Smart Energy
CONFERENCE EDITION
AN OFFICIAL SMART ENERGY COUNCIL PUBLICATION

MASSIVE
RENEWABLES BUILD PLAN

VOLUME 43 ISSUE 172 SUMMER 2023

The Big Ask: $100bn to turbocharge renewables
The Big Delivery: 32GW for Australia's energy transition
Frameworks for a Net Zero economy
Climate warnings and energy solutions
Central Queensland Hydrogen Hub: powerful consortium
Pacific Islands Forum
Rooftop PV uptake – it just gets bigger and better

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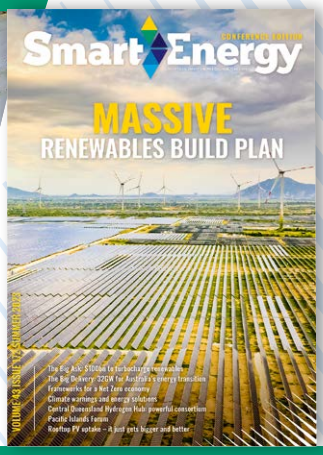
MAGAZINE DESIGN
Mitzi Mann

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.

Smart Energy is published quarterly.



COVER *Just the ticket: The 32GW boost to renewables*

WELCOME

John Grimes, Chief Executive
Smart Energy Council

SMART ENERGY COUNCIL

A 'SUPER CHARGED' Capacity Investment Scheme (CIS) will underwrite the roll out of 23GW of large-scale solar and wind, and 9GW of energy storage, in auctions twice a year, starting April 2024 through to 2027.

It's a big deal. It coordinates the build-out of renewable energy before the aging coal fleet is turned off (or simply breaks down). It is critical in the orderly transition to a clean, cheap energy system. Something the market, left to its own devices, is incapable of doing.

Of course the usual renewable detractors are all wringing their hands, '...but the cost!' A predictable and self-serving response.

The government is not building these new assets, the private sector is. Companies compete to deliver quality projects for the lowest cost. Against the backdrop of volatile energy prices, projects nominate a minimum sell price, guaranteed by the government. Payments are only made when electricity prices fall below this minimum price, set through a competitive process.

Then, on the other end of the 'price collar', when the project is making super profits, these profits are shared back with the Commonwealth. Support for downside risk. Profit sharing for upside gains.

It is all about stripping out project risk at the lowest cost. Lower interest rates equal lower costs for all consumers. It means projects get built.

The Smart Energy Council was pivotal in the design of the scheme. A big shout out to our Large-Scale Working Group who developed the blueprint the scheme is based on, and who actively helped refine the scheme in its final design. It is fantastic to see it rolled out at scale.

The next chapter in our transition to a low cost, clean energy system, at scale has begun.

IN MY VIEW

Greg Combet, Chair of the
Net Zero Economy Authority

A new Net Zero Economy Authority

THE TRANSFORMATION to a net zero economy is undoubtedly a massive task – but it is also a tremendously exciting opportunity to shape the future of our country.

For Australia, I have previously likened the scale of the decarbonisation challenge to post-war reconstruction.

Achieving net zero emissions by 2050 and the global status of a renewable energy superpower will require a whole-of-economy transformation in just over 26 years. It will require us to shift our reliance on fossil fuels, which have powered our households, businesses and industries, and supercharged our exports for decades.

To help manage this transformation and ensure the benefits of the net zero economy are realised and shared, the Australian Government is establishing the Net Zero Economy Authority.

There are well over 200 programs related to net zero across the Australian Government, with countless more at the state, territory and individual business levels. The Authority will play a critical role in coordinating this work to support regions and communities to attract and take advantage of the opportunities presented by clean energy industries and set them up for success.

The Authority will also support workers in emissions-intensive industries, like coal-fired power generation, who are impacted by the transformation by providing access to new employment, skills, training and advice. And it will focus on helping investors and companies engage with emerging opportunities from net zero transformation.

The Authority's work has been kick-started by the Net Zero Economy Agency, which is a precursor to a legislated Authority. Since I started as Chair of the Agency in July, I've been travelling around the country to the regions with emissions-intensive industries, and what I've found is that local communities, state governments, local governments and regional organisations are already thinking about these issues and the transformation that is underway. They are preparing themselves for this challenge and have proposals and plans that will require investment and that can generate jobs of the future in those regions.

What is needed is coordination that catalyses the investment in these transformational projects – and the first step in achieving that is establishing a statutory authority to take on this work.

The Net Zero Economy Authority has an important role in this and ensuring that the workers, industries and communities who have powered Australia for generations can seize the opportunities of Australia's transition to a net zero economy.

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INDUSTRY DEVELOPMENTS

SOMETHING TO CELEBRATE:

IN OTHER DEVELOPMENTS, the SEC welcomes the **Net Zero Economy Agency** which is charged with the task of "promoting orderly and positive economic transformation across Australia as the world decarbonises, to ensure Australia, its regions and workers realise and share the benefits of the net zero economy" and is chaired by Greg Combet.

Pacific leaders have agreed in principal to establish a **Pacific Energy Commissioner** to oversee transition to a fossil free, renewables powered future in the regions.

The SEC which attended the Pacific Island forum looks forward to working with Pacific nations, the Australian government, smart energy firms and NGO partners across the Pacific to aid the transition.

Read more on pages 26-27.

Developer Edify Energy has sold the 185MW/370MWh **Koorangie Energy Storage System** near Kerang to Sostoneo – one of the world's biggest asset managers – which in Australia is led by former ARENA chief Ivor Frishknecht. The multi-million dollar Koorangie battery is significant to the renewables rich region in Victoria and will ease grid issues through a 20-year contract with AEMO.

Next we head north to NSW where **two of Australia's biggest battery projects** will take shape: one a 500MW two-hour battery (AGL) at the old Liddell coal power station and the 415MW four-hour battery at Orana in the west of the state, as proposed by BlackRock's Akaysha Energy. The tenders are jointly funded by the NSW and federal governments with coal plant closures in mind. Both projects are scheduled for completion by December 2025.

SHOUT-OUT TO RENEWECONOMY **On the map: A state-by-state guide to all operating generators on the NEM**. Great reference based on maps contained in the Australian Energy Regulator's State of the Energy Market report: *https://reneweconomy.com.au/on-the-map-a-state-by-state-guide-to-all-operating-generators-on-the-nem/*

CLIMATE READY AUSTRALIA 2030 Log on to www.climatereadyaustralia.com.au for fully hyperlinked infographics that detail the national climate policy landscape.

PRIME MINISTER ALBANESE and Minister for Climate Change and Energy Chris Bowen officially opened SunDrive's solar manufacturing pilot production and commercialisation facility in Kurnell, NSW in early November. It's the first time in over a decade that Australia has produced a mass-manufactured solar cell, and the facility, the PM said, "symbolises everything that my government is about… it is innovation, then commericalising that innovation…it's creativity and scale."

SunDrive has developed a cell metallisation technology that uses copper, a metal that is approximately 100 times cheaper and 1000 times more abundant than commonly used silver, and plans to accelerate the development of the technology to commercial-scale production capacity of >100MW/yr of metallised cells.

SunDrive Founder and CEO Vince Allen said "Australia has the opportunity to not only be a renewable energy superpower, but an advanced solar manufacturing powerhouse."

The government backed SunDrive efforts through ARENA, the Clean Energy Innovation Fund, and Main Sequence Ventures.

Vince Allen (L) and Wyatt Roy (R) with Prime Minister Albanese and Minister Bowen

ADDITIONAL 32GW RENEWABLE CAPACITY BY 2030

ONE YEAR ON from the government's announcement of a Capacity Investment Scheme (CIS), a very welcome boost to expand it to add 32GW of renewable generation, including 9GW of dispatchable capacity and 23GW variable capacity.

This effectively doubles renewables capacity and will ensure the government meets its 82% renewable energy target by 2030.

"We need more reliable, clean, cheaper, renewable energy before the coal-fired power stations leave," **Climate and Energy Minister Chris Bowen** said.

John Grimes hailed this as "marking an ambitious build program that promises cheaper power bills for all Australians and a substantial boost in jobs and investments in regional communities nationwide, fostering sustainable growth." The Smart Energy Council played a pivotal role in the development of the Capacity Investment Scheme.

The news was delivered just one week after the **USA and China agreed to pursue efforts to triple renewable energy capacity globally by 2030** and sufficiently accelerate renewable energy deployment in their respective economies so as to accelerate the substitution for coal, oil and gas generation. *(More on page 8)*

This significant undertaking by the world's two superpowers will underpin COP28 discussions in Dubai which John Grimes and Richie Merzian are attending, and who will broadcast updates.

ACCELERATING VICTORIA'S RENEWABLE FUTURE Premier Jacinta Allen: "Victoria's State Electricity Commission (SEC) is back: we'll invest in government-owned renewable energy, help households switch to all-electric and build the renewables workforce Victoria needs"

Key priorities under the SEC's Strategic Plan 2023-2035: Investing to accelerate the energy transition; Supporting the switch to all-electric households, and Building a renewable energy workforce.

The Commission will invest an initial $1 billion towards building 4.5 gigawatts of new power through renewable energy and storage projects and support 2.6 gigawatts of renewable generation and storage assets by 2028.

Music to our ears – the Smart Energy Council is pleased to share its acronym with the Commission which shares similar vision and ambition.

MEANTIME... the **Institute for Energy Economics and Financial Analysis** has revealed electricity network operators have scooped $11 billion in 'supernormal profits' since 2014. Report author and energy consultant Simon Orme concludes Australians are paying too much for electricity due to the excessive profits of those with 'monopoly power'.

SPARE A THOUGHT – CLIMATE VICTIMS Heartbreaking images from Pakistan of a tiny, exhausted three-year-old child weighing less than one kilogram. That's 10kg less than average for a toddler of that age. A living skeleton. 44% of kids in Pakistan are malnourished. A legacy of the 2022 catastrophic floods that wiped out crops and livestock. 33 million are affected by the floods that have brought malaria and typhoid to the region. This is the world we live in, what man-made climate catastrophe looks like, and it need not be so.

Senator David Pocock's Office: A Duty of Care Bill amends critical Acts to prioritise the health of Australian children and future generations in decisions involving substantial greenhouse gas emissions. It further prohibits emissions that pose health risks from coal, oil, or gas extraction.

#CleanUpPoliticsAct: Staying on Bills, in early November Independent MP Monique Ryan introduced her first Private Member's Bill to Parliament, a Bill which seeks to clean up politics and restore faith in democracy; effectively bring accountability to political decision-making. Monique said the Act would "create a new lobbyist register, stop the revolving door between politics and lucrative lobbying jobs, and open up Ministerial diaries. "In the face of twin crises — climate change and cost of living — lobbying reform has never been more urgent," she said.

VAST HAS RECEIVED equity commitment of up to US$10 million from Canberra Airport Group, which recognises the potential for Vast's technology to be used to produce low-cost sustainable aviation fuels as the industry aims to achieve decarbonisation targets.

Craig Wood of Vast (pictured), said: "Canberra Airport's commitment will help us accelerate the global implementation of our proprietary Concentrated Solar Power v.3.0 technology for the decarbonisation of methanol and sustainable fuel production."

Vast's CSP v3.0 technology has received support from ARENA which recently announced approval for up to $65 million in grant funding to support the construction of Vast Solar 1 (VS1), a 30MW CSP plant with 288MWh of thermal storage located in Port Augusta, South Australia.

INDUSTRY DEVELOPMENTS

PROMINENT PEOPLE

The Australian's 2023 **The List: Australia's Top 100 Green Energy Players** identified the top 100 innovators, developers, investors, policymakers, environmentalists and 'energy gurus' driving positive environmental change "from pioneers who have spent decades advocating for meaningful climate action to the rising stars making a real impact".

SEC is delighted to report that **John Grimes** was recognised for his Policy work, along with **David Pocock**, Independent ACT Senator. Other familiar names: Impact – **Katherine McConnell** of Brighte; Innovation – **Vince Allen** of Sundrive; Technology – **Robyn Denholm** of Tesla; **Craig Wood** of Vast Solar; Hydrogen – **Andrew Forrest** of Fortescue Future Industries. Congratulations one and all.

Former PM **Malcolm Turnbull** has been appointed **President Designate of the International Hydropower Association**. He said: "The stakes have never been higher. The world is on a catastrophic path to a 2.7 degrees Celsius increase in global warming. This is far beyond the 1.5 degrees Celsius limit that was agreed by the international community as part of the 2015 Paris Agreement. Renewables are key to addressing this challenge. We do not need new technologies; we have the tools to do the job now. It is a matter of political will and choice."

SEC ZERO CARBON HYDROGEN AUSTRALIA MANAGER Joanna Kay has been appointed to the **Board of the University of Adelaide Institute of Sustainability, Energy and Resources.**

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

Jianhua Zhao, Andrew Blakers, Martin Green and Aihua Wang

PHOTO: JASON ALDEN

LOCAL HEROES Professors Martin Green and Andrew Blakers along with Dr Aihua Wang and Dr Jianhua Zhao picked up the prestigious **2023 Queen Elizabeth Prize for Engineering** for their pioneering role in and the far-reaching consequences of Passivated Emitter and Rear Cell (PERC) technology that now accounts for around 90% of the global market.

In October they were presented with their awards by King Charles in a ceremony at Buckingham Palace.

Professor Andrew Blakers told *Smart Energy* "The fastest energy change in history is underway, with annual new global solar panel capacity comfortably exceeding everything else combined. Solar is growing fast enough to produce a fully decarbonised energy system sufficient to meet the needs of ten billion affluent people in 2050. About half of all solar panels made to date are based on the PERC design, and cumulative sales of PERC solar panels have passed A$200 billion. These panels are mitigating about 2% of global greenhouse emissions, a figure that is growing rapidly."

Blakers acknowledged the QEPrize judging panel for also recognising the thousands of solar cell researchers and commercialisation specialists who contributed to PERC technology.

Martin Green said "As engineers, we are constantly striving to improve the world we live in.

I hope that PERC technology winning the QEPrize will highlight the importance of accelerated solar adoption to address climate change. As the world feels the devastating impacts of our changing environment and collapsing ecosystems, I feel passionately that we must rapidly reduce our reliance on fossil fuels if we wish to maintain the trajectory of human civilisation on our shared planet."

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THE HEAT IS ON

THE WRITING IS ON THE WALL – whether it's from the never ending man-made natural disasters gripping the world causing widespread upheaval and suffering, or in the unremitting stream of reports and warnings on climate, on emissions. Bleaker pictures and increasingly dire warnings.

One of the weightier reports was the recent **Emissions Gap Report** delivered by the **UN Environment Programme:** *Broken Record: Temperatures hit new highs, yet world fails to cut emissions (again),* telling us that predicted 2030 emissions must be reduced by at least 28-42% compared to current policy scenario to reach the Paris Agreement goals of limiting global warming to 2°C and 1.5°C, respectively. And of the alarming increase in global GHG emissions of 1.2% from 2021 to 2022, reaching a new record of 57.4 gigatonnes of carbon dioxide equivalent.

The report continues "the world is on track for a global average temperature rise of 2.5-2.9°C above pre-industrial levels unless countries deliver deeper cuts in greenhouse gas emissions this decade". It's a sobering read.

Global Stocktake Technical report

The findings followed the United Nations Framework Convention on Climate Change (UNFCCC) Global Stocktake Technical report on the critical nature of governments, business agreeing on rapid action to cut emissions by 2030; that wind, solar, energy efficiency and protecting nature is the best value way to reduce GHG cuts; that coal phaseout must be "accelerated" in the next seven years.

An insider reinforced the GST message calling for no new fossil fuel infrastructure: stating the technical report makes clear coal must be rapidly phased out in the next seven years and all unabated fossil fuels must be phased down over the next two decades. Government and business must focus on driving investments into clean energy.

"All parties need to undertake rapid and deep reductions in GHG emissions in the decades after peaking. Limiting global warming to 1.5°C (50 per cent probability) with limited or no overshoot implies a reduction around 43, 60 and 84% in global GHG emissions below 2019 levels by 2030, 2035 and 2050, respectively, as assessed by the IPCC," they said.

And among the more alarming recent headlines: "Global fossil fuel subsidies double as 2023 expected to be hottest in 100,000 years." Global scientists tell us we are now in "uncharted territory", with 2023 temperatures the highest in 100,000 years and likelihood of reaching 1.5°C global warming in early 2024. (Though some flat-earthers would prefer to dismiss their well proven finding as part of the 'alarmist climate cult'.)

Records continue to tumble, September global-average temperatures hit 1.7°C above pre-industrial levels and greenhouse gas emissions continue to rise. An increase of 2°C degree would cause a 10-centimetre sea level rise and 420 million more people exposed to frequent heatwaves.

All part of the existential threat.

But now a glimmer of hope.

Pivoting to a sustainable planet

In significant news that failed to gain the mainstream media traction it deserved in Australia, the US and China released a statement in November pledging to work

together, and with other countries "to rise up to one of the greatest challenges of our time for present and future generations of humankind," having taken on board "the best available scientific findings" including the IPCC Sixth Assessment Report.

Both countries agree to pursue efforts **to triple renewable energy capacity globally by 2030** and intend to "sufficiently accelerate renewable energy deployment in their respective economies through 2030 from 2020 levels so as to accelerate the substitution for coal, oil and gas generation, and thereby anticipate post-peaking meaningful absolute power sector emission reduction, in this critical decade of the 2020s."

The US and China "remain committed to the effective implementation" of the UNFCCC and the Paris Agreement on climate change to contain global warming to "well below" 2°C and to pursue efforts to limit it to 1.5°C, "including efforts to keep [1.5°C] within reach."

The move followed a call from the influential EU grouping in mid-October to back an agreement to call for a tripling of clean renewable energy by 2030 at COP28.

The EU also drew attention to Australia's energy targets, noting Australia will have to invest AU$100 billion to hit its target of 82% renewables by 2030. It turns out efforts were already underway, **with an ambitious new plan to rewrite Australia's energy landscape unveiled in late November.**

SUPER CHARGED AND *ENERGISED*

It was just one year ago – December 2022 – when renewables advocates were hailing the agreement among Commonwealth, state and territory ministers to establish a Capacity Investment Scheme to encourage new investment in dispatchable renewable energy and boost grid reliability.

Back then the scheme was expected to attract $10 billion of new investment and 6GW of renewable energy generation and storage to Australia by 2030. These numbers are dwarfed by the recent announcement for the **'super charged' Capacity Investment Scheme: 32GW of new large-scale renewables – 23GW of variable wind and solar power and 9MW dispatchable, ie battery or hydro storage – to be built across Australia by 2030.**

In effect a doubling the capacity of the existing national system of about 65GW.

"Let that sink in: 32 gigawatts of new large-scale renewable energy, Australia's largest-ever renewable energy announcement: it's timely, it's necessary, it takes us from a fossil fuel petrostate to a smart renewable electrostate," John Grimes declared.

This, the biggest single investment in large scale renewables in Australia's history, sets us on a trajectory to meet the 2030 emissions reductions target of 42% and boost renewables from today's 35% to 82% by 2030.

Reverse auctions whereby renewable energy investors bid to establish their projects' minimum and maximum price points will be staged twice yearly, commencing in April 2024, in partnership with state and territory governments that sign on to renewable energy transition plans, with the federal government underwriting revenue to de-risk investments and entice capital into new renewables projects.

Investors then have a guaranteed buyer at a floor price, and governments benefit by taking a share of the profits of successful projects.

Reverse auctions have proven successful in the ACT, Victoria and NSW; the ACT reverse auction system has resulted in the nation's lowest electricity prices with the Territory's 5% retail price rise defying the national average of 21%.

Peter Hartcher, political editor of the *Sydney Morning Herald*, labels the use of federal funds to attract private capital as smart policy that drives national wealth (while drawing attention to Australia's missed opportunity after pioneering solar technology).

Investment in renewables is in dire need, having stalled to just of 0.6GW over the year to late November, well short of the 7GW needed annually to meet targets, and placing national targets further out of reach.

Not a good look in the lead up to COP28 and for Australia's aspirations to co-host COP31 in 2026.

The turbocharged Capacity Investment Scheme salvages Australia's renewables ambition as well as its international reputation.

It is in no small part thanks to the Smart Energy Council which played a pivotal role in the development of the 2022 CIS after securing support from all Australian governments.

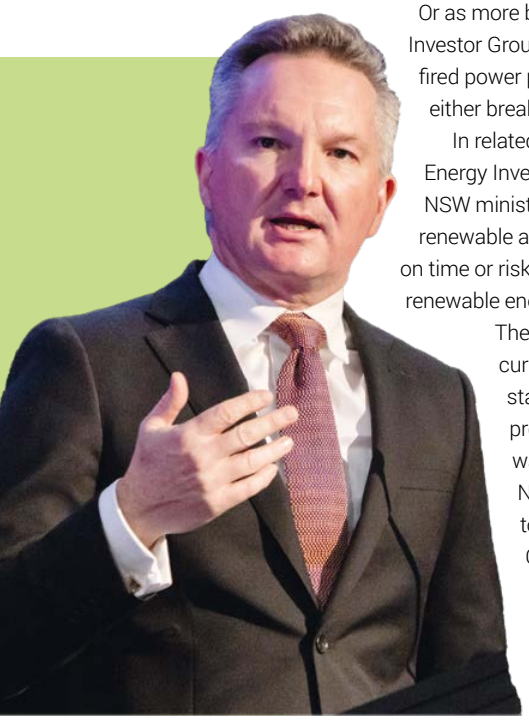
"The beefed-up investment scheme that sets the foundation for an ambitious build program delivers all-round benefits through cheaper power bills for all Australians and a substantial boost in jobs and investments in regional communities nationwide," John Grimes said "the largest renewables scheme in Australia's history by a long shot. It's very welcome and also smart because it sets out a co-ordinated investment framework and firmly places Australia on a path to meet its target of 82 per cent renewable energy by 2030, well up on today's share of about 35 per cent.

"It nurtures sustainable growth and future-proofs the economy and ticks all the boxes in terms of smart policy for a brighter Australia, for generations to come."

The SEC is now urging all governments to agree to strong and timely planning approvals by signing on to improved planning approval processes to expedite the renewables rollout.

RAMPING UP RENEWABLES

DURING MEDIA ROUNDS to promote the new and improved Capacity Investment Scheme, Climate Change Minister Chris Bowen did not hold back on the need for "More reliable, clean, cheaper, renewable energy before the coal-fired power stations leave… the biggest stretch of reliability in our energy grid today is coal-fired power stations breaking down unexpectedly."

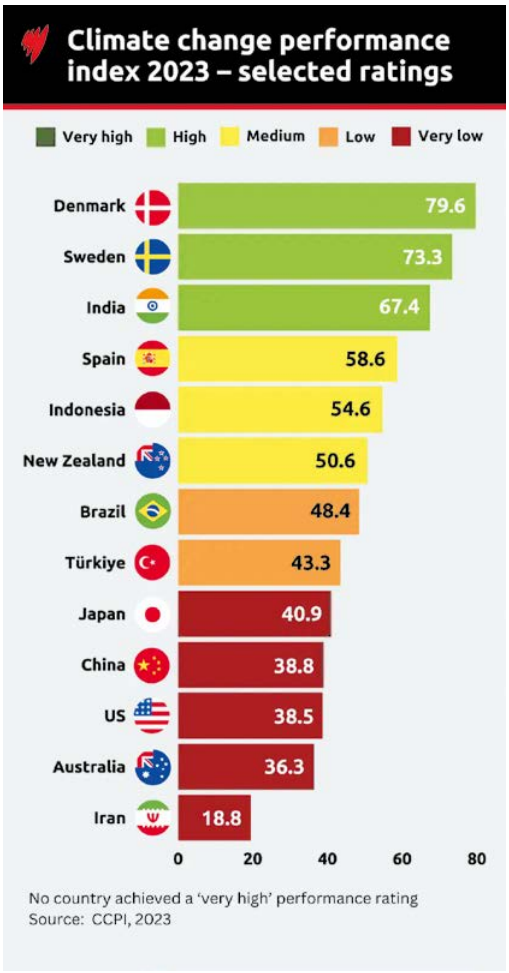


Or as more bluntly put by Erwin Jackson of the Investor Group on Climate Change: "Most of our coal-fired power plants are rust buckets right now that will either break down or blow up."

In related news SEC joined forces with the Clean Energy Investor Group and Nexa Advisory to urge NSW ministers to prioritise and accelerate the state's renewable and storage projects and close Eraring on time or risk missing national and New South Wales renewable energy and emissions reduction targets.

The state's planning approval process is currently up to three times slower than other states, adding as much as seven years to project progression – time we don't have to waste. And a real deterrent to developers in NSW who face 25 times the cost compared to an equivalent project over the border in Queensland.

All being well the supercharged Capacity Investment Scheme will take care of this, with the mandate for state governments to improve planning processes.



ANZ SHAREHOLDER CATHERINE ROSSITER has caused a shake-up by lodging a Federal Court case that questions the bank's failure to address the risks of climate change, stating "I'm worried that ANZ is not playing the part a financial institution should be playing in the 21st century, in managing climate change and biodiversity risk.

"ANZ appears to be a climate and biodiversity laggard, and I want more information on how the bank is governed."

Financial institutions are obliged by law to manage material risks, including emerging material risks.

In 2022 ANZ loaned $2.6bn to fossil fuel projects, up from $2bn in 2021 while CBA significantly reduced its lending to $267 million in 2022, down from $1.3bn in 2021.

"ANZ's peers are significantly reducing their fossil fuel lending," Rossiter says. "That's in line with the International Energy Agency's finding that we must stop investing in new fossil fuel supply if we want to reach net zero emissions by 2050."

Equity Generation Lawyers describe this a world-first court action against ANZ.

STAYING ON REALITY CHECKS… in a somewhat candid (or more accurately completely forthright) opinion piece titled "Billionaires are out of touch and much too powerful. The planet is in trouble" *Guardian* US columnist Rebecca Solnit wrote:

"When you talk about the climate crisis, sooner or later someone is going to say that population is the issue and fret about the sheer number of humans now living on Earth. But population per se is not the problem…

"The richest 1% of humanity is responsible for more carbon emissions than the poorest 66%. The rich are bad for the Earth, and the richer they are the bigger their adverse impact (including the impact of money invested in banks, and stocks financing fossil fuels and other forms of climate destruction)… plenty of billionaires operate like the lords of the Earth while campaigning to protect the economic inequality that made them so rich and makes so many others so poor.

"They use their power in arbitrary, reckless and often environmentally destructive ways.

She continued "If leaders spent more time talking to community organisations that represent people that really are on the frontline of the climate catastrophe … and less time listening to fossil fuel executives explaining the role that gas has to play in tackling climate change … I think we'd get much better outcomes."

Food for thought, though we'd like to say some Australian billionaires are more than making amends…

And a bit more from the research led by Oregon State University in the US which tracks global changes in carbon emissions, ocean acidity, sea level rise and loss of tree cover.

Among the group of 12 international scientists in the global stocktake on climate is Dr Thomas Newsome from the University of Sydney who said "The wealthiest communities are causing the impacts and the poorest are feeling them the most."

Case in point: Pakistan contributes just 1% of greenhouse gas emissions yet 33 million in the region are severely impacted by the 2022 flooding.

BY THE NUMBERS

GLASS HALF FULL

- 40% rise in global renewable energy investment since 2020
- 2020: one in 25 cars sold worldwide was electric; 2023: one in five
- >500GW of renewables generation capacity added in 2023
- >$US1 billion spent on solar deployment each day

Source: IEA world energy outlook

GLASS HALF EMPTY

- Doubling of global fossil fuel subsidies between 2021 and 2022 ($US531bn to >$US1 trillion)
- Record breaking temperatures 2023 – warmest months since records began; hottest year in past 100,000 years
- World may reach 1.5°C warming by early 2024
- 2°C degree increase = +10 cm sea level rise

Source: Global Stocktake Report

GOOD WORK VICTORIA

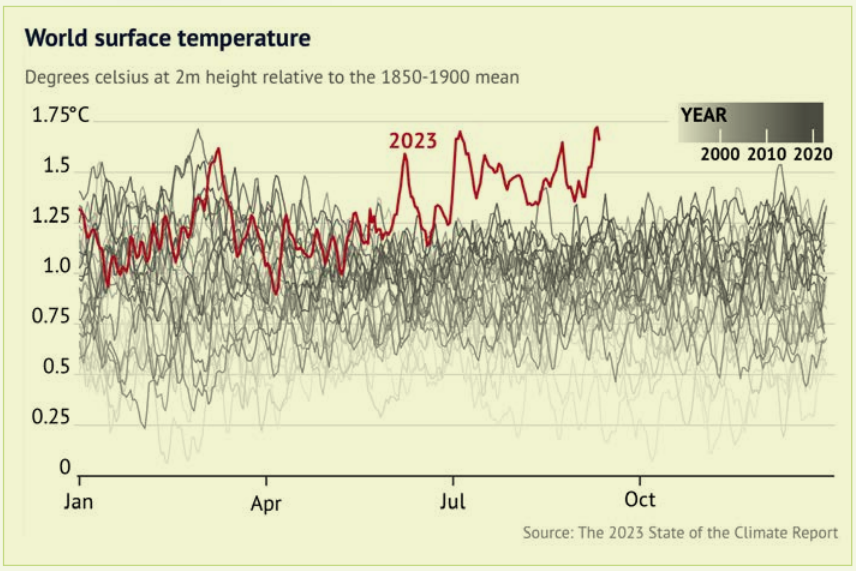
- ✔ Now reaching 38% renewable energy generation, on way to 40% target by 2025
- ✔ 2,972MW of new renewable projects in construction or commissioning 2022/23
- ✔ 37,400 Victorian households installing solar, creating >3,800 jobs

Source: Victorian Renewable Energy Target Progress Report 2022-23

LATEST OFFICIAL DATA ON STATE RENEWABLE GENERATION (AND TARGETS)

TAS **99.1%** (100% renewable electricity since 2020 150% by 2030; 200% by 2040)
SA **71.5%** (100% by 2030; 500% by 2050)
VIC **36.8%** (65% + 2.6GW storage by 2030; 90% + 6.3GW storage by 2035)
WA **35.2%** (State-owned coal-fired power stations retired by 2030)
NSW **30.7%** (12GW renewables by 2030)
QLD **22.6%** (50% renewables by 2030; 70% by 3032; 80% by 2050)
ACT (100% renewable electricity since 2020; transition away from gas by 2045)
NT (50% by 2030; 70% renewable electricity for Indigenous Essential Services communities by 2030)

Source: DCCEEW (2022) as contained in IEA's Australia 2023 Energy Policy Review (recommended reading)



IEA forecasts Australia's renewable energy capacity to expand by **85%** to reach 40GW by 2027

AEMO expects renewable energy to account for **83%** in the NEM by 2030 as part of the Step Change Scenario

CLIMATE CALCULATIONS AND ENERGY INTEL

In recent weeks several detailed reports on the state of the climate, energy transition, and pressing need to meet or lift targets have been tabled. Here we present some highlights.

AER: State of the Energy Market 2023

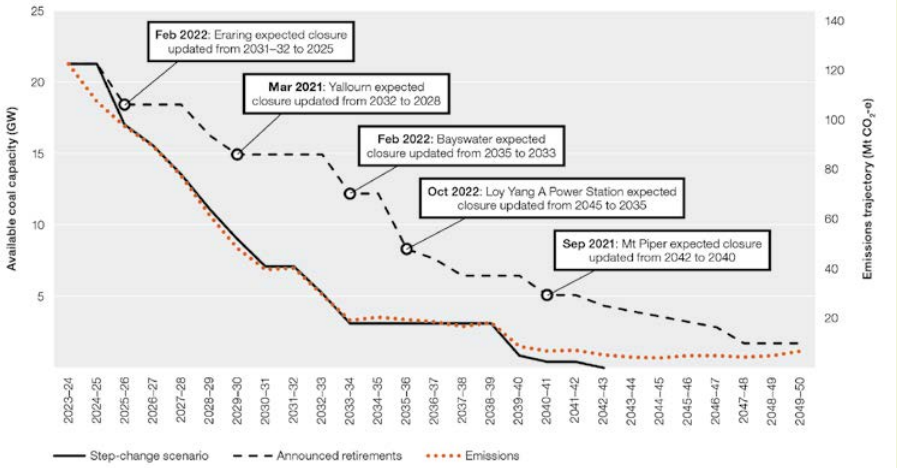
October 5 2023, 265 pages
www.aer.gov.au

Possibly the most comprehensive compendium addressing Australia's energy market, digest all this report has to offer to become fully versed on all aspects of the transition. Far too much content to even attempt to condense here but amid the lengthy and detailed information we spotted two charts that we think complement each other and neatly capture the direction of the market, ie the demise of coal and uptake of rooftop PV.

Commenting on the energy system in transition, **AER Chair Clare Savage** wrote: "This report highlights the coordination challenges required to ensure new generation is built before existing coal-fired power plants retire. While the pipeline for new investment appears healthy, not enough of that pipeline is committed. The need for new investment is pressing and widespread across the NEM. In addition, it is vital that coal exits in an orderly way.

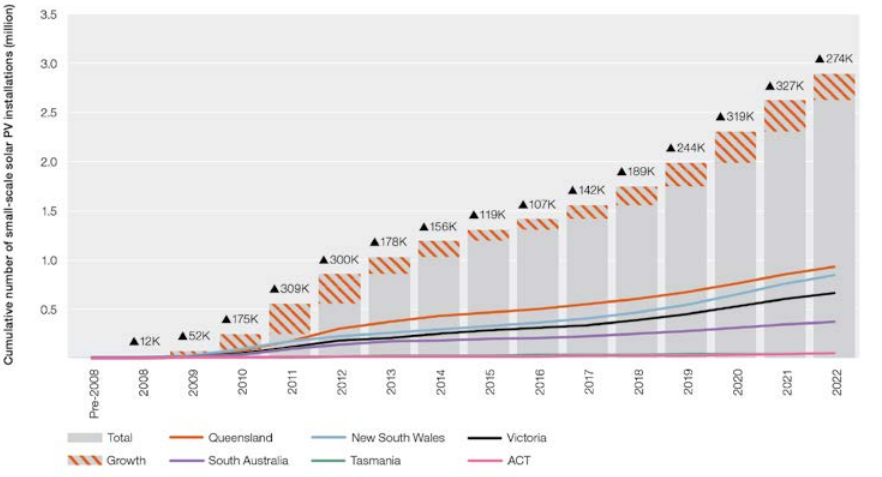
"The greatest challenge identified through this transition relates to the timely and least-cost delivery of major transmission projects. These projects are important enablers of the transition. They are also large and complex, particularly impacting on local communities. These investments have been progressing more slowly than planned, and their costs have been escalating significantly, intensified by international and domestic supply chain issues."

Figure 1.6 Forecast coal retirements and links with emissions



Note: The 'emissions' line shows the forecast emissions trajectory from the 'step change' scenario.
Source: AER analysis, AEMO data.

Figure 7.24 Small-scale solar PV installations



Note: Small-scale generation units have a capacity of no more than 100 kilowatts (kW) and a total annual electricity output of less than 250 megawatt hours (MWh).
Source: Clean Energy Regulator, Postcode data for small-scale installations, data as of 30 June 2023.

The Clean Energy Generation: workforce needs for a net zero economy

October 2023, 285 pages
www.jobsandskills.gov.au

Jobs and Skills Australia undertook a detailed study of the workforce implications of the transition to net zero with preliminary modelling of three scenarios.

Under all the scenarios, demand for employment in the sectors related to clean energy – supply, demand and enabling – will be among the sectors with the strongest employment growth in the Australian economy over the next 10 years.

Jobs and Skills Australia identified 38 critical occupations, mainly in trades and technical occupations in clean energy segments involved in developing, generating, storing, transmitting and distributing energy generated from renewable, net zero emissions

Climate Council – Mission Zero: How today's choices will reshape Australia

September 20, 2023, 60 pages
www.climatecouncil.org.au

The Climate Council presents the latest scientific evidence and emphasises the only effective way to put the brakes on extreme heat is to drive down emissions, fast. The review reaffirms the Climate Council's recommendation to slash emissions 75 per cent by 2030, and reach net zero by 2035, in line with the science.

Report author, Climate Council Research Director **Dr Simon Bradshaw** states "There's no safe level of global warming. Everything we do now matters. The only way we can turn down the heat is to get our emissions plummeting, and fast… continuing reckless coal and gas dependence, and relying on false solutions including offsets, is greatly endangering Australia's future… we are not on track to achieve the deep cuts needed this decade. Collectively, governments around the world – including Australia – aren't doing enough to drive down emissions. Today we must ask our leaders: do you want to be remembered for inching ahead with incremental changes that fell catastrophically short of what we knew was necessary? Or for rising to the challenge and seizing all the opportunities now before us?"

As Pacific leaders have put it: we're all in the same canoe when it comes to combating climate change, and if we paddle together there's nothing we can't do.

(See more on the Pacific on pages 26-27.)

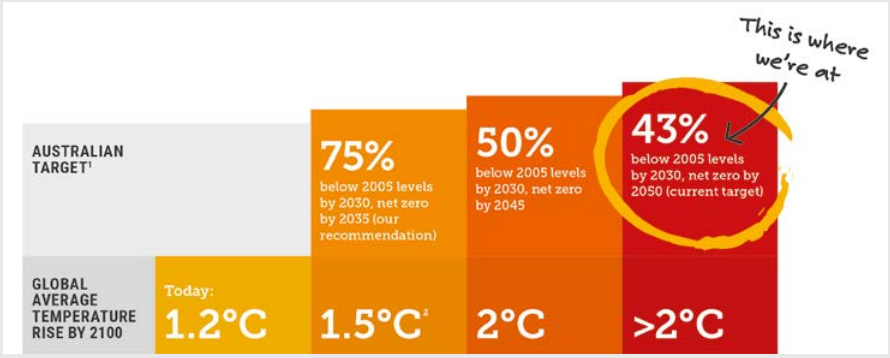
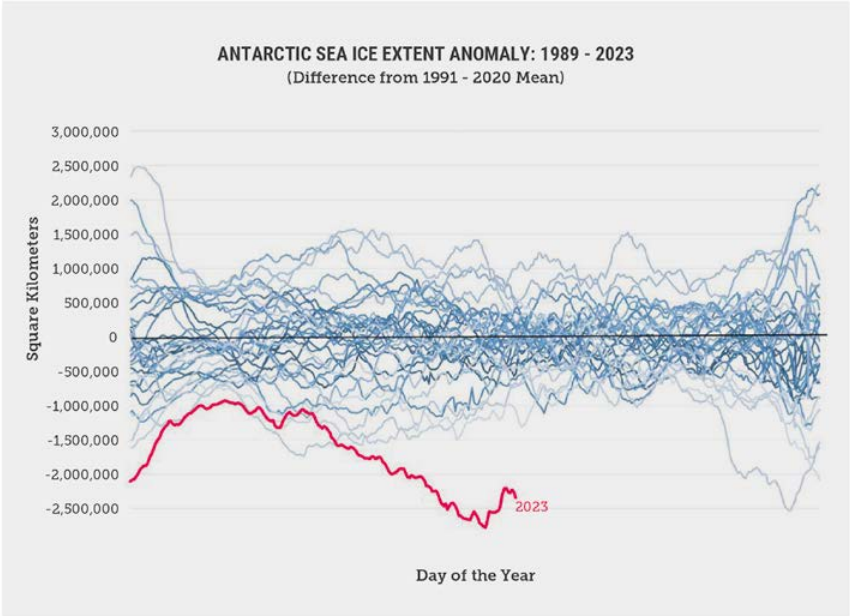
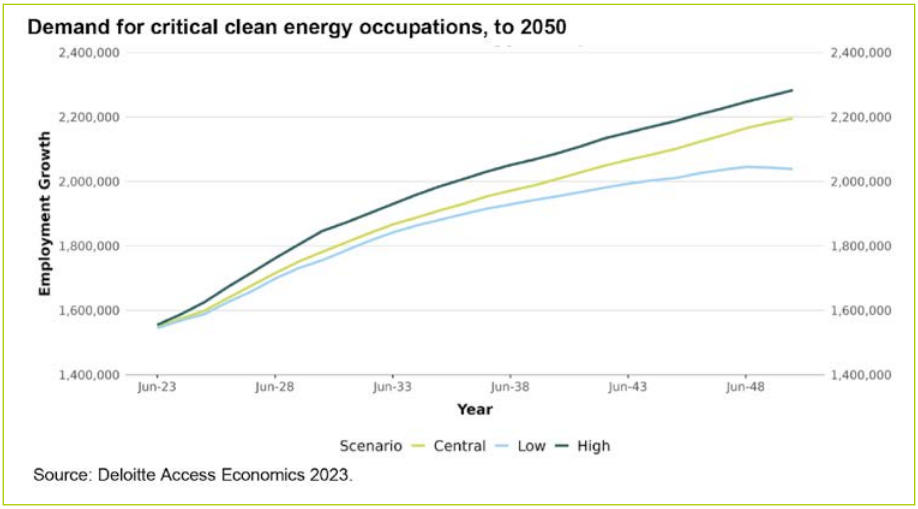


Figure 12: The seas around Antarctica were very slow to refreeze this year. This graph shows the amount by which the area of sea ice has deviated from the mean for that time of year, with previous years shown in blue and 2023 shown in red. **Source**: Professor Eliot Jacobson, based on data from the Arctic Data archive System.



sources, installing and maintaining the technology that uses clean energy rather than fossil fuels, and enabling the clean energy transition through education, training, regulation and supply chains.

Acting Commissioner Jobs and Skills Australia, **Professor Peter Dawkins** wrote: "I am confident that this report, and the policy reform and innovations that follow out of it, will help ensure Australia is well positioned to pursue a prosperous net zero future."



Source: Deloitte Access Economics 2023.

The Australia Institute's Climate of the Nation 2023

September 13, 2023, 56 pages
www.australiainstitute.org.au

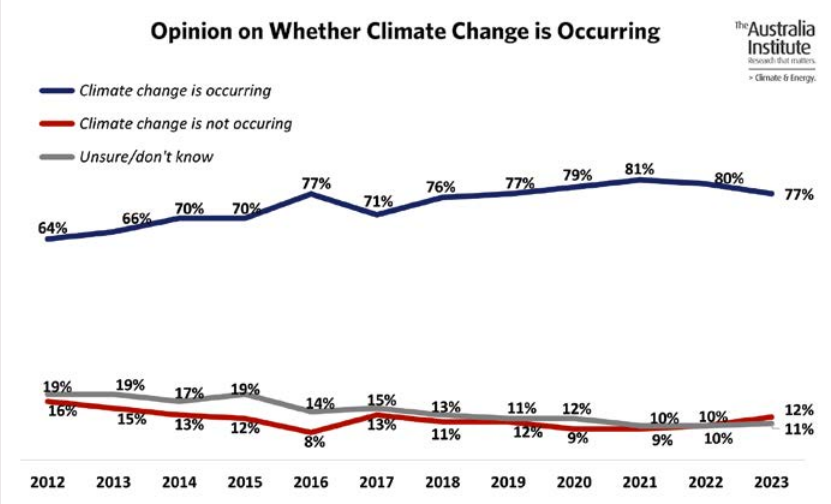
Among the key findings: Australians support the government introducing new policies that would make the fossil fuel industry pay for its contribution to climate change, including a polluter-pays tax (74% support, 16% oppose), a windfall profits tax on the oil and gas industry (66% support, 18% oppose), and a levy on fossil fuel exports to fund climate adaptation (59% support, 24% oppose).

Australians blame the excessive profits of electricity companies and poor policy making, more than climate impacts, for rising electricity prices.

TAI Climate & Energy Program Director **Polly Hemming** commented "The proportion of those wanting an end to fossil fuel project approvals in line with the International Energy Agency's 1.5°C pathway is higher among younger people: 74% of Australians aged 18-24 support the idea.

Having voted for climate action in 2022, Australians are losing patience with greenwashing and incrementalism. Almost half of Australians (47%) say that the Australian Government is not doing enough to prepare for, and adapt to, the impacts of climate change.

Ultimately, Australia's climate policies should serve the climate and the Australian people, not the fossil fuel industry. Australians want transparent, evidence-based climate action, and a government with the courage to implement policy that will drive genuine decarbonisation."



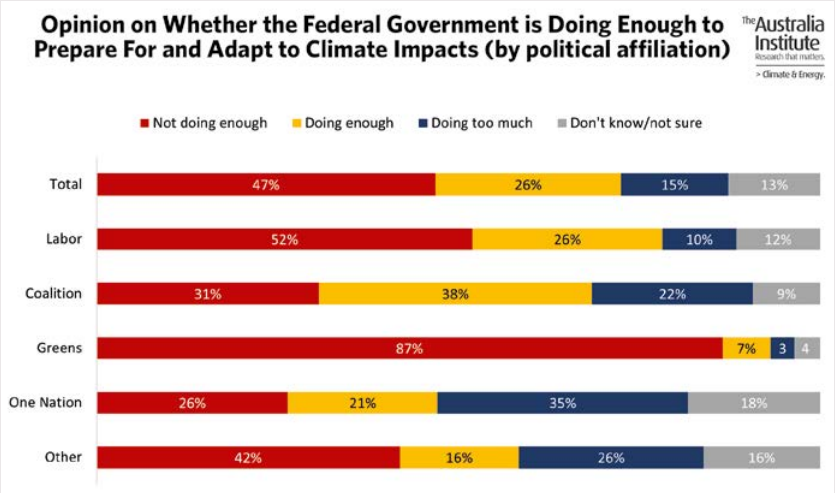


Image of dry river bed from the Australia Institute's Climate of the Nation 2023 report

Net Zero Roadmap: A Global Pathway to Keep the 1.5°C Goal in Reach

International Energy Agency 2023 Update,
217 pages
www.iea.org

The key messages: the path to 1.5°C has narrowed, but clean energy growth is keeping it open; the case for transforming the global energy system in line with the 1.5°C goal has never been stronger.

Scientific warnings about the dangers of the climate change pathway are clearer than ever.

Global carbon dioxide emissions from the energy sector reached a new record high of 37 billion tonnes in 2022, 1% above their pre-pandemic level.

Positive developments over the past two years include solar PV installations and electric car sales tracking in line with the milestones set out for them in the IEA's 2021 *Net Zero by 2050* report.

Ramping up renewables, improving energy efficiency, cutting methane emissions and increasing electrification with technologies available today deliver more than 80% of the emissions reductions needed by 2030.

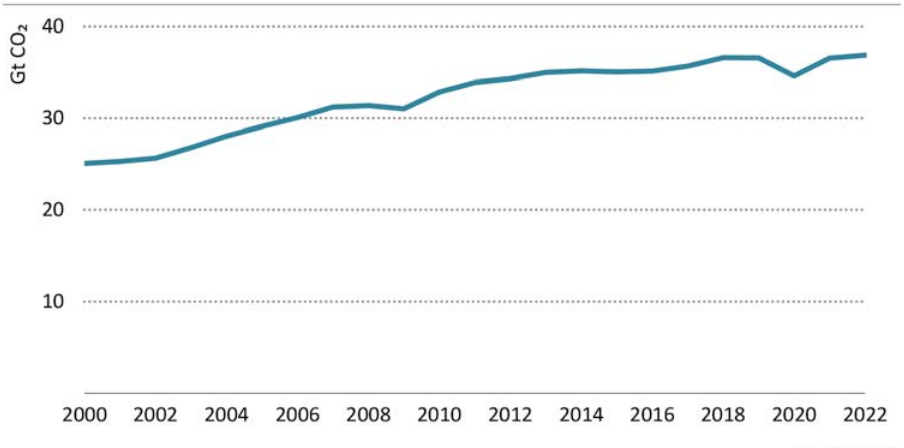
Tripling global installed renewables capacity to 11,000 gigawatts by 2030 provides the largest emissions reductions to 2030 in the NZE Scenario.

The world is set to invest a record US$1.8 trillion in clean energy in 2023: this needs to climb to around US$4.5 trillion a year by the early 2030s to be in line with our pathway.

By 2035, emissions need to decline by 80% in advanced economies and 60% in emerging market and developing economies compared to the 2022 level.

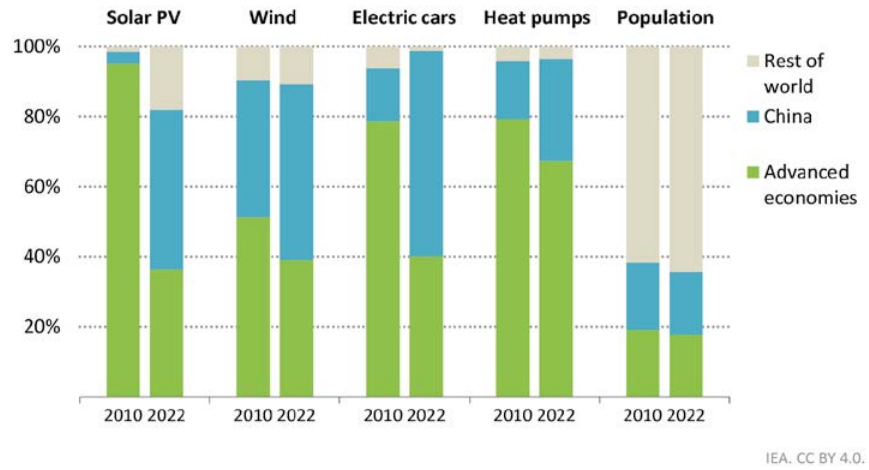
International Energy Agency Executive Director **Dr Fatih Birol** highlighted one message in particular: "In an era of international tensions, governments need to separate climate from geopolitics. Meeting the shared goal of preventing global warming from going beyond critical thresholds requires stronger cooperation not fragmentation. Climate change is indifferent to geopolitical rivalries and national boundaries – in its causes and its effects. What matters is emissions, regardless of which country produces them, calling for leadership on collaborative efforts to tackle them."

Figure 1.1 ▷ **Global energy sector CO_2 emissions, 2000-2022**



Global energy sector emissions have not fallen in the last two years, as envisaged in our 2021 roadmap, but instead have risen to record levels

Figure 1.13 ▷ **Share of the global deployment of selected clean energy technologies in advanced economies and China, 2010 and 2022**



Deployment of clean energy technologies remains highly concentrated in China and advanced economies

Notes: Solar PV and wind indicate capacity additions. Electric cars and heat pumps indicate sales.

Carbon Market Institute's 8th Australian Business Climate Survey

September 2023
www.carbonmarketinstitute.org

Of the respondents:

- 71% support planned phase out of fossil fuels by 2040
- 80% say the safeguard mechanism should expand into an economy-wide scheme
- 71% say Australia's level of private investment into climate action is inadequate proportionate to its economy
- 87% say Australia should set a target for net negative emissions
- 92% urge government to develop a national carbon market strategy
- 56% want a national 2035 target of over 60%
- 65% support Australia imposing a carbon border adjustment mechanism
- Almost two-thirds of respondents (65%) supported Australia hosting a UNFCCC COP with Pacific partners in 2026

CMI chief executive **John Connor** said: "The findings show most businesses recognise that Australia must transform its economy, but they want the right policy settings in place to ensure it's achieved smoothly and in a fair way. The newly appointed Net Zero Economy Agency, chaired by Greg Combet, is an important step in this regard, just as the enhanced Safeguard Mechanism will be in addressing industrial emissions."

How could Australia actually get to net zero? Here's how

By Anna Skarbek et al, Climateworks Centre

EVERY BIT OF WARMING MATTERS if we want to avoid the worst impacts of climate change, as the latest report from the Intergovernmental Panel on Climate Change shows.

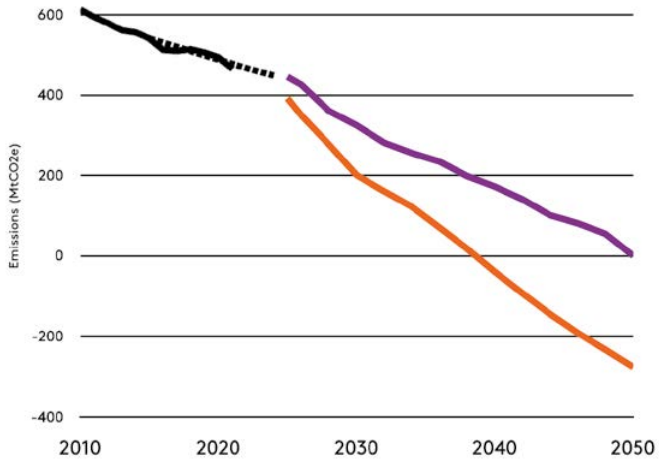
In 2020, we released modelling showing how Australia could get to net zero faster – and keep the Paris Agreement goal of holding warming to 1.5°C in play. Our new update shows this is still the case.

In mid-November, we released our latest modelling based on cutting emissions in line with the 2015 Paris Agreement, which set an upper limit on warming of well below 2°C, with a commitment to strive for the lower harm limit of 1.5°C.

At present, the government's 2030 goal is a 43% reduction from 2005 levels, with plans to set a further target for 2035 soon. Our new modelling of 1.5°C and well-below-2°C (1.8°C) pathways shows we must increase the pace of emissions cuts to between 48–66% for 2030 and 61%–85% for 2035.

This means Australia would reach net zero emissions by 2039, around a decade sooner than the current target of net zero by 2050. Our research shows this is possible.

Climateworks Centre decarbonisation scenarios 2023: Australian emissions in 1.5°C and well-below-2°C scenarios



Climateworks Centre decarbonisation scenarios 2023, Historical data: Australian Government

Climateworks CENTRE

So how do you actually do this?

In July, the government announced the development of net zero plans for six sectors: electricity and energy, industry, built environment, agriculture and land, transport, and resources. Treasurer Jim Chalmers recently said the government is preparing an ambitious policy agenda with big spending on green industries to help cut emissions, and to grow the economy as reliance on gas and coal falls.

These plans are now under development. Our modelling of these sectors shows which ones must cut emissions fastest – and how to do it for the least cost.

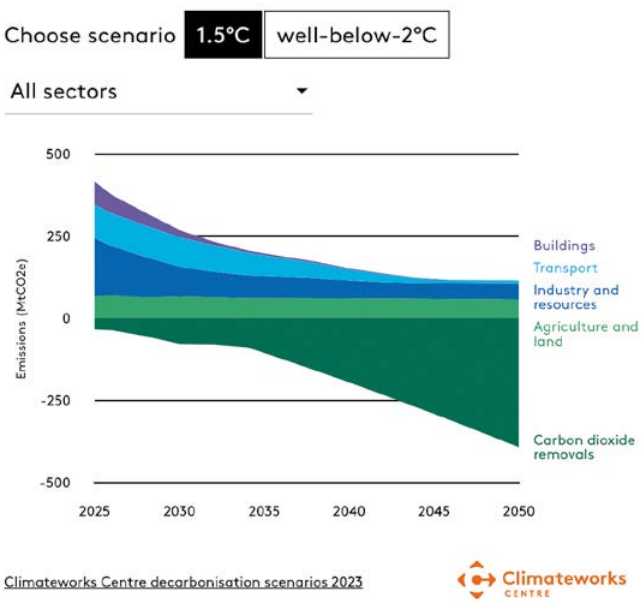
Electricity: In these 1.5°C and well-below-2°C least-cost scenarios, the electricity sector reaches near zero between 2034 and 2038. Renewable energy is already the least-cost way to generate power. In turn, clean electricity can help decarbonise the rest of the economy.

Industry and resources: In our scenarios, industrial emissions fall by 42% (well-below-2°C) or 54% (1.5°C) by 2035. By 2050, they fall by 54% and 67% respectively. Earlier and faster electrification and uptake of hydrogen technologies through the 2020s and 2030s drives more emissions reductions in the 1.5°C scenario.

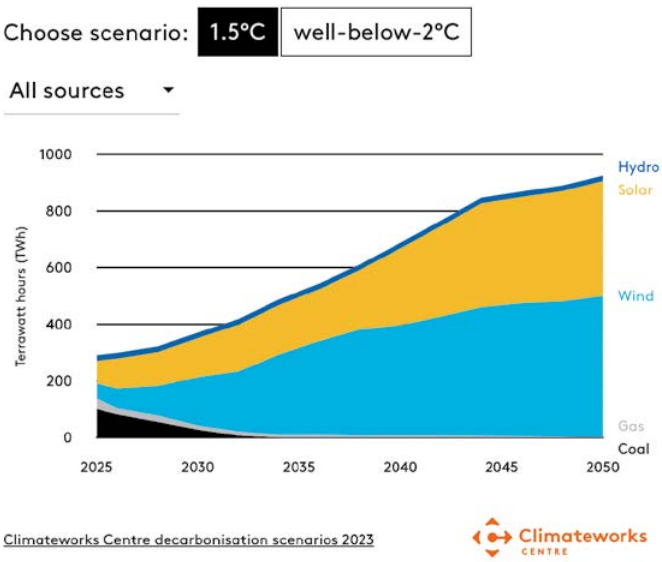
Buildings: Rapid emissions reductions in the building sector come from electrification and improvements in energy performance in both scenarios. Housing energy efficiency improves by 41% by 2050 compared to today's levels.

Adding algae to livestock feed could help reduce methane emissions

Climateworks Centre decarbonisation scenarios 2023: Australian emissions by sector



Climateworks Centre decarbonisation scenarios 2023: Australia's electricity generation mix



Agriculture and land: Cutting emissions in line with the 1.5°C goal will require much more removal of carbon dioxide from the atmosphere, mainly through sequestration in trees or soil. This can happen without damaging agricultural production.

How much CO_2 we need to pull from the air depends on our ambition. For the well-under-2°C scenario, we need to remove 1.4 billion tonnes (1.4 Gt). For 1.5°C, it's 4.6 Gt. Farming emissions such as methane from livestock and nitrous oxide from fertilisers will take longer to cut, as emissions per, say, kilogram of beef falls while production increases overall. Adding algae to livestock feed and rolling out slow and controlled-release fertilisers may help lower emissions here.

Transport: Without strong action on transport, emissions will keep growing. Both scenarios show minimal change in total transport sector emissions until 2030. That's because steady increases in vehicle use as our population and economy grows will prevent overall reductions – even as people go electric.

Under both scenarios, the transport sector changes markedly. Electric vehicles (EVs) become dominant, making up 73% of new car sales under the 1.5°C scenario or 56% in the well-below-2°C scenario. Our modelling doesn't account for the additional potential benefits of shifting trips from cars to public transport, or from road to rail freight.

For most sectors, net zero relies on clean electricity

Our modelling suggests it's most cost effective for Australia to rapidly switch fossil fuel electricity to renewable sources and push beyond the current 82% clean energy target by 2030. We should instead aim for between 83 and 90%, and almost 100% by 2050.

Coal-powered electricity generation disappears before 2035 in our 1.5°C scenario, and by late 2030s in our well-below-2°C scenario. Gas-powered electricity falls sharply around the same time period.

By 2050, gas-fired power stations would contribute less than 1% of total generation, only firing up briefly to firm electricity supply to the grid.

Under both the 1.5°C and well-below-2°C scenarios, Australia's electricity generation increases markedly. Renewable-powered electricity generation in 2030 would be greater than the total amount of electricity generated in 2020. By 2050, it is more than three times as great.

The rise of hydrogen for hard-to-tackle sectors

Support for green hydrogen has soared in recent years, both internationally and locally through government programs such as Hydrogen Headstart.

Why the change? Because of its potential uses in hard-to-green sectors. Industrial processes such as steelmaking rely on high temperatures. Traditionally coal has been used, but hydrogen is emerging as an alternative. It may have a role in transport, through fuel-cell vehicles, and to replace gas in those industries that rely on high-temperature heat.

Neither of our modelled scenarios show a role for hydrogen in buildings, passenger transport or short-haul freight. That's because electrifying homes and using battery-electric vehicles is cheaper and more market-ready.

But our modelling shows hydrogen can play a role in industry, long-haul freight and maritime shipping – if it becomes commercially viable for these sectors.

In our scenarios, domestic hydrogen demand grows to between 383 and 465 petajoules by 2050 – around 12–16% of Australia's energy demand.

Time is more precious than ever

Our latest analysis shows a 1.5°C least-cost pathway would see Australia reach net zero more than a decade earlier than the current goal of 2050.

If Australia and the rest of the world can cut emissions in line with the Paris Agreement goals, a safer and more prosperous future awaits.

But it's only possible if Australia acts quickly, builds on the momentum towards net zero and seizes the enormous opportunities offered in fast decarbonisation.

Authors: Anna Skarbek Anna Malos and Michael Li of Climateworks Centre

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The Big Ask: $100 billion
to power up and re-industrialise the nation

IT'S SEVERAL MONTHS since the Smart Energy Council and a major alliance of organisations including the Climate Capital Forum presented its big picture, Big Ask for $100 billion to turbocharge the energy sector and position Australia as a superpower, and in turn reap big dividends. Happily, the bold messages seem to have cut through with a series of positive developments.

Recapping, the Australian Renewables Industry Summit saw the collaboration of the Smart Energy Council, Australian Conservation Foundation, Australian Council of Trade Unions, Climate Action Network Australia, Climate Energy Finance, First Nations Clean Energy Network and New Energy Nexus present its big picture vision to Parliament House. A Big Ask that both recognises and steers Australia's potential in renewables.

Climate Energy Finance founder Tim Buckley summed up the focus of the Summit, stating "We need a far more integrated and 'big picture' approach to encourage greater investment, commensurate with the scale of this massive renewables and critical minerals/metals embodied decarbonisation export opportunity for Australia.

"This would create hundreds of thousands of jobs, diversify the export base and revenue streams as well as increase local value-added production, secure supply chains and develop sovereign manufacturing capabilities."

$100 billion is indeed a big ask, but fortune favours the bold. The Climate Capital Forum foresees $300 billion in annual renewable export revenues by 2035. And it would be a vital counterpart to the range of renewables support measures in the EU, Canada, India, Japan and in particular the US with its 'gamechanger' US$625 billion *Inflation Reduction Act* that has doubled US manufacturing spending in the past 12 months and attracted $1.7 trillion of public and private capital in manufacturing.

THE BIG ASK: A ten-year $100 billion policy package to power up critical minerals; green iron, steel, and aluminium; advanced manufacturing including solar and wind components and batteries; heat pumps and home energy management; transmission; clean energy exports; zero carbon transport vehicles and fuels; and recycling.

John Grimes: ***"Without significantly greater investment, we simply won't be able to build the industries of the future, reduce emissions, create jobs or strengthen national prosperity and social equity. Australia stands at a crucial juncture in the nation's history. You don't build prosperity with a mindset of austerity."***

Economic multipliers

Andrew Forrest of Fortescue describes the *Inflation Reduction Act* as a "really serious economic multiplier" for new industries. "It's a lesson to other economies – including Australia – that if you back a new industry like renewable energy, then you're creating an economic multiplier and economic growth engine within your economy, which gets to pay for taxes, or increases in education, hospitals, and the whole box and dice," he said.

Prominent SEC member EVO Power, a leader in advanced energy storage systems, boldly opened two factories in southern California in 2022 (prior to the IRA) in a bid to duplicate the business success of home shores. The IRA has, however, delivered mixed blessings due to the tax break depending on the percentage of locally (US) made or sourced components.

Jamie Allen explained "We were early adopters in Australia in the sub 5MW commercial and industrial and small utility market and saw an opportunity in the US but now the IRA has been turned on, the market is going crazy and many others are flipping into this area… there is strong competition from American manufacturers."

SEC president Terri Butler notes the IRA is drawing away green energy investment from Australia and "Unless the Australian Government mounts a robust response to the US, and other nations, our country will lose the opportunity to build a strong smart energy manufacturing industry in Australia. We will lose the race before it has even begun."

Positive moves

A few months on from the Big Ask and the ground appears to have shifted – in a good way.

Today the government appears to have a much better understanding and appreciation of the potential awaiting Australia's energy sector, says Blair Palese of the Climate Capital Forum who is instrumental in the Big Ask. "We know this through meetings we've had, key people in government and agencies have spent time and effort researching the opportunities, and that is good news.

"One of the challenges was the ability to hire people with deep expertise and skills, a thorough understanding of value adding and other opportunities in renewables. Former shadow climate minister Greg Combet who chairs the Net Zero Economy Agency and Martijn Wilder of the National Reconstruction Fund, they get it. They are critical to this transition and both appointments bode well for the sector," Blair said.

"We are seeing some very welcome developments."

Indeed. Prime Minister Anthony Albanese recently stated Labor recognises the energy transition is the "most significant economic opportunity since the Industrial Revolution" and commits to "substantial public investment in or underwriting of" critical assets.

Finance available to key exporters has doubled from $2 billion to $4 billion in the hope of unlocking vast reserves of lithium, nickel and other essential elements for batteries and other renewable technologies.

Up to $16 billion worth of deals have already been done in the $20bn Rewiring the Nation fund for transmission and the first auctions are already underway in the Capacity Investment Scheme to accelerate investment in battery storage and the $15bn National Reconstruction Fund.

In other positive signals, Treasurer Jim Chalmers delivered a good dose of foresight amid strong messages in his Keynote address to the Economic and Social Outlook Conference in early November, revealing energy and the economy as a major policy focus of Cabinet.

Treasurer's keynote address on energy: A Must Read

In a nod to the Big Ask the Treasurer said "There have been calls to pursue our own Australian version of the *Inflation Reduction Act,* and to mobilise more public capital into the industries that will help us realise our potential as a renewable energy superpower.

However "Incentives like the type we've seen in the United States can be part of an answer but they're not the whole answer… our industry policy framework needs to be recast and modernised so we can maximise our advantages and leverage our strengths in a new age of net zero.

"Our ability to become a superpower is reliant upon our ability to generate cheaper, cleaner, reliable, renewable power, he said, cataloguing the magnitude of solar, wind and critical minerals resources.

"A big focus [on capital] tends to be on the availability and magnitude of public and private capital required to reach both our near-term and longer-term objectives.

"That's obviously critical, with $225 billion in additional investment required by 2050 across energy and industry, by some estimates."

[But] We will complement not copy the priorities and plans of other nations, not just do exactly the same kind of investment with the exact same subsidies.

"Our plan will be ambitious, but uniquely Australian… building on our existing $40 billion plan to make Australia a renewable energy superpower."

He concluded by saying "I really believe that the net zero transformation will be the defining piece of the defining decade. Whether we succeed or fail in these 'turbulent twenties' will in large part be determined by how we maximise our advantages and leverage our strengths when it comes to energy in our economy.

"And as we look to the 2024-25 Budget we'll be backing our ambition with further action."

Forward thinking

"Lots of positive and promising messages, watch this space, now is our moment!" Blair Palese told *Smart Energy*.

"Now we need to see a clear vision where they are taking us, from the PM to Treasury and others who pull the levers and get through blockages that hold us back on investment here in Australia.

"We are hoping for more of a clear signal over the scale of ambition from government on this investment thinking.

"There is lots of rhetoric about an energy superpower but we're in a global race, there is so much that prevents us keeping pace with global efforts and we need to move much more quickly and itemise specifically how it can happen for example through the multi-million dollar funding of reconstruction fund and net zero group… also the vision and how it all fits together."

Coordination is absolutely critical, she emphasised.

"We wait to see the vision, where they are taking us, how it works, and if it is the kind of thing we need.

"If not we, the force behind the Big Ask, will know if we have to go back in and if it's not enough or a great start, let's keep going!"

Tenacity. That's what the Big Ask is all about.

Editor's note: The disadvantage of timing in print publications! Refer to pages 8-9 which address – or even respond to – much of the Big Ask.

Recommended reading: *The Conversation* September 13, 2023, *We urgently need $100bn for renewable energy. But call it statecraft, not 'industry policy',* author Elizabeth Thurbon, UNSW Sydney

Fun fact: The term 'Big Ask' denoting a demand or situation that requires a specified degree of effort or commitment was allegedly coined in Australia.

Blair Palese fourth from left with fellow Climate Capital Forum participants including Nicolette Boele, Satya Tanner, Wayne Smith, Stephanie Bashir and Tim Buckley

SMART ENERGY COUNCIL
CONFERENCE AND EXHIBITION
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AUSTRALIA: THE RENEWABLES POWERHOUSE

We have the vision

The Smart Energy Council cordially invites everyone with a stake in the renewable energy industry to join us in early March 2024 in Sydney to learn more about Australia's journey toward a renewable energy generation and exporting superpower.

Never has it been so urgent to transition to a decarbonised energy network.

We need to tackle this head on to avoid the worst consequences amid dire warnings of 'climate collapse' being echoed around the world.

And yes we do have the solutions. Right now. Right in front of us.

In the halls of the 2024 Smart Energy Show delegates and visitors, policy makers and cleantech investors among them, will be able to hear and see the transition in action. Smart Energy Council members' innovation in all its forms from physical products to financial, digital and other support services that are playing a vital role to construct a better, smarter electricity network.

Guaranteed there will be a buzz in the room!

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GREEN HYDROGEN

The past few months have delivered a series of ground-breaking green hydrogen project announcements and collaborations on a scale never before seen, as Australia gears up for the projected $50 billion hydrogen industry by 2050.
Here we relay some key developments highlighting momentum in green hydrogen and its derivatives.

> *"The global shift to clean energy and decarbonised economies is a huge economic opportunity for Australia. We are determined to grasp this opportunity."*
>
> PRIME MINISTER ALBANESE

HYDROGEN HEADSTART

The green hydrogen industry has been spurred on by the largest ever Commonwealth funding program for renewable hydrogen, $2 billion to help tap into the enormous global pipeline of private investment in hydrogen in Australia.

The program will help large-scale renewable hydrogen projects get going by bridging the commercial gap between the cost of producing renewable hydrogen and the market price.

Minister for Climate Change and Energy Chris Bowen said "This is the first of many subsidies needed to take industry forward."

Hydrogen Headstart will be administered by ARENA.

HYDROGEN HUBS

The Government is investing over half a billion dollars for regional Hydrogen Hubs including in Pilbara, Kwinana, Gladstone, Townsville, the Hunter, Bell Bay and Upper Spencer Gulf.

Minister for Climate Change and Energy Chris Bowen added "Green hydrogen will play a crucial role in our clean energy transformation… investing in an Australian green hydrogen industry puts us on a path to become a renewable superpower."

Indeed, back in 2022 the International Energy Agency declared Australia would be the world's largest exporter of hydrogen by 2050.
https://www.iea.org/reports/global-hydrogen-review-2023

WELCOME WORDS In a landmark address in early November **Treasurer Jim Chalmers** (pictured) made it clear that renewable hydrogen and its derivatives (along with critical minerals and battery manufacturing) would be a major focus of the **May 2024 federal budget**. This represents "A big win for the Zero Carbon Hydrogen Australia team and its working groups," Joanna Kay said.

SCALING GREEN HYDROGEN CRC

Recapping: the vision for the Cooperative Research Centre is an Australian green hydrogen sector of 1TW of installed electrolysis by 2040 delivering green hydrogen at competitive costs for domestic and export customers.

The Green Hydrogen CRC Round 24 Bid features a consortium of 97 partners offering a substantial $163 million in cash and in-kind support. If the bid proves successful, the CRC is poised to secure Australian Government funding over the next decade, specifically designated for addressing integration and scale challenges within the green hydrogen value chain. Zero Carbon Hydrogen Australia has played a pivotal role in the CRC Bid.

SUNNY SOUTH AUSTRALIA

Hydrogen Jobs Plan and Whyalla

South Australia's government has announced the group involved in the FEED study for the 250MW electrolyser and 200MW hydrogen gas generator The consortium of Atco and BOC Linde outranked 29 contenders in the Hydrogen Jobs Plan, supported by state funding of $593m. Epic Energy will provide hydrogen storage capabilities.
www.hydrogen.sa.gov.au

Port Bonython Hydrogen Hub near Whyalla

In related ground-breaking developments, the federal and South Australian Governments are each investing $100 million to develop infrastructure at Port Bonython and prepare it to become South Australia's first large-scale export terminal for hydrogen and help propel Australia to a renewable energy superpower.

Along with private sector funding, the redeveloped Port Bonython is expected to host projects worth up to $13 billion and projected to generate as much as 1.8 million tonnes of hydrogen by 2030.

SA Premier Peter Malinauskas

FUN FACT The term 'hydrogen economy' was coined at Adelaide university by a local professor in the 1960s.

CQ-H2: CENTRAL QUEENSLAND HYDROGEN PROJECT – THE POWER OF A COLLABORATIVE CONSORTIUM

The CQ-H2 project will develop 720MW of electrolysers and establish a large-scale renewable hydrogen production facility near Gladstone, supplying hydrogen to an ammonia plant and a liquefaction plant at the Port of Gladstone. The project will supply Asian export markets as well as domestic users, and aims to initially produce approximately 200 tonnes of renewable hydrogen daily by 2029 before scaling up to 800 tonnes per day by the early 2030s.

The project is supported by the Australian Government's Regional Hydrogen Hubs Program, which is providing $69.2 million to Stanwell and other proponents to develop a broader regional hydrogen hub, $20 million from the Australian Renewable Energy Agency and $15 million from the Queensland Government.

For this to become reality, Queensland state-owned generator Stanwell has formed a consortium of key Japanese and Singaporean energy, gas and trading companies: Iwatani, Kansai, Keppel and Marubeni.

Smart Energy managed to speak to Stanwell Hydrogen General Manager Phil Richardson (pictured) before he jetted off to Singapore for meetings.

The project is ramping up, he said, "Early contractor involvement process is in place with several OEMs around their designs to incorporate into the FEED (Front End Engineering Design) study which will conclude in 2024 and all being well the project will move to FID (final investment decision) during 2025."

Off-takers

Two of the main off-takers are in the consortium and contributing funding to the FEED study, they have skin in the game, Phil said, with Singapore-based manufacturer Keppel set to procure approximately 400 tonnes per day renewable ammonia for its nitrate plant. In due course Japan's Kansai will secure 400 tpd liquefied hydrogen for export.

"The initial phase of the project is all about ammonia, but down the track we are open to considering green steel and Gladstone is ideally placed; we will explore this in due course but are a few years out now in terms of technologies," Phil said.

He emphasised the effectiveness of the collaboration between consortium partners who are "all on the same page on the FEED and other complex project developments, including approaches to secure off-takers, having signed a detailed commercial agreement, and with a steering committee leading project development in phases.

Stanwell is working with Hysata to pilot its 5 MW Australian-made electrolyser in 2025.

"We are keen to encourage Australian content in all phases of the project and will have a very strong focus on local parts in our procurement process," Phil said.

Guarantee of Origin

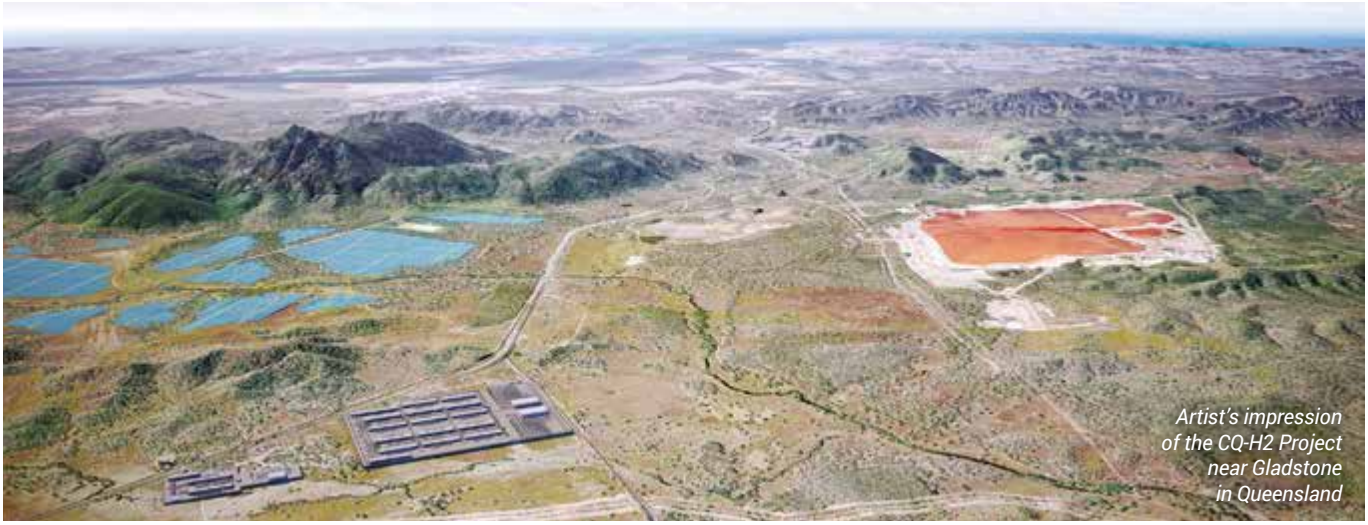
Phil stressed the "incredible importance" of Guarantee of Origin (for renewable hydrogen) through authentication, saying Australia's strong advantage lies in its ability to produce renewable hydrogen. "It is vitally important for a framework – a Guarantee of Origin to be robust so Australia can capitalise on its advantage and show its contribution to both domestic and global decarbonisation."

Commenting on the impact of the US's Inflation Reduction Act, Phil cited Hydrogen Headstart as an important indicator that Australia wants to pursue a hydrogen industry. "The scope and scale of the IRA is at a different level but Australia does not need to match that as we have a certain competitive advantage in terms of proximity to market, renewable resources and availability of land that is unique.

"However we do need to be mindful that the IRA will drive incentives and activity away from Australia if we don't try and develop a framework that gives enough weight and incentives… we await the next federal budget.

"Hydrogen Headstart will play an important role closing the price gap, it's an opportunity to secure funding from overseas and this is key; it will help Australia reach scale earlier. There is still a price gap between renewable hydrogen and incumbent fuels so encouraging the export market and leveraging funding sources from overseas is vital," Phil said.

"This is an important message: we must focus on international markets."



Artist's impression of the CQ-H2 Project near Gladstone in Queensland

QUEENSLAND PAVES THE WAY

In mid-October the Queensland government passed legislation "to unlock the greatest climate, economic, and jobs opportunity in a generation – green hydrogen", with a change to the Gas Supply and Other Legislation (Hydrogen Industry Development) Amendment Bill 2023.

The legislation places Queensland at the forefront of clean energy transition and paves the way for a wealth of job opportunities in regional Queensland.

Mick de Brenni MP, Qld Minister for Energy, Renewables and Hydrogen displays the newly passed legislation

"Although this isn't wholistically all about green hydrogen it is a great step forward, and it helps create the momentum for a strong policy framework in Australia and gives confidence to the green hydrogen industry," Joanna Kay explained. "It sends a message to investors and developers that Australia is a good place to develop green hydrogen projects."

SEC Special Advisor Scott Hamilton described it "As good as anything I've seen, and a model for other states."

NATIONAL HYDROGEN STRATEGY REVIEW

Early this year the Energy and Climate Change Ministerial Council agreed to a review of the 2019 National Hydrogen Strategy to ensure it positions Australia on a path to be a global hydrogen leader by 2030 on both an export basis and for the decarbonisation of Australian industries.

Since 2019 the world has advanced significantly in terms of hydrogen developments and opportunities, including hydrogen derivatives and metals and global policy landscape, Joanna Kay commented. Also back in 2019 only three nations had a hydrogen strategy, of which Australia was one, now there are 30, so the race is on to secure a slice of the market.

The hydrogen strategy explores Australia's clean hydrogen potential; considers future scenarios with wide ranging growth possibilities; outlines an adaptive approach that equips Australia to scale up quickly; includes showcases from each state and territory; and details nationally coordinated actions involving governments, industry and communities

SPEAKING ENGAGEMENTS Zero Carbon Hydrogen Australia manager Joanna Kay has presented the case for Australia's green hydrogen industry at numerous gatherings: the Korea Offshore Wind and Hydrogen Summit; French Chamber of Commerce Sustainability Conference; Corrosion Conference; the review of National Hydrogen Strategy among them. The full list of engagements that include presentations at Japan and Singapore Forums can be seen on her LinkedIn post, along with her reports and submissions, with recommended policies on green steel and iron.

NEAR ZERO STEEL 2030 INITIATIVE In mid-November Zero Carbon Hydrogen Australia and Greenhouse presented an information session on the Near Zero Steel 2030 initiative; a partnership between Greenhouse and the First Movers Coalition of the World Economic Forum with an objective to be a catalyst for near-zero emissions steel deployment of which hydrogen is integral.

"It's an opportunity for Australian industry to help decarbonise a global steel supply chain that generates 7-8% global emissions," Joanna said.

The webinar attracted leading players in green hydrogen, steel manufacturing, institutional investors and others.

TWIGGY FORREST OF FORTESCUE says he's never had to work so hard to convince people about the benefits of hydrogen… getting his green hydrogen business off the ground has been one of the "hardest sells" of his career, but he believes "we're on a very serious tipping point".

Fortescue is in funding negotiations with the US government for US$150m in green hydrogen subsidies for the Pacific Northwest Hydrogen Hub consortium which includes Fortescue's Centralia green H2 scheme in Washington state.

The US has earmarked US$7bn for H2 Hubs.

IN MID-OCTOBER Victorian Energy Minister Lily D'Ambrosio visited a **world leading renewable hydrogen project, led by Energys** and supported by the Victorian government, to kick off the Telstra Hydrogen Fuel Cell pilot that will use renewable hydrogen as a zero emissions fuel for back-up generators. These will be rolled out to five trial sites in regional communities to keep telecommunications towers powered during storms, bushfires and floods.

Lily D'Ambrosio with Lee Tarlamis of Energys

EU MANDATES GREEN HYDROGEN USE BY INDUSTRY

The European Union has introduced a renewable hydrogen mandate that will require industry to procure 42 per cent of its hydrogen from renewable fuels, opening a large potential market for Australian exports. The mandate will increase to 60 per cent by 2035.

Several supply chain studies have been undertaken between Australia and European countries to determine the requirements of establishing a renewable hydrogen supply chain, including the Australian-German HySupply feasibility study.

GLOBAL HYDROGEN REVIEW 2023 the review is an annual publication by the International Energy Agency that tracks hydrogen production and demand worldwide, as well as progress in critical areas such as infrastructure development, trade, policy, regulation, investments and innovation. This year's report includes a focus on demand creation for low-emission hydrogen.

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Partnering with the Pacific

Good neighbours, good friends

Prime Minister Anthony Albanese and Minister for International Development and the Pacific, Pat Conroy (out of shot) found common ground with SEC's Wayne Smith and Richie Merzian during the Pacific Islands Forum

In the build-up to the COP28 UN climate summit in Dubai in December, several climate-related meetings have been held in various corners of the globe. One of the more picturesque settings was the tropical Cook Islands which hosted the 52nd Pacific Islands Forum in early November.

ON MAPS AND GLOBES, the Cook Islands appears as a speck in the middle of the Pacific. Located between American Samoa and French Polynesia, the 15 low lying islands with a total land area of 240km^2 are home to around 17,000, a small population that is just as vulnerable to rising sea levels as other – and otherwise idyllic – islands spanning the South Pacific.

Climate induced existential threats and security topped the agenda at the 2023 Pacific Islands Forum, where Prime Minister of the Cook Islands and host of the summit, Mark Brown welcomed leaders from 18 Pacific countries and territories.

Australian Prime Minister Anthony Albanese attended the Forum to "demonstrate Australia's commitment to deepening engagement in the Pacific and addressing shared challenges facing us all, including shaping a peaceful, stable and prosperous Pacific."

He described the "extremely positive reception" received by Australia, saying there is a recognition that Australia is committed to climate action, "and we are playing a positive role, not just with our commitment to reduce our emissions by 43 per cent by 2030 and to reach net zero by 2050, but that importantly, we are playing a role in the region and indeed around the globe."

Among the headline announcements at the Forum: Australia will make further investments to support the climate adaptation and resilience of Pacific partners, including at least $350 million for climate infrastructure for the region, and contribute to both the Green Climate Fund (GCF) and the new Pacific Resilience Facility, an innovative climate financing initiative.

This is both welcome and significant said SEC International Director Richie Merzian, who attended the PI Forum and said the SEC has been urging government to rejoin the GCF after a five year hiatus under the previous government.

"The Green Climate Fund is the main multilateral finance mechanism for climate action in developing countries and it is wonderful to see the Albanese government commit to significant funding.

Rooftop PV is supplementing energy supplies and reducing diesel consumption

SEC Board member Barbara Elliston with Richie Merzian at SEC's booth at the Pacific Islands Forum held in Raratonga

"It is also a good sign that Australia takes seriously this pivot to a more prominent and influential role in climate politics," Richie said. "Timing is critical too in terms of our aspirations to host COP31. It would be untenable for Australia to play a leadership role in climate change and sit outside the global fund for climate action."

The PM also announced a special visa category for people affected by rising sea levels in Tuvalu citizens displaced by climate change. Australia will welcome up to 280 each year who want to "migrate with dignity".

Tuvalu is particularly vulnerable, the highest point of the country which spans nine low-lying islands halfway between Australia and Hawaii being just 4.6 metres.

Foreign Affairs Minister Penny Wong whose office had championed the special visa program described this as "the most significant outcome of the Pacific Island forums since the independence in 1975."

Although Australia's commitments were warmly welcomed, many in the region remain concerned about Australia's approval of new coal and gas projects.

Watered down while sea levels rise...

During the Forum the call for fossil fuel phase-out was weakened to state leaders "aspiring to a just and equitable transition to a fossil fuel free Pacific, acknowledging that the pathway is not immediate nor is it one size fits all".

Leaders did however commit to "a transition away from coal, oil and gas in our energy systems in line with IPCC pathways for limiting global average temperatures to 1.5ºC".

Nuclear energy and waste were on the agenda, and some discussion centred around EU's goals with German Climate Envoy Jennifer Morgan calling for a tripling of renewable capacity by 2030.

In other developments, leaders scoped an agenda for the next PI Forum in Tonga in 2024 and, importantly, the new role of Pacific Islands Energy Commissioner was agreed upon in principle.

"The Commissioner's remit is still in the works but Smart Energy Council did meet with the Oceans Commissioner to gain an understanding of the office charged with actively transitioning the region to renewables, which may provide a useful model," Richie Merzian said.

He commented the Forum was the ideal opportunity for the SEC to provide a vision for the nature of a renewables partnership between the Pacific Islands and Australia.

The Smart Energy Council staged a presence with a formal booth at the 'Pacific Partnerships for Posterity' section on the fringe of the Forum which facilitated meet-and-greets with several high-ranking officials including those from the US and China, Richie said.

"Our presence enabled us to discuss the prospect of a partnership to co-host COP31 in 2026 and to understand the top priorities for the area; there is a real appetite to bring attention to the region."

On the ground (and rooftops)

"On matters more directly related to the SEC, Richie and Wayne Smith explored options to formalise and foster closer cooperation between renewables companies and associations in the region, and assess interest in the SEC providing a more formal way to engage.

Several SEC members are actively involved in the Pacific region, some building microgrids for communities, so we could showcase what members are already doing at the same time as learning about local challenges, Richie said, citing the case of Raratonga's heavy reliance on diesel and restrictions on the amount of new solar accepted into the grid, despite the Cook Island's ambitious renewables target of 2015.

"We addressed practical matters how to address that for example through training; SEC undertakes significant training in Australia and we could run sessions in the Cook Islands, with a new Renewable Energy Centre to be scaled up, and also address gaps in energy system hardware and facilitate interest among financing partners/organisations from multilateral banks to investors."

Going forward there are many opportunities around SEC engagement on a practical level from equipment training and capacity building to advocacy, Richie said. And at a high level we are bringing in the right partners.

"The real gap or opportunity for SEC members in the Pacific Islands is, although the decision to be fossil fuel free is clear, the practicalities are far more challenging, and this is where we should be helping."

Islanders have a preference to work with Australians where possible.

SEC is now further exploring how best to engage in useful discussion with the Cook Islands, Fiji, Tonga and regional organisations in the area including the UN's regional office and other formal agencies operating in the Pacific.

"Now we just have to determine how best to engage going forward, now there is a clear mandate to make it happen - and with urgency."

The Pacific Islands Forum was created in 1971 by the leaders of newly independent countries in the Pacific who were frustrated with the South Pacific Commission of the time making decisions about their region; decisions in the hands of colonial powers including the UK, France and the US.

SCALE AND SUBSTANCE: China delivering the green dream

IN LATE OCTOBER the Smart Energy Council led a delegation of 20 smart energy companies to China to visit world leading solar PV, storage and EV manufacturers and witness the sheer scale of production.

Delegates visited Ningde, Xi'an and Shanghai as well as Suzhou, which is home to Contemporary Amperex Technology Co. Ltd whose 2022 global sales in battery cells exceeded 190GWh.

Stephanie Bashir of Nexa Advisory and Smart Energy Council board member was among the delegation; she noted the sharp contrast between CATL capacity and Australia's Energy Renaissance which aims to produce 1GWh annually at its new battery manufacturing facility from 2024.

CATL also produces battery cells which are ubiquitous, found in Apple products, EVs, energy storage systems and more; some CATL batteries can power a car for 1,000km; their fast chargers fill a car in 10 minutes. And a fun fact: staff can park and charge their cars for free at the company's solar-powered fast-charging car park.

Stephanie Bashir centre front

Large and noticeable

"Everything is bigger in China," Stephanie exclaimed. "The scale of manufacture is amazing, no amount of numbers on a page gives the visual, being there is an eye opener, particularly in the EV space with a number of brands we've never heard of."

One of the premium EV brands is NIO which this year has sold over 100,000 cars; she contrasts that with the 19,594 Teslas Australians bought in 2022.

EVs are easy to identify on China's roads due to their green number plates, among them taxis and ubers, she said, and the extent of EV uptake is having a big impact; air quality is markedly clearer that it was during her last visit in 2013 when "the air was so bad you could not see in front of you. This trip – blue skies."

A very fast train transported the SEC delegation to Shanghai where they took in BYD and LONGi Solar, which produced 95GW wafer and 85GW modules in 2022 alone.

"For comparison, Australia's Tindo Solar is capable of producing 150MW of panels each year," Stephanie noted.

Staying on comparisons, Australia's Nexport aims to lift manufacturing to 400 electric buses in the next few years whereas China's Higer Bus Company is producing tens of thousands of electric buses each year.

The SEC delegation included representatives from the SEC, CEFC, Solar Citizens, Tindale, Zest Energy and Climate Energy Finance who also visited GoodWe, and dropped in on the 2023 SNEC International Energy Storage Technology, Equipment and Application Conference & Exhibition which boasts a capacity for 100,000 attendees and 1,000 exhibition stands.

As a member of the SEC board it is worthwhile gaining knowledge about technologies in renewables markets; the SEC represents several technology sectors and businesses that are starting up or scaling, or are well established, Stephanie said.

"As an advocacy body, partnerships and relationships are what SEC does well and building relations with overseas entities which are manufacturing at scale but with whom we can't compete is nevertheless beneficial as we can establish ties which will give us leverage."

Her takeaways on the week in China? Wonderful hospitality from all the friendly and generous hosts, and some profound insights.

"The trip opens your eyes to the global perspective of what we are up against and clearly the scale of development means much for Australia; the level of ambition shown by industry and political leaders here needs to be viewed in this global context.

"We are in a global race to decarbonise, and Australia needs to create the policy, investment and industrial environment to compete, or we will get left behind," Stephanie said.

"It's clear that China has a head start on the rest of the world... it's time for Australia to catch up!

"We have our work cut out!"

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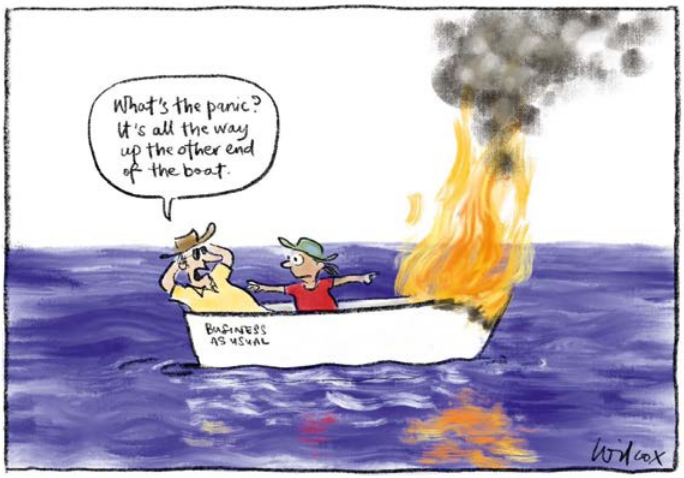
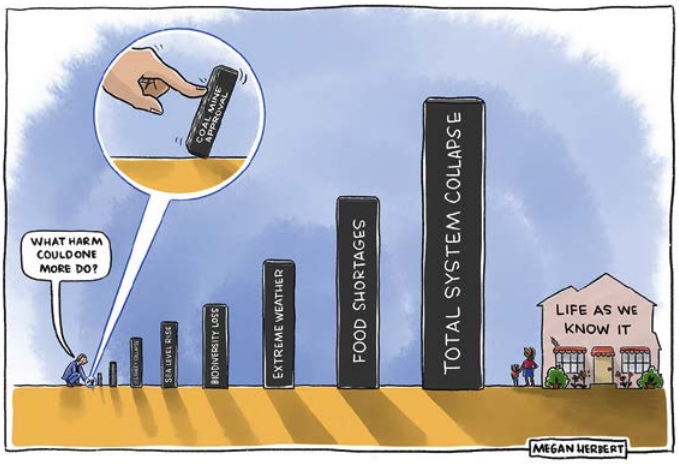
IN CASE YOU MISSED IT Two of the nation's finest cartoonists who regularly and brilliantly caricature climate crisis complacency have snapped up top awards.

Congratulations **Cathy Wilcox**, the People's Choice winner in Climate 200's first ever Climate Cartoon People's Choice Award, and **Megan Herbert** who snared the inaugural Climate Cartoon of the Year by the Climate Council at the 39th Annual Stanley Awards.

The timing of the awards coincided with the Australian Cartoonists Association 39th Annual Stanley Awards and were created to recognise cartoonists who boycotted the 2023 fossil fuel-sponsored Walkley Awards for Journalism. Nearly 1,200 people have signed the Climate 200 open letter calling on the Walkley Foundation to sever ties with Ampol and create a standalone climate awards category.





STAYING ON ACCOLADES, **Geoff Stapleton, GSES Co-founder and Director of International Training** (pictured), has been awarded the prestigious International Electrotechnical Commission 1906 Award granted in recognition of exceptional individuals who significantly advance IEC activities.

Geoff was recognised for his work on the Joint Working Group for Solar PV Energy Systems which focuses on renewable energy off-grid systems, access to electricity, rural electrification and hybrid systems.

SMART BANK **Bank Australia has launched an Electrify Your Home pilot program** to test how to create a smooth, convenient customer experience of electrifying a home.

Bank Australia has partnered with SEC member BOOMPower to provide pilot customers with a free digital home electrification assessment and access to pre-vetted suppliers and installers; they will also have the option to receive advice from the Yarra Energy Foundation and can apply for finance to cover the cost of upgrades with Bank Australia.

Georgia Windrum, Bank Australia Manager Climate Action Strategy told *Smart Energy* "Helping our customers get off gas will be critical to achieving our Climate Action Strategy with our ambitious net zero by 2035 target, and we intend to apply the learnings from this pilot to scale a broader program in the future."

IMAGE COURTESY OF BANK AUSTRALIA

CATCH ACCLAIMED SCIENTIST **Tim Flannery's Climate Changers doco** in which he searches for the missing ingredient in the fight against climate change – leadership.

The documentary was screened in cinemas nationally in September following its world premiere at the 2023 Sydney Film Festival.

"For a long time, there has been a gap in climate leadership. I wanted to dig deeper; work out why we are so lacking in climate leaders, and talk about how we can tackle this challenge," Professor Flannery (pictured right with Al Gore) said. "I met with some incredible minds during the making of this film: people who are out there doing incredible work. I hope some of the ideas explored can empower policy-makers and the broader population to instigate the changes we so desperately need." *www.climatecouncil.org.au*

AFTER A FIVE-YEAR HIATUS, Australia has re-joined support for the **United Nations Green Climate Fund for green projects** in developing nations and will make a "modest" contribution by year's end.

Launched in 2015, the fund has raised more than $20 billion in two funding rounds which among others have supported a $10m solar project in Fiji and a $47m project to help Tonga shift away from a reliance on diesel-generated power.

The fund is the fifth-largest source of climate finance in the region.

A Lowy Institute report revealed that every dollar contributed by Australia to the fund unlocked up to $1.60 in additional global climate finance.

Inking monumental deals in climate finance

PUTTING THE POWER IN PEOPLE'S HANDS **Stephanie Bashir of Nexa Advisory** has published a report with key recommendations for Energy Ministers to consider that would put customers in the centre of the energy transition: "If DER is to help accelerate Australia's decarbonisation, we need a coordinated national energy strategy. A key part of that strategy would be removing some of the barriers to DER take-up by households and businesses," she writes, before recommending the Ministers:

- Immediately establish of a national DER body with appropriate funding to:
  1. Deliver a coordinated national strategy and policy plan to accelerate DER
  2. Direct the market bodies, including the operator, on the technical and regulatory approaches to DER
- Prioritise (in parallel to the national DER body) energy programs and reforms in three key areas:
  3. Reform 'export' management and tariffs with a focus on consumer outcomes and trust
  4. Obligate network service providers to make network data publicly available to enhance innovation and competition and reduce monopoly behaviour, and
  5. Reform outdated network voltage standards in line with global best practice.

www.nexaadvisory.com.au

SMART ENERGY ACTION AND ADVOCACY

PEOPLE POWER

The Smart Energy Council is actively promoting a smarter framework for the energy sector, with a six-point plan that focuses on long term benefits to all.

The SEC's six-point plan calls on all governments to adopt a People Power Plan, a six-point plan to slash power bills by putting solar on the roofs of homes, businesses and industrial facilities, backed up by residential and commercial-scale batteries and smart energy management.

"Our fear is that unless all governments urgently unlock investment in rooftop solar – a Rooftop Revolution – we will not reach our 82% renewables and 43% emissions reductions targets," John Grimes said.

The plan was presented to the Energy and Climate Change Ministerial Council meeting in late November in Perth and prior to that at meetings with government officials at state and federal levels.

The SEC is also supporting calls from Crossbench MPs to allow landlords to access instant asset tax write-offs to install heat pumps, induction cooktops and smart, energy efficient space heating.

The recommendations are based on detailed work undertaken by the Smart Energy Council's Distributed Energy Resources Working Group comprising 50 companies (manufacturers, distributors, solar retailers and installers), and detailed and highly commended work undertaken by SEC members IEEFA and Nexa Advisory.

HIGH LEVEL MEETINGS WITH POLITICAL LEADERS, MINISTERIAL ADVISORS AND AGENCIES

The Smart Energy Council was successful in its push to list Distributed Energy Resources on the agenda of the **Energy Ministers meeting in Perth** late November, with SEC's Wayne Smith in Perth for the meeting..

Wayne regularly meets with parliamentary staffers, energy and trade ministers, and government agencies on a range of matters including the People Power Plan, boosting investment in the sector, consumer energy, residential retrofits and more.

Complementing the above efforts is the work of Government Relations Manager Leigh Heaney who continues to pen vital industry submissions and address contentious matters at federal and state level including addressing serious delays in NSW large-scale project development. All in a bid to push back against the spiralling anti-renewables, pro-nuclear, anti-offshore wind, anti-transmission crusade led by the Coalition.

INTERNATIONAL FOCUS

Richie Merzian was one of a select few invited to meet with eminent economist Jeffrey Sachs (right) hosted by The Myer Foundation and Climateworks Centre to discuss the significance of hosting COP31.

"I managed to talk to him privately and he was buoyed by the fact Australia had an ambitious target of 82% renewables by 2030 and delighted Australia aspires to host COP31," said Richie who along with John Grimes is attending **COP28 in Dubai** in December 2023 where "Our key priority will be to focus on the global call to triple renewables by 2030."

In other international developments, Richie Merzian and John Grimes briefed EU diplomats on the energy transition and met with the Tongan high commission, the island nation hosting Pacific Islands Forum 2024.

Richie at a meeting with the German Climate Minister Jennifer Morgan who was in Australia to discuss Australia's energy transition and leadership.

The SEC was delighted to join Minister Mick de Brenni at the announcement of the Queensland Government's rebates of up to $1,000 on solar hot water and heat pumps for efficient air conditioning. John Grimes hailed "Queensland is the sunshine state, the solar state and increasingly the smart energy state" and listed three key outcomes of the rebate: it strengthens the grid, helps families with power bills and helps them make smarter choices with their energy.

TECH TALK

SEC's **Connor Woulfe** has a seat on Solar Victoria's key advisory body, the **Industry and Consumer Reference Group** which implements the flagship $1.3 billion Solar Homes Program. He's been instrumental in achieving progress in shaping solar apartments which will help members including Allume.

This is one of many technical committees Connor's involved in, covering issues ranging from modelling battery uptake for potential inclusion in the small-scale renewables scheme (STCs); WA solar connections, national construction code feedback, the large scale working group; AEMO guidelines on solar standards and small scale battery policy; NEM Reform; Utility scale Renewables Working Group meetings; and facilitating a big push for big Renewables:

Connor is working with AEMO and representatives on complexities of inverter compliance; is actively involved in the Distributed Energy Resources working group and with Queensland Energy on their policy for consumer energy resources.

International Group on Climate Change: Energy Working Group meeting

Connor hosted a delegation from Norway PV Association and presented to a South African Delegation on solar and other consumer energy products, services and companies.

INSTALLER ROADSHOWS

Former SEC director and **veteran solar specialist Geoff Bragg** presented sessions in early November in Adelaide, Melbourne, Hobart and Sydney. He commented on the strong attendance and engagement of installers across Australia.

Geoff Bragg is also collaborating on the design of an Indian PV training program and a similar course tailored for the Pacific.

Keen to keep up with the Smart Energy Council?

Tune in to Twitter at: @SmartEnergyCncl

Titanium, Platinum and Gold members receive regular industry briefings & updates via the special WhatsApp group messages

KEY EVENTS

Australian Renewables Industry Summit and $100bn Big Ask: The September 11 event held in Canberra summit generated enormous media interest and has helped pave the way for significant focus on and investment in renewables which in turn benefits the economy. *Full report on page 18.*

The following day the SEC assembled a high-level delegation to address a DFAT gathering (pictured below).

Electrify Boorondara (Vic): A very popular, well attended informative event with stalls, demonstrations, ebikes and more which attracted more than 1,000 people, among them politicians "from all sides", ABC's Alan Kohler, Independent MP Monique Ryan and John Grimes.

John Grimes joined Stephanie Bashir and Ric Brazzale in a special panel discussion at Electrify Boorondara

SEC special advisor Scott Hamilton was a key presenter at the Transform Gippsland Expo 2023 in Traralgon

John Grimes chaired a meeting on practical tips for businesses to electrify at the popular **Sustainable Canberra Expo** in mid-October

He was also special guest at the **Australia India Business** event at Federal Parliament in mid-October addressing Australian clean export opportunities.

Parliamentary friends of India with Andrew Charlton and Irfan Malik

In late October John Grimes was special guest at the **Austrian National Day** which agreed that global decarbonisation will create massive opportunities between Austria and Australia. "Big shout out to SEC members Fronius, an Austrian export success story," John said.

John joined a panel at **Australian Centre for International Trade and Investment** event with Rod Sims of the Superpower Institute and Professor Fiona Beck.

In late November John Grimes presented at the prestigious **India Australia Dialogue** that featured India's top 100 stakeholders in energy.

John Grimes at the Australia India Leadership Dialogue in late November

MEMBERSHIP WEBINARS: Among the many: November 14 REC webinar with Glen Morris and November 28, with John and Wayne highlighting the vital role of the Smart Energy Council in backing a smart, sustainable future through smarter policies and regulations which are listed on these pages.

QUEENSLAND PANEL RECYCLING – THE NEXT IMPORTANT PHASE

The SEC continues to roll out its solar panel recycling program in Queensland.

The focus will be on establishing collection centres and working with local councils for tip/resources recovery, **Carlos Nunez** explained.

The model will be built on the success of the residential pilot program.

Darren Johannesen previously of The Active Group and a former solar retailer, has joined SEC to lead the project.

Emma Hall (fourth from right) at Solar Victoria meeting with delegation from Washington state and Rewiring Australia

SEC Program Manager Emma Hall is progressing renewables agenda through a series of meetings with key agencies.

FORWARD STEPS

The clock is ticking as we edge closer to 2030 when, to meet our renewables targets, we need to boost the workforce to 600,000 by finding 480,000 more workers.

The Smart Energy Council's Gender Action Plan (GAP) is intended to address the gender imbalance by attracting more women to the smart energy industry and to boost the number of workers in renewables

SEC's STRATEGY to address the demand for more workers in renewables is taking shape through the Gender Action Plan led by SEC Expert Advisor Nicolette Boele. She's ably assisted by the GAP Advisory Board of 12 leading Australian business advisors and innovators, former parliamentarians, industry associations and trade union leaders.

Much of the effort to date has been focused on compiling course content designed to increase awareness among businesses of the way staff interact with each other and to enhance appeal of the renewables sector.

The program kicked off in September when industry veteran Geoff Bragg delivered a foundations training module at the SEC's Queensland conference.

The 100 or so participants ranged from skilled installers to business owners, and all in between, who were asked to deliberate over the key question: "What is your plan to attract people to your company, to boost participation in the industry, to foster diversity, implement improvements and help others?"

"It's a 101 foundation on how to add value with gender inclusion in mind and workforce more broadly," Nicolette Boele explained. "And we are constantly refining the content and seeking feedback so we can present maximum meaning and value, and ensure all members benefit in due course."

Geoff Bragg also presented the course at the installer roadshows in November, on this occasion he condensed the content to engage time-poor participants.

The 90-minute foundations course was filmed and is available for viewing online at the SEC website, enabling all with access to the site to view the content.

Rising to the occasion

This brings SEC closer to the mid-way point of the two-year GAP pilot program which is scheduled to conclude in late 2024 and features four pillars: **R**eflect (on your concept of gender and its role in your workplace), **I**nnovate (create a plan that best fits your organisation's ambition and its resources), **S**tretch (to embed gender right throughout your organisation,

The Smart Energy Council acknowledges the significant support of the LMCF for the Gender Action Plan

products, customers relations and supply chains) and **E**levate (by playing an advocacy role to promote wider gender inclusion across our industry); in effect 'RISE' to the occasion.

The first six of the 24 steps have been mapped out in the four pillars, with sessions designed to take place online in a cohort of people with breakout sessions to enable sharing of stories.

"We are piloting this over two years and gathering all resource materials refined and signed, getting feedback and input so by the end of 2024 we should be able to scale up with other industry groups including the Energy Efficiency Council, and beyond that approach government departments for training funds," Nicolette said.

Public awareness is also vital; SEC will spread the message emphasising quality and commitment, and build the renewable energy brand more broadly through effective marketing campaigns that will include everyday spokespeople who have participated in the course, as well as some higher profile people that are easily recognisable by the public to be in step with the goals of our sector.

"Inclusive employment is the only way forward."

Members are encouraged to sign up for the Gender Action Program at www.smartenergy.org.au/gender-action-plan/

PEOPLE POWER

"Victoria's electric vehicle levy of 2.8 cents a kilometre was an obstacle to electric vehicle uptake and we need to do all we can to de-carbonise the roads. I felt like I was being punished for trying to do the right thing."

Plaintiffs in the high profile High Court case KATHLEEN DAVIES and CHRIS VANDERSTOCK: *"What Victoria had is a good example of what not to do."*

"While some people are talking about how can we get to 100% renewables what we're missing is the conversation about how can we use our renewable energy resources to make sure that we're winners in a global race to a low emissions economy."

HEIDI LEE, Beyond Zero Emissions

"Governments and regulators need to make it easier – not harder – to get more solar and more renewables on people's homes, businesses and on the energy grid. There should be a basic test for all government policies. Will they speed up, or slow down, the energy transition."

TERRI BUTLER, SEC President

"The solution is to give the 'power to the people'. Australians love rooftop solar. They love the cost of living impact, they love the climate impact, and they love the control over their own costs and assets. Distributed Energy Resources is Australia's secret weapon in transition – it is what will make us a clean energy superpower. And governments can enable it now, with a coordinated national strategy that focuses on removing barriers to DER take-up by households and businesses."

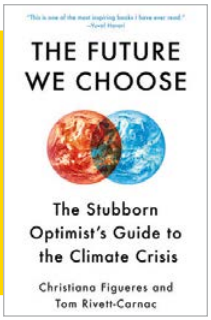
STEPHANIE BASHIR, Nexa Advisory

"Murdoch has been the largest voice in the English-speaking world – or the loudest voice, at any rate – to deny the reality of global warming and delay action to address it."

Former PM MALCOLM TURNBULL

"In recent years oil companies have rolled back their climate pledges and continually lobbied against climate regulations, while reaping record profits and 'paying dividends' to their shareholders. They could have an amazing impact on accelerating decarbonization, but they've decided not to do it."

Former UN climate chief CHRISTINA FIGUERES, co-author of *The Future We Choose: Surviving the Climate Crisis*.



"In an era of international tensions, governments need to separate climate from geopolitics. Meeting the shared goal of preventing global warming from going beyond critical thresholds requires stronger cooperation not fragmentation."

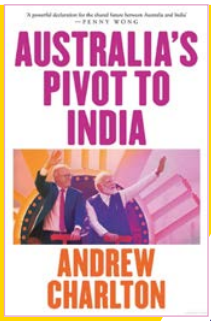
FATIH BIROL of International Energy Agency

"In reality, studies show that investments to spur renewable energy and boost energy efficiency generate far more jobs than oil and coal."

JEFF GOODELL, Author

On India's rise as the next global superpower: "When one country invests in another, it gives each a stake in the other's future… This is what will switch our interactions from transactional to mutual and elevate our relationship from friendship to partnership."

ANDREW CHARLTON, federal MP for Parramatta, author of *Pivot to India*



"I'm worried that ANZ is not playing the part a financial institution should be playing in the 21st century, in managing climate change and biodiversity risk [however its] peers are significantly reducing their fossil fuel lending in line with the International Energy Agency's finding that we must stop investing in new fossil fuel supply if we want to reach net zero emissions by 2050."

ANZ shareholder CATHERINE ROSSITER who has taken her concern to the Federal Court of Australia

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SUCCESSFUL ENERGY TRANSITION DEPENDS ON MANAGING WHEN PEOPLE USE POWER. SO HOW DO WE MAKE DEMAND MORE FLEXIBLE?

ENERGY SECURITY CONCERNS are mounting as renewable projects and transmission lines are delayed.

In New South Wales, for instance, the government has flagged it may defer the closure of Eraring coal power station beyond 2025.

NSW has other new policies to 'get the energy transition back on track'. These include expanding 'customer energy resources', such as solar panels and batteries, and increasing 'demand flexibility' (broadly, using smart technology to shift the times when businesses and homes use power).

With more variable supply from solar and wind energy, demand flexibility is a cheaper and cleaner way to keep the electricity grid stable.

Modelling for the Australian Renewable Energy Agency (ARENA) shows this approach could save consumers up to A$18 billion to 2040. Shifting demand can avoid:

- higher-priced power use at the end of the day
- building new poles and wires to increase network capacity to meet peak demand
- paying coal plants to stay open.

What does flexible demand involve?

Examples of flexible demand include:

- shifting water heating from night-time (mostly coal-powered) to daytime (using solar)
- reducing temperatures in commercial coolrooms using solar power in the middle of the day, then switching chillers off in the late afternoon until they return to standard refrigeration temperatures
- remotely controlling air conditioners to turn them down when the grid is under stress. Households get paid and don't notice if the aircon is briefly turned down, but across many homes it can make a big difference.

The Australian Energy Market Operator (AEMO) estimates NSW needs an extra 191 megawatts (MW) of capacity to maintain reliability when Eraring closes.

Another way to cover that capacity shortfall is more flexible demand. Queensland already has almost 150MW of remote-controlled air conditioning. Other types of demand management that Queensland grid operators can call on total about 900MW.

In Western Australia, a newly signed contract will provide 120MW of demand flexibility.

So what are the obstacles to more flexible demand?

ARENA commissioned the Institute for Sustainable Futures to review the pilot demand flexibility projects it has funded. Many didn't deliver as much as hoped.

Sometimes, this was because businesses were too busy with day-to-day operations or payments for households were too low to catch their interest. But often it's a matter of putting policies, technical standards and regulations in place to make demand management seamless and efficient.

ARENA has spent about $180 million on 55 projects with at least some focus on flexible demand. They include air conditioning, pool pumps and hot water systems in homes, commercial building air conditioning and electric vehicle charging.

Four ways to increase demand flexibility

What do these projects tell us about how to increase demand flexibility?

1. Better technical standards

The technical standards required of manufacturers often don't ensure devices can be used to shape demand. Many air-conditioners couldn't be controlled in ARENA pilots.

There is also no technical standard for 'inter-operability' of devices within homes. Batteries, hot water systems and other devices with different companies' technologies don't always work well together.

Vehicle-to-grid charging for electric vehicles will be the largest opportunity for demand flexibility, but there is no common technical standard. It's vital to have one before the mass uptake of electric vehicles.

Outside Victoria, smart meters that provide real-time information on home energy use are rare. The Australian Energy Market Commission has recommended governments accelerate roll-out of smart meters to 100% by 2030.

2. Simpler measurement systems

The measurement systems to calculate payments for demand flexibility are a barrier to expansion. It's tricky as you need to measure how much electricity was used relative to what would otherwise have occurred.

ARENA pilots that tried to precisely measure residential demand flexibility found it was financially unviable at the smaller scale.

The system used for AEMO's Wholesale Demand Response Mechanism (WDRM) effectively limits participation to businesses

Aerial view of Eraring power station next to coal mine and substation

OR

?

There are cheaper and cleaner ways to keep the power on than paying coal power stations like Eraring to stay open

with predictable, flat consumption profiles. This excludes as much as 80–90% of sites. International measurement models could be trialled here to open up participation.

3. More certainty about payments

Earnings from providing demand flexibility depend on weather, market prices and so on. This uncertainty makes it hard to get businesses to sign up.

Overseas, some energy markets guarantee payment for making demand flexibility available. These have the highest participation.

The federal government is consulting on a capacity investment scheme. Because it will have the same measurement system as the current mechanism, participation is likely to be limited.

4. Fresh policy approaches

Businesses that sign up under the Wholesale Demand Response Mechanism make bids in the National Electricity Market to be paid for reducing their power use when demand and prices are high. This should reduce prices for all consumers and improve energy security when the grid is under stress. However, it has attracted only one participant – mainly due to the complex measurement system – and isn't open to households.

Another incentive scheme for electricity networks to invest in demand management is chronically under-used.

There are simpler alternatives that have worked before. The national Renewable Energy Target and state energy efficiency certificate schemes fund rooftop solar or energy retrofits based on average output or energy savings from past experience. These simple calculations offer a relatively stable incentive, which could work for demand flexibility.

NSW's Peak Demand Reduction Scheme, launched last year, could provide a model for using certificate schemes to boost demand flexibility.

Get serious about demand flexibility

The focus of NSW's development of a customer energy resources policy appears to be on 'virtual power plants'. These co-ordinate household solar and battery systems to store solar power and export to the grid when it's most needed.

Batteries are part of the solution, but cheaper options exist. An electric water heater with a 300-litre tank can store as much energy as a second-generation Tesla battery at much less cost.

Modelling for ARENA finds hot water systems could store as much energy as more than two million household batteries. Retrofitting these systems will spread savings more widely to include low-income households as well as those that can afford a battery.

It's time we got serious about developing a holistic demand flexibility strategy. It will be cheaper and cleaner than paying coal plants to stay open.

Chris Briggs is Research Director, Institute for Sustainable Futures, University of Technology Sydney. The Institute for Sustainable Futures is the knowledge sharing agent for the Australian Renewable Energy Agency's demand flexibility portfolio. ARENA provided funding for the review of its demand flexibility pilots referred to in the article. The views in this article are those of the author and should not be considered the views of ARENA.

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Solar and storage's positive trends and impact

***Warwick Johnston** of SunWiz presents a series of graphs and insights into the strength of the solar and storage market. Key takeaways are listed here.*

1. PV uptake continues to rise

This is primarily attributed to the attractive and affordable price of rooftop PV, coupled with cost of living pressures which have caused people to act to rein in energy bills. Prices of solar PV continue to fall so people are getting more bang for their buck, and good value for their money.

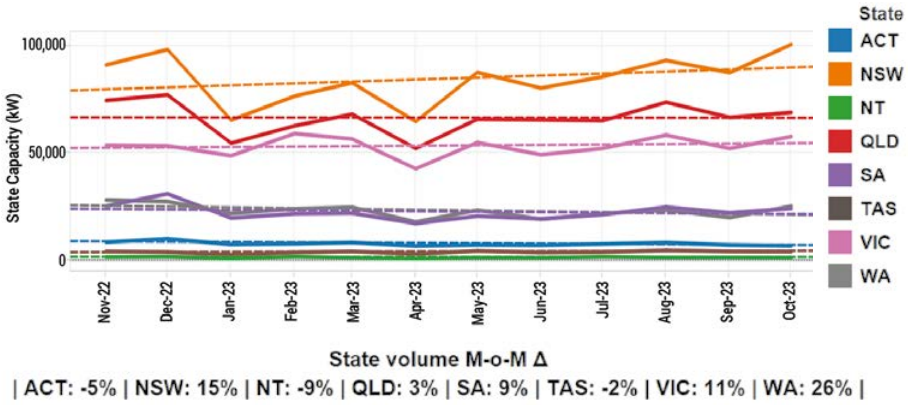
2. Energy storage is setting record highs

The overall strength of the energy storage market is partly driven by the Victorian government's removal of the subsidy and replacement with a loan which brought forward many customers and caused a surge. Storage uptake is also affected by the increasing gap between import and export feed-in tariffs.

There is also the perception by many that the world is an uncertain place, they look to electrify homes for security.

Chart 1. Growth Driven by NSW, Qld & Vic

States' contribution to the nation – registered STC capacity by state



State volume M-o-M Δ

| ACT: -5% | NSW: 15% | NT: -9% | QLD: 3% | SA: 9% | TAS: -2% | VIC: 11% | WA: 26% |

This chart shows the capacity of SRES (sub-100kW) installations by state and month of system registration

3. Commercial boom continues

Small scale technology certificates (STC) data reveals that the commercial installation sector is on track for record months; medium volumes are well above any previous recorded.

Why so? Electricity prices are a major driver combined with those driven to meet their deeming targets.

There is also commonly a lag between when electricity prices rise and when businesses act, and momentum is building.

4. Leading states

True to form NSW, Queensland and Victoria lead the way in small scale installations, followed by South Australia – Chart 1 says it all.

5. PV system sizes

Chart 2 documents state PV system sizes over the past six years, highlighting incremental increases in system sizes over the years. Although the most commonly installed residential system today is 6.6kW we are starting to see those in the 10-15kW ranges; that is where the growth is. Homeowners have in mind battery storage and electrification of vehicles.

Industry these days encourages people to install the biggest size they can because there are barriers to adding more later. Now is a good chance to do it right first time; stifling high mortgages are not working against the industry.

6. Hot water heat pumps

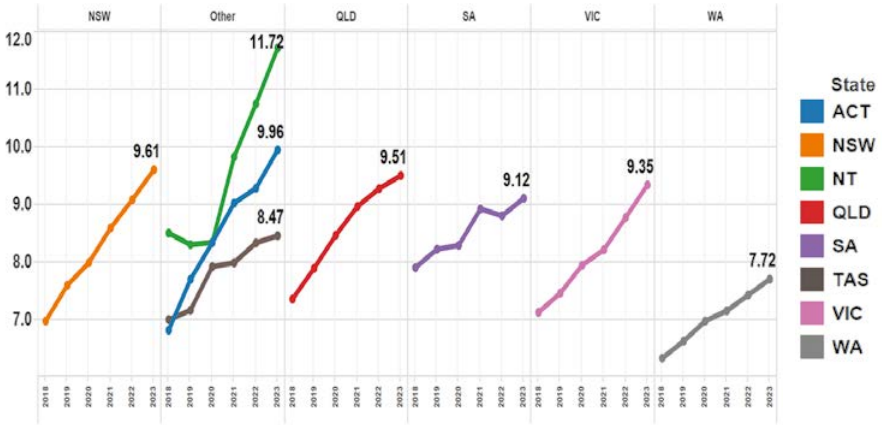
More people are opting for hot water heat pumps as a first preference for reducing utility bills. Even those having to finance a system are ahead; a significant proportion is financed and continues to be so.

7. Payback is improving

Chart 3 tracks the trend, with residential PV + ESS and PV-only revealing healthy rates of decline.

Chart 2. All states observe increasing average system sizes

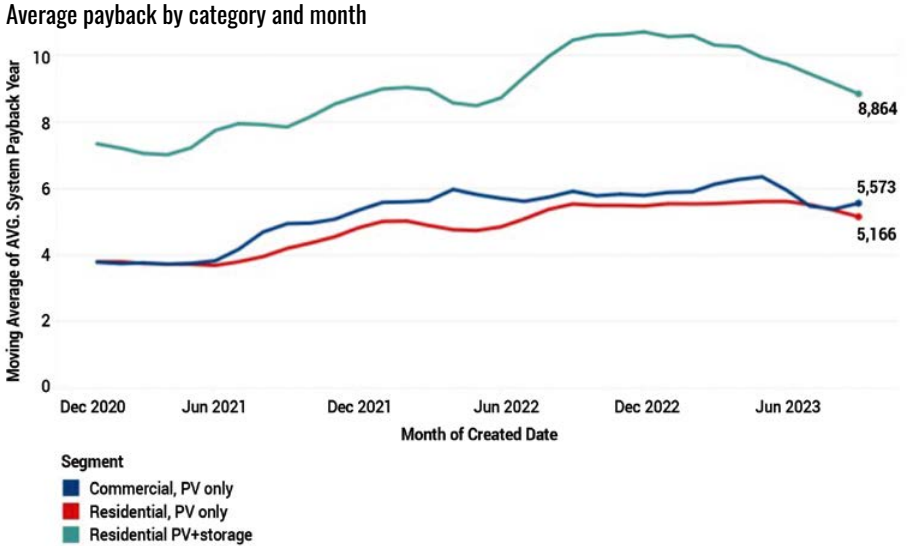
Annual average system size by state



QLD and TAS are the states whose average system size hasn't increased substantially in 2023 to date. This chart shows the national average system size broken down by year, over the last 6 years, broken down by state

Chart 3. Payback improving for Resi PV + ESS & PV-only

Average payback by category and month



8. 2024 – what to expect

Outstanding growth and a record year, strong EV sales will bolster the PV market.

Around 100,000 EVs were sold in 2023; it won't be long till that is 300,000 or more a year and that will drive more solar and storage uptake.

Further, state and federal governments are moving towards greater stimulation of renewables and speeding traction through behind-the-meter energy systems.

Green Energy Markets: STCs

PV: Formbay remains the top creator, with an annual market share of around 22%.
OSW/Advance Finance Solutions remains the top creator in the retailer/wholesaler space with an average of around 11.1% market share.
Chromagen Australia leads in both the solar water heater market (24.9%) and in the air source heat pumps market (14.9%).

As the Prime Minister says, *"We love solar in Australia. We've put 60 million solar panels on our roofs in the last ten years. And to meet our targets, we need to put another 60 million on in the next seven years."*

THE 2024 SUNWIZ AWARDS CEREMONY

RETURNS BIGGER AND BETTER!

The 2023 awards venue was jam packed with SunWiz Award winners!

A much bigger room to accommodate all winners and contenders has been booked at the Smart Energy Expo in March 2024.

There are multiple benefits of being involved in the Awards, the presentation will be videotaped, helping award winners to promote their award-winning status, enhancing brand awareness and raising business profile.

There will be a combination of still and moving media channels, social media posts, lapel pins and badges, and more. You have to be in it to win it!

Note: to be eligible for the Volume Awards, contenders need to submit STC data to SunWiz. Other evidence will need to be presented, eg for eligibility in customer review ratings.

info@sunwiz.com.au

Chart 4. Volume installed in postcodes from Qld on average are the highest

All-time top 10 postcode volumes by state

This chart shows the volume of capacity (kW) installed by postcode for the top 10 postcodes in each state and is sorted by total capacity installed over all-time. Data sourced from CER

sonnen

The energy transition is for everyone.

We are the connection to a sustainable energy future.

The number of people using sonnen products is growing every day. We call them the sonnenCommunity.

We are visionaries who share a common goal:
clean, reliable, and affordable energy for all.

We are pioneers in clean energy:

We are prosumers, using energy that we generate ourselves.

We are connected so every person who joins makes the sonnenCommunity stronger – including you.

"sonnen is more than just a global leader in home battery solutions; they are a game-changer for homeowners seeking energy independence. With sonnen, we now have 24/7 access to stored clean energy, ensuring our home is powered not just during the day but also at night and even during power outages. sonnen's commitment to reliability and sustainability has reshaped the way we power our home, and we couldn't be more impressed with the results."

Alisa & Lysandra Fraser – **The Design Duo**

sonnen

ELECTRIFYING NOOSA

Communities in and around Noosa are reducing emissions thanks to the Zero Emissions Noosa team who are successfully spreading the message about renewable energy.

NOOSA AND SURROUNDS offer something for everyone, from the sandy beaches and clifftop coastal paths to the scenic hilly hinterlands and craft markets capped off in the region blessed with a temperate climate and long sunny days.

Little wonder the region is a magnet for holiday makers, retirees and an increasing number of young families. And long may the largely unspoilt atmosphere continue, aided by a not-for-profit community group Zero Emission Noosa established in 2017 by former councillor Vivienne Griffin and others to assist the local community in achieving net zero greenhouse gas emissions by 2026.

Anne Kennedy, who is the driving force of ZEN today said "Our mission centres on building awareness about emission reductions and cost savings from electrifying homes; we empower residents, businesses and community organisations on energy efficiency, zero emission transport and innovative local commercial activity.

"One of our two foci is stationary energy promoted through our Zen Electricity Group (ZENE) which encourages people and businesses to install solar PV. We provide tips about solar, finance, landlord/renters kits and government incentives and subsidies, and generally assist them to ask the right questions when seeking energy solutions."

Unsurprisingly, Noosa Shire boasts some of the highest rates of rooftop PV uptake in the nation. "Solar uptake in the region is tangible, with an average of 44.8 per cent take-up on residential roofs. There's a noticeable difference however with the hinterland's higher uptake compared to Noosa Heads and the beaches area due to the higher concentration of residential and business strata developments.

"Strata is notoriously difficult when it comes to solar uptake but we are actively highlighting the potential for business properties and tourism accommodation to increase embedded networks to minimise daily charges and free up funds for solar installations.

"One exception is the 500kW residential units in Tewantin (see image below) which has led to business models which we are outlining in our 'Solar for Strata' project and online manual now being developed," Anne explained.

ZEN's second focus in on transport energy, ie uptake of electric cars, e-scooters or e-bikes; this is expedited by the Zen Transport Action Group (ZENTAG) through guided e-bike rides and the annual Noosa EV Expo & Street Fest.

Clearly the EV expos staged over the past five years are reaping results, numbers of participants have increased exponentially and sales of EVs shot up in the shire.

Anne Kennedy of Zero Emissions Noosa has compiled a detailed presentation for community gatherings which demonstrates the impact of greenhouse gas emissions on climate change by highlighting the dangerous rises in carbon dioxide, global temperatures, ice melts and sea levels over the decades.

The 500kW residential units in Tewantin have provided the impetus for new business models

Clocking up wins

In other developments, Noosaville was one of the areas chosen for a community-owned battery thanks to ZEN's active work in this area with Yarra Energy Foundation and Noosa Council.

Anne is justifiably proud of ZEN's achievement, stating, "We were successful in gaining funding, now plans for a battery in Noosaville are being progressed through a consortium involving Yarra Energy Foundation and Noosa Council.

"This shows what communities can do! We'll have the only community-owned community battery in Queensland," she said.

There is a place for all these technologies in the puzzle.

"Many areas within Noosa Shire are solar positive during the day with rooftops generating significant amounts that are fed back into grid. Ideally we would see several hundred community batteries installed in the shire to help soak up excess solar.

"I believe there is a very important role for community energy in the whole transition to renewables and electrification. Governments have concentrated on high level infrastructure and policy development, now is the time for community energy to raise its profile.

"We need to join the dots and include community energy as part of the total solution,

ZEN Chair Anne Kennedy (centre) with the committed team of Zero Emissions Noosa (ZEN) volunteers whose goal is to facilitate net zero greenhouse gas emissions for the Noosa Shire by 2026

which is what the SEC strongly stands for ", said Anne who is a prominent advocate for councils to extend Environmental Upgrade Agreements to residential households; Queensland's Energy and Jobs Plan currently limits this to commercial properties.

In other notable achievements, ZEN is one of ten partners to work with Saul Griffith of Rewiring Australia to electrify everything.

"'Rewiring Noosa – electrify everything' is our project and we regard transport as integral to electrification," commented Anne whose passion is only matched by the hours she puts into ZEN.

Reflections

"Making a difference is what drives me, seeing there are solutions to the climate situation and understanding the consequences of failing to act. It's about paving the way for greater uptake of renewable energies. On this we are in step with the Smart Energy Council.

"Yes we encounter some nay-sayers, climate deniers, trolls on facebook and like any community there are those in favour of our efforts and others who are not, but we keep moving forward, we work around the challenges and barriers.

"We are happy with our progress, as a volunteer organisation we have done some pretty amazing things. Critical to our success is our a team of passionate volunteers putting in a phenomenal effort, and working collaboratively with Noosa Shire which has funded many of our cutting-edge projects."

Anne lists those passionate volunteers as the number one ingredient for success for like-minded groups: those who want to be part of the energy transition and to make a difference; it is also critically important to have collaborative relationships with key stakeholders, she said, councils in particular.

On the drawing board now? Building on the pilot community battery and Rewiring Noosa projects to bring the community on the electrification and emissions reduction journey.

www.zeroemissionsnoosa.com
info@zeroemissionsnoosa.com.au

PUTTING ENERGY INTO ACTION

SMART ENERGY COUNCIL

The **SMART ENERGY COUNCIL** is the peak body of the smart energy sector in Australia. We are a not-for-profit, membership-based organisation with around 1,000 members nationwide, consisting of companies and individuals operating in this rapidly expanding industry.

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

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

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

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The **SMART ENERGY COUNCIL:**

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

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

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

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

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Supply Partners Group

Did you know non-electricians can become accredited solar & battery designers?

As of December 2022, a series of exciting new **Nationally Recognised Renewable Training Units** were released. A new pathway now exists for sales, administration and support roles across our industry to upskill and become accredited. At **New Energy Training**, we're excited to be providing courses for this new pathway with no prior qualifications needed.

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Delivered in partnership with New Energy Training Pty Ltd (RTO Number 45919)

Recharge + refresh

MORE THAN 150 INDUSTRY ENTHUSIASTS got into the spirit of the fun and purpose-filled 'Recharge your Spark' event organised by Australian Women in Solar Energy (AWISE) on the fringe of All-Energy in late October.

'Authenticity' was the theme of the uplifting address on personal and professional development by **Heather Yelland of The Elevation Company**, complemented by her colleague Lisa Taylor's presentation on personal branding which drew the consensus "inspiring and motivating".

For her part, **Victorian Energy Minister Lily D'Ambrosio** was all about affirmation. The Minister highlighted the significant impact that AWISE is having on the industry and emphasised the support that the government and organisations like AWISE can offer women entering trades or non-traditional roles.

AWISE has received $100,000 from Minister D'Ambrosio to run their mentoring program Solar Sisters, a program to mentor women already working in the solar industry in Victoria with the aim around career mentoring/ progression and retention.

Then there's the Solar in Schools program which was announced by **Minister Natalie Hutchins**, Minister for Women as well as Jobs and Industry, and is a program designed to speak to young women in schools about all the opportunities that exist in the renewable energy industry.

"We are hoping these two programs will be seen and picked up by other state governments and rolled out in other areas," said Bobbi McKibbin of the AWISE committee. "And we hope to gain further funding to be able to continue these programs."

Dolores Dowdall of SolarJuice left a firm impression on participants with her candid account about how much harder she had to work, as a woman, simply to prove her worth in renewables. Several years on and she's still punching above her weight, however she feels change is in the air.

"Dolores is an amazing woman and many at our event identified with her experience; she was particularly inspirational for the younger women and new entrants into our industry," Bobbi said.

Capping off the day was the presentation of certificates to participants in the WAVE program, a pre-vocation course for women, as well as the awarding of Training Scholarships from New Energy Training for their three new courses for non-trade qualified people. These were presented to Marjo Young of Leeson Group; Alison McDiarmid of Total Solar Solutions, and Danica (Dani) Perisic of Formbay. Nearly 100 women have now participated in the program that is successfully addressing the gender gap.

Committee accolade and credit

Happily, the AWISE board of hard working, dedicated volunteers: Sam Craft, Sophie Wright, Christine Kennedy, Lily Pejkic and Bobbi benefitted from the day-long event that entailed significant planning.

"This really helped recharge our spark, as did all the amazing feedback we have had since," Bobbi said. "We are growing so much. There is great demand out there now for supportive programs in the industry.

"We are the fastest growing industry in the country, possibly the world."

Another supremely successful and energised AWISE event "to embrace diversity, network with like-minded industry colleagues and recharge your spark!"

Other states are keen to stage local AWISE events and programs, she said, and soon AWISE will be rolling out state chapters; the movement will continue to grow and to flourish, and have an even greater impact on the sector.

What's next? SEC event organiser Zoe Grimes is drawing up plans with AWISE for a big bash at Smart Energy 2024, Sydney ICC in early March.

Stay tuned for more details on what's now dubbed "The hottest ticket in town".

"We are growing so much. There is great demand out there now for supportive programs in the industry… We are the fastest growing industry in the country, possibly the world."

Greenbank's Ria O'Hehir takes centre stage with one of her trademark signs, amid wholesalers, installers, sales and admin staff gathered for an action packed day full of highlights

greenbank environmental

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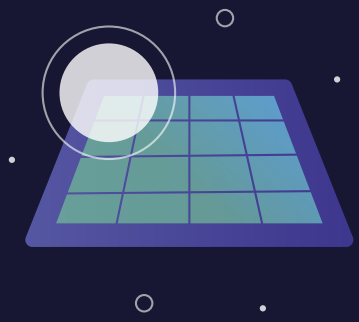

NATIONAL
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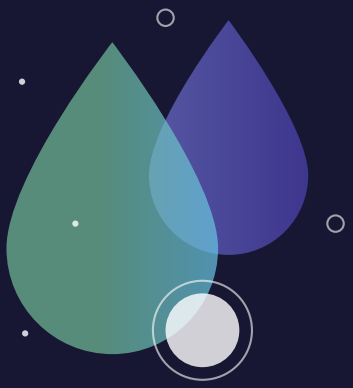

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or visit **green-bank.com.au**

Constructive communities

SMART ENERGY RECENTLY CAUGHT UP WITH Michael Frangos of Indigenous Energy Australia who is in the box seat to drive developments having worked in industry and been lobbying for better energy outcomes for First Nations People for over 17 years.

"Our whole approach at the IEA is to determine how to unlock First Nations community aspirations with energy – flipping the current model of community engagement on its head, and working from community outcomes backwards to the project at hand," Michael said.

The work of IEA inevitably dovetails with the First Nations Clean Energy Network.

"We essentially implement what they advocate and feed into what they are saying with our on-the-ground experiences," Michael explained. "This is all semi-formal; we have regular catch-ups with them and are currently formalising the relationship."

IEA's two main prongs are knowledge sharing and project development (the core business, to develop infrastructure in a way that enables communities to achieve their economic and social goals). Following is a colourful example of one successful project.

From drawing board to reality: Powering up the Lockhart River community, a case study

Lockhart River is about as far north in Queensland as you can go, an idyllic coastal setting that is home to a population of 700 Traditional Owners spanning Kanthanumpu, Uutaalnganu, Umpila and Batavia people.

Today, thanks to the good work of the IEA, the small settlement is powered by a rooftop solar and battery hybrid system (for cloud smoothing) coupled with a diesel generator. In all, 130 households are decarbonised, saving the community $90,000 a year ($100/household) in energy bills.

The diesel offset of 75,000 litres has resulted in 365 tonnes a year of emissions abatement.

After successfully overcoming an early speed bump involving community engagement, solar contractor Australian Sustainable Energy coordinated with the community in a move facilitated by the IEA and Lockhart River Aboriginal Shire Council. From there, all systems go. Weather permitting...

Traditional Knowledge came to the fore with Indigenous science in the form of 'bio-indicators' which have been used in Aboriginal culture to guide traditional custodians to care for, and understand, their lands for 60,000 years. This was used in the management of the project to predict weather conditions ahead of the Bureau of Meteorology and respond appropriately.

Picturesque Lockhart River; the community aims to further establish the eco-resort to capitalise on the community's natural beauty

The 209kW solar system with 60kW battery storage installed across council offices, school and council depot

In this case, to de-mobilise ahead of an intense deluge prior to the peak rainy season.

Local Labour. Two traditional owners were involved in the physical install, and both recognised for their hard work and dedication. Importantly, the involvement of local labour enabled the community to have an extra degree of input into the project given locals were physically installing their own energy system.

"Ultimately the Lockhart River Project was an excellent success in terms of community outcomes and cost," Michael reported.

"The Lockhart River project is a great example of a motivated community and principal contractor collaborating and reducing costs by adapting the project to community characteristics, and community needs, and by leveraging community and Indigenous knowledge."

IEA, ASE and the Lockhart River now aim to work together to develop a number of the community's long-term goals, one being a 4-Star eco-resort.

SEC Program Manager Emma Hall is working with Michael along with other First Nation Organisations with a view to presentations at the March conference and ensuring First Nations voices are heard within the industry. *www.indigenousenergyaustralia.com*

Indigenous Energy Australia

Indigenous Energy Australia (IEA) is an Aboriginal profit-for-purpose organisation committed to combating climate change and improving the livelihoods of remote, regional, vulnerable and Indigenous Australians.

IEA achieves these commitments through the development of enabling infrastructure (electricity, water, telecoms, transport, waste and wastewater) with communities.

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MARKET MANOEUVRES

Here we talk to Lliam Ricketts, Marketing and Innovation Director of wholesaler Supply Partners about his past and present experiences, expectations of the future and how certain polices would help.

SMART ENERGY: First up, can you give us an idea of an everyday business issue you have to navigate?

Lliam: *One good example is deciding what opportunities or new products to focus on, we are regularly approached by manufacturers and service providers who desire Supply Partners to push their product or service. The cost of time and resources to conduct due diligence on a new opportunity is expensive and comes at an opportunity cost.*

SE: How do you successfully pre-empt trends to ensure adequate stock at all times?

Lliam: *As a wholesaler we rely on constant communication with our customers, the solar retailers, as to their pipeline, ie what is changing and what customers are buying.*

At times it can be a challenging balance between manufacturer and client supply and demand. Our procurement process is always evolving with the future of the market.

SE: What has helped you to build the business?

Lliam: *Having installed 5,000 houses with solar PV and small portfolio commercial systems before fully focusing on wholesale distribution I found my unique perspective useful in that I understood that side of the business. So as our tagline goes we are "not just a box mover". Staff understand technical drawings and can provide tech support and DIFOTS – that's Delivery In Full On Time.*

SE: What are the main changes you have observed in the market over the past 14 years?

Lliam: *Back in 2009 the average residential solar system was just 1-1.5kW and there was very little PV in the commercial space. Today the average PV rooftop system is around 9kW and battery attachment rates are starting to soar.*

Electric vehicles are impacting decisions; many people either already have an EV or are considering purchasing one and want their home energy system to be EV ready.

So these days it's not just about solar, it's about energy as a whole, people are regarding their energy system and the eco system in their home.

In terms of the growth of the industry what's noteworthy is just how much manufacturing has scaled up and prices have come down, and how this has put a rocket under uptake.

For example in 2009 panels were priced at US$3 per watt and now they are under US$0.50 cents! The levelised cost of energy is now so attractive, scale and cost are driving the market.

Manufacturers are now moving fast to N type cells; Heterojunction cells or HJT is the new buzz word (an N type cell with thin film over the cell to capture power generation as it passes through).

SE: What can you tell us about any particularly tough times you have endured as a wholesaler?

Lliam: *Lots of challenges! Especially during solar coaster rides, the most recent being the floods that engulfed eastern Australia in March 2021. All wholesalers looked forward to a good year ahead in 2021 and purchased stock for the anticipated sales, however the natural disaster, the rains and flooding just continued so installers couldn't get on roofs to complete projects. Mother nature threw a curve ball at us!*

Most wholesalers had already contracted the stock – it was either being manufactured or on the water. This resulted in a glut of stock in the market where competitors used the lever of price to offload goods. Everyone started undercutting and selling at a loss.

By late 2021 we all experienced big write downs.

SE: What will the average home look like in 10 years – what technologies will be dominant and how widespread?

Lliam: *Rooftop solar will be much bigger as people maximise what they can fit on their home to future proof it with battery storage and EVs. Most will also have home automation with load control.*

The next big and exciting change then will be EVs with vehicle-to-grid capabilities.

Virtual power plants are the future – we are already seeing this and interesting innovations from retailers such as new electricity retailer models where the end user participates on the wholesale market similar to the large power stations; homeowners can sell the energy generated and stored in the home battery to the market at good prices, making big profits. This is changing the traditional relationship between the electricity retailer and the customer.

Think of it: the average home battery is about 10-15kWs whereas EVs carry 80kW batteries. That is a lot of storage to discharge into the network!

SE: What headwinds might we encounter?

Lliam: *The main issue would be a shortage of microchips at manufacturing level; this could stall the industry. That and data breaches during shipping and with ports locked up causing sea freight constraints.*

(During COVID the cost of shipping a container from China soared to $12,000, after which it sat at an average $3,000, now it's under $1,000.)

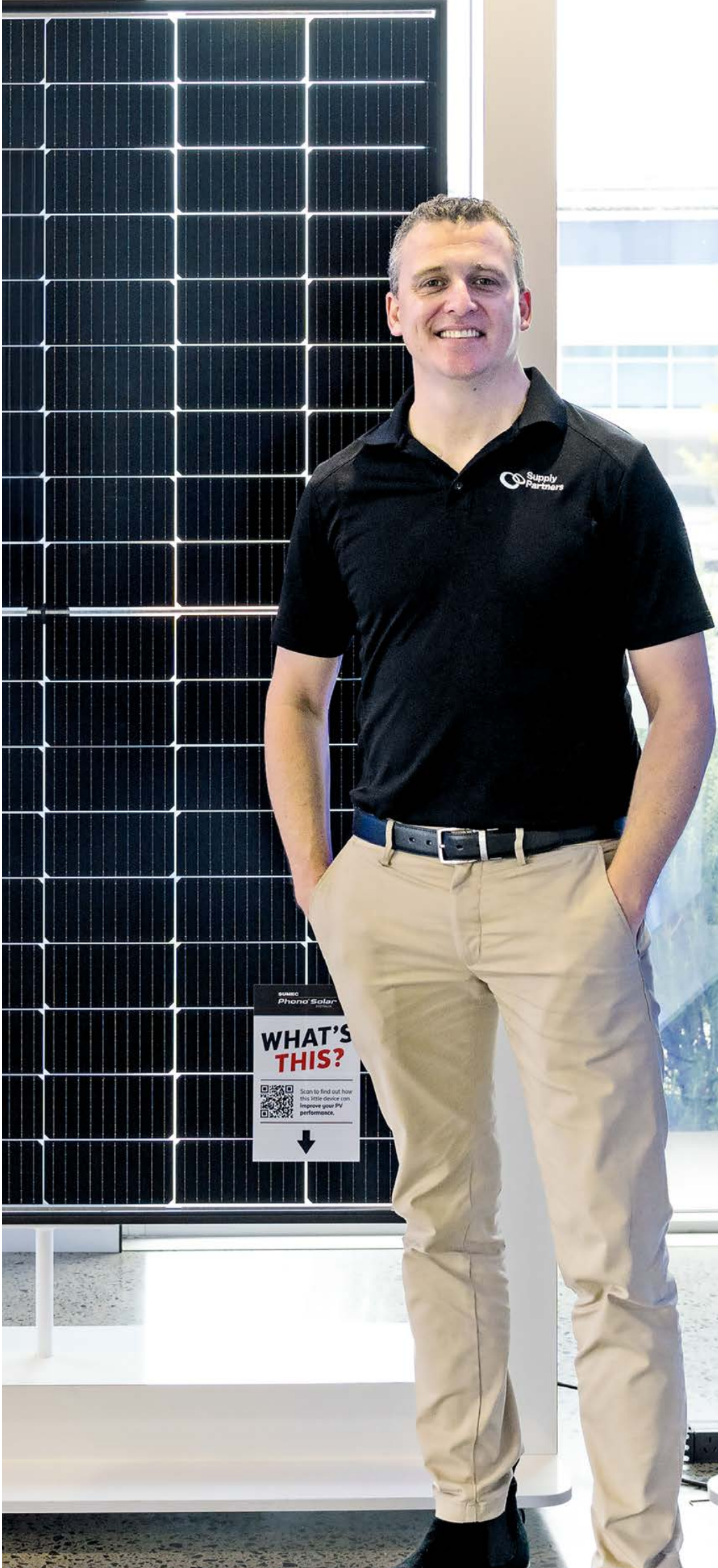
SE: Any messages for politicians or powers that be?

Lliam: *Yes! Industry needs federal subsidies for residential and commercial energy storage, this should be supported with policies and incentives.*

Subsidies make sense for Distributed Energy Resources. In line with this we need to expand the Renewable Energy Target to allow batteries to be eligible for STCs (small scale certificates).

SE: Your favourite podcast?

Lliam: *Solarcoaster! Presented by Wade Allen and Andrew Thompson.*



NEW FACES

The Smart Energy Council welcomes new staff and a couple of babies!

PROGRAM MANAGER EMMA HALL

A distinguished industry professional with a proven track record spanning more than thirty years, Emma brings to the table a wealth of expertise in membership and event strategy as well as a strong business background. Emma's academic background is grounded in the realm of association and event management, further reinforced by the attainment of a Bachelor of Business with a major in Marketing.

Emma's career narrative has been defined by an unwavering commitment to harmonising member-centric entities with value-driven products and services. Over the years, Emma has forged relationships through strategic partnerships and relationships, while meticulously cultivating brand identities that resonate authentically with the target audience.

In all work Emma undertakes, every facet of her decision-making process, is to consistently steer initiatives towards outcomes that not only enhance the bottom line but also amplify the value proposition for members and the organisation.

SEC BOARD MEMBER TARRYN LANE and her partner Felix Wilson welcomed gorgeous little Tove Saffron Lane into the world on August 24, 2023.

"Being a new mum represents a new phase and every day is a learning experience that I'm so grateful to have," Tarryn told *Smart Energy.*

"Life has slowed down and reorientated a little. We live directly on the Loddon River in northern Victoria and baby Tove loves the sound of the water, she is happiest when we walk along the river."

Taryn added she's missing dinners at excellent restaurants, but likes to think they will resume before too long!

Dan, Ria and baby Georgia

SEC EVENT MANAGER RIA KELLEHER is on maternity leave after giving birth to beautiful baby girl Georgia on September 10, 2023.

Between feeds and baby burps she told Smart Energy "Being a first-time mum is hard work but so rewarding! I couldn't be more in love!

"Life has changed... Waking up everyday knowing you're in charge of a mini human is a lot of responsibility! Relying on a few hours of sleep is tough but it's great to live all the firsts. Georgia is becoming more alert and we're even getting some smiles from her.

"With both Dan and I hailing from the UK, we've had both sets of grandparents come visit and Georgia has already seen a lot of the Sydney sights, her favourite being the Harbour Bridge!

"There hasn't been much time to think about work and SEC but I do miss it! I've been kept up to date but following along on LinkedIn! Can't wait to bring Georgia along to the SEC Expo in March and teach her all about saving the planet!"

DIARY NOTE

The Better Futures Forum on 8 – 9 October 2024 in Canberra and online, convened by partners including the Smart Energy Council, is set to redefine Australia's climate policy and catalyse ambitious climate action in the upcoming government term.

Better Futures Australia brings together public and private sector leaders to scale success stories and demonstrate Australia's readiness for an ambitious national response to climate change.

Smart Energy Council chief executive and Better Futures Australia Champion, John Grimes, says "The Better Futures Forum is the genesis of a sustainable, prosperous Australia, capitalising on our rich renewable resources and we're calling on Smart Energy Council members to be part of this groundbreaking journey. Members insights and participation are crucial as we collectively strive for a climate-resilient and sustainable future."

www.betterfutures.org.au/forum

Charging forward with NRMA Electric

We're working hard to prepare our members and communities for the future of transport. By rolling out Australia's largest regional electric vehicle charging network supported by renewable energy, we're ensuring that every community remains connected.

Scan the QR code or visit mynrma.com.au/electric

AlphaESS: Transforming Homes into Energy-Efficient, Profit-Generating Powerhouses

ALPHAESS IS ON A MISSION TO REVOLUTIONISE the way Australians use and generate energy. Our residential energy storage solutions are increasingly being designed with a focus on Virtual Power Plant contributions. Specifically, our third-generation residential solutions are equipped with FAST FCAS (Frequency Control Ancillary Services) technology, and have set a new standard for efficiency, reliability, and cost-effectiveness. The FAST FCAS function allows faster response to the grid frequency fluctuations, ensuring stability and security for the entire power grid… but what does this mean for the homeowners?

Incorporating FAST FCAS into our products allows AlphaESS battery owners to join the growing number of Virtual Power Plant offers available in Australia. Joining a Virtual Power Plant is like leasing your battery to a company who will then use it to support the grid. The homeowner is still provided with the benefits of owning their battery, but they get additional benefits from allowing a VPP to use the same battery when the grid needs support.

Joining a VPP has a two-fold benefit:

1) It helps to secure our power grid – a home's power supply, especially during periods of high demand and unexpected grid disturbances, can help stabilise grid issues and, combined with thousands of other home batteries, can keep the lights on where otherwise there may be widespread blackouts or curtailment. This will become more important in the years to come as coal-fired generation continues to be phased out.

2) The FAST FCAS technology allows the AlphaESS system to participate in more services in a VPP. The mechanism for supporting stable Frequency in Australia is complex, but VPP operators who can use a battery in faster responses to frequency issues receive higher revenues which they pass on to AlphaESS battery owners through more attractive VPP offerings.

Well-designed batteries can provide exceptionally fast support to the grid, much faster than generators can react, and this fast support means AlphaESS battery owners in VPPs can save even more money.

VPPs are the future of residential energy management. AlphaESS's SMILE-G3s are perfectly aligned with this concept. When a system is part of a VPP, it can also sell excess energy back to the grid during peak hours, earning owners additional income.

Joining a VPP is easy with an AlphaESS Battery – our products are also compatible with 'Bring Your Own Battery' (BYOB) power plans offered by leading energy retailers across Australia.

Alphaess

The AlphaESS wrap

Leading Technology: Fast FCAS for VPP, Unique API, SN Binding Control: AlphaESS leads the industry by offering one of the fastest Frequency Control Ancillary Services for Virtual Power Plants (VPP) in the Australian market.

Being one of the few brands that can deliver this level of service, our residential solutions are fully compatible with "Bring Your Own Battery" (BYOB) Energy Plans offered by leading Australian energy retailers, maximising potential energy gains/savings. VPPs allow Alpha battery owners to save even more money from their battery, with no additional investment.

Easy and Fast Installation: AlphaESS solutions are designed with ease of installation in mind, making them an attractive option for both homeowners and businesses.

Money Matters: In many cases, an AlphaESS battery will pay itself off many years faster than other brands.

Local Technical Support Team: AlphaESS provides comprehensive aftersales support from a dedicated support team within their Australian offices.

Residential to Commercial: AlphaESS Australia is expanding its growing commercial energy storage offerings. The new Hybrid 30kW battery system aims to fill the gap between residential systems and large commercial units, completing the Alpha range from small apartments to businesses and through to utility-scale installations.

www.alphaess.au
Tech Support: (02) 9000 7676, techsupport@alphaess.au

Visit the AlphaESS team at Smart Energy Conference and Exhibition, March 6-7 2024 at stand Titanium 3.

5B turns brownfields into green fields

SOLAR PIONEER 5B is witnessing an uptick in demand from mining and industrial companies using its low-ground penetrating utility-scale array to repurpose waste deposits and contaminated land into clean energy hubs.

The company, which unveiled the first deployment of its next generation cyclone-resilient technology on the Tiwi Islands in the Northern Territory in November, has completed production of 342 relocatable 50KWp 5B Maverick arrays bound for a Western Australian overburden rock dump.

Repurposing rock dumps

5B chief strategy officer, Nicole Kuepper-Russell says these types of "impacted" land sites have been tricky to repurpose for renewable energy generation because conventional technologies require deep drilling for stability. 5B's prefabricated ballasted arrays do not.

"Not all waste rock dumps or tailings dams will be suitable for solar farms, but many are," Kuepper-Russell says.

"What's more, many have fat network connections giving operators the option to eat what they kill from an energy generation perspective and accelerate their decarbonisation agenda or feed surplus into the grid. We need to think about leveraging existing infrastructure as much as possible in the energy transition," she says.

Converting tailings dams into clean energy hubs

5B expects strong demand in the coming 12 months from resources companies looking for productive applications for waste rock dumps and retired tailings dams at remote open pit mines.

Like rubbish dumps, the waste at rock dumps continues to settle for years, often making them too unstable to build on, while the membrane on retired tailings dams makes piling for conventional single axis trackers tricky. This is less of a concern for 5B's ballasted Maverick technology.

"Operators of industrial processing facilities are looking for ways to reuse and repurpose impacted land," Kuepper-Russell says.

"The main driver for the utilisation of these rock dumps is the land constraints that mine sites face."

"We want to see more opportunities like these to increase the speed at which we can deploy solar energy. Solar farms on contaminated land are a win-win because it's typically land that can't be developed for other uses."

5B has been watching the retirement of coal-fired power plants around the country

Trash to treasure: 5B converts Albury rubbish dump into a clean energy hub

5B chief strategy officer, Nicole Kuepper-Russell: appetite to use waste dumps for solar farms is growing

from AGL, Origin and Energy Australia, as well as site rehabilitation plans, with interest.

"These impacted sites can use the energy density of 5B's solar arrays to generate the same amount of energy from about half as much land as conventional single axis trackers," Kuepper-Russell says.

This energy density makes 5B Mavericks a feasible solution for projects in or near urban areas, even though the technology is optimised for utility-scale solar projects like Sun Cable and the Asian Renewable Energy Hub.

"We've looked at a 30 kilometre radius around the Liddell Power Station and using only one per cent of the land we could build a four gigawatt solar plant, which would leverage the existing infrastructure and skills in the Upper Hunter community," Kuepper-Russell says.

She concedes that four gigawatts of solar does not equate to four gigawatts of coal-fired power. However, 5B's analysis shows about 20 similar assets around Australia that could generate 16 gigawatts of firmed power using solar and battery storage.

"Repurposing coal-fired power stations has the benefit of leveraging land, infrastructure and communities already geared for energy generation," Kuepper-Russell says.

"Also, we know that transmission is difficult, so being able to build solar as densely as possible, as close to where humans will use it as possible is really important," she says.

Turning trash into treasure

5B has carved out a niche in repurposing contaminated land over the years. One of its early projects was a 1.5 megawatt solar farm on top of a reclaimed landfill site at Albury's Waste Management Centre.

The project was a partnership between AlburyCity, LMS Energy and Joule Energy. In addition to a solution that didn't penetrate the membrane capping the landfill, the operators also required access to a gas line running beneath the site.

The ability to pack up 5B's Maverick arrays as easily as deploying them is becoming a big drawcard among industrial operators. Scrutiny is intensifying around solar waste and how farms are decommissioned.

As land constraints become more of an inhibitor to reaching net zero targets, Kuepper-Russell says governments should look at place-based incentives to encourage more productive uses for impacted land. These have been effective in the United States alongside local content provisions, she says.

The 342 5B Maverick arrays bound for WA's rock dump are designed in Sydney and manufactured in 5B Adelaide. 5B's South Australian facility has built over 1300 5B Mavericks since being acquired by 5B in 2021, generating a steady stream of peripheral work for local South Australia suppliers in the process, from engineering consultants, to prototyping and tooling specialists and concrete suppliers.

5B new chief executive David Griffin says the company is doubling down on sales and delivery in high-performing "sweet-spots" in its home market in Australia. It will kick off a roadshow with prospective customers in these segments, including off-grid mining, contaminated land, EV charging stations, and heavy industry, to help them extract more benefits from 5B's latest product suite.

To participate in the roadshow register at www.5b.co/contact

Visit the 5B team at Smart Energy Conference and Exhibition, March 6-7 2024 at stand Titanium 1.

5B unveiled its next generation cyclone-resilient solar arrays on the Tiwi Islands in NT. 342 of these relocatable 50KWp 5B Maverick arrays are about to be deployed on a rock dump in WA.

RAYSTECH: A leading renewable energy wholesale distributor in Australia and New Zealand

RAYSTECH OPERATES in Australia and New Zealand with self-operated sales offices and distribution centres in Queensland, New South Wales, Victoria, Western Australia, South Australia, Tasmania and Auckland, providing comprehensive solar solutions to clients.

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Why Raystech?

Raystech is a company that goes above and beyond to deliver more than just products to its clients, no matter their business size. We treat all our clients equally and guarantee that the same high-quality level of services will be delivered.

Over the years, Raystech has expanded its value-added services with partners and suppliers to help clients to stand out and gain competitor advantage.

We offer various services, including customer support, product options, high-efficiency freight, marketing, energy services, and finance.

Moreover, Raystech has developed in-house warranty support, C&I EPC services, Virtual Power Plants (VPP) partnerships, and energy plans to provide additional support and value to its customers.

RAYSTECH
Your Trusted Solar Partner

Raystech staff and business colleagues at All Energy 2023

During the Smart Energy Show in May solar and storage solutions provider Sungrow signed a distribution contract with Raystech Group to supply 250MW PV inverters and 50MWh energy storage systems (ESS). The agreement was signed by Joe Zhou, Country Manager of Sungrow Australia and Mark Miao, Director of Raystech Group, in the presence of industry leaders.

Mission and vision

- To enable the global renewable industry to grow by supporting partners and moving towards a carbon-neutral economy protecting our planet Earth.
- To accelerate the adoption of solar energy by providing high-quality solar products and services that are accessible, affordable, and reliable while contributing to a more sustainable and equitable future for all.

As a leading solar distributor in the industry, Raystech is known for its innovation, expertise, and commitment to customer satisfaction while helping to drive the transition to a cleaner, more resilient energy system that benefits people and the planet.

www.raystech.com.au

Visit the Raystech team at Smart Energy Conference and Exhibition, March 6-7 2024 at stand Platinum 2.

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LONGi highlights

LONGI SOLAR AUSTRALIA AND SOLAR TRAINING CENTRE have signed a 24-month Memorandum of Understanding which encompasses collaborative initiatives designed to enrich training, marketing and promotional efforts in the Australian solar installer community.

The collaboration includes advanced technology panels for educational purposes, joint development of rooftop solar systems, and the documentation of installation processes for future training and marketing content. LONGi BDMs will participate in training classes and Solar Training Centre's facilities used for industry events.

Speaking at the signing, SEC's John Grimes said, "This partnership between these two big established companies bodes very well for our industry."

In other developments, **LONGi and its three major Australian distribution partners, OSW, Raystech and Solar Juice**, have committed to a comprehensive collaboration around the supply of cutting-edge back contact technology products, featuring the Hi-MO X6 solar modules.

The collective capacity covered by the agreements, which span from January 2024 to December 2026, is 1.4GW of back contact solar modules.

"The confidence we have in our Back Contact technology and in how we see PV technology moving forward in the next five to seven years has driven us to take these steps and get our authorised partners in the BC wagon. They too believe this is a technology that will shape the future of PV globally," said Daniel Lin, Managing Director of LONGi Solar Australia.

John Grimes of SEC and Steve Kostoff of Solar Training Centre joined LONGi dignitaries at the signing ceremony.

The Hi-MO X6 solar modules are built on high-efficiency HPBC (High Performance Back Contact) cell technology and feature a busbar-free frontal design to maximise the use of incident light, reduce optical losses, enhance conversion efficiency and optimise the Levelised Cost of Energy.

The standard version of the HPBC cell has achieved a groundbreaking efficiency rating of 25.5%. Hi-MO X6 achieves a 6% to 10% improvement in power generation performance, with a maximum module efficiency of 23.3%.

www.longi.com/au

Energy One's software services

ONE OF THE MOST essential and exciting new technologies enabling the energy revolution is grid-scale batteries. While solar and wind will provide most of the power and energy to our grids, batteries are the technology that will provide the energy balancing as well as supporting a network under increasing strain as the nature and location of generation shifts.

The highly flexible nature of battery devices, combined with a 5-minute market for multiple services, means that analysts and traders need sophisticated software to understand how to best operate these assets.

Energy One is a long-established global provider of software and services for the energy industry. It offers a unique solution to help operators of battery and hybrid battery/solar/wind assets to get the best return on investment. The software solution uses artificial intelligence techniques to help traders and analysts understand all the impacts of a trading strategy on both profit outcomes and long-term battery degradation and depreciation.

Ross Attrill, Chief Innovation Officer at Energy One, commented: "It is fantastic to see so many batteries already in the NEM and so many more in the pipeline. However some existing batteries are not delivering their full potential and some developers are not fully confident about the returns they might achieve from a proposed asset. Better software and services can help."

A unique feature of Energy One's solution is the high degree of flexibility, allowing trading optimisation to reflect the unique conditions under which an asset operates. Another is the ability to configure the interactions between human and computer, based on the need and complexity of the trading context.

The solution can be provided as software to operate in a customer's premises or as software-as-a-service (SaaS).

Energy One can also provide a full 24 x 7 trading operations service, where the asset is operated by the software in accordance with an agreed trading strategy with supervision from highly experienced trading operations staff.

www.energyone.com

Information, views and technical details on these pages supplied by Smart Energy Council Members

iStore eyes up a sustainable future

MOST PEOPLE ASSOCIATE SOLARGAIN'S ISTORE with the smart air-to-energy hot water system that's built specifically for Australian conditions. Now the company is forging ahead by diversifying into solar inverters and modular batteries, which made their debut at All Energy Australia in late October.

The new product range will include innovative 5kW and 6kW hybrid inverters, complemented by modular batteries ranging from 5kWh, 10kWh, to 15kWh capacity.

"iStore's mission is to forge strategic partnerships with technology leaders, creating tailor-made electrification solutions that meet the unique needs of Australian households. Our foray into the solar energy sector, seamlessly integrated with our existing product ecosystem represents a natural progression," says Eliese Deoliveira, General Manager at wholly Australian-owned family enterprise iStore.

"Our target is to electrify homes, our end goal – which we are delivering in bit-sized pieces – is to be a one-stop-shop solution within Australia so we will see an expansion of products, we're adding in broader aspects of electrification to the home.

"Our range of water heat pumps was our primary product, and last year we introduced pool heats pumps, now, as announced at All Energy, we are getting into the PV side of the market by introducing PV batteries and inverters.

"From the middle of year 2024 we will add EV chargers to the range,'" she said. "This new line perfectly complements iStore's highly successful hot water solutions... iStore firmly believes that intelligent, energy-efficient solutions lay the foundation for a sustainable future."

iStore batteries and inverters are manufactured in China under an OEM arrangement.

Security

"We want to eventually invest in local supply and manufacturing but we don't yet have the ability, the more important thing now is the supply chain; the issue of cyber security in solar is a hot topic right now, certainly in WA where I'm based, and this was the area we wanted to prioritise taking ownership of," Eliese told *Smart Energy*.

"We have taken precautions using global entity, the Singapore-based Universe EMS [Energy Management Systems] as our developer. They have several big name global clients including Nissan that they provide applications for, and provide the application using French servers while we are the administrators so any software changes on the inverter side the data is protected.

Eliese added that EMS meets stringent international cyber standards which are more developed than Australia's.

The new iStore range attracted positivity and interest at All Energy where Eliese picked up the noticeable increase of end-users attending the show, from young families with babies up to retirees. "This is exciting as it shows people are invested in the same journey, smart energy is what we are about and electrification of the home, it's an important matter," she said.

"We need to start regarding rooftops as real estate. There's a shift in sustainable living that's heading toward PV generated battery storage and an uptake in EVs, home-owners are finding themselves financially squeezed but are also more environmentally conscious and energy savvy than ever, and our industry is poised to deliver."

Eliese Deoliveira (centre) at All Energy 2023

Eliese attributes the uptick in consumer interest to cost of living pressures and greater awareness of home electrification which is an obvious option for those wanting to live sustainably and gain greater control over their energy assets.

"Another trend is the amount of PV installers who want to expand into hot water systems, so businesses are also adopting the mindset of being a whole home solution for their customers, I think this is exciting."

She explained the timing of the arrival of new iStore stock in mid-November was less than ideal given most installers had booked out their STC spots, however she anticipates stock will move more rapidly in 2024.

Meantime the heat pump hot water market is tracking very well. "That is not ground-breaking news but the positive level of volume and enquiries is welcome," she said. The popular website My Efficient Electric Home is evidence of the increased interest with hot water heat pumps being the most frequently asked question, having overtaken the number of rooftop PV enquiries a couple of years ago.

www.iStore.net.au

Pssst... Want to win a BYD Dolphin valued at $38,800?

iStore is giving away two cars in a draw: one to a lucky homeowner and the other to an installer (see page 39).

Second and third prizes are a hot water heat pump and a 5kW battery.

This generous offer is being promoted through iStore and retailers in a collaborative endeavour to reach a wide audience.

iStore's expanded range

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Redflow – flying high

RENOWNED ZINC BROMINE flow battery specialist Redflow has signed a US$2.83 million contract with the United States Department of Defense's Innovation Unit to deliver a prototype microgrid using a 1.2 to 1.4MWh Redflow long duration energy storage system.

Redflow will partner with cleantech integrator Ameresco to deliver the microgrid project which aims to extend the duration of energy storage for existing installations, by repowering a solar-powered microgrid currently located at the Stewart Air National Guard Base in New York state.

Redflow CEO and Managing Director Tim Harris said "We have been working with the Defense Innovation Unit for the past year to support their energy resilience objectives across the military's global operations. To be selected as the solution provider is validation that Redflow's LDES solutions hold the potential to deliver significant benefits to US Department of Defense installations worldwide."

Deployment and commissioning of the system is planned for the second half of 2024.

If successful, the solution could be rolled out across numerous US Department of Defense facilities and critical infrastructure around the world.

www.redflow.com

Tim Harris continues to secure impressive Redflow contracts

Yurika: Transformational growth

THE ELECTRICITY SECTOR is undergoing a massive transformation and Queensland's Yurika is developing solutions to enable projects across the National Energy Market.

Since forming in 2016 Yurika's high voltage energy and infrastructure business has designed, constructed and managed more than $3.5 billion worth of work across Queensland, New South Wales, South Australia, Victoria and the Northern Territory. The business has connected an impressive 1.8GW of wind energy and 1GW of solar energy.

It has also delivered a number of battery energy storage systems on behalf of several energy providers and is contracted to support ongoing connections in excess of 1.65GW of battery energy. In total, this is equivalent energy to power around 270 million Australian households for a year.

"We're trusted by government agencies, national and multinational companies to come up with solutions that will enable them to integrate a range of renewable generation projects into the grid," Executive General Manager, Belinda Watton said.

"It's been a whirlwind of activity and, while it's been challenging trying to keep pace with our customers' appetite for growth, that's why capability has become our mantra."

Belinda explained projects included installation and connection of high voltage transmission lines and substations for the Clarke Creek wind farm, MacIntyre, Wellington North and Wunghnu solar farms. It also included substation and electrical infrastructure work for Wambo wind farm, design and installation of network-connected batteries for Ergon Energy Network, as well as construction of Queensland Electric Super-Highway EV charging network.

Yarrenlea solar farm

Yurika also plays a key role in maintaining Queensland's transmission infrastructure as a provider for Powerlink Queensland.

"We are witnessing the largest growth in the electricity sector in more than a century," Belinda said. "The Queensland Government has committed to 70% renewable energy by 2032 as part of its $62 billion Energy and Jobs Plan – and that's just in Queensland."

As part of a collaboration with Ausgrid and the Upper Hunter region, Yurika has also helped design and plan for a microgrid trial of generation, storage and new technologies to deliver more resilient, reliable local power supply to communities in that region of New South Wales.

"The work we are doing right across the NEM requires an incredibly broad portfolio of skills and that means we need to attract and retain expert engineers, technicians and field workers to consistently deliver for our customers," Belinda said.

"Yurika has also expanded its offerings in data infrastructure, integration and electrical hardware because that's what the market is demanding – greater integration of products and services to meet customers' needs."

www.yurika.com.au

Berri good news for EVO Power

A FORMER RACECOURSE 240 kilometres north-east of Adelaide has been transformed into a mass smart solar farm, the $25 million Berri Energy Project which is capable of powering up to 4,000 homes.

Developed, built, owned and operated by Flow Power, the 5.8MW solar farm is coupled with a 6.7MWh battery energy storage system and uses an SMA Central Inverter, Canadian Solar bifacial panels and EVO Power's CONNECT Series Battery Storage, the Australian-first DC coupled storage technology which unlocks additional revenue stream for Flow Power by time-shifting of energy, enabling the plant to participate in energy arbitrage and eventually providing critical market services including Frequency Control Ancillary Services.

The DC-coupled solar and battery energy storage system is engineered to amplify the revenue stream of large-scale Solar PV plants and speed up Australia's progression toward net zero emissions, with the site currently saving almost 8,000 tons of carbon per year.

EVO Power Group CEO Jamie Allen told *Smart Energy* that all was operating smoothly in the unique hybrid system and that "This DC-coupled solar and battery energy storage system is the first of its kind to be deployed in Australia and we believe the trend might take off as it's a good workable option."

Flow Power's 5.8 MW solar farm featuring EVO Power's CONNECT Series Battery Storage

In other developments, EVO Power and global electrical power conversion specialist Ingeteam have signed a Memorandum of Understanding for Utility-Scale Energy Storage Market.

This alliance aims to bring together the expertise and cutting-edge technologies of both EVO Power and Ingeteam to further advance the utility-scale energy storage market. The partnership provides EVO Power access to Ingeteam's liquid-cooled, bi-directional storage inverter technology – the INGECON® SUN STORAGE 3Power – for deployment in its AMP Series Battery Energy Storage System.

Jamie Allen said "We look forward to partnering with Ingeteam both in Australia and the USA, sharing our commitment of providing sustainable technology-enabled energy solutions that pave the way for a greener, more energy-efficient future."

EVO Power has already begun deploying its AMP Series BESS in more than a dozen projects across Australia, with several more currently undergoing grid modelling.

www.evopower.com.au

GoodWe's EcoSmart and BIPV solutions

GLOBAL SOLAR ENERGY SOLUTION provider GoodWe has announced a collaboration with Umax Energy, its authorised distributor, to offer GoodWe's EcoSmart Commercial solution to Alspec, a prominent aluminium processing company based in New South Wales.

The project includes supplying and installing a 100kW solar system on the roof of Alspec's headquarters and manufacturing facility, incorporating primarily GoodWe's 315W Galaxy Ultra panels, coupled with its HT 100kW string inverters.

GoodWe's Galaxy Series solar panels proved to be an ideal solution to address Alspec's concerns over its new roof's low-bearing capacity.

The entire EcoSmart Commercial system is projected to cover 80% of Alspec's electricity needs for production and operations.

In more good news, GoodWe has launched its new building-integrated photovoltaic (BIPV) solar carport panels, Polaris Series, to the Australian market. The series of products tailored primarily for carports and shade rooftops offer a power output of 550W, boasting a solar efficiency of 20.4%.

Apollo Chai, Head of GoodWe Australia BIPV Marketing, said "The Polaris series adapts to diverse application scenarios, including carports, flat-to-pitched roof conversions, and sun sheds and effectively overcomes significant limitations found in conventional panels for similar applications."

GoodWe has also recently introduced its Sunshine Tiles BIPV products to the market

In 2021, GoodWe was recognised as one of the top three hybrid inverter suppliers worldwide by Wood Mackenzie.

www.goodwe.com.au

GoodWe's smart light solar systems

Information, views and technical details on these pages supplied by Smart Energy Council Members

Solar Shift – reuse, recycle

SOLAR SHIFT in conjunction with Joii Ltd Solar Recycling is 'open for business' and offering a complete solution for disposal of all surplus solar equipment in Queensland.

The partnership is in response to the thousands of solar panels that would be dumped but could be repurposed to extend their lives, said Damon Sincock, Operations Manager of Verseo Distribution which trades as Solar Shift.

Several big solar energy providers have engaged in the processes, showing their interest in a newly recognised need for refurbished PV components.

"We believe that a large amount of our inventory would be used up in the Australian market for the purpose of maintenance and repairs alone where manufacturers do not supply discontinued lines," Damon said.

"Knowing there's no back up from manufacturers for supply of discontinued stock, we are actively solving that problem.

"All that's needed now is to get the word out to encourage engagement."

Solar Shift is also working with neighbouring developing countries to supply affordable energy.

For panels that are in working order but don't meet the high standards set in Australia, Solar Shift is able to send them overseas to help people in less developed nations to enjoy low-cost electricity.

By extending the useful life of solar panels, Solar Shift is helping those in need while also keeping the panels out of landfill in Australia

By extending their useful life, Solar Shift is helping those in need while also keeping the panels out of landfill in Australia. It's a win-win, they say.

"We believe this is important logistically to capture the resources back into our circular economy. Not only for the purpose of continuing the circular economy but to help provide EOL solutions to our own neighbours, concentrating on our own backyard.

Solar Shift currently has panel drop off locations in Queensland, South Australia, Victoria and Western Australia. Collections can be made anywhere in Australia by arrangement.

www.solarshift.com.au

A good deal for Orkestra

ORKESTRA HAS SECURED SEED FUNDING from lead investor Tidal Ventures to revolutionise the energy industry with their platform that enables critical decision-making throughout the lifecycle of renewable energy projects. Orkestra's cloud-based software facilitates energy feasibility assessment for commercial and industrial solar, battery, electric vehicle charger projects, and electricity tariff analysis.

James Allston, Chris Cooper and Michael Jurasovic of energy analysis software company Orkestra

Their comprehensive software empowers energy teams to manage projects from start to finish, having successfully modelled over 2,500 projects in 2023 alone.

The funding round was supported by Rampersand, Impact Ventures, Luxem, and climate tech specialists including Phil Blythe, Danin Kahn, Oliver Hartley and Andrew Rogers.

The team has earmarked the funding to fuel their global expansion initiatives, the development of innovative product features and the execution of strategic growth plans.

"As we progress towards our Series A funding, our primary emphasis will be on optimising our software's capabilities to streamline and expedite our customers' processes," says James Allston, Co-CEO and Co-Founder of Orkestra.

S-5! racking a fitting solution

IN THE SCENIC ROLLING HILLS just north of Auckland is a newly developed gated community with 20 or so architecturally designed modern homes, among them one featuring a separate garage/home office studio, as seen in the aerial image.

On its standing seam metal roof is a 12.6kW solar array secured in placed with the S-5! PVKIT direct-attach, rail-less, solar solution. The rooftop solar system consists of 32 405-watt black PV modules and is connected to a 10kW solar inverter coupled with a 19.2kW hour battery storage system.

The S-5! system is touted as providing a simple, secure method to 'lay & play' PV modules with tested, engineered, cost-saving, direct-attachment onto the seams of the metal roof. The S-5! clamps meant the homeowner could maintain warranties due to the non-invasive, penetration-free attachment.

www.s-5.com/products/solar-racking-systems

Idyllic solutions in idyllic surrounds

Australia's Solar Industry Entering 'Golden Era'

PROMINENT PV MANUFACTURER Trina Solar casts Australia's solar energy industry as entering a period of 'momentous innovation and technical development' including the launch of higher efficiency and higher power modules.

At All Energy Australia, Trina Solar exhibited its module that has power output up to 700W, with Edison Zhou, Trina Solar head of Australia, New Zealand and the Pacific Islands declaring "Trina Solar Vertex N type modules are leading the industry into the PV 7.0 era."

The NE21C.20 module has maximum efficiency of 22.5% and maximum power output of 700W.

"The solar industry is entering a 'golden era', with the 700W Vertex N module a precursor of what is about to come," says Zhou.

Australia's scientific community is also part of the new 'golden era' in solar cell development. Zhou said: "Trina Solar has a strong track record of collaborating with leading Australian universities such as the University of New South Wales, the Australia National University and Monash University on solar cell research and development."

Trina Solar also exhibited the Vertex S+ 450W, a mono-facial module designed for residential rooftops and a 610W Vertex N bifacial module (NEG19RC.20) that has efficiency of up to 22.6%, as well as the 500W Vertex N module, and took the opportunity to promote its new generation Vanguard 1P smart tracker which is fully compatible with ultra-high-power modules ranging from 400W to 700W+.

Capping off exhibits at the show was Trina Solar's new Elementa 2 4MWh energy storage system which is designed specifically to cater to utility-scale energy projects. Offering high energy density, it fits within a 20ft size container for easier transportation and logistics.

www.trinasolar.com

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Alistair and Marianne are committed to helping companies increase their exposure through the magazine as well as at Smart Energy webinars and conferences.

Despite the challenges of the past two years, Australia's renewable industry sector continues to thrive so it has never been a better time to showcase your products and services to the widest possible targeted audience.

MAGAZINE REACH: *Smart Energy* magazine is read by more than 20,000 industry professionals, spanning solar PV designers and installers, large-scale solar project contractors, industry consultants and trainers, manufacturers, suppliers and wholesalers, energy retailers, and thought-leaders.

So, if you want to reach thousands of people involved in all sectors of the smart energy industry, call Alistair or Marianne.

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SOLAR INDUSTRY Positive Quality™

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

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

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

The Smart Energy Council developed the program because the generic appearance of panels makes it difficult to determine good from bad, unless an identification mark denotes otherwise.

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

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

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

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

POSITIVE QUALITY™
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By displaying the Positive Quality™ logo solar companies convey high standards in panel manufacturing to industry and consumers

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

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