive electric vehicle policies, a briefing on the Hub's work with Hydrogen Australia, and news of the ACT Renewable Hydrogen Cluster.

Quite a lot to cover at the COVID Safe Event that attracted more than 50 people including many familiar faces and several newcomers to the ever-expanding Hub.

"Early last year when we took on the Hub we had a database of about 1,500 people. Within twelve months we have almost doubled it. I would say that our webinar series and renovated website had a lot to do with it," Alethia said.

"The tremendous boost to our Hub membership highlights the determination of people working in renewables to not just get on with business but also to bolster connections, and we are really pleased to play a pivotal role in facilitating industry networks.

Among the diverse group of Hub members are Reposit Power, Global Power Generation, Icon Water, ActewAGL Energy, Electromotiv, Intelligent Energy Solutions, Solar Hub and Stored Solar.

"The better-connected people are the more benefits they can reap whether it be through access to technical knowledge or innovative systems and at day's end the renewables industry advances more quickly.

"That is the end game: to accelerate developments in what is already a dynamic, fast-moving industry."

For more information about the range of resources available through the ACT Renewables Hub contact Manager Alethia Barceinas on 0452 414 070 or alethia@smartenergy.org.au, www.actrenewableshub.org.au

SEC President Steve Blume (left) at the popular ACT Renewables Hub's first event of 2021

Alethia Barceinas (centre) with SEC's John Grimes and ACT Minister Shane Rattenbury

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LMS: Waste to bioenergy

Landfills produce significant quantities of a potent greenhouse gas. Without companies such as LMS, these gases would escape to the atmosphere. Though it may not garner much mainstream media attention, biogas capture has been a quiet Australian success story, says Tiana Nairn.

EACH YEAR Australians generate over 74 million tonnes of waste and dispose of some 27 million tonnes, but have you ever wondered what happens to all the non-recyclable rubbish collected from the kerbside and businesses each week?

Fortunately, around 82 per cent of Australia's disposed waste, which includes organic matter such as food scraps, paper, cardboard, natural textiles and garden waste, is delivered to landfills with biogas capture systems. Better still, three-quarters of this waste is destined for facilities with bioenergy generation, which is the largest source of waste to energy in Australia.

Landfills have evolved significantly from 'holes in the ground'. Modern sites are equipped with liners, leachate management systems and sophisticated containment systems designed to improve environmental protection alongside biogas capture activities pioneered by specialist companies such as LMS.

The scale of landfill biogas operations is extensive: LMS services 48 landfills across Australia and two in New Zealand. Across these, it operates 28 bioenergy facilities and 19 flaring facilities, three of which are being upgraded to bioenergy facilities over the coming year.

To date, LMS has captured over two billion cubic metres of landfill biogas, installed more than 3,300 biogas wells across Australia and abated over 40 million tonnes of carbon emissions from the earth's atmosphere.

LMS' complete in-house service includes design, engineering, construction, installation, operation and maintenance of biogas capture and generation facilities and the sale of all output products (eg, Electricity, Australian Carbon Credit Units and Large-Scale Generation Certificates).

All up LMS is responsible for nearly half of all landfill biogas capture in Australia, making it Australia's largest carbon emissions reducer. Its bioenergy facilities, which are 100 per cent grid connected, also deliver synchronous, baseload and dispatchable renewable energy which assists the electricity network with critical services such as inertia, voltage control and fault ride through. It's a significant win for the environment and electricity network and quite an achievement for a company whose origins are somewhat remarkable.

Three generations of the enterprising Falzon family: John, Matthew, Elyce and company founder Emmanuel Falzon

Seizing the opportunity

Nearly 40 years ago, Emmanuel Falzon noticed the grass kept dying on an oval next to the family's brickyard business. With an inquisitive mind, his investigations revealed gas was escaping from what turned out to be an old landfill, with the breakdown of organic matter creating biogas, around half of which is methane.

Emmanuel had aspired to find an alternative fuel source for the brick kilns and had now effectively unearthed the solution. He went on to successfully pioneer the commercial collection and conversion of landfill biogas in Australia.

By 1988, the Falzon Landfill Gas Company had become the first national organisation to concentrate entirely on landfill biogas-to-energy.

Its successor, LMS Energy, was formed by Emmanuel's son, John Falzon in 1996. SIMS Metal Management acquired a stake in 2001 and subsequently three generations of the Falzon family have brought their diverse expertise into the business that now employs around 150 people.

Continuous innovation is the hallmark of the multi-generation family business that has installed solar farms at four landfills and two further related sites ranging from 100kW to 1.5MW, and deployed engineering expertise to design and build a custom solar mounting system enabling solar over former landfill cells.

Environmental imperatives

Matthew Falzon, who works closely alongside his enterprising father John, and is the grandson of company founder Emmanuel, says climate change policies are one of the key motivators for LMS and other biogas sector participants.

"Methane is a potent greenhouse gas, with a global warming potential around 28 times higher than carbon dioxide. Hence, its capture and destruction offer significant environmental benefits and this is recognised through the issue of Carbon Credits.

"Landfills with high biogas capture rates and bioenergy generation can be carbon emissions neutral, meaning for every tonne of waste that ends up in landfill, no net emissions from this waste can be achieved. The renewable energy generated from landfill bioenergy facilities also helps displace (offset) the use of fossil fuel based electricity (eg coal) in the grid," he explained.

In the current policy environment, LMS is typically able to provide biogas capture systems at no cost to Councils or other landfill operators and offers the benefits of improved environmental outcomes and a share of revenue gained. However, wholesale electricity prices are declining significantly due to the increased supply

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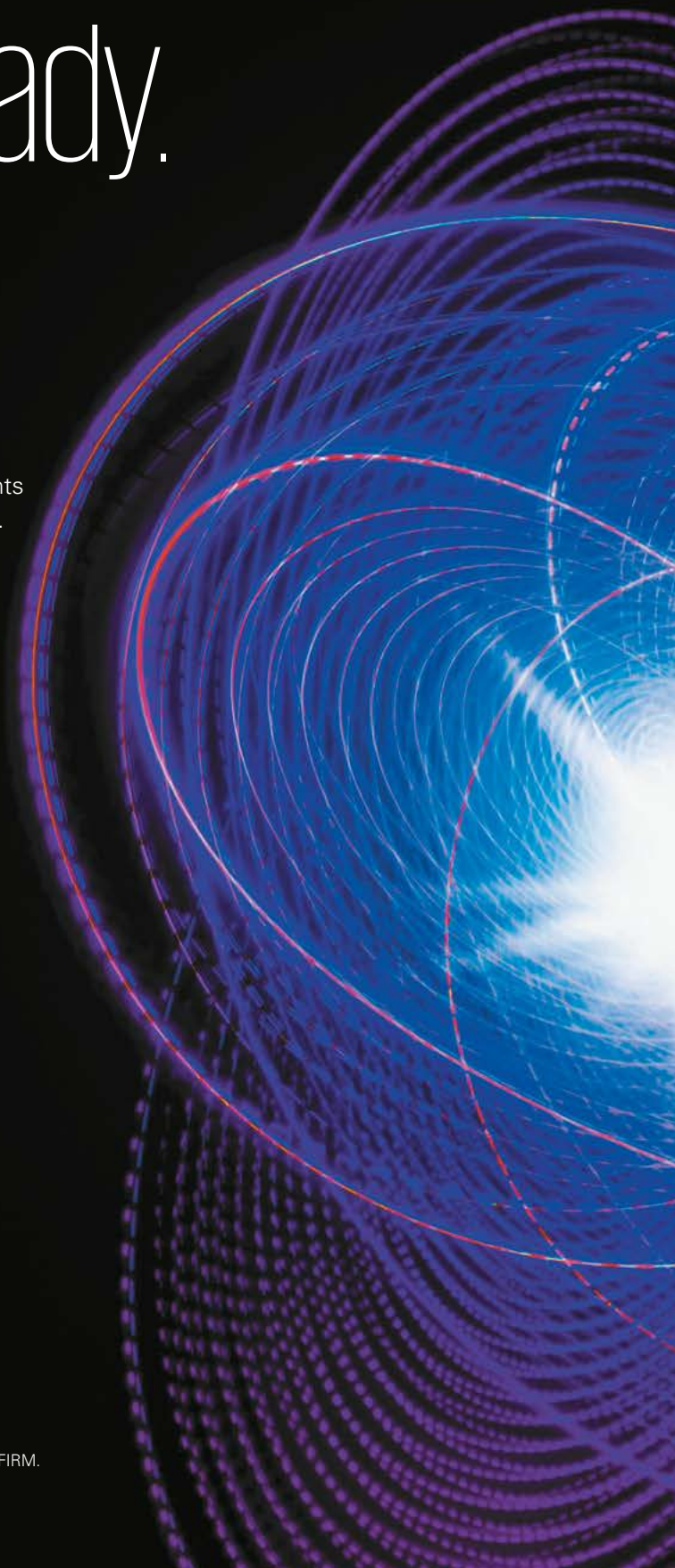

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KPMG

of solar and wind power generation. Without suitable policy, these valuable emission reduction projects are likely to become unviable.

"Landfills emit biogas for decades and landfill bioenergy projects are unique in their ability to provide baseload and dispatchable renewable energy. The ability for these bioenergy projects to participate in new electricity markets and to create carbon credits for the significant emissions reductions they achieve is critical," says Matthew.

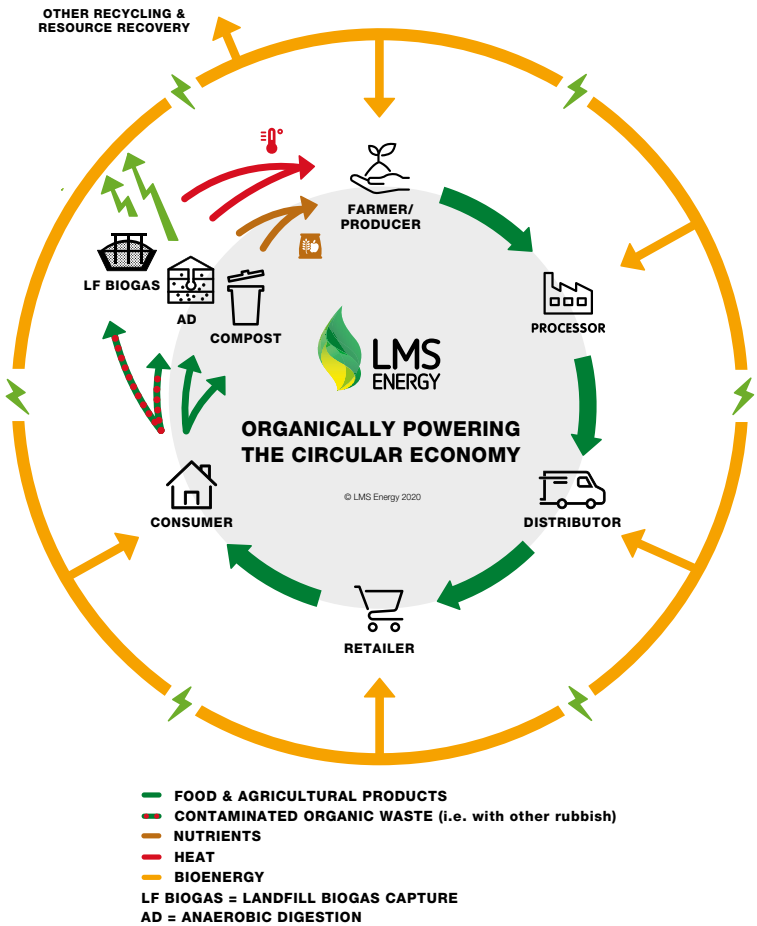
Without these measures, the operation of the landfill biogas sector as an important part of the transition to a low emissions and circular economy is in danger.

Overlooked Industry

Despite its scale and environmental benefits, landfill biogas is not well recognised in current waste policies across Australia, with little or no delineation from landfills with biogas capture from those without.

"Our view is that as regulators seek to maximise resource recovery from waste, the scope and scale of landfill biogas capture needs to be presented. It is the baseline against which other EfW (energy from waste) technologies ought to be assessed, using future-focussed scenarios, given our changing renewable energy and waste mixes.

"Large waste volumes are required for combustion EfW viability, and failure to undertake a fair assessment could result in increased carbon emissions securely 'locked-in' over long periods of 20 years or more, preventing the adoption of better tools or technologies that may emerge during the term of a contract.



As waste and energy mixes transition to a more sustainable future, landfill biogas capture pioneer LMS is taking the lead in Australia's transition to a circular economy and lower emissions

"This could prevent jurisdictions from reaching their emission reduction goals, which overseas countries like Denmark are now experiencing," he said. In other spheres the regulatory landscape is evolving.

A circular economy

Australia is edging toward a circular economy, where the value of resources is retained for as long as possible, reducing reliance on virgin materials and avoiding pollution and waste. As part of this movement, national and state waste policies are now seeking to halve food waste generation and halve organic waste to landfill by 2030, creating new biogas recovery opportunities.

"However until Australia transitions from a linear economy to a fully circular economy, there will continue to be organic materials with limited recovery options due to their characteristics. Should they end up in landfill, the best possible environmental outcome is to capture the biogas they produce and use it to generate renewable energy. Essentially, recovering the energy of these materials and using them to power the circular economy," says Matthew.

A better way forward

"Biogas capture rates at landfills can vary significantly, so we strongly encourage regulators to pursue both energy and waste policies that will maximise biogas capture, therefore reducing carbon emissions. Beyond new supportive carbon policies, this could include incentivising landfill operators to pursue better environmental management practices rapidly, such as timely final capping.

"As more waste is diverted from landfill, anaerobic digesters (AD) can be used to generate nutrient outputs, substituting for fossil-based fertilisers and complementing compost operations, while the biogas generated can provide renewable electricity and heat or support emerging opportunities.

The ramifications are widespread and timely in a year in which more nations are ramping up commitments to carbon emissions abatement and introducing carbon border adjustments.

"Significant opportunities also lie ahead for renewable gases, such as biomethane and green hydrogen which can be derived from landfill biogas and AD. These fuels can assist with the decarbonisation of Australia's gas and transport sectors, We now need to begin this process if Australia is to meet our Paris climate goals. " Matthew said.

Where to next? "The key challenge for this bright future is achieving the right policy settings to accelerate sustainable waste management and renewable energy generation.

www.lms.com.au

CAPTURING THE CONSEQUENCE OF WASTE

- Modern landfills with >85% gas capture rates and renewable power generation offsetting grid emissions provide an emissions neutral outcome (and potentially even a net reduction)
- The total landfill biogas sector holds nearly a third of all issued ACCUs.
- LMS is the largest carbon emissions abater in Australia, responsible for around 15% of all issued ACCUs.
- LMS has 70MW installed capacity, including 4.2MW of solar PV.
- The company prevents more than 4 million tonnes CO_2e from being emitted each year and has saved over 41 million tonnes CO_2e from landfill emission.

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Harvesting sunshine

With the world fast transitioning to solar energy the outlook for inverter maker Sungrow is more than positive, says Australia Country Manager Joe Zhou who outlined company plans to devote resources to expansion in all market segments.

CONFIDENCE IN THE STRENGTH of the solar energy market is a fine thing and Sungrow has it in spades. And in the coming years, they say, ever more countries will be riding the renewables wave which will set the planet on a strong path to curbing carbon emissions.

Demand for clean technologies will soar.

"We anticipate a big boom in demand for more climate-friendly energy systems and technologies over the next two to three years," said Australia Country Manager Joe Zhou. "And Sungrow is primed for the boom."

His optimism follows an incredible year for the inverter colossus whose meteoric rise in annual capacity from 50GW to 90GW was facilitated by the development of new factories in India and China.

Significant investment in plants as well as resources and research with as many as one-third of company staff involved in R&D hammers home Sungrow's market conviction, and the company is on a sure footing for the future.

"Three years ago there were hundreds of solar companies but many have since departed the industry. We recognised the opportunity to step up and focus on R&D and develop higher production standards, and this has enabled us to secure an ever-increasing market share," he said.

Sungrow's range of solar inverters includes the popular SG series that have helped the company achieve 24 per cent market share within Australia's residential sector. But it's just the start, Sungrow plans to "keep pushing the boundaries here".

"Helping the process is Sungrow's sophisticated iSolarCloud monitoring platform which plays a significant role in maintaining a healthy system by helping customers monitor system performance and ensuring the best solar yield," Joe explained, listing useful functions that include a platform displaying all historical data which is vital for troubleshooting.

Should an inverter report a fault on iSolarCloud, the system also can provide installers tips for solving the issues.

Overcoming hurdles

Last year's pandemic was very tough for the industry and like many others Sungrow suffered from the uncertainty and travel bans.

"However, we recognised the challenges early on and took strategic action that enabled our business to not only stabilise but also grow during 2020," Joe said.

"Specifically, we strengthened our online presence by holding regular webinars and training sessions, trouble-shooting, customer meetings and other actions to streamline our day-to-day activities.

"We also ensured that we had sufficient stocks in our Greater Sydney warehouse to prevent supply chain issues for customers. With all the challenges put to rest, we delivered 450MW to the Australian market in 2020 in the residential sector alone, an increase of more than 120 per cent on 2019."

Moving in on the commercial market

Now Sungrow is keen to boost its share of the commercial PV market and is promoting the rollout of its CX Premium range inverters as ideally suited for the purpose.

"The commercial PV sector is the ideal market for us to increase our footprint. We launched our new CX range of inverters starting from 30kW to 110kW last year and gained good traction for these solutions among EPCs and project developers," Joe Zhou said.

He explained the CX range loaded with top-of-the-line features such as multiple MPPTs, standard DC Protection Cover, in-built DC isolator, easy monitoring setup on iSolarCloud etc which makes the installation and commissioning quick and easy.

String level monitoring, IV Scanning and the PID recovery feature enable simpler maintenance.

Adding a bit of market spin he said with a 10-year warranty and superior pre-sales technical support and after-sales service, Sungrow has "got it all covered", supporting customers over the entire lifecycle of the

The 1MW Bass Hill Plaza PV project near Bankstown west of Sydney equipped with Sungrow SG110CX inverters

The 2.2GW PV+202MWh ESS UHV project in Qinghai, China that went online in October 2020. Sungrow is proud to be associated with the project with its 250kW 1,500V string inverter (SG250HX – the largest string inverter in the market) and battery energy storage systems

system starting from design and installation through to commissioning, maintenance and service.

Late last year Sungrow launched the new 9.6kWh HV batteries, capitalising on the strength of demand in the local residential market and increasing self-consumption of solar power paired with back-up power during supply outages, along with greater participation of Residential Energy Storage Systems in Virtual Power Plants (VPP) and frequency services.

Sungrow puts the average battery size at about 10kWh, which maintains "a good balance" between the system cost and ROI.

"With the release of our new HV Batteries in the coming months, we aspire to be one of the leading residential energy storage system providers in Australia," Joe said. "This, combined with our popular hybrid inverters, means we are all set to capture a good market share in this sector."

There's more.

Upping the ante

A series of utility-scale solar projects in Europe, India, Southeast Asia, north and south America feature Sungrow technology. A prime example is the world's largest solar plant, a mighty 2.2GW power plant that went online in China in October 2020, and Sungrow is proud to be associated with the project with its 250kW 1,500V string inverter (SG250HX – the largest string inverter in the market) and battery energy storage systems.

The company is keen to participate in more Australian large-scale projects, emphasising its inverters are designed to operate in Australia's harsh conditions such as high heat and humidity.

"As an example, we could supply central inverters up to IP-65 ingress protection, with C5 anti-corrosion ratings suitable for coastal installations. We have installed our inverters in various conditions such as deserts, snowy regions, over water (on our floating PV systems), hilly terrains etc and are well aware of the unique climatic conditions of Australia," Joe explained.

A 100MW/300MWh of utility-scale BESS Project is underway in Australia and Sungrow is near to signing for a large-scale project but details remain under wraps for the time being.

Although confidentiality rules out revealing additional specific projects, what can be said is that Sungrow has a strong pipeline of front-of-meter projects in 2021 and beyond.

"Most of these projects have already passed the stringent grid studies of Australia and we shall see the deployments happening from Q3 2021 onwards.

"To get into the utility side of the market you need robust GPS and we have developed that as a model tool for the sector as approved by AEMO and Electranet.

"And so along with an already strong foothold in the Australian residential sector, we will be establishing ourselves more prominently in Australia's utility-scale segment in the coming years. We already have had a good breakthrough, and we shall see more solid deployments happening from this year.

"We will keep improving ourselves and our systems and technologies and prepare for greater challenges from the market and other players. We aim to always stay one step ahead."

https://sungrowpower.com

- Annual capacity in Sungrow's Chinese and Indian manufacturing facilities total 90GW; batteries ESS 6GW/6GWh.
- As of December 2020 Sungrow Power Supply Co had installed 154GW worldwide.
- During 2020 Sungrow deployed >450MW of inverters to Australian households securing a strong foothold (around one-fifth) of the residential market share in Australia.
- Globally, energy storage system shipment in 2020 was in excess of 800MWh.
- Within Australia Sungrow products can be sourced through OSW, Supply Partners and Solar Juice.
- A staff of 15 in Sydney cover sales and technical support, also engineering and service engineers at the ready to support local customers with their installations and daily use.

POWERING AHEAD

Co-founder of EVO Power is well known industry identity Jamie Allen who is excited about the future of renewable energy and the intelligent solutions that energy storage can provide to consumers and Distribution Network Service Providers. He commented on the fast growth of the energy storage market that will accelerate due to the falling price of lithium and greater uptake of rooftop PV.

Mindful of the increasingly competitive residential energy storage market, EVO Power is positioning itself as an engineering and projects focussed manufacturer with sights set on the commercial and industrial market. Timing is good, given one prominent supplier has withdrawn from that market and demand is on the rise.

Firstly, what can you tell us about the genesis and characteristics of EVO Power's ESS Prime system?

Our turnkey solutions are designed, engineered and thermally tested from our factory in Melbourne to Australian Conditions and Standards. Our team of mechanical and electrical engineers have spent 10 months developing and testing the PRIME series of Battery Energy Storage Solution.

During those 10 months we also carried out more than 40 days of testing in our environmental chamber pushing the system to extreme temperatures from negative 5 degrees up to 50 degrees at full power.

Once we were all happy with the design and our test results we had full system EMC testing carried out and TUV Australia tested and certified our systems to Australian Standards.

What distinguishes EVO Power ESS?

We are very confident with the solutions reliability as we have selected proven hardware and have a wealth of experience integrating ESS solution for the Australian market. EVO Power is an Approved Australasian Turnkey Solution Provider for the two largest EV/ESS cell manufacturers in the world (LG Energy Solutions & CATL), a partnership that ensures that our technology and pricing remains at the most competitive level.

We have also assembled an experienced and well-connected Australian management, sales and electrical and mechanical engineering team to provide strong technical support resources for pre-sales and after-sales project and service support to our ever-expanding knowledgeable dealer network and partners.

In all we believe that our dedicated team has the right quality and support focussed business model to be leaders in this more technical and project focussed C&I space, and our two key cell manufacturing partners who also believe are backing EVO Power to be the leaders in this C&I space throughout Australasia.

How smooth was the rollout?

Our Prime system is ideally suited to off-grid, small commercial and large residential applications, our biggest challenges was having the product ready to launch in the middle of the Melbourne COVID lockdown. EVO Power sells directly to solar and battery installation businesses nationally and we are growing our network of EVO Power Dealers.

Through dealers we have rolled out solutions to most states in Australia now and as our sales and engineering team can now travel interstate we are excited about getting back out and visiting installation businesses and expanding our dealer network.

How close a monitoring role does EVO Power play post ESS installation?

As the manufacturer of turnkey solutions our technical support team is on call to support installer technical calls and, if the system owner allows EVO Power access to their system's monitoring portal, we

EVO Power's new ESS range and global battery partnerships will be launched at the Smart Energy Conference & Exhibition in May at Sydney's ICC

keep a close eye on alerts or faults and inform the installation business with our recommendations on how to resolve issues.

Where is most interest in energy storage brewing?

Many of our current enquiries are from consumers wanting power reliability solutions for their remote properties that are exposed to frequent blackouts, bushfire risks and who are sick of losing money on running inefficient diesel generators. Some customers are so passionate about renewable energy they are disconnecting from the electricity grid and installing large solar and storage systems.

What wider targets are in sight for EVO Power?

EVO Power has a strong focus on providing commercialised project sized ESS solutions to the Australian and Pacific markets. We aim to provide high quality and high-performance solutions to support commercial properties like council buildings, factories and shopping centres from 15kW to 500kW power requirements. This new range and exciting new global battery partnerships will be launched at the Smart Energy Conference and Exhibition in May and will be a scalable solution in 100kW/260kWh liquid cooled increments to 2MW/5MWh.

Have you observed any shifts in demand in energy storage?

The past two years have been very up and down in the ESS space, many installation businesses are busy just keeping up with demand for residential and commercial solar installation. However lithium based ESS prices are now at a point where combined with solar that they are well ahead of diesel generation systems and in the commercial and industrial markets can now compete in the National Energy Market.

We are seeing an increase overall in requirements for standalone power systems from utility networks and consumers setting up their (off-grid) weekender properties up to 60kWh, also lots of new opportunities are now coming from the 500kWh to 5MWh space.

Further, many Councils are continuing taking up the renewable energy challenge and a series of ongoing Federal and State government programs encourage this. With continued pricing improvements for solar and battery installations Councils are realising that the benefits are not just environmental; they are saving thousands of dollars and recognise that ESS provides important backup power to specific sites.

The new 100kW to 2MW Liquid Cooled Battery solutions 'NEO' being launched by EVO Power at the Smart Energy Conference & Exhibition in May is touted to be "at a quality and price point not seen before in the Australian market".

Any more comments on the uptake and direction of smart energy storage systems?

EVO Power has a strong focus on ensuring its control software platforms remain flexible through online API [Application Programming Interface] protocols for C&I solutions. This allows future proof 'Smart Energy' third party control of our systems by various energy retailers, utility networks and Virtual Power Plant optimisation operators. We see this as critical as the market adapts to a range of current applications including Frequency Control Ancillary Services, Peak Shaving, Energy Arbitrage and prepares for mass adoption of Electric Vehicles.

www.evopower.com.au

"Lithium based ESS prices are now at a point where combined with solar they are well ahead of diesel generation."

SMART ENERGY
CONFERENCE & EXHIBITION

SMART ENERGY ON SHOW 2021

Positioning Australia as a Renewable Energy Powerhouse and Exporting SuperPower

Wednesday 12 and Thursday 13 May 2021 | SYDNEY ICC, Exhibition Halls 5 & 6, Level 4

JOIN US FOR ONE OF THE BIGGEST ENERGY EVENTS OF THE YEAR AT THE SMART ENERGY CONFERENCE & EXHIBITION 2021

For this first time in many months industry has a chance to gather in person under one roof and see what's in store for the renewable energy industry.

Rendezvous with your industry colleagues, meet new people, hear from experts and see industry innovation on show. Talk to those in the know.

Featuring three concurrent, FREE TO ATTEND conference streams.

SMART ENERGY POLICY AND TOPICAL ISSUES: Emerging trends in PV and storage battery uptake, green hydrogen, VPPs, DERs, electrifying the vehicle fleet, solar cell advances, addressing network and infrastructure issues.

Australian and international approaches to climate change, emissions policies and targets, and carbon-laden products and exports.

PROFESSIONAL DEVELOPMENT STREAM WITH CPD POINTS: The market in action; Boosting market potential: How to win customers and improve sales performance.

SMART TECHNOLOGY IN THE EXHIBITION HALL: The latest technology and products on offer from leading manufacturers and innovators. Talk to exhibitors and gather information.

Some of the prominent exhibitors feature on the following pages.

MORE TO SEE AND DO AT THE SHOW:

- DNV GL Breakfast Thursday May 13, 2021 7:30am-9am (invitation only)
- Firmer – Wednesday 12th May 2021 11am-12pm
- Enphase – all day training on both days
- Fronius – Two training sessions each day
- AWISE – Gathering for women in solar on Wednesday afternoon
- REC – Network drinks Hall 7 from 5pm to 7pm Wednesday May 12 2021

Details will appear in the Event Guide and on the event app.

The 2021 Show is an Approved Event under the Austrade Business Events Grants Program. Exhibitors and sponsors at Smart Energy 2021 can apply for a grant to cover up to **50% of the costs of participating in the conference and exhibition**. Austrade Grants from $10,000 to $250,000 per entity are available.

Grant applications close at 5pm (AEDT) on 30 March 2021 or earlier if funding is exhausted.

For further information visit https://business.gov.au/grants-and-programs/business-events-grants

"May 2021 is the time to make a smart business development move. Join us for a great line up of leading industry experts enlightening us on the transition to a healthier, greener economy. The Smart Energy Show is the most effective and efficient way to reach target audiences and to gain resources and insights that will deliver ongoing value."

JOHN GRIMES, CHIEF EXECUTIVE, SMART ENERGY COUNCIL

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INNOVATION MAKES SOLAR ENERGY INCREASINGLY ATTRACTIVE

DURING 2020 many things changed, the way we meet, the way we work and more, all because of the pandemic. In the solar industry, people switched to join webinars, online meetings and virtual exhibitions. How the solar industries stay connected was changed. However what has not changed is continuous innovation within the solar industry. COVID-19 did not hinder leading solar PV companies in their efforts to bring out product innovations.

"For sure, the pandemic did bring challenges, but product development at Growatt continued and we recently introduced new three-phase inverter MOD 3-15KTL3-X in Australia," said Lisa Zhang, Growatt Marketing Director.

"It's part of our continuous efforts and commitment to bringing advanced and reliable PV solutions to Australian customers."

Building a presence

More than a decade ago when Growatt exported its first load of inverters to Australia, the company set up its local service centre to provide better technical support and more efficient customer service and has since established itself as an indispensable player of Australia's solar industry.

Over the years, the company has built robust partnerships with local distributors and installers. The company has been awarded Top Brand PV Seal 2020 by German market intelligence provider EuPD Research for its leading position in Australia in terms of reliability, market penetration, brand awareness, satisfaction etc.

"With over a decade of experience in the Australian market and the solar industry, our team understands what customers need and the technological trend in solar energy," Zhang said.

"When you look at our new generation three-phase inverter MOD 3-15KTL3-X, you'll find it has an elegant and compact design, enabling a better fit for homes. It's also designed to provide better HMI (human machine interface) experience for users. It comes with OLED (organic light-emitting diode) display and a clearer interface as well as a touch button that's more durable and can last over three million clicks."

Additionally, the new inverter makes installation and configuration easier for installers according to Zhang.

The MOD 3-15KTL3-X inverter has two MPPTs and can be oversized at up to 1.5, facilitating flexible PV system design. The installer can also have access to Growatt's OSS (Online Smart Service) cloud platform for remote monitoring and smart O&M.

"At Growatt, we provide a wide variety of monitoring solutions using various communication solutions such as WiFi, RF radio frequency, GPRS (General Packet Radio Services, a packet-based wireless communication service) and RS485 to meet customers' demands and requirements," Zhang explained.

Using the Growatt OSS system, installers can monitor their installed solar plants and diagnose system issues remotely. Configuration and software upgrades can be also done on the OSS system to allow troubleshooting.

That can significantly reduce onsite visits by 60 per cent, save time and lower O&M costs, Lisa Zhang said.

In a way, the product innovation by Growatt reflects how Australia's solar industry as a whole has been benefiting from continuous efforts and innovations by committed players in the country with LCOE (levelised cost of energy) of solar being driven down and smarter features being introduced to PV systems, enabling more powerful functions to make solar an increasingly attractive energy solution for householders.

Growatt

Founded in 2010, Growatt provides residential, commercial and utility-scale PV inverters, energy storage, microgrid systems and smart energy management solutions and ranks among the global top 10 PV inverter suppliers according to IHS Markit and Wood Mackenzie.

Growatt invests heavily in research and development and its R&D team has more than 400 professional engineers.

By the end of 2020, Growatt had shipped over 2.5 million inverters to more than 100 countries.

www.ginverter.com

Visit the Growatt team on stand number 60 at the Smart Energy Conference and Exhibition in May at the ICC Sydney

Growatt Marketing Director Lisa Zhang says installers can monitor solar plants and diagnose system issues remotely by using special company software.

AN AGE WHEN ENERGY SHOULDN'T COST THE EARTH

AlphaESS is offering residential batteries at a 'terrific' price with a 30kW off-grid solution for Australian households and businesses.

HARNESSING SOLAR ENERGY and storing it for use when required is a step towards being in control of your energy demands, and that is the central mission of AlphaESS. Since the establishment of its Australian subsidiary in 2015, AlphaESS has significantly developed its energy storage business, providing Australians with greater independence.

And with advances in battery storage technology, a growing market for consumer electronics and demand for electric vehicles driving down prices much faster than anyone expected, now is the time to take on home energy storage.

AlphaESS is pleased to present the new 13.3kWh home battery and 30kW off-grid solution for big families and outbound business owners.

Home battery with a competitive price

Alpha's new systems could be the turning point for large families with a vision for a home battery plan but hesitating due to the financial situation. The new home battery promises 10.3kWh/13.3kWh storage capacity, a 10-year warranty, and a long lifespan with 8,000 cycle life.

AlphaESS fully understands the dilemma that big families are facing these days. More people under one roof, greater ownership and use of home appliances and with that more electricity consumption and higher power bills, yet tighter budgets.

That's where AlphaESS steps in to save money through the best deal!

As with the old 5.7 battery module, the new offering can be integrated with the SMILE5 5kW inverter and form a sleek all-in-one home battery system. The best part of the plan is not only the cost-effective investment, but the payback from bill savings, feed-in tariff and VPP offerings.

According to industry data total electricity savings with AlphaESS 13.3P is predicted at over $15,000 in 10 years, and nearly $27,000 over 15 years.

With energy storage taking off, AlphaESS is providing a true game changer.

The very first 30kW hybrid and off-grid solution in Australia

- **Off-grid Available**

H30 works perfectly with PV panels in off-grid areas. Those with an existing diesel generator can simply use it for backup power (even though it may not be needed).

- **3 Phase System**

Unbalanced 3 phase load can be connected to the H30, maximum 10kW for each phase.

- **Hybrid System**

1. Hybrid simply means that H30 can be connected to PV panels and diesel generator directly so owners can cut their budgets by avoiding various kinds of inverters, saving in the process.
2. Meanwhile, AlphaESS guarantees to provide a neat deployment and sleek all-in-one system.

Information, views and technical details on this page supplied by Smart Energy Conference & Exhibition Partner

3. Cut the red tape with a direct line to after-sales support.
4. Strong power generated from the PV? No worries! H30 can handle up to 60kW PV power!

- **Battery Capacity**

8.1kWh modular
64.8 ~ 2106kWh available

- **Flexible location**

Outdoor / indoor installation available

- **Warranty Options**

a) 5 years product warranty + 10 years performance warranty
b) 10 years warranty

Larger solution starts from 50kW

- **T50 - 50kW ESS (Energy storage system), Gundaroo farm, NSW**

At Gundaroo farm a T50 energy storage system has been integrated into a 62.5kW solar system to satisfy the entire farm's electricity needs, so it can be independent from the grid. To match up with the existing solar system, AlphaESS provided a solution consisting of a 50kW output inverter and 103kWh energy storage capacity.

Being off-grid might sound a bit extreme in a modern society however these days advanced energy storage technology makes off-grid an available option for those who cannot fully access the grid but do have the benefit of sunlight. AlphaESS is happy to help property owners achieve the energy independence for a future powered by clean and reliable energy.

- **T100 - 100kW ESS, advertising company, New Zealand**

An advertising company in Auckland, New Zealand has provided inspiring services to the community for over 30 years. Now AlphaESS has enabled the company to contribute more: the installation of solar panels and a 100kW/237kWh ESS has resulted in green energy becoming the main power source for the company's daily operations.

Specifically, the system satisfies three major missions in daily life:
1. Storing the excess solar energy
2. Peakshaving / loadshifting - discharging during certain times or when consumption from the grid reaches the pre-set limit.
3. Makes full use of the TOU Tariff Structure - in this case, T100 has been programmed to charge at night so the cheaper off-peak power rates would be applied.

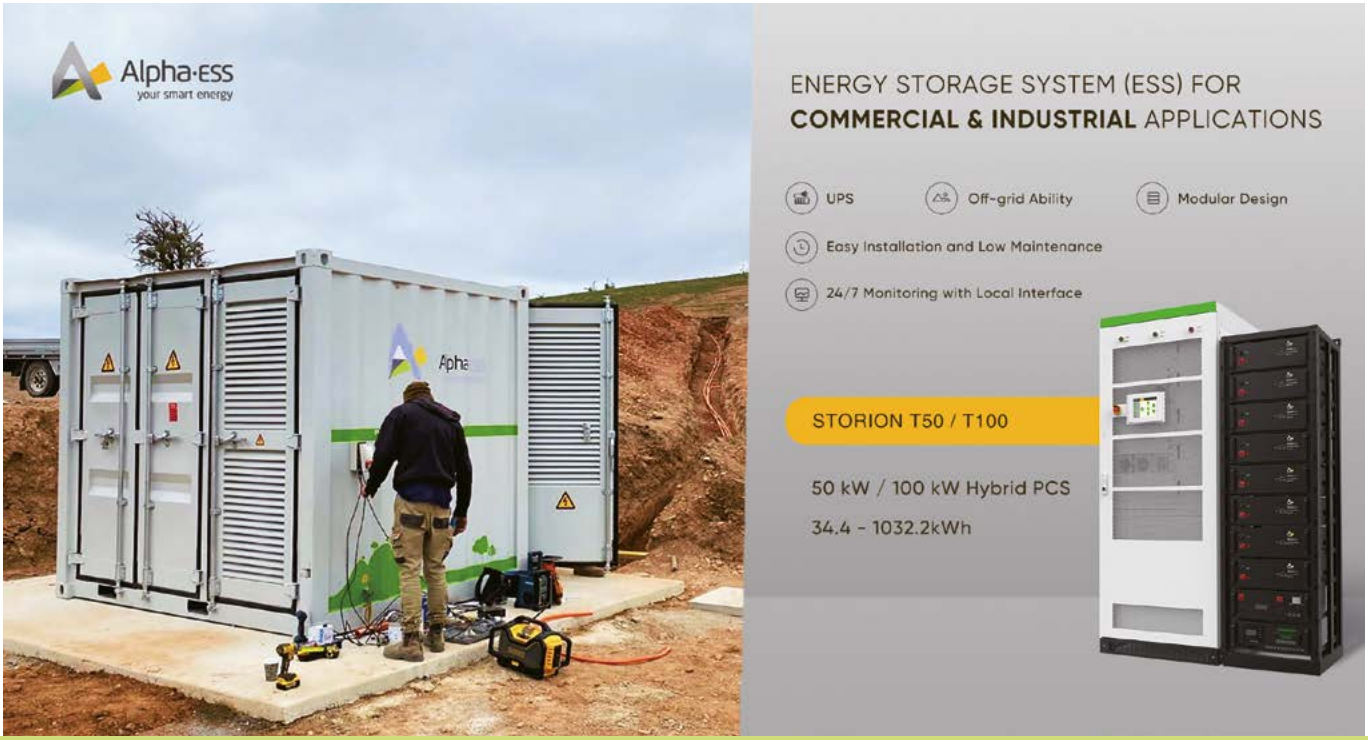
About AlphaESS

Founded in 2012, AlphaESS is one of the leading energy storage solution and service providers in the globe. The company specialises in the residential and commercial market, aiming to deliver the most cost-effective and fit-for-purpose solutions.

AlphaESS has more than 10 subsidiaries providing local services and 40,000 systems actively running in over 50 countries, enabling millions of people to live with reliable, accessible and clean energy.

For more information: info@alpha-ess.com, Tel: 040 250 0520 or 1300 968 933 (press 2 for sales), www.alpha-ess.com

Visit the AlphaESS team on stand number 53 at the Smart Energy Conference and Exhibition in May at the ICC Sydney



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PYLONTECH MEETS BOOMING GLOBAL ENERGY STORAGE DEMAND WITH DEDICATED INNOVATIVE R&D

ONE OF THE WORLD'S leading providers of Energy Storage System (ESS) solutions, Pylon Technologies has announced it is on track with the tight schedule of a 4GWh expansion within the three-year plan.

It's all hands to the wheel, according to Wen Tan, CEO of Pylontech who said "We took just three days off during the Chinese New Year holiday for both cell production and capacity expansion, it's a departure from Chinese traditions but we are eager to serve our long-time customers with more resources."

He commented on the successful IPO in China's Shanghai Stock Exchange STAR Market on 30 December 2020, as the first energy storage focused listing company Pylontech raised more than 2 billion RMB (US$301m) from public investors.

Since 2013, Pylontech has developed a strategic blueprint for BESS (battery energy storage systems) in the global market. For example during recent years Pylontech has grown steadily with the advantage of vertically integrated LFP (lithium ferrophosphate battery) ESS solutions.

Products cover the full range of voltage from 12V to 1500V and full capacity from 500Wh to more than 100MWh, meeting the demand for residential ESS, C&I ESS and grid tie services.

There is a saying that opportunity awaits those who are well prepared; which sheds light on Pylontech's success. And opportunities abound.

Market analysis reveals the global energy storage market is undergoing rapid development and in particular demand for lithium-ion battery energy storage is rising significantly. At the same time, supplies are falling short. Data indicates that in 2019, the global market demand for lithium-ion batteries for communication base stations was 12.1GWh. By 2025, demand is expected to reach 60GWh.

Collaborative culture enhances operations and hastens transition to renewables

"Over the past decade we had been redefining the electric power's generation, storage and usage with our partners globally," said Geoffrey Song VP of international business.

"Continuous innovation and widespread collaboration are the only route to an efficient, sustainable and affordable new energy structure, we strongly believe in the carbon neutral commitments from global leaders and strive to contribute our passionate force in the movement."

Battery energy storage is poised to become one of the most critical components to any renewable energy project.

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Renewables are expected to expand approximately 50 per cent by 2025. Corporate funding for energy efficiency, smart grids, BESS increased 75 per cent last year, indicating continued confidence in the energy sector's trajectory. Anticipating and facing challenges will help keep this sector on track to achieve global environmental goals.

The innovation for reliable/scalable/affordable energy storage systems is indispensable, Pylontech strives to innovate in these areas based on our technology and application know-how to make a better world. Ned Yu shed more light on Pylontech operations as follows.

Services provided by Pylontech for BESS

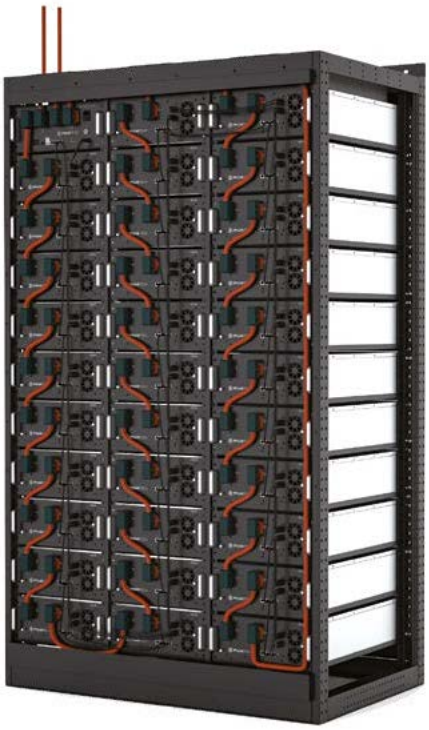
Pylontech covers all aspects on the DC side and in vertically integrated from Li-ion battery cells to pack, module, rack and containers; we work with our power converting partners covering all scenarios including energy shifting, micro grid, storage plus charging, frequency responding, ancillary services, backup services and more.

What are the most important aspects for BESS deployment?

It's hard to determine the most important factor for BESS as we are at the beginning of this huge evolutionary industry, but if I have to put it down to one aspect, I'd like to say dedication.

The development of BESS requires attentiveness combined with the highest safety level and longest life cycle performances, given it combines electric-chemistry, electric power engineering, communication, system controlling and integration. It takes ambition and perseverance as well as substantial resources to deliver a satisfying result.

Pylontech brings more than eight years' dedication to the industry and up to seven years in the Australian market, and would like to work closely with partners with similar attitudes.



New product solution available in Australia

During the past seven years we have continued to provide new features and improvements on performances such as deeper DOD (depth of discharge), higher power, larger expandable capacity and more.

After the very special year of 2020 we are accelerating our steps into Australia and bringing more products and features. In the residential sector, alongside our Force L/H series, we are introducing the C version of star product US series and other exciting products will be announced in Q3. In the C&I sector our reliable and flexible Powercube M series will have a new M3 with higher energy and power density coming into the market. And for the grid-scale BESS market our 1500V product will be performing in a much more efficient way with our local partners.

Pylontech will present more detailed product information during Smart Energy Council websites, seminars and through other media.

For more information contact
Ned.Yu@pylontech.com.cn, http://pylontech.com.cn

PYLONTECH

Visit the Pylontech team on stand 59 at the Smart Energy Conference & Exhibition in May at ICC Sydney

'YOU ARE MY SUNSHINE'

TOP REASONS TO CHOOSE HUAWEI RESIDENTIAL SMART PV SOLUTION

RENEWABLE ENERGY is hot. Investors have placed renewable energy investments at the top of their wish list even ahead of technology – the sector completely outshines technology stocks, property and even gold, according to research. Investment aside, in an effort to reduce their carbon footprint, we now see more and more homeowners across the world turning to solar energy. Today, the photovoltaic (PV) cell is widely considered an essential part of addressing climate change by weaning the electricity grid off fossil fuels.

Huawei finds its place in the sun

Believing that the future belongs to renewables, Huawei, a Fortune 500 company, is using its vast expertise in communication technology to seamlessly integrate 5G, IoT, optical, IP, cloud, big data, and AI technologies into their solar power systems.

The next generation of residential smart PV solutions

Huawei offers a full suite of smart PV plug-and-play solutions for homes that include inverters, battery bank, monitoring and mobile software controls.

Their latest residential products are classified under two distinct categories:

- The 2-6kW SUN2000-2-6KTL-L1 (single phase battery-ready inverter)
- The 5-6kW SUN2000-5/6KTL-M1 (3 phase battery-ready inverter)

These systems, combined with second generation optimisers and the LUNA2000 intelligent battery storage system, make up the Smart Energy Centre.

Why choose Huawei?

1. True-hybrid Inverter. Battery-ready with high voltage DC coupled battery interface which allows an expansion of the battery system by simply plugging and playing. Backup Box and 5-30kWh Luna Battery compatibility.
2. More usable energy with Huawei Smart String ESS, with 100% depth of discharge.
3. Optimiser ready. For full and partial shading, better meets complex rooftop challenges. 5~30% more energy yields by optimiser solution when compared to conventional string inverter solution.
4. Reliable brand. Ranked 49 in Global Fortune 500, harnessing more 30 years of expertise in digital information technology. 10-year warranty and 24/7 hotline.
5. Ultimate safety with AI-powered AFCI. Accurately detects arc faults and shuts down inverter within 0.5 secs in case of an emergency.
6. One-fits-all solution. One service window for all technical enquiry and single app for all set up & monitoring.
7. Communication, built-in as default WLAN communication and also support Ethernet and 4G communication as an option.
8. Lightweight, easy installation thanks to being compact 12 kilogram power module and 50 kilo battery module for easy installation by one or two people.

It's the next level. "Huawei's PV business has evolved from digital PV to internet-powered PV, and now to AI-powered PV" says Chen Guoguang, President of Huawei's Smart PV Business Unit.

Huawei's strength is its ability to integrate leading ICT technologies – such as 5G, AI, and the cloud – which have developed rapidly over the past two years with solar and storage. By using digital technologies to connect energy products, enables preventive maintenance, and realises the 'intelligentisation' of energy products.

Built to last: Quality and reliability are of paramount importance for solar inverters and Huawei ensures that its inverters are subjected to some of the most extreme and rigorous testing procedures unparalleled in the industry, including subjecting the inverter to real lightning strikes!

The Huawei laboratory and testing facility is recognised by leading international testing verification organisations including TUV, UL and FCC. They perform many extreme durability tests including thermal cycling, extreme humidity and salt-mist corrosion, and even submerge the inverters underwater.

What's next? The grid of the future is the solar inverter enabled with storage that is an interactive asset that can be controlled in part by the homeowner but also in part by the grid operator or an energy aggregator. That requires a very different product from residential solar 1.0. And that requires the kind of innovation that only Huawei delivers. Watch this space.

http://solar.huawei.com/au

Visit the Huawei team on stand number 26 at the Smart Energy Conference & Exhibition in May at the ICC Sydney

HUAWEI

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GLOBAL ESS PIONEER SOLAX POWER SEES BRIGHT POTENTIAL FOR AUSSIE PV MARKET

SolaX Power, which was one of the earliest enterprises to deliver energy storage inverters, has invested in and contributed to a series of Australian Virtual Power Plants programs and teamed up with an energy specialist to provide a generous feed-in-tariff to Australian residents.

DESPITE THE BUSHFIRE and lockdown rendering 2020 a challenging year for Australia, the PV market got through the barriers, and many state governments scaled up solar and battery schemes.

Market analyst IHS Markit reported that approximately 82,000 energy storage units were cumulatively installed in 2020, and more than 10,000 of them were delivered by SolaX Power according to the SolaX Sales Analysis Report in 2020.

SolaX Power regards Australia as one of the most important markets, with its location on a sunny, spacious and beautiful continent and its unlimited potential for developing PV programs including Distributed Generation, VPPs and other world leading renewable-energy technologies.

Continuous development

SolaX Power which is one of the few suppliers in China providing string inverters and energy storage solutions has been researching and developing its core technology of energy storage solutions relying on its solid technical foundation.

The first generation of the SolaX X-HYBRID inverter was delivered in 2013 and was the first such energy storage inverter in Asia. It was a tremendous milestone for SolaX Power which has continued to prove its strength in researching and developing energy storage solutions and its position as a top tier energy storage enterprise among the global industry.

At the end of 2020, UK based *PV-Magazine* reported the launch ceremony of the fourth generation of SolaX energy storage system, X-ESS G4. The all-in-one solution contains concentrated multiple self-developed innovations and technologies.

SolaX Power has drawn up strategic growth plans based on its knowledge of the global energy storage industry. Having built local service teams and provided residential solutions specifically for Australia, Europe, North America and Japan markets, SolaX Power keeps complementing the global product lines and has built its brand, products and solutions to more than 100 countries and areas.

SolaX Power laboratories ensure the products and solutions can be reliable enough under the most rigorous situations, and SolaX Power products and systems have been awarded certificates including AS/NZS 4777, CE, EN 50549, VDE 4105, JS S-mark etc.

As a steadfast manufacturer and supplier, SolaX Power actively invests in and contributes to many local programs. Last November, Channel 9 TV's *Current Affairs* reported the 40c/kWh feed-in-tariff (SolaX Power and Social Energy co-announced the FiT deal which is more than four times the average FiT in Australia).

SolaX Power has been supplying VPP solutions globally and teamed up with Social Energy to develop VPP programs in Australia, linking its self-developed Triple Power batteries to smart networks. SolaX Power provides practical solutions to cater for Australian demands and conditions such as blackouts caused by bushfires or flood.

R&D

SolaX Power has devoted much time to the research and self-development of energy storage technologies. As recently reported, SolaX Power has applied for Initial Public Offering (IPO) and will be listed on the share market by the end of 2021.

SolaX Power is committing to a stricter operating standard and appreciates the trust and confidence of users and investors. Main shareholders and investors include major power and electricity companies and energy companies in China.

Manufacturing capabilities are being expanded in order to keep up with increasing global demand, with a new plant under construction adjacent to the existing base in Hangzhou, China, which is well-equipped with world-class producing and testing facilities.

SolaX Power manufacturing capacity is expected to double or triple by the end of 2022.

www.solaxpower.com

Visit the SolaX Power team on stand 57 at the Smart Energy Conference & Exhibition in May.

DYNESS BATTERY ENERGY STORAGE SYSTEM FOR DAY AND NIGHT-TIME POWER

DYNESS IS A HIGH-TECH COMPANY focusing on the research, development, and manufacturing of LFP (LiFePO4) energy storage solutions.

Currently Dyness has two R&D centres and two production factories in China. The company has also set up branches in Australia and South America and to better serve local users.

With strong R&D capability and production capacity, Dyness has developed products in multiple energy storage fields and obtained a number of patents. All company products are produced in strict accordance with international standards, and have obtained CEC, CE, IEC, EMC, ROHS and other certificates.

Dyness battery solutions are unique:

1. CEC approved and qualified for solar battery schemes: Dyness batteries are CEC approved and qualified for the South Australian and Victoria solar battery rebate schemes.
2. More inverter options: Dyness batteries are compatible with a wide range of hybrid inverters in the market. Including Goodwe Solis, Imeon, SAJ, Luxpower, Sungrow etc.
3. Premium design and easy installation: Dyness products offer a range of modular design, IP65 optional, easy-installation solutions for on-grid & off-grid residential and commercial applications. They are scalable from 2.4kWh to 144kWh. Maximum flexibility for any application with up to 40 modules

connected in parallel without additional device support needed.

4. Market proven quality products: Dyness batteries are high-quality and good value products, which is reflected in the thousands of units sold globally in markets such as Europe, Brazil, Japan, and South Africa. By the end of 2020, Dyness home installations numbered more than 80,000 units across the globe.
5. The new HV Tower battery solution: Dyness is launching its high-voltage battery system (200~700VDC) for the Australian and European markets.
6. Dyness offers a new solution for camping and RV applications: Dyness is launching the latest battery solutions for the RV and camping market, to provide customers with power freedom during trips.
7. Dyness provides customers with flexible solutions for different applications and capacity demands of customers. And Dyness is keen to create a win-win collaboration by providing market rebates for customers.

Dyness products are used across Europe, Oceania, Africa, South America and Asia, enabling thousands of end users to achieve energy self-sufficiency and energy independence, as well as contributing to the world's clean energy goals and providing relief to stressed energy grids.

The company notes Australia has the highest roof top space per capita in the world, 80 per cent of people live in houses with the largest house space per households. Therefore, Australians have the inherent advantage of deploying renewable energy through photovoltaic and battery storage solutions.

As subsidies for solar STCs decrease year by year, and as the South Australian Home Battery Scheme and NCT Home and business battery schemes that the Victorian, ACT and NSW governments will issue along with new and successive battery subsidy policies, the Australian battery energy storage market will usher in new growth points.

Dyness Renewable Energy Australia is committed to bringing more and better energy storage solutions to Australian users, as well as creating more job opportunities and economic value for Australians.

For more information visit http://dyness.com.au

Visit the Dyness team on stand number 43 at the Smart Energy Conference & Exhibition in May at the ICC Sydney

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THE FRONIUS PRIMO GEN24 PLUS

THE SINGLE-PHASE Fronius Primo GEN24 Plus hybrid inverter – a compact, versatile all-in-one solar energy supply solution – is now available in Australia and New Zealand.

The GEN24 Plus offers a unique range of solutions, whether for photovoltaics, storage, backup power, heating or e-mobility, making it a milestone in the energy revolution for use in the home or for small commercial systems.

The new Primo GEN24 Plus hybrid inverter from Fronius has already shone in the prestigious German Plus X Award, heralded as "product of the year" in four categories by the expert jury.

It combines proven features such as Multi Flow Technology, the Dynamic Peak Manager and free energy management through Solar.web.

These features are complemented by smart innovations such as an integrated basic back-up power supply through the PV Point in case of grid outage, and a quick three-step commissioning process using a smartphone or tablet. A new service concept allows almost all parts to be replaced individually, with Fronius going the extra mile on the road to greater sustainability and resource conservation.

Ultra-flexible system design

The Fronius SuperFlex Design and improved Active Cooling Technology give the design of the PV system maximum versatility.

"The GEN24 Plus can do it all, whether hung up, lying down or in a mounting bracket, whether indoors or outdoors, even unprotected. Roof constructions with differently aligned and small surfaces can also be optimally used for energy generation," explained Leonhard Peböck, Product Marketing Solar Energy at Fronius International GmbH.

"The Primo GEN24 Plus DC input voltage range starts at 65 volts and goes up to 600 volts, allowing strings of three or more modules to be implemented. With active cooling, not only is the maximum service life of the power electronics in the inverter achieved, but the MPP trackers can also be loaded with significantly more current and more strings can be connected in parallel."

The simple answer to shading

With the Fronius Dynamic Peak Manager, you can always bring out the best for your customers – even when there is partial shading. This highly efficient MPP tracking algorithm detects any shade and optimises the yield at the string level. No additional, sensitive components are needed at the module level, as it is already integrated into the GEN24 Plus. Not only does this cost less because there are fewer system components, it also keeps installation and service costs to a minimum. In addition, having the lowest number of system components and a minimal number of connection points increases the safety of the solar system.

In comparison, power optimisers need energy to boost or decrease. The more shade there is, the higher the consumption of the optimiser, and the lower the efficiency. This means, especially in partial shading, that power optimisers often cannot compensate for the shade, so they do not generate a higher yield.

Acting Managing Director of Fronius Australia, Hans Georg Einwager added, "A string inverter system with an advanced MPP tracking algorithm gives the easiest solution for system design, along with the highest possible yield. The myth that partial shading on solar modules

pulls down the production of the entire module or string in a system is simply not true. The Dynamic peak manager provides the most cost-effective solution if shading is unavoidable."

Plenty of open interfaces

The GEN24 Plus is a forward-looking, future-proof introduction to solar self-sufficiency. It already has the most important interfaces for extensions with batteries, water heating and electric car charging points or for connecting external systems on-board. This forward-looking equipment with four digital inputs and outputs (I/Os) allows the parallel energy management of several consumers, such as heat and pool pumps. In addition, the compact housing offers sufficient space in its protected interior, should further relays or overvoltage protection be required.

Simple installation and commissioning

The inverter can be installed in a few simple steps, saving time and money, thanks to the sophisticated wall mounting system, push-in spring-loaded terminals and 180° quick-release screws. Using the new Fronius Solar.start commissioning app, configuration and registration can take place in just three steps via smartphone, tablet or laptop. Other useful platforms such as Fronius Solar.web or Solar.SOS are also available to provide an overview of the system status, energy management and service.

Orders for Fronius Primo GEN24 Plus can be placed through any authorised Fronius Sales Partner.

More details on the Fronius Australia website https://www.fronius.com/en-au/australia

Fronius is presenting training sessions on the GEN24 at the Smart Energy Conference & Exhibition at the ICC Sydney. Sessions will run from 9am to 10am and later from 2pm to 3pm on both days (four sessions in all).

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EXTENDING THE IN-FLUENCE

Fluence has been selected by AGL to supply projects within its planned 1,000MW (1GW) portfolio of grid-scale battery-based storage projects in Victoria, NSW and South Australia.

The gentailer has committed to build 850MW of battery-based assets by 2024, located near its Loy Yang A power station in Victoria (200MW), Liddell (150MW) and Broken Hill power stations in New South Wales (50MW), and Torrens Island power station in South Australia (250MW).

Fluence's latest-generation Gridstack technology will support the National Electricity Market by providing support on weak areas of the network by delivering synthetic inertia and reducing the need for similar services traditionally provided by natural gas in Australia, Regional Marketing Manager, Asia Pacific Steven Goldman explained.

He remarked on the stellar year for Fluence which secured a US $125 million investment from the Qatar Investment Authority and acquired software developer Advanced Microgrid Systems in addition to a series of energy storage megaprojects around the globe.

It's two years since Fluence, a Siemens and AES company, successfully secured interconnection for a grid-scale battery-based energy storage project in Australia, the 30MW/30MWh solution deployed at AusNet Services' Ballarat Terminal Station in Victoria.

www.fluenceenergy.com

SUNGROW recently launched its second generation three-phase residential inverters tailored for the Australian landscape.

The residential line-up of Sungrow's Gen-2 three-phase inverters come in five variants: 5kW, 7kW, 10kW, 15kW and 20kW and are loaded with cutting edge technologies such as Arc Fault Circuit Interrupter (AFCI) to reduce the risk of electrical fires and Smart IV Scan and Real-time monitoring for quick fault location and troubleshooting.

Also included is a wide MPPT voltage range (180V-1000V) translating to higher system yield and a fully compliant built-in DC Switch enabling easier installation and huge cost-savings.

As at December 2020 Sungrow had installed more than 154GW power products in 150 countries. Its local team of 20 operate from offices in North Sydney and warehouses in greater Sydney.

Read more about Sungrow's activities on pages 40-41 where Joe Zhou, Country Manager of Sungrow Australia reveals plans for expansion.

www.sungrowpower.com

GOODWE has increased its warranty to a standard 10-year full warranty across its full range of on-grid inverters for users registered on GoodWe's Smart Energy Management System portal. The 10-year warranty period applies to all inverters produced after October 1, 2020 and installed in Australia after January 1, 2021.

Dean Williamson, Country Manager of GoodWe Australia stated the increase "shows our strong desire to stay in the Australian market for the long haul" and is encouraging all customers to connect to their SEMS portal (www.semsportal.com) and to upload the inverter's power generation data for the warranty to take effect.

GoodWe boasts delivery of two million inverters and installations of 16GW in more than 80 countries

www.goodwe.com.au

Q CELLS which is best been known as a panel manufacturer is now launching its own inverter and battery.

The key differentiator for Q.HOME, which is scalable from 4kWh and 12kWh making it suitable for most types of homes, is that it is the first seamlessly integrated hybrid inverter and battery system introduced to the Australian market, Q CELLS Australia Key Account Director Myungsin Shim said.

The Australian launch of the new solar energy storage system comes on the back of Q.HOME's successes in the European market. Q.HOME can be paired with either of Q CELLS' new launched premium panels with 25-year product warranty, the Q.PEAK DUO-G5+ or Q.PEAK DUO-G6+.

The Q.HOME system, on average, is expected to generate 355kWh more energy than the industry standard or a surplus of 35.5kWh per year which is the equivalent of running five 10W LED lights for two hours longer every day for 10 years, the company says.

The Q.HOME's Home Energy Management System (HEMS) will be able to monitor and help consumers predict household usage patterns and solar energy production.

www.q-cells.com.au

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SMART ENERGY COUNCIL

OPEN THE DOOR TO A GREENER FUTURE

Since 2016, YES Group have been working with South Australian land-owners and investors in reactivating redundant land parcels by creating a network of large-scale solar farms through its Redmud Green Energy project. We are actively assisting agriculturalists in diversifying their business enterprise by introducing new markets to regional centers, stimulating jobs and economic growth and retaining generated revenue within local communities. For information about investing in the future of green energy visit redmud.net.au.

yesgroup

yesgroupsa.com.au

FORECASTING SUNNY DAYS AHEAD

Australia's largest weather business, Weatherzone recognises solar energy as a vital form of renewable energy and is working closely with the solar farm industry to further enhance the double-digit growth the sector has been experiencing throughout Australia in the past few years.

Industry specific products and software including the Solar Forecasting Solution, Storm tracker, Lightning Detection and Weather Data – both live and historic – enable planning, safety and reliability and are actively enhancing the renewable energy sector.

Weatherzone services both the grid-scale ground-mounted solar systems and owners of commercial solar rooftop systems.

To date 3GW of big solar farms have used Weatherzone services.

www.weatherzone.com.au

Integrated PV module manufacturer **TRINA SOLAR** is launching Vertex S, a technologically-advanced and reliable solar panel that has a higher power density, aimed at Australia's Growing residential and SME Market.

Vertex S incorporates the new technologies found in Trina Solar's high-power Vertex panels used in utility-scale projects. Vertex S panels, however, are smaller and lighter, making it easier to handle and install on the rooftops of homes and SMEs.

Interestingly, Trina Solar surveyed Australian installers to determine the most practical size and weight for panels, and found that, ideally, the panels need to weigh less than 23kg and be no longer than 1.8m for easy design and installation.

The 390-405W Vertex S modules have a energy density and are lightweight, weighing 21kg and measuring 1.75m in length and 1.09m in width.

The size and weight make Vertex S easier to carry and install on Australian rooftops, says Govind Kant, senior country sales manager at Trina Solar who anticipates Australia's residential solar market will grow by 8 to 10 per cent this year.

The Vertex S series - a 400W Vertex S module and 390W Vertex S panel - will be available in Australia from April in all states and territories.

Vertex S panels have a maximum power efficiency of 21.1% and come with a 15-year warranty as standard that can be extended to 25 years upon request and evaluation.

www.trinasolar.com

Trina Solar has released the **TRINATRACKER VANGUARD 600+** series in China, a product series that has passed TÜV and UL certifications, increasing energy efficiency by 2%-8%. TrinaTracker consists of two series of trackers, the Dual Row Agile 600+ and the Single Row Vanguard 600+, which cater to leading 210mm ultra-high power 600W+ and 550W modules and continue the trend of 600W+ ultra-high power modules development in the industry and enable optimised construction costs and lowest risks for EPCs and long term energy outcome for IPPs.

Up to 120 modules can be installed with one Vanguard 600W+ series 2P tracker.

In 2020 Trina Solar's global shipments of trackers exceeded 2GW. This year Trina Solar's self-owned production capacity for trackers is expected to reach 7GW, 70% of these new trackers applicable to 600W+ ultra-high power modules.

www.trinasolar.com

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SMART ENERGY COUNCIL

SMART ENERGY LAB

Well known industry technical training provider SolarQuip has become a 100 per cent online business, now running training courses and producing content for online product reviews.

Here Glen Morris shares aerial images of the smart energy lab and planet-friendly Moora Moora cooperative at Healesville as well as the joint project taking shape between LONGi Solar, Arctech Solar, Selectronic and SolarQuip.

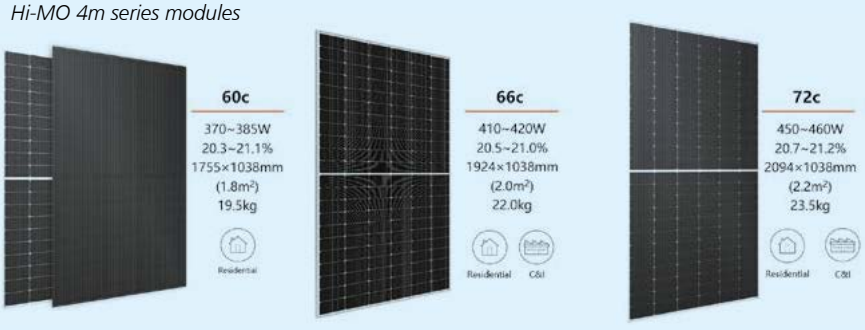
There's no stopping the tech guru, check out Glen's live show every Sunday at 2pm AEST where he dresses as a 'bad arse rapper' to deliver his tech talk: *https://youtu.be/nD4_5biSrSc*

Installing a 70kW solar tracking system to power the Smart Energy Lab and seven homes connected to Glen Morris's microgrid at the community coop in the scenic hills east of Melbourne

Solar technology company **LONGi** has launched its new 66C type Hi-MO 4 monofacial PV module (Hi-MO 4m) for the global distributed generation (DG) market. With an area of about 2m², weight of 22kg and power of 410-420W, the new module can be widely used on rooftops in residential, industrial and commercial applications.

A company spokesperson explained what's interesting is how flexible the physical form factor is becoming at the residential level. "Large projects can almost specify the specs they want these days but for smaller installers to be able to have the latest mono silicon, high-efficiency product in four sizes, weights and outputs is new and offers remarkable flexibility to really tailor small scale rooftop installs," he said. "This is a positive move forward."

Hi-MO 4m series modules



The development follows the 2019 launch of LONGi's Hi-MO 4 series high-efficiency PV modules that within a year of mass production achieved the milestone of 10GW in global shipments.

In addition to 66C, the Hi-MO 4m series also offers 60C and 72C types covering power ranges of 370-385w, 410-420W and 450-460W, with maximum efficiency of up to 21%, providing DG users with wider flexibility and options.

LONGi supplies more than 30GW of high-efficiency solar wafers and modules worldwide each year, about a quarter of global market demand.

https://en.longi-solar.com/

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INNOVATORS, PRODUCTS AND SERVICES

Mackay based **LINKED GROUP SERVICES** is celebrating 10 years of innovating sustainable solutions.

Peter Shaw and Managing Director Jason Sharam joined forces a decade ago to provide electrical contractors to mining companies throughout Australia and have since diversified operations with a focus on renewable energy.

Among the offerings an EcoSkid portable solar power system providing remote power plant for off-road projects and an EcoSkid Hybrid Power Supply designed as a direct alternative for diesel generators that uses portable solar panel kits, batteries and inverters to generate, store and distribute power, the EcoHub, a satellite, portable solar-power station and the solar powered EcoHabitat for temporary or remote accommodation, office or construction building.

Jason was pleased to share images of the company's new release solarport suited to residential and light commercial solar carports.

www.linked.net

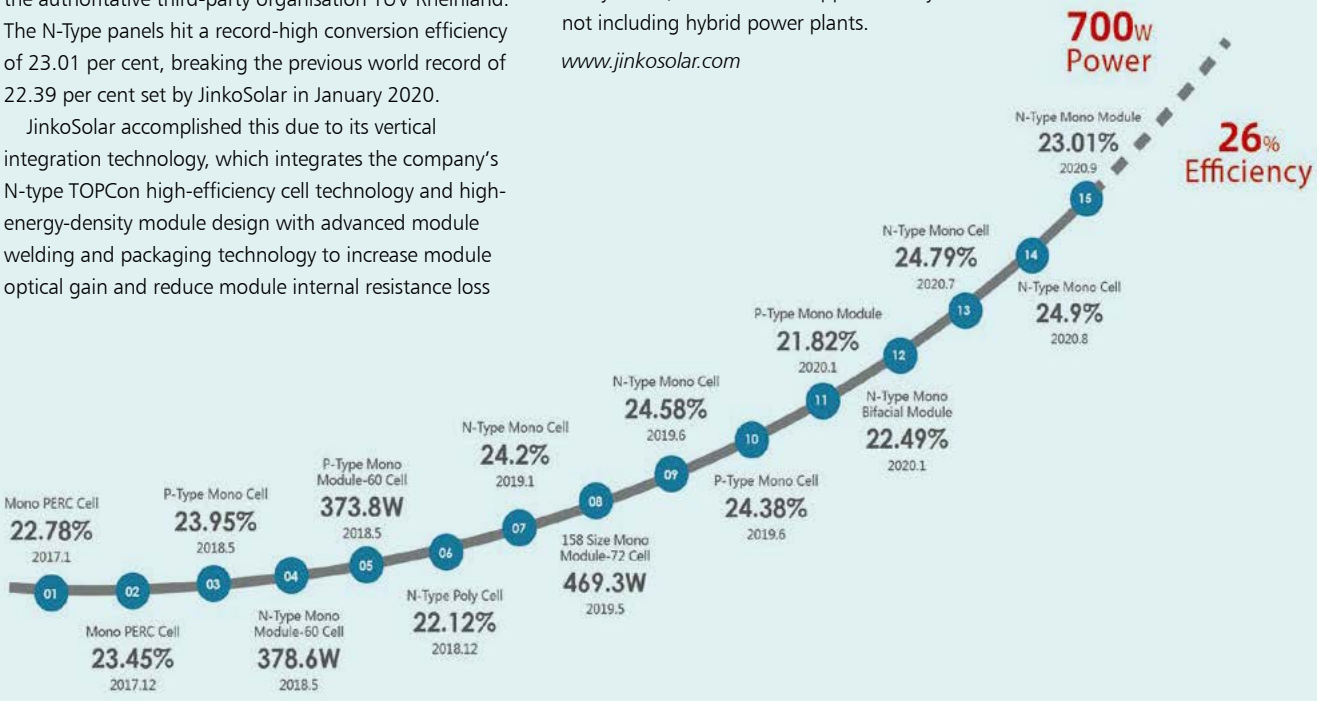
JINKOSOLAR'S N-type Mono Module has set a new world record reaching the highest conversion efficiency of 23.01 per cent.

Recently, JinkoSolar announced that after the JinkoSolar N-type TOPCon Mono Cell conversion efficiency broke the record, the company's latest developed N-type mono modules have been tested by the authoritative third-party organisation TÜV Rheinland. The N-Type panels hit a record-high conversion efficiency of 23.01 per cent, breaking the previous world record of 22.39 per cent set by JinkoSolar in January 2020.

JinkoSolar accomplished this due to its vertical integration technology, which integrates the company's N-type TOPCon high-efficiency cell technology and high-energy-density module design with advanced module welding and packaging technology to increase module optical gain and reduce module internal resistance loss as well as to increase the proportion of cell area in the module.

According to AEMO's Market Dashboard, Google Data Studio, modules deployed by JinkoSolar for utility scale solar farms in Australia are currently generating almost 550MW AC, more than one-third of the combined capacity of solar PV installations in the Australian utility sector, which reaches approximately 1.5GW not including hybrid power plants.

www.jinkosolar.com



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SMART ENERGY COUNCIL

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Proudly Manufacturing In Australia.

We support our customers' success through highly innovative design for manufacture and contract manufacturing. Our applied engineering disciplines, lean manufacturing principles and cross-functional team approach successfully bring your products to life.

Your end-to-end solutions provider

Electronics – Our sophisticated electronics facility is housed in an environmentally controlled clean room to manufacture PCBAs.
• SMT lines • Laser marking • Terminal insertion
• Testing • Selective soldering • Auto de-panel
• Auto optical inspection • X-Ray machine

Moulding – Our 70 moulding machines, all with robotic capability, operate 3 shifts over 24 hours and range from 10 to 500 tonnes.
• Visual and structural moulding • Injection moulding • Microcellular (Mucell) moulding
• Two-component moulding • Over-moulding
• Lens and optical moulding

Coatings – We create functional and decorative surfaces for innovative applications, using the latest in PVD technology.
• Plastic mirror • Transparent chrome
• Polymerised coatings • Metallic finishes

Assembly – Versatile assembly cells can adapt to different project volumes and sizes, working with more than 300 employees and 80 robots.
• Traditional (Human) • Hybrid (Human + Robot)
• Fully automated (Robots)

australia.motherson.com | au@motherson.com

SMART ENERGY COUNCIL
SOLAR, STORAGE, SMART ENERGY

ABOUT US

The **Smart Energy Council** is the peak body of the smart energy sector in Australia. We are a not for profit, membership-based organisation with over 1,200 members nationwide, consisting of companies and individuals operating in this rapidly expanding industry.

HYDROGEN AUSTRALIA
A DIVISION OF THE SMART ENERGY COUNCIL

We are passionate and independent. Our deep understanding of and connections with our members and industry ensures that we deliver results for the smart energy industry and the community.

SUPPORT THE DRIVING FORCE OF SMART ENERGY

The Smart Energy Council:

- Fights hard for smart energy policy
- Provides actionable market intelligence
- Creates valuable networking and introductions
- Delivers high quality training and professional development
- Promotes your business and brand

We represent companies across the Smart Energy spectrum including: solar, solar hot water, storage, energy management, electric vehicles, hydro, wind energy, hydro, bioenergy, ocean energy, geothermal, hydrogen, co- and tri-generation and hybrid and enabling technologies.

We also represent smart energy customers and consumers and provide expert advice to governments and the public.

As the national voice for smart energy the Council is committed to high-quality, long-term smart energy solutions for all Australians.

"The Smart Energy Council has the key people, experience, demonstrated effectiveness, and industry and government network and relationships, to rate as one of the top industry bodies in Australia and globally."

– John Hewson, Former Liberal Party leader, financial and economic expert

BECOME A MEMBER TODAY

Don't sit on the sidelines. Become a Member and play an active role in driving industry quality, safety, and smart national energy policy.

For further information please contact:

Luke Shavak, Membership Sales
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METAL ROOFING BY THE SEA

Safeguarding rooftop utilities installations from salt air corrosion

By Rob Haddock, CEO and Founder of S-5! Metal Roof Innovations, Ltd

WHEN IT COMES TO MARINE ENVIRONMENTS, the metal roofing playbook is much different than inland applications, and given Australia's population concentration in coastal areas this is particularly relevant to Aussie rooftops. This difference is due, in large part, to the way oxide layers do (or don't) react with each other on the roof and also in the presence of sodium and chlorides (salt). To add complexity, chloride levels vary within different seas and areas within the same ocean. Volcanic atmospheres in many coastal and island environments can exacerbate corrosive effects as well. And, "wet" chlorides are more corrosive than dry ones. "Wet" chlorides are more prevalent in cool damp climates like Maine and the Pacific Northwest.

All metals oxidise over time when exposed to air and moisture. Notably, these resulting oxide layers may have very different galvanic properties than the parent metals that created them. Although we think of "corrosion" in a negative context, technically, oxidation is a corrosion process. Other synonyms we sometimes use are "aged," "weathered," "patinated" or "pre-patinated." Most often, oxides act to seal and protect the base metal, retarding or preventing further corrosion, so it's a good thing.

Oxide layers are why, for example, in a "normal" environment, stainless is compatible with aluminum, although they are distant on the galvanic scale. Stainless oxide is electrolytically compatible with aluminum oxide, although the parent metals are not. While the oxidation of any metal happens naturally, it can also be induced and accelerated artificially in production. Often stainless oxide is induced by "passivation," and aluminum oxide by "anodization".

What alters this oxide protection process in a severe marine environment depends on how the specific metal oxide reacts with chlorides from ocean spray; the oxide layer may never fully form because it continually boils away by acids. So, now two potential issues may exist: the corrosive nature of the acid on the oxide or its parent metal, as well as saltwater acting as an electrolytic agent and accelerating dissimilar metals' corrosion – assuming there are dissimilar metals, are in an electrolytic couple. To aggravate the foregoing, blowing sand is frequently an added issue on the seacoast. Blowing sand can cause mechanical damage, abrading the oxide layer, paint layer or the base metal itself.

Combatting salt spray

So, what is the best way to dodge the salt-spray bullet? The first move is a physical one – build further inland if possible. The prevailing wind direction also comes into play with respect to how far salt spray and sand are carried – just 30 feet can make a huge difference. Significantly more severe problems can occur on roofs 20 feet from breaking surf when carried by prevailing winds vs. 50 or 100 feet away.

Regardless of the metal roof type, be sure it is freely drained (slope of 3:12 is a suggested minimum). All metals in salt environments are prone to accelerated corrosion if this criterion is not met. This also means that using non-metallic soffit materials is well-advised as water lingers on flat soffits – both inside and out.

It is also helpful to rinse the roof of salt deposits and other debris, such as pine straw and deciduous fallout. When these residues collect on the roof, they retain and trap moisture against the roof surface. While this is true of any metal roof type, with the heightened corrosive effects of saltwater over time, the salt retained may cause unsightly staining and/or corrosion of the roof material when it lingers. Depending on the severity of other factors aforementioned, the frequency of rinsing can vary from every two weeks to several months or more. The greater the rinsing frequency, the longer the roof life and aesthetics will prevail. Bottom-line, a metal roof by the seacoast will last measurably longer if rinsed often.

Use a standing seam double-folded profile regardless of material type with concealed clips (stainless strongly recommended). And, conceal all other fastenings from direct exposure to salt spray. Lap-seams, snap-seams and exposed fastenings complicate metals compatibility, potential infiltration and other issues. If these materials are used, then expect a significantly shorter roof life. Adding a small bead of butyl copolymer sealant within the seam and moistening the clips into it as the roof is installed will help further prevent sub-surface moisture, which can cause corrosion and galvanic corrosion.

Coated steel: 55% AlZn (Galvalume®) coated steel is still a favourite choice for these applications. This material will carry an exclusion in its warranty for a specified distance from breaking surf (usually ¼ mile). Despite this and the availability of better options, the price tag to upgrade presents a significant difference that many choose not to invest. In normal environments, this material will carry a 25-year warranty and an expected life of 70+ years. In severe marine environments, it may service for up to 25 years or more, even within the distance disclaimed by the warranty. Expect a shorter roof life as

the proximity to the coastline and headwinds decrease. Use bare, mill-finish material, not pre-painted especially in direct salt spray. In this environment, paint coatings actually exacerbate corrosive effects at cut edges, minor scratches and severe radius bends.

Aluminum: .032" or .040" unpainted sheet aluminum will generally do somewhat better than coated steel and yield a 20-30% service life improvement. It may also cost 20-30% more. Again, with pre-painted material, the aforementioned problems exist so the precautions are the same.

Titanium Zinc: The oxide layer that forms on zinc sheeting in a salt environment is chloride rather than hydroxide. This material demonstrates good performance in marine environments. Although manufacturers provide only limited warranties, historic performance is significantly better than coated steel. Expect a service life of about 80 years. Talk to the manufacturer for additional recommendations with regard to surface finishes.

Copper and Tin-Zinc Coated Copper: Bare sheet copper will obtain green patina (which represents oxide layers) much faster in seacoast environments than inland. The expected life of this material in coastal environments is in the range of 75-100 years for 16 oz material and slightly longer for 20 oz material. Warranted life from manufacturers may be only 25 years or less, but the material will far outlive its warranty. The tin-zinc coated product will not perform as well as bare copper primarily because of earlier degradation of the coating that will present some objectionable cosmetic issues. This may happen only after extended years of exposure, and it may happen much sooner, depending on the nature and severity of the contaminants and the proximity to breaking surf.

Stainless Steel: Stainless steel sheeting is available in a number of different alloys. 316-L is a "Marine-grade" with lower carbon content than other alloys. It is better suited for coastal applications and provides significantly better performance than coated carbon steel, but at a higher price tag as well. Stainless should render a service life in excess of 100 years in coastal applications. Remember: it is stain-LESS, not stain-proof.

Lead Sheet: (The best of the bunch, but fallen from grace and unavailable.)

Rob Haddock, the inventor of metal roof attachment solutions, is an award-winning roof-forensics expert, author, lecturer and building envelope scientist and he has worked in various aspects of metal roofing for nearly five decades. For more information, visit www.s-5.com

THE YEAR THAT WAS... AND WHAT LIES AHEAD

THIS SMART ENERGY INDUSTRY is powering ahead, during 2020 the renewables market added a record annual tally of 7.1GW spread across small scale and large scale renewable energy systems. More than ever before. Phenomenal.

This year promises to be as dynamic as ever but without some of the hurdles. During 2020 the Smart Energy Council quickly adapted to life in a pandemic and by year's end had delivered 35 online events. Webinars fast became the most efficient and effective means for SEC to share market news, technical updates and installer training sessions with the data base of more than 26,000.

Last year, the SEC successfully launched the renewable hydrogen scheme; gained an extension to the battery rebate scheme in Victoria; and went into battle over SA's rushed inverter changes. The Council also launched the ACT Renewables Hub and doubled membership in under a year.

The Smart Energy Council is the independent body for the Australian smart energy industry. For those who want ambitious action, we are bold partners with a proactive, dynamic approach that drives real progress – for the future, the industry and your business.

The jewel in the crown was the Global Smart Energy Summit held in September with a raft of prominent local and global speakers that drew 6628 attendees from 60 countries including Antarctica. The event put the spotlight on what is and what could be.

Now, with the prospect of a federal election later this year, SEC will ramp up the campaign for climate action and renewables, pushing for stronger climate and energy policies from government and the opposition. There will be renewed focus on the need to achieve net zero emissions by 2035 and for Australia, seen as a climate laggard, to present a strong position at the COP26 gathering in November.

On the policy front SEC will continue to push for energy market reform through AEMO and for a national PV recycling (stewardship) scheme to ward off waste. Earlier in this magazine we outline the SEC's launch of a Zero Carbon Certification Scheme for renewable ammonia and hydrogen and this is currently a significant focus with key supporters and collaborators from here and overseas.

Much of the advocacy work carried out by the SEC is behind the scenes addressing significant state policies ranging from the NSW electricity infrastructure roadmap to no interest loans for batteries, Queensland's just transition from coal, and Solar Victoria's home energy rebates. The SEC is also actively involved in the SA smarter homes program and changes to inverter standards, support for Renewable Energy Zones and expansion of energy auctions, the increasing uptake of energy storage and much more. Results are not always recognised or trumpeted, but have a significant impact on industry. Best highlighted perhaps by the Council's strong position over Victoria's solar and battery rebates.

The SEC's active campaign to bolster Victoria's Solar Homes scheme resulted in the number of rebates being raised, delivering an estimated $100 million win for the industry with thousands more installations. This would not have been possible without the very vocal, SEC-led group standing on the steps of Victorian parliament and outside the Treasury, backed by meetings with government reps.

The action and results prove the mantra "The world is changed by those who show up" and highlights the independent status of the SEC as a bold and progressive voice that is empowering the renewables industry.

REFLECTIONS ON WHO WE ARE

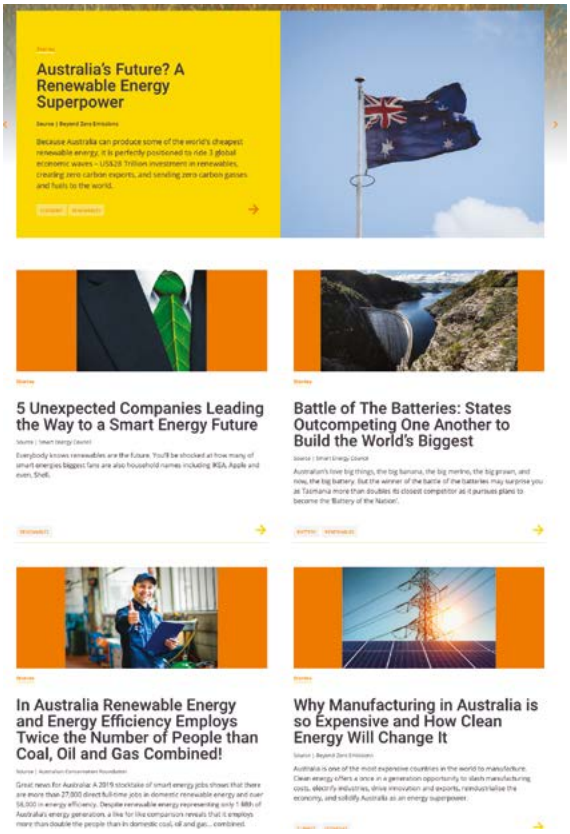
When the Smart Energy Council conducted an external review to assess perceptions and sharpen the focus on members' needs the results were overwhelmingly positive. The majority surveyed commented on the Council's commitment to all member matters, its ability to tackle big issues and its fearless leadership on campaigns.

The recent survey revealed members' favourable views on the SEC's proactive agenda, its speedy action and delivery on what matters most to members, its delivery of extensive resources and industry networks with links to commercial opportunities, and its integrity and powerful stakeholder collaboration.

Also acknowledged and lauded is the independence of SEC which is unencumbered by political affiliations that otherwise compromise activities and weaken the stance.

But we copped some mixed messages – others said they didn't fully understand the value of the SEC and that the "fantastic work of the organisation was not fully communicated".

On this, says SEC chief executive John Grimes, we are committed to lift our game.



Smart Energy Exchange

Sharing positive news – coming soon to a laptop near you: SMART ENERGY EXCHANGE

The Smart Energy Exchange – the SEE – is the uplifting information hub powered by the Smart Energy Council in cooperation with well-known and respected Australian organisations, including WWF, Beyond Zero Emissions, Climate Council and Solar Citizens.

Visitors to SEE will find the content centres on the unstoppable rise and popularity of renewable energy in all its forms which is transforming the way we live and staving off rises in emissions.

At the click of a keyboard readers can view top industry news, reports and features in inspirational content such as: *Power can be clean and cheap at the same time; Making Australia a Renewable Export Powerhouse; Battle of The Batteries: US Climate Laggard to Global Leader;* and *A Renewable Energy Superpower.*

Stay tuned for the upcoming launch.

WARM WELCOME

The Smart Energy Council would like to welcome the following new members:

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Q CELLS Engineered in Germany	q-cells.com
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GPG Naturgy Group	globalpower-generation.com

If you would like to speak to any of these companies or find out more about membership with the Smart Energy Council please contact:

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MARIANNE FANG
China Sales Manager
marianne@smartenergy.org.au
或添加微信 18896983297

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For full listing of Smart Energy Council Members see **www.smartenergy.org.au**

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- Vista Power Tech
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SOLAR INDUSTRY Positive Quality™

THE SMART ENERGY COUNCIL'S Positive Quality™ program sets rigorous standards that ensure manufacturers who achieve and maintain high standards are singled out and recognised.

Prominent panel maker **JinkoSolar** meets those high standards and proudly displays the Positive Quality™ logo, a symbol of manufacturing excellence, which sends a signal of confidence to consumers.

Participating manufacturers are fully recognised, consumers enjoy peace of mind and the industry's reputation is strengthened, delivering **Positive Quality™** for all. Australian consumers and businesses can have confidence in the quality of the solar panels they are installing by looking out for the **Positive Quality™**.

The Smart Energy Council developed the program because the generic appearance of panels makes it difficult to determine good from bad,

unless an identification mark denotes otherwise. A logo that signifies superior quality.

The **Positive Quality™** program admits and endorses manufacturers that are independently tested and verified through plant visits. The initial assessment consists of a company's entire manufacturing processes undergoing independent and intensive inspection and testing.

This is carried out by the Smart Energy Council's specially appointed **Positive Quality™** specialists in a three step process: Certification check and compliance with IEC and Australian standards; Factory inspection with a 60-point check; and a Product quality check: appearance, IV, EL, Hi-Pot, and leakage current.

Positive Quality™ participants' premises are then inspected at random every 12 weeks to ensure the continuity of those high standards. All solar PV manufacturers of high quality can participate.

JinkoSolar was recently awarded the 'Top Brand PV Australia 2021' by specialised European research firm EuPD Research.*

Contact Positive Quality™ Manager Luke Shavak on 0499 345 013, email luke@smartenergy.org.au or visit www.smartenergy.org.au

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