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- Wind power's remarkable potential
- Climate action and the energy market
- First Zero Carbon Hydrogen Certificate
- Renewable hydrogen vs greenwashing
- Rooftop PV performance and projections
- Smart Energy Conference and Exhibition

VOLUME 42, ISSUE 165, AUTUMN 2022

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SMART ENERGY COUNCIL

FRONT COVER *Wind farms are getting bigger and are key to Australia's status as an energy superpower*

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WELCOME

John Grimes, Chief Executive
Smart Energy Council

Elections matter

ELECTIONS IN AUSTRALIA remind me of primary school sports carnivals.

Split into teams, with imaginative names like 'red team' (or blue, green or yellow team), every year was the same. Your real friends were always in other teams, and some bossy year sixers made everyone cheer, hell bent on getting the team bonus points for the most banners.

And so we turn up to vote. Metaphorically wearing the scarf with the colour allocated at birth. Informed by family history. Class. Grandad's views on the world. Never questioned, a matter of identity. And then we fight our way into the polling place, past every team desperate to score the bonus points for the most team banners.

This colour is good. That colour is bad.

I hope this year will be different. I hope people vote on issues and policy, not on team colours.

When it comes to smart energy policy there are five simple things to look out for. Helping renewable energy, not hindering it. Planning and building ahead of the need to close coal. Encouraging a rapid transition to electric vehicles powered by renewable energy, and a climate policy guided by the science, not vested interests.

I know it takes a bit more work. All the teams say they are doing heaps, when really some are dead set against renewables and pro fossil fuels like coal and gas. Some teams even bring lumps of the stuff into parliament with them. So doing the research should not be too hard, just beware the greenwashing ads on TV.

You see, we are not at primary school any more. How we vote matters. In every electorate across the country. We get what we choose.

At this election ditch the coloured scarf and go for substance instead.

Give Australia the zero carbon, smart energy future it deserves.

IN MY VIEW

Monica Richter is Senior Manager Low Carbon Futures with WWF-Australia

EVERY WEEK BRINGS new and more urgent and exciting developments on the climate and energy front. Over the past few weeks, we have seen Origin Energy announce the early closure of Australia's largest coal-fired power station, an M&A play on AGL by a billionaire disrupter and a large international pension fund, and Rio Tinto calling for a higher carbon price to drive market signals to avoid dangerous climate change.

I have been a climate action advocate from the late 1990s working to stem the worse effects of climate change. My work has involved policy and industry advocacy engaging with industry and cities to drive change. It has been a tough ride, dealing often with denialism, obfuscation, delay and sheer bastardry to overturn or delay well-crafted carbon policies.

In my work I have tried to be practical, and solutions focussed. The success of the Science Based Targets Initiative, the Business Renewables Centre-Australia and now the Materials and Embodied Carbon Leaders' Alliance, are a testimony of the hunger within corporate Australia and within governments to be part of the solution and drive change at scale within their businesses and supply chains.

The thing that inspires me today is the pace of change, although we still have a long way to go to create a climate safe future.

There is a rapid energy transition towards clean electrons and clean molecules to power our buildings and transport, and as a feedstock for our industry. The commitment to scaling this transition requires investment by patient capital to support the disruptors, entrepreneurs and start-ups as well as supporting the incumbents to make the transition.

"We need to get out of the CO_2 business quick smart."

We still need a massive shift in capital allocation from high to low carbon investments and that means not investing in or building any new high carbon infrastructure assets. We need to get out of the CO_2 business quick smart.

We are all stakeholders in a better more climate safe future. We know the urgency of the challenge. To have any chance of keeping warming to 1.5°C we need to halve emissions globally well before 2050. The recent IPCC Report *Working Group II: Climate Change 2022: Impacts, Adaptation and Vulnerability* makes a clear and compelling case for why we need to accelerate action. It is in our common interests to do so.

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We are back on the road!

GoodWe Australia will be exhibiting at the Smart Energy Conference & Exhibition this May, we hope you can visit our booth as we return to offline events! We will also be a main sponsor of the Smart Energy Council's Installer Roadshow events across Australia in July and November!

Follow us on Facebook and Instagram for details on these events and more exciting news and announcements in the coming months!

www.goodwe.com.au @GoodWeAUNZ @goodweaunz

SMART ENERGY COUNCIL PLATINUM MEMBER

GRAND DESIGNS AUSTRALIA MAGAZINE HOUSE OF THE YEAR TRADE PARTNER

INDUSTRY DEVELOPMENTS

NATIONAL AND STATE ROUND-UP

A truly audacious bid to accelerate decarbonisation: Eclipsing all Big News Items on the reshaping of the energy market – and there have been many – is the fundamentally game changing **$8 BILLION BID FOR ENERGY GIANT AGL BY RENEWABLES TRAILBLAZER MIKE CANNON-BROOKES** in concert with Canadian asset manager Brookfield.

The tech billionaire with an aptitude for pre-empting market futures, together with former Bank of England Governor Mark Carney, calculate an outlay of $20 billion on 8GW of renewables and storage to replace AGL's 7GW of coal-fired generators (Including Loy Yang A brown coal) would steer AGL to zero emissions by 2035.

If successful the actions would reduce Australian emissions by 8 per cent; AGL is responsible for more than double the carbon emissions of Energy Australia and more than BHP, Rio Tinto, Glencore and Qantas combined.

At the time of going to print the bid had been rejected by AGL but given Mike Cannon-Brookes lacks neither tenacity nor vision we can only say Watch This Space.

Top 5 polluting companies in Australia

Company name	Total Scope 1 Emissions
AGL Energy	42,227,180 tonnes
Energy Australia	17,935,957 tonnes
Stanwell Corporation	17,126,943 tonnes
Origin Energy	15,997,984 tonnes
C S Energy	13,199,922 tonnes

In other market shake-ups Origin intends to bring forward by seven years to 2025 **THE CLOSURE OF ITS STRUGGLING ERARING COAL PLANT**, which currently generates 20 per cent of NSW energy capacity. The announcement displeased the fossil-fanatic federal energy minister who appears unable to grasp the monumental scale of changes in the energy landscape.

More than 80 projects worth $100 billion and a combined generation capacity of 40GW have been proposed for the **RENEWABLE ENERGY ZONE IN THE HUNTER AND CENTRAL COAST ALONE**.

NSW energy minister Matt Kean (pictured) welcomes the avalanche of interest in NSW REZs, which is poised to unlock up to **135GW IN RENEWABLE ENERGY GENERATION**. In all 24 solar projects, 13 onshore and seven offshore wind projects along with eight pumped hydro energy storage projects and 35 big batteries would generate energy equivalent to 10 coal plants.

Meantime the **QUEENSLAND GOVERNMENT HAS ATTRACTED 60GW** worth of proposed project capacity in its Renewable Energy Zone.

GROWTH SPURT Australia boasts a near trillion dollar portfolio of large-scale renewable projects spanning onshore and offshore wind, solar PV, hydrogen electrolysers and storage.

Rystad Energy identifies nearly 1,300 projects involving 600 different companies that amount to **400GW NEW CAPACITY AND ARE WORTH AROUND $830 BILLION**. That's well beyond the amount of energy needed to supply the nation and paves the way for Australia's evolution as a **GLOBAL ENERGY SUPERPOWER** and exporter of renewable hydrogen and ammonia.

Among the bigger developments taking shape is **NEOEN'S 400MW WESTERN DOWNS** solar farm west of Brisbane. On completion within 12 months, it can claim the title of largest solar farm in Australia. More recently Neoen began work on the first stage of the **412MW WIND FARM AT GOYDER SOUTH** in South Australia, which on completion will be the country's biggest grid-connected wind, solar and battery hybrid project.

Work on **PROJECT ENERGYCONNECT $2.4 BILLION 900KM TRANSMISSION LINK** between South Australia and NSW has commenced with the first transmission poles cemented into place. The interconnector's anticipated completion in 2025 is a vital step in shoring up infrastructure to support the transition to a grid-powered 100 per cent by renewables.

The **VICTORIAN BIG BATTERY** which is Australia's biggest came online late last year: Neoen's 300MW/450MWh lithium-ion battery in Geelong unlocks an additional 250MW of interconnection capacity and will supply grid services such as frequency response in the NEM.

IMAGE COURTESY VICTORIAN BIG BATTERY

Over in the west Twiggy Forrest's Fortescue Future Industries has announced plans for **5.4GW RENEWABLES PROJECT** to power its Pilbara mining operations. The grand plan for the Uaroo Renewable Energy Hub includes 340 wind turbines, >2GW and 3,333MW solar farm with a battery energy storage system of 9,100 MWh.

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INDUSTRY DEVELOPMENTS

SUPPORT FOR MORE RENEWABLES A recent Essential national poll, commissioned by Greenpeace Australia Pacific, found the majority of Australians support coal closures. 60 per cent of Australians think that coal companies and governments should work together to close Australia's coal-burning power stations as soon as possible, and 55 per cent of Australians believe coal power companies, like AGL, should close all their coal power stations and replace them with renewable energy as soon as possible.

VISIONARY CLEANTECH INFLUENCER OF THE YEAR Congratulations to Christine Milne (pictured) for picking up the coveted World CleanTech Awards Distinction as a Visionary CleanTech Policy Decision-Maker (Hans Josef-Fell Distinction).

The Global Greens Ambassador, Advisory Board Climate Accountability Institute; Former Leader of the Australian Greens; and Senator for Tasmania has long been a Patron of the Smart Energy Council.

Daniel Huang, Founder & President at GoodWe; CBC Chair for China gained the WCA Distinction Visionary CleanTech Disruptor (Tony Seba Distinction).

SMART ENERGY COUNCIL PRESIDENT STEVE BLUME was recently elected as a Vice-Chair of the Global Solar Council for two years, and is getting used to the idea of the midnight to dawn virtual meetings with the multinational Board members.

The GSC maintains an active schedule to amplify the visibility and potential of the spectrum of solar PV in mature and emerging markets, at all scales and off-grid, and its contribution in driving the sustainable energy transition through decarbonisation, decentralisation, digitalisation and democratisation.

www.globalsolarcouncil.org

A SENSATIONAL CENTURY OF SOLAR The rise and rise of solar energy: those with even half an interest in the fascinating rise of solar power in all its forms – solar thermal, CSP, architecture – driven by pioneers and innovators will be fascinated by the epic compendium assembled by Geoff Stapleton *The Century of Solar - Stories and Visions of Renewable Energy* and the ISES Solar Energy Museum – Past, Present and Future.

The booklet is free to download as a PDF from www.swc50.org

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

HOUSEHOLD ENERGY FINANCER BRIGHTE is offering five scholarships of $2,250 for female electricians or apprentices who wish to obtain a qualification in battery storage systems and grid-connected photovoltaic systems at the Canberra Institute of Technology.

Brighte chief executive Katherine McConnell (pictured) says the scholarships allow female electricians to make the most of the boom in the solar sector and be part of building a brighter future.

Brighte's sustainable homes platform has to date facilitated more than 500MW in new solar generation and reduced CO_2 emissions by more half a million tonnes each year.

www.brighte.com.au

CRICKET FOR CLIMATE AND SOLAR CLUBS Thanks to leading Australian cricketers Pat Cummins and Rachael Haynes, solar panels are being installed at 15 local cricket clubs as the first step in unlocking the solar potential of more than 4,000 clubs.

They have helped drive the Solar Clubs initiative under the newly formed Cricket for Climate which is focused on driving tangible change and saving clubs money while reducing carbon emissions.

Solar Clubs is supported by partners including **LONGi, Sungrow** and **One Stop Warehouse**, who have generously donated the solar and inverter systems for the first 15 cricket clubs taking part in the initial phase of the program.

AT SOME POINT IN THE FUTURE will we be wearing solar panels? Solar engineers at Stanford University are striving to create almost 'impossibly-thin' flexible solar panels for use in mobile applications, from self-powered wearable devices and sensors to lightweight aircraft and electric vehicles.

The technology involves transition metal dichalcogenide solar cells (TMDs) on a flexible polyimide substrate which absorb ultrahigh levels of the sunlight that strikes their surface compared to other solar materials.

The skinny solar array is said to be less than six microns thick, or 15 times thinner than a piece of paper. However to date the researchers have been unable to convert more than two per cent of the sunlight they absorb into electricity.

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TIME FOR A RESET

The renewable energy sector is expanding by the day and winning more support among investors and the community. Meanwhile the popularity of the political party that staunchly supports old polluting technologies is waning, despite the fact coal giants appear to be conceding the market is undergoing a fundamental shift. Has the tide finally turned?

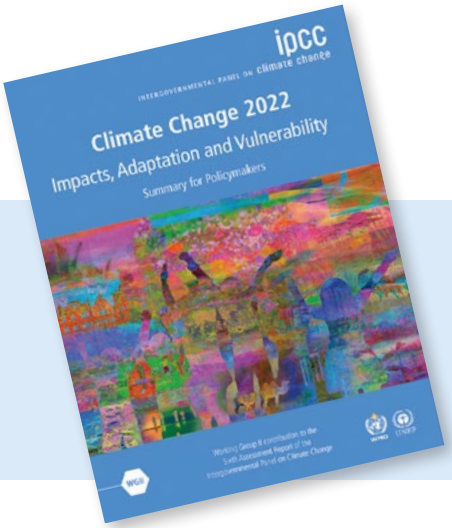
AUSTRALIA'S ENERGY INDUSTRY recently commanded headline news for all the right reasons: the proposed early closure of two coal plants (albeit decades between them) and a billionaire's bid for the country's biggest polluter top the list. Staying on positives, there's a promising pipeline of new, multi-GW renewables capacity across the length and breadth of the country.

What we are witnessing is a renaissance of the energy industry, with renewables projects and aspirations driven by progressive state governments, investors, developers and innovators who are shaping a decarbonised society.

Mike Cannon-Brookes is one staunch individual determined to make a difference. It wasn't that long ago he was on the podium at a Smart Energy conference where he revealed his billion dollar 'punt' on renewables – then referring to the top end 5GW Sun Cable project – was not a gamble but born from a deep understanding of the natural progression of markets. And beyond that, to determine with a relatively high degree of accuracy and confidence just what lies ahead and take appropriate action. It's a modus operandi that has proven resoundingly successful and is highlighted by the runaway global success of his company Atlassian.

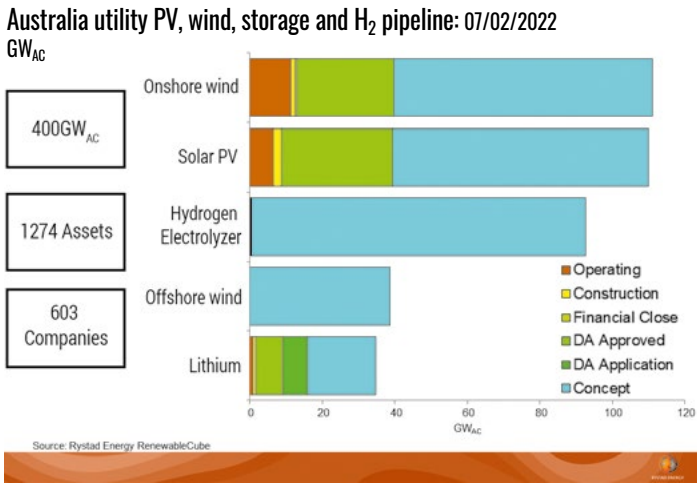
The audacious $8 billion bid by Grok Ventures and Brookfield to replace AGL's 7GW of coal infrastructure with an 8GW renewable energy project by investing $20 billion on smart energy technologies and dial down to zero emissions by 2035 sent whoops of joy (albeit short-lived) among climate activitists, environmental campaigners and the renewable energy industry alike.

Cannon-Brookes maintains there's no logical reason, no economic reason, why



IPCC: Beware the future. Extremities on the way

The latest report from the IPCC states the world faces unavoidable multiple climate hazards over the next two decades with global warming of 1.5°C. To avoid mounting loss of life, biodiversity and infrastructure, ambitious, accelerated action is required to adapt to climate change, at the same time as making rapid, deep cuts in greenhouse gas emissions. So far, progress on adaptation is uneven and there are increasing gaps between action taken and what is needed to deal with the increasing risks.



Australia should not have the cheapest power in the world, and that is what he intends to deliver.

Finance reporter Alan Kohler cheekily observed that "Between them, AGL Energy and the Coalition have been among Australia's biggest emitters of nonsense about climate change, and the biggest roadblocks to the energy transition."

Smart economic decisions fall somewhat short too. AGL's acquisitions of the Loy Yang A, Liddell and Bayswater generators between 2012 and 2014 resulted in loses of about $5 billion to its shareholders.

Drilling down on the recent AGL offer, Kohler established it would enable Mike Cannon-Brookes to access AGL's 4.5 million customers as a guaranteed market for new, renewable electricity and to reuse the existing grid connectivity from the coal power stations, while also linking Australia's three million rooftop PV systems into virtual power stations and providing flexible, demand response services.

A timely reminder here of the PM's words "We believe climate change will ultimately be solved by 'can do' capitalism; not 'don't do' governments."

So, who else is leading the charge to renewables?

Plenty of others as it turns out. The chart tabulated by Energy analyst Rystad illustrates phenomenal ambitions in all sectors of renewable energy: close to 1,300 projects proposed by around 600 companies amounting to 400GW of new capacity worth around $830 billion.

That's more than enough to meet all electricity demand in Australia several times over, as well as power large industrial projects aspiring to green hydrogen and ammonia exports and to supply new local green steel and other low carbon products.

"The federal government is not incentivising the transition but actively blocking it by supporting the coal industry and expanding fossil gas, throwing money into CCS, and failing to set renewables targets or establish climate action."

"The pipeline factors in all announced export assets such as the Asian Renewable Energy Hub, the Western Green Energy Hub, Sun Cable etc. Basically anywhere that there is an announced asset yet to be developed," Rystad's David Dixon told *Smart Energy*.

"The pipeline has grown substantially over the previous few years, and today the export projects completely dominate the new additions in capacity terms. However those export projects are dependent on hydrogen economics and also rely on reduced costs of wind/PV electricity which in turn will largely be driven by technology improvements and cost reductions for modules and wind turbines."

He explained the pipeline in the chart does not include the NSW Renewable Energy Zones as Rystad only includes assets or projects that have an owner, technology and capacity associated with them on their database.

Nevertheless, NSW has unearthed a fierce appetite for smart energy, with its Renewable Energy Zones attracting around 135GW in project capacity. The government received interest from 24 solar projects, 13 onshore and seven offshore wind projects, eight pumped hydro-energy storage projects and proposals for 35 utility-scale batteries.

That is many, many times greater than the 12GW of generation capacity and 2GW of energy storage the NSW Government was seeking to commission under its forward-thinking energy blueprint the Electricity Infrastructure Strategy.

In all, equivalent to 10 coal plants.

A memo needs to be despatched to the federal energy minister addressing his fears over the closure of the 2.8GW Eraring coal plant: *Sky's not falling in.*

"Smart investors and developers are shaking up the energy market which is showing clear and healthy signs that the future does not involve coal-fired power plants," John Grimes said.

"This should serve as a reality check, a wake-up call for the fossil fuel-fixated federal government that for the past eight years has done all it can to put roadblocks in the way of smart energy and stall the inevitable supremacy of climate friendly renewable energy.

Blair Palese agrees Australia lags far behind in terms of government support, saying "They are not incentivising the transition but actively blocking it by supporting the coal industry and expanding fossil gas, throwing money into CCS, and failing to set renewables targets or establish climate action."

Blair Palese, Climate and Capital Media commentator

The Climate and Capital Media commentator said "The freight train left the station long ago and anyone with an awareness in smart investments sees it quite clearly."

In part referencing scaremongering by economics agency McKinsey over the 'trillion-dollar cost' of change, Palese stated "We need a real change in the thinking that the energy transition is a major burden on the economy, it is just not accurate; the US for example is now looking at a trillion dollar *opportunity* in low carbon technologies."

Many get this.

"Mike Cannon-Brookes is a perfect example of what's to come, whether it is from Brookfields to BlackRock to global pension funds, public and private partnerships and the World Bank… everyone is waking up to the amazing economic opportunities that arise from taking coal out of the mix and moving into renewables," she told *Smart Energy*.

The Australian Council of Superannuation Investors reported that 49 ASX200 companies had made net zero commitments for 2050 or earlier as of March 2021, well up from 18 companies from the previous year.

"Mike Cannon-Brookes is a perfect example of what's to come, whether it is from Brookfields to BlackRock to global pension funds, public and private partnerships and the World Bank… everyone is waking up to the amazing economic opportunities that arise from taking coal out of the mix and moving into renewables."

Significantly, this equals half of the collective ASX200 market capitalisation, which means over $1 trillion worth of the corporate sector is now covered by net zero commitments and the trend is only escalating.

Palese says industry now needs to identify the highest emitters "and work on the difficult sectors like heavy industry aviation which need to leapfrog ahead in clean alternatives.

"Therein lies the challenge of the next ten to fifteen years… how to bridge that gap and speed it up, and mobilise all areas and investors." She emphasised it was time for a change in thinking at the 'do nothing' federal level, with an inept government that has eschewed a series of economic opportunities and "failed to develop an authentic approach to solve problems".

"We are now almost two decades behind on climate action and urgently need a federal government that is 100 per cent better and ready to deliver responsible leadership.

"We cannot waste another three years on a government whose only end-game is staying in power and doing nothing."

Words echoed by the Business Council of Australia chief executive Jennifer Westacott and president Tim Reed who declared "As the world moves to decarbonise by 2050, Australia faces a choice.

"As a nation we can either embark on a co-ordinated, planned transition or we can take

The ACF illustrated its message about party political donations by commissioning artworks such as this colourful piece by Jess Harwood

a more costly, more haphazard route," they warned, while urging widespread adoption of net zero targets by the nation and by business.

One possible version of the future

Should voters decide they have had enough of the eight-year reign of the LNP, a more climate friendly Labor-led government would usher in a new era.

The ALP's comprehensive *Powering Australia Plan* would boost the share of low-cost renewables in the National Electricity Market to 82 per cent by 2030, up from today's 32 per cent, achieve a 43 per cent reduction in emissions by 2030, and Australia's ageing electricity grid would be modernised through a $20 billion *Rewiring the Nation* plan.

Up to $3 billion would be invested in renewable metals, renewable energy component manufacturing and renewable hydrogen electrolysers; and 85 solar banks and 400 community batteries would appear across Australia.

The ALP also plans to remove taxes from low priced EVs to accelerate the transport transition – and ward off shocks in oil prices reflected at the pump.

"The ALP's *Powering Australia Plan* is the foundation stone for establishing Australia as a renewable energy superpower," John Grimes said. "To say nothing of the benefits to society as we move toward an electrified future and address action on climate."

Give and take

However, as we inch close to the ballot box, some worrying trends and practices have come to light about the scale of fossil fuel donations to both major political parties.

According to the Australian Electoral Commission, during the 2020-2021 financial year fossil fuel companies donated almost $960,000 to the three major parties; $80,000 more than the previous year.

The Liberal Party received the majority, netting $506,810 while the ALP scored $392,354.

Each year subsidies to fossil fuel industries and support for gas projects amounts to $10 billion.

The ACF and ANU have also identified a blowout in emissions with "one in five coal, oil and gas projects polluting significantly more than estimated… some of the worst offenders have emitted 20 times more than estimated, indicating the Morrison government's safeguard mechanism, in its current state, is not working… it is riddled with flaws and needs a complete overhaul to make it effective."

Simon Holmes à Court at his recent National Press Club address

Colossal fossil

Evidently an alternate reality exists in the LNP's $31 million taxpayer funded pre-election advertising campaign.

The party has ramped up its rhetoric aimed at hoodwinking voters over its strength on climate change and energy commitments through its 'Making Positive Energy' advertisements.

There are strong parallels with the glittering announcements in the build-up to the CoP meeting in Glasgow last year when the PM put on a straight face while listing all the 'strong actions' on energy and climate under his administration.

'Actions' that amount to a net negative with vast support for fossils, but deliverance took place in Glasgow with Australia branded a 'colossal fossil'.

Can we plot a different course?

And further, in light of party-political donations, just what would it take to keep the major parties honest? A reinvention of the Australian Democrats Party… or a bunch of independent MPs who stand by their principles?

Simon Holmes à Court is spearheading actions through the Climate200 campaign which has raised more than $7 million to support independent candidates at the federal election, people who are committed to key policy areas including a science-based approach to climate change and ending corruption in politics.

Simon, who is also on the Board of the Smart Energy Council, says "We are frustrated about climate inaction. We are frustrated about corruption in politics, and we are frustrated about the treatment and safety of women."

And he's doubtless frustrated by offensive attacks on the movement he leads.

He needn't be.

Every time he's heckled, Climate200 is flooded with goodwill and donations.

Momentum grows by the day for the pro-climate group.

Time's up?

If recent polls are accurate, things are imploding for the federal LNP.

The results of the NSW by-elections provide a strong indication of the extent of dissatisfaction bubbling in the community, which is echoed in surveys.

A quick sweep reveals:

- **Newspoll**, late January: "PM Scott Morrison faces electoral wipe-out with support plunging." Primary votes were 41% Labor (up three), 34% Coalition (down two), with Labor looking at a winning margin of 56-44.
- **uComms** polls of the federal NSW seats of Wentworth and North Sydney: Main independent challenger in Wentworth has a 56-44 lead over the Liberal incumbent, and in North Sydney 59-41. *[Note that single seat polls are notoriously unreliable].*
- **Morgan poll**: 56-44 to Labor; Primary votes 37% Labor, 34.5% Coalition, 8.5% independents (up one) suggests climate-focused independents are doing well, and Labor would benefit from their preferences.

And in a separate poll, six in 10 voters in regional, rural and metropolitan Queensland and New South Wales believe the states' future economic prosperity lies in clean industries, such as renewable energy exports of green hydrogen, critical minerals like lithium and cobalt, and manufacturing renewable products.

The survey, commissioned by the Climate Council and conducted by YouGov, also found six in 10 say the government's top investment priority should be in renewables. In Queensland only 20% nominated coal and 15% said gas. In NSW, the figures were 15% for coal and 17% for gas.

So, three years on, maybe voters in key electorates will indeed help deliver a different result this time around.

And if they don't?

Well there's always 'can do' capitalism to sort things out.

COMMITMENT, CLARITY and URGENCY

Demand for renewable energy remains strong. People trust in solar now. There's no question about whether it works, or 'will it cut my power bill?' – those things have been resolved. The industry's mature, over the 20-year life of a solar system period, the effective cost you're paying is 0.5c per hour. If you were a typical customer without rooftop PV, you'd be paying .35c per hour. All in all, we expect growth year on year. The question now is really how big is that growth going to be.

JOHN GRIMES of the Smart Energy Council as reported in *The Guardian*

Targeting 'net zero by 2050' while simultaneously considering a set of market regulations that will unnecessarily subsidise the coal fired electricity generation base is ridiculous. There are alternative solutions that would be much quicker and less expensive to deploy and would support the flexibility required to rapidly transition to a renewables powered energy system. We have the technology required globally to deploy renewables and electrify everything such that if we were really motivated we could all be aiming for net zero by 2030. Let's do that.

BEN HUTT, Evergen

While not a G7 member state, Australia should look to join the club of economies that see the transition to a carbon free future as an opportunity for growth and international collaboration.

PATRICK MATWEEW, Redback Technologies

We should be neither fearful nor complacent about accelerating carbon cuts; if emissions merely glide down now, they will need to power dive later.

INNES WILLOX, Australian Industry Group

We know that climate change means a warmer, drier climate with hotter days, harsher fire seasons and less overall but more intense rainfall, and more extreme weather events including storms and flooding. Victoria's Climate Change Act is world-leading and is the most comprehensive legislation in Australia. We have also invested nearly $2 billion to address climate change which will help us reach our ambitious target of halving emissions by 2030.

Victorian Minister for Energy, Environment and Climate Change LILY D'AMBROSIO

(If only this could be duplicated in federal legislature…)

Firms that do not plan for a carbon-free future risk being left behind… the next 1,000 unicorns won't be search engines or social media companies, they'll be sustainable, scalable innovators – startups that help the world decarbonise and make the energy transition affordable for all consumers.

LARRY FINK of BlackRock in his annual letter to CEOs, and who is urging companies to cut their carbon emissions to net zero by 2050. BlackRock manages about $10tn (AU$14tn) in assets

Australia is one of the sunniest and windiest countries in the world. We have extraordinary opportunities in a decarbonised economy for more Australian investment and more Australian jobs. So let's get on with it. Climate change is an economic problem – but we can make it an economic opportunity. We should give businesses the chance to thrive in a new, decarbonised economy… Australia's economy and environment stands to gain from the clean energy boom. More climate action means more jobs, more investment and a stronger economy. We can't afford even one more electoral cycle of spin, denial and inaction on climate change.

ALLEGRA SPENDER, Renewable energy advocate fighting for a better climate this federal election and standing as Wentworth independent candidate

The global commodities crunch has created new challenges for the clean energy sector, raising input costs for key technologies like solar modules, wind turbines and battery packs. Against this backdrop, a 27 per cent increase in energy transition investment in 2021 is an encouraging sign that investors, governments and businesses are more committed than ever to the low-carbon transition, and see it as part of the solution for the current turmoil in energy markets.

ALBERT CHEUNG, Head of Analysis at BloombergNEF

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The *uplifting* Winds of change

During 2021 renewable energy generation reached record levels, delivering almost one third of Australia's energy mix. Wind power contributed the lion's share at 11.6 per cent, ahead of rooftop PV's 7.8 per cent and large scale solar's 4.2 per cent. Now some major developments both in terms of size and location of wind farms herald an astonishing change of direction and ambition.

AUSTRALIAN WIND GENERATION has come a long way since 1987 when the ground-breaking six turbine Salmon Beach wind farm towered over the land near Esperance. The next notable development was also in the region and an impressive one and a half times the size with nine turbines.

In the intervening decades the industry has undergone a remarkable evolution. Today's largest wind farm, the 453MW Coopers Gap Wind Farm in Queensland boasts a field of 123 turbines and the 420MW Macarthur Wind Farm in Victoria houses 140 wind turbines, while South Australia is home to the 369MW Snowtown Wind Farm.

Last year the industry powered ahead with the commissioning of a series of utility scale wind farms.

Australia now has ten wind farms with a generating capacity greater than 200MW, including CWP Renewables' 270MW Sapphire Wind Farm. All are located on the East Coast, and perhaps surprisingly Victoria takes the lead with its 31 wind projects and 2,610MW capacity, followed by SA's 204 wind farms (2,051MW) and NSW with 20 wind projects totalling 1,902MW – three times that of wind power pioneer WA's 638MW capacity.

Projects in today's pipeline are set to eclipse all others. Among the top five onshore wind power projects are the 800-1,000MW Golden Plains Wind Farm near Ballarat in Victoria scheduled for completion in 2024. There's also the $1.5 billion 800MW Clarke Creek Energy Hub in Queensland which proposes up to 195 wind turbines and the mighty 1,200MW Forest Wind Farm also in Queensland which will host up to 226 Siemens Gamesa turbines and could be operational by late 2023. On the drawing board is the 1,026MW, 180 turbine MacIntyre Wind Farm in Queensland. Along with others in development this will add 6,926MW – yes, an astonishing 6.9GW – in capacity, enough to power more than two million homes.

The wrap on wind

Typical land-based turbine blades measure up to 52 metres; the world's largest is GE's Haliade-X offshore wind turbine with blades 107 metres long, the length of a football field.

Most blades are white for aesthetic reasons, some are grey, some have a red stripe to boost visibility to aircraft.

Worldwide during 2020, wind power delivered more than six per cent of electricity at 743GW of which 707.4GW was onshore.

China's 7.9GW Gansu Wind Farm (Jiuquan Wind Power Base) on the fringe of the Gobi Desert is the world's largest. But for how long?

SMART ENERGY COUNCIL

A series of other mega projects are in the pipeline: somewhere between conception, drawing board and construction there are more than 60 wind projects slated for the next five years with a total value of $33 billion, according to Rystad.

Bigger and better

The wind industry, says CWP's Andrew Dickson, is being turbo charged for good reason. "As wind turbines have scaled in size and reduced in cost, they are becoming ever more competitive on the National Electricity Market, and this has been key to development," he told *Smart Energy.*

CSIRO GenCost estimates on the levelised cost of electricity place wind power in the range of $45 to $57 per MWh, and solar PV at $44 to $65 per MWh. These compare favourably to gas generation costs of $65 and $111 per MWh which blows out to $107 and $170 per MWh with carbon capture and storage, and the cost of new black coal plants of between $87 and $118 per MWh ($162 and $216 per MWh with CCS).

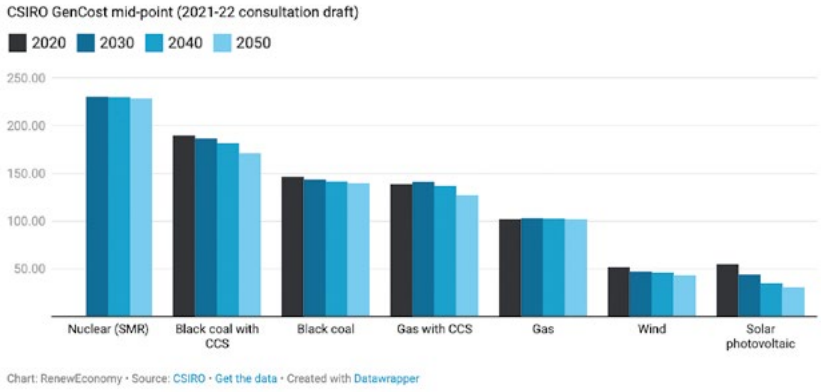
RenewEconomy's chart (above) compiled from CSIRO data steps out projected costs over the next three decades with wind costs remaining a fraction that of gas and coal and reducing over time.

Technology efficiencies have ramped up, one decade ago each onshore turbine could generate around 2MW, whereas today they generate around 6MW, Dickson explained. "In the same timeframe, offshore turbines have come into the mainstream, with the latest offshore turbines able to generate 14MW." More on that in a moment.

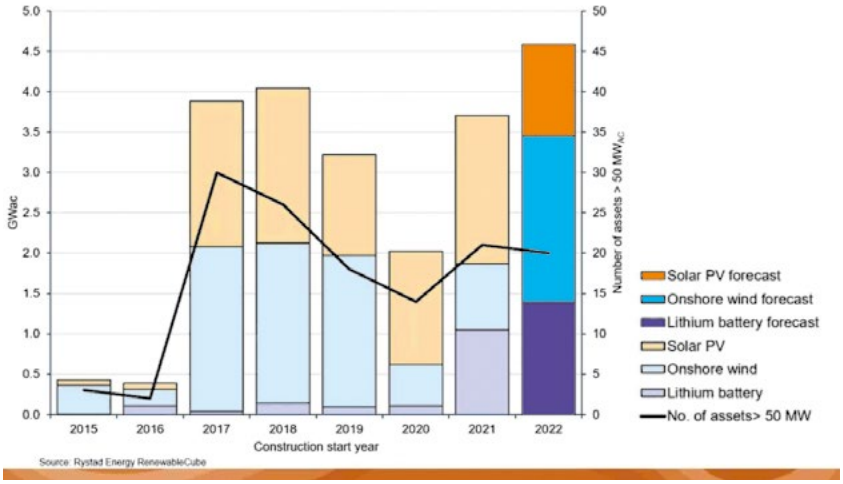
Onshore, larger turbines mean that areas with lower wind speeds can host viable wind projects. They also reduce the number of turbines needed for projects of a given capacity, which reduces development complexity, so although the Australian wind industry commenced in the highest wind speed locations of South Australia, Victoria and WA, larger wind turbines have facilitated expansion to lower wind speed locations such as NSW and Queensland.

Western Australia which has plentiful wind resources and available land has a relatively small grid which isn't connected to the National Electricity Market, which limits the quantum of wind and solar generation it can sustain. However the winds of change are in operation, with the mineral-rich state poised to take on a significant role in the export of global commodities.

Electricity generation levelised cost projections ($ per MWh)



Wind construction set to bounce back in 2022. GW_{AC} Number of assets >50MW_{AC}



Mining taps into wind

First to WA's large and heavily carbon exposed mining industry. The Pilbara region alone imports approximately 3 billion litres of diesel per year, which creates large emissions, is bad for balance of trade and, especially in today's precarious geopolitical climate, represents genuine fuel security risks.

"Renewable energy can drive energy transformation in the mining industry by replacing its electricity and its liquid fuels for haul trucks, trains and ships with renewable alternatives. Iron ore producer Fortescue Metals Group, the fourth-largest in the world, is an excellent early mover and the other miners are starting to move now too," Dickson said.

The grand plan for Fortescue's $10 billion 5.4GW Uaroo Renewable Energy Hub 120 kilometres south of Onslow in Western Australia involves 340 wind turbines and 3,333MW solar farm spread over 25 square kilometres, with a battery energy storage system of 9,100 MWh.

Uaroo's 2.04GW wind farm is nine times greater than WA's biggest wind farm, Yandin, and would reduce plant annual carbon emissions of 2.2 million tonnes by at least 1.5 million tonnes by the end of this decade.

But size and scale is not all about mining, proximity to export markets is also key to development. Rising global demand for hydrogen and ammonia created from renewable energy places Western Australia at the forefront of Power to X projects.

Power to X

Also referred to as P2X and PtG, Power to X capabilities enable the decoupling of renewable energy from the electricity

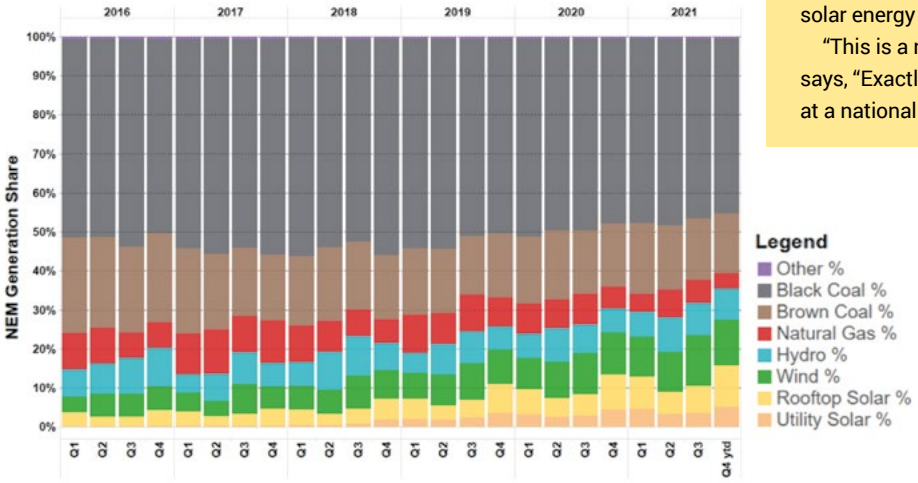
Powering ahead offshore

Victoria's Government has unveiled plans for a phenomenal 2GW of offshore wind by 2032 (with generation commencing in 2028), ramping up to 4GW offshore wind by 2035 and 9GW by 2040.

This paves the way for round-the-clock renewables: optimum generation of offshore and onshore wind occur at different times, and both in turn complement daytime solar energy generation.

"This is a revolutionary announcement," John Grimes says, "Exactly the sort of leadership we desperately need at a national level."

The changing energy mix with more renewables in the grid



sector for use in other sectors, with the X referring to, for example, power-to-ammonia, power-to-hydrogen, power-to-chemicals, power-to-fuel, power-to-gas.

Power to X projects represent an enormous opportunity for WA though its excellent wind and solar resources which can be harnessed at huge scales, offgrid, with an export focus, and Andrew Dickson is leading CWP Global's mega scale Power to X projects such as the 26GW solar and wind Asian Renewable Energy Hub.

"Our Power to X projects in Australia, Africa and South America are all onshore, using large desert sites to produce hydrogen and derivatives at massive scales," he said, adding. "We believe that these large onshore projects will be more commercial than offshore projects for Power to X applications for the foreseeable future.

The proposed 50GW Western Green Energy Hub with its eye watering $100bn price tag and thousands of turbines spread over 15,000 square kilometres aims to generate 3.5 million tonnes of renewable hydrogen and 2.0mt of ammonia each year. If constructed the WGEH plant would dwarf the world's largest wind farm, the monolithic 7.9GW Gansu Wind Farm in China with its 7000 wind turbines – truly heralding a new age for the renewables industry.

A seismic shift is unfolding in other areas.

Offshore opportunities

Australian developers are turning their sights to the seas and looking to realise offshore wind capabilities, and more than a dozen prospective projects were identified following the introduction of the federal Offshore Electricity Infrastructure Bill late last year that unlocks opportunities. The NSW Renewable Energy Zone has already generated interest in seven potential offshore wind farms.

Late last year Victoria's Energy Innovation Fund provided a $40 million funding boost for offshore wind projects to kickstart three major offshore wind projects from Star of the South, Macquarie Group and Flotation Energy.

The wheels are in motion with the proposed 2.2GW Star of the South. It's destined to be one of the largest offshore wind farms in the world and a first for Australia.

Owned by its Australian founders of the same name and fund managers Copenhagen Infrastructure Partners, Star of the South wind farm will on completion connect to the main transmission lines in the Latrobe Valley and power up to one fifth of Victoria, eventually filling the gap left by the 2028 closure of the Yallourn coal-fired power station.

Construction could commence around 2025 and the offshore wind farm aims to be generating full power by 2030.

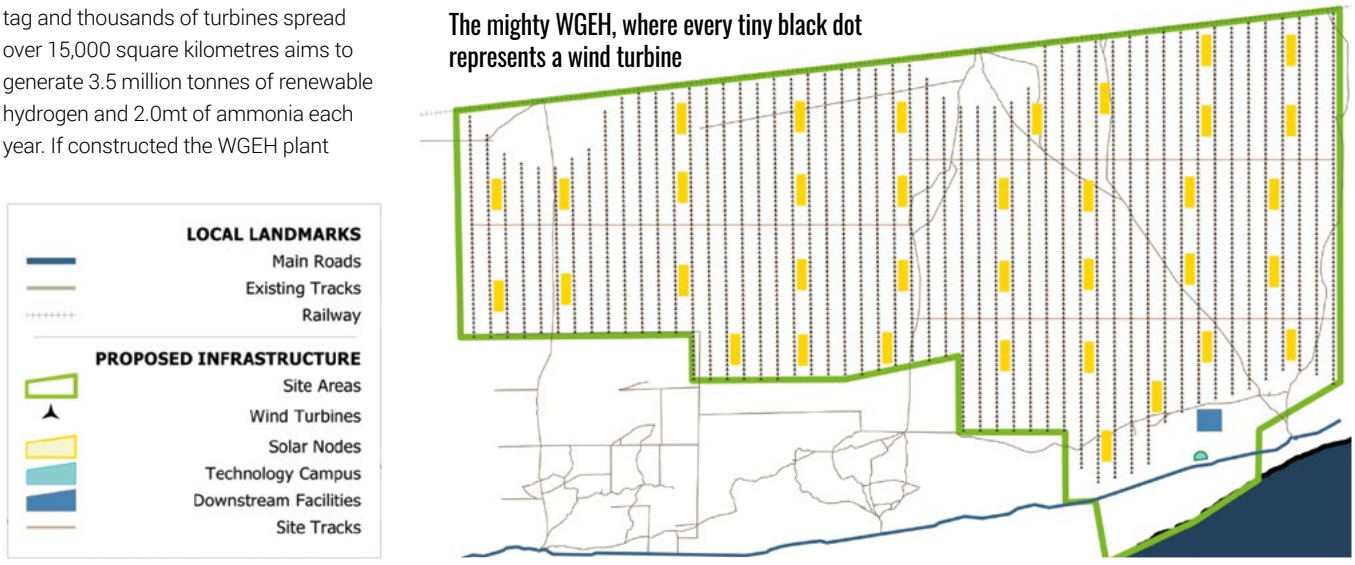
Global growth

Offshore wind is now labelled one of the fastest growing renewable technologies. BloombergNEF data indicates the offshore wind sector will exceed 10GW of installations again in 2022, after first breaching that total for the first time in 2021.

The Global Wind Energy Council estimates that in the years 2020 to 2024, 344GW of new onshore and offshore wind power capacity will be installed around the world.

Longer terms projections place an increase from around 35GW of installed capacity globally to about 234GW by 2030, led by the Asia-Pacific region.

The mighty WGEH, where every tiny black dot represents a wind turbine



Neoen's Bulgana Green Power Hub 204MW wind farm and 20MW/34MWh battery in Stawell, Victoria has the capacity to generate 750,000MWh of energy annually and $40.6 million in annual benefits for the Victorian economy

Pioneering Gale and Gusto

The composition of Australia's next government will help determine the levels of support for action on climate and renewable energy. And should Labor be elected, says Taryn Lane, the future for mid-scale wind and community battery projects will be a lot brighter.

Taryn is part-time manager of Hepburn Wind, Australia's first community-owned cooperative wind farm. The 2.1MW plant with its two aptly named turbines Gale and Gusto was many years in the making and pioneered the community energy movement in Australia. But it took some convincing in the early stages.

The proposal eventually and successfully swayed nay-sayers and sceptics to develop into a vital and welcome energy resource for the local community, powering 2000 homes and presenting a range of popular progressive partnership programs.

Under the Hepburn Z-NET banner the benefits on offer include solar and battery bulk buy, energy audits, EV bulk buy, EV charging infrastructure.

So successful is the co-op that a 4.1MW solar farm with one-hour battery storage facility is now in the pipeline at the Hepburn site.

Denmark in Western Australia is the only other community wind farm, built not long after Hepburn.

Why so few? Has not the model caught on?

"The main reason is there is no long-term stimulus or incentives or mechanism suitable for this mid-scale community energy projects, whereas projects over 10GW can access government schemes," Taryn explained.

"Mid-scale wind projects cannot tap into incentives such as rooftop solar Small-scale Technology Certificates under the federal government mechanisms or state-based programs like Solar Victoria which stimulate so much movement in those areas.

"There is a gap in the mid-scale market which also suffers economies of scale in the planning process," she explained.

"Without significant support it is difficult for those projects to be economically viable, even though they deliver a raft of positive yet non-financial aspects like social attributes, so that's been a major issue."

The emergence of some mid-scale community energy projects on the back of some grant funding in Victoria and New South Wales has facilitated more mid-scale solar farms, but more opportunities can and should be realised, she says.

"It is important to have different types of packages come into existence in the market such as community batteries powered by renewables, which is proposed by federal Labor. If that party is elected it is likely there will be a big trend in the number of smaller scale renewable energy projects being deployed."

Farming wind

The regional resident also alluded to the wide range of benefits afforded farmers as well as those communities in the proximity of large-scale wind farms.

"All of those landowners benefit. For farmers who host turbines on their property, and particularly those heavily impacted by droughts, the annual lease payment they receive provides a boost to income. These farmers are very much on the front line when it comes to climate change and it will only get worse in the years ahead.

"Often farmers don't have huge superannuation or other savings put aside and so the income from turbines enables farmers to stay on the land longer, and also provides greater certainly for the younger generations who are more confident to take over the family farm. They are leaving a legacy for future generations.

Andrew Dickson agrees, saying turbine income can 'drought-proof' farms.

Under his watch, CWP's Sapphire Renewable Energy Hub in New England was the first to introduce a commercial community investment for the 13 landowners who accommodate the Hub's 270MW wind, 165MW solar, 35MWh battery storage facility.

In like-minded vein, the Bulgana Green Power Hub (see image above) is supporting local community-building and sustainability initiatives through an annual $120,000 Community Benefit Fund established by Neoen and administered by the Northern Grampians Shire Council.

Well known NSW farmer, climate activist and wind advocate Charlie Prell has spent the best part of the past two decades touting the advantages provided by wind farms to farmers and the wider regional communities. Prell has been on a mission to encourage transparent and equitable sharing of benefits, namely profits generated by renewables, among those in proximity of host farmers' turbines.

Proving, as they say, that what goes around comes around.

WIND TURBINES OFF THE COAST COULD HELP AUSTRALIA BECOME AN ENERGY SUPERPOWER, RESEARCH FINDS

IMAGE BY ALEXANDER KUHN FROM PIXABAY

"More than ten offshore wind farms are currently proposed for Australia. If built, their combined capacity would be greater than all coal-fired power plants in the nation."

OFFSHORE WIND FARMS are an increasingly common sight overseas. But Australia has neglected the technology, despite the ample wind gusts buffeting much of our coastline.

New research released in mid-2021 confirms Australia's offshore wind resources offer vast potential both for electricity generation and new jobs. In fact, wind conditions off southern Australia rival those in the North Sea, between Britain and Europe, where the offshore wind industry is well established.

More than ten offshore wind farms are currently proposed for Australia. If built, their combined capacity would be greater than all coal-fired power plants in the nation.

Offshore wind projects can provide a win-win-win for Australia: creating jobs for displaced fossil fuel workers, replacing energy supplies lost when coal plants close, and helping Australia become a renewable energy superpower.

The time is now

Globally, offshore wind is booming. The United Kingdom plans to quadruple offshore wind capacity to 40 gigawatts (GW) by 2030 – enough to power every home in the nation. Other jurisdictions also have ambitious 2030 offshore wind targets including the European Union (60GW), the United States (30GW), South Korea (12GW) and Japan (10GW).

Australia's coastal waters are relatively deep, which limits the scope to fix offshore wind turbines to the bottom of the ocean. This, combined with Australia's ample onshore wind and solar energy resources, means offshore wind has been overlooked in Australia's energy system planning.

But recent changes are producing new opportunities for Australia. The development of larger turbines has created economies of scale which reduce technology costs. And floating turbine foundations, which can operate in very deep waters, open access to more windy offshore locations.

More than ten offshore wind projects are proposed in Australia. Star of the South, to be built off Gippsland in Victoria, is the most advanced. Others include those off Western Australia, Tasmania and Victoria.

Our findings

Our study sought to examine the potential of offshore wind energy for Australia. First, we examined locations considered feasible for offshore wind projects, namely those that were:

- less than 100km from shore
- within 100km of substations and transmission lines (excluding environmentally restricted areas)
- in water depths less than 1,000 metres.

Wind resources at those locations totalled 2,233GW of capacity and would generate far more than current and projected electricity demand across Australia.

Second, we looked at so-called 'capacity factor' – the ratio between the energy an offshore wind turbine would generate with the winds available at a location, relative to the turbine's potential maximum output.

The best sites were south of Tasmania, with a capacity factor of 80%. The next-best sites were in Bass Strait and off Western Australia and North Queensland (55%), followed by South Australia and New South Wales (45%). By comparison, the capacity factor of onshore wind turbines is generally 35–45%.

Average annual wind speeds in Bass Strait, around Tasmania and along the mainland's southwest coast equal those in the North Sea, where offshore wind is an established industry. Wind conditions in southern Australia are also more favourable than in the East China and Yellow seas, which are growth regions for commercial wind farms.

Next, we compared offshore wind resources on an hourly basis against the output of onshore solar and wind farms at 12 locations around Australia.

At most sites, offshore wind continued to operate at high capacity during periods when onshore wind and solar generation output was low. For example, meteorological data shows offshore wind at the Star of the South location is particularly strong on hot days when energy demand is high.

Australia's fleet of coal-fired power plants is ageing, and the exact date each facility will retire is uncertain. This creates risks of disruption to energy supplies, however offshore wind power could help mitigate this. A single offshore wind project can be up to five times the size of an onshore wind project.

Some of the best sites for offshore winds are located near the Latrobe Valley in Victoria and the Hunter Valley in NSW. Those regions boast strong electricity grid infrastructure built around coal plants, and offshore wind projects could plug into this via undersea cables.

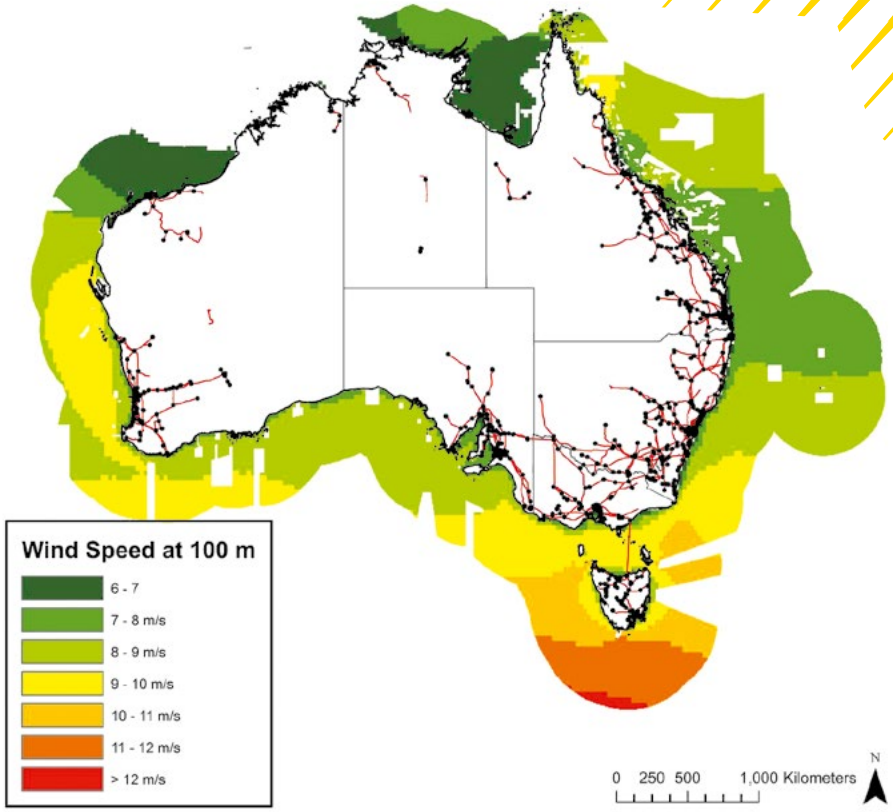
And building wind energy offshore can also avoid the planning conflicts and community opposition which sometimes affect onshore renewables developments.

Winds of change

Our research found offshore wind could help Australia become a renewable energy 'superpower'. As Australia seeks to reduce its greenhouse gas emissions, sectors such as transport will need increased supplies of renewable energy. Clean energy will also be needed to produce hydrogen for export and to manufacture 'green' steel and aluminium.

Offshore wind can also support a 'just transition' – in other words, ensure fossil fuel workers and their communities are not left behind in the shift to a low-carbon economy.

Our research found offshore wind could produce around 8,000 jobs under the scenario used in our study – almost as many as those employed in Australia's offshore oil and gas sector.



Average wind speed (metres per second) from 2010-2019 at 100 metres (Authors provided)

Many skills used in the oil and gas industry, such as those in construction, safety and mechanics, overlap with those needed in offshore wind energy. Coal workers could also be re-employed in offshore wind manufacturing, port assembly and engineering.

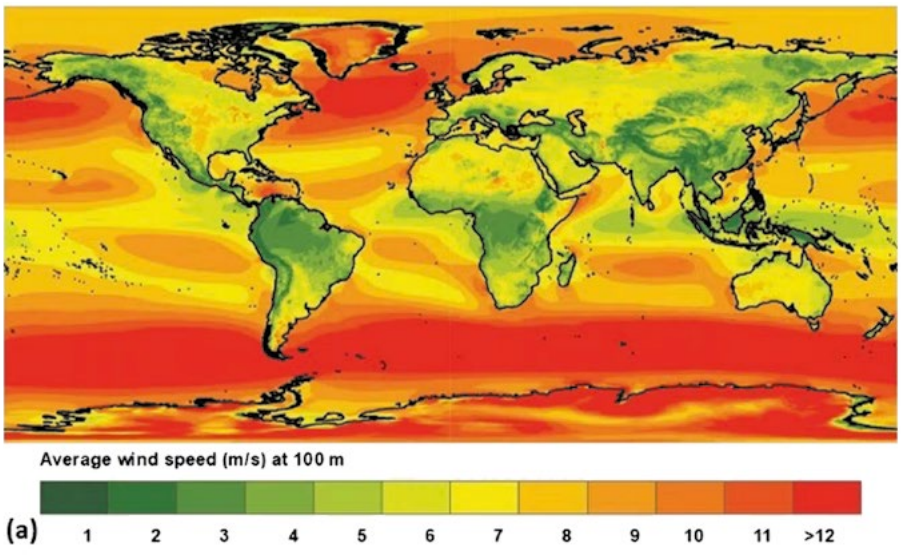
Realising these opportunities from offshore wind will take time and proactive policy and planning. Our report includes ten recommendations, including:

- establishing a regulatory regime in Commonwealth waters
- integrating offshore wind into energy planning and innovation funding
- further research on the cost-benefits of the sector to ensure Australia meets its commitments to a well managed sustainable ocean economy.

If we get this right, offshore wind can play a crucial role in Australia's energy transition.

Authors: Sven Teske, Chris Briggs and Rusty Langdon, University of Technology Sydney; Mark Hemer of CSIRO; Philip Marsh, University of Tasmania.

This article first appeared in The Conversation *and is republished under Creative Commons licence. It was published on July 22, 2021, and some developments have occurred since then.*



Global average wind speed (metres per second at 100m level (Authors provided)

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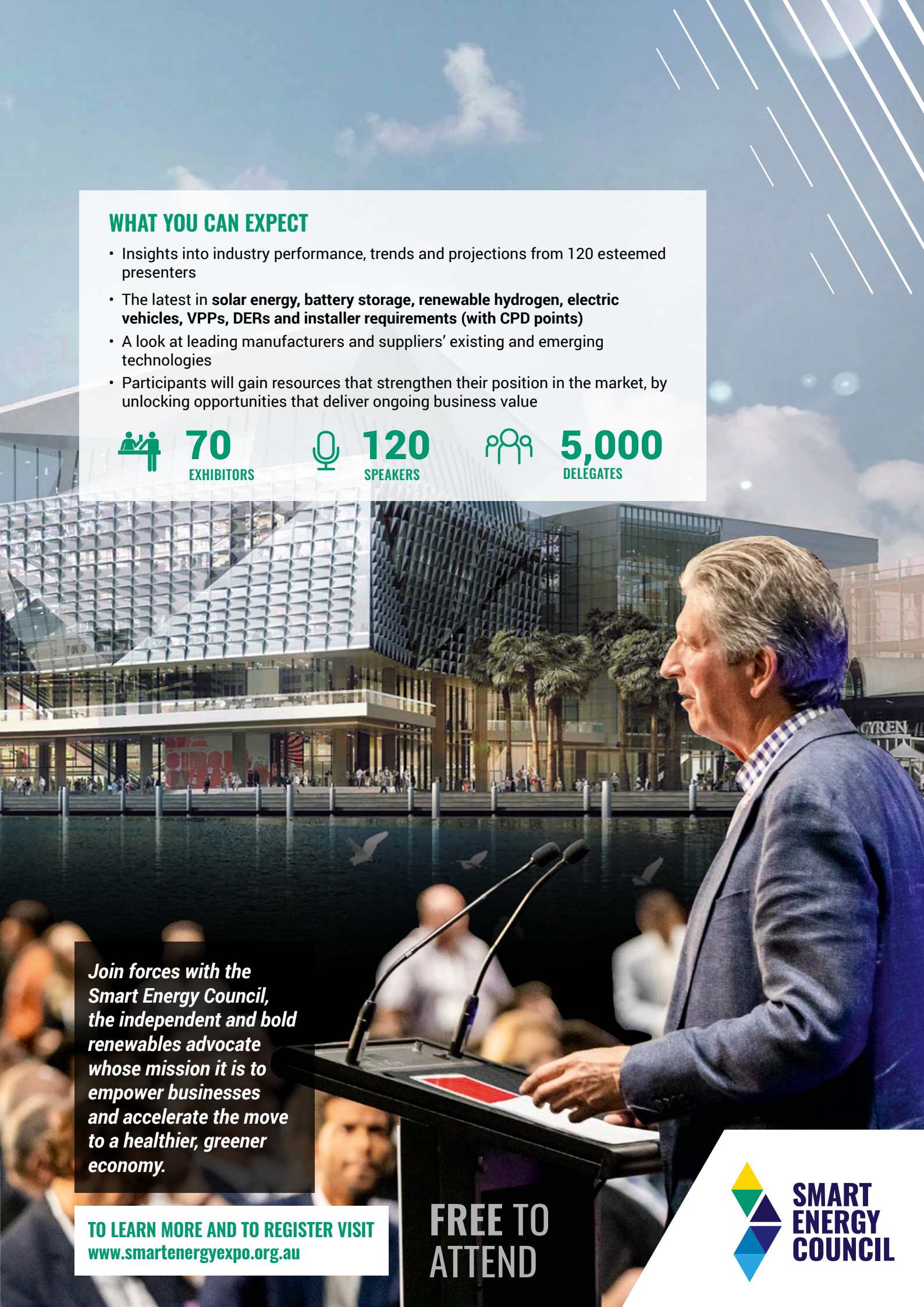

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RENEWABLE HYDROGEN GATHERS PACE

A look at the evolution of renewable hydrogen across many frontiers

ACT Hydrogen Refuelling station: a glimpse of the future

In a first for Australia, ActewAGL's hydrogen refuelling station in Canberra has been certified with renewable green hydrogen produced from 100 per cent renewable energy and with zero carbon emissions.

It's also a first for the Smart Energy Council's world-leading Zero Carbon Certification Scheme, which is backed by some of the biggest renewable hydrogen companies in the world, the German Energy Agency, State Governments of Victoria, Western Australia and Queensland, and the Australian Capital Territory.

Shane Rattenbury, ACT Minister for Energy and Emissions Reductions marked the occasion by driving a hydrogen car to the facility and refuelling it there.

The ACT Minister states all investment and production in the hydrogen industry should be hydrogen made using renewable electricity.

"The Smart Energy Council's scheme is important because it will enable hydrogen and related products to be certified as zero emissions. It is critical we can track how these products are manufactured so customers can be certain the product they select is genuinely zero emissions," Minister Rattenbury said at the certification ceremony.

The Scheme's Founding Partners include the Ammonia Energy Association, COP26 High Level Champions, CWP Global, Energy Web, Star Scientific and ACT renewable hydrogen cluster. The German Energy Agency and Green Hydrogen Catapult are Advisors.

ActewAGL's John Knox commented "Achieving certification provides certainty to our customers that their vehicles are running on green hydrogen."

According to auditor Point Advisory, the ActewAGL refuelling station can produce up to 7,884 kilograms of renewable hydrogen each year using 100 per cent renewable electricity from the ACT grid and potable water from the mains.

Manager of Hydrogen Australia, a division of the Smart Energy Council, Max Hewitt says "The Zero Carbon Certification Scheme being led by Hydrogen Australia is the most advanced hydrogen certification scheme in the country.

"With its focus on renewable hydrogen and its derivatives the scheme plays a critical role accelerating the uptake of renewable production methods, consequently driving down the cost of production."

The Smart Energy Council is now turning its attention to Yara's green ammonia plant in the Pilbara region of Western Australia and anticipates the ammonia production facility will be pre-certified by late July 2022.

Commenting on the "clear desire from industry for the implementation of a domestic and an international scheme to assess embedded emissions in hydrogen products", Max explained the Smart Energy Council is working with the Green Hydrogen Organisation to develop a global standard for green hydrogen.

It's a timely move, given BloombergNEF's recent listing of its Top 10 Hydrogen predictions for 2022. The market analyst singles out five sectors — steel, ammonia, methanol, chemicals and oil refining — that will use more renewable hydrogen in 2022 than all the world's 51,000 hydrogen cars combined.

Industry projections and surveys

Heavy industry is likely to be a dominant end-use for hydrogen as the world strives for net zero by 2050. Importantly, green ammonia will help companies transport large volumes of green molecules across borders well before hydrogen pipelines become viable, given the supply chain for shipping ammonia is already established and this can be easily leveraged for hydrogen exports, the analyst states.

National and corporate net-zero goals will drive more clean hydrogen demand in 2022 than carbon pricing but in the meantime carbon pricing will be key for the growth in demand for clean hydrogen to grow.

"ActewAGL's hydrogen refuelling station is a landmark project, Australia's first public hydrogen refuelling station. We have now certified that it is powered by 100 per cent renewable energy and that it is producing zero emissions hydrogen." JOHN GRIMES OF THE SMART ENERGY COUNCIL

FROM LEFT: James Dunlop, General Manager, New Energy, ActewAGL and John Grimes of the Smart Energy Council. ACT Minister Shane Rattenbury refuelling ACT government vehicle run on renewable hydrogen. The ACT Government is a founding partner of the Zero Carbon Certification Scheme which now has 15 Founding Partners and international advisors.

Further, as the price of electrolysers rapidly declines, 'green' hydrogen from renewables will be cheaper to make by 2030 than 'blue' hydrogen produced from natural gas with carbon capture and storage across the world. Blue hydrogen project developers will increasingly need subsidies to stay viable.

Software services company AspenTech has revealed 65 per cent of respondents of the 340 global companies surveyed were planning to invest in hydrogen in the next five years as a solution to greenhouse gas emissions.

The sustainable investment community is pushing for the green approach, which is largely hydrogen synthesis with electrolysis fuelled exclusively by renewable energy.

Although 56 per cent of companies are planning a move into green hydrogen, 49 per cent are into blue hydrogen, and 25 per cent are in the established approach of grey hydrogen.

Carbon mitigation expert Robert Socolow of Princeton University dubs this phenomenon the 'colour wars' in the move towards this new hydrogen economy.

Slippery shipping news

The departure of the *Suiso Frontier* from Hastings in Victoria in late January loaded with the world's first cargo of liquefied hydrogen to Kobe in Japan which captured media attention has also been met with scepticism and dubbed greenwash.

The vessel, manufactured by Kawasaki Heavy Industries, has a capacity of 1,250 cubic metres which equates to 75 metric tons of liquid hydrogen.

The $500 million Hydrogen Energy Supply Chain project funded by Australian and Japanese governments involves the production of hydrogen from coal gasification in Victoria's Latrobe Valley.

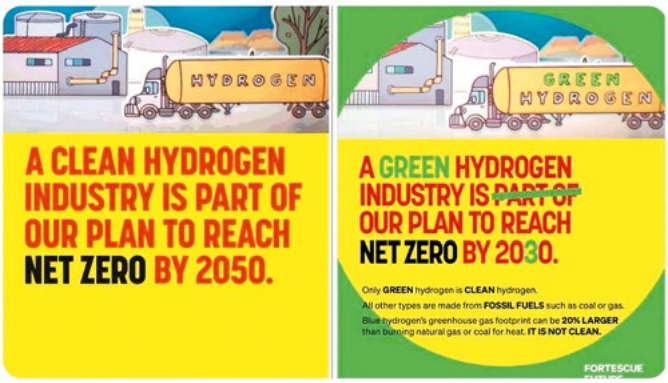
HESC aims to produce 225,000 tonnes of hydrogen per year, but is producing only 1-3 tonnes of hydrogen during its pilot phase.

It is believed 2,900 tonnes of CO_2 was created in the first shipment.

Max Hewitt of Hydrogen Australia (at the Smart Energy Council) condemns the use of brown hydrogen and CCS.

"This project is useful as a proof of concept to demonstrate ability to ship liquid hydrogen over long distances," he said. "But using 160 tonnes of brown coal to generate just 3 tonnes of fossil hydrogen and creating more emissions than burning it directly, whilst claiming it is 'clean' is an embarrassment to Australia. CCS is ineffective, inefficient and expensive – Gorgon is a perfect example. I think it is very telling that they have elected not to use CCS for the pilot period."

Shell claims its use of CCS prevented release of 5 million tonnes of carbon dioxide over five years but in reality is believed to have released 7.5 million tonnes in that same time – a fact Shell appears to have overlooked with just 48 per cent of the CO_2 (or less, 39 per cent when methane is factored in) captured the plant has a carbon footprint equal to 1.2 million cars.



Exposing greenwashing

"Only green hydrogen – made from renewable energy – can truly be called 'clean'. All other types are made from fossil fuels such as coal and gas. Blue hydrogen's greenhouse gas footprint can be 20 per cent larger than burning natural gas or coal for heat. IT IS NOT CLEAN."

This was the message delivered in no uncertain terms by Andrew 'Twiggy' Forrest of Fortescue Future Industries in *The Daily Telegraph* and the *Australian Financial Review* in early February. "Indirectly demonstrating, through a $500 million pilot project in Victoria, that international trade in liquid hydrogen is technically feasible… let's not pretend we're exporting 'clean energy' to the world… peddling hydrogen made from brown coal – the dirtiest of all coals – as 'clean' is a cringe-inducing backwards shuffle into the dark ages.

"We look like zero-IQ idiots if we make hydrogen out of the dirtiest fossil fuel on the planet and hawk it as 'clean'."

In a piece published in the esteemed publication *Konrad Adenauer Stiftung Australia & the Pacific*, Max Hewitt said the extent of emissions is often downplayed or ignored in governments' public statements about future hydrogen supply chains, with many treating low-emission and zero-emission production as functionally equivalent or interchangeable. "The high rates of carbon capture typically posited in government strategies are likely to be both difficult to achieve in practice and costly," he wrote. "We must add scrutiny to the pursuit of certification of low-carbon products which will require careful deliberation and determination of appropriate emissions' thresholds, production technologies and emissions' capture technologies."

Cost curve

Globallly green hydrogen costs are expected to fall as much as 75 per cent by 2030, as the price of electrolysers rapidly declines which is leading pundits to state renewable hydrogen will be cheaper to make than fossil gas-based hydrogen across the world by 2030.

Tim Buckley formerly of IEEFA says green hydrogen is moving at lightspeed and global investment, with strong policy support and replication of the solar learning curve, is adding to the momentum. "The outcome is as inevitable as it is overdue," he wrote in *Financing the future of green hydrogen*. Investors are punting and risk capital is moving.

He cites energy cost deflation and the scaling up of electrolyser manufacturing as accelerating the shift from the current green hydrogen (GH2) cottage industry to the global gigawatt-scale commercialisation that will take place this decade.

Electrolyser unit sizes are moving from 0.2MW to 5MW, a massive twenty-fold scaling up; BloombergNEF estimates electrolyser capacity globally at 15GW by 2024, Tim notes. Global production was 70MW in 2020, which itself was a doubling from the previous year, according to the IEA. Back in mid-2020 IHS Markit predicted electrolyser facility sizes would reach 100MW by 2030.

RENEWABLE HYDROGEN DEVELOPMENTS

HYUNDAI MOTOR COMPANY AUSTRALIA (HMCA) is investing in a new hydrogen refuelling station at its corporate headquarters in Macquarie Park, Sydney. The facility which will be developed in partnership with Australian gas technology company ENGV will enable Hyundai to support its expanding range of hydrogen fuel cell vehicles through faster refuelling and green hydrogen generated on site.

The new station is forecast to produce up to 20kg of hydrogen per day via an integrated electrolyser, and provide 700bar refuelling capability that paves the way for the Nexo FCEV to travel up to 666km on a single tank, with a refuelling time of less than five minutes.

Long distance drivers will barely have time to enjoy a coffee break!

Over in the west BP is progressing plans to produce renewable fuels and green hydrogen at its former oil refinery in Kwinana that is serving a purpose today as a fuel import terminal.

BP plans to use hydrogenated vegetable oil, aka renewable diesel, and waste-based feedstock to produce sustainable aviation fuel.

In early February the **TASMANIAN GOVERNMENT** signed a memorandum of understanding on green hydrogen with the region of Flanders in Northern Belgium.

Energy Minister Guy Barnett said the scope of this MOU extends beyond exporting and importing green hydrogen.

"Synergies have also been identified between the two states in more niche areas, such as the use of green hydrogen in aquaculture operations and offshore energy systems as well as in the shipping sector," he stated.

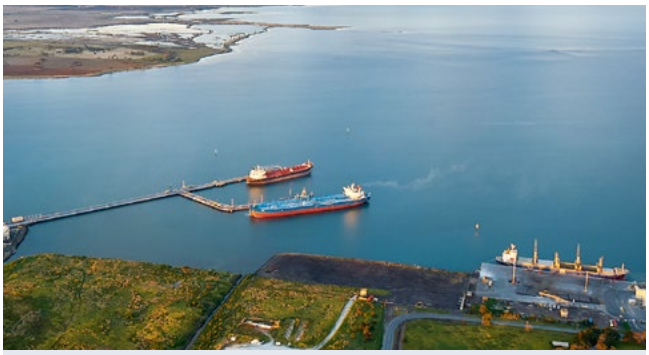
The new MOU follows that of mid-December between the government and the Port of Rotterdam in the Netherlands with the duo investigating the feasibility of future exports of green hydrogen from Bell Bay.

Tasmania's Renewable Hydrogen Action Plan sets a goal for the state to be a leader in large-scale green hydrogen production by 2030 for domestic needs and export demand.

PROMINENT HYDROGEN INNOVATOR STAR SCIENTIFIC has appointed Dr Ashkan Vatani (pictured) to the role of Principal Engineer to lead the concept design, simulation works and all facets of project engineering in general, managing a team of engineers, designers and workshop staff.

Dr Vatani's appointment follows a reorganisation of Star Scientific's key staff aimed at facilitating the move to the commercialisation of services based around its groundbreaking HERO® catalyst, the Hydrogen Energy Release Optimiser that produces unlimited, affordable, safe and reliable heat with zero emissions.

Star Scientific Global Group Chairman Andrew Horvath, who is steering development of technologies to help businesses and governments transition to a new energy economy, expressed his confidence in Dr Vatani's ability to "provide the leadership and rigour to enable us to deliver against one of our most important strategic priorities".



GEELONGPORT IS EXPANDING OPERATIONS with a $100 million investment to build the Geelong Hydrogen Hub, a production and distribution facility for green hydrogen which can be used as an alternative fuel source for Victorian households, businesses and industries, and help reduce Victoria's reliance on fossil fuels and accelerate the state's transition to a low carbon future.

The first stage of the Geelong Hydrogen Hub is expected to be operational in December 2023, and will include the ability to produce green ammonia for export into Asia to meet the growing demand in the region.

ANDREW FORREST'S FORTESCUE FUTURE INDUSTRIES has acquired a stake in Sparc Technologies which aims to commercialise 'photocatalyst' technology which splits water using direct sunlight thus avoiding the need to use conventional electrolysis.

The technology, developed by researchers at the University of Adelaide and Flinders University, can potentially eliminate the need for renewable hydrogen production though large-scale solar and wind farms.

Melbourne is set to be Australian HQ for **HYDROGEN VEHICLE MAKER HYZON** which, in partnership with RACV, will develop a purpose-built facility in the city's south-east.

Hyzon's global HQ is in New York, and as many know its chief executive and co-founder Craig Knight is Australian and a regular presenter at Smart Energy Council events.

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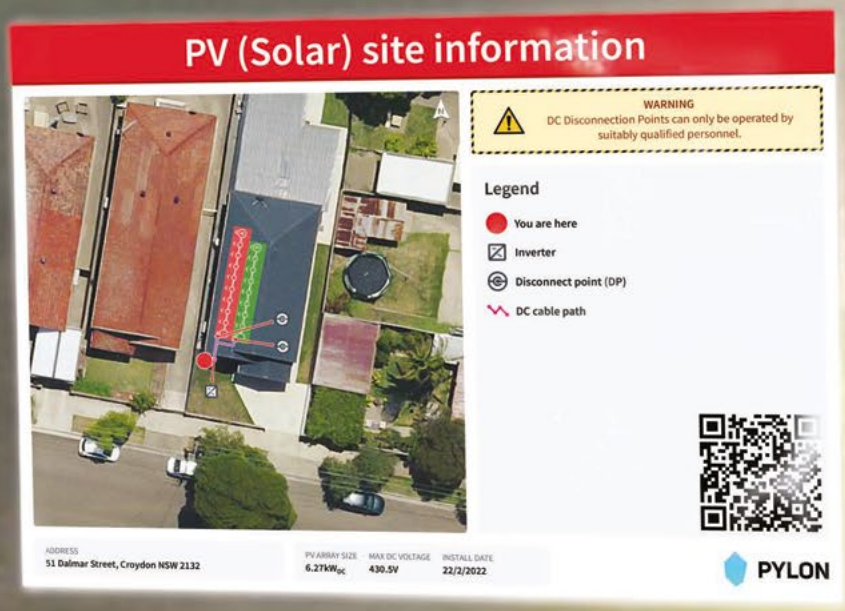


https://pylon.solar/smartenergy

RENEWABLE HYDROGEN DEVELOPMENTS

THE VICTORIAN GOVERNMENT is committing more than $7 million of funding for trials and studies to fast-track predicting the uses of renewable hydrogen to accelerate decarbonisation in the transport and industrial sectors.

Up to $6.6 million is being provided through the Renewable Hydrogen Commercialisation Pathways Fund to support six projects that will see Victoria produce and use renewable hydrogen in 'real-world' applications and help Victoria meet its target of halving emissions by 2030 and hit net zero by 2050.

SINGAPORE'S SOVEREIGN WEALTH FUND GIC PRIVATE LIMITED, formerly known as Government of Singapore Investment Corporation, has snapped up a stake in InterContinental Energy which commands a development portfolio of 200GW of wind and solar capacity to generate around 14 million tonnes of green hydrogen or 80 million tonnes of green ammonia annually.

Readers will be familiar with the name InterContinental which has teamed with CWP Global to draw up plans for two of the world's most ambitious plants, both in Western Australia: the 50GW Western Green Energy Hub and the 26GW Asian Renewable Energy Hub.

The Sovereign Wealth Fund Institute estimates the fund's assets at US$744 billion and its investment team strives to achieve strong long-term returns above global inflation over a two-decade investment timeline.

Research by Steven Percy with the **VICTORIAN HYDROGEN HUB** reveals that from a cost perspective the renewables-rich locations of far north Queensland and Tasmania could be those best placed to produce green hydrogen in future, with production costs today at $4.1/kg and $4.4/kg respectively.

Should Australia achieve a $50 billion green hydrogen industry it would take only around 4 per cent of the water used for crops and pastures in 2019-20 to generate an export industry that size – 225,000 megalitres.

Beyond that, much more water will be freed up as coal-fired power stations exit the grid. In Queensland and NSW alone, these power stations consume around 158,000 megalitres a year according to a 2020 report prepared for the Australian Conservation Foundation. Coal mining in these two states takes an additional 224,000 megalitres.

OVERSEAS NEWS

- The US Department of Energy has announced US$21.5bn in federal funding for Office of Clean Energy Demonstrations and the biggest single slice of $9.5bn is earmarked for green hydrogen to establish four regional hubs, and a manufacturing and recycling program.

  The Demonstration's aim is to achieve the largest number of innovative carbon-free technology projects at scale in US history.
- Renewable H2 is already separately the focus of the first of the DoE's 'energy earthshot' initiatives, which aims to slash the cost of production of the green fuel by 80% over the next decade.
- The US is expected to be the second largest electrolyser market this year, behind China,

and

- According to BloombergNEF, Chinese companies already sell electrolysers at one-quarter the price of their western counterparts.
- IEEFA reported that in February 2020, the largest operational GH2 facility (10MW) opened in Japan, not long after Air Liquide had opened its 20MW facility in Canada.
- At the same time as this facility was commissioned, construction started on a 100MW facility in Germany and Shell's Rhineland electrolyser, known as Refhyne.
- Fast forward to January 2022, when thyssenkrupp and Shell announced a 200MW unit in Rotterdam to be commissioned by 2024/25, and another doubling even before the 100MW facility is built.
- In New Zealand Meridian and Contact Energy are proposing an ambitious 600MW facility with a 2025/26 start-up.

RENEWABLE HYDROGEN POISED FOR TAKE-OFF

Today in Australia

- **> 60** renewable hydrogen projects underway
- **7** large-scale (GW) production hubs in progress *('Australia the prospective renewable hydrogen superpower')*
- **$300m** CEFC Advancing Hydrogen Fund – open until exhausted

Fossil 'fools' generating carbon emissions

COAL **1 tonne of hydrogen** generated from coal produces **18.8 tonnes CO_2e**
When burnt directly, coal generates ~11.1 tonnes CO_2e

FOSSIL GAS **1 tonne of hydrogen** generated from gas produces **9.3 tonnes CO_2e**
When burnt directly, gas generates ~6 tonnes CO_2e

'CLEAN HYDROGEN' WITH CCS **1 tonne of hydrogen** using carbon capture and storage generates a**round 4.8 tonnes CO_2e** (depending on feedstock)

1 tonne of hydrogen generated from renewable electricity = zero emissions

Source: Hydrogen Australia (a division of the Smart Energy Council) calculations from various publications

Forecasts

Electrolyser* capacity costs will fall as much as two-thirds from current levels over the next decade

BY 2040 83% fall in electrolyser costs

BY 2050 > 90% fall in electrolyser costs

Minimal cost reduction in fossil gas hydrogen with CCS

'Renewable hydrogen is likely to capture much of the market for hydrogen from 2030 onwards.'

**The key cost component of renewable hydrogen production*

Source: CSIRO Electrolyser costs and GenCost 2020-21

A glimpse of H_2 in 2022

- **Electrolyser sales** will quadruple to **1.8–2.5GW** (458 megawatts in 2021)
- China will account for **62-66%** of total demand
- **22 more countries** will adopt hydrogen strategies in 2022 (during 2021 countries with a hydrogen strategy doubled from 13 to 26)

Source: BloombergNEF Top 10 Hydrogen Predictions for 2022.

Global perspective

Hydrogen could cover **~12% of global energy use** by 2050

>30% of hydrogen could be traded across borders by 2050 (more than today's natural gas share)

By mid-2030, green hydrogen will cost-compete with fossil-fuel hydrogen globally

Source: International Renewable Energy Agency (IRENA): Geopolitics of the Energy Transformation: The Hydrogen Factor

"Hydrogen could prove to be a missing link to a climate-safe energy future… [it is] clearly riding on the renewable energy revolution with green hydrogen emerging as a game changer for achieving climate neutrality without compromising industrial growth and social development. Green hydrogen will bring new and diverse participants to the market, diversify routes and supplies, and shift power from the few to the many."

– Francesco La Camera, Director-General of IRENA

PV AND BEYOND: THE YEAR THAT WAS AND A LOOK AHEAD

Last year brought many COVID-related challenges to business across the spectrum, with lockdowns limiting site visits and disruptions impacting supply chains. However the rooftop PV market continued to power ahead. Industry's top analysts have assessed all available data to paint a picture of market trends and the outlook for the year ahead. Here we provide a synopsis of key findings.

TWENTY TWENTY ONE – what a year. One that many would rather forget, or at least have been happy to see the end of after the series of rolling restrictions imposed on business and lifestyles. But as things panned out it was not all bad for renewables, certainly not the rooftop PV sector which in many ways defied the odds to come out on top.

The proof of the pudding was the amount of installed capacity of small-scale rooftop PV systems which at the end of December 2021 came in at 3,220MW; a healthy 10 per cent above the 2,938MW installed in 2020. In all a total of 29,888 more residential systems were registered in 2021.

The rise of 10 per cent may be a third less than the 15 per cent expected, but nevertheless highlights the ongoing popularity of solar PV in Australia, a nation that still leads the world with 17GW of installed panels. That's more than three million households and small businesses.

According to industry consultant Green Energy Markets (GEM) by year's end Queensland led the overall tally board with 4,483MW of installed capacity, closely followed by New South Wales (4,256MW) and Victoria (3,839MW).

Interestingly, and in a departure from the norm, for only the second time since the 2011 introduction of the small-scale residential scheme, the majority of installations were registered in the first half of the year. Further analysis reveals the weeks prior Easter and Christmas fared best.

Although during 2021 PV systems sized 6-7kW still accounted for almost half (49 per cent) of systems, larger residential systems continued to become more popular.

As illustrated in the GEM chart on the opposite page, systems between 7kW and 15kW represented a third of the residential market; that is up from the near quarter (24 per cent) market share in 2020 and a big lift from the 15 per cent recorded in 2019.

Turning to state take-up and NSW hung on to top spot with its record annual installed capacity of 806MW, followed by Queensland with 664MW and Victoria at 554MW. The story was different at the top end of NT where residential installed capacity came in at 13MW, down 43 per cent on 2020.

Commercial PV fared well during 2021: 16,700 systems with an installed capacity of 563MW, up on 2020 levels by 16 and 7 per cent respectively and reflecting the strong growth in the small (15-20kW) commercial market.

Meantime the solar water heating market warmed up during 2021, registering 97,800 systems, the highest since 2011. Victoria was well ahead of other states, accounting for 58 per cent of the market with its 56,000 new SWH systems.

Powering on

Reflecting on 2021, market analyst Warwick Johnston of SunWiz noted a key trend was the slowdown in growth compared to each of the previous four years that saw annual growth rates of 33 to 50 per cent in the <100kW installation category, and a very welcome quadrupling of the market size in those four years.

Other than COVID-related causes, he attributes the slowdown to panel production constraints and inverter/isolator regulations as well as falling electricity prices and feed-in tariffs that impact the economics of rooftop PV.

Many of these issues will prevail, however demand for rooftop PV will undoubtedly remain strong, says John Grimes of the Smart Energy Council. There is an air of optimism about the future. "Despite last year's bumps the rooftop PV industry managed to forge ahead, albeit not quite at the pace of previous years, but nevertheless a ten per cent rise on that of 2020 indicates the market remains robust. Few other markets have performed as strongly during the pandemic.

"Consumers have developed a real affinity for rooftop PV and indications are that we will continue to see year-on-year growth in uptake," John Grimes said. "The energy market is undergoing a fundamental transition at both micro- and macro-level and once we have a federal government that recognises and supports the need for renewable energy the transformation will accelerate."

What of 2022?

For his part Warwick Johnston does not anticipate substantial growth of small-scale PV in 2022, which has seen a quiet start to the year. That makes it tougher for retailers, who he says need to focus on optimising their profitability in a structural, lasting way such as automating business processes and promoting the benefits of returns on systems to customers. A much lower monthly power bill holds great appeal.

In his 2021 Australian Solar Year in Review *The Wrap* Warwick writes there are headwinds and hope, and that "there is still runway left".

Most of the three million existing PV systems are small in size and could be scaled up to accommodate changes brought about by the shift to electric vehicles and need for home batteries, he says.

The trend has already begun, with CER data revealing 11 per cent of systems installed in 2020 were at the same address as existing residential systems. The forecast for 2023 is 17 per cent growth.

"What reduces the financial outcome for PV improves the financial outcome for storage, so retailers can revisit old customers with a storage upgrade and sell EV charging points, or partner with EV retailers."

Warwick also suggests retailers promote the value of electrifying homes and consider selling finance as well as address untapped markets such as renters and apartments.

SunWiz has developed a suite of data tailored for different market segments with a bevy of colourful names including Mastermind, Accelerate, Luminate SR.

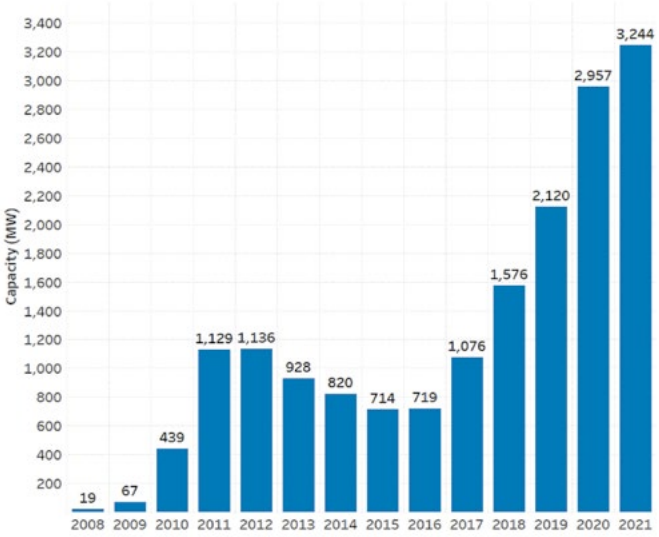
A straw poll conducted by the SunWiz team found 36 per cent of respondents anticipate market growth (installed PV capacity 2022 versus 2021) between 10 and 24 per cent, 28 per cent are optimistic with growth of 25 per cent or more, 32 per cent reckon demand will stay steady in the +/-9 per cent bracket. Just 2 per cent believe the market will contract by 10 per cent or more.

www.sunwiz.com.au

Bring on the batteries!

Home energy storage is very much on Ric Brazzale's radar. Addressing the Smart Energy Council's Virtual Conference held late last year the managing director of Green Energy Markets commented residential Solar PV attractiveness will continue to decline and new residential system installations will slow until batteries become more economic; in the coming years PV will be more attractive with batteries.

"Batteries will become increasingly important to support PV economics and as a demand reduction measure," he told delegates.



2021 End of Year Tally (STC). Chart courtesy SunWiz

Critically, with solar capacity on a trajectory to overtake coal by 2025, it is time to focus more on batteries as "the next battlefront in decarbonising Australia's power system".

In a comprehensive paper penned with colleague Tristan Edis, Director of Green Energy Markets, he highlights the importance of coupling further roll-outs of solar with battery storage which provides the potential to deliver vastly greater value to electricity consumers as well as "deliver greater improvements in both electricity reliability and affordability because it provides a replacement not just for power station capacity but also costly network capacity".

Essentially a policy pivot from PV support to the roll-out of batteries. And one that is the best solution for the real reliability problem, noting that 95.6 per cent of blackouts are caused by problems with powerlines, not the actual power stations.

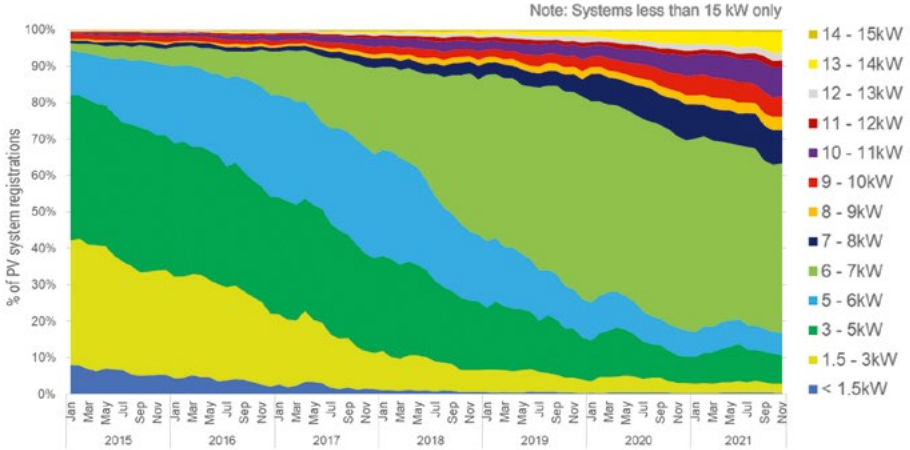
Brazzale and Edis propose modifications to the Small-Scale Renewable Energy Scheme as an incentive to drive up to 10,000MW of household battery storage by 2030.

The GEM paper is a shrewd piece of work that deserves widespread contemplation as a smart and timely blueprint for a cleaner, greener future.

For a host of reasons, not least of which is the favourable climate, Australia probably has the most to gain out of developed nations from driving down the cost of home battery systems, they say.

Today, all roads lead to batteries.

And on those roads are more electric vehicles.



Increasing proportion of larger solar systems. Chart courtesy GEM

ENERGY SPARKING COMMENT AND COMMITMENT

Déjà vu?

We found a curious news item recently when surfing the web:

"The Australian government is launching a major new initiative aimed at preventing global warming," it read, "The Prime Minister has announced an investment of $500m in clean technology, much of which will look at reducing carbon emissions from coal.

"The country has been facing its worst drought in a century... destroying the livelihoods of thousands of farmers... [but] the PM has dismissed claims that the drought is the product of long-term climate change.

"In his weekly radio address, the PM said Australia would invest in new technologies to cut down emissions from fossil fuel power plants. Some of it would also go towards renewable energy systems. He stated 'We must respond on a number of fronts. There is no one single solution that will reduce greenhouse gas emissions over the years ahead'."

As you may have guessed this is an old piece, spotted on the BBC website and dated October 23, 2006 in the mistitled "Australia launches climate plans". Monica Richter was on hand to right the record, declaring government had "set its course on a technological fix" to deal with climate change and overlooked Australia's bountiful renewable energy resources.

"We could be exploiting these options and be a real leader in the renewable energy industry," Monica Richter formerly of the Australian Conservation Foundation told BBC World Today. Back in 2006. Some battles just never change ...

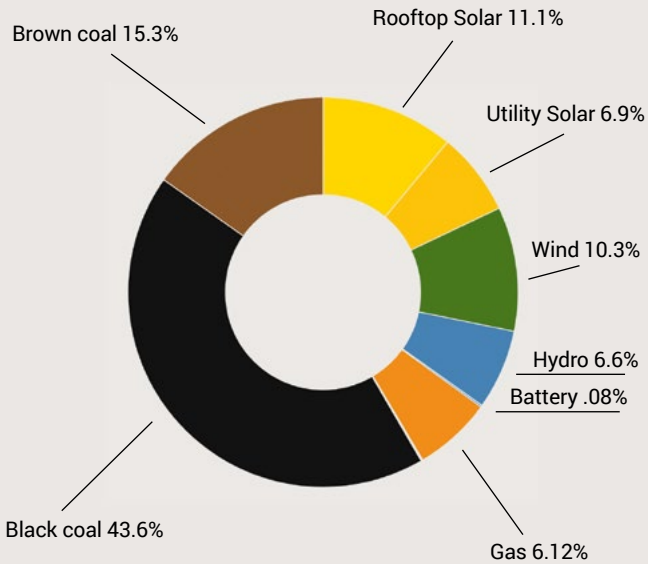
A simple solution

Global identity and climate campaigner Saul Griffiths is a popular presenter at Smart Energy Council conferences, his key message being climate change is a planetary emergency and we need to make a big switch.

Indeed, that is the title of his new book, *The Big Switch*.

'We don't have to be perfect to solve climate change. We just need to be electric [powered by renewables]. If we go hard and early on cutting emissions we have everything to win... transforming Australia into the most prosperous, entirely renewable, economy in the world."

His book steps out the actions needed to transform infrastructure, update the grid and adapt households.



The energy market mix at late February 2022

Source: OpenNEM, www.opennem.org.au

Unhealthy habits

Climate action group 350.org Australia has found that during 2020-2021 fossil fuel companies donated $959,155 to the three major parties, up $80,000 on the previous year. The Liberal Party received the majority, at $506,810, however the ALP was gifted $392,354.

Woodside, which is pumping millions into carbon capture and storage trials, was the largest fossil fuel donor, pledging $124,350 to the Liberals and $108,000 to Labor.

The Minerals Council of Australia donated $101,192 and $64,660 respectively and the St Baker Family Trust gave Liberal party $112,758 and Labor $52,444.

Unsurprisingly, gas companies which are among Australia's biggest political donors are also recipients of massive public subsidies.

350 Senior Campaigner Shani Tager stated "There should be no room for fossil fuel companies in our politics but instead they're bankrolling the major parties to try and shore up their future... it's clear that money is talking,"

Ending on a positive note, total generation from Australia's wind and solar plants grew 22 per cent in 2021 compared to the year prior, setting a new record and supplying more than 32 per cent of Australia's electricity needs.

In turn coal generators market share dropped below 60 per cent and gas generation fell to 7.8 per cent, according to OpenNEM data.

A market in transition

BloombergNEF predicts that 2022 will be the first year in which more than 200GW of solar will be installed globally; possibly around 228GW which is significantly greater than earlier expectations of 206GW during 2022.

But before we pop open the prosecco, a sobering reminder that during 2021 coal power supplies generated more than half of the 6 per cent increase in global energy demand, growing 9 per cent. Deployment of renewables hit new highs of 290GW/yr however the sector grew just 6 per cent while greenhouse gas emissions from electricity rose nearly 7 per cent.

As much as 185GW of coal is reportedly under construction and 309GW more planned, however country pledges at CoP could see 88GW cancelled, according to informed sources. Further, up to 550GW of the world's 2,110GW coal capacity has a phase out date, including some significant plants within Australia which are now slated to retire early, most notably that of Origin's 2,880MW Eraring coal generator in NSW.

SMART ENERGY COUNCIL

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SMART ENERGY COUNCIL WORKING FOR YOU

The mission of the Smart Energy Council is to stand up for the smart renewables industry and push for progress. We continue to fight for good state and national smart energy policies and to create jobs, attract investment, and stimulate renewable energy manufacturing growth and export. Here we look at events and activities underway to set the foundation for the rise and dominance of renewable energy.

A RALLYING CRY FOR RENEWABLE ENERGY

Over the past eight years the federal Liberal National Party Government has done everything it can to protect the coal industry, massively expand fossil gas, and to roll back and stop the expansion of smart energy. To our shame, as a nation we lack federal renewable energy targets and smart energy policies and have long been locked in a battle for science-based, rational climate and energy policies.

Smart Energy Council chief executive John Grimes has for many years led the case for a strong renewable energy sector to unlock enormous economic opportunities.

In the lead up to the federal election, the Smart Energy Council is sharpening its focus with a publicity campaign aimed at bringing an end to the pro-coal, anti-renewables reign and calling for a parliament that takes strong action on climate.

Much of the work is guided by the SEC's **Federal Election Advisory Committee**. The Committee of high-ranking industry individuals and political experts provides advice that is strengthening the SEC's campaign which is aimed at securing a federal parliament committed to action on climate change and supporting renewable energy. The Committee has already worked with some Independent candidates, as well as Greens and Labor candidates, to assist them in their knowledge of the industry's potential for local businesses in their electorates.

"We want parliamentarians who recognise climate change science and are willing to act accordingly and who support the renewable energy industry," said External Affairs Manager Wayne Smith who provided significant input to Federal Labor's comprehensive *Powering Australia* plan to modernise the economy, create new jobs, industries and business opportunities. A foundation that establishes Australia as a renewable energy superpower. The plan involves boosting the share of low-cost renewables in the National Electricity Market to 82 per cent by 2030.

"We will be pushing for a Federal Labor Government to increase this target over time, consistent with climate science and international commitments," Wayne said.

Smart Energy Council chief executive John Grimes with a senior BBC reporter Phil Mercer

David Pocock, Independent candidate for the ACT, pictured with John Grimes

SMART VOTING AND BIN STICKER CAMPAIGN

The Bin Stickers 'chuck them out' campaign successfully mobilised tens of thousands of citizens wanting a government that supports the move from polluting coal-fired energy to renewable energy.

News of the campaign travelled fast thanks to social media, and tens of thousands of stickers have been posted out.

Legalities of the Australian Charities and Not-for-profits Commission (ACNC) prevent Smart Energy Council involvement in the Sticker campaign, however a new entity 'Smart Voting', which is not affiliated with the Smart Energy Council, is continuing the sticker campaign in the lead up to the federal election.

For more details and to order stickers visit www.smartvoting.store

SPECIALIST SECTORS

DISTRIBUTED ENERGY RESOURCES WORKING GROUP The rapid rise and decentralisation of energy generation, storage and management has seen renewables challenge the dominance of fossil fuels. Although smart technologies present great opportunities, much of the potential is constrained due to poor governance, insufficient technical standards and weak compliance monitoring.

The Smart Energy Council has ramped up efforts to address the challenges and formed the Smart Energy Council DER Industry Working Group. The group which is chaired by Gabrielle Kuiper includes many leading smart energy innovators: Evergen, Reposit Power, Discover Energy, Redback Technologies, Brighte and Enphase Energy. Thy are promoting the need for a change in mindset to deliver a brighter future driven by the enormous opportunities in DER, which is forecast to be responsible for half Australia's energy resources by 2050. Details are spelt out in the Working Group's submission to the AEMC.

LARGE-SCALE RENEWABLES WORKING GROUP The SEC has convened a Large-Scale Renewable Energy Working Group as an opportunity to talk through the priorities and opportunities within this sector. The group comprises large-scale project companies, project developers, investors, engineers and procurement companies.

2022 CALENDAR OF EVENTS

MARCH 2022

INSTALLER ROADSHOW

18 BRISBANE
23 MELBOURNE
30 SYDNEY
31 ADELAIDE

WORKING AT HEIGHTS TRAINING

23 WAGGA WAGGA
25 GRAFTON

30 **ACT RENEWABLES HUB**

APRIL 2022

WORKING AT HEIGHTS TRAINING

6 BATEMAN'S BAY
20 BROKEN HILL

12 **HYDROGEN BUYERS AND SUPPLIERS FORUM**

MAY 2022

4-5 **SMART ENERGY CONFERENCE & EXHIBITION**
60th Annual Conference & Exhibition
Sydney, NSW

JUNE 2022

22 **VIC SMART ENERGY SUMMIT**

28 **ACT RENEWABLES HUB**

JULY 2022

TBA **INSTALLER ROADSHOW**
VIC, NSW, SA, QLD

AUGUST 2022

2 **SA SMART ENERGY SUMMIT**

SEPTEMBER 2022

14 **QLD SMART ENERGY CONFERENCE & EXHIBITION**

OCTOBER 2022

TBA **INSTALLER ROADSHOW**
VIC, NSW, SA, QLD

NOVEMBER 2022

16 **NSW SMART ENERGY SUMMIT**

17 **HYDROGEN AUSTRALIA SUMMIT**

INDUSTRY TECHNICALITIES

Official Resolution to DC Isolator Issue

Late last year the Smart Energy Council's intervention in the certification of DC isolators resulted in a pragmatic resolution that provided a safe pathway forward for consumers and manufacturers, and successfully averted any shutdown of the solar industry.

The critical issue centred on the listing of solar inverters and compliance with new AS/NZS 4777.2:2020 inverter standard which would have impacted tens of thousands of jobs nationwide and could have caused the solar industry to come to a halt on December 18, 2021.

Representatives from the Smart Energy Council met with regulators which brought about the much-needed resolution, and the SEC subsequently circulated information prepared by ERAC and the Standing Committee of Officials of the Electrical Equipment Safety System.

Small-Scale Renewable Energy Scheme

The Federal Government is amending the small-scale renewable energy scheme (SRES) in order to approve installer accreditation schemes, have greater control over approved solar components, and improve compliance monitoring enforcement.

The Smart Energy Council successfully sought change to the 'with effect' date from January 1, 2022 to April 1, 2022, for amendments to the written statement and other evidence installers will need to provide. In brief, from April 1:

- Solar designers will be required to provide a written statement or compliance to the CER
- Solar installers will be required to provide a written statement or compliance to the CER
- For the first time the solar retailer, who sold the unit to the customer, will be required to provide a written statement or compliance to the CER, and
- The responsible person for an inverter or PV module must provide all the serial numbers of the inverters and PV modules used in an installation

The Smart Energy Council is working with the Clean Energy Regulator to provide clear guidance and industry-wide education before the new requirements are enforced.

Note: after July 1, 2022, a process is set out whereby any organisation (not limited to the CEC), can apply to register a solar designer and installer accreditation scheme.

More information at: email enquiries@cer.gov.au or call the CER Contact Centre team on 1300 553 542, www.cleanenergyregulator.gov.au/RET/

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Tim Washington of JET Charge who also Chairs the Electric Vehicle Council foresees the day when electric vehicles serve as a valuable energy storage device and a generator

INSIGHTS FROM TIM WASHINGTON, CO-FOUNDER JET CHARGE AND CHARGEFOX

When Tim Washington of JET Charge addresses industry conferences – a regular occurrence, he's in high demand – he invariably paints fascinating fresh perspectives on the trajectory of the EV industry.

The year 2022 marks one decade since Tim pioneered EV charging by founding JET Charge. Was it a leap of faith, or one based on sound reasoning fused with his trademark foresight? Here we look at the former corporate lawyer's foray into the world of electric vehicles and his foothold as Australia's leading provider of charging infrastructure.

What aspects of your background led you to EVs?

TIM: *I've always loved technology. I think those who really believe and look forward to new technology are always taking a leap of faith – this one will be better, it will make my life easier, more entertaining, more enjoyable.*

That and my love of and cars was ultimately combined when I started looking at EVs. This is 'something', I thought. I guess in our crazy start-up world where, at least at the start, belief is more important than a slick pitch deck, 'something' was enough.

By the time my co-founder, Ellen Liang, and I travelled to Scandinavia, including Norway, we had already made up our minds that we were going to get into EV charging. When we arrived we realised just how fast we needed to move, as this transition was coming hard and fast.

My background in the law definitely helped me speak with incumbent industries, especially at the higher level, but it was my five-year stint in the family business that actually prepared me for the emotional turmoil that would come from starting my own business.

Did you suffer any early doubts about demand for JET Charge services here in Australia or were you confident from get go about the industry's traction?

TIM: *I suffer doubts all the time! I guess the difference is that doubts, which I think is an 'I am helpless' word, turns into problems. I can solve problems – it's harder for me to solve doubts.*

At the start of my journey almost every person I spoke with, including my family, told me that I was making a mistake. Everyone. The only people who believed in us were my co-founders Ellen and Jay [Jay + Ellen + Tim = business name JET], and the early folk at Tesla Australia.

When I saw that there was a clear trend towards EVs being cheaper to buy, cheaper to run, and the convenience of charging at home, I knew it was only a matter of time. Every criticism that was levelled at EVs at the time was timing

based – "it's too expensive", "it doesn't have enough range", "it can't charge fast enough", "the grid isn't green enough" – I knew all of these challenges were being solved quickly by extremely smart people around the world, and the charts were already showing increased adoption year on year, and the challenges were being solved year on year.

So that's why I knew Australia would follow the same path.

Today we operate in New Zealand and JET Charge technology is also installed in the US. But for the moment, our primary focus is on Australia and New Zealand. There's enough here for us.

What are the key milestones and challenges in the development of JET Charge and Chargefox?

TIM: *For JET Charge, it would have been investment by the Clean Energy Finance Corporation. It was the first time we had accepted money from investors, but it helped propel our growth drastically, and set us up for the burgeoning market.*

For Chargefox, I think it was when we decided on a strategy to work with the vehicle OEMs on the first ultra-rapid public charging network in Australia.

But every day is a hurdle and a challenge because we are trying to do things that have not been done before in this country. For example it's hard to convey 'value' in the EV charging market, because it's too young, and nobody has had the opportunity to really prove themselves yet. Also, the lack of understanding of the differences between EVs and ICE and how they fuel leads to bad organisational and governmental decisions.

In 2032 JET Charge will celebrate two decades of business and Chargefox its 25th anniversary: just what will the EV industry look like?

TIM: *The EV industry will just be the car and energy industries. The role of the vehicle as an energy storage device, a generator, and a motor vehicle in one, will place it at the top of the pile in terms of asset value.*

EV sales will have hit around 70% of new vehicle sales, and almost 30% of us will be driving EVs, hitting 100% of all vehicles on the road in the same decade.

Kids will forget what ICE vehicles are, and everyone will be used to powering their home with an EV, regardless of whether they live in an apartment or a house.

The start of autonomous vehicle zones allows EVs to freely move between nearby locations, absorbing large amounts of excess renewables, or providing grid support where required, all while supplementing the existing electricity grid. This behaviour encourages the build out of local renewable generation, and lowers everyone's motoring and electricity costs.

This is an abridged version of Tim's journey in the EV industry. Read the full story at www.smartenergy.org.au

PUTTING ENERGY INTO ACTION

SMART ENERGY COUNCIL

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 around 1,000 members nationwide, consisting of companies and individuals operating in this rapidly expanding industry.

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.

"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."

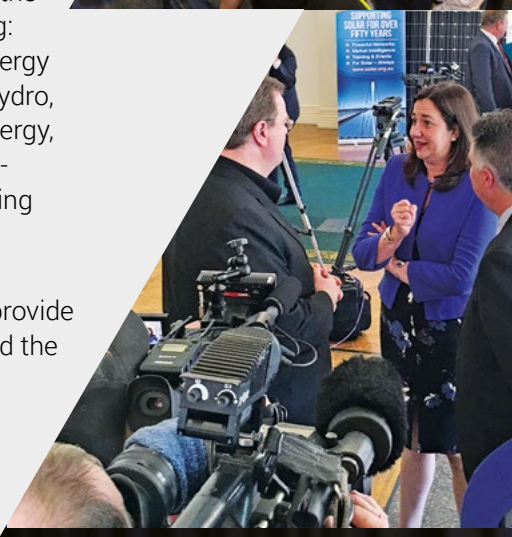
– John Hewson, Former Liberal Party leader, financial and economic expert

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, 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.

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:

ALISTAIR McGRATH-KERR, Sales Manager
Email: alistair@smartenergy.org.au
T: 0499 345 013

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Safer for electrical contractors.
Safer for the future of the industry.
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Safer Solar

WANNA BE A PROSUMER? ALPHAESS MIGHT BE THE ONE TO HELP

WHAT IS PROSUMER?

A PROSUMER is a person who consumes and produces media. It is derived from 'prosumption', meaning 'production by consumers'. From the economic to the environmental, the monetary to the moral, there are real-world benefits of being a PROSUMER. For instance, we generate power from sun and we use the electricity we store. We save the planet and save money.

Let's be a PROSUMER and choose renewable energy with an efficient storage system for your business or home.

AphaESS has earned its reputation in the industry

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. The multinational company has 10+ subsidiaries providing local services and 60,000+ systems actively running in over 70 countries, enabling millions of people to live with reliable, accessible and clean energy.

AlphaESS offers modular storage solutions for all requirements from its own source, ranging from 3kW-500kW inverter output and 2.75kWh-10+MWh storage capacity, which can be individually dimensioned according to customer requirements.

Despite the challenge posed by COVID-19, the company has found success, supported by AlphaESS's growing dynamic team based around the world, including Germany, Australia, China, the UK, Japan, etc., with the design and technical know-how to see any project through to the highest quality. The team combines this wealth of knowledge and experience in order to remain up to date with the latest technologies.

Innovation as a growth driver

This year, at the Smart Energy Conference & Exhibition, you will see several AlphaESS energy storage systems spanning the 1kW portable power station up to the 30kW hybrid PCS solution.

BlackBee 1000, the 1kW/1kWh portable power station, supports 12 devices simultaneously for outdoor activities as well as emerging power supply for families. This is a lifestyle change-maker and the dream device for adventurers.

SMILE5 10.1kWh Our hot-selling product battery can bring an independent power network to your house. It can store the excess solar power, enable your essential appliances to work during the blackout and maximize your PV self-consumption to cut your power bill.

SMILE-S6-HV & SMILE-T10-HV The 8.2kWh high voltage battery module can be configured either for single (6kW) or three-phase (10kW) applications, both on-grid & off-grid.

SMILE-S5 This is a 5kW hybrid all-in-one system with 5kWh in-built battery, which means lower initial investment and easier to install. This cost-effective residential energy storage solution is with 96% conversion efficiency.

STORION-H30 For C&I, here comes the unique product on the market with its 30kW hybrid-coupled system for off-grid in Australia. The three-phase inverter can be configured to 60kWp, DC input and support unbalance load. The cost-effective solution is designed for the outback, farms, and remote areas.

STORION-T30 The large industrial container on the market for its 30kW AC-Coupled system in Australia. Also, T30 could be programmed to discharge and meet the energy demand on project basis, designed for small businesses.

SMILE G3 The standard version of this residential ESS is with 5kW hybrid single-phase inverter and 10kWh battery module. This product can capture more precise data for stricter VPP requirements. Also, in off-grid scenarios, this system has a better performance and can work in parallel.

Information, views and technical details on this page supplied by Smart Energy Council Member

Alpha·ESS
your smart energy

AlphaESS intensifies global project work

Bethells Beanz to be a PROSUMER – Auckland

Bethells Beanz is a specialty coffee roasting company located in beautiful Bethells Beach, Auckland, New Zealand. Peter and Peroesjka, the owners of the company, are passionate about high quality coffee, fair trade organic and protecting the environment by reducing waste and emissions, in another word, a PROSUMER.

AlphaESS makes it happen.

"We use organic beans reducing waste, and now we can add renewable energy,"they say.

An Alpha SMILE5 with 5.7kWh capacity and 20 solar panels at 6.7kW were installed, fitting perfectly their unique situation, which includes a handful of considerations such as the energy patterns and consumption.

"In terms of solar, I definitely recommend looking into it and for us, it works from a sustainability perspective," the couple said.

The system has been running perfectly for more than a year now.

And they have reaped all the benefits:

- Never losing their roasting capability in the middle of a power outage
- Making full use of sunlight

- A significantly reduced electricity bill, and
- Grid independence

"It's really good to be eco-friendly that way and support the beautiful environment that we live in here," they said. It's the only place we have and leave to our children and their children to look after, so the only way to make it livable for us is to be more sustainable."

Enjoy clean energy with your family – South Australia

An Alpha SMILE 5 energy storage system has been running for more than six years in Millicent, South Australia. This system belongs to a lovely coupe with two kids, who raise horses, dogs, cats and alpacas on their farmland. Several years ago, the family struggled with the unstable gird power supply and high electricity bills. And then the whole family chose to become a PROSUMER with the support of AlphaESS.

The system has generated more than 56MWh and export 18MWh to the grid ever since the installation. The PV self-consumption rate is higher than 67%. Considering that the total load consumption is around 46MWh, the self-sufficiency rate reaches to higher than 80%. With AlphaESS, they are able to eliminate poor grid service and high electricity bills and enjoy renewable energy, even during nighttime.

Be a PROSUMER

Nowadays more and more people become increasingly aware of the effects of climate change. Renewable energy technologies such as solar panels, electric vehicles, and storage systems are coming to the forefront of the carbon emissions debate.

And AlphaESS might just be the one you need:

1. Make the best use of your PV system and get the highest self-consumption of solar power
2. Reduce the electricity cost by self-consuming, load shifting and peak shaving
3. VPP revenue, including ancillary services and electricity arbitrage
4. Cost-effective
5. Energy independence
6. No blackouts, uninterrupted power supply (UPS) available
7. Reduce carbon footprint
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11. IoT (Internet of Things) compatible
12. Safest LFP battery ONLY

From an old school CONSUMER to a transformative PROSUMER, this is an evolution.

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BOOTH TITANIUM 2 at SECE 2022, May 4-5 in Sydney

Or call+61 1300 968 933
https://www.alpha-ess.com

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5B ACCELERATES CLEAN ENERGY TRANSITION

IT IS A MILD SUMMER MORNING just outside Canberra and half a dozen parliamentarians are picking their way between densely packed 5B Maverick solar arrays at Bungendore's renewable power facility.

They are discussing the speed, safety, and operational efficiency of 5B's innovative technology compared with the fixed-tilt solar system in the neighbouring paddock.

Climate change is a chief concern among their constituents. The global decarbonisation push is driving a 50-fold increase in installed solar, from roughly 900 gigawatts to at least 40 terawatts by 2050. And they are pinning Australia's hopes of being a clean energy superpower on fast growing dynamos like 5B.

Some 14,000 kilometres away in Panama, a unique design feature of 5B's technology is paying dividends at the seaport city of Colon where a crew is folding up 10 of 62 5B Maverick solar arrays, initially deployed in 2020, to make way for an expansion of a gas plant.

The excitement among 5B's engineers, its deployment partner, and the client on site is palpable. It is the first redeployment of 5B Mavericks from one commercial site to another. The ability to easily shift the location of a solar farm within days and continue to sweat the assets is a game changer. It makes solar more commercially viable for customers with short and medium-term needs, under 10 years. Roughly 10 per cent of 5B's market share comes from projects that need solar on a five to 10 year basis.

The redeployment aspect also cracks open new business models for off-grid power generation and service suppliers. The scramble among miners and oil and gas producers to cut embedded emissions in their supply chains is driving an extraordinary level of activity. And 5B has just delivered them an edge, removing the risk of stranded assets while allowing for end of life recycling.

Disruptive innovation

Founded in 2013, 5B is the brainchild of solar engineers Chris McGrath and Eden Tehan. It was created with a singular purpose – to solve the problems they encountered working together on Australia's first large-scale solar projects.

The pair were part of a small army of workers traversing hot and hostile construction sites carrying and installing solar modules by hand. It occurred to them that if one were to build a large-scale array from scratch on a blank sheet of paper, with no preconceptions, it would look very different.

They set about completely redesigning where and how solar farm infrastructure is made. By prefabricating an accordion-style solar array, they succeeded in moving the time, cost and risk from the field into a controlled factory environment, and by doing so increased safety.

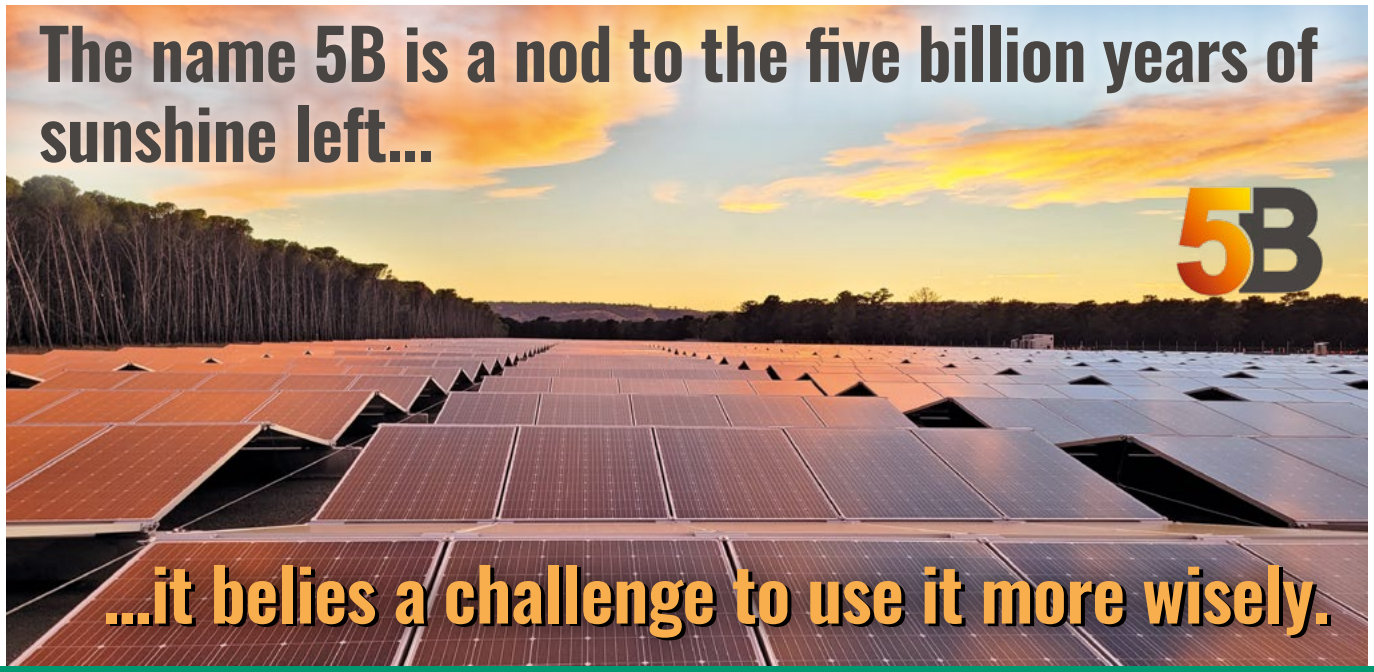
The result is a folding solar farm that can be deployed by machine up to ten times faster, using a small crew. 5B Maverick arrays arrive on site fully built, pre-wired and ready to plug-and-play.

Few places highlight the extent to which 5B has recalibrated conventional solar deployment better than Chile's Aconcagua Valley. On a site accessible only by a precarious single lane road, transporting anything extra in and out can cause severe cost blowouts. This includes packaging waste on solar modules. Skilled workers are scarce in the region and accommodation for them is limited. In environments like these, 5B is completely redefining the levelised cost of energy (LCOE) for solar which measures the lifetime cost of building and operating a power plant.

The need for speed

The name 5B is a nod to the five billion years of sunshine left. But it also belies a challenge to use it more wisely. It calls for creative collaboration across the entire energy sector.

"To build 50 times the amount of solar we currently have requires building individual



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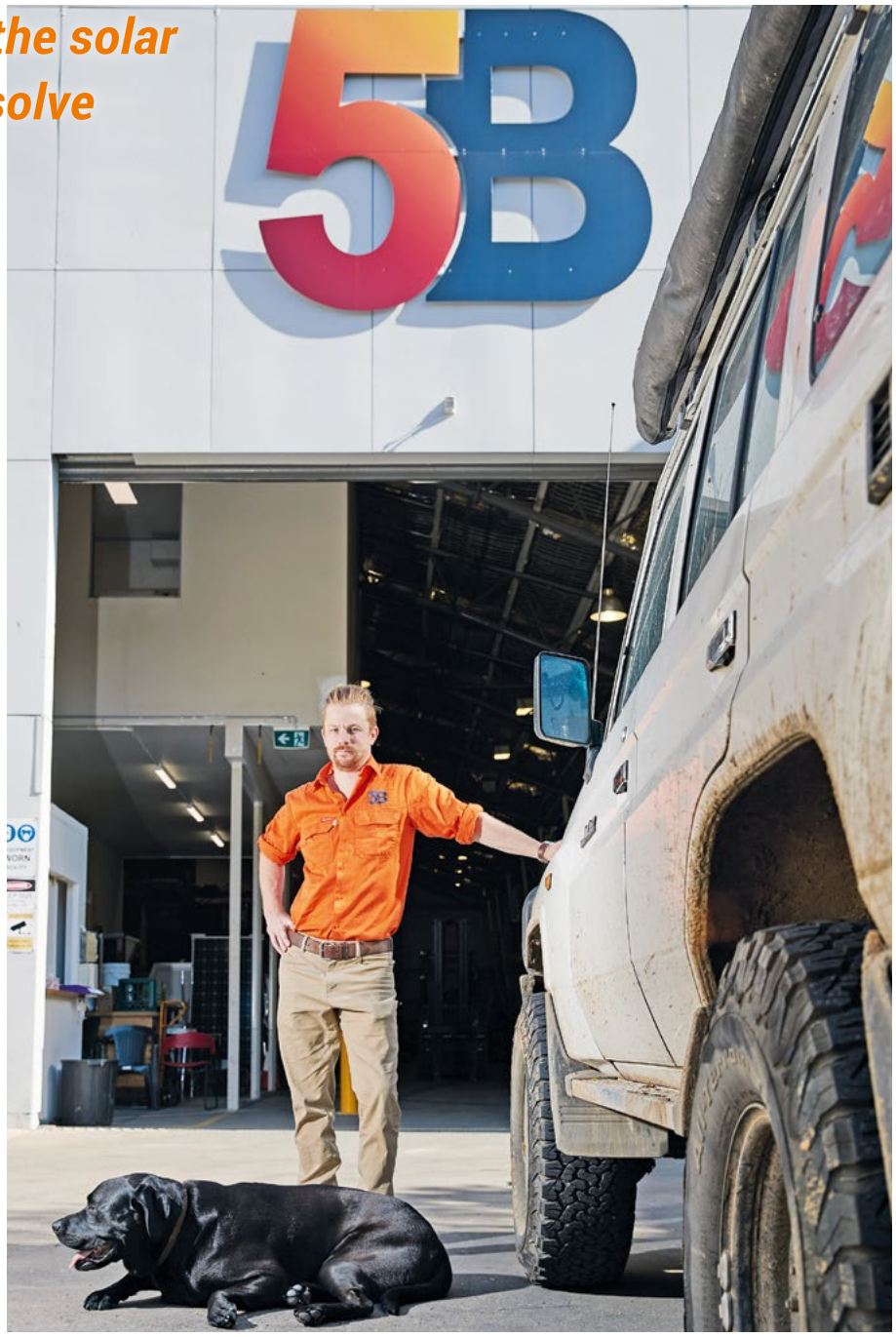
"Speed is central to the solar industry's ability to solve climate change."

– CHRIS McGRATH



projects faster, but also ramping up the global solar industry by a huge magnitude," 5B co-founder and chief executive Chris McGrath says. "Speed is central to the solar industry's ability to solve climate change at a very fundamental level."

5B's high-speed cycles of innovation are already delivering a step change in the logistics, safety, speed of deployment, and operational efficiency of solar farms globally.

A $33 million technology program, kicked off this year with the help of $14 million from the Australian Renewable Energy Agency, will up the ante. Advanced manufacturing and roboticised deployment are innovations these funds will help deliver.

Significantly, 5B is transforming the way renewable energy, and solar in particular, is built on a global scale, not just through a singular technology but by tackling inefficiencies across the entire value chain.

As the preferred solar technology supplier to Sun Cable's proposed Australia–Asia Power Link (AAPowerLink), 5B is "running the trip wires" on fortifying a supply chain to produce, ship and deploy solar on a scale never previously attempted. The project – slated to start selling solar power to Singapore in 2027 – encompasses the world's largest solar plant at up to 20 gigawatts, situated in the Northern Territory.

"Sun Cable is a really illuminating example of where the system starts to stretch and break when you turn the dial up that much," McGrath says.

Since its first commercial deployment in 2017, 5B has completed 56 projects with over 33MWp capacity alongside the biggest utility scale players globally.

Two years ago, its innovative approach caught the eye of Fortune 500 energy juggernaut AES, now one of 5B's largest strategic investors.

AES' investment marked a significant turning point for 5B, bringing not just an influx of cash to fuel growth but also a critical validation of its technology, a utility grade customer, plus an experienced global player to provide strategic support and guidance.

What's next

This provided a springboard to enter three new markets – the United States, Chile and India – last year. "It was probably the worst year of the decade you could choose to expand internationally but we did it through sheer stubbornness and grit," McGrath says.

5B's international expansion is informed by a careful assessment of where the most solar projects will be built that play to its strengths in order to position itself in the path of growth.

www.5B.com.au

An extended version of this article can be found on the Smart Energy Council website, www.smartenergy.org.au

Visit the 5B team at Smart Energy Conference and Exhibition in May on stand Titanium 1.

GROWATT'S 'BATTERY READY' INVERTER

GROWATT HAS WON the coveted *pv magazine* Award 2020 for its MIN TL-XH 'Battery Ready' inverter, which was first launched in Australia. This new generation inverter has proven a great success with over 70,000 units shipped in the country in 2020. Globally, more than 150,000 units have been sold. In the three years ahead, Growatt expects to have shipped more than one million units worldwide.

The MIN TL-XH inverter is the intelligent core for Growatt's GroHome solution that integrates solar and storage, EVs and IoT devices to deliver higher self-consumption and a smarter, more efficient energy solution.

Today, the biggest challenge of a solar storage system is the price of the battery. Now, consumers can install the Growatt MIN TL-XH battery-ready inverter as a standard on-grid inverter with solar panels, then when the price of lithium battery reduces to a more cost-effective level, clients can seamlessly add a battery and update it to a Solar Energy Storage System to enjoy the solar power generated from their own roofs.

Growatt MIN TL-XH includes localisation improvements including a 375x350x160mm compact design, 10.8 kg lightweight, long-last OLED Screen, one million times lifespan touch button, 5 minutes easy WiFi setup, qualified in-built DC switch and a powerful monitoring platform with the pre-made volt-var and volt-watt settings for Australia and New Zealand to shorten the inverter installation time.

The new member of the XH family – the ARK-XH lithium battery is the last piece of the puzzle. This uses LiFeO4 (LFP) technology to ensure high-reliability and a cost-effective price. Its qualified in-built DC switch means no external DC switch is needed for installation, and the

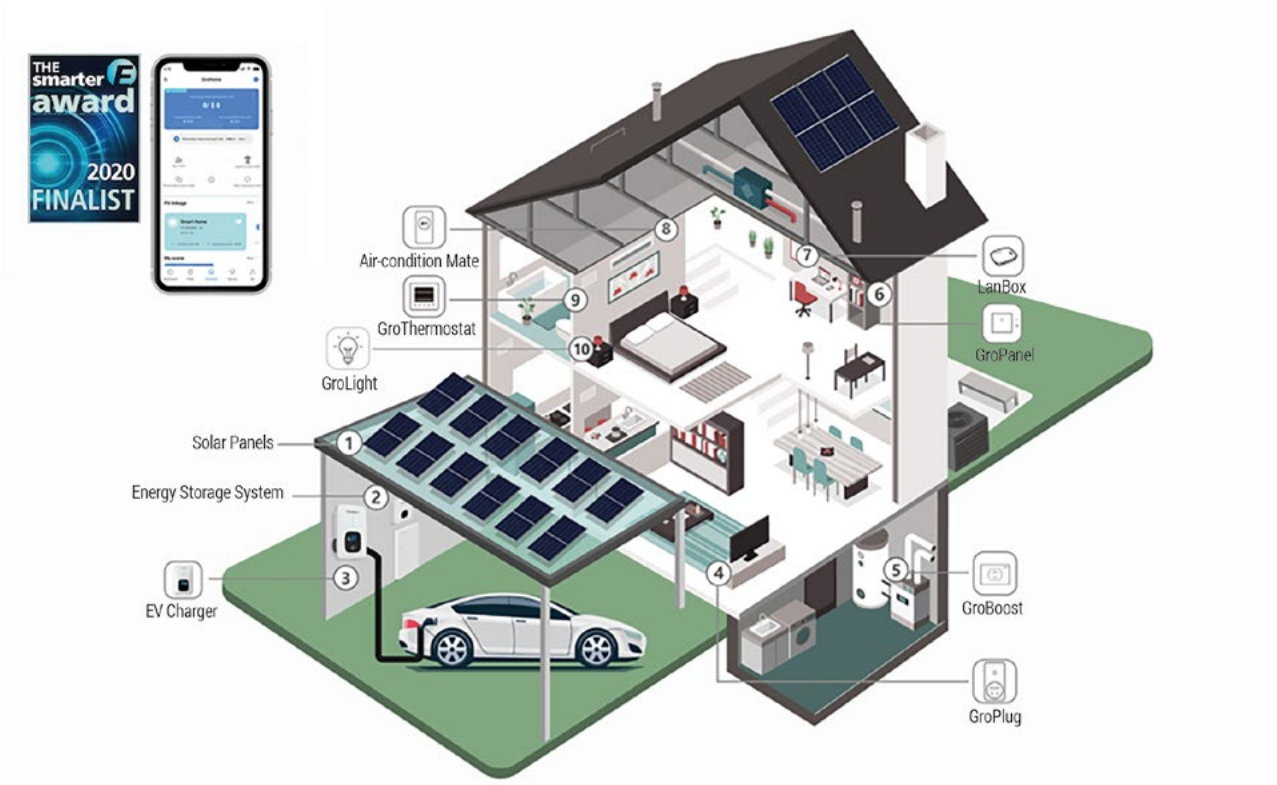
2.56kWh modular and maximum ten stackable modular with a total power capacity of 25.6kWh supports whole family power storage and consumption.

Growatt's local service team will provide full technical and warranty support in Australia; the XH inverters (free registration) and ARK-XH lithium battery have a ten-year warranty.

Growatt is consolidating its market-leading position as the Top 2 Residential Inverter manufacturer of 2021. The MIN TL-XH Battery Ready inverter and ARK XH lithium battery will be a game-changing combination for the solar industry. It is a milestone for Growatt's development from an inverter manufacturer to a smart energy solution provider. *www.ginverter.com.au*

Visit the Growatt team at Smart Energy Conference and Exhibition in May on stand Platinum 3.

GROWATT



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GOODWE IN ACTION

GOODWE
Smart Energy Innovator

PROMINENT INVERTER AND ENERGY STORAGE systems manufacturer GoodWe has refreshed its brand to reflect the evolution of the global new energy space, with a focus on harnessing smart tech to drive the global energy transition and usher in a more sustainable future.

The new logo and brand slogan 'Smart Energy Innovator' were launched early in 2022, just days after GoodWe celebrated the opening of its new company headquarters in Jiangsu. The headquarters – which will extend 20 floors above ground and three floors underground – are a major investment, set to feature smart tech and house a smart energy R&D facility where some of the company's PV product and technology research will be conducted.

Meantime GoodWe's strong market and financial performance has earned it the coveted highest Altman-Z score among PV manufacturers in BloombergNEF's annual report. The score is a measure used to determine the financial stability of companies, particularly within the manufacturing space, taking into account profitability, liquidity, leverage, solvency and activity ratios. In recent years GoodWe has gained significant market share across its segments and signed several global distribution agreements with some of the world's largest PV distributors, the reach spanning six continents and all inverter product categories.

www.goodwe.com, www.goodwe.com.au

Visit the GoodWe team at Smart Energy Conference and Exhibition in May on stand Gold 6.

GE PLATINUM RETAILER PROGRAM GE is promoting its new award scheme titled Platinum Retailers of the Year. The high-level Sales & Marketing Program is aimed at recognising superior sales, service and customer service for Australia qualified retailers of GE-branded solar inverters. Under the program trusted solar partners benefit from exclusive access to training, training material, marketing material and branded gear onsite/end-user leads from the GE solar website, on call commissioning support for the first installation and comprehensive marketing support

Visit au.gesolarinverter.com for more information

GoodWe's Lynx Home U Series is a low voltage lithium battery especially designed for residential applications. Each 5.4kWh battery comes with a built-in 63A DC breaker and can be connected in parallel up to 32.4kWh

Information, views and technical details on this page supplied by Smart Energy Council Member

SOLPLANET: BRINGING SOLAR POWER TO THE MASSES

IN THE SPIRIT of the Year of the Tiger, inverter maker Solplanet is poised to deliver changes with enthusiasm, confidence and innovation.

Over the past year, Solplanet was pleased to record many milestones including new strategic co-operations in numerous regions, breaking into a new market in Brazil, and winning two awards on the 'Light Energy Cup'.

This year, Solplanet is stepping up activities under its more robust and vigorous business blueprint which is designed to boost market share not only in Australia but also across the world.

For those not familiar with the name, Solplanet is the international brand of AISWEI, which began manufacturing Zeversolar inverters in 2007. AISWEI was formerly SMA's Chinese subsidiary but in 2019 commenced its own business. The company maintains a good relationship with SMA and retains its role as a critical service provider to the company. Now, Solplanet has not only opened its markets in Asia-Pacific but also in Europe, South America and the Middle East. Annual production capacity has exceeded 9GW and is expected to increase this year.

New product launches in Australia

Solplanet always endeavours to deliver 'up to the minute' solar inverters to the industry. The team aims to continue to expand its expertise and aptitude in bringing cutting-edge technology to the market, in the knowledge all improvements benefit the planet and its inhabitants. The company also strives to provide the best experiences to all distributors, installers and end-users by making the products easy to install, reliable and user-friendly. The range of the hybrid, single-phase and three-phase inverters demonstrates the company's commitment to bring solar to everybody in every scenario.

Currently, Solplanet offers 1kW to 10kw single-phase residential inverters in Australia and is planning to introduce more up-to-date products to the local market in the future.

ASW S Series 6-10kW

At the start of 2022, Solplanet was proud to introduce its latest product the ASW S Series 6-10kW single-phase string inverter which features easy installation and reliable, user-friendly, efficient operations. Technological advances have led to a lighter and smaller yet more powerful inverter.

The key benefits of ASW S Series 6-10kW are:

High efficiency

- 3MPPTs, reduced string mismatch, boost generation
- High efficiency on DC/AC conversion, increase system output, more returns for customer
- Intelligent O/M, multi-layer management

Easy to install

- Lightweight, higher power density
- Plug and play without opening the lid and wiring.
- Tool-less DC connection via Phoenix Contact connectors, reduce DC arcing

- **Reliable**
- IP66 ingress protection suitable for outdoor use
- No wearing parts, low failure rate
- DC reverse polarity protection, avoiding potential safety hazards
- Low noise emission, care for user's health

User-friendly

- 3MPPTs for more flexible PV array design on multiple orientation roof
- Maximum 16A input string current (Imp), compatible with different high power modules
- Feature-rich App & cloud, anytime anywhere to monitor systems

Three independent MPP trackers with up to 150% PV array oversize provide optimum PV plant design flexibility. The ASW S Series 6-10kW inverter is the ultimate choice for residential and small business applications. The inverter can connect to a roof with multiple orientations, while the 3MPPT tracker reduces shading effects. The input current of 16 A input per string makes the SW S Series 6-10kW ideal for bifacial and large area PV modules.

Although the pandemic delivered tough times, Solplanet feels positive about the future. With the introduction of a leading-edge new inverter, Solplanet is keen to strengthen its market share in Australia and enter the markets of South Australia and West Australia.

Supported by the solid R&D and technical teams, Solplanet is confident about building its customer reach.

www.solplanet.net

Visit the Solplanet team on stand Gold 4 at the Smart Energy Conference & Exhibition in May at ICC in Sydney's Darling Harbour.

Information, views and technical details on this page supplied by Smart Energy Council Member

CHOOSE GREEN LIFE, CHOOSE DYNESS

THE GLOBAL PHOTOVOLTAIC SOLAR ENERGY MARKET is gaining more and more approval in all parts of the world. Companies in the segment are gaining recognition in markets outside their country of origin. Dyness is one of the earliest companies which accessed the Australian market.

Australia has the inherent advantage of deploying renewable energy through photovoltaic and battery storage solutions. For those regions where access to electricity is precarious or non-existent, an off-grid system is a great solution.

This type of solution has been applied in several places such as on farms and islands, and in industries, businesses, telecommunication towers and homes. This market opening has attracted several battery brands to the country, including Dyness.

Why choose our products?

1. In order to meet the needs of multi-application scenarios, Dyness provides a safe and resource-conserving solution for the management of the energy needs of residential homes and commercial buildings and facilities.
2. All our products are produced in strict accordance with international standards, and have obtained TUV, CE-EMC, UL, IEC, CEC list and other certifications.
3. Dyness energy storage systems adopt high-safety lithium iron phosphate battery technology and are equipped with high-performance BMS battery management modes with over-discharge, over-charge, over-current, temperature and other protection functions, which guarantee the security of the system.
4. Flexible configuration system-wide compatible, matching leading inverter brands.
5. The residential series products which come with a 10-year warranty and more than 6000 cycles ensure a long battery service life.

About Dyness

Dyness specialises in high-tech battery storage solutions and manufactures and distributes lithium-ion batteries. Dyness has a sophisticated team of renowned industry experts. The company focuses on researching and manufacturing lithium iron phosphate battery energy storage solutions. It currently runs two production factories with a total area of 8,300 square metres situated in the cities of Yangzhou and Taizhou, both in the eastern province of Jiangsu. During 2022 Dyness is relocating to a new 12,826 square metre factory.

Dyness has established a branch in Sydney with local technical engineers and after-sales teams, and there are plans to set up a local warehouse to better serve local users.

Dyness Renewable Energy Australia Pty Ltd will be committed to bringing more energy storage solutions to Australian users.

Dyness' energy solutions can be found in more than 80,000 homes in over 70 countries including Oceania, Europe, Africa, Asia and Latin America. An additional R&D centre for the development of battery materials is located in Xi'an, Northwest China, and Dyness has developed a joint laboratory with well-known domestic universities to focus on power battery research and development.

www.dyness.com

Visit the Dyness team on stand Gold 7 at the Smart Energy Conference & Exhibition in May at ICC Sydney.

Dyness aims to become a low-carbon energy storage service provider leading the new era, with superior new energy storage technology and energy-saving models for a green future for the world

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DONATED ENPHASE MICROINVERTERS REMOTELY MONITOR AND MANAGE SOLAR PV SYSTEM FOR COMMUNITY HALL REBUILT AFTER BUSHFIRE

ENPHASE HAS DONATED MICROINVERTERS to a remote Kangaroo Island community devastated by Black Summer bushfires so solar panels for its rebuilt hall can be easily monitored and managed from Adelaide.

Enphase microinverter-equipped REC solar panels will provide energy for the $1.3 million reconstructed Stokes Bay Community Hall, which was hit by catastrophic bushfires in 2020.

Located on the north coast of Kangaroo Island, Stokes Bay has a population of more than 200 people, for whom the 60-year-old hall is the heart of the community. In January 2020, a bushfire badly damaged the hall and destroyed a recently completed adjacent kitchen building, as well as 17 houses in the community. Across Australia, the Black Summer bushfires of 2019-20 caused 33 deaths, destroyed 3,094 houses and burned more than 17 million hectares.

As part of the rebuilding project supported by the Prince's Trust, Enphase Energy has provided 18 IQ7+ microinverters for 18 370-watt REC solar panels, which were installed on a nearby Country Fire Service (CFS) shed by Enphase partner Energy SA.

Energy SA co-founder and sales manager Robby Mack said Enphase was perfect for the remote location on Kangaroo Island, which is separated from the Australian mainland by the 13.5km Backstairs Passage. "Enphase is the best inverter manufacturer, with the most efficient and most reliable equipment," he said.

REC's Alpha series solar panels installed along with Enphase microinverters on the CFS shed next to the Stokes Bay Community Hall

Stokes Bay Community Hall after the January 2020 bushfire

"Importantly, panels are configured in parallel, not daisy chain, so there is no single point of failure. We can also use the Enphase software to easily monitor the panels remotely without going on-site, which is more than 230 km by road. Remote management allows us to make configuration changes from Adelaide and, if a problem occurs with a panel, we can diagnose it, place a warranty claim and ship the replacement panel to our local partner without the customer experiencing a problem."

The 6.66 kilowatt-peak (kWp) solar system, with a retail value of about $12,000, will provide energy for the rebuilding project this year and for the entire hall when it's completed in the second half of the year.

As Stokes Bay lacks fixed-line Internet access, Energy SA installed a 4G modem at the hall to enable remote monitoring of the system using the Enphase Enlighten web-based solar energy monitoring software. Enphase also donated five years' worth of monitoring data for the system.

Stokes Bay Community Hall Committee Treasurer Michael Stanton said the hall was the heart of the small community. "We use it every week for everything from tennis club meetings and church services to sports tournaments and Christmas shows," he said.

"Since the bushfire, we've either had to make do with our truck shed or travel all the way to Parndarna, which is 27km away. Our new solar system is fantastic because it will lower the cost of power and increase its reliability. Because of the extra energy generated by the solar system, we can now have lights on the tennis court and extra power and airconditioning for the kitchen and our planned conference room."

Enphase Energy donated its IQ7+ microinverters through its Giveawatt program while REC provided its Alpha Series solar panels through its REConstruct initiative. The system went live in December.

Energy SA is an Adelaide solar energy system and storage installation specialist that operates from its warehouse-turned-office in Darlington, about 20 minutes south of Adelaide. Mr Mack and his partner Paul Avion established Energy SA in 2011, eight years after they had founded an electrical contracting business together. Energy SA designs and installs residential and commercial solar PV systems throughout Adelaide and regional South Australia.

Enphase Energy, a global energy technology company based in Fremont, California, is a world leading supplier of microinverter-based solar and battery systems that enable people to harness the sun to make, use, save and sell their own power – and control it all with a smart mobile app.

https://www4.enphase.com/en-au
https://www.recgroup.com/env

Visit the Enphase team on stand Gold 1 at the Smart Energy Conference & Exhibition in May at ICC in Sydney's Darling Harbour.

ENPHASE

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Ideal for Cryptomining, Food fibre processing facility, Agri-business.

Each of these projects have unique characteristics and tremendous potential for excellent ROI

Enertech PV Australia Pty Ltd is an innovative new energy company offering a unique approach to overcoming the challenges facing Australia's transition to a carbon friendly future. We are a vertically integrated, renewable energy company offering solutions and benefits in PV solar, battery storage, blockchain billing and micro-grid transmission networks.

Our Australian team offers clients the knowledge and experience in delivering a fresh, positive approach to managing the delivery of electricity in the Australian market and provides clients the strength of their engineering expertise, top quality products, services and investment finance.

We deliver projects across regional Queensland through our network of strategic partners including suppliers, engineers, local tradespeople and electricians.

Interested? Contact:

Luciano Giangiordano • CEO
luciano@ener-tech.com.au
Mob: 0406 209 785

MEET THE BOARD OF THE SMART ENERGY COUNCIL

The Board of the Smart Energy Council meets to agree the Council's key strategies to accelerate development in all facets of the renewable energy sector. Board members have diverse backgrounds and a range of complementary disciplines which bodes well for the development of the renewables sector.

President Steve Blume says: "Our industry plays a vital role in shaping the low carbon future, yet we continue to face many threats from those that remain locked in a fossil-fuel time warp. The Smart Energy Council chief executive and his team maintain a demanding work schedule and our Board members contribute significantly by helping shape policies and programs which in turn facilitate the growth of a progressive renewables industry."

Now for a closer look at the Who's Who of the Board of the Smart Energy Council.

STEVE BLUME President

Renewables veteran and Smart Energy Council President Steve Blume is well known to many in the industry in Australia and across the globe. He holds a series of leadership roles with national and international not-for-profit peak bodies, including Director, Australian Institute of Energy; Director, Global Solar Council, Treasurer, New Zealand & Pacific Solar and Storage Council; and CEO, NoCarbon Pty Ltd. Steve was recently elected as a Vice-Chair of the Global Solar Council. He is committed to the voice of the smart energy, energy storage, green hydrogen and solar industries offering solutions for a 100 per cent clean energy future for Australia and the world.

GEOFF BRAGG Secretary

SEC Secretary Geoff Bragg has long championed complex technical regulations and standards on behalf of the PV installer community. His role as an advisor dates back to 2002 by which time he had already spent a decade pioneering a life living off-grid and powered by rooftop PV. Geoff holds accreditation for both on and off-grid design and installation.

In his role as a consultant designer/installation supervisor for New England Solar Power (NSW) Geoff is currently managing several small commercial PV projects sized 40 to 100kWp and can draw on his professional expertise when presenting short courses in New Zealand on PV basics on behalf of the SEC. Geoff is also NSW Chairman of SEIA and is involved in community project 'Farming the Sun'.

SAMANTHA (SAM) CRAFT Director

It's just seven years since Sam, Director at NRG Solar, completed her Bachelor of Law and Legal Practice, before being lured to the renewables industry where she has amassed experience in operations management developing and implementing key strategic initiatives to strengthen and encourage industry professionalism. Sam is a passionate advocate for renewable energy and has an ability to deliver support in technical areas, strategy planning, network requirements and customer service. She has a particular interest in seeing the industry collaborate to create a better world. Many will have heard Sam's impassioned addresses in her role with the Women in Solar Energy (WISE) group.

SIMON HOLMES À COURT Director

Simon Holmes à Court has cemented his place as one of Australia's leading energy analysts and commentators, proficiently and frequently dispelling myths and misinformation in the coal vs renewables sectors. The public profile of the prolific tweeter continues to grow; his strong views on renewables on show in contributions to *The Guardian* and *Renew Economy* and as seen on ABC TV's *The Drum* and *The Business.* Simon draws on his experience as senior advisor to the Climate and Energy College at the Energy Transition Hub at Melbourne University. Earlier on he established Hepburn Wind and also community renewables consultancy Embark Australia. Along with his counterparts on the Board he is playing a leading role in Smart Energy Council's advocacy for the transformation of the Australian energy sector.

RIA O'HEHIR Director

Ria, CEO of Greenbank Environmental, one of Australia's largest independent environmental traders, has played a key role in facilitating the renewable energy transition with extensive leadership experience, helping stakeholders including wind and solar farms, installers and carbon farmers bring environmental units and renewable energy certificates to market. Ria also works with major energy companies and financial institutions to enable them to meet obligations under federal and state environmental schemes. During Ria's 17 years dealing with Australian environmental products, she has gained the knowledge and expertise to help clients navigate complex energy markets and carbon schemes. Ria and Greenbank are focused on continuing to use their market-leading knowledge to deliver positive outcomes for local and international clients while supporting the renewable energy transition.

BARBARA ELLISTON Director

New Zealand-based Barbara Elliston is a director of Elliston Power Consultants, Infratec Limited and Easy Warm. The qualified electrical engineer's experience spans corporate governance, strategic development, transmission engineering, product development and start-ups in renewable energy, both solar thermal and solar photovoltaics. Barbara held directorship roles in utilities Genesis Energy and Transpower, and in power management with Comalco NZ. Across three decades she has delved into energy generation, transmission and distribution, power purchase, and more recently solar in homes. The entrepreneur is currently commercialising Hot PV™, a solar hot water product directly using solar PV to heat water, aiding stretched electrical networks and avoiding fuel supply to remote locations.

OLIVER YATES Director

Oliver Yates is the former Chief Executive Officer of the Clean Energy Finance Corporation and is currently Executive Director of UPC Renewables. It is widely accepted that no one in Australia knows more about financing the renewable energy sector than Oliver Yates. To the Board of the Smart Energy Council he brings more than 20 years of global experience in corporate advisory, financial structuring, project finance, debt structuring, equity raising and listings with extensive experience in clean energy. Oliver's role at Macquarie Bank combined establishing new businesses and growing operations internationally while leading the Bank's initiatives in wind, solar, biofuels, carbon credits and other renewable businesses. Oliver's fundamental belief is Australia's "lay-down misère" ability to capitalise on its renewable resources and scale up to become an energy production and export powerhouse.

ANDREW DICKSON Director

Andrew is Development Director with CWP Global. His experience as a renewable energy project developer commenced back in 2004 with Wind Prospect. He's developed wind farms (including the Snowtown Wind Farm in South Australia), solar thermal (including Solar Dawn in Queensland), solar PV, microgrids, hydrogen and ammonia projects. Currently Andrew is developing 'Power to X' (large-scale hydrogen and ammonia) projects for CWP Global, with projects in Western Australia, including the Asian Renewable Energy Hub in the Pilbara, Africa and South America. This reflects his passion for the potential for green hydrogen and ammonia energy to dramatically increase renewable energy adoption and to decarbonise hard-to-abate sectors. Andrew chairs the Ammonia Energy Association's Australia Committee and is also a member of the AEA's Global Strategy Committee. He led CWP Renewables' Community Investment Scheme at the Sapphire Wind Farm which was the first such investment scheme for the general public into a utility-scale renewable energy project in Australia.

TARYN LANE Director

Taryn Lane is part-time manager of Australia's first community-owned cooperative wind farm, Hepburn Wind, which has pioneered the community energy movement in Australia and collected national and global awards. Hepburn Wind delivers a range of partnership programs under the collaborative banner of Hepburn Z-NET with its council and community such as solar and battery bulk buy, energy audits, EV bulk buy, EV charging infrastructure, aiming to reach zero-net emissions by 2030.Taryn also works for UNSW on the project 'Just Climate Transitions in Regional Victoria', which is focused on how social justice frameworks can stimulate community-led climate transitions. Taryn runs her own small consulting practice which undertakes research and advisory engagement work for the renewables sector and is a founding director of RE-Alliance, also the Coalition for Community Energy. She is a 2017 Winston Churchill Trust Fellow.

EARTHCONNECT'S 10MW ROOF-MOUNT OBERON PROJECT

NEWCASTLE-BASED engineering, procurement and construction provider earthconnect recently completed the second stage of Australia's largest roof-mounted solar PV system, the mighty 10MW atop Australian Panel Products' manufacturing facility in Oberon, 180 kilometres west of Sydney

The massive 10.06MW DC solar PV system which features 27,000 panels and more than 80 inverters spread across almost 8.0 hectares of rooftop, features six network protection units and sits behind the meter of the private HV switch yard, was recently energised.

This follows the completion of the 2MW first stage in October 2019 with the 2MW DC solar system now generating approximately 98 per cent of the expected energy output.

The Stage 2 extension which delivered 8MW resulting in a combined 10MW DC rating is expected to perform as well as, if not better than, the original system, and generate around 14GWh of solar powered electricity each year.

Australian-owned manufacturer APP which incorporates the polytec and Structaflor brands currently boasts a solar PV portfolio of around 14MWdc is described as progressive, a corporation that understand the benefits of solar energy in both a monetary and environmental sense – the Oberon system alone will reduce carbon emissions by an estimated 15,000 tonnes annually.

The Oberon Project not only sets a new record for earthconnect, eclipsing the 5.0MW Hunter Solar Farm but also triples the previous record for a roof-mounted solar system of 3MW.

Getting there was not the easiest, says earthconnect chief executive Adam James. "Obviously, 2021 was not the best year for international sourcing. Container pricing and movements were particularly challenging, however as a whole we had contracts established and production allocations set well in advance," he told *Smart Energy*.

"The impact of the pandemic was also awkward to manage. And the relatively remote location introduced a challenge to coordinate tasks from our headquarters in Newcastle, NSW."

He also revealed field staff had to contend with freezing temperatures throughout the winter months, and at times arrived on site to find the roof and the panels atop it buried underneath snow.

The Oberon rooftop PV system gracing Australian Panel Products' manufacturing facility is the largest in Australia and also the largest project delivered by earthconnect to date

"When a day's progress is held up by something trivial, and it must be rectified, there are always going to be hurdles on a project of this scale.

"However all issues were overcome, with clear communication and a coordinated response to the challenges presented by the project enabling it to be delivered within the agreed budget and timeframe."

To date earthconnect has delivered more than 44MW of solar panel installations, including around 17MW of residential installations and 14MW in commercial projects which includes the 5MW Lovedale Solar Farm in the NSW Hunter Valley.

The earthconnect team is now looking forward to commencing work on a second solar farm in the Hunter Valley later this year.

www.earthconnect-australia.com

Robust commercial inverter **FRONIUS TAURO** is now also available in the 50kW power category. Under harsh environmental conditions, it delivers full power and maximum yields with low total system operating costs, smart control and an open system architecture. It also offers maximum flexibility in terms of system design and saves time and money with its sustainable structure.

The Fronius Tauro follows on from the Fronius Tauro ECO launched in May last year. They are "designed to perform" and deliver cost-effective yet flexible projects.

The Fronius Tauro is available in the 50kW power category and has three MPP trackers coupled with a wide input voltage range, making it well suited to more challenging PV configurations. The Tauro ECO has one MPP tracker, is optimised for efficiency and cost, and is available in the 50, 99.99 and 100W power categories.

"Cost optimisation, a long service life, design flexibility and efficient servicing are what set our Fronius Tauro commercial inverters apart," says Martin Hackl, Global Director of the Business Unit Solar Energy, Fronius International GmbH. *www.fronius.com*

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SMART ENERGY COUNCIL


The power of possibility
South Australia is leading the world in renewable energy resources, such as solar and batteries, and SA Power Networks is helping to make this happen.
We're connecting our community to an energy future we can all be proud of. Together, let's imagine the power of possibility.
Find out more at
sapowernetworks.com.au
SA Power Networks
Empowering South Australia

AUSTRALIA'S FIRST RESIDENTIAL SMART METER CELEBRATES ITS FIFTEENTH BIRTHDAY

Fifteen years ago **Metropolis Metering Services** installed the first residential smart meter in Australia, and this, says co-founder and Director Marco Bogaers marked the start of the 'energy revolution'.

"Up to that point smart meters had only been available for large commercial customers and no-one had dared think it possible that smart meters could be made available for domestic use, until we proved that it could," he said.

The smart meter installed in a leafy Melbourne suburb in early February 2007 continues to operate flawlessly to this day and over half a million individual meter reads have been collected from the meter.

"In comparison to a standard meter, only sixty meter reads would be available today for the same period," Bogaers said.

The homeowners agreed to install a Metropolis smart meter to gain a better insight into their energy usage, saying the limited information available through their electricity bill "was never very useful".

"Metropolis gave us immediate access to our metering data through a simple online tool, so we could see exactly how much electricity we were using at different times of the day," Mrs Marsic said.

"Then, when we installed solar, we could see how much less energy we needed to buy, and how much we exported, helping us make decisions about which retailers to sign with to get the best rates."

In the early days everyone was using dial-up modems to contact to electricity meters said Chris Boek, co-founder and chief technology officer for Metropolis. "That was cumbersome and unscalable. So we turned it around and had every smart meter contact us instead.

"Ours was the first smart meter in Australia to be connected through the Internet, and we've been scaling ever since. With this technology we're able to upgrade firmware, change networks and switch between carriers to prolong asset life."

Metropolis, which is described as a pioneer in smart metering services and technologies, continues to be an innovator with metering services designed for solar and small generating units, virtual power plants, distributed energy resources and electric vehicles.

The company's extensive smart meter network covers all major capital cities, regional townships, rural properties and remote locations from far north Queensland to southern Tasmania. Today about one-quarter of Australia's homes and businesses have a smart meter, however projections suggest that by 2030 all meters in Australia will be smart, in a services market valued at $1.2 billion annually.

Metropolis Co-founder and Director Marco Bogaers and Chief Executive Officer Andrew Randall celebrate 15 years of Australian smart metering with Nadia and Daniel Marsic. Today Metropolis services all major licensed electricity retailers and distributors in the National Electricity Market and counts some of Australia's largest institutions among its direct clients, including Lendlease, Telstra, Optus and the Australian Department of Defence.

"Energy consumers generally associate meters with billing, which is true, but smart meters can do so much more," Bogaers says. "Metropolis has solutions that streamline new connections for home builders, monitor the performance of plant and equipment, report on sustainability initiatives and allow consumers to access cheaper electricity rates."

Metropolis's accomplishments include:

- the first independent metering services provider accredited by AEMO
- the first residential smart meters nationally and in Victoria, South Australia, New South Wales and Queensland
- the first on-line energy portal for residential consumers
- the first home area network; and
- the first to provide real time data access.

www.metropolismetering.com

S-5! LAUNCHES NEW SOLAR PRODUCT PVKONCEAL

Metal roof attachment technology specialist S-5! recently introduced its newest addition to S-5!'s PVKIT® direct-attach™ solar solution for metal roofs.

Paired with the PVKIT, the PVKONCEAL module skirt conceals the front face of the solar PV array, protecting all mechanical and electrical components underneath, as well as creating an attractive, clean finished look. PVKONCEAL also helps to minimise the intrusion of small animals, debris and unwanted objects under the solar array.

PVKONCEAL is made of corrosion-resistant aluminium with a prefinished black high-quality PVDF (polyvinylidene fluoride – the same premium paint finish used to coat metal roofs) made to last the life of the solar array and the metal roof. The versatile lightweight solution can be used in two orientations to cover module frames from 30-46 mm thick.

www.S-5.com

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We're here to support you! **partnerships@sonnen.com.au**

BOWMANS SOLAR FARM PROJECT AND RENMARK SOLAR FARM PROJECT

For many years **South Australia-based Yates Electrical Services (YES) Group** has installed numerous residential and commercial solutions, working with farmers to develop small-scale solar farms that generate new income sources, and developing large-scale utility solar projects.

In September 2020 YES Group and Sustainable Energy Infrastructure entered into a long-term agreement to design, develop, own, operate and maintain five mid-large scale solar farm projects in regional South Australia which combined will deliver approximately 20MW of electricity generation to the South Australian grid.

The first two projects began construction in early 2021, with final commissioning in September 2021. The YES Group designed both solar farms to include FIMER's PVS-175 and Medium Voltage Compact Skid inverter solutions.

Director of YES Group Mark Yates said "Since YES Group launched the Redmud Green Energy project five years ago in South Australia, FIMER/ABB has been a key component of our medium to large-scale projects, enabling us to roll out our distributed network of solar farms – consisting of over one hundred 200kW to 5MW projects – throughout South Australia."

As seen on these pages, the 1.9MW Bowmans solar farm located 100km north of Adelaide encompasses 4,400 solar panels, single-axis tracking and 11 FIMER PVS-175 string inverters combined with FIMER's PVS-175-MVCS solution and will produce over 4,850MWh annually.

The 4MW Renmark solar farm 250km northeast of Adelaide encompasses over 9,790 solar panels, single-axis tracking and 24 FIMER PVS-175 string inverters combined with FIMER's PVS-175-MVCS solution will produce over 10,000MWh annually.

www.yesgroupsa.com.au

Pictured above is the 1.9MW Bowmans solar farm located 100km north of Adelaide. Below is the 4MW Renmark solar farm 250km northeast of Adelaide

SUSTAINABLE MOVE Late last year **Officeworks** announced its Head office would be on the move in mid-2023 to a new clean, green, Net Zero Carbon certified office in Chadstone, having signed a long-term lease with Vicinity Centre which co-owns Chadstone with the Gandel Group.

Spread across 8,000 square metres the emphasis in the workplace is sustainability, with features including: a 5.5-star Green Star rating (targeted); a 5.5-star NABERS Energy rating; and an Australian-first International Living Future Institute (ILFI) Zero Carbon Certification (targeted).

The ILFI Zero Carbon Certification is described as one of the world's most stringent, taking into account operational and embodied carbon and requiring 12 months of performance data to prove results are being delivered in reality.

Officeworks Managing Director Sarah Hunter commented "Officeworks is committed to taking meaningful climate action including reducing our carbon emissions, and to operating as sustainably as possible, so finding an office with very high green star and energy ratings and a zero-carbon certification was mandatory."

www.officeworks.com.au

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SMART ENERGY COUNCIL

LG ELECTRONICS has launched its new enhanced 415W LG NeON H+ solar modules into the Australian solar market.

The range includes the flagship 415W LG NeON H+, as well as the LG NeON H+ White 410W and the LG NeON H+ Black 410W models.

The range uses innovative LG half-cut cells, gap-free design and a new wiring technology with the combination of innovative technologies boosting output, increasing resistance to thermal stress and external impact and providing a "sleek uniform and aesthetically pleasing look".

LG estimates that, at 25 years, a typical 10kWp NeON H+ 410W installation can produce an additional 32,632kWh when compared to an installation using the same 10kWp conventional 370W panels.

The new LG NeON H+ modules made by LG Electronics in its state-of-the-art solar factories in South Korea come with a 25-year warranty for a performance level of 90.6 per cent of initial performance at 25 years of continuous use.

"The introduction of the NeON H+ range provides the type of high-efficiency and high-quality solution which is increasingly sought after by Australian homeowners," said Gus Paviani (pictured above), General Manager – Solar and Energy, LG Electronics Australia. He stated that as more consumers adopt electric cars and add battery storage to their homes, the average solar system is likely to reach 15kWp in the coming years, assuming it follows the national trend over the past 10 years.

IN OTHER NEWS: LG Electronics has announced updates to its LG NeON H BiFacial and Commercial solar panel range.

The LG NeON H BiFacial will now include three new models: 440W, 445W and 450W, which can absorb sunlight from both the front and rear sides of their cells by using a transparent back sheet. This LG bifacial technology is designed to provide up to 30 per cent of higher energy production when installed under optimal conditions.

New models for the commercial line-up include: 460W, 465W and 470W commercial models, which feature high module efficiency of up to 21.4 per cent.

www.lgenergy.com.au

JET CHARGE has successfully raised more than $25 million in a Series B funding round, which will enable it to meet the challenges and opportunities of low emissions mobility in Australia and expand in the fast-growing EV market.

The market leader in EV charging infrastructure predicts sales of new EVs will increase from 2 per cent of new vehicles sold in Australia in 2021 to over 50 per cent by 2030. The market is already picking up pace; according to the Electric Vehicle Council sales of new plug-in and hybrid electric vehicles tripled in the past 12 months to over 20,000 vehicles sold in 2021.

JET Charge which has spearheaded developments in EV charging infrastructure and technology has quadrupled its staff to 100 since the 2020 Series A funding round, with capital from the Clean Energy Innovation Fund and individual investors.

The Series B investor group was led by RACV with participation from the Clean Energy Finance Corporation through the Clean Energy Innovation Fund, and Claremont Capital in addition to further support from $4.5M Series A investors Greg Roebuck, founder of Carsales.com.au and climate tech investor Simon Monk.

Commenting on the development, JET Charge co-founder Tim Washington said "This funding will allow us to realise ambitious plans immediately, as well as invest in R&D to remain at the forefront of innovation in our sector.

"We're just getting started.

"With our scale and Australasian presence, JET Charge is in a unique position to ensure that Australia and New Zealand are ready for the mass adoption of EVs."

The company will also focus on its role in electricity grid integration of EV charging and work with utility partners to solve electricity generation and demand issues, mindful of the nascent role of EVs as an electricity consumer and as a storage device.

CEFC chief executive Ian Learmonth said "The transition towards net zero emissions can be led by innovative companies like JET Charge delivering clever solutions to complex problems such as smart charging infrastructure. This is an exciting step in accelerating towards a stronger, decarbonised future."

https://jetcharge.com.au

ELECTRIC CHARGING INFRASTRUCTURE TECHNOLOGY

Ready for the home, suburbs or along highways

THE ELECTRIC MOBILITY'S GLOBAL MARKET continues its unstoppable growth, both in terms of registrations of 'hybrid' (PHEV) and 'full-electric' (BEV) vehicles.

Although Australia is lagging behind the rest of the developed world in its uptake of electric vehicles (EVs), the last edition of *Smart Energy* magazine looked at how the adoption of EVs in Australia is starting to grow and the perception of electric vehicles versus ICE vehicles was changing in a positive direction.

These insights were further illustrated by the Electric Vehicle Council's recent release saying EVs represented a 2.39% share of vehicles sold in 2021, compared to 0.78% in 2020.

One area needed to support this continued growth is ensuring a reliable electric vehicle charging network, whether at the home, office or out and about, to counter any 'range anxiety'.

For the home, the market offers AC chargers for both single-phase and three-phase electricity connections. These chargers can come in a range of power ratings and features to suit the homeowner's needs and vehicles. The most popular style is the wall box design that can be mounted to the wall in the garage, or for shared residential complexes, where there are options to mount the charger/s on a stand to allow for better positioning and ease of access in a shared car park.

In these cases, most EV car owners will fully charge their vehicle over many hours (typically overnight) so charging time isn't that important.

Wallbox charger

FIMER offers three FIMER FLEXA AC Wallbox charger varieties in four power ratings which provide a lot of flexibility to suit the type of power supply connection to the home and the charging capacity of the vehicle. These three options provide an entry-level, networked or solar/battery integrated solution for the owner.

Some chargers on the market can integrate into a home solar and battery solution to maximise the amount of renewable energy used when charging the vehicle thus ensuring a genuine carbon-friendly option. FIMER's InverterNet model can speak directly to the new FIMER PowerUNO & PowerTRIO series hybrid solar inverters and PowerX battery solution all from the one mobile app. However, even homes without solar can still get complete monitoring and control of their home charger with free apps, such as FIMER's MyFIMERwallbox app.

Public, commercial and industrial locations have more options for the configuration of AC chargers. In this space, some may want to offer free charging to certain people or a pay-as-you-charge solution connected to a charger management network like Chargefox.

FIMER's FLEXA AC Station is a solution for a car park in a shopping centre, office or industrial complex. These stations can charge two vehicles simultaneously, with up to 22kW per vehicle (up to 44kW in total). This model has different connectivity configurations to offer the right solutions regardless of budget or complexity.

Fast chargers

However, for those requiring something with more juice, DC fast chargers are the way to go. These chargers pump energy directly into the vehicle's battery without the need to convert the voltage from AC to DC first. The charging times are much quicker, with fewer energy losses. For instance, FIMER's ELECTRA DC charger is a modular charger available in power ratings from 60kW up to 150kW, offering both AC and DC charging up to three vehicles at one time. The charger will dynamically distribute the available power to the vehicles, depending on the number of vehicles being charged and also the number of chargers installed at the same site.

FIMER is the fourth largest solar manufacturer globally and still manufactures its string inverters and electric vehicles in their two manufacturing facilities in Italy. Since 2017, they have been manufacturing electric vehicle chargers, and to date, have more than 55,000 units installed around the world.

To learn more about FIMER's charging solutions: http://fimer.com/charging-electric-vehicles

FIMER

Let the energy drive you with FIMER's charging solutions

Since 2017, we have supplied more than 54,000 charging stations around the world and partnered with the main players in the industry. We have developed AC and DC charging platforms designed to meet the diverse needs of users, who are seeking solutions for private, public and commercial use.

Our FIMER FLEXA AC Wallbox, FIMER FLEXA AC Station and FIMER ELECTRA (Fast) DC Station, are all easy to install and will provide an efficient, reliable and safe charge every time.

Learn more: **fimer.com/charging-electric-vehicles**

TRINA SOLAR: ON CLOUD NINE

Trina Solar has picked up pace in recent months, introducing a series of innovative developments. This follows a steady and sterling performance; by EOFY 2021 Trina Solar's cumulative global PV modules were estimated as generating 104 billion kilowatt hours of clean energy over their lifetime which in due course reduces carbon dioxide emissions by a total of 104 million tons. Over the past six consecutive years Trina Solar has been ranked the top score of 100% in the BloombergNEF bankability survey. Here we look at recent key developments.

Clever cloud

Let's start with mid-December last year when Trina Solar launched Trina Smart Cloud, a real-time data monitoring system enabling solar farm operators to carry out 'predictive maintenance' by analysing the performance data from a solar system.

It's described as a unique intelligent monitoring and control tracking solution that leads to intelligent operation and maintenance of PV stations that lowers the levelised cost of energy (LCOE) by minimising power loss, improving system performance and reducing O&M costs.

The Trina Smart Cloud application includes user-friendly software that can be easily integrated into other platforms and a network architecture that can be configured and adapted to the characteristics of each project.

How it works: TrinaTracker's new control solution centralises its intelligent algorithm to provide a smart O&M tracking total solution. It enables reliable and accurate operation across a wide range of weather conditions. In addition, it increases productivity through preventive diagnosis and O&M suggestions by drawing on comprehensive and reliable data analysis to ensure the stable operation of the whole PV station.

Trina Smart Cloud supervisory control and data acquisition (SCADA) includes highly visualised human machine interface; remote monitoring and data acquisition; data on-line analysis and processing; data package API, alarm protection system; quick trouble shooting; quick remote control and command; mature customised configuration; and flexible and secure network architecture of multiple machine learning frameworks.

The Trina Smart Cloud has already been deployed at the 30MW Tongchuan PV plant in China as seen in the image (right).

Tracking progress

As of late 2021, 14 of the world's leading tracker manufacturers, accounting for more than 90% of the global market, had launched trackers that are compatible with Trina Solar's 210mm Vertex modules. This represents a significant increase from the tally of eight tracker manufacturers from early 2021.

According to an information document authored by Trina Solar, bifacial dual-glass modules coupled with trackers can increase energy yield by about 5-30% under different reflectivity conditions.

The compatibility with ultra-high-power modules also enhances tracker value in the integrated systems, achieving 1+1>2 effect with reduced costs and increased efficiency in various application systems, the company says.

Trina Solar has responded to the rise in use of trackers by upgrading its solar system matching database and its intelligent compatible inverter database to include 14 mainstream tracker manufacturers in the world with about 30 models.

The online matching tool 2.0 is available at www.pvd.trinasolar.com

External validation

Trina Solar has welcomed the reception of its 660W modules which have now been recognised by global engineering and construction company Black & Veatch.

In its study of capital expenditure, Black & Veatch confirmed Trina Solar Vertex 660W PV modules offer the lowest BOS (balance of system) and LCOE (levelised cost of energy).

The study compared the new generation of ultra-high-power modules that use 210mm diameter wafers, with modules that use 182mm, 166mm and 158mm diameter wafers.

The 210mm wafer modules used in the study were Trina Solar DEG21C.20-660W and Trina Solar DEG19C.20-545W modules.

According to findings the 210mm Vertex modules perform the best overall for reducing CAPEX and LCOE among all the module types and reduced both CAPEX and LCOE by more than 9% compared to the 166mm 450W module.

Compared to the 182mm 535W modules, the 210mm 660W modules reduce CAPEX up to 4.58% and lower LCOE up to 3.94%. Additionally, Trina Solar's 158-84 cell piece layout with 480W peak wattage performs better than standard 166-72 cell piece format regarding CAPEX and LCOE savings.

Notable projects include the 850MW 'super large' project in Brazil and the 112MW PV agricultural project in Qinghai, north-western China.

Want more details? Trina Solar has released a white paper on the LCOE across the range of modules with different size solar cells on the market.

https://pages.trinasolar.com/lcoe-whitepaper.htm

A vertical solution

In industrial circles the word 'vertical' is often followed by 'integration', however in the case of Trina Solar the words 'Packing Solution' follow as a means of reducing freight costs for its larger format size modules, the 600W+ Vertex modules.

Late last year Trina Solar unveiled its integrated delivery solution whereby modules are packed vertically rather than horizontally to maximise the space inside shipping containers.

This configuration is said to significantly increase loading power and maritime freight efficiency, reducing freight costs, and consequently means fewer shipping containers are needed to ship a given quantity of panels. In turn this is estimated to reduce CO_2 emissions from ocean transport by 4% to 8%.

Trina Solar calculations reveal that during the sea-going trip from Shanghai to the port of Rotterdam the carbon emissions from transporting a container of the Vertex 660W modules will be about 75kg which would amount to 2,000 tons fewer emissions for every 10GW.

Dr Zhang Yingbin, Trina Solar head of product strategy and marketing, says compared with conventional horizontal packing, the new solution can increase loading power by 10% and space use by 5%, maximising the use of containers.

"At a time of rising shipping costs, this solution saves 0.3 cents per Watt on maritime freight costs, assuming that a container is fully loaded with 558 modules and each module is 660W, calculated at the current mainstream price of $10,000 per container," he explained.

Savings naturally vary according to port freight prices, says the company which has found a ready market for its larger modules that are now found worldwide.

Chairman Gao Jifan: Solar energy is a powerful strategy in achieving carbon neutrality

Trina Solar Chairman Gao Jifan says China is playing a major role in achieving carbon neutrality. He estimates that by 2025, China's total installed capacity of solar energy will increase to 450GW, well up on the 282GW of solar capacity installed by October 2021.

"Solar energy is becoming a powerful new force on China's path to achieving carbon neutrality. PV power generation, energy storage, ultra-high-voltage power and energy digitisation are the four pillars in achieving carbon neutrality," he says.

"In the future, larger wafers, more efficient cells, and durable and reliable modules will be the direction of all PV technology. Thanks to the rapid development in recent years of large wafer-based solar cell technology, this has become the clear trend.

GAO JIFAN, 2018 PHOTOGRAPHER: JASON ALDEN/BLOOMBERG

Gao revealed that Trina Solar, founded in 1997, was inspired by the Kyoto Protocol and the Million Solar Roofs initiative announced by then US president Bill Clinton

"Since our foundation we have dreamed of putting into place China's million solar roofs initiative [and] pushing ahead with that initiative all over China. More than 200,000 solar roofs for homes have been connected to the grid, delivering economic benefits to end-users and connecting them to clean energy, thus fulfilling Trina Solar's mission of 'solar energy for all'."

"As the next step, we will push to develop more efficient N-type cells to achieve a conversion efficiency of 25.5%. Multiple technical routes are available for developing N-type cells. Whether one technology or many technologies will develop in parallel and become mainstream depends on cost-reduction."

The Chairman is upbeat about reductions in energy consumption resulting from zero-carbon system construction in the PV industry. According to the latest data, the clean energy generated within just six months after a PV power plant installed in North China commences operations can balance out the energy consumed in construction. He added that PV power plants continue to generate electricity for up to 30 years.

"The carbon peaking and carbon neutrality goals are the most important driving force for the development of the renewable energy industry," he said. "Trina Solar will continue to maintain vigorous growth through innovation, and contribute to achieving carbon neutrality and powering the world with carbon-free, renewable energy."

www.trinasolar.com

SUNTECH'S SUNWAY INVERTERS RECEIVE FAVOURABLE RESPONSE

AS THE WORLD MOVES INTO 2022, we have seen solar manufacturers embracing larger cell size modules, moving away from the common 166mm to 182mm and 210mm sizes. With the trend towards a larger cell size, the module current will increase accordingly.

Sunways P-Series inverters are designed to deal with a higher maximum input current of 15A and a maximum short circuit current of 20A which prevents damage to the inverter from the latest high output solar modules.

Sunways dates back to 1993 when it was established in Germany. In 2014 it was acquired by Suntech's parent company.

The Sunways brand was introduced into the Australian market at the beginning of 2021 by Suntech and has already been listed by Solarquotes as a trusted inverter brand.

In January 2022, Sunways won the 'Solar Champion' award authorised by Joint Force for Solar (JF4S) due to their technological contributions and global commitment to clean photovoltaic energy.

Sunways has now returned to its birthplace of Konstanz, with the opening of new offices in the German economic centre of Munich.

Re-establishing their major German operations centre and further expanding their business in other parts of the world is a strong indicator of their commitment to providing their product on a global scale.

Sunways in Australia

Since the 2021 introduction by Suntech of sister company inverter brand Sunways into the Australian market, the range of residential and commercial inverters has received many positive reviews from industry experts.

Sunways inverters are made with robust components, are competitively priced, and come with an industry-leading 12 years parts and labour warranty. This is managed through the Suntech Sydney office by a team of dedicated engineers with many years of experience.

Staff are always available to respond to customer queries.

www.suntech-power.com

ATESS MAKES ITS MARK ON THE GLOBE

FOR THOSE UNFAMILIAR WITH THE NAME, Shenzhen-based ATESS which was founded in 2017 is today a global supplier of solar energy storage and EV charging solutions including all-in-one hybrid inverters, battery inverters and lithium battery solutions.

ATESS inverters ranging from 5kW to 1MW are destined for residential, commercial and utility applications.

A company spokesperson highlighted the advantage of the one-stop energy storage solution that integrates the inverter, charge controller, bypass cabinet, battery system and online monitoring system.

"Our system is a scalable design that can be adapted to different project sizes and we are focusing on the commercial and industrial sectors," she said.

"Our power conversion system is designed for 100kW to MW scale C&I projects, which is ideal for off-grid, peak-shaving or grid support applications. For outdoor installations, we can provide turnkey containerised solutions that integrate PCS with PBD and bypass. It can be used with or without solar.

"When the grid cuts off, our ESS can switch over in just 10 minutes to ensure uninterrupted power supply which means our battery BMS system with active balancing function can improve the reliability, stability and adaptability of the overall energy storage system," she explained.

Separately, the EV charger portfolio comprises 3kW to 300kW AC and DC electric vehicle chargers for home and public charging stations that are compatible with all mainstream EVs in the market as well as e-buses and e-ferries.

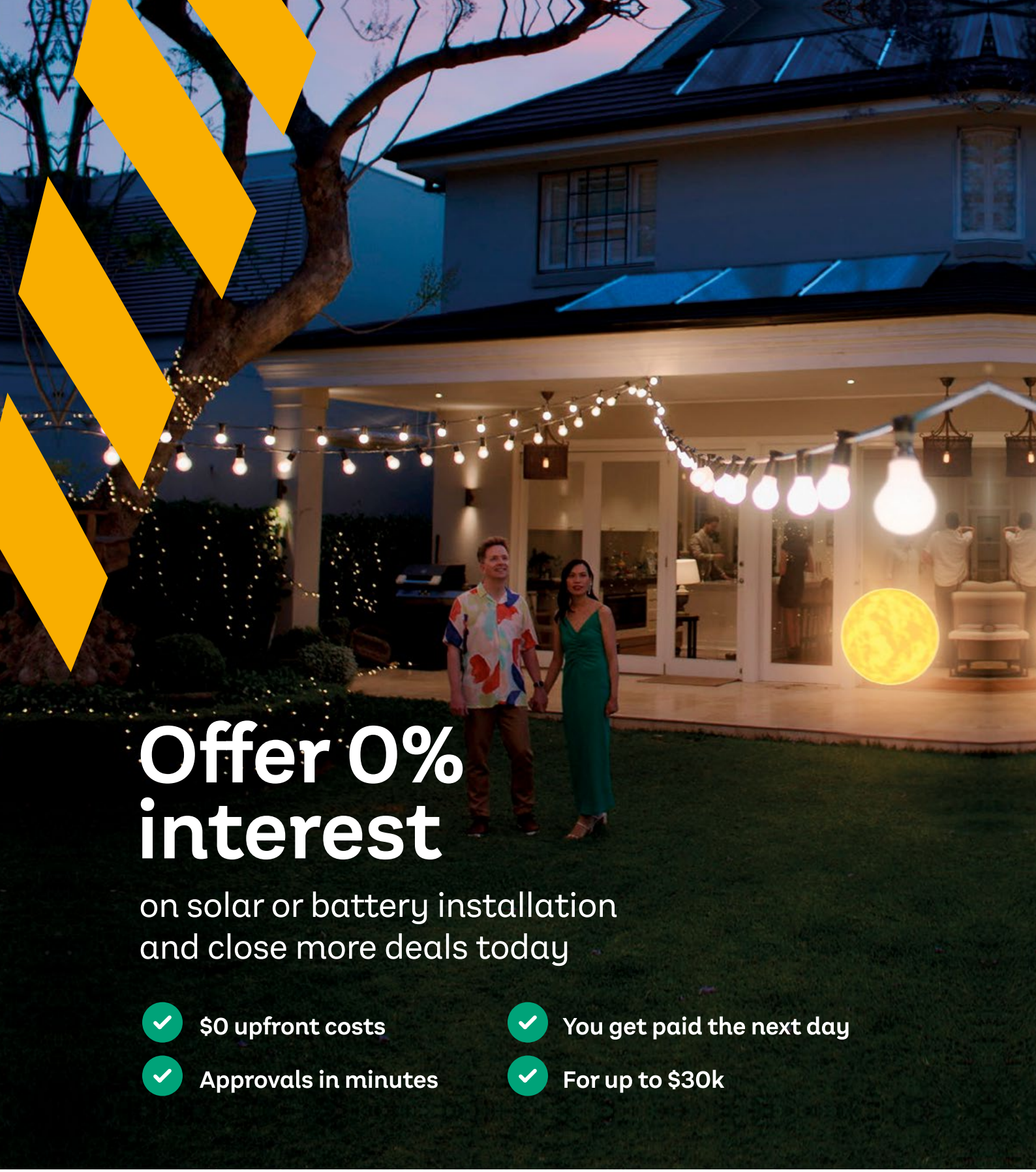
Smart factory with ATESS power conversion system

In the five years since its foundation, ATESS has developed an international service network with offices and warehouses in five continents and products have been installed in over 76 countries.

The ATESS energy storage system PCS250 and HPS50 were selected for micro-grids in Tanzania and Sierra Leone in collaboration with the United Nations Development Program in poverty aid projects.

ATESS recently opened an office in Australia in a bid to gain a foothold in the smart energy market.

www.atesspower.com



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Late last year **SONNEN LAUNCHED ITS SONNENBATTERIE EVO**, the company's first outdoor home battery solution developed specifically for Australia and New Zealand.

The German designed and engineered sonnenBatterie Evo is described as an innovative, fully integrated AC coupled storage system that has an IP56 outdoor rating for the battery to be installed both outdoors or indoors and complies with the AS/NZS 5139 standard.

It is the first storage system that contains a Lithium Iron Phosphate (LFP) battery module customised by sonnen. Two fully usable 5.0kWh battery modules bring usable storage capacity to 10kWh.

sonnen has optimised the performance of the sonnenBatterie Evo by creating a proprietary intelligent Battery Management System and sonnenInverter. The sonnenBatterie Evo includes backup power to support households when the grid is not functioning. The battery's Black Start function can 'wake' up an AC coupled PV system when the grid is down.

sonnen's Nathan Dunn said "By reducing the complexity of designing a home battery system, sonnen is creating value for installers and giving them more time to focus on selling a sonnen home battery instead of installing a product."

sonnenBatterie owners can join sonnen's virtual power plant and sonnenBatterie Evo owners will get access to an updated my sonnen App and customer portal offering an improved customer experience to monitor and manage their home battery.

Visit sonnen.com.au

The Clean Energy Regulator is seeking applications for version 46 of the **REGISTER OF SOLAR WATER HEATERS** which lists all solar and air source heat pump water heaters that are eligible to have small-scale technology certificates (STCs) created for them.

Applications must be submitted through the Client Portal by 5 pm (AEDT) on 1 April 2022.

Email CER-RET-SWH@cleanenergyregulator.gov.au or visit http://www.cleanenergyregulator.gov.au

In late February **LG ELECTRONICS** announced it would be closing its solar panel business due to uncertainties in the global solar panel industry such as intense price competition and the rising cost of raw materials.

In a company statement LG said solar panel production itself will continue until the second quarter this year to maintain adequate inventory for future service support.

LG's Business Solutions Company will instead focus on Information Technology and Information Display in a bid to accelerate growth with its "diverse lineups of advanced products and tailored services".

The closure of the solar panel business is expected to be completed by June 30.

CHINA'S CONTEMPORARY AMPEREX TECHNOLOGY (CATL), one of the biggest electric vehicle battery suppliers, is developing a A$6.8 billion **battery recycling facility** in the province of Hubei, China.

Once operational, the facility will process end-of-life EV batteries by extracting valuable materials including cobalt and lithium and will re-use them in various storage devices.

'FREE BUT PRICELESS' Late last year the **Smart Energy Council staged a successful Virtual Conference** with a host of top presenters addressing key industry topics to thousands of 'virtual' delegates.

Among them was Joseph Ting, then with ARENA, who as winner of the Gamification competition stated: "I attended this Smart Energy Council virtual conference for the first time not expecting much but I was blown away by how easy it was to navigate around and see all the information at the click of my fingertip, literally!

"The best part for me, was being able to jump between sessions and exhibitions without wasting time physically getting around and missing out in between sessions. I do look forward to in-person sessions to be able to interact physically with everyone though. It was such a well-done virtual conference so kudos to the organising committee and to the sponsors for making it free but yet priceless!"

VIRTUAL CONFERENCE SPONSORS WERE: Titanium Partners: **FIMER** *(read more on page 58)* and **Trina Solar** *(see page 60)*, along with Platinum Partner **CATL**, and Gold Partners **Growatt, GoodWe and GE, EVO Power, Sunways Suntek** and **ATESS**.

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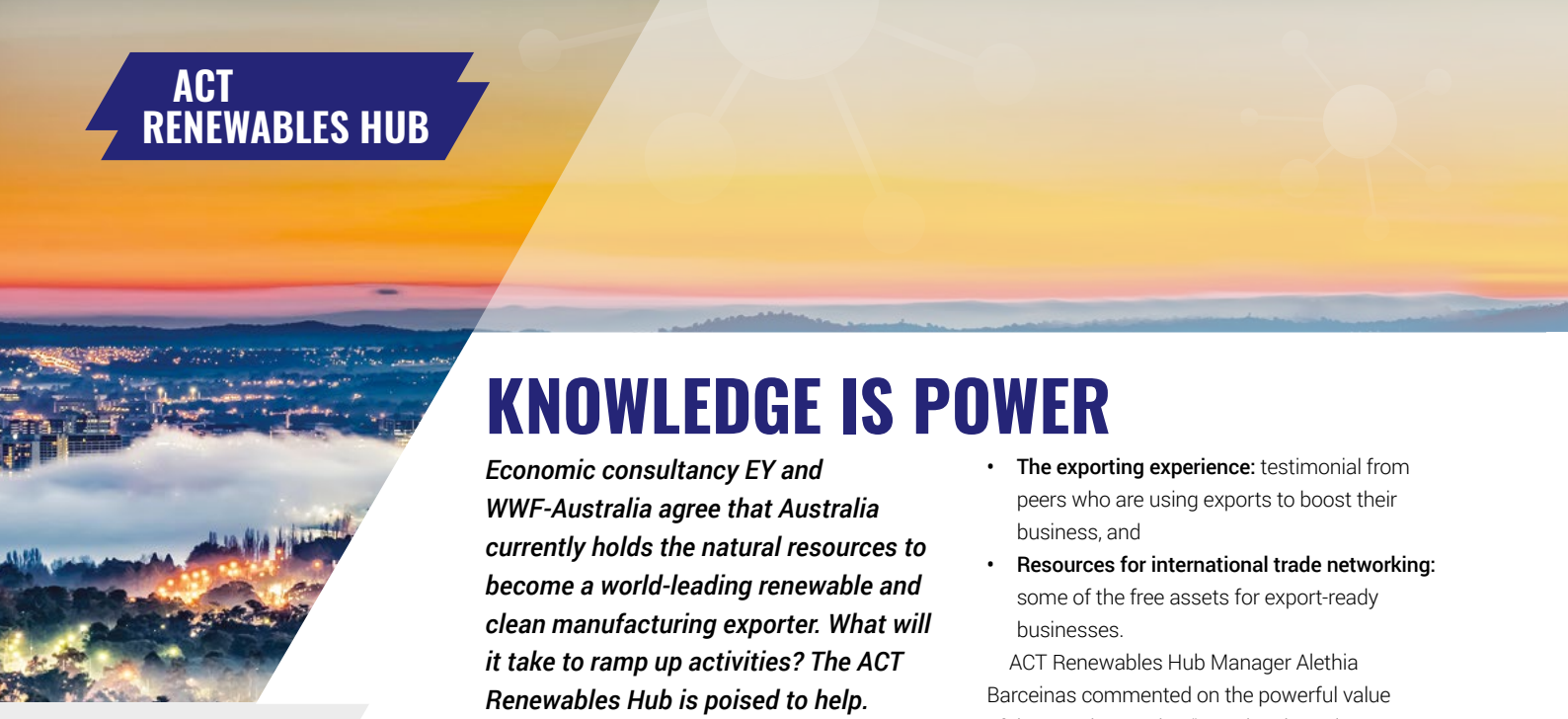

KNOWLEDGE IS POWER

Economic consultancy EY and WWF-Australia agree that Australia currently holds the natural resources to become a world-leading renewable and clean manufacturing exporter. What will it take to ramp up activities? The ACT Renewables Hub is poised to help.

International trade opportunities within the renewables sector abound in all states and territories, and that includes Australia's capital, which is home to the ACT Renewables Hub and many smart energy innovators ready to explore opportunities.

The Hub staged a popular event in early March in a bid to link potential exporters with experienced international traders and facilitate expansion of the local market beyond nearby borders. The event addressed practical matters including:

- **Local industry and government support:** a snapshot of the local renewable energy market and government support
- **Global opportunities for Canberra market networking:** how to successfully navigate the overseas markets
- **The exporting experience:** testimonial from peers who are using exports to boost their business, and
- **Resources for international trade networking:** some of the free assets for export-ready businesses.

ACT Renewables Hub Manager Alethia Barceinas commented on the powerful value of the meeting, saying "Certainty based on knowledge is key to making astute financial decisions and we aimed to deliver that through a series of strategic insights delivered by a top line-up of industry specialists."

The expert speakers were Mark Shorter, Assistant Director Economic Development at ACT Government; Philippe McCracken, Engineering Manager at ITP Renewables; Ruth Keane and Isaac Court, Global Engagement Managers at Austrade; Robert Holgate, Trade & Export Specialist for the Canberra Region; ACT TradeStart Adviser at ACT Government & Austrade; George Cora of Ardexa; and David Barbalet of AusIndustry.

Wayne Smith of the Smart Energy Council also attended the event to support the efforts of the Hub and to introduce potential business partners.

ACT Renewables Hub

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

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

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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.*

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Contact Positive Quality™ Manager Alistair McGrath-Kerr on 0499 345 013, email alistair@smartenergy.org.au or visit www.smartenergy.org.au

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224 GW+	NO.1	150+	25
Deployed Worldwide	Largest PV Inverter R&D Team	Countries with Sungrow Installations	Years in the Solar Industry

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