

GENDER ACTION PLAN

addressing workforce shortfalls

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Industry Climate Action Summit addresses values-based economy
Rewiring Australia, a force for greater good
Smart Transport: laying foundations to drive EV uptake
The state of renewables in NSW
PV panel recycling: establishing a Product Stewardship Scheme
Local Energy Markets the way to go, says Powerledger
Business Renewables Centre Australia's material impact

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MAGAZINE DESIGN

Mitzi Mann

The Smart Energy Council acknowledges the Traditional Owners and Custodians of the lands on which we work and pays respect to Indigenous Elders past, present and emerging.

Smart Energy was first published in 1980 as *Solar Progress*. The magazine aims to provide readers with an in-depth review of technologies, policies and progress towards a society which sources energy from renewables rather than fossil fuels.

Except where specifically stated, the opinions and material published in this magazine are not necessarily those of the Smart Energy Council. Although every effort is made to check the authenticity and accuracy of articles, neither the Smart Energy Council nor the editor are responsible for any inaccuracy.

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FRONT COVER Capable and committed women in the workforce.
Photo Nic Walker, courtesy of 5B

SMART ENERGY COUNCIL

Forewords by CEO and Saul Griffith
Conference and Exhibition May 2023
Smart Energy advocacy
Meet SEC's new team members
Membership services
Corporate Members
Positive Quality

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Climate Capital Forum blueprint
Powerful messages at Industry Climate Action Summit
Big Polluters' Program
Rewiring Australia: a force for good
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WELCOME



*John Grimes, Chief Executive
Smart Energy Council*



I AM ALMOST OUT THE DOOR to embark on one of the most significant things the Smart Energy Council has ever done. A 34-person delegation of smart energy companies to India. Five cities in nine days. More than 60 meetings and events. Hundreds of potential partners and strong industry interest.

Significant, not because it changes a policy today, or books a short-term win, but because it creates a foundation of cooperation over such a wide front.

Renewable hydrogen, renewable ammonia, energy control and tracking software, concentrating solar thermal, EV fleet management software and so much more are represented.

As India scales up solar and battery production, looks to build massive projects overseas, and rolls out cutting edge energy technology at home, the opportunities for collaboration are immense.

Disproportionate impact. That is what the India Delegation in 2023 could deliver. And it is that potential that the most senior policy

makers on both sides want to facilitate. The eyes of senior Indian and Australian policy makers, officials, investors, manufacturers, media and more are on this delegation.

Can our industry harness that goodwill and potential, and turn it into real tangible business opportunities? Opportunities that shift the climate dial here at home, but more importantly for the 1.4 billion people in India? Can Australian smart energy help deliver the cleanest and cheapest power to improve the lives of people on the ground?

With the calibre of people we are taking, and the calibre of people we are meeting, I reckon it is a sure bet. This feels like the start of something big. I look forward to giving you a full report on my return.

IN MY VIEW

*Dr Saul Griffith is an inventor, author,
and founder of multiple companies and
nonprofits including Rewiring Australia*

AUSTRALIA'S RENEWABLE ENERGY discussion is finally shifting away from sacrifice and towards opportunity.

NSW Treasurer Matt Kean's announcement of \$8 million for up to three suburbs to take part in an electrification pilot shows how the sands are shifting. This pilot would provide the proof of concept for broad scale electrification, backed by renewable energy. Households across a town or suburb will upgrade to efficient zero emission electric appliances and vehicles, supported by community solar, batteries and local EV charging infrastructure.

Of course this is a huge advance for everyone interested in emissions reduction. But it is also a significant financial win for our towns and suburbs. When households install solar and a battery and then replace gas-fired heating, water, cooktops and petrol/diesel cars for modern electrified alternatives, they permanently strip thousands of dollars from their annual energy bills.

The Treasurer's announcement turned the page on years of misinformation, distraction and diversion. It signalled that key decision makers are increasingly aware that Australia has more to gain from electrification and decarbonisation than possibly any other developed nation.

To really land this transition and build its broad legitimacy, all Australians must share the benefit of clean, cheap energy. The environmental benefit will be marginal if the bounty of electrification is only enjoyed by those who can afford the technology.

And that's why the coming federal Budget is the perfect opportunity to lay the groundwork for inclusive electrification.

Rewiring Australia is pushing for a significant investment to electrify low-income households and disadvantaged communities. Community level generation and storage in social housing can bring significant financial relief to those badly burned by the cost-of-living crisis.



We are also seeking targeted subsidies for the purchase of efficient electric devices, such as induction stoves, heat pumps and electric-bikes or EVs. This would be designed in consultation with communities so that the devices and technology respond to local needs.

We have to grasp this opportunity and bring the whole community along. Freeing communities of fossil fuel power bills provides a significant economic boost and ongoing job opportunities. It's the right thing to do, and also the smart way forward.



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INDUSTRY DEVELOPMENTS

SWEET JUSTICE! SOLARSTOPPER HAS BEEN STOPPED; LOCATIONAL MARGINAL PRICING SCRAPPED

The late February announcement is a great win for the renewables industry and for the Smart Energy Council which has been vocal in its strong opposition to SolarStopper, the proposal that would have stifled the development of new solar and wind farms.

The ludicrous proposal ran counter to the need to accelerate the amount of renewable energy in the mix to stem rising levels of carbon emissions.

"This was a terrible idea that the Energy Security Board had been stubbornly pushing for years," John Grimes said. "Australia would never have achieved 82% renewables by 2030 had Locational Marginal Pricing been implemented."

Read more about significant industry wins on page 8.

SUPER-SIZED BATTERY Construction of the mighty 850MW Waratah Super Battery has been given the all clear, and all being well the project will be completed by 2025, prior to the closure of the Eraring coal-fired power station. The Waratah Super Battery will drive up to \$1 billion of private investment into NSW and will play an important role in supporting the security of the electricity system. The NSW Planning Minister said "It is fast to roll out, has a relatively small footprint, repurposes land and connection infrastructure previously used for a coal-fired power station and will be able to respond almost instantly to disruptions in the energy system."

The battery is being delivered by Akaysha Energy in partnership with Transgrid and will be built on the site of the former Munmorah coal-fired power station, approximately 50 kilometres south of Newcastle.

[Anyone remember breathless scepticism among naysayers back in 2017 in reaction to the then-proposed 100MW battery proposed for Hornsdale... "It simply cannot be done"?]

The runs are on the board and staggering sized plans taking shape. Storage is here to stay and to serve.



Artist's impression of the new Waratah Super Battery. Image courtesy of NSW EnergyCo

ARENA'S \$2.7 BILLION LARGE SCALE BATTERY STORAGE FUNDING ROUND

ARENA is backing eight of the largest batteries ever built in Australia to boost grid-forming storage capacity in the NEM tenfold.

The near three-billion-dollar project pipeline was unveiled in December by Federal Minister for Climate Change & Energy Chris Bowen, and is partly funded by an additional \$60 million allocated by the Government in the October 2022 budget.

Each of the eight grid-scale lithium-ion batteries will be at least 200MW/400MWh with advanced inverters and, together the new batteries, have a combined capacity of 2.0GW/4.2GWh.

Successful recipients include:

- **NSW:** AGL's new 250MW/500MWh battery in Liddell
- **Victoria:** FRV's new 250MW/550MWh battery in Gnarwarre; Origin's new 300MW/900MWh battery in Mortlake; and Neoen's retrofit of the 300MW/450MWh Victorian Big Battery in Moorabool, Vic to enable grid-forming capability
- **Queensland:** Neoen's new 200MW/400MWh battery in the Western Downs; TagEnergy's new 300MW/600MWh battery in Mount Fox
- And in **South Australia:** Neoen's new 200MW/400MWh battery in Blyth, and Risen's new 200MW/400MWh battery in Bungama

The seven new batteries are expected to reach financial close in 2023 and to be operational by 2025.



Origin's new 300MW/900MWh battery in Mortlake, Victoria. Image courtesy Origin

WHYALLA GREEN HYDROGEN GARGANTUAN The South Australian government is funding a \$600 million, 250MW hydrogen electrolyser, which on completion would be ten times bigger than any other in the world and supply a 200MW hydrogen power plant, also the largest in the world.

Read more on page 30.



WINDS OF CHANGE The 10GW Newcastle Offshore Wind project off the Hunter-Central Coast renewable energy zone has been bought by French entity EDF Renewables which intends to develop the project in stages.



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INDUSTRY DEVELOPMENTS

‘STOP THE GAS INDUSTRY PROFITEERING FROM WAR’ The Smart Energy Council has launched an advertising blitz to counter the gas industry’s attempts to undermine government interventions to bring down soaring prices.

“If the gas industry thinks that they’ll step onto the field of play and that there aren’t people to call them out, well they’re sorely mistaken,” John Grimes asserts.



NEOEN AND STANWELL HAVE SIGNED A 15-YEAR POWER PURCHASE AGREEMENT

for 215MW of energy from Mount Hopeful Wind Farm in Central Queensland. Construction is scheduled to commence in the second half of 2023, with first generation expected in 2026. Mount Hopeful Wind Farm will have a total capacity of 330MW and will be fully owned by Neoen.

The project is expected to unlock 220 construction jobs and up to 12 ongoing operational and maintenance roles.

Neoen Chairman Xavier Barbaro said “This is a clear indication of what we will be able to accomplish over the next decade, with highly competitive projects providing value to customers and regions in transition.”

Neoen acknowledges and is engaging with the Traditional Owners of the land on which it is located, the Gaangalu Nation People.

Stanwell is also leading Australia’s renewable hydrogen industry, with plans to progress the development of the country’s largest green hydrogen export hub in Gladstone.

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ELEVEN AUSTRALIAN LITHIUM BATTERY START-UPS AND INNOVATORS

will receive hyper-accelerated business support, helping build Australia’s role in the global US\$400 billion lithium battery market.

“Australian innovators are uniquely placed to supply emerging and mature global markets with low impact lithium products and resources to support our energy transition with better batteries,” said Danny Kennedy, CEO New Energy Nexus (pictured).



Refer to page 60 for more on this or visit www.energylab.org.au/superchargeaustralia

MODELLING BY THE AUSTRALIAN INDUSTRY ENERGY TRANSITIONS INITIATIVE

reveals more than 350TWh of electricity generation could be needed each year by 2030, and nearly 600TWh per year by 2050.

To achieve this, Australia must more than double its total current electricity generation by 2050, achieved through multi-gigawatt renewable generation and storage developments, the report says.

By 2030, around 60GW of wind generation, 20GW of large-scale solar PV and 45GW of rooftop solar could be required. And by 2050, around 80GW of wind generation, 90GW of large-scale solar PV and 80GW of rooftop solar could be needed, as well as 70GW of storage.

The report shows industry emissions could be reduced by 92% by 2050, decreasing from 221MtCO₂e/year in 2020 to 17MtCO₂e/year in 2050.

The ETI focuses on five supply chains (iron and steel, aluminium, other metals, chemicals and LNG) which contribute an estimated 25% of Australia’s total emissions, generate more than 17.3% of GDP and employ around 414,000 people.



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GREEN LIGHTS FOR RENEWABLES

Sanity prevails. #SolarStopper has been plugged

The great news was delivered in late February following the State Energy Ministers meeting: Locational Marginal Pricing – SolarStopper – has been scrapped.

It's a massive win for the smart energy industry.

John Grimes said "Locational marginal pricing was a big and troubling policy issue that the Energy Security Board had been pushing for years and would have had the effect of new entrants, predominantly large scale solar and wind projects, subsidising existing players in coal and gas.

"This would have put the brakes on Australia's ability to achieve 82% renewables by 2030. The industry needs certainty, not additional investor uncertainty at such a crucial period in its buildout.

"For many years we pushed hard for LMP to be quashed, it was not needed, it would have been a zombie policy and was driven by ideology rooted in the former fossil fuel-driven federal government," John said.

"We were reasonably confident we would receive the outcome we had long hoped for following the February 24 state energy ministers' meeting and the announcement was a big relief for us and a win for the future of renewables."

In a joint media release with the Clean Energy Investor Group and Nexa Advisory, the Smart Energy Council credited Jonathan Upson, Chair of the Smart Energy Council's Large-scale Working Group, Stephanie Bashir from Nexa Advisory and all Large-scale Working Group members for their powerful, ongoing and successful advocacy.

Getting results is what it's all about. And there's more.

The Capacity Investment Scheme

The great news was delivered just in time for Christmas: a Capacity Investment Scheme to drive new, renewable, dispatchable capacity and reliability.

In a nutshell a gold standard to accelerate new investment; a national framework that will encourage the ideal mix of storage and renewable

technologies needed in the system over the coming decade.

How it will work: open tenders through reverse auctions will determine which renewables projects will gain CIS support, with an agreed revenue 'floor' to help cover project operating costs and debt repayments. The government will pay the difference when revenues fall short, and reap a share of profits returned when revenues exceed an agreed 'ceiling'.

"The super profits range is where huge money is made and this will be shared with the governments, they get a cut on the upside," John Grimes explained. "Unlike the gas industry which wants to make as much profit as possible and run!

"This was all part of the proposal we put forward to the federal and state governments, we were the only ones with this proposal and it has been adopted in full.

"Our campaign for a renewable energy storage target has been put at the core of what they are going to do and they have added on renewable energy projects.

"This is a huge, a massive win for us and the renewables industry.

"It's a great outcome."

Speaking at the Smart Energy Council summit late last year Minister for Climate Change and Energy Chris Bowen paid tribute to the Council for its guidance on dispatchable energy with storage attached.

"The Capacity Investment Scheme is in effect what the SEC has been calling for, it is a national storage target but more than just a target, this is a target accompanied by a policy regime so this is all vitally important," he said

The new revenue underwriting mechanism will unlock around \$10 billion of investment and unleash at least six gigawatts of renewable dispatchable power to support reliability and security, Bowen said, as the energy market undergoes its biggest transformation since the industrial revolution.

"This probably is the most important development in renewables we've seen, we know how to do renewable energy but we need more and we know how to do it; the big challenge is not only transmission but also storage and hence our commitment."



A MEASURE OF SUCCESS AMID SOME BURNING ISSUES

"Australia should ... consider 'big time' subsidies for those making the batteries or tap strategies to make sure this happens instead of shipping rocks to foreign-owned industries... What Norway did with gas is what Australia should be imagining doing with these critical minerals for supply chains"

DANNY KENNEDY

SMARTER THINKING, POLICES AND PRACTICES are driving the rapid transformation of Australia's energy market. We welcome the Capacity Investment Scheme which marks an end to 'CoalKeeper' and the shedding of Locational Marginal Pricing aka SolarStopper; both significant developments that pave the way for more renewables and lower emissions.

Critically, these underwrite Australia's ability to meet climate-related targets. And while it is true to say we understand the science and have the tools to mitigate the worst impacts of our already fragile climate, we also need to continue to put pressure on the forces that put fossil fuel profits and pollution over the planet, and maintain calls for a fundamental shift in thinking and actions to drive an ever smarter and more lucrative energy sector.

Affirming the infinite benefits of renewable energy was the focus of the Smart Energy Council's inaugural Industry Climate Action Summit, where some of the best and brightest individuals and organisations shared their visions and ambition for realising the economic and employment gains while acting on climate change.

The Summit homed in on key issues including the need for a values-based

economy, to duplicate the success of the US's legislative framework, to catch up on a decade of lost opportunities in zero emissions technologies, to ramp up renewables ambitions and investment and export value though value added critical minerals, and boost emission reductions targets.

"It's time to confront the past decade of inertia and assert the role of Australia as a smart energy powerhouse, to reindustrialise... if we can mine it, we can build it," John Grimes told delegates, "We need to establish a comprehensive whole-of-economy 10-year plan that outlines the 'where, what and when' of projects needed for our energy transition and that address climate action."

The Smart Energy Council was pleased to host the **Launch of the Climate Capital Forum Discussion Paper** that outlines a powerful vision for Australia's economic and environmental future.

Blair Palese who brainstormed the Climate Capital Forum over the Christmas break with 17 other leaders in climate finance describes it as a roadmap for policymakers and big business (big polluters) to achieve a zero-emissions future and to realise the economic and employment potential of renewable-led reindustrialisation.



The 'Dirty Dozen' exposed at Parliament House

VALUES-BASED ECONOMY

John Grimes, Blair Palese, Zali Steggell and Nicolette Boele

It sets the foundations for exciting new zero emissions industries – green aluminium, green iron and steel, electric heavy transport, lithium hydroxide, battery cathodes and anodes, renewable hydrogen and ammonia, all powered by world- scale solar and wind, the cheapest, cleanest energy in history.

Blair told the Climate Action Summit “It’s time to redefine what our economy looks like. We need to stop digging and shipping and instead add value and jobs, create a values-based economy that seriously addresses climate change.

“The race is on but the question is will we get in the game fast enough? The *Inflation Reduction Act* is already driving massive developments in the US economy and allowing investors great opportunities, we need to follow suit and our newly convened Climate Capital Forum is an outline for the government. NGOs, investors and industry leaders see the opportunity,” Blair said. “This is our songsheet to go to government on all levels, to encourage investment and set up strategic policy and set us on a path to get back in the race.”

Grasping the opportunity of a lifetime

Fellow brainstormer Satya Tanner who mapped out the chart seen below depicts the Climate Capital Forum’s proposals as “an opportunity of a lifetime in this transition” while



CCF co-founder Tim Buckley, citing moves in the US, REPowerEU and Japan’s trillion dollar GX Roadmap and China’s 5-year plan, warned “These global trading partners are moving at scale and rapidly with public private interaction; we need to build private and public partnerships and build first mover capital at scale by getting the government onside with equity capital.

“I’d like to crowd in private capital also ARENA and debt funding from CEFC, NAIF the Futures Fund, equity capital... we need to scale up and mandate these. Up to \$200 billion in fossil fuel exports will eventually diminish to zero and our economy will be crippled if we don’t deal with this. We must unlock hundreds of billions of dollars by exporting value-added critical minerals.”

Former Reserve Bank deputy governor Guy Debelle doubled down on the “big influence”

Treasurer Jim Chalmers’ essay, ‘Capitalism after the Crises: My vision for a new values-based capitalism’

“Australia can do more and do better than just batten down the hatches in 2023 or hope for the best... [first we need] an orderly energy and climate transition, with implications for living costs, employment, where and how we live, the commercialisation of technology, and the trajectory of our economic development.

Second, a more resilient and adaptable economy in the face of climate, geopolitical and cyber risks, unreliable supply chains, and pressures on budgets from an ageing population.

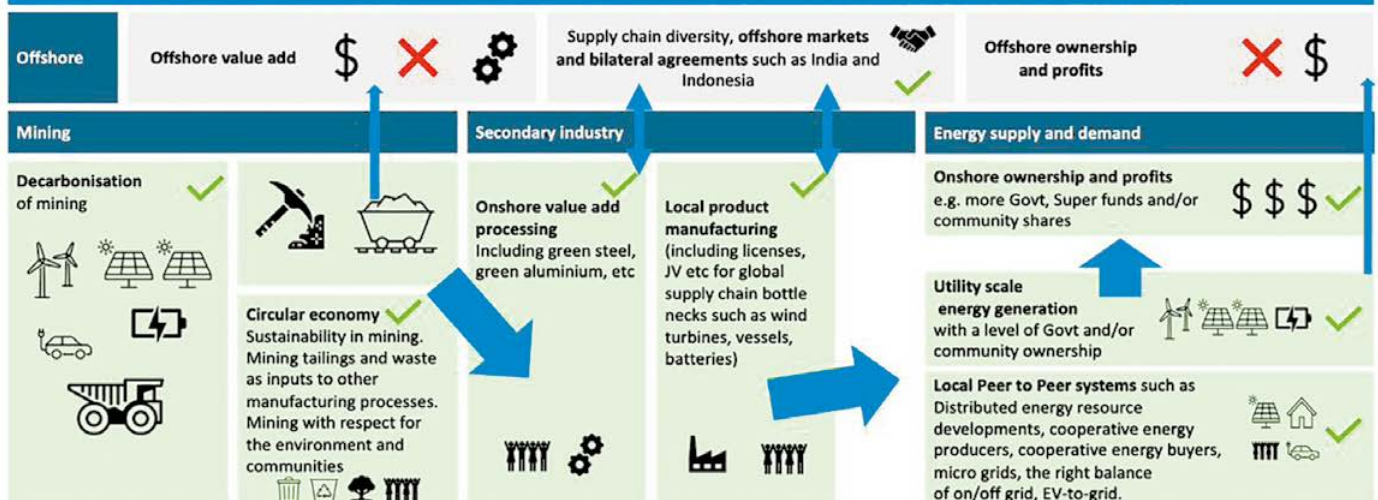
Third, growth that puts equality and equal opportunity at the centre.”

A value-adding Australian climate economy

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"We need to take our vision, our blueprint to Canberra and present clear messages about the opportunities in employment and business which deliver a strong economy and safer climate."

JOHN GRIMES

of the IRA and highlighted the Middle East's sovereign wealth funds which are "piling huge amount of money into the green energy sector, and into green hydrogen".

"The longer Australia waits the more US and Middle East will cut our lunch and they are probably eyeing off Japan and Korea for an export market, they have a first mover advantage in tying up long-term contracts."

We need a policy response here in Australia to focus on realising the opportunities and advantages; we also we need to ensure necessary approvals processes to get green energy on stream as fast as possible, said DeBelle who is now leading green hydrogen developments at Fortescue Future Industries.

The biggest challenge is playing catch up for a lost decade, he cautioned, today demand for green energy greatly exceeds supply and the imbalance will get worse unless addressed.

Renewable metals superpower

This is the opportunity that stands in front of Australia, says Danny Kennedy of New Energy Nexus who observes "Australia literally has got all the battery resources, way more than US and others, there is enormous potential to capture that value to get scale and engineering of battery manufacturing and integrate scale to build bigger export businesses for EVs everywhere and electrification of everything.

"Batteries are the linchpin technology and Australia is the linchpin in the economy in the battery value chain," he told the Summit.

"You sell 55% of all the stuff in laptops, phones and EVs right now – 14 ore bodies in Australia constitute the best lithium resources in the world with one of the few ecosystems that can develop a value-chain at scale, all that is missing is a mission-oriented public-private partnership attitude.



"Australia needs a goal, a purpose, a moonshot," Danny Kennedy said.

"The point is it is not capitalism as a means to an end but as a means to something greater, and Australia needs to decide on ambition."

The US's IRA is a competition to the top, Danny said. Australia should enact something similar and consider 'big time' subsidies for





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James Choi
of Korean
Trade at
the Climate
Action
Summit

those making the batteries or tap strategies to make sure this happens instead of shipping rocks to foreign-owned industries.

"Build a sovereign wealth fund," he declared, earning a big round of applause from Summit delegates.

"What Norway did with gas is what Australia should be imagining doing with these critical minerals for supply chains."

Discerning thoughts

Raising ambitions was a core message at the Climate Summit where Zoe Whitton of

Pollination suggested a change in mindset. "Mobilising trillions of dollars looks challenging but it's about moving from one to another, that is from extraction to power infrastructure, that is the challenge, and it's realised through the development of investment opportunities.

"The scale of this industry in a few years' time will be mind boggling and we will keep building... capability will be the theme this year."

Many more stirring messages were delivered by the leading line-up of presenters including Jon Dee of RE100, James Choi of Korean Trade, NSW MP Jihad Dib, Independent MPs Allegra Spender and Zali Steggell, Monica Richter of WWF, Ann Austin of Lendlease, and Kristian Fok of Cbus Super.

At the conclusion of the consensus-laden Summit John Grimes remarked on the billion dollar opportunities that lie ahead for Australia if it were to chart a new and bolder path in the transition to a net-zero emissions economy.



Monica Richter
of WWF

"We need to engage with experts in the steel, aluminium and cement sectors; heavy industry must be at the heart of our conversation, so too the finance industry, trade unions and a broad coalition of support," he said.

"We need to take our vision, our blueprint to Canberra and present clear messages about the opportunities in employment and business which deliver a strong economy and safer climate.

"We want to go on and change the world."

Review of Australia's central Climate Policy the Safeguard Mechanism

Much has been said and written about the reforms to the Safeguard Mechanism and in particular its main sticking point, the unbridled use of carbon offsets.

Analysis by Climate Analytics concludes the majority of land sector offsets (of which tree planting and forest regeneration account for more than half to date) fail to deliver genuine or additional emission reductions.

They calculate that for every Australian Carbon Credit Unit generated to offset one tonne of CO₂ equivalent emissions from LNG production in Australia, about 8.4 tonnes of CO₂ equivalent lifecycle emissions are emitted globally.

"For coal, the equivalent is even bigger, for every tonne of CO₂ equivalent emissions from coal mining offset on average about 58-69 tonnes of CO₂ equivalent lifecycle emissions are emitted globally," Climate Analytics writes.

"Every tonne of carbon emitted from the fossil fuel industry stays in the atmosphere for far longer than the life of a land-based offset which in Australia, at best, is guaranteed for only 100 years. **For each tonne of carbon released into the atmosphere, around 40% remains after 100 years, 20-25% remains after 1,000 years, and up to 20% after 10,000 years, centuries after a land-sector offset stops absorbing carbon.**"

It's a sobering read.

Emissions from the extraction and combustion of fossil fuels make up roughly two-thirds of global annual greenhouse gas emissions and there's no real end in sight.

Richard Denniss of TAI declares "No matter how sensible it might seem to some, there is no scientific or economic reason to keep building the things that are causing the problem that the Safeguard Mechanism is trying to fix."

The Smart Energy Council, which joined 26 signatories in a Better Futures Australia letter to Minister Chris Bowen and DCCEEW to strengthen Safeguard Mechanism reforms, says it's time to rename the Safeguard Mechanism the Big Polluters' Program.

"It is not at all clear what the Safeguard Mechanism is safeguarding. If it is safeguarding the coal and gas industry, particularly new coal and gas, the policy is a fundamental failure and should be discontinued," the SEC wrote in its submission.

"Australia's biggest companies and Australia's biggest polluters should reduce their emissions through direct emissions reduction projects in Australia, creating jobs, new industries and economic opportunities in regional communities across the nation.

"International offsets should be banned under the program and domestic offsets should be limited; and new entrants to the Big Polluters' Program need to enter the scheme at net zero, with new entrants using Safeguard Mechanism Certificates before they can access Australian Carbon Credit Units."

The Smart Energy Council's Submission can be seen in full at www.smartenergy.org.au

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REWIRING AUSTRALIA:

**We can,
and we
must!**

It's the topic that everyone is talking about and the majority aspire to, but how do we go about electrifying all households? The catchphrase Rewiring Australia has become synonymous with Saul Griffith who has now joined forces with the Smart Energy Council to amplify messages around the benefits of household electrification in the concerted effort to turn vision into reality.

HOUSEHOLDS ACROSS AUSTRALIA face ever increasing cost of living pressures, they are struggling with inflated grocery prices, soaring mortgage interest rates as well as power and gas prices while retailers profiteer from a war being waged on the other side of the globe.

What if we could wave a magic wand and electrify homes, equip them with solar PV, battery storage and for those with electric vehicles, install chargers?

We don't lack the available technologies or the willpower but the 'getting there' is another matter, which brings us to the lifelong mission of Australian engineer and inventor Saul Griffith, who collaborated with Whitehouse staff and the US Senate to help deliver President Biden's ambitious climate outcomes and advised on content of the widely lauded *Inflation Reduction Act*.

"I've seen the success that passion for widespread electrification can bring," says the Founder of both Rewiring America and Rewiring Australia. "And the opportunity right now, and mindful of a values-based economy, is to address our 10 million households through electrification by 2030/2035."

Speaking at the recent Smart Energy Council's Climate Action Summit Saul Griffith noted that since 1990 the cost of home electricity, running gas appliances and petrol cars has risen exponentially from \$2,000 to somewhere north of \$6,000 in 2022 and is very much on the rise.

By contrast the cost of running an electrified home with 100% solar and 50% battery sits at \$2,000 a year, with savings of \$42,000 over a ten-year appliance lifetime.

Ergo — the more fossil fuels are relied on the higher the costs rise.

"If you can finance a household today to be all-electric with EVs, solar and batteries on a fixed finance plan it is literally anti-inflationary."

(There's also the not insignificant matter of carbon mitigation. A study of the impact of the *Inflation Reduction Act* suggests it will lead to 40% emissions reductions in the United States by 2030.)

"We need a \$50 billion Rewiring Australia plan, not \$20 billion," Saul told the Summit.

"We need to address the demand side of household electrification. Green is ready to go — we know how to decarbonise. We just need more ambition."

Collaborating for the greater good

Saul's vision is shared by the Smart Energy Council which has entered into a landmark new partnership with Rewiring Australia to amplify the message by relating the wealth of economic, social and environmental perks of powering the nation with zero emissions electricity.

Smart Energy Council CEO John Grimes declared "By welcoming Saul and the Rewiring Australia team to the Smart Energy Council collective we can deliver some monumental wins."

The team has already taken the opportunity to step out the path to electrification, conveying strong messages in submissions to government.

A call for a sensible, sustainable future

In its 2023-24 pre-budget submission Rewiring Australia proposed \$13.5 billion of expenditure over about a decade to use electrification to reduce cost of living pressures as well as slashing emissions. In December 2022 Chris Bowen, the Minister for Climate Change and Energy, announced that the 2023-2024 federal budget would include a "meaningful and substantial package" of electrification measures and that is what Rewiring Australia and the Smart Energy Council are collaborating to deliver.

Rewiring Australia points out that its sister organisation, Rewiring America helped design US President Joe Biden's landmark *Inflation Reduction Act* (IRA) in 2022. It continued "The most ambitious climate legislation in the world, it is worth around US \$369 billion in new climate and energy spending across households, business, industry and large-scale energy supply. If Australia was to keep up with America and spend pro-rata what the U.S. will spend under the IRA this would require over \$40 billion in investment."

Most of the funding would be finance provided by the Clean Energy Finance Corporation. But there needs to be a paradigm shift in how governments steer the energy market, so Rewiring Australia called for \$11 million for a powerful new Office of Electrification that would coordinate policy across all governments, through the Energy Ministers Meeting.

The Treasurer of Australia Jim Chalmers recently wrote that “The energy transition and adoption of new technologies...will be the defining phenomena of this decade and possibly the defining opportunities for this government”. Electrification is best way to build this new opportunity for Australia.

Thirteen billion dollars sound like a lot of dough?

How about the \$11.2 billion subsidy given to the fossil fuel sector each year by Australian state and federal governments. It's a staggering figure that continues to blow out on the back of inflation and fuel price rises.

Meantime, Saul notes that just half of all Australian households have access to banking and credit facilities, ie upfront capital systems they can tap into.

“We need regulatory and policy settings for all to come on the journey; we need to grapple with this, how do we fix this as a nation, for example loan guarantees for credit we need to think about with utmost urgency.

“Yet the technology is there and there is a pressing need to reduce emissions now,” Saul said at the Smart Energy Council's Climate Action Summit in his t-shirt emblazoned with 2515, the postcode of his suburb which he aspires to become the first in Australia to undergo an electrification retrofit.

By the numbers: 4,000 households, 10,000 people, who collectively spent \$22m on fossil fuels last year, \$16m of which leaves the community ‘on a one-way ticket overseas...’

“Just think about community transformation – schools, bowling clubs,

churches – when the energy is being generated locally by rooftop PV and reinvested in the community,” said the compelling communicator.

“That is the opportunity.

“This is the values-based capitalism we need.

“And we can realise that potential.”

From gaslighting to enlightenment

Dan Cass who has “been in the climate battle for 25 years” and was disillusioned by the “decade of gaslighting from the federal Coalition” co-founded Rewiring Australia.

“What makes this partnership so exciting is that there's such a big shared agenda; from innovative energy policy solutions to adapting cutting-edge science for the Aussie market,” said Dan whose expertise lies in forging strong collaborations and robust policies.

“We've got to do it well and get it right, but we can absolutely do it and we can do it relatively quickly, household electrification and commercial electrification would take at most 10 years and involve a big, big spend, a bit of a wartime effort.

“We need to reach net zero emissions by decarbonising the household economy for starters and those anti-inflationary savings for consumers will make the climate transition an electoral success. We share a strong and common vision on this transition with the Smart Energy Council and by working closely together in the mission we are much more likely to win,” Dan said.

The Council is committing significant effort into the work program and John Grimes says “This year promises to be a colossal year for the Smart Energy Council and Rewiring Australia – together our impact on Australia's smart energy future knows no bounds.”

Go Team Smart Rewiring Australia!

Action stations! On the starters' block!

In the build-up to the NSW election Treasurer and Minister for Energy Matt Kean announced an **\$8 million pilot program to trial innovative ways to fully decarbonise homes in up to three local communities**, and slash home energy bills and emissions.

“This trial will focus on finding the best ways to save households money on their energy bills by installing zero emissions appliances and technologies or installing rooftop solar,” Mr Kean said. “This is all about using the latest technology to give people more control of their energy bills, while contributing to NSW's target to reduce emissions by 70% by 2035.”

The household electrification program could not be more welcome or timely for Rewiring Australia and the Smart Energy Council.

“Matt Kean has fired the starting gun for home electrification in New South Wales,” John Grimes declared. “Families in New South Wales are itching to ditch gas and go electric and these trials will be a big help.

“The Smart Energy Council's partner agency Rewiring Australia has led the national debate on home electrification, and we pay tribute to Saul Griffith and his team for their extraordinary work in this area.”

If re-elected the NSW Coalition government will run a competitive process to deploy a pilot. This could include private or federal government co-finance to upgrade to zero emissions homes in an urban, regional and remote community.

The pilot program launch in the second half of 2023 and would be voluntary for households in the selected communities to join.

“Australia is at the genesis of its ‘electrify everything’ journey; partnering with the Smart Energy Council is the no-brainer our nation needs”

**DR SAUL GRIFFITH
REWIRING AUSTRALIA**





BATTERIES ON THE MOVE

Smart transport is on the move! Policy makers and innovators are helping drive developments that will bolster electric vehicle uptake, and this was clearly demonstrated at the Smart Energy Council's Batteries on Wheels Summit. Happily, calls for fuel efficiency standards are being heard loud and clear.

THE LATEST DATA on electric vehicle sales paints a positive picture: Australia is on track to soon pass the milestone of 100,000 electric vehicles, with more than 83,000 EVs now estimated to be on Australian roads. That's a significant shift from the 44,000 EVs that were in circulation at the beginning of 2022, says the Electric Vehicle Council which compiled the data.

"The number of EVs purchased increased by 86 per cent in the last year, with 3.8 per cent of all new cars purchased being electric," EVC chief executive Behyad Jafari said, but he tempered this by saying we won't achieve national emissions targets on the current EV trajectory.

"To get there, we'll need a near fully zero-emission vehicle fleet by 2050. To stay on track that means reaching one million EVs by 2027 and around three million by 2030," Jafari said.

"We can definitely hit these goals, but not without an ambitious fuel efficiency standard to expand the supply of EVs to Australia. The federal government should introduce this standard this year as a matter of urgency."

In its lengthy and detailed submission to the National Electric Vehicle Strategy review the EVC recommends the federal government implement an average fuel efficiency target of less than 60 grams of CO₂ per kilometre for new light vehicles by 2030, and amend the fuel-efficient luxury car tax limit from the current threshold of 7 litres per 100 km to an emissions based threshold of 50 grams CO₂ per kilometre, with the additional revenue directed towards EV incentives.

The EVC notes stronger standards would result in cost savings of between \$10.8 and



supply of the best, most efficient vehicles to Australia.”

For the NRMA “A mandated CO₂ standard is the obvious missing link that can help supply moving forward and further strengthen market signals... failure to implement a mandated CO₂ standard and reduce emissions across Australia’s light vehicle fleet will undermine efforts across other sectors of the economy to decarbonise, and make Australia’s international commitments to decarbonisation more difficult to achieve.”

Independent MP Zoe Daniel notes the success of fuel efficiency standards in Europe which have driven down emissions by 40 per cent for new car purchases and recommends the Australian Government incentivise low emission vehicles until there is post-incentive price parity with ICE vehicles.

And in a recent op-ed, Independent Senator David Pocock emphasises that “Our laggard approach [to fuel efficiency standards] means we remain highly reliant on expensive, imported fuel. The average household spends more than \$100 per week on fuel, 90 per cent of which is brought in from overseas. Tens of billions of dollars flow out of Australia to oil producing countries. The transition to EVs will mean we can keep those billions of dollars in Australia.”

Mindful that transport emissions account for 18.6% of national tally, SEC’s Smart Transport lead Audrey Quicke reminds us that EVs of all scale and size can replace fossil fuel energy with home grown emissions-

free energy. The more that is generated on household rooftops the better, she said, reinforcing the urgent need for fuel efficiency standards that “should be implemented as soon as possible, be strong, be ambitious and without loopholes”.

To address vehicle availability and increase market penetration of EVs in overall vehicle sales, the Good Car Co points to the key requirement to open up access to electric vehicles from other jurisdictions and regions, a mission it is already successfully undertaking.

The near-500 submissions to the National Electric Vehicle Strategy dominated Minister for Climate Change and Energy Chris Bowen’s summer reading list. Speaking at a Smart Energy Council gathering he lauded the response to the national electric vehicle consultation paper while emphasising the “clear and explicit support” by the majority for fuel efficiency standards and their “concrete advice about policy design”.

Batteries on Wheels Summit

Addressing the SEC Batteries on Wheels Summit of late last year Minister Bowen spoke of his passion for EVs and the importance of transitioning to 82% renewables by 2030 and making the grid fit for purpose to accommodate the monumental shift underway.

That, he said, is the concern of his government which has set out to assuage concerns about battery reliability and grid strength, and he was pleased to report the

“Tens of billions of dollars flow out of Australia to oil producing countries. The transition to EVs will mean we can keep those billions of dollars in Australia.” – DAVID POCOCK

\$27.5 billion by 2040, in combination with a reduction in greenhouse gas emissions between 91 to 231 million tonnes, edging us close to a decarbonised transport sector.

The call for fuel efficiency standards was a strong and common theme among the 447 submissions to the National Electric Vehicle Strategy. We’ve picked out several comments which broadly reflect the majority of views (though unsurprisingly some from the car lobby poured cold water on efficiency standards. The table on page 22 helps explain why).

For its part, Boundless Earth is calling for the standards to be legislated as soon as possible, by mid-2023 at the latest, given “Robust and effective fuel efficiency standards (FES) will encourage the



Roev's Paul Slade takes Senator Pocock for a spin

"There is clear and explicit support by the majority for fuel efficiency standards." – CHRIS BOWEN

passage of the Electric Vehicle tax that will exempt EVs from the fringe benefits tax and slash the cost of electric vehicles by up to \$9,000 for businesses which is described as "a win for motorists, a win for businesses and a win for climate action".

Minister Bowen told the Summit "I'm delighted to read EVC's analysis indicating the tax exemption is already having a big impact, with their projections of 8 per cent uptake in EVs by 2025.

"There is more to do," he said, "And we are making good progress with our transition of the Commonwealth fleet to 100% zero emissions, 75% by 2025. This is important because with 10,000 cars in the fleet we are a big purchaser, and we turn over cars every three years.

"We'll have a second-hand electric vehicle market in no small time because of these measures which facilitate affordability and act as an incentive."

Integrating the grid and electric vehicles stands in front of us, he said, citing a Nissan Leaf has the same capacity as three Tesla powerwalls. Referencing REVS project comments (see page 22) he declared that were Australia's fleet to be 100% electric that would be equivalent in storage to building Snowy 2.0 *five times over*.

Electrifying bus depots

The BoW conference was abuzz with smart transport developments and ambitions, and although passenger cars tend to get all the headlines in the EV space there's now greater momentum around commercial and heavy vehicles, Behyad Jafari of the Electric Vehicle Council observed.

He commended Steve Lewis of Everengi Australia for modelling bus opportunity costs that reveal \$10m in capex to electrify a depot would result in \$1m lower power bills, saying these figures help paint the whole picture and are critical to operators for profitability.

Fuel tax credits folly

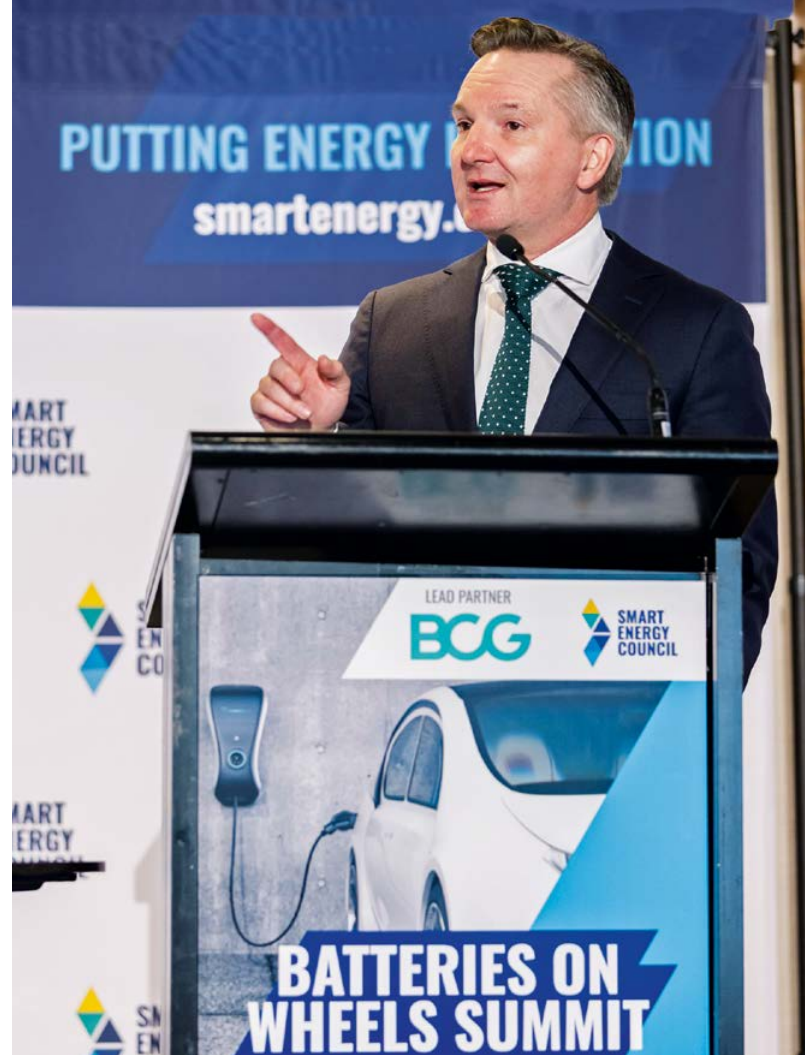
The Grattan Institute is calling for a reform of fuel tax credits given to businesses to help repair the budget and reduce carbon emissions. The Institute declares only about half of the \$8 billion a year outlay is justified in economic or social terms.

"Winding back the credits could reduce the structural budget deficit by about 10 per cent, or \$4 billion a year [and] help Australia hit its target of net-zero emissions by 2050 because burning diesel contributes about 17 per cent of Australia's total carbon emissions.

"At present, no fuel tax is payable for vehicles that only drive off-road, such as trucks on mine sites, and a reduced rate of fuel tax is payable for on-road vehicles heavier than 4.5 tonnes, such as semi-trailers, B-doubles and passenger buses.

"There is no business reason why larger vehicles should pay less than smaller vehicles – in fact quite the reverse, since heavy vehicles do far more damage to roads," the Institute wrote.

"Cutting fuel tax credits would be a win-win: it would shrink the



The average bus requires 300kWh energy per day; a 90-bus depot draws 27MWh per day, with a peak capacity of 4.5MW which equates to \$10 million worth of electrical upgrades, Lewis said.

"Bus depots are large, new sources of energy consumption, grid capacity building is an expensive and lengthy process, electrification represents large and unfamiliar costs to operators; hence the importance of modelling to enable good planning and ensure grid stability and optimise costs."

Modelling for smart charging is key, and for the grid operator it's an equivalent of adding 1,888 homes to the grid. Given NSW is home to 8,000 buses with potential storage capacity in the thousands of

budget deficit and help Australia hit net-zero carbon emissions by 2050."

These views are strongly supported by SEC whose statement reads: "The fuel tax credit scheme doesn't directly fund our roads and impedes our climate targets. Reform could save the budget \$4 billion per year and slash emissions. Budget spending should transform the grid, not subsidise fossil fuels."

Writing for the Australia Institute, Audrey Quicke last year exposed the fuel tax credit rebate as one of the top 20 most expensive programs; this year up to \$7.8 billion worth of fuel tax credits are forecast, rising to \$11.3 billion in 2025-26.

"In terms of total amount claimed, the mining industry takes 45% of the total," she wrote "So not only does this subsidy encourage the use of a fossil fuel, it also primarily benefits the fossil fuel industry."

Audrey notes metal ore mining and coal mining are the top earners, claiming over one billion dollars each, while claims from farmers average in the thousands of dollars.

megawatt hours, depots have the potential to create a dynamic load during the solar peak to help grid stability. Evenergi Australia is currently trialling integration.

The Summit also heard from Lex Forsyth of Janus Electric Australia who captivated delegates with the Janus conversion module which enables a 'simple' conversion from diesel engines to battery and electric drive train system producing zero emissions without modification of the OEM vehicle.

The Janus side battery comprises two 310kWh battery modules ie 620kWh delivering up to 600km range from one charge. Taking 8-12 hours to deplete, the exchangeable battery can be swapped out in just four minutes.

Revolutionary!

Staying on Aussie innovation, Roev, which was founded by former Atlassian executives Noah Wasmer and Paul Slade, is taking the ute market by storm by converting petrol-powered Toyota Hilux and Ford Ranger ute fleets to electric. The process involves fully removing the diesel engine, exhaust and gearbox and



"Robust and effective fuel efficiency standards (FES) will encourage the supply of the best, most efficient vehicles to Australia." – BOUNDLESS EARTH

replacing it with an electric drive unit including battery packs.

Looking ahead, the duo, who point out that utes make up one in five vehicle sales and are no friend to the environment with their diesel-powered engines and high mileage, aspire to develop an Australian vehicle manufacturing industry with a locally made electric ute.

"Through our vehicle-to-load (V2L) capability, a Roev EV Ute will also power your tools, your workplace, your home, and your community," Wasmer told delegates.

Roev has won the heart and mind of key Independent Senator David Pocock who went for a spin in the battery powered Toyota Hilux ute and gave it two thumbs up, saying "Electric

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vehicles are the future and utes are no exception."

Mode shift

Australia must reach 100% EVs by 2035 if it is to achieve net zero by 2050, however it's not all about cars, says Gabrielle Kuiper. "We need to take a broader approach to reducing vehicle emissions, currently 81% of trips are by car and 19% walk or use public transport, we need to almost double that to 36%.

"Electrification and mode shift are necessary, and e-bikes and cargo carriers are a solution."

Gabrielle outlined a path to 1% modal shift each year of which e-bikes are the fastest in the route.

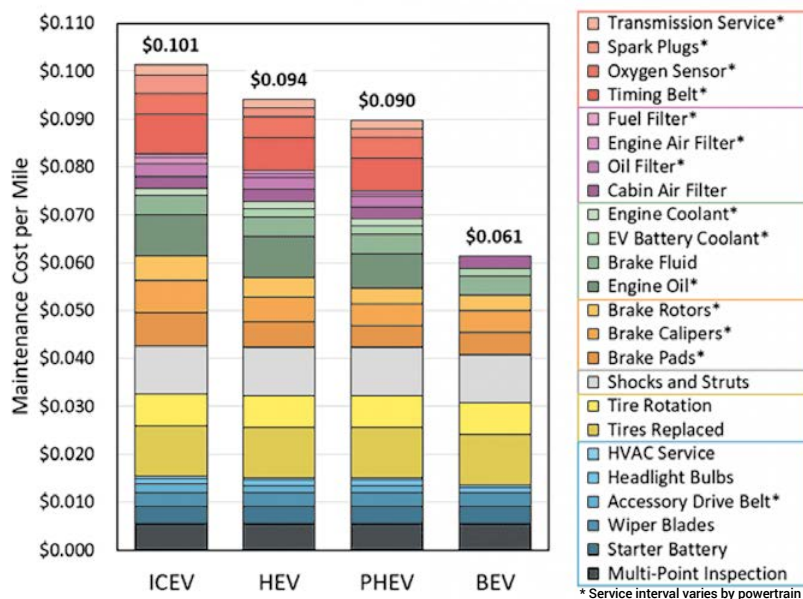
Eight in ten Australians believe government should invest more in public transport, 66% say more footpaths and bike lanes are needed, and a similar number would welcome trying e-bikes for free.

In its own findings, NRMA revealed 45% of those surveyed would buy an EV if looking for a new vehicle, just 3% already own an EV but 24% said 'no'.

"Consumers are curious about EVs yet also cautious," said NRMA's Vivian Miles.

Which brings us to the work of the REVS project – Realising Electric Vehicle-to-Grid

Scheduled LDV Maintenance Costs



Electric Vehicle batteries are estimated to last up to two decades in a vehicle that contains no transmission, no spark plugs, timing belt or air filter, and are therefore significantly less costly to service, as illustrated in this colourful chart (courtesy of US Office of Energy Efficiency & Renewable Energy). LDV – light-duty vehicle

Services – undertaken by AGL, ARENA and ANU. Project lead Bjorn Sturmberg was on hand to present early findings.

"Our experience to date suggests that V2G may stand to be of greatest attraction for the grid and that there is much to be done by the grid to accelerate this innovation becoming a seamless part of the EV experience," he said.

"Vehicle-to-Grid technology presents a huge opportunity by making the batteries in electric vehicles available for grid services, but who will this benefit and who will drive uptake of the technology?" Bjorn asks.

The trial which is due to report after mid-March will be covered in more detail in the winter edition of *Smart Energy*.

As EV uptake continues in Australia, the likelihood of drivers finding themselves in need of roadside assistance due to a flat high voltage battery will naturally increase. With that in mind **NRMA has announced the addition of mobile EV chargers** to their regular patrol fleet, to give stranded EV drivers a battery boost. The Mobile EV Chargers add around 1km of range to a vehicle every two minutes.

The NRMA will also partner with the NSW Government in delivering at least 20 additional electric vehicle fast chargers across major regional corridors to "create the most comprehensive regional charging network in the country".



e-Motorbike tragic Nigel Morris of Solar Analytics has launched a new channel dedicated to all things electric motorcycles which he intends filling with "all the totally cool electric motorcycle stuff I get to play with" (think Nigel steering a Harley Davison around Sydney's scenic northern beaches). *Tune in to motoelectro at www.motoelectro.com.au*

Mitsubishi's Adelaide head office has flicked the switch on Australia's first bi-directional EV charging facilities that will allow the flow of electricity both to vehicle from grid, and from vehicle back to grid (V2G). Mitsubishi Motors teamed with Jet Charge to install the two Wallbox Quasar chargers.

SEA Electric's Melbourne made all-electric trucks are now available from a nationwide dealer network.

During 2022 SEA doubled the size of the company's manufacturing base to 8,000m², paving the way for the in-house production of up to 2,080 units annually.

Brakes on! Republican lawmakers in the US state of Wyoming are pushing for legislation to ban the sale of all new electric vehicles to preserve the state's fossil fuel industry. "The proliferation of electric vehicles at the expense of gas-powered vehicles will have deleterious impacts on Wyoming's communities and will be detrimental to Wyoming's economy and the ability for the country to efficiently engage in commerce," the resolution reads. *Whoa!*

The FIMER logo is displayed in white capital letters on a dark blue rectangular background.

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NSW: A wad of cash, a cache of commitments

NSW heads to the polls in late March and it's a tight contest between the parties, both of which are promising to fund large renewables projects to help meet emissions reduction targets. On the flip side are plans to expand oil and gas projects that would wipe out any gains.

TIMING OF THE SEC'S NSW SUMMIT was perfect for the state's incumbent leaders. The WWF had just released its latest Renewable Superpower Scorecard which listed NSW as the "new leader setting the pace of the transition". An understandably pleased LNP Premier told the Summit via video link the top spot in the rankings reflected his government's efforts to decarbonise the economy and green the power supply with their \$1.2bn Electricity Transmission Infrastructure roadmap.

The plan which involves twice-yearly auctions for generation and five new renewable energy zones in a bid to attract 12GW of new capacity and 2GW of long duration storage is complemented by a \$633m investment over four years to drive sales of electric vehicles and prepare the NSW road network for a low emissions future, with 50% EV sales by 2030. And rising thereafter.

Terry Niemeier of NSW Office of Energy and Climate Change told the Summit about the Strategies: \$3,000 rebates for EVs costing up to \$68,750; waiving of stamp duty on EVs up to \$78,000; and \$105m in fleet incentives and aspirations for a state government EV fleet by 2030.

Building a network based on an EV charging masterplan is central to achieving the vision, he said, before Michael Probert took the podium to outline the state's ambitious hydrogen infrastructure masterplan with its 60 actions, \$3bn in incentives, hydrogen hub initiative for GW scale combined electrolyser capacity by 2030 delivering green hydrogen at just \$2.80 kg, and a green ammonia market study. Quite some portfolio.

Then there was this...

On the eve of the March state election the stakes were raised with the NSW Coalition announcing a \$1.5 billion Clean Energy Superpower Fund to fast track more rooftop solar, community batteries, big grid batteries and pumped hydro across NSW.

Further, the government will invest \$23 million to kickstart the expansion of the Electricity Infrastructure Roadmap to cover rooftop solar and small-scale batteries and to unblock local grid constraints to allow more people to produce and share energy locally.

The Clean Energy Superpower Fund builds on the landmark \$7.8 billion Rewiring the Nation agreement the NSW Liberal and Nationals Government struck with the Commonwealth in December.

The Coalition has also announced a new \$8 million program to pilot innovative ways to fully decarbonise homes in up to three local communities across NSW by upgrades to new, energy efficient appliances or installing rooftop solar and "making it more cost effective to live in a zero emissions home," NSW Energy Minister Matt Kean said.

"Households can save hundreds of dollars on their energy bills and this program contributes to NSW's target to reduce emissions by 70% by 2035."

Music to the ears of long-time electrification campaigner Saul Griffith and the Smart Energy Council ("*Matt Kean has fired the starting gun for home electrification in New South Wales*". As covered on page 14).

The pilot program would launch in the second half of 2023 if the NSW Coalition is re-elected.

Labor has some grand plans of its own to woo progressive, climate action voters. Topping the bill is creation of the NSW Energy Security Corporation, a state-owned body to accelerate investment in renewable energy assets and "deliver cleaner and more reliable energy and help keep the lights on".

Upping the ante: Labor's \$1 billion NSW Energy Security Corporation

The Corporation which draws on the Clean Energy Finance Corporation model would be seeded with a \$1 billion investment from the existing Restart NSW

"When it comes to renewable energy storage, we need everything, everywhere, all at once and NSW Labor's proposed Energy Security Corporation will help deliver that through a major investment in medium and long-term renewable energy storage."

JOHN GRIMES



Fund and partner with industry on projects that provide affordable, accessible and reliable energy to NSW.

NSW Labor leader Chris Minns alludes to “a decade of failed privatisation” while emphasising the need to deliver a secure energy transition through investment, not privatisation.

Plans include medium to long duration renewable storage solutions pumped hydro and commercially viable technologies to provide grid stability, and community batteries to maximise the benefits for household rooftop solar.

Labor’s broader plans include 50% renewables by 2030, and “as close as possible to 100%” by 2050, enough secure, clean and affordable energy to power the State’s 3 million+ homes and reduce greenhouse gas emissions by 15 million tonnes, the equivalent of offsetting every car in NSW.

NSW Labor is critical of delivery delays in materialisation of the state’s Electricity Infrastructure Roadmap with its promise that all five Renewable Energy Zones (REZs) would be up and running by 2030, supported by 2GW of storage.

“Feedback from industry is concerned these targets will be missed due to delays and a lack of government certainty,” Chris Minns said, mindful of the absence of a single ‘shovel-ready’ project in what is touted the most advanced REZ, despite closures of coal-fired power stations.

Jihad Dib, NSW Shadow Minister for Energy & Climate Change declared “Our plan for the Energy Security Corporation is not a bandaidd solution... Whichever way you look at it, NSW Labor will address the issue of energy reliability and affordability to set us up as a renewable energy superpower.”

Not surprisingly the Smart Energy Council warmly welcomes the plan. John Grimes said “Labor’s commitment to a \$1 billion Energy Security Corporation is a game changer for cheap, smart and reliable power in New South Wales.

“When it comes to renewable energy storage, we need everything, everywhere, all at once and the Energy Security Corporation will help deliver that through a major investment in medium and long-term renewable energy storage.

“Renewable energy is the cheapest form of energy and this \$1 billion investment will unlock that cheap power by ensuring it is matched with renewable energy storage,” John said.

“Community battery storage has also got a critical role to play in the renewable energy storage mix and the Smart Energy Council welcomes this strong focus.”

This, along with the recent decision by all Australian governments to establish a Capacity Investment Scheme to unlock investment in zero emissions renewable energy storage facilitates Australia’s ability to move to at least 82% renewables nationwide by 2030.

Missed opportunities

Speaking at the SEC’s NSW Smart Energy Transition Summit Jihad Dib rued the untapped potential of NSW manufacturing and reminisced on the fate of what was then, incredibly, the largest solar factory in the southern hemisphere. BP Solar in Homebush was selling panels locally while also exporting to South-East Asia but had to close doors due to unfavourable domestic policies.

If Jihad Dib had his way, we’d be well on the path to establishing ourselves as an independent hub of activity manufacturing solar panels



and other renewable energy components. Is it too late? “We sit on the cusp of great economic opportunities, we need to support and partner with businesses with good ideas... I believe in and support locally made; those with drive, with aspiration... they need opportunities,” he said.

We’ll find out after the election whether Dib can set about achieving his vision through smart manufacturing policies.

Harsh reality check

NSW voters have much to mull over. Here we offer some salient reminders:

Despite all the rhetoric, the NSW Liberal-National government has approved 26 coal and gas projects over the past seven years which together nullify action on climate by producing 34 times the annual emissions of the entire state.

The NSW Coalition is contemplating approval for the eight fossil fuel projects in the pipeline and recently granted an authority for Santos’ Hunter Gas Pipeline; a highly controversial move which has incensed thousands of farmers, renewables advocates and climate activists across the country.

Lock the Gate Alliance comments the NSW Government “has sided with a giant gas company that is only interested in keeping prices high so it can continue making obscene profits at the expense of NSW communities”.

Another major sticking point is the NSW Government’s failure to address the PEP11 proposal to drill for oil and gas off Sydney’s northern beaches, instead relegating the final decision to the federal government.

If Climate200 strategies succeed, several NSW community Independents could be swept into office on March 25 and by holding the balance of power would ban offshore oil and gas drilling and introduce a bill stopping PEP11’s proponents from using any onshore infrastructure.

Worth noting here that NSW and Tasmania are the only remaining right-leaning governments in Australia. Clearly the pendulum is swinging, but is the die cast?

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The Smart Energy Council's Pacific Forum

TUESDAY MAY 2, ICC, SYDNEY

The Smart Energy Council's Pacific Forum is an opportunity for delegates to engage in meaningful discussion on how to navigate doing business in the region. The event will provide delegates with the tools to understand the region and its complexities. This event will bring together industry experts, policy makers and Pacific leaders to discuss the opportunities and challenges, and provide insights into the Pacific region.

This important event is being staged the day before the SEC's Conference and Exhibition, but in the same venue, the ICC at Darling Harbour in Sydney.

The world's carbon price is a fraction of what we need – because only a fifth of global emissions are priced

AT THE END OF LAST YEAR, the world's average price to emit one tonne of greenhouse gases was around US\$5.29 (AU\$7.77). For pricing to work as we want – to wean us off fossil fuels – it needs to be around \$75 by the end of the decade, according to the International Monetary Fund.

Why is the price still so low? Because even in 2023, close to 80% of the world's emissions from land clearing, power plants, cars and industry are pumped into the atmosphere without any cost to the polluter.

Carbon prices have long been favoured by economists and experts as a way to drive faster change. If you want to discourage something, the easiest way is to make it cost more. Pricing the three main greenhouse gases – carbon dioxide, methane and nitrous oxide – is an elegant and effective way to force polluters to find alternative ways of producing power or creating forms of transport. (Carbon price refers to pricing a tonne of carbon dioxide equivalent, CO₂-e, which covers all three gases).

There's long been a strange disconnect between the minute-by-minute updates on financial asset prices and the lack of information on carbon prices. In 2023, as extreme weather, droughts and floods propel climate change to the front of our minds, it's far easier to access streams of data on share markets, commodities, foreign exchange than it is to find data on the measure most critical to global survival – the price of carbon. That's why our research team worked to produce the first global carbon price index as a way to easily track changes in pricing globally – and see change over time.

How did we determine the true price of carbon?

To nail down the global price of carbon, we took into account every national or supranational scheme as well as the price

of carbon traded through emissions trading schemes. We did not use carbon credits or offsets, as these tend to lack transparency, be rubbery and often questionable.

Different countries and jurisdictions have come at the problem of atmospheric pollution from different directions.

The simplest is to simply tax the pollutants you don't want. This works if the price is set at the right level – not too low or too high at first – and increased as necessary.

Another common approach is to create a market for pollution through an emissions trading scheme, where high emitters have to purchase allowances. Over time, the new market will set the price on polluting as emitters and others compete for this finite pool of allowances. Regulators progressively cut the number of allowances, driving up the price of each allowance. The end result is to nudge large polluters to cut more and more of their emissions.

We didn't include carbon credits or offsets in our indices, as their use is largely voluntary, they tend to be unregulated or loosely regulated, their supply is uncapped, and their impact varies widely. Whistleblowers have claimed Australia's main carbon offset scheme is largely useless, for instance.

So what changes have we seen?

We first calculated this index a decade ago, when it became possible to pull together reliable price and scope information. When the index began, the global carbon price was just \$0.67 per tonne of CO₂-e (or carbon dioxide equivalents). Back in 2013, only 20 jurisdictions had a price on carbon, covering just 8% of global emissions. At the time, Australia was one of them, before the so-called 'climate wars' took over national politics.

Over the last decade, however, we've seen significant progress. The current price of around \$7.77 per tonne of CO₂-e is almost eight

times higher than in 2013. From 20 countries or jurisdictions, we now have 58, accounting for 22.5% of global emissions. That includes the European Union's emission trading scheme and China's new national scheme, which respectively account for around 3% and 9% of emissions globally. The schemes don't cover their whole economies.

That's the good news. The bad news is there's still a way to go. More than three-quarters of emissions go unpriced – costing the polluter nothing. That's why the global carbon price is still so low. Nations like India, Iran, Russia, Indonesia and Australia have no carbon price or trading scheme.

Australia still bringing up the rear

Australia's domestic emissions account for 1.27% of global greenhouse gas emissions. When you include our staggering fossil fuel exports as the world's top LNG exporter and major coal exporter, our impact on the world climate almost quadruples to 5%. That's depressingly high, given our population is just 0.3% of the world's total.

Despite our vastly outsized carbon footprint, Australia still doesn't have a mandated carbon price. We do have a safeguard mechanism – a baseline above which its big polluters need to pay. At present, the baseline is too high, meaning only a small number of polluters participate. The mechanism is currently under review.

Until the baselines are set lower and penalties enforced, Australia will remain a laggard in the fight against climate change. Labor's pledge to cut emissions 43% by 2030 came without mention of a price on carbon.

Will the rest of the world embrace carbon pricing?

Political pushback killed Australia's first effort at pricing carbon in 2012. Similarly, political

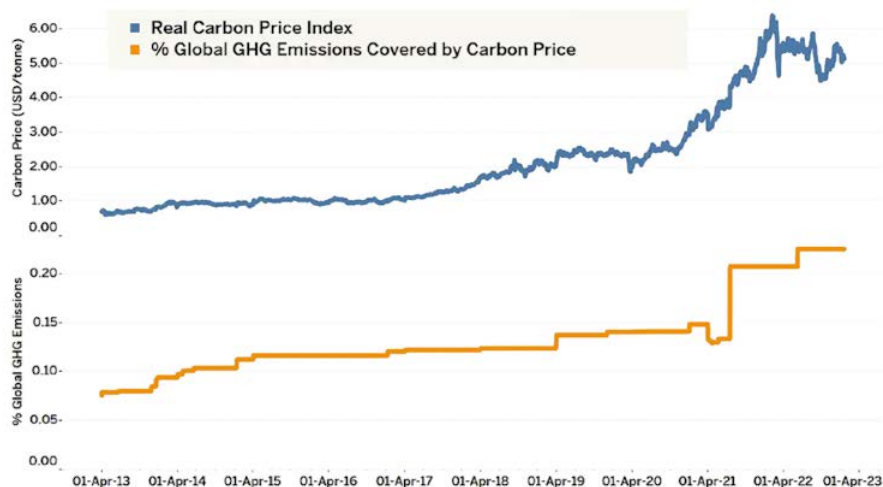


gridlock in America has made carbon pricing a non-starter at the national level. In response, left-of-centre governments have turned to different approaches, such as spending heavily on newly cheap clean energy.

Does this mean we'll never see the global carbon price hit the point where it will be effective? It's hard to say, but at present it seems unlikely every major nation will price carbon.

That doesn't mean it's a waste of time for the nations and jurisdictions like the European Union which are embracing it. Far from it. It's well established we can drive behaviour change by measuring it against a benchmark or expectation. That's where we hope the real carbon price index can play a role. After all, this is one of the numbers that really matters.

Almost all of the trillion tonnes of carbon dioxide we've emitted since the Industrial Revolution were emitted for 'free'. As global heating intensifies, the true cost is becoming ever more apparent.



This chart shows the evolution of the carbon price index since 2013

Authors: Bei Cui, Nga Pham and Ummul Ruthbah of Monash University.

The authors would like to thank Roger Cohen from C2Zero who was part of the index team and provided support for this article.

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GREEN HYDROGEN AMBITIONS AND ACTIONS

ON THE DRAWING BOARD: THE WORLD'S LARGEST HYDROGEN ELECTROLYSER PLANT

The South Australian government has announced plans to build a 250MW hydrogen electrolyser which on completion would be ten times bigger than any other such plant in the world and in turn supply a 200MW hydrogen power plant, also the largest in the world.

The \$600 million Whyalla green hydrogen project funded by the South Australian government has attracted enormous interest among international technology suppliers and project developers as well as potential green hydrogen customers.

At the helm is CEO of the Office of Hydrogen Power in South Australia, Sam Crafter (pictured),



the same man who is used to commandeering big picture developments, having paved the way for what was then the world's biggest lithium-ion battery, the Tesla big battery in Hornsdale, South Australia in 2017.

Crafter told RenewEconomy's Energy Insiders podcast that back in 2017 "I think everyone was sceptical, I mean, everyone..." and that the 200MW hydrogen plant "Will be the launching pad to get to those larger scale projects that the industry is rushing towards."

Modelling by Frontier Economics suggests the average load of the electrolyser and power plant will be close to 200MW, and it will run an average 4.4 hours a day in winter to 8.9 hours in summer. The average operation of the hydrogen turbine, on the other hand, will be little more than one hour a day, throughout the year.

VAST AMBITION

Australian company Vast Solar is on track to build 'VS1', Australia's first full scale solar concentrated power plant which will be sized at 30MW and 288MWh and located in Port Augusta, South Australia.

Included in the \$203 million funding package is \$40 million from the Australian and German governments to develop a hydrogen electrolyser and world-first green methanol demonstration plant at the site.

Methanol is described as the most versatile hydrogen derivative and one that when produced using renewable energy can help decarbonise several hard-to-abate industries, including shipping and aviation.

The consortium has already attracted the interest of local and international off-takers, including diesel-dependent major shipping companies and airlines, said Tim Buckley (pictured) of think-tank Climate Energy Finance which was established in 2022 to work pro-bono in the public interest to accelerate decarbonisation.

"This project could serve as a valuable learning curve and could well act as catalyst for a solar methanol industry in Australia.

"I welcome the use of government funding to trial innovative renewable energy solutions... this is far, far better than providing yet more subsidies to perpetuate the fossil fuel industry," Tim said.

"This is also consistent with our Climate Capital Forum discussion paper in which we promote public funding to drive innovation and RD&D in the local context.

"We can only learn by doing."



"This project could serve as a valuable learning curve and could well act as catalyst for a solar methanol industry in Australia. I welcome the use of government funding to trial innovative renewable energy solutions... this is far, far better than providing yet more subsidies to perpetuate the fossil fuel industry." – TIM BUCKLEY

THE WEST AUSTRALIAN GOVERNMENT has identified land near the Pilbara coastal towns of Port Hedland and Onslow for seven renewable energy projects, predominantly hydrogen related, collectively valued at \$70 billion.

BP is taking advantage of the allocations with plans to progressively develop 26GW of wind and solar energy at a remote 6,500-hectare site 250km from Port Hedland.

The land will be secured to support development of the \$53 billion Australian Renewable Energy Hub that BP has operated since June 2022 and whose electricity would be used to produce green hydrogen. Fortescue meanwhile is considering producing and using green

hydrogen at both sites and is seeking approval for a 5.4GW wind and solar farm south of Onslow.

Staying in the region, Australia's first commercial-scale green hydrogen project could commence production as early as Q424, with Infinite Green Energy's acquisition of the 11MW Northam Solar Farm in Perth and the all-important signing of the first offtake agreement. The site is tipped to produce four tonnes of renewable hydrogen daily via electrolysis which will initially power Fuel Cell Electric Vehicle truck fleets. The plan is to scale up the solar farm capacity to 18MW and connect a 10MW electrolyser for green hydrogen production in the second half of 2024.



GUARANTEE OF ORIGIN The Smart Energy Council presented a detailed submission to the Department of Climate Change, Energy, Environment and Water discussion paper on Australia's Guarantee of Origin scheme.

Key extracts from the 2,600-word submission follow:

There is a clear and urgent need for a transparent, consistent and trusted emissions accounting framework to underpin the creation, use and export of renewable electricity, hydrogen, renewable ammonia and renewable metals.

The key test of a certification scheme is whether it will prevent 'greenwashing' and give households, businesses, investors and customers robust and easily understood information in relation to the green credentials of particular products.

The proposed Guarantee of Origin scheme as currently designed fails this test by providing an identical framework for renewable hydrogen and fossil fuel hydrogen. Fossil fuel hydrogen is inconsistent with the Climate Change Act and the 82% renewables by 2030 target.

Fossil fuel hydrogen, ammonia and metals must be removed from any Guarantee of Origin scheme.

The Smart Energy Council position is that hydrogen or hydrogen related products made from fossil fuels (including those using Carbon Capture and Storage) should not be included in the GO scheme. It is equivalent to including electricity made from logging native forests in the Renewable Energy Target scheme.

The Smart Energy Council supports a minimum threshold of less than 1kgCO₂ per kgH₂ for participation in the scheme. This is consistent with the international Green Hydrogen Organisation standard and still well above the intensity of products certified under the Smart Energy Council's Zero Carbon Certification Scheme.

HYDROGEN AUSTRALIA, A DIVISION OF THE SMART ENERGY COUNCIL, IS PLEASED TO WELCOME JOANNA KAY

to the role of General Manager. Part of her mission, she says, will be to "comprehensively assess the green hydrogen market in a bid to dispel a few myths around its economic viability and levels of safety" while promoting its as yet untapped yet enormous benefits.

"Right now, many of these issues are being contemplated around the globe, we know demand for green hydrogen and its derivatives is a big issue, an important issue, and that at this stage the economics are something of a challenge which we need to overcome because clearly the opportunity is great," Joanna says.

"Timing is of utmost importance, other economies are advancing their ambitions and, as we report on these pages, policies are being formed now to address vital matters such as guarantees of origin and legislation defining green hydrogen."

Although Joanna has only just landed at SEC, she soon takes off on the top-level trade delegation to India. However it's familiar territory for the former advisor to the Australian Government who was seconded as Specialist Advisor to the International Solar Alliance in Delhi. Stationed in Delhi for three years, she oversaw matters relating to energy security and access to renewables technologies including green hydrogen.

Such experience provides the perfect springboard for the SEC's March trip to India where the top-level delegation will focus on opportunities in renewable energy, storage and green hydrogen during meetings with Indian companies which are developing major projects in Australia and looking to invest in Australian projects or licence Australian smart energy innovations.

"The Indian government is very focused on green hydrogen for domestic use and potentially export market and this is important to our interests as they want to invest in and learn from Australia," Joanna said.



"Decarbonisation of hard-to-decarbonise sectors such as shipping, aviation and some industrial processes including steel and ammonia will be facilitated by green hydrogen and its derivatives including ammonia and methanol. These low carbon, renewable commodities are central to the energy transition to replace fossil fuels."

JOANNA KAY

"During the trip we will be visiting several green hydrogen sites across India and meeting organisations in the sector... we need to leverage corroboration in strategic projects in which we can learn from each other and gain mutual benefit," says Joanna, mindful of India's G20 ambition to create Centres of Excellence for Renewable Hydrogen.

The Smart Energy Council which leads the delegation is receiving formal support from Austrade; other partners include the Confederation of Indian Industry, the Australia India Business Council and the Hydrogen Association of India, which will coordinate some Business-to-Business meetings.

Once back on *terra firma* in Australia Joanna is staging senior level talks with industry leaders in hydrogen technologies from the Philippines, Laos and Thailand.

We will report on the outcomes of these meetings in *Winter Smart Energy*.

We also want to hear more about Joanna's experiences living and working in India where, she says, one occasional office visitor was a cute but rather cheeky monkey.

DEFINING GREEN HYDROGEN: The European Commission recently published its definition of green hydrogen in a document that provides the certainty required by producers and investors that the hydrogen they manufacture can be sold and traded as "renewable" within the EU.

Notably, EU Parliament agreed that 'All efforts should be made to avoid hydrogen

heating — and blending should be a last resort; a mix of up to 20% hydrogen can theoretically be blended into the gas grid without causing significant problems, but due to its lower energy density by volume compared to methane, this would only reduce greenhouse gas emissions by about 6-7%, while increasing the cost of fossil gas by up to 43%.

"It also affects the operation of gas infrastructure, end-user applications, and the

interoperability of cross-border systems," the document reads.

"Hydrogen should be prioritised for feedstock, raw material or energy purposes in hard-to-decarbonise industries such as steel or chemicals and hard-to-decarbonise maritime and aviation applications."

The EU's new Delegated Act does not allow green hydrogen to be made from nuclear power.

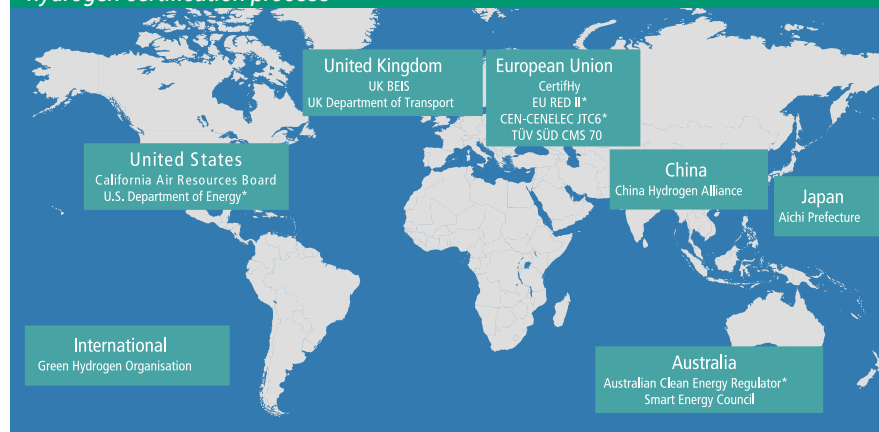
GETTING IN EARLY The Smart Energy Council is one of just eight worldwide operating Guarantee of Origin Certification Schemes for green hydrogen.

Such is the finding of IRENA which assessed existing certification systems around the globe.

In its report *Creating a Global Hydrogen Market Certification to Enable Trade* IRENA states "Certification is an essential element of any trade, especially for the development of a new trade in hydrogen. Certificates for hydrogen and its derivatives would contain information on compliance with standards and regulatory requirements, and enable verification through data on sustainability criteria, such as carbon footprint and renewable energy content, thereby allowing differentiation from other less green products.

"Certification would also allow compliance with additional environmental, social and governance criteria to be verified and would enable hydrogen consumers to signal demand for greener products by purchasing hydrogen that is certified as low carbon or renewable. Certification is an essential part of developing a global market for hydrogen."

The SEC is one of just a handful of organisations worldwide operating a green hydrogen certification process



Notes: * in development. BEIS = Department for Business, Energy and Industrial Strategy; CEN = European Committee for Standardization; CENELEC = European Committee for Electrotechnical Standardization; JTC = Joint Technical Committee; RED II = Renewable Energy Directive II.

Disclaimer: This map is provided for illustration purposes only. Boundaries and names shown on this map do not imply the expression of any opinion on the part of IRENA concerning the status of any region, country, territory, city or area or of its authorities, or concerning the delimitation of frontiers or boundaries.

INVESTING IN GREEN MINING

The potential for lithium and hydrogen projects lies ahead but the harsh reality today is that gas and coal projects continue to attract the majority of funding, says Commonwealth Bank mining and energy analyst Vivek Dhar (pictured).



He notes the 54% increase in the value of committed mining and energy projects in the 12 months to October 2022, at \$83.1 billion, of which more than three-quarters was in fossil fuels: 55% related to oil and gas, 9% in coal and 12% iron ore.

The prospect of Australia replicating the previous mining boom depends on it developing into a major hydrogen exporter, says Dhar whose views are shared by Hydrogen Australia.

The Department of Industry, Energy and Resources classifies two dozen hydrogen projects worth \$118.6 billion as "feasible", the economic viability of 22 other hydrogen projects worth \$147.4 billion is yet to be announced, and Dhar notes two hydrogen mega-projects account for more than 50 per cent of the value of hydrogen projects.

Dhar also observes losses associated with transporting hydrogen, particularly by ship, "opens the door" to more downstream processing located on Australian soil.

SEC SENIOR ADVISOR SCOTT HAMILTON

(pictured) has co-authored *Reimagining climate disaster resilience and the role of green hydrogen energy systems* with a colleague from UN Coalition for Disaster Resilient Infrastructure based in Delhi.



Climate impacts are being disproportionately felt in the developing world, they write; the Pacific Island nations are especially at risk and have low levels of disaster resilience and capacity for adaptation.

Renewable Hydrogen can play a crucial role in disaster resilience, including: decentralisation of energy systems providing independent and reliable source for essential services; zero carbon powerfuels for emergency response vehicles; and energy storage systems while renewable energy generation infrastructure recovers.

Renewable hydrogen has some advantages over other zero carbon solutions such as solar-powered batteries. Hydrogen also presents many challenges including storage, transport and fuelling.

There needs to be significant infrastructure investment and efficiency gains to help realise hydrogen potential.

Disaster resilience solutions will need to be reimagined to potentially include renewable hydrogen as an enabler for energy system resilience. New frameworks of risk governance will need to be developed.

Multi-stakeholder collaborations and public-private partnerships are key tools for disaster resilience, ensuring that essential services are maintained and communities are better prepared for future emergencies.

The paper was prepared for the Australian Disaster Resilience Conference 2023 taking place in August in Brisbane.

<https://www.aidr.org.au/events/34445>



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A POWERFUL INDUSTRY VOICE

"A bigger team, a louder voice, delivering bigger and better outcomes."

The **Smart Energy Council** launched into action early in the year recruiting eight new experts to join the tireless Wayne Smith's high-powered advocacy team and they all hit the ground running, as the saying goes.

The term is said to derive from 'troops dropped into a combat zone' which in some ways is an apt description of the renewables sector as we continue to tackle tricky issues head on while navigating the often treacherous and somewhat rapid transition to renewable energy.

"The core mission is to grow our renewables manufacturing base and exports, to electrify households and transport, to drive net zero emissions, and to build a fit-for-purpose energy market that is sustainable and that will serve future generations well," Wayne said.

Getting results is the main game, and on that score the Smart Energy Council is tracking well.

The SEC's new partnership with Saul Griffith's **Rewiring Australia** team in a shared mission for **household electrification** is already paying dividends (*as seen on page 14*); the significance of a state government's commitment to kick start such a scheme cannot be overstated. It places Australia on the path to a values-based economy, one that Treasurer Jim Chalmers himself advocates.

Household electrification is one of many strategic campaigns that will endure over many years, including the SEC's **Gender Action plan** (*more on page 38*) and **Product Stewardship Scheme** (*page 36*).

Other campaigns tackle present-day absurdities. The SEC is a fearless voice in its **War Profits Tax Campaign** to block gluttonous gas war profiteering, mindful of the fossil fuel sector's intent to wage a **\$20 million smear campaign** against the relief package in response to the federal government's proposed price cap on gas and coal.



The SEC is also challenging the **Queensland Solar Backstop** and calling for dynamic integration of solar into the energy sector in the smartest way and at the lowest cost through smart software solutions.

Team Advocacy: kicking goals

On page 8 we highlight two recent major wins for industry: the introduction of a **Capacity Investment Scheme** ("everything we asked for and more" says John Grimes, "This is a huge, a massive win for us and the renewables industry, a scheme which puts storage at the core... our proposal was adopted in full") and more recently the scrapping of **Locational Marginal Pricing** aka #SolarStopper which would have quashed development of new solar and wind farms.

#2 RENEWABLE ENERGY STORAGE TARGET

Comprehensive approach to unleashing renewable energy storage; delivering the Capacity Investment Scheme allowing Australia to double renewable energy generation by 2030.



Other key projects the Advocacy team is dedicated to include **Small-Scale Renewable Energy Storage** and a **Safeguard Mechanism** that genuinely addresses emissions, and the Council has thrown its support behind the **Carbon Capital Forum**.

Meantime SEC's **Large-scale Working Group** under Jonathan Upson's realm is prosecuting the case for expansion of large scale solar and wind to replace coal plants, and the newly established **Smart Transport division** pressing for fuel emissions standards and smart EV policies (*as seen on page 16*).

The **Distributed Energy Resources Working Group**, ably led by Stephanie Bashir, played a key role developing the proposal **Unleashing Renewable Energy Storage** which is another priority for the Smart Energy Council. The group has since penned a comprehensive proposal and staged a thorough consultation process with energy experts and key stakeholders.

Other activities around a **Small-scale Renewable Energy Storage Target** also take centre stage, SEC's recent submission to government urges the CEFC to prioritise renewable energy storage at all scales: household battery storage, electric vehicles as batteries on wheels, community and commercial battery storage, large-scale battery storage, solar thermal as well as pumped hydro.

Keen to keep up with the Smart Energy Council?



Tune in to Twitter at:
@SmartEnergyCncl



Platinum and Gold members receive regular industry briefings and updates via the special What'sApp group messages.

SUBMISSIONS' PROPOSITIONS

Here we list some of the many recent submissions penned and presented by SEC's expert advocacy team members **Wayne Smith, Nicolette Boele, Connor Woulfe** and **Leigh Heaney**. Each has drawn on their extensive industry expertise to deliver compelling arguments on:

- National Energy Performance Strategy
- National Reconstruction Fund
- National Energy Objectives
- Australia's Guarantee of Origin scheme
- The 2023-24 Pre Budget to build a better future for Australia.
- Safeguard Mechanism Reforms Position Paper
- Energy Security Board Transmission Access Reform
- CEFC Treasury Law Amendment Submission
- Powering the Regions Consultation Paper, and
- Migration, Pathway to Nation Building

These submissions can be seen at www.smartenergy.org.au

The Smart Energy Council is also prolific in its use of social media to inform and communicate key messages as seen on Twitter (with 15,000+ followers), Facebook, Instagram, LinkedIn and WhatsApp. Stage managing 24/7 digital communication is new recruit Harrison Johnstone who is used to being in the hot seat, having joined SEC from live TV production.



Smart transition

Between meetings with Queensland's ministerial staff and at Parliament house in Canberra, John Grimes told us there's never been a more critical moment in history for Australia. "We stand at the crossover point where we chart new and smart energy generation and transmission to replace old polluting technologies. Society cannot function without a constant and reliable source of electricity and the planet will not remain habitable unless carbon emissions are reined in."

He complimented all the innovators, installers, retailers, developers and investors

committed to smart energy, saying "We have all the natural resources, we have the brains trust with all the practical solutions. "Australia can and should set an example to the world. We simply need to intensify our efforts."

In early May the Council welcomes industry heavyweight **Richie Merzian** to the newly established position of International Affairs Director, with a remit to unlock the enormous international opportunities available to Australia. This includes the potential hosting of the UN COP31 climate talks in 2026.

To position Australia on the world stage in the energy transition – just where it should be.

"Our vision is to help build a strong economy and a safe climate though values-based capitalism."



Late last year the Smart Energy Council in partnership with Climate Action Network Australia and Clean Energy Investor Group presented the Unleashing Renewable Energy Storage proposal at Parliament House

During one week in late February Smart Energy's senior management attended a function with Chris Bowen and NSW Opposition Leader Chris Minns, met with LAUTEC's Satya Tanner, participated in a Safeguard Mechanism roundtable with Senator David Pocock; joined a Commonwealth e-stewardship reform working group meeting and Climate Capital Forum meeting, met with Chris Bowen's Chief of Staff, appeared before two Senate inquiry meetings, conducted Hydrogen Australia meetings and staged a series of meetings in Canberra and met with CANA transport campaigners.

We did say Team Smart Energy was committed.

The Smart Energy Council is pleased to announce several new staff have joined the team, and who bring a wealth of talent and experience to enhance services to members and the renewables industry at large.

Richie Merzian, International Affairs Manager

Richie has been the inaugural Climate & Energy Program Director at The Australia Institute for the past four and a half years. During his time there he helped make the case for smart energy solutions in electricity and transport public policy, while challenging roadblocks like EV taxes, fossil fuels subsidies and dodgy international (Kyoto) credits. Richie was formerly an Australian Government representative to the UN climate change conference for almost a decade and helped coordinate the Green Climate Fund Board during Australia's tenure as Chair. In his new role at SEC he will be gearing into the huge international opportunities available to Australia, including the potential hosting of a UN climate conference (COP31).



Joanna Kay, General Manager for Hydrogen Australia



Joanna joins the Smart Energy Council after working as the Senior Advisor to the International Solar Alliance. The role was based in Delhi, India on behalf of the Australian Government, where Joanna was focused on advocating for the clean energy transition globally. Joanna's experience spans both private and public sectors, in Australia, China and India. Joanna's experience will be integral in Hydrogen Australia's mission to promote and grow the presence of renewable hydrogen as a sustainable fuel source in Australia. One of her first tasks was to strengthen ties ahead of the Smart Energy Delegation to India in March.

Audrey Quicke, Smart Transport Lead



Prior to joining the Smart Energy Council, Audrey led the transport decarbonisation research at the Australia Institute. She brings five years of experience in climate change research and advocacy, and has authored research on Australian attitudes to climate change, transport decarbonisation and electric vehicle policy, including a published book chapter comparing Norwegian and Australian EV policy. Audrey

is passionate about making transport clean, smart, safe, equitable and accessible for everyone. She trained as an AI Gore Climate Reality Leader and holds a Bachelor of Laws and Bachelor of Environment in Environmental Management and Climate Science.

Harrison Johnstone, Digital Communications Adviser

Harrison has a breadth of experience in Australia's news and current affairs landscape. His bylines can be seen in industrial transport and sustainability titles. More recently, working as a producer at SBS News & Insight, as well as for The Project on Channel 10.

Harrison has embraced a range of storytelling mediums, focusing on breaking news and politics. Complementing this experience is a Bachelor of Journalism and Science from Monash University. His role at the Smart Energy Council oversees the dispatch of numerous hard-hitting campaigns, advocating for smarter policy, technology and a transition to a sustainably powered Australia.



Carlos Nunez, Senior Project Officer

Carlos Nunez rejoins the Smart Energy Council team as a Senior Project Officer responsible for Product Stewardship and the ACT Renewables Hub.

He is also providing information technology support to the advocacy team.

Carlos's previous work experience includes government, education, not-for-profit and private sectors in multinational and small-medium companies.



Arli Fender-Barnett, Communications and Marketing Manager

This Visual Communications graduate with a passion for building a brighter, more sustainable future brings a wealth of knowledge and experience having worked in marketing, design and communications in government, professional services, research and small business.

In her role at CSIRO Arli worked among some of Australia's top scientists and researchers; more recently she managed the marketing and communication efforts within local government and the arts.



Elvira Pan, Marketing Assistant



Driven by her passion for digital value and sustainability, Elvira has honed her marketing skills to further her career in the renewable energy industry.

With a Bachelor of Arts in Economics, International Business and Trade, and a Master's degree in Marketing and Organisational Sustainability, Elvira has a good understanding of business operations and marketing and has gained a global perspective having worked in Australia, China, and the US.

PUTTING ENERGY INTO ACTION



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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.

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

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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.



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For further information please contact:
ALISTAIR McGRATH-KERR, Sales Manager
Email: alistair@smartenergy.org.au
T: 0499 345 013



SOLAR STEWARDSHIP

The best solution to a looming problem? Address it before it occurs. That is the plan for the mountain of waste from dismantled solar panels that will accumulate in coming years. The Smart Energy Council has joined forces with The Activ Group to coordinate a trial focusing on the logistics of collecting and recycling solar panels.

AUSTRALIA PROUDLY TOPS THE WORLD in per capita uptake of rooftop solar PV but as thousands of panels reach their end of life can Australia also take the lead in addressing logistics around PV panels dismantling, replacement and recycling?

The numbers are somewhat daunting, industry experts forecast that around 3,900,000 PV modules will have reached their EOL by 2030.

But even that could be a conservative estimate, says Darren Johannesen, Market Engagement, Innovation, Product Strategy of The Activ Group ('Activ').

"If we factor in 'early losses' such as product quality and weather damage, house demolition, incentives to remove or update systems to accommodate storage or to capitalise on more efficient solar cell technology and output, we are looking at far greater numbers," he said, noting the volume of schools currently commissioning upgrades to rooftop PV systems.

"As many as five million modules could well reach their end of life within five years and we need to address all the issues such as how they are dismantled and what becomes of them. In Victoria alone it is forecast that from 2035 up to 26,000 tonnes of solar panels will be thrown away every year."

That's a lot to contend with.

"There's a tsunami of PV waste coming down from rooftops; we need to be ready and prepared to deal with all the logistics surrounding the PV waste stream and we need to consider it an opportunity for industry," says John Grimes of the Smart Energy Council.

To put the wheels in motion the Smart Energy Council has formed a strategic partnership with Activ and the Queensland government to trial operations in a pilot solar stewardship scheme

PV waste pilot program

The first-of-its-kind PV collection and recycling trial was announced in early March.

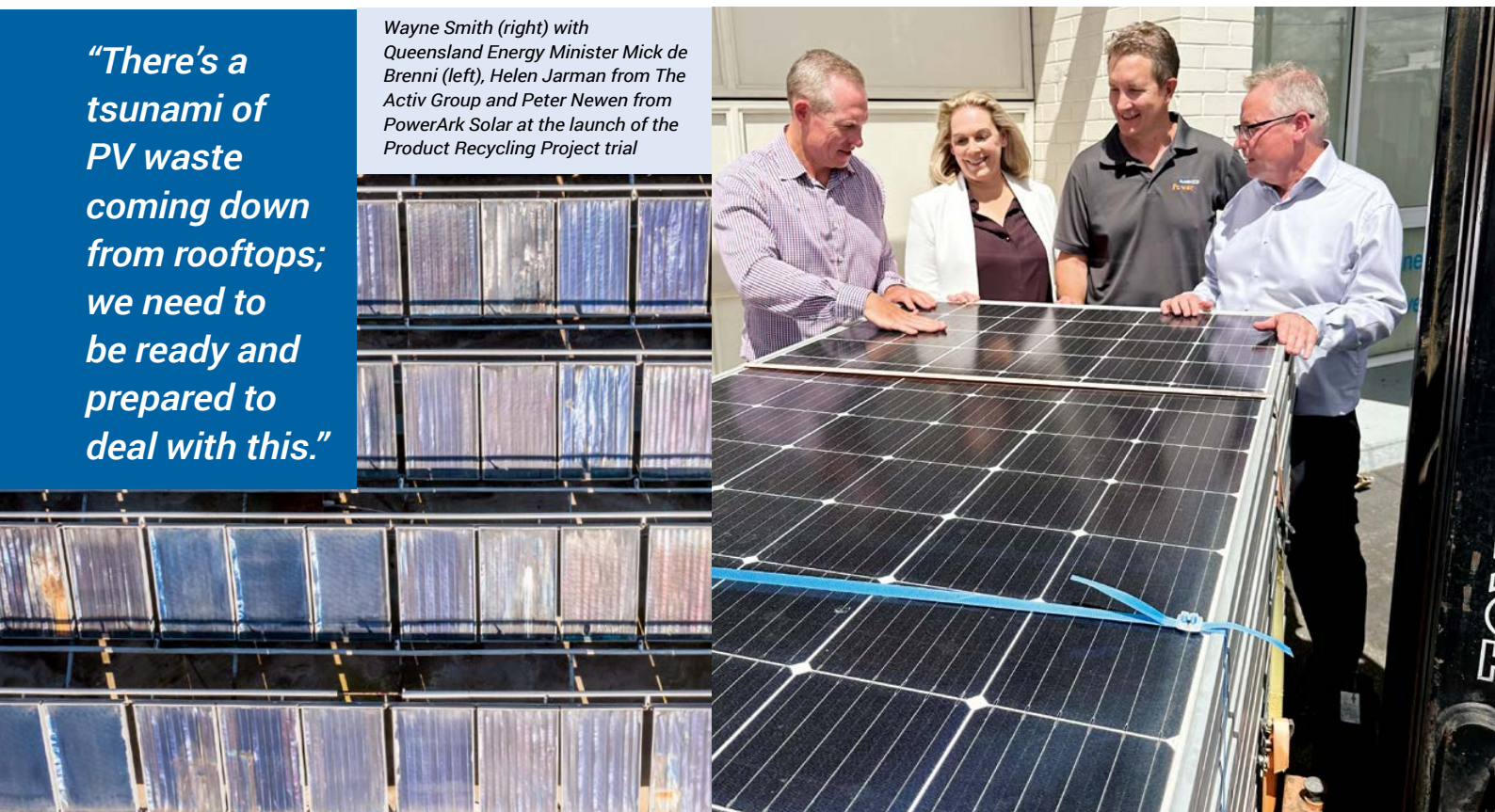
The pilot – which will focus on domestic and small-scale solar systems – will test the most effective methods to ensure solar modules are recovered and processed in a way that enables the best 'reformation' path with due consideration of circular economy principles.

The program will coordinate and facilitate the collection of used solar panels and transport them to a panel recycling facility which is likely to be in the state's north.

Why Queensland? The aptly named sunshine state leads the world in the installation of household rooftop solar panels as well as grid scale solar and renewable energy adoption, John explained.

"There's a tsunami of PV waste coming down from rooftops; we need to be ready and prepared to deal with this."

Wayne Smith (right) with Queensland Energy Minister Mick de Brenni (left), Helen Jarman from The Activ Group and Peter Newen from PowerArk Solar at the launch of the Product Recycling Project trial



Further, as a renewables early adopter the Queensland government recognises aging installations will require renewal and foresees the need to address the surge in solar modules reaching end of life, not just in the sunny state.

Existing industry recycling capacity across Australia is limited to about half a dozen recyclers who collectively have the ability to recycle between 1,500 to 3,000 tonnes over the next two years, Johannesen says.

"More recyclers are entering the market but we need even greater capacity in the e-waste stream to be ready within three years to cater for the next 10 years of processing the volume glass, aluminium, copper, plastic and silicon from physical recycling of solar modules, inverters and associated infrastructure," Darren Johannesen said.

"The process itself is reasonably well understood, but stripping and sorting the materials is a costly exercise and in states where it is not banned many of the broken or expired solar panels end up in landfill which is the lowest cost option.

"We urgently need to determine the best way to encourage end users to avoid this, and that is one of the many considerations in the trial."

The pilot program will also gather important data to inform the development of a state or national Product Stewardship Scheme for solar modules and associated products and materials.

It's widely assumed that the federal government will regulate product stewardship of solar panels by 2025 with an expansion of the *Product Stewardship Act* which covers electronic waste with the potential to include PV panels.

All the more reason to get to grips with the plethora of issues within the PV waste stream.

"We look forward to running this pilot program, the first industry-coordinated trial of solar panel recycling funded by a state government. We anticipate learning a great deal which will put us in a position to inform industry going forward," John Grimes said.

"We commend Queensland for its leadership and hope this pilot program acts as a launch pad for other states to get involved in solar panel stewardship."

Smart Energy Council senior project officer Carlos Nunez will be overseeing the Product Stewardship trial with Activ Group.

The NSW Government's Office of Energy and *Climate Change Going circular in clean energy* issues paper aims to identify key barriers and opportunities in adopting a circular economy for clean energy.

"The rapid rollout of clean energy technologies is essential to achieving NSW climate change goals of a 70% reduction in our state's emissions by 2035 and net zero emissions by 2050. We need to ensure the entire process of designing, producing, deploying and decommissioning those technologies is sustainable," a spokesman said.

"Adopting a circular economy for clean energy technologies presents a significant opportunity to build new economic value while reducing waste, emissions and environmental impacts."



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Boosting the renewables workforce

Australia's energy mix is on a trajectory to strike 82% renewables by 2030 which is great news. However, the more-than-a-doubling of present-day capacity calls for a corresponding uptick in the capacity of the Australian workforce.

"We will portray our sector as the most exciting and meaningful, one in which people don't want to miss out, and we will spread that message across Australia."

THE SMART ENERGY COUNCIL has put the wheels in motion with its Gender Action Plan, a long-term strategy to shore up human resources in the renewables sector.

On one level the numbers are encouraging: Australia has set a target for emission reductions of 43% by 2030 and 82% renewables to deliver a safer climate. But to reach those targets and aspirations the number of workers in the renewables sector needs to increase exponentially, from today's estimated 120,000 to around 600,000 in 2030.

That's a mighty 480,000 new people in the renewables sector. Just shy of half a million. The numbers are daunting in an industry already struggling to achieve full employment quotas.

Analysts cite a current shortfall of up to 15,000 electricians and potentially 41,000 engineers along with all the attendant support and consumer services roles.

Without significant intervention and investment, the total workforce deficit will cripple efforts to transform our energy system leaving us high and dry on the path to decarbonisation, says SEC Expert Advisor Nicolette Boele.

"The Smart Energy Council and its members know we can have a strong economy and a safe climate, but we face significant capacity constraints in terms of workforce numbers and skills, and in the context of climate action, a lack of workers presents an existential threat.

"There simply aren't enough workers to deliver at the pace and scale needed to achieve the 82 per cent by 2030 ambition we have across Australia," she said.

The Smart Energy industry, encompassing solar rooftops, battery storage, efficient appliances and smart transport, green hydrogen, wind energy and more is key to emissions abatement but we are very much a male dominated industry. If we can flick the switch and attract more women and a horde of

newcomers we can go some way to addressing the shortfall, she said

It's no secret that just two per cent of solar installers are female, ideally that will be lifted to 30 per cent or more, which brings us to the:

Smart Energy Council's Gender Action Plan

"The smart energy industry is seen as 'blokes on roofs' installing solar panels backed by resource- and time-poor SMEs who don't have the time to adequately address staffing needs and skills development.

"That's why we need to contemplate what we can do, and that might involve a shift in our current approaches," said Nicolette who heads the Gender Action Plan, funded by a grant from the Lord Mayor's Charitable Foundation.

"We are building resources that help men understand where the conversation is at and how they can change their behaviours to make the workforce more attractive and inclusive of people other than blokes!"

The official launch of the Gender Action Plan in May this year kicks off an initial two-year program of events before broadening in scope in the five years from 2025.

The long-term Plan includes skills development programs and partnerships with local and remote learning institutes and TAFEs to usher in the next generation of workers.

The SEC will also form strategic partnerships with CRCs, industry associations and think-tanks, and develop into a highly attractive program where people are recognised and rewarded for their participation.

There's a swag of ideas and items on the drawing board:

- Remove workforce barriers and unlock opportunities including apprenticeships and trades
- Enhance advocacy capacity to ensure all states and territory vocational training systems address barriers

"We aim to position renewables as the industry of choice, a smart energy workforce that is inclusive, safe and provides meaningful work for all" Nicolette Boele discusses the renewables industry with Lucy Turnbull AO



Readers might identify some parallels with *Equal by 30: closing the gender gap*; the public commitment by public and private sector organisations to work towards equal pay, equal leadership and equal opportunities for women in the clean energy sector by 2030.

Equal by 30 complements the work of the Gender Action Plan by asking organisations, companies and governments to endorse principles, then take concrete action to accelerate the participation of women in the clean energy sector, and close the gender gap.

Equal by 2030 has been endorsed by a host of private sector organisations and 13 national governments, including the Australian Government, which joined the initiative at COP26 in Glasgow in late 2021.

- Respectful workplaces: A cultural shift towards seeing business decisions through a gender lens; ultimately delivering a more inclusive and respectful workforce that provides opportunities, skills/training and favourable working conditions for women
- Industry capacity: An industry that is inclusive and fit for purpose, so it can attract and retain women, and
- Women's determination: Quality employment outcomes and economic empowerment of women in new jobs that are meaningful, flexible and local.

In many respects the SEC's Gender Action Plan mirrors the Reconciliation Action Plan, whereby reference to 'first nations' is swapped out with 'gender'.

Key to the success of the Plan is communication, Nicolette emphasised, given renewables are competing with every other sector with staff shortages (notice the number of 'We are hiring' posters around your neighbourhood?).

"We will portray our sector as the most exciting and meaningful, one in which people don't want to miss out, and we will spread that message across Australia," Nicolette explained.

"The outcome will be that our industry – importantly, our members – will be well staffed with capable, committed workers who collectively continue to transform society by supplying reliable renewable energy in all its forms," Nicolette said

"We cannot overstate their vital importance in driving Australia's energy transformation and meeting and beating targets leading to net zero emissions."

The Smart Energy Council is calling for expressions of interest from members to join the Plan's Advisory Group. Those interested please contact nicolette@smartenergy.org.au

Migration, Pathway to Nation Building

Complementing the Gender Action Plan is the Smart Energy Council's submission to the Joint Standing Committee on Migration Inquiry: Migration, Pathway to Nation Building. Key extracts follow:

- *The SEC views migration as one important pathway to nation building and a safe climate. We also need to significantly increase the number of apprentices in this field – and the Australian Government's New Energy Apprenticeships Program will be an important contributor to this – and particularly increase the participation of women in the smart energy workplace.*
- *Migration is an important policy lever to assist with the workforce shortage for the smart energy sector.*
- *By broadening and deepening the pathways for migrants – skilled, semi-skilled and unskilled – Australia improves its chances of delivering on its national climate change commitments which further assists in improving our energy security and putting our economy onto a sustainable footing for the medium to long-term, and*
- *The smart energy workforce – solar, battery storage, energy efficiency, smart energy management, electric vehicles and renewable hydrogen – should be specifically identified as a priority area for skilled migration.*

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THE RACE IS ON

THE APTLY NAMED RACE FOR 2030 – in this case Reliable, Affordable, Clean, Energy – stands with Smart Energy Council in identifying the need for significantly more workers in renewables in the coming years to meet emission reductions goals.

Late last year RACE for 2030 released *The Australian Electricity Workforce for the 2022 Integrated System Plan: Projections to 2050* which models the workforce required to deliver the Australian Energy Market Operator's 2022 Integrated System Plan.

Not to be confused with Race to Zero, RACE for 2030 is the 10-year co-operative research program with \$350 million of resources to fund research towards a reliable, affordable and renewable energy future.

Their report which presents the first workforce modelling on National Electricity Market investments identifies significant workforce shortage, stating "Boom-bust cycles for the energy construction workforce are likely without intervention."

Readers will be aware that the 2022 ISP informs Australia's energy transformation based on optimal development of essential transmission investments to efficiently enable low-cost, firmed renewable energy to replace exiting coal generation.

The ISP includes four scenarios for the energy transition. A rapid scale-up of an adequately skilled workforce is needed to deliver all but the 'Slow Change' scenario, in which Australia fails to meet emissions reduction goals.

The Step Change scenario which is considered most likely by energy stakeholders identifies the need for 12,000 extra workers in renewable generation, storage and transmission in the next two years.

Overall electricity sector employment is expected to grow by 37,000 from 2023 to peak at 81,000 jobs in 2049.

Implementing the scenario that sees Australia becoming a major exporter of renewable energy (the 'Hydrogen Superpower' scenario) would need 31,000 extra workers by 2025. (With dividends: ACIL Allen forecast that Australian hydrogen exports could be worth up to \$5 billion by 2040.)

Report author Jay Rutovitz of UTS Institute for Sustainable Futures says "The rapid increase needed for in-demand occupations brings a high risk of skills shortages which could impact on the achievement of the ISP. Skills shortages create risks of delays and increased project costs."

RACE for 2030 CEO Jon Jutsen added "The electricity workforce needed nationally to deliver the energy transformation is actually far larger and more diverse than outlined in this report. The modelling does not include the growing requirement for jobs in energy efficiency, demand-side and energy management, or electrification, which could more than double the workforce projections."

The report recommends that research bodies undertake the required research to address gaps and maintain the accuracy of workforce projections, including:

- Developing detailed occupational indicators for batteries and offshore wind to support training strategies
- Regularly revisiting the employment indicators for major technologies, in



RACE for
2030 CEO
Jon Jutsen

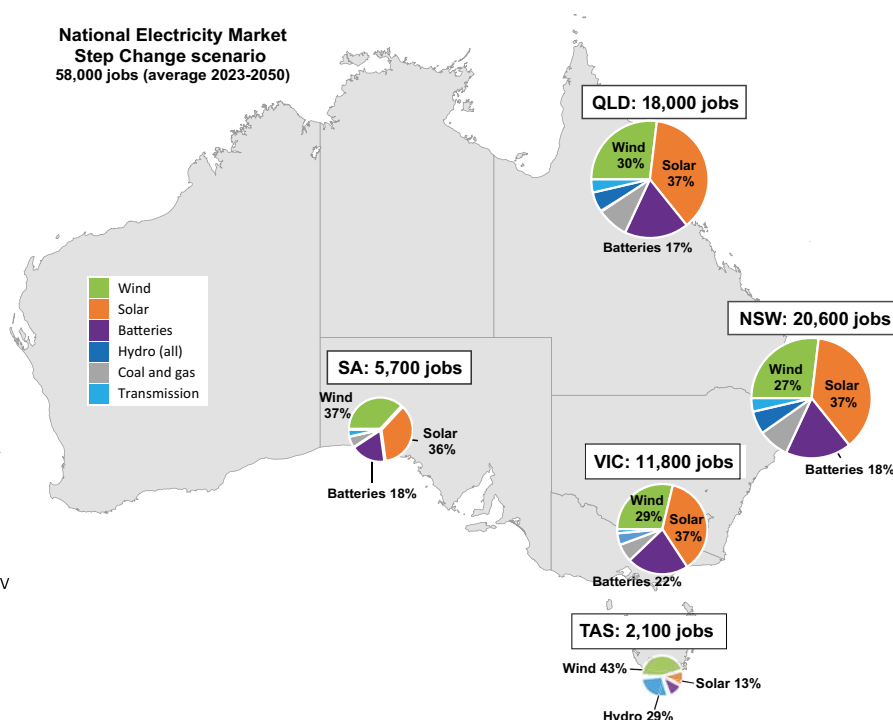
particular wind and solar, with reference to the Australian industry

- Developing better employment indicators for onshore manufacturing for key technologies (solar, wind, batteries) including occupational indicators to support training strategies, and
- Undertaking supply chain analysis to determine more accurate projections for onshore manufacturing.

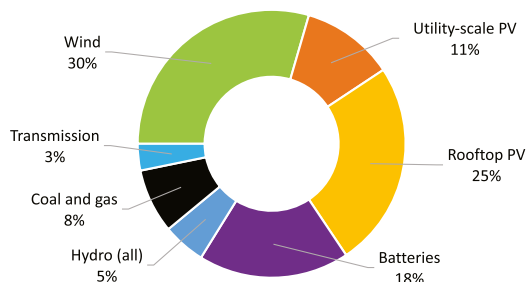
<https://www.racefor2030.com.au/project/australian-electricity-workforce-for-the-2022-integrated-system-plan/>

<https://www.racefor2030.com.au>

**National Electricity Market
Step Change scenario
58,000 jobs (average 2023-2050)**



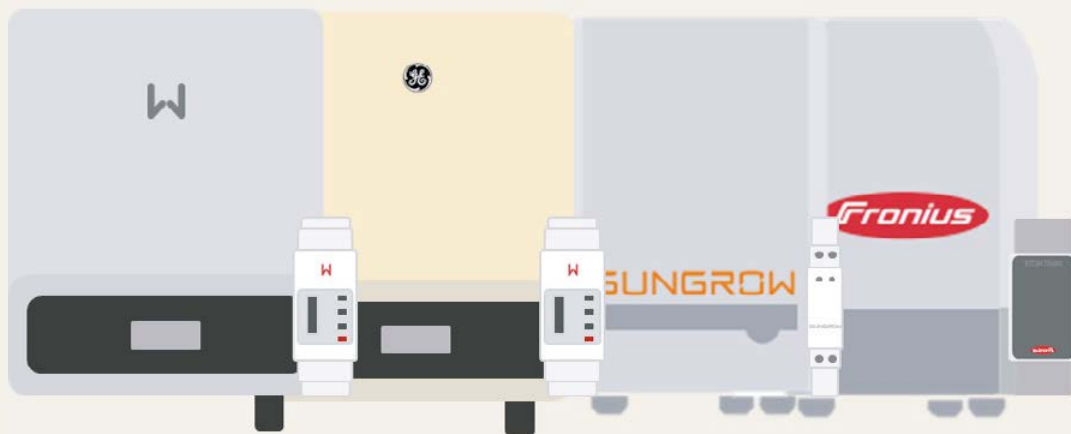
**NEM: Step Change
Average employment 2023-50: 58,000**





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THE PV MARKET: AN INSIDER'S VIEW

WE'RE TWO MONTHS INTO 2023 and the summer sun has been shining down on rooftops and generating power for the more than three million households with rooftop PV, containing the power bills to a fraction of those not lucky enough to have PV systems.

But more and more homeowners are expressing interest in solar power and the outlook appears pretty positive.

Who better to gain insights from than 'oracle' Warwick Johnston of SunWiz.

"The year has started well, installation rates for January 2023 were far better than those of January 22 and on par with the same month in 2021 so the PV market is already looking much better," Warwick told *Smart Energy*.

"The momentum built towards the end of 2022 has carried over into early 2023 and provided a strong start to the year."

One of the challenges faced by the industry that we are seeing at present though is the amount of time-to-sale is stretching out, he says, and the conversion rate from proposal-to-sale are falling back.

"Why this is we can only guess, perhaps people don't care too much about making big financial decisions in January which is of course traditionally a holiday month.

"And the slower than usual conversion rates are a bit of a trend, maybe people are reacting to front page news about spiralling power prices.

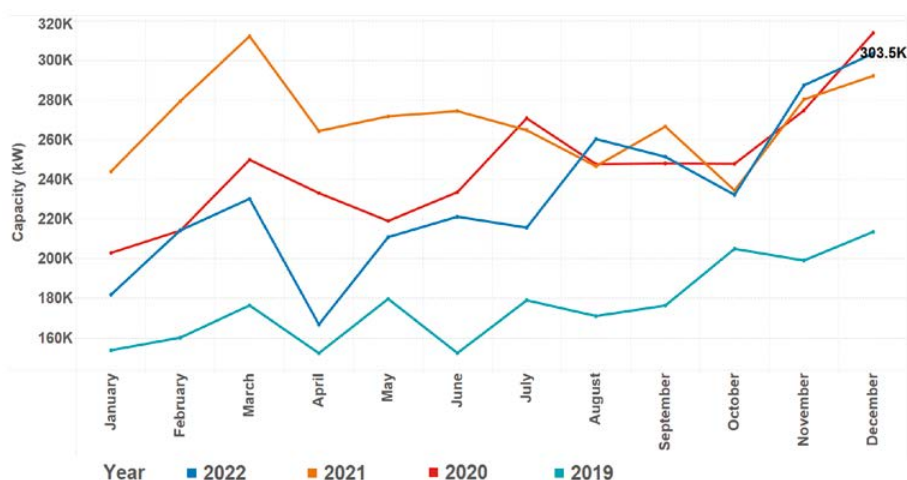
"But in all we are seeing decent volumes of systems being registered. As mentioned, some of that will be a result of December 2022 activities, however the leading indicators of PV systems sales are looking good."

A look at 2022

SunWiz recently released its Annual Australian PV Report which revealed the residential market was one of the worst performing markets in the country during 2022.

STC registration fell 14% on the previous year (2021), though residential PV suffered an 18% decline.

Those planning to enter the market or to significantly grow their business in 2023 can purchase the 2023 SunWiz Report. Visit www.sunwiz.com.au/2023-annual-sunwiz-australian-pv-report/



The 303.5MW recorded in December 2022 is above the volumes seen for the same month in 2019 and 2021 while below those observed in 2020

Warwick believes the trend was caused by homeowners turning their attention away from home improvement projects and instead focusing on recreation, a hang-over too perhaps of post-COVID restrictions and uncertainty.

That was until soaring electricity prices on the back of the war in Ukraine made front page news.

"The second half of 2022 was a story of rapid growth in the PV market due to soaring electricity prices," Warwick said.

"It took some time for that to flow through to installation volumes, partly due to all of the rain on the east coast. But installation volumes leaped skywards when the weather cleared, with November and December becoming two of Australia's five biggest months on record.

The dynamics are interesting in light of interest rate rises putting enormous pressure on home mortgages, and higher than ever grocery bills. Household budgets are stretched to the max.

Warwick believes these pressures have a natural impact, some will and some won't buy solar because of these matters.

There was however a big contrast in state performance, during 2022 Victoria was particularly hard hit with a 23% decline in small scale technology certificate registration. By contrast the far smaller ACT market grew by a whopping 56%.

"On this trend I can only speculate that Victorians were revelling in freedoms more than other states and perhaps opting for road

and plane trips out of the state!" Warwick quipped.

Market segments were likewise bouncy, the 8-10kW and 10-15kW ranges posted some growth, but not enough to make up for the 25% contraction in 6-8kW volume.

Smart move!

"What this tells us is that in general people are adding bigger systems as they have storage and EVs in mind, these factors are acting as stronger drivers as people today are keen to future proof their houses and avoid ever rising power prices.

"What they are deciding to do is invest in the maximum possible size rooftop PV system now rather than scale up at some stage in the future," Warwick says.

"In the past there was a thought it was too hard to get a connection above 5kW but that has been addressed so we are seeing much larger systems."

SunWiz data illustrates that although rooftop PV ended the year strongly, it wasn't enough to make up for the downturn in the first half of the year, with the rooftop PV segment posting an overall contraction.

Price fluctuations

There has been a flurry of reports in the media about panel prices reductions in the region of 10 per cent, but opinions seem to vary.

Warwick himself believes panel prices might well ease, however this might be offset by increases in labour costs.

*** TOP PV RETAILER AND MANUFACTURER AWARDS ***

TOP VOLUMES: The SunWiz award celebrates the contributions of those PV retailers and PV manufacturers who have contributed significantly to the delivery of PV systems across Australia.

The winners will be announced by Warwick Johnston of SunWiz during a special event at the Smart Energy Conference and Exhibition in May. The winners will receive coverage through various digital media and feature in the next issue of *Smart Energy* magazine.

"Wages are increasing throughout the economy so this will have an impact on the cost of installing PV," he commented.

"Also it's getting harder to source European equipment as it's all being taken up by the local [EU] market, so this also puts pressure on prices.

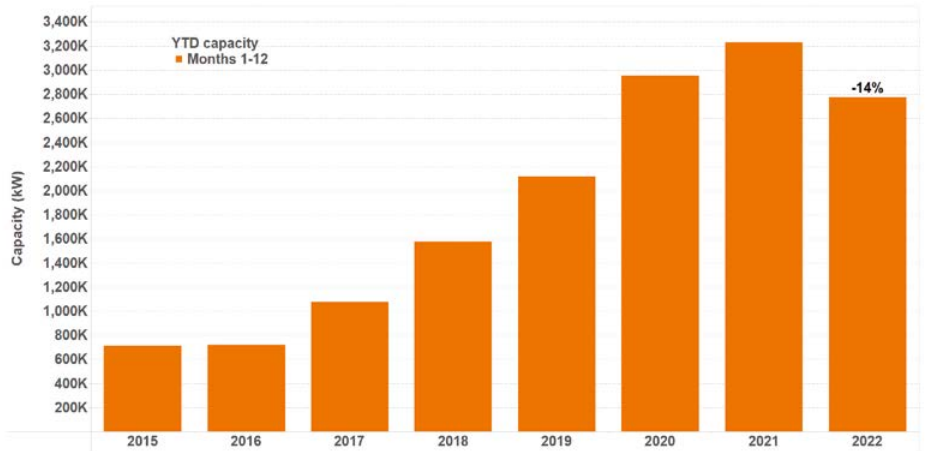
In other developments, Warwick notes the momentum in commercial market, saying there will likely be more growth in commercial than residential this year.

And a timely reminder:

"It is worth noting the instant tax write-off ends June 30, 2023, so businesses thinking of investing in rooftop PV should get a move on and industry should be reminding them of that."

Other key takeaways from SunWiz

- In total 5.3GW of PV capacity was installed in 2022, which lifted total installed capacity in the country by 20%.
- Solar farms posted a record year for new capacity being brought online, including



Year to date capacity compared to previous years

three super-sized solar farms each exceeding 200MWac in capacity.

- The record year for solar farms offset the contraction in rooftop PV, so the market in 2022 remained relatively steady; the 2% increase in total deployment enables the industry to claim 2022 as a record year.

- 2023 brings the all-time tally to 31.4GW, of which 21.7GW is rooftop (of which 19.9GW is sub-100kW).

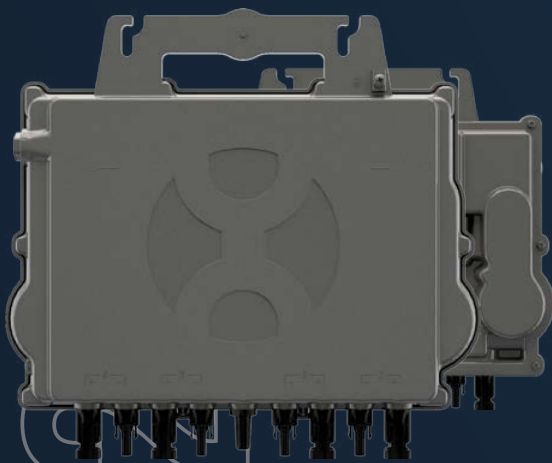
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Meet the SunWiz team on stand 41 at the Smart Energy Conference & Exhibition in May.



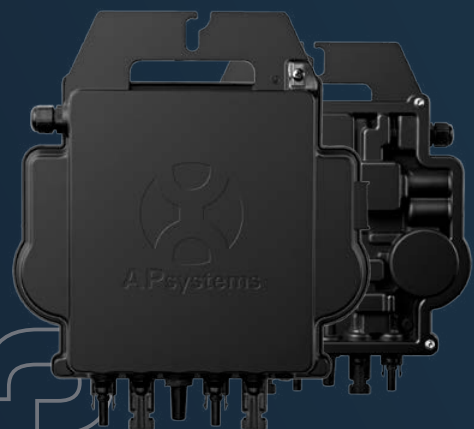
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WHY THE TIME FOR LOCAL ENERGY MARKETS IS NOW

The energy landscape is transforming at a rapid pace. Powerledger's Dr Jemma Green says Local Energy Markets will be the next big thing in our race to decarbonise.

WITH GOVERNMENT MANDATES AND LEGISLATION

around emissions becoming a reality in Australia, the path towards decarbonisation is now about how fast we can move.

Energy networks are stepping up to the challenge, looking to better incorporate solar, wind, hydro and the newcomer hydrogen into traditional and future grid infrastructure. Batteries are in demand, microgrids have come into their own, and virtual power plants are on the rise. We're on the way.

However, there's one solution in the renewable future toolkit that is yet to gain momentum – Local Energy Markets (LEMs).

By coordinating Distributed Energy Resources (DERs), improving the use of renewables and empowering customers, LEMs are a decarbonisation solution built to answer our modern energy system needs.

We are predicting LEMs will be the big mover in energy transformation technologies, adopted at speed by networks looking to answer their infrastructure and decarbonisation requirements.

Harnessing the power of community

LEMs have been a well discussed concept for a number of years, but more recently, advances in technology have made them widely feasible.

As a real-world solution, they are an attractive option for Distribution System Operations (DSOs) looking to reduce the export and import of DER energy into the network, and increase the benefits that customers and the community derive from the renewable energy sources, such as rooftop solar.

Desktop modelling of various scenarios shows that prosumers, those with solar and a battery, could benefit by up to 15 to 25% on sell-in rates for DER they generate. Straight energy consumers – those with no solar – could save up to 5% on energy costs.

This financial incentive is in addition to the environmental considerations, with a higher percentage of renewables being used rather than 'lost' on the network, and better customer satisfaction by green-minded customers for being able to use more 'clean' energy.

The ideal LEM model

LEMs allow individual DER trading with each other at the point of generation and use, rather than aggregation of DER into larger volumes as if found in a virtual power plant.

To be effective, a LEM needs to be localised, and therefore have participant limits. Ideally with a few thousand customers, all located within a single substation. This will keep trades and transactions



Attention innovative energy retailers

localised, reducing cross substation transfers, therefore reducing pressure on grid infrastructure.

Within a LEM, you need a mix of energy participants. An ideal ratio is 50% consumers, 30% prosumers with solar PV, and 20% prosumers with solar and a battery.

A distributed ledger technology for the LEM provides the mechanism to execute the trades between the prosumers and the consumer.

Solving DSO dilemmas

The challenges faced by distributors across the world by the two-way flow of power on systems designed for one-way traffic, are well known.

Network upgrades and infrastructure redesign – and the associated high costs – is currently a high priority for many distributors, to better manage and balance the increased pressure created by the flow and fluctuations of renewables.

Along with other technologies like batteries, LEM can answer those needs.

By matching energy demand in an area with energy generation, they reduce pressure on infrastructure around managing the flow, alleviating the need for large investments in augmentation.

LEM also reduce the burden on DSOs to aggregate and manage the many small DERs that are a feature of modern networks.

Making small-scale DERs easier to manage, and reducing pressure on transformers means more DERs can be generated, distributed and used, thus improving decarbonisation of the network and economy.

New opportunities for retailers

If LEMs are a win-win for customers and DSOs, the last piece of the puzzle is for retailers, and despite perceptions, LEMs can offer wins here too. While on the face of it LEMs appear to reduce incentives for retailers given they provide autonomy to customers and improved pricing structures, that would not be the case considering their reduced exposure to volatile high spot prices and lower prudentials.

However, as the adoption of LEMs gather pace, we believe retailers will be able to develop new commercial models that include LEMs.

Offering a LEM option can increase a retailer's appeal, attracting larger numbers of customers motivated by the increased green energy consumption, or prosumers looking for a better return on solar generation. This vastly increases customer acquisition and retention.

Bringing LEMs to life

Real world LEM projects are kicking off, one of the newest in India where a distributor will soon trial the benefits of a LEM to the grid and participants. Facilitated within a grid-connected microgrid environment, using a community battery as a back-up power supply, participants are a mix of commercial, industrial and residential customers. The results of this trial in India are yet to be shared.

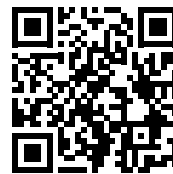
Without doubt, LEMs are only one piece of the solution in creating a more renewable future. But with the multiple wins they offer to stakeholders, plus decarbonisation, they are a solution for right now.

If you would like to know more about LEM technology, see a demo of how it works, or receive further case studies and insights, please email Powerledger at sales@powerledger.io

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Plenti's GreenConnect: accelerating battery and VPP uptake

Household budgets are under increasing strain from the spiralling cost of living, abetted by the ever-rising electricity and gas prices. Plenti has a plan to alleviate the burden.

ACROSS THE COUNTRY there are moves to electrify Australian households, by weaning them off gas and installing solar and batteries to become more energy self-sufficient and reduce electricity bills. For many, the electrification transition can be hard to navigate and costly.

Fintech lender Plenti Group Limited (Plenti) which to date has provided more than 30,000 solar and home battery loans has upped the ante by launching its new tech platform GreenConnect, an all-in-one renewable energy solution, combining subsidised solar and battery systems, energy plans, Virtual Power Plants (VPPs) and affordable finance.

A recent survey of more than 3,000 Plenti customers found only 29% knew the benefits of connecting to a VPP, while 25% were interested in a battery system, but don't know where to start – and 17% were put off by the upfront costs, even factoring in savings from rising energy costs.

Plenti's Head of Renewable Energy Louis Edwards (pictured) highlights that in 2022 there were 389,000 solar installations, but only 34,000 battery installations. However, the Australian Energy Market Operator (AEMO) has called out the urgent need for more energy storage capacity, which includes batteries and VPPs, to increase by 30 times by 2050.

"It's abundantly clear that batteries and VPPs will lead the charge in the household electrification transition and we know that solar and battery installers are best placed to take this challenge on. Solar has and will continue to play an important role for households, but now batteries and VPPs need their time in the sun. This is why Plenti has built and launched GreenConnect," Louis Edwards told Smart Energy.

"If we really want to accelerate battery and VPP uptake, it requires the whole industry to work together to make customer propositions simple and easy to understand. We've been delighted at the response from energy retailer and battery manufacturers who have joined GreenConnect, sharing the same commitment to making the transition to renewable energy more affordable and easier for Australian households.

"GreenConnect is a first of its kind for the Australian renewable energy industry."

Keeping it simple: GreenConnect in operation

For the first time ever, suppliers of renewable energy equipment are able to connect consumers to all-in-one energy solutions that make access to solar and battery systems the most affordable in Australia and the process to join an energy plan and a VPP extremely



"Accelerating battery and VPP uptake isn't a nice-to-have, it's a must do, but it needs to be simple, easy and affordable.... We want to duplicate the mobile phone experience with one bill payment."



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GREEN FINANCE

simple and easy to understand. And it's that simplicity, he says, which is key.

"Solar and battery suppliers don't want added friction to their sales processes. They want solutions that are simple, compelling and easy to understand. If it's not helping improve the consumers purchasing decision, it's not helping at all."

Leveraging its finance and technology capabilities, Plenti has cleverly integrated the VPP sign-up process into its finance process, creating a single application experience for suppliers to connect their customers to VPP.

"What customers need is one single application, with one single monthly repayment, covering all of their renewable energy needs – think the mobile phone for solar and battery systems."

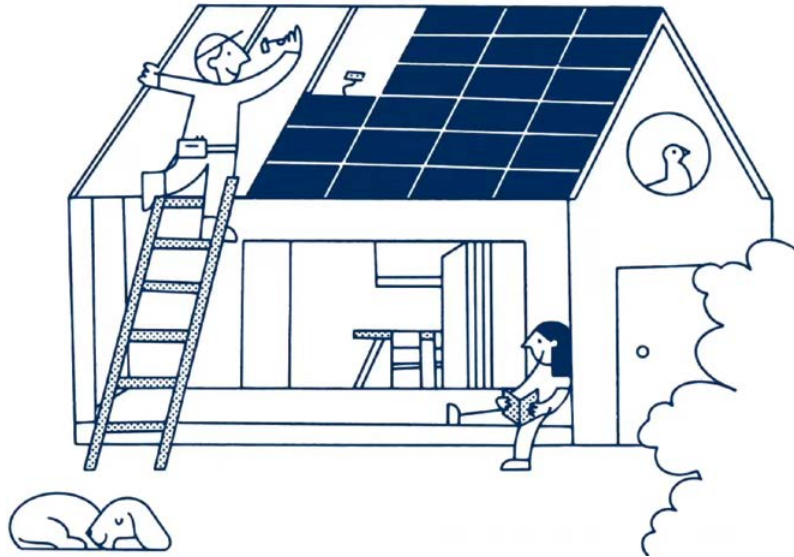
Groundswell of support

Smart Energy Council's John Grimes welcomed Plenti's GreenConnect, saying it dovetails nicely with the SEC's partnership with Rewiring Australia in the bid to electrify households.

"It's clear that the next step change as we build a decarbonised society will come from a greater uptake of batteries and Virtual Power Plants – people's power.

"As an industry body advocating for accelerated battery and VPP uptake, it is pleasing to see an initiative that has brought together all major stakeholders, working towards a common goal," he said.

We asked Louis about the prospect of extending GreenConnect to small businesses.



"That is something we are actively considering as the barriers to entry are very similar," he said. "For now, the focus is on the residential sector and encouraging energy efficiency manufactures to also participate."

With battery uptake and household electrification top of mind across all levels of government, it's platforms like GreenConnect that can deliver state or local council-based programs or schemes more quickly and effectively.

For more information visit: www.plenti.com.au

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SCHLETTER

5B on a mission to make solar farm construction 'stupidly simple'

Australian solar pioneer 5B will launch a series of game-changing innovations this year to make engineering, procurement, and construction easier.



ORDERS AT PREFABRICATED SOLAR ARRAY PIONEER, 5B, have surged by 36 per cent since closing its \$55 million Series B capital raise late last year.

5B booked its largest ever order, a 68 megawatt project, within two weeks of closing the funding round, which included a \$20 million injection from a new strategic partner, global energy major, bp Ventures, alongside existing investors The AES Corporation and Artesian.

Four weeks later, 5B signed another five deals totalling 50 megawatts.

The pipeline signifies a growing recognition that the rate of renewable energy installation needs to be vastly accelerated to meet climate ambitions, and to keep pace with the retirement of fossil fuel generation.

Entering the mainstream

In 2013, when solar engineer Chris McGrath and former Infigen Energy colleague Eden Tehan set out to design an accordion-style array, that would allow 50 kilowatts of pre-mounted solar panels to be installed in roughly an hour, their fundamental driver was to make the deployment of solar better.

"Our goal was to make solar deployment faster, lower cost, lower risk, safer, and easier," McGrath says.

At the time, he says figures like 80 terawatts, representing the scale of solar required globally to avoid catastrophic climate change events, were completely absent from the narrative.

So too were terrifying deadlines, like the 86 months in which Australia must build 28 gigawatts of grid-scale wind and solar to meet the Albanese Government's climate targets.

Now, they are part of mainstream dialogue.

"The world's realisation of the challenge, what we need to do to solve it, and the clean energy and broader energy industry's mobilisation around that has evolved," McGrath says.

Speed is front and centre, alongside labour shortages and land scarcity, in the global energy transition debate. These also happen to be challenges that 5B's Maverick system is uniquely positioned to solve.

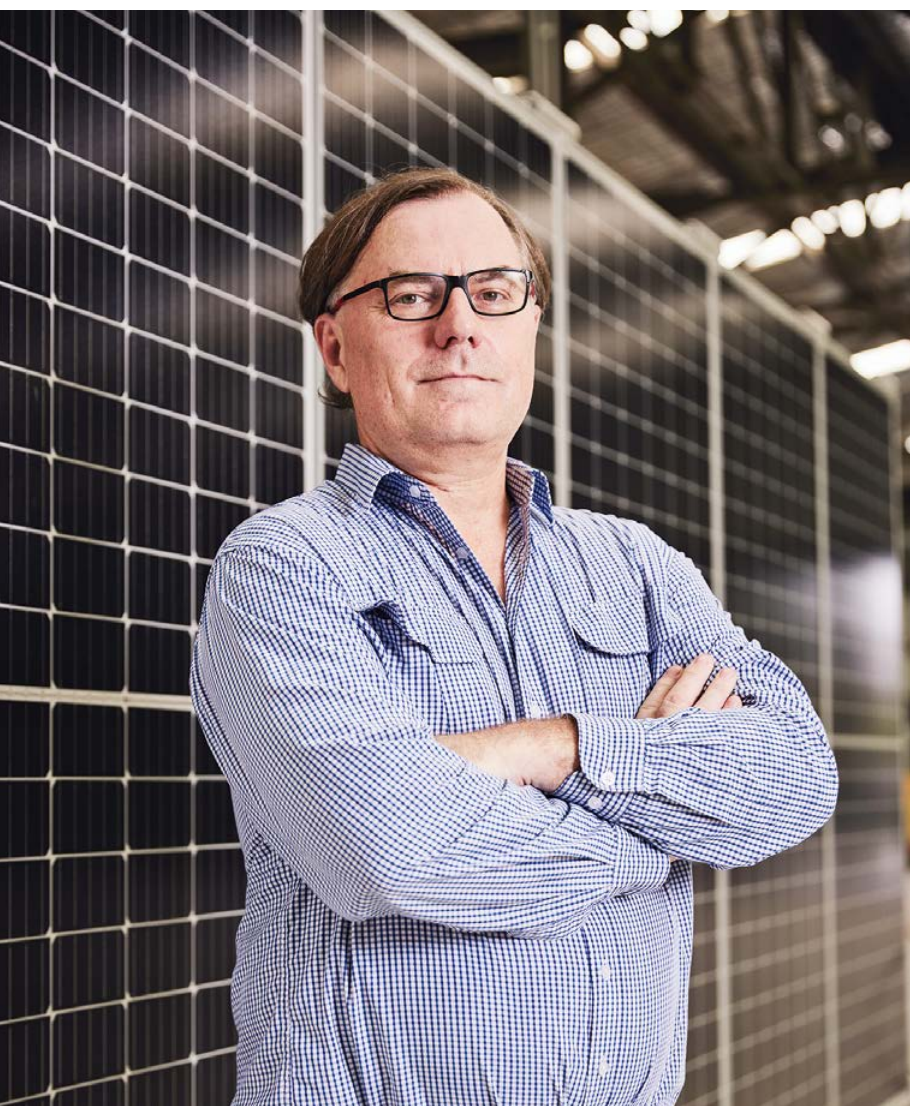
Hotbed of innovation

Last month, 5B commenced testing of a fully automated deployment machine designed to deploy a 40 metre long Maverick array in five minutes. This will be a 10 to 20-fold improvement on the company's current deployment speed record of a megawatt in a day with a team of 10.

The autonomous deployment project is one of at least 15 major innovation projects that consume close to half of 5B's workforce.

"The dare that 5B shows to build a low fidelity prototype that it can use to better understand the customer requirements is unmatched," 5B's chief product officer, Simeon Baker-Finch says.

Adrian Turner, 5B chief technology officer: an industry game-changer, producing a 50-70 kilowatt solar array every 30 minutes with minimal labour



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Simeon Baker-Finch, 5B chief product officer:

"We've doubled down on standardisation to deliver more end-to-end engineering, procurement and construction benefits"

The Apple iPhone of solar

A decade on, 5B's innovation efforts still derive from a fundamental desire to remove complexity and risk from solar farm construction by taking as many activities as possible out of the field and bringing them into an automated, air-conditioned factory.

5B is pushing down the path of becoming an integrated solution provider, embracing the quality, cost down and continuous improvement benefits which, according to Turner, are just not possible with traditional field constructed solar arrays and farms.

"We need to build a truly integrated product for our key market so customers come to understand that 5B Maverick is synonymous with ludicrously simple and better projects, not just with a 50 kilowatt array," Baker-Finch says.

"We've got the underlying components in place, we just need to stitch them together. Whether that's module procurement, site layout or electrical integration – there are currently many atomised discrete steps in the project engineering process, that we're doing or our customers are doing. These are unnecessary with a completely integrated 5B Maverick solution."

www.5B.co

Visit the 5B team at Smart Energy Conference and Exhibition, May 3-4 at stand Titanium 1.

Stupidly easy to use

5B's product innovation team is gearing up for the release of its next generation 3.0 suite of products in April. The range will sport an enhanced structure to withstand 250 kilometre-per hour wind gusts, better flood height clearance, and be more suitable for sites with steeper slopes. A standardised skeleton will make it easier for engineering and electrical designers, as well as logistics teams, to work with.

"To supercharge its use and utility for our customers we need to make the 5B Maverick even more stupidly simple to use," Baker-Finch says.

"With 3.0 we've doubled down on standardisation, so that we can deliver more end-to-end engineering, procurement, and construction benefits. That whole EPC flow is easier," he says.

The 3.0 will be the first Maverick product assembled on 5B's new advanced manufacturing pilot line. Once fully operational, the pilot line is expected to produce a 50-70 kilowatt solar array every 30 minutes with minimal labour.

This pace will be a game changer in the solar industry, 5B chief technology officer, Adrian Turner says.

"It should not be underestimated, both in terms of its impact on the sector and how hard it is to achieve. It is a very big deal in the industry. We are not naive to the challenges to be overcome and we certainly appreciate the support of all our suppliers, partners and customers in this provocative endeavour," he says.

Ann Johnson and Wayne Baker: Out of the field, into an automated, air-conditioned factory. 5B is removing complexity and risk



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Leaders in sustainability: How OSW is revolutionising the solar energy industry

AS WE LOOK TOWARDS A GREENER FUTURE, companies like One Stop Warehouse (OSW) are leading the way in creating a sustainable world. With a mission to reduce carbon footprints, drive sustainability, and create savings for customers, OSW is committed to helping solar installers worldwide thrive in their businesses. Their innovative solutions and dedication to sustainability make them a crucial player in the industry, and an essential partner for those looking to make a positive impact on the environment.

Embracing new technologies

Understanding the importance of technology in improving their services, OSW has diversified its services to include GreenDeal IT Software, Virtual Power Plants (VPP), power services, and financing. OSW, in conjunction with its subsidiaries GreenDeal and Manta Energy, empowers customers on the journey of sustainability from the beginning to end.

OSW's commitment to innovation is evident in the development of GreenDeal, an all-in-one platform and app that streamlines customer workflows. This platform allows customers to manage their day-to-day checklists on one platform, from installation jobs, administrative paperwork, STC prices and trading, and customer data management. The latest feature, a link to add the entire work process to XERO, boosts their administrative productivity. The benefit of this innovation is that it provides concise and convenient A-Z services to customers.



Advancing sustainability

OSW's ongoing efforts to push the boundaries of sustainability in the industry are reflected in the impressive figures. They have sold over 1.1GW of solar equipment in the last three years, equivalent to over 200,000 residential households with a 5kW solar system. The company reported an astonishing revenue of \$516m in FY2019/20, a 31%



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



increase from their FY2018/2019 figures. OSW's growth offers hope to the industry, reflecting an ongoing trend and a continuing shift towards a sustainable energy future through solar energy.

OSW's dedication to sustainability is evident in its efforts to integrate innovative solutions into the entire vertical chain of the solar energy market. By finding and integrating sustainable solutions, OSW is making renewable energy more accessible to everyday Australians. The company's advancements in sustainability benefit the environment and communities, aligning with the vision of many Australians to reduce the carbon footprint and drive sustainability.

Industry leadership

OSW's leadership style sets it apart from others in the industry. Upstream, OSW supports its suppliers by sharing sales preferences and trends so that they too can bring the best products to the market at the most competitive prices. Downstream, OSW supports their customers' needs by providing a wide range of prices, products and technical support. By empowering their suppliers and customers, OSW knows that it helps their business over the long term, creating win-win strategies for all.

OSW's recent openings of distribution centres in Poland, Netherlands and Texas, and its upcoming locations in Germany and France in 2023 reflect direct demand for the company's C&I offerings in the European and US markets. Hillhouse Investment's support has further enhanced OSW's revolutionary energy value chain, with the amalgamation of software capabilities, technologies and solutions in areas such as VPP and electric vehicles capturing the essence of the organisation's capacity.



A brighter future for all

Anson Zhang, CEO of OSW, shares his vision for the future, noting that the company is seeing incredible demand for sustainable energy solutions, and for countries like Australia, which enjoys an abundance of sunshine, solar power generation has to be at the forefront. By expanding the company's network, OSW seeks to bring to market an even greater portfolio of new and innovative solutions that will help customers meet the growing demands.

OSW's innovative and sustainable approach to business makes it an excellent choice for clients looking to embark on a solar energy project. By choosing OSW, clients can benefit from the company's cutting-edge technologies, commitment to sustainability, and leadership in the industry. OSW's expansion and investment in innovative solutions create opportunities for more sustainable energy generation. With OSW leading the way towards a sustainable future, the world can look forward to a brighter, cleaner, and greener tomorrow.

About OSW

OSW is the largest solar distributor in Australia that offers a wide range of solar products, including PV panels, inverters, EV chargers, solar storage options, racking, and components from leading solar innovators. OSW's mission is to help solar installers do better business by diversifying our services to include GreenDeal IT Software, VPP, Power services, and Financing. We are listed among the top 500 privately listed companies and are recognised as one of Australia's fastest growing top 100 companies. With six warehouses across Australia and expanding into the European market and other locations across the globe, including Poland, Munich, Texas, Spain, Italy and the Netherlands,

OSW is committed to reducing the carbon footprint and driving sustainability. With a focus on digital intelligence, OSW is revolutionising the way we deliver business to business, making it simpler for solar installers to help the planet move toward a cleaner, greener future.

www.onestopwarehouse.com.au

**Visit the OSW team at Smart Energy Conference and Exhibition,
May 3-4 at stand Titanium 3.**

Powering Your Future Today with AlphaESS, Your Best Partner in VPPs (Virtual Power Plants)

Don't Just Use Energy, Control It with VPP

LOOKING FOR A WAY to generate electricity without the need for a physical power plant? Look no further than a Virtual Power Plant (VPP)!

By integrating multiple renewable energy sources like solar panels with energy storage systems, a VPP creates a robust energy network that allows for seamless bi-directional power flow. Not only does this help grid operators manage the variability of renewable energy, but it also benefits individual users with potential cost savings and revenue streams. With a VPP, you could choose to participate in demand response programs and even sell excess energy back to the grid.

A VPP is incomplete without energy storage systems, as they are an essential component that enables the aggregation and management of energy resources, greatly enhancing the effectiveness and versatility of the VPP.

So why not join the energy revolution and find the best partner for your distinctive needs?

AlphaESS: VPP-Ready Systems for Reliable Power Supply

AlphaESS is a world-leading energy storage solution and service provider covering the full power range. All the AlphaESS VPP-ready systems have excellent standard configurations – easy installation, 24/7 monitoring, UPS (Uninterrupted Power Supply) ability and LiFePO4 only, which makes them the perfect solution for residential, commercial and industrial needs.

Now the question is, how to pick the right product for you to join the VPP?

'Don't Let Self-Consumption Be a Headache' – Residential Solution Comes to Your Aid

For residential users, AlphaESS presents *Your Almighty Knight* – the SMILE-G3 energy storage system that was born to be part of the VPP. With a 5kW hybrid inverter and a 10kWh battery module expandable to 60.5kWh, the

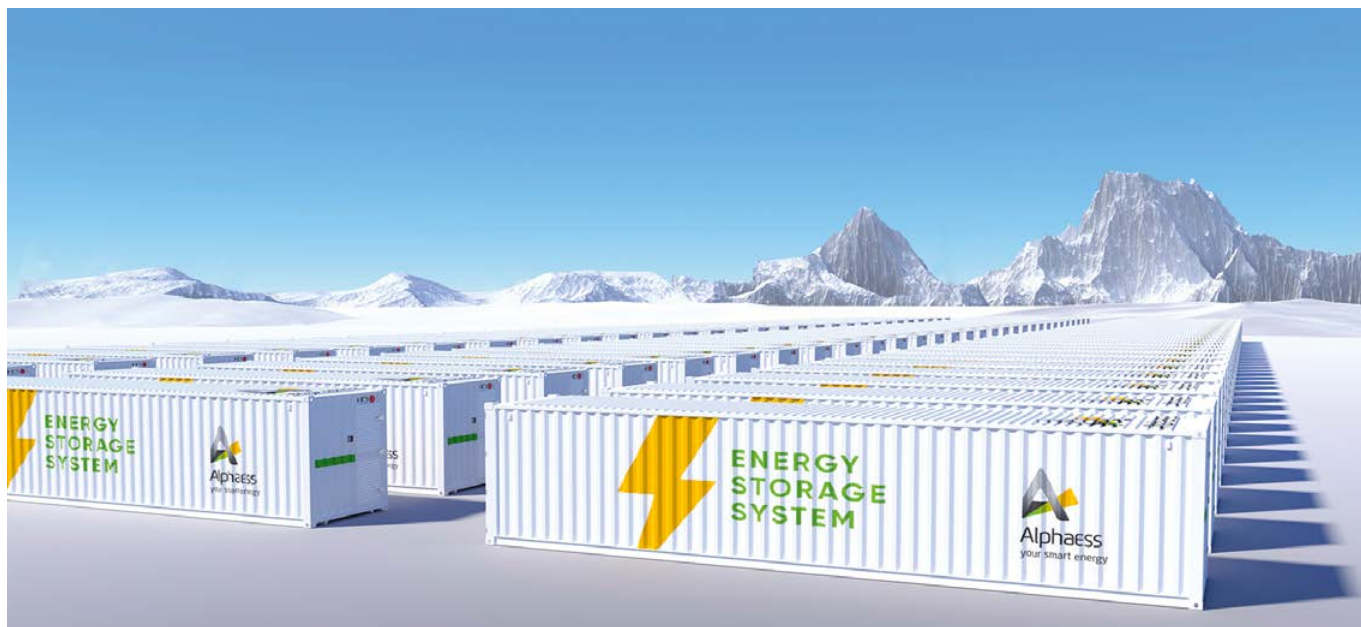


SMILE-G3 features fast FCAS (Frequency Control Ancillary Services) that enable the system to capture more precise data for stricter VPP requirements. Its innovative grid-forming function ensures that the solar PV system will continue to operate seamlessly

when the grid goes down, keeping home appliances running smoothly instead of leaving you in the dark. In addition, the off-grid capability of the SMILE-G3 enables customers to attain energy independence while reducing their reliance on the grid.



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For smaller households, AlphaESS also offers budget-friendly options, such as the SMILE-S5, as a starter package on your energy storage journey.

‘Bigger & Stronger’ – C&I Solution Supports Your Business

Besides residential systems, AlphaESS also provides comprehensive energy storage solutions for commercial and industrial applications, serving clients across the globe. From hospitals to shopping malls, the systems keep businesses and communities running strong.

Among the C&I solutions, the VPP-ready STORION-T50/T100 packs a serious punch. With a power range from 50kW to 10MW+ and multiple battery options from 34.4 to 2073.6kWh, it is an excellent choice for a variety of scenarios.

Need an even bigger solution? The AlphaESS containers can be expanded to infinite scale, and no matter how large your system gets or what Mother Nature throws its way, you can always trust that your system is safe and built to withstand the toughest weather conditions.

Take a look at one of AlphaESS's recent accomplishments in China: a 20MW/40MWh

energy storage system, consisting of 8 sets of 2.5MW/5MWh 1500V wind-cooled battery containers that are seamlessly integrated with 200MW of distributed PV panels. The system has significantly improved grid throughput and ensured uninterrupted power supply for critical loads in the area, with an annual accumulative discharge of approximately 12,000MWh.

Lighting the Way with VPP: AlphaESS Sees the Future of Australia's Energy Landscape

Embarking on a sustainable energy journey, Australia is at the forefront of the VPP revolution. With the increasing adoption of solar PV and energy storage systems, VPPs are emerging as a game-changing solution to accelerate the shift towards renewable energy. At the same time, utilities, governments and other stakeholders are looking for innovative ways to modernise the power grid and meet the surging demand for clean energy.

As a frontrunner in the energy storage industry, AlphaESS is lighting the way forward in Australia's VPP market. By forging strategic partnerships with local energy companies and government agencies, AlphaESS is driving the deployment of energy storage solutions in residential, commercial and industrial settings.

With a commitment to sustainability and innovation, AlphaESS collaborates with prominent VPP providers across Australia such as Energy Australia, Ausgrid and Amber, among others.

With its flagship VPP-ready systems, AlphaESS is poised to play a pivotal role in shaping Australia's energy future. By providing safe, reliable and flexible energy storage solutions, AlphaESS is empowering communities, businesses and utilities to harness the full potential of renewable energy. So, join hands with AlphaESS, your best partner in VPP, and be a part of the clean energy revolution!

Discover more about AlphaESS Australia

Tel: +61 02 9000 7676

Email: info@alpha-ess.com

Global Website: <https://alphaess.com>

Office Address: 19 Heath St, Lonsdale SA 5160, Adelaide

8/15-21 Gibbes Street, Chatswood, NSW 2067, Sydney

Visit the AlphaESS team at Smart Energy Conference and Exhibition, May 3-4 at stand Titanium 2.

PRODUCTS AND SERVICES

OSW: GOING PLACES OSW, one of Australia's largest wholesale solar distributors and a subsidiary of GCL Integrated Holdings has announced a successful Series A funding round of AU\$51 million, providing a 'capital war chest' for international expansion and reinvigoration of products and service offerings locally.

As part of the strategic investment, global private equity firm Hillhouse Investment has acquired AU\$27 million worth of shares from GCL Integration, with an additional AU\$24 million capital injection into the Australian firm.

The investment is designed to fortify OSW's rapid global expansion. Recent openings of distribution centres in Poland, Netherlands and Texas are soon to be followed by additional locations in Texas, Germany and France.

The evolution "is a result of the direct demand OSW has determined for its C&I offerings in the European and US markets," the media statement read.

OSW is at the forefront of the industry with its revolutionary energy solutions, including areas such as Virtual Power Plants and Electric Vehicles.

"We're seeing incredible demand for sustainable energy solutions and for countries like Australia, which enjoys an abundance of sunshine,



Anson Zhang, Co-Founder and CEO (L) and Jeff Yu, Co-Founder and CEO of OSW

solar power generation has to be at the forefront," said Anson Zhang, Co-Founder and CEO of OSW.

www.onestopwarehouse.com.au

REDFLOW ZINC BROMINE FLOW BATTERIES have been installed at the final of three weather radar locations in regional NSW as part of the Bureau of Meteorology Renewable Hybrid Power Supply project. The projects at these sites are designed to improve the reliability of power at these critical infrastructure facilities while reducing net emissions and ongoing power costs. The hybrid system provides integrated renewable generation and battery storage for lower cost power as well as delivering backup power for extended operation of the sites in the event of a grid power failure. Between 8 and 10 ZBM2 flow batteries were deployed at each site and are integrated and controlled using the Redflow Battery Management System which operates with the installed Victron inverters.



Redflow CEO and Managing Director Tim Harris explained "Redflow batteries are designed for challenging Australia conditions, have a high cycle rate with a medium to long duration profile and with no risk of thermal runaway which makes them the perfect solution for the BoM's regional radar locations," he said. The sites form part of the BoM's initial pilot program, with the potential for a wider rollout to their remaining national radar locations in the future.

In other company developments, Redflow has supplied its third energy storage system, to Knox City Council in Melbourne's outer east. Sized at 60kWh, the storage forms part of the city's redevelopment of its regional netball centre which now sports rooftop solar PV. The two previous systems were installed at Child Care Centres in 2019 and include two lots of 100kW peak of photovoltaic solar panels and 18 Redflow ZBM2 batteries, storing 180kWh of energy.

The City Council committed to delivering energy efficient buildings as a core part of their Climate Response Plan. Tim Harris said: "Other Councils around Australia can learn much from the Knox City Council experience and see the impact that specific renewable projects can have on their sustainability commitments and the benefits they deliver to the local community."

www.redflow.com.au

INTERNATIONAL SOLAR PANEL AND BATTERY MANUFACTURER QCELLS

has announced that two new solar modules will join its list of industry leading next generation solar panels: the Q.MAXX BLK-G5+ and Q.MAXX-G5+.

Both new solar modules have a 25 year product and 25 year performance warranty and are based on a refinement of Qcells' proprietary Q.ANTUM DUO Technology, which has been further developed to deliver greater power and efficiency. The power class has been increased up to 15Wp compared to the previous modules and are described as ideal for residential buildings.

Both the Q.MAXX BLK-G5+ and Q.MAXX-G5+ are 1,722mm long and feature a lighter, and robust frame that allows multiple clamp and bolt options, and up to 13 mounting configurations (three more than other



Qcells modules). The high-tech aluminium alloy frame is certified for high snow (8,100 Pa) and wind loads (3,600 Pa).

qcells.com/au/

Next generation PV inverters for next generation PV modules.



The new DNS G3 single phase inverter has been designed for compatibility with high power solar panels, with a high current input of 16A per string and a short circuit current of 23A.

Available from 3kW to 6kW, the DNS G3 series features 150% DC input oversizing, 110% AC output overloading and 24/7 load consumption monitoring among many improved features, for a small, but powerful residential solution.



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SUPERCHARGING AUSTRALIA: THE CHALLENGE IS ON!

Australia's lithium battery value chain – currently representing just 1% of global product value despite the nation producing 60% of the world's lithium – is about to get a major boost through support to eleven startups that are participating in the inaugural Supercharge Australia Innovation Challenge.

The Challenge is an initiative of Supercharge Australia, which aims to drive local lithium battery innovation to capture more of the value chain in Australia, helping build Australia's role in the global US\$400 billion lithium battery market.

Startups will be matched with mentors and experts, receive pitch coaching and collaborate with each other to bolster a vibrant national battery ecosystem.

Winners will be announced at a gala event in Sydney on March 30.

The 11 startups in the Challenge range from developers of novel cell chemistries to electric vehicle upscalers and critical metals recyclers. Competitively selected and to be judged by an expert panel from CSIRO, Boundless, New Energy Nexus, and Australia and New Zealand's largest climate tech startup accelerator EnergyLab.



Danny Kennedy of New Energy Nexus

We are pleased to report that one of the contenders includes The Good Car Company which provides affordable EVs through bulk-buys, direct sales and subscription by importing new and second-hand EVs to help drive a second-hand EV market in Australia, and can upcycle EVs with newer batteries and enhanced functionality to allow bidirectional charging.

Another entrant is Roev, which converts large fleets of utes to electric, solving unmet demand and managing energy usage (read more on page 18).

Among the others, Perth based Renewable Metals which recycles lithium batteries using a novel technology recovering six critical metals – lithium, nickel, cobalt, copper, manganese, and graphite – from end-of-life batteries minimising waste by-products.

"Australian innovators are uniquely placed to supply emerging and mature global markets with low impact lithium products

and resources to support our energy transition with better batteries," said Danny Kennedy, CEO New Energy Nexus, pictured speaking at the recent Smart Energy Council Industry Climate Action Summit.

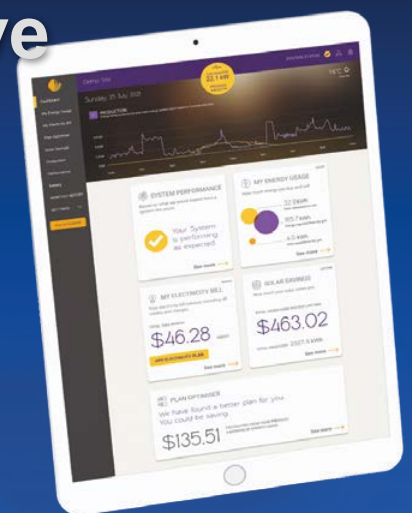
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More savings and more control for your customers, plus save time and money in your solar business!

Installers or users can easily activate Solar Analytics in just one click! For more information please visit www.gesolarinverter.com.au/solar-analytics



solar analytics



www.gesolarinverter.com.au

GreenConnect

The home of more accessible batteries



GreenConnect is the first point-of-sale platform in Australia that makes accessing solar and battery systems and joining a Virtual Power Plan (VPP) simple and easy.

With GreenConnect, for the first time ever, suppliers of solar battery systems can connect consumers to all-in-one energy solutions - it's the one-stop shop for all your energy needs.



Upfront solar and battery subsidies from selected providers



Easier access to energy plans and VPPs



Unlock monthly VPP bill credits from selected providers



Affordable finance with loan terms of up to 10 years

Get accredited for GreenConnect today

www.plenti.com.au/green-connect

Subject to approval. T&Cs apply. Plenti RE Limited ABN 57 166 646 635 holds Australian credit licence number 449176. TMD available on our website.

Plenti

BRC-A: a guiding hand on the road to decarbonisation



Companies contemplating the mind-boggling task of renewable energy procurement options can relax – staff at Business Renewables Centre Australia have done all the heavy lifting. And thanks to their herculean efforts there's more renewables in the energy mix and fewer emissions.

PRIOR TO 2017 businesses contemplating the transition to renewable energy to mitigate their carbon footprint and counter rising electricity prices and market volatility had no single agency to turn to for comprehensive advice on finance, process, contracts and deliverables.

That all changed in 2018 when Business Renewables Centre Australia hit the scene. Since then its small team of experts has punched well above their weight, as the saying goes, advising hundreds of Australia's biggest corporations including Woolworths and Transurban on renewable energy procurement and along the way gaining accolades as one of the most innovative, collaborative organisations.

The compliments are well earned given the level of resources developed and shared.

BRC-A Program Director Jackie McKeon says her focus is on delivering as much vital information through as many channels as possible which she lists as corporate training and workshops; PPA guides, tools and primers; regular 'Buying Power' webinars (sometimes staged with Jon Dee of RE100); and the fun-sounding PPA training bootcamps.

"We also like to identify barriers by regularly surveying our membership of 250 companies on challenges such as internal understanding of energy dynamics and complexity in order to fine-tune our organisational support and guides," she told *Smart Energy*.

"By covering all bases participants end up well-versed in the complex world of renewable energy procurement and can confidently make the switch. But making a decision can take a great deal of time, in some cases up to 18 months to execute a wholesale PPA so we encourage energy buyers to consider this 12 months out from current contract expiry.

"We effectively reduce barriers to accessing information and manage to speed up the time taken to execute wholesale power purchase agreements affixed to a new or operating solar or wind farm, retailer sleeved PPAs and innovative alternatives such as project equity in community solar.

"This hedges companies against the ongoing energy price fluctuations, enabling them to achieve budget certainty," she said. "Market volatility will continue due to international and local factors and this is encouraging more corporates to lock in a PPA price to gain certainty."

Unsurprisingly 2022 saw the highest ever volume of new PPAs – as tracked by BRC-A's Chris Briggs in the charts on these pages – and they are not anticipating a drop off anytime soon. That's good news for solar and wind project developers, PPAs are vital for shoring up new projects.

From a broader perspective the wins can be seen in all quarters: developers secure certainty through long-term offtake agreements; governments and corporations achieve corporate sustainability and meet financial goals by sourcing electricity from renewable sources, the shift to decarbonisation is accelerated, emissions are reduced, the planet breathes a bit more easily.

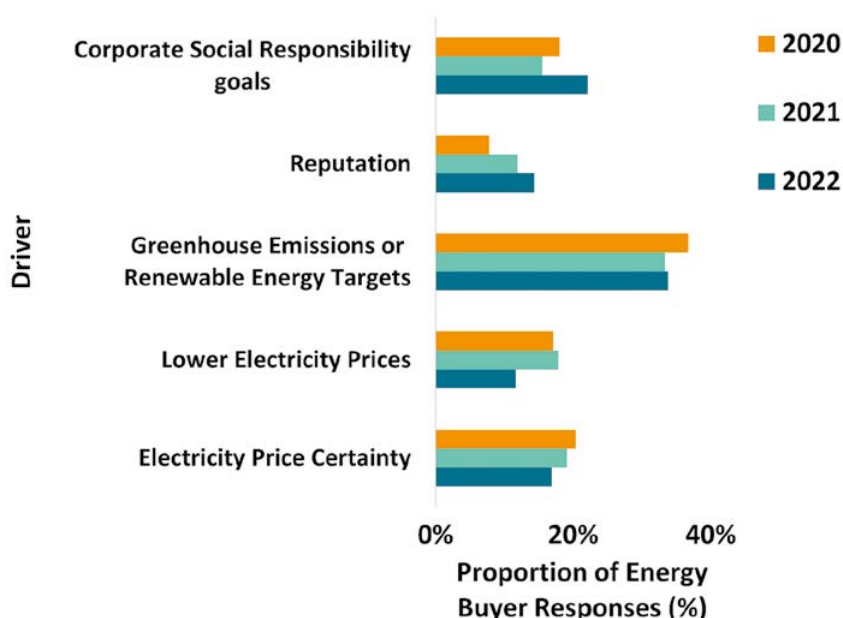
Concerted efforts

In other developments Jackie notes the evolving membership base and with it interest in varied sources of renewables.

"BRC-A's membership has to date typically been large corporations keen to gain assistance navigating wholesale PPAs but today there's big growth in the medium to smaller energy users who are setting net zero targets and aspiring to 100 per cent renewables.

"We are guiding them on a broader range of offtake renewable energy options from switching to GreenPower contracts to large scale generation certificates or retail PPAs."

Drivers for Energy Buyers completing a PPA



BRC-A is loosely based on the model of the US-based Rocky Mountain Institute's Business Renewables Centre (BRC), now named the Clean Energy Buyers Association (CEBA).

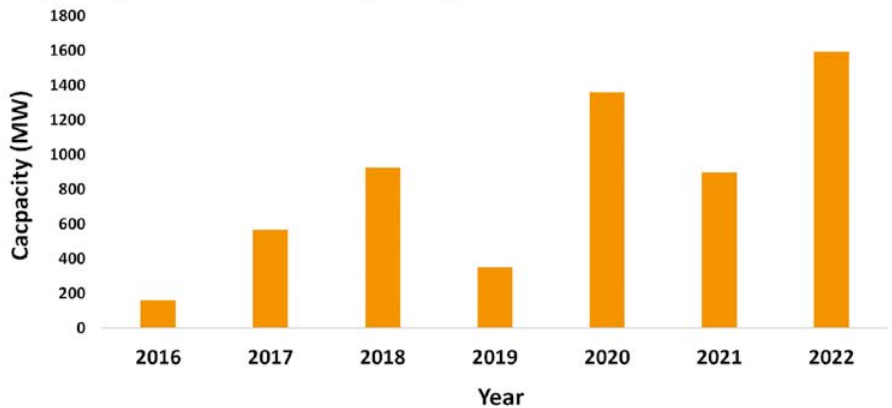
The collaborative initiative involving Climate-KIC Australia, the Institute for Sustainable Futures (University of Technology) and WWF was established with funding support from ARENA and the Victorian, NSW and Queensland Governments and WWF-Australia.

In some cases smaller users consider rooftop PV as part of their portfolio, for that they are referred to the relevant experts such as the Energy Efficiency Council and the Green Building Council. Many companies today are looking beyond their electricity component into levels of scope one, two and three emissions mindful of their social, environmental and reputational benefits.

The team has developed a buyers' diagnostic tool to support the emergence of new small and medium-sized energy buyers.

"The diagnostic tool poses some simple questions about a company's renewables aspirations, their annual electricity load, their goals, and interest in aggregation where we are seeing lots of demand for group impact and better pricing.

Capacity Contracted through Corporate PPAs



"So we are now assisting companies that are procuring from 500MWh renewables annually right up to 200GWh in the case of banks and supermarkets," said Jackie who has over 15 years' experience in carbon and energy management, project development management, renewable energy procurement, decarbonisation strategy, strategic planning, corporate advisory and stakeholder engagement.

Notching up a few runs on the board

Team BRC-A's 2022 goal was to help its members procure 1GW of energy from renewable energy sources by 2022, growing to 5GW by 2030. In its final report to ARENA which provided original seed funding, BRC-A stated it had far exceeded that goal.

As of early 2023, BRC-A had helped its members contract 1.8GW energy, supporting 6.4GW of renewable energy projects and directly enabling 11.2GW of new generation, as highlighted in the latest annual *State of the Market* report.

Not bad for a team of six, ever the collaborators and innovators who this year have upped the ante with a website refresh and mapped out a dynamic year ahead with a new Buyer Diagnostic tool, videos and fact sheet guides, new user dashboard and additional resources as well as the full complement of Bootcamps, networking and regular webinars.

Hop on board and visit www.businessrenewables.org.au for more.

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Greater government incentives required to meet Australia's renewable energy targets

THE PAST SIX MONTHS have seen countless announcements on decarbonisation through renewables, from the government and private sector alike. The Australian government's long-term plan to achieve a 43% reduction by 2030 and net zero by 2050 has been enshrined in legislation, backed by the public's growing demand for serious action on climate change.

After decades of confusion and disappointment around Australia's emissions strategy, it should go without saying that these new targets are brilliant news for the country and for the planet.

But against a backdrop of supply chain issues, elevated prices and a global chip shortage, the proposed growth is set to present serious challenges for the industry. Demand is already outstripping supply in many key areas of the renewable energy value chain, with the issue showing no signs of abating.

Although the private sector is keen to invest in battery storage projects and major industry players have the capability, government incentives remain critical for widespread confidence and uptake. Unless the government moves to incentivise the broader sector, meeting targets will remain a huge challenge.

Solar farms require a diverse range of raw materials, especially for use in equipment like solar panels and solar inverters, which are high in electrical components. Intense demand is resulting in engineering, procurement, and construction (EPCs) and developers facing long equipment delays or even cancellations, threatening the commercial viability of PV capacity projects.

Pipeline of supplies impacting project timelines

The Rystad Energy report states that "high prices and long lead times threaten solar PV capacity build-out", meaning the forecasts of 225GW (AC) of PV to start construction in 2023 could potentially be downgraded.

The report also highlights how lead times for new inverters are currently being quoted anywhere between six to 15 months, highlighting the severity of the current blockages in the supply chain.

Since inverter selection is made at such an early stage in Australia, the risk of commercial delays is massive. It is no longer possible to rely on costs continually decreasing and misguided assumptions that

supply capacity will meet demand for Australia to remain on track with its ambitious transition to clean energy, developers must look to forge and strengthen relationships with key suppliers instrumental in addressing supply chain shortages.

The good news is that well-established suppliers are much better placed to rapidly develop resilient supply chains, thanks to their capacity to source large volumes of raw materials and ability to ramp up production lines.

In order for Australia to build a reliable, stable and sustainable supply chain, it's critical that the government and private sector chooses their partners wisely. Such challenges are one of the key reasons SMA announced plans to double its production capacity at its German headquarters. With a current capacity of 21GW, the German manufacturer expects to take that capacity to 40GW by 2024. The expansion is to start construction later this year and will primarily be dedicated to the manufacture of inverters for the large-scale PV industry.

We're living through a historical moment for the future of our planet, and the decisions we make today will have an immense impact on future generations. Australia's new targets are a great starting point, but in order to achieve them, the underlying supply chain must be working as smoothly as possible. If we can get it right, we'll be well on our way to net zero by 2050.

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NEW ENERGY APPRENTICESHIPS PROGRAM The Australian Government is spending \$95.6 million over 9 years to support 10,000 New Energy Apprenticeships.

"An army of skilled workers will be required to build the infrastructure needed to achieve a 43% emissions reductions target by 2030, and net zero by 2050," the statement read. (NSW where have we already heard this?)

Eligible apprentices will receive up to \$10,000 over the course of their apprenticeship to assist with the cost of living.



\$16 MILLION IN ENERGY EFFICIENCY GRANTS The federal government is providing grants from \$10,000 to \$25,000 for small and medium businesses to install heat pumps, lighting upgrades, space and water heating improvements and energy monitoring systems in the bid to improve energy affordability and productivity, benefit the wider economy and lower carbon emissions.

Grant applications close at 5pm AEST Wednesday 19 April 2023, or until funds are exhausted.

VALE PROFESSOR WILL STEFFEN In a moving tribute to their colleague, Climate Councillors described Will Steffen as a brilliant, world-renowned scientist, gifted communicator, brave climate warrior and one of the most influential thinkers of our time. "He pushed boundaries and built on our knowledge by advancing concepts such as the Anthropocene, planetary boundaries and tipping points," they wrote.



"Will has made an indelible contribution to ensuring that the world understands the severity of the climate crisis and our capacity to tackle it. The groundbreaking scientific contributions he made will continue to shape our understanding of the climate crisis for many years to come."

Will co-founded the Climate Council in 2013 after the Abbott Government abolished the Climate Commission.

ANY CRYPTIC CROSSWORD PUZZLERS OUT THERE?

Here's a nice little one for you:

'Get mechanical solution to global problem'

7, 6

Answer 'climate change'

FANCY A FREE TRIP TO FABULOUS FIJI? Enter the Its Time raffle for an exotic holiday at a relaxed Fijian resort. The holiday for two at Paradise Taveuni includes 5 nights in an air-conditioned room overlooking the ocean, all meals (drinks not included), transfers to and from the airport, reef snorkelling, and \$1000 cash toward travel or spend.

All proceeds support the installation of solar PV at remote island schools in Fiji through the Its Time Foundation. Money saved powering diesel generators frees up cash flow for computers and other school resources, enabling a modern education.

Its Time has already made a massive difference to hundreds of Islanders' lives and as we go to print Its Time Founder Rob Edwards is in the process of installing eight more PV systems.

The resort holiday raffle will be drawn on Wednesday May 3 during the Smart Energy Conference and Exhibition.

<https://iitime.org/>, <https://itstime.org/nf-itstime>



ANDREW BLAKERS, MARTIN GREEN, AIHUA WANG AND JIANHUA ZHAO

, whose ground-breaking work on Passivated Emitter and Rear Cell solar PV technology accelerated the global shift to affordable renewable solar power, have been awarded the highly prestigious 2023 Queen Elizabeth Prize for Engineering, affectionately known as the 'Nobel prize of engineering'.

Referring to Professor Green's suggestion that solar costs could reduce to \$10/MWh, Blakers told Giles Parkinson of RenewEconomy "We don't even need to get anywhere near \$10/MWh to be completely dominant, at \$20 to \$30/MWh solar completely sweeps the board against any other technology apart from wind. It wipes fossil fuels out of the global economy, and I think it's highly likely that we will be in that range by 2030 in many places in the world... The faster we go to solar and wind, the cheaper our wholesale electricity prices will be, and we can get away from being held to ransom by gas and coal companies."

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ILLUSTRATING THE ENERGY TRANSITION

TODDLERS, PARENTS AND GRANDPARENTS

the world over regularly tune in to the phenomenally popular Australian cartoon *Bluey*. Among *Bluey*'s many millions of fans is Dr Bjorn Sturmborg – yes, the same guy who is a Research Leader in the Battery Storage and Grid Integration Program at the ANU, a regular contributor to *The Conversation* and recipient of the 2022 Tall Poppy award.

While watching the iconic series with his young son, Bjorn realised the power of kids' stories to convey messages that resonate. He'd already commenced work on what was to be a four-year labour of love, *Amy's Balancing Act*, featuring the diligent latter-day climate warrior and her new co-workers Sol, Gail and Snowy taking over the reins from the ageing Clyde, as pictured on this page.

All of which are powerful metaphors for the rapid energy transition which, Bjorn told *Smart Energy*, is for many not just a technical challenge but also an emotional journey following years of stability, and where we need to be mindful of the previous contributions of coal generators. (Those tired eyes, Clyde!)

That, of course is all part of the mission, with competing expectations managed by the book's young protagonist Amy who must reassess long-used systems while meeting community expectations. "That's part of the balancing act, we need to get to 82 per cent renewables in just 83 months and our energy supplies must be reliable. AEMO in particular is reassessing all systems," Bjorn said.



Amy's Balancing Act is published by Little Steps Publishing. Available through Dymocks, Booktopia and other leading bookstores.

There is an element of satisfaction for him that heavyweights managing the highly complex energy transition have read his book, among them AEMO's Daniel Westerman (we are also told there's a copy in AEMO's mission control room), Powercorp executives, Matt Kean, Mike Cannon-Brookes and more.

"It's super satisfying seeing my book get support from the energy industry!" said the author of numerous complex technical reports and academic dissertations.

"As for Clyde we must be appreciative of and respectful for coal communities; for many decades coal has been the lifeblood of essential energy supplies."

"But coal generation is increasingly unreliable and it is polluting, we need to move on, we need to be clear eyed; we cannot have coal in the system for much longer.

"We have a raft of new energy players to step in and allow coal to retire, to me that is the most important part, it helps resolve the climate wars, it's a new beginning," Bjorn said.

He added that much of the success of children's books relies on engaging pictures by sympathetic artists – in this case the talented Laura Stitzel – and that most have a moral and are generally cheerful and upbeat. They incorporate diversity, positivity, change and challenges, and typically feature a happy ending with a 'can do' aspect.

"With regards to energy supplies, we are on a fantastic journey, we too can get through this!"

Not surprisingly *Amy's Balancing Act* has received glowing testimonials from numerous well-known identities including Ketan Joshi, Rosie the Engineer and Nicky Ison of Boundless. ABC's Craig Reucassel commented it's "A great book to teach young children and old politicians about clean energy."

Next move? Getting more copies of *Amy's Balancing Act* into schools to spread the message.

And a thought – maybe in some future episode team *Bluey* could be seen reading the book, with a global audience taking note?



PHOTO: TRACEY NEARMY/ANU

Dr Bjorn Sturmborg (seated) with the Member for Canberra Alicia Payne and ANU Vice-Chancellor, Professor Brian Schmidt during the launch of 'Amy's Balancing Act' at Parliament House

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



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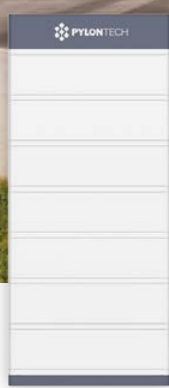
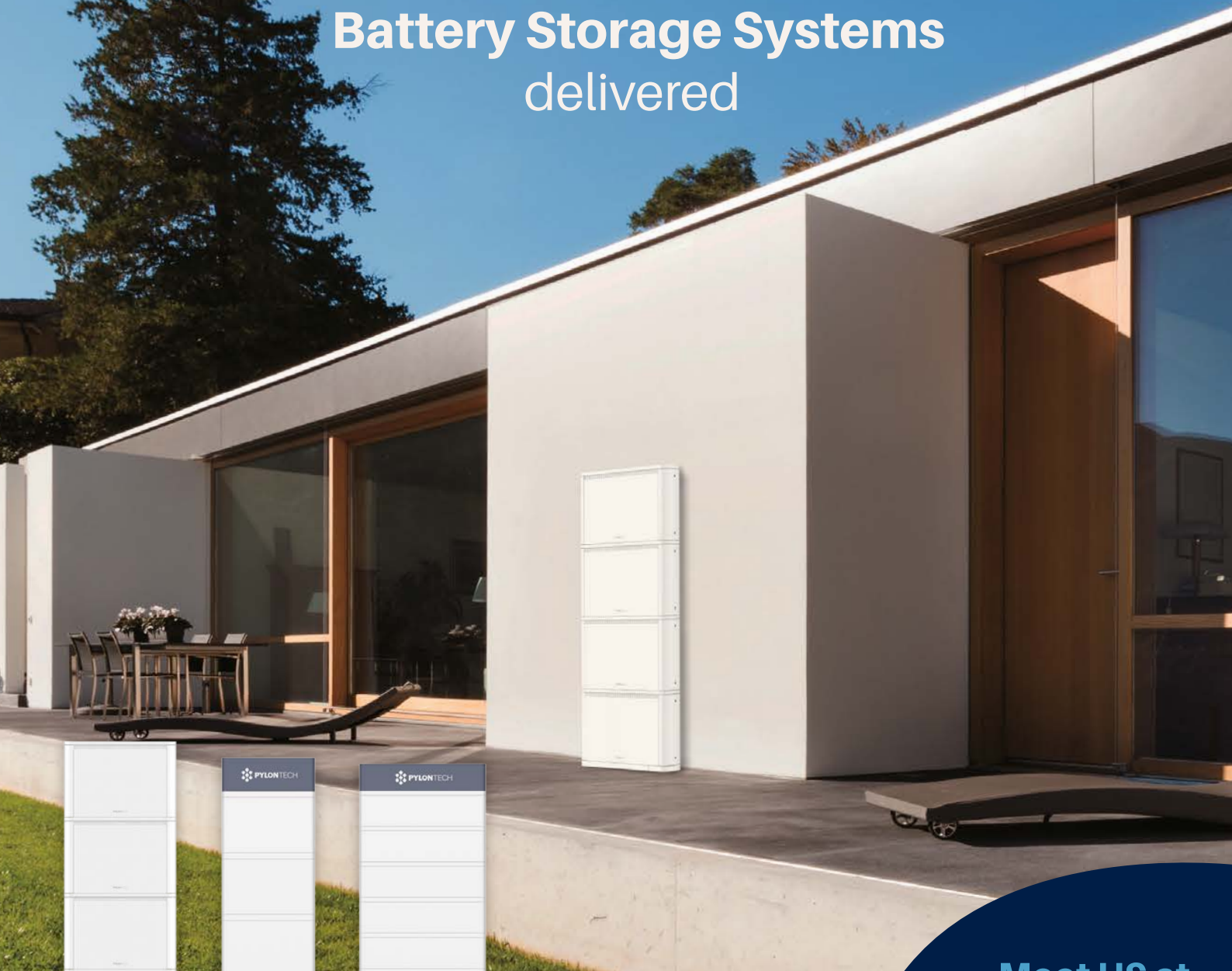
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