



SMARTER HOME ENERGY CONTROL & GREENER LIFESTYLE

- Three-Phase Unbalanced Output Function Supported
- Diesel Generator / Heat Pump Supported
- 100% Off-Grid Mode Supported



Smart Energy SUMMER 2022 Volume 42 Issue 168

SMART ENERGY

is published by the

SMART ENERGY COUNCIL

ABN 32 006 824 148 Smart Energy ISSN 2206-1673

www.smartenergy.org.au



@SmartEnergyCncl



@AustSmartNRG



CHIEF EXECUTIVE John Grimes

PO Box 231, Mawson ACT 2607 admin@smartenergy.org.au 1300 768 204

ADVERTISING, SUBSCRIPTION & MEMBERSHIP

Alistair McGrath-Kerr

Australia & International Sales Manager 0499 345 013 alistair@smartenergy.org.au

Marianne Fang

China Sales Manager 智慧能源理事会的杂志广告预定、企 业会员服务、展会及网络研讨会等活 动请咨询中国企业负责人方媛

电话: +64 21 182 4699 邮件: marianne@smartenergy.org.au

微信: 18896983297

SMART ENERGY EDITOR

Nicola Card editor@smartenergy.org.au nicola@smartenergy.org.au

CONTRIBUTORS

Nicolette Boele, Ric Brazzale, Jacquie Bridge, Mark Diesendorf (The Conversation), Heidi Douglas, Max Hewitt, Ketan Joshi, Ria Kelleher, Jessica Lynch, Penny Parle

MAGAZINE DESIGN

Mitzi Mann

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

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

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

Smart Energy is published quarterly.

© Smart Energy Council 2022

8	

SMART ENERGY COUNCIL

Forewords by CEO Eytan Lenko of Boundless	2
Smart Energy Conference and Exhibition May 2023	20
Smart Energy advocacy paying off with wins	38
Dedicated working group activities	38
NSW State Energy and Batteries on Wheels Summits	41
Collaboration with Indian businesses	42
Meet the new SEC team members	
Corporate Members	66
Membership services	67
Positive Quality	68

SPECIAL FEATURES

Powering up the renewable energy revolution	8
Key messages from SEC's Brisbane Summit	14
Queensland's SuperGrid in the making	18
First Nations Clean Energy Network in action	22
The Conversation: Reducing energy consumption	32
Energy savings schemes to drive electrification	34
Acceleration of EV sales; The Good Car Co	36
The strong case for electrification of everything	46
Spotlight on Safeguard Mechanism and carbon offsets	48

150 P. 150 P.	
ThinkPlace's staff carbon reduction incentives	
Solar Citizens forging a bright future	
Q&A with 'reality checker' Ketan Joshi	

FRONT COVER Concerted plans to build and link smart energy systems

52

56

62

26

27

28

57

58

58

59

60

60

60

INDUSTRY ROUND-UP

News and views	4
PV market wrap	53
Engineering the energy revolution: notable quotes	
The Big Teal and other books	65

HYDROGEN AUSTRALIA

Developments in green hydrogen		
World first for Yara's Pilbara plant Yuri		
Hydrogen's role in heavy transport		
SMART ENERGY INNOVATORS		

U	Maximum Energy unleastling carbon free energy
22	Solargain operations
32	Q Cells and Plenti team up
34	BASF and NAS containerised batteries
86	LONGi gains top award
16	Brighte's Tasmanian offering

South Street Energy's sustainability award





WELCOME



John Grimes, Chief Executive Smart Energy Council

IT FEELS LIKE everything has changed.

The Climate Bill is now law, fuel efficiency standards are being reviewed federally, Queensland and Victoria have set fantastic renewable energy targets (along with strong plans to get there), and much more.

Coal generator closures are being announced one after another, and all much sooner than many forecast.

I am just so pleased to be finally focused on the real task at hand, delivering a smart energy roll out on a scale and against a timeframe never seen before.

Customers big and small are 'all in' and massive energy bills will drive even more



people to install cheap, clean, renewable energy at every scale.

Smart energy companies across the country are well and truly up for the challenge.

They are experiencing rapid growth in what was once a fringe industry but is now at the centre of our national policy.

The year 2022 marks the point when we stopped having to fight governments from dragging us backwards, and instead we have got on to the most pressing work of all: delivering for the economy and for the planet.

A truly inspiring group of people are doing the hard work of transitioning our entire economy to a zero-carbon future.

IN MY VIEW

Eytan Lenko, Chief Executive, Boundless

JEFF BEZOS famously said that all 'overnight' successes take 10 years. That is certainly true for the smart energy sector, where we have seen years of hard work and advocacy spectacularly paying off with an incredible list of initiatives and leaps forward over the past few months.

Just a few examples of this are:

- Australia significantly raised its 2030 emissions reduction targets
- Victoria announced an ambitious Renewable Storage Target
- The Queensland Energy Plan was announced, bringing forward coal closures and rapidly building out renewables
- The Victorian government announced its intention to legislate for 80% emission reductions by 2035, and
- The federal budget allocated \$25bn for climate initiatives

What is really interesting to reflect on is the lack of push back or opposition to any of these ambitious measures. We have well and truly

"The Smart Energy Council and its members should be congratulated for their role in helping to make all of these incredible things happen." won the argument that climate action is good for the economy and jobs.

It helps that the last federal election showed clearly that the community is impatient for change and will take matters into their own hands if necessary.

The Smart Energy Council and its members should be congratulated for their role in helping to make all of these incredible things happen

So we now shift into a new phase where governments, businesses and the community all understand that we are going to do this, that we are racing towards a zero emissions economy. And the penny is dropping that there is a lot to do!

It is easy to be overwhelmed at the scale of what needs to be built, retrofitted and replaced over the next 20 years. The best antidote to that is to simply take steps forward.

Many climate solutions have a technology basis and follow Wright's law, which says that the more we deploy, the cheaper a technology can be.

Our job is to deploy wherever and whenever we can in order to trigger tipping points, as we have seen with solar energy and LED lighting, where the cost of new technology becomes so low that the market takes over.

Every step we take brings us closer to those tipping points.



"We have well and truly won the argument that climate action is good for the economy and jobs."

My organisation, Boundless Earth, was proud to take a step in partnership with the Smart Energy Council by hosting the National EV Summit in Canberra last August. We brought the industry together and secured a commitment from the federal government to pursue fuel efficiency standards, which should help Australia become a priority market for EV manufacturers.

This will take us towards EVs taking a 10% share of the new car market by 2024, which has been a clear tipping point in other countries.

Let's take a moment to celebrate our achievements, take a deep breath, and start down our next 10-year journey towards
Australia taking its place as a renewable energy superpower.





Join the GE Platinum Retailer program and grow your business.



Benefit from exclusive access to a suite of resources, including:

- Exclusive discounted pricing
- End consumer sales leads
- Exclusive training and enhanced technical support
- · Comprehensive marketing and support
- Opportunity to win Platinum Retailer of the Year

Email sales.au@gesolarinverter.com for more information









Backed by advanced knowledge and experience in research and development, we integrate the most advanced safety features and intuitive data monitoring to create a range of premium PV inverters and energy storage solutions.

www.gesolarinverter.com.au



@GEsolarinverter



@ge_aunz_solarinverters

INDUSTRY DEVELOPMENTS

REGENERATION

In late September the **VICTORIAN GOVERNMENT SET AUSTRALIA'S BIGGEST RENEWABLE ENERGY STORAGE TARGETS: A MASSIVE 2.6GW BY 2030**, with an increased target of 6.3GW of storage by 2035. The
Government is investing \$119 million from the \$540 million Renewable
Energy Zone Fund in a 125MW big battery and grid forming inverter in
the Murray Renewable Energy Zone to support targets.



The **QUEENSLAND GOVERNMENT** has pledged \$776m toward what will be Australia's largest publicly owned windfarm, a 500MW 150-turbine plant near Tarong, west of the Sunshine coast. Premier Palaszczuk has also released the state's landmark 10-year energy plan. On the following pages we expand on this as well as other states' ground-breaking announcements.



Annastacia Palaszczuk Premier of Queensland



Matt Kean MP NSW Treasurer and Minister for Energy

Turning now to **NSW** which has launched the first of its **RENEWABLE ENERGY AND ENERGY STORAGE AUCTIONS** which, combined, will mobilise around \$32 billion in private capital and deliver 12GW of renewable energy and 2GW of long duration energy storage by 2030.

Not before time, given four out of the five coalfired power stations in NSW are destined to close doors within 11 years. The **ALICE SPRINGS FUTURE GRID PROJECT** has launched its largest trial: the Solar Connect Virtual Power Plant. The trial, which is a first for the Northern Territory, will run for up to 12 months and involve about 50 participants from across Alice Springs, most of whom are residential energy customers with rooftop solar PV and a solar battery.

Future Grid is supported by ARENA.



The Clean Energy Finance Corporation has committed \$35.5 million in project finance to the 100MW **CAPITAL BATTERY** to provide critical network support and help the ACT reach net zero emissions by 2045. The battery is on track to be operational in the first half of 2023.



ARENA has committed \$1.5 million in funding to Spinifex's **\$3.47 MILLION 1,000MW OFFSHORE WIND FARM PROJECT** off the coast of

Portland in western Victoria which will connect to the NEM and supply renewable electricity to the Portland Aluminium Smelter.

This brings the number of offshore wind projects in early stages of development to 20, moves that have been expedited by the *Offshore Electricity Infrastructure Act 2021*.



In mid-September renewables supplied over 40% of total energy generated in the NEM setting a **NEW INSTANTANEOUS RENEWABLES RECORD OF 64.1%**, according to AEMO, a rise of 2.2% from the previous record. And in a sign of the times, AEMO aims to engineer grids to manage up to 100% renewables, at times, by 2025.

Data compiled by market researcher Fact.MR reveals the **GLOBAL DISTRIBUTED ENERGY STORAGE SYSTEM MARKET** currently worth US\$ 4.2 billion is set to surge ahead at a CAGR of 9.6% from 2022

to 2032, reflecting the shift towards renewable sources for power generation.

In other findings: the global market for distributed energy storage systems is projected to grow 2.5X and reach US\$10.6 billion by 2032; the market exhibited 7.2% CAGR between 2017 and 2021; lithium-ion batteries dominate with US\$ 1.5 billion valuation in 2022.





C&I Lithium Battery Energy Storage System



Original Manufacturer With Vertical Industry Chain



Top Safety Certifications: UL1973, IEC62619, UL9540A, IEC63056, VDE



Optimal Electricity Long Life Cycle And Superior Performance



Modularized Design With Maximum Flexibility





Self-Consumption



Demand Charge



Micro-grid



EV charge Station



Back Up



Peak Shavin



Off Grid





Frequency



Renewable Regulation



MAXIMUM SAFETY FOR YOUR ENERGY

CONTACT

- https://en.pylontech.com.cn

INDUSTRY DEVELOPMENTS

The October budget/MYEFO included \$5.5 million in funding for the FIRST NATIONS CLEAN ENERGY STRATEGY with First Nations communities.

Read all about the First Nations Clean Energy Network on page 22.



LAWYERS FOR ENVIRONMENT VICTORIA have

argued that in early 2021 the Environment Protection Authority failed to consider state climate law when assessing licences for three coal-fired power stations that have created millions of tonnes of pollution: in all generating a third of the state's emissions

Yallourn, Loy Yang A (whose particle limit is allegedly eight times higher than what's allowed in China) and Loy Yang B coal power stations which are owned by AGL Energy, Alinta Energy and EnergyAustralia pump out about 112,000 tonnes of carbon dioxide emissions daily. Ironic note: The EPA fines Victorians for dumping litter.

The case heard by the Supreme Court tests Victoria's Climate Change Act of 2017.

Meanwhile welcome news of the early closure of AGL's Loy Yang A power station in 2035, a full decade sooner than planned and way earlier than the original forecast of 2048.

AGL is also on track to close its Bayswater coal plant in the NSW Hunter Valley before 2033.

Farmers in WA are being equipped with solar and battery powered STANDALONE POWER SYSTEMS in lieu of replacements to the Western Australia's regional power grid as SAPS are more economical than maintaining poles and wires.

"Electricity poles are being cut down and carted away, 23,000km of overhead wiring are being rolled up," we read, "enough to string a power line around mainland Australia" and "a sprawling grid larger than the UK," according to Western Power.

Smart Energy is printed by Camten on 100 per cent recycled paper which is certified Carbon Neutral by the Department of Environment under the National Carbon Offset Standard (NCOS). Made in Australia by an ISO 14001 certified mill. No chlorine bleaching occurs in the recycling process. Camten uses sustainable printing practices - Sustainable Green Print - Lean and Green, and is fully FSC certified SGS COC 004746.

















GOOD MOVE, EU From 2026 the European Union is mandating installation of PV panels all new rooftops following new rules on energy efficiency and energy profiles of residential and commercial buildings. Hey Australia, how about we follow suit?

UK NOT SO OK Oh Rishi, all that dithering over attending CoP27 in Egypt. UK's new PM may be a dapper dresser with a winning smile but by initially snubbing the world's top gathering he was displaying alarming disregard for climate action. No wonder, the stylish man has this year



allegedly pocketed (in his Saville Row suits, we assume) around \$250,000 in donations from supporters with interests in oil, gas and aviation. Further, he signed off on approval of six new oil and gas fields in the North Sea and allegedly blocked plans for investment in energy efficient homes. Not such a great look.

Leeson Group has launched its AUSTRALIAN-ENGINEERED BUILDING-INTEGRATED PHOTOVOLTAIC (BIPV) ROOF TILE 'VOLT' that delivers a solar efficiency of up to 19.3%, the highest energy generating solar tile in the world according to the Melbourne-based renewable company. A 5kW system is believed to cost around \$12,000 after STCs.

CONGRATULATIONS SCIENTIA PROFESSOR MARTIN GREEN, the first

Australian to win the prestigious Millennium Technology Prize for transforming the production of solar energy through his leadership in the development of the Passivated Emitter and Rear Cell. PERC it is, being the world's most commercially viable and efficient silicon solar cell technology that today accounts for more than 90% of worldwide

production of silicon solar modules. The biennial prize comes with a very worthy €1 million.

"The pace of change is accelerating and the world will shift to solar and wind energy over the coming decade. I believe a huge transformation of historic significance is underway," said Martin Green (pictured) who is now steering work on options such as stacking cells on top of each other in a bid to achieve 40% solar cell efficiency.



Information overload of the absolutely best, most positive kind.

For anyone not living under a rock, you will appreciate the brief news snippets on these two pages provide a glimpse only of the scale of developments underway. For those keen to devour a daily digest of all things renewables, tune in to the phenomenal coverage in RenewEconomy.com.au compiled by Giles, Sophie and team.



GreenPower is an independent, government-managed accreditation program. GreenPower provides confidence to customers that their purchase of a GreenPower Product from an electricity provider means they are getting Australian, renewable energy with net-zero greenhouse gas emissions.

By sponsoring Smart Energy magazine, GreenPower has ensured all grid electricity used in the production, design and distribution of this magazine is matched with 100 per cent accredited renewable energy.



The New

SENEC

Is Here

Becoming self-sufficient has never been easier and safer with SENEC's 360° German energy and mobility product suite, certified installers and expert support service.

With our sophisticated energy solutions, SENEC gives people the freedom to generate, use and share their sustainable energy.

SENEC products are the smarter choice. We have the highest quality products, industry leading 20-year extended warranty, and market leading performance so you can have total peace of mind in your SENEC investment.

100% Freedom 100% Flexibility UP TO 100% | Self-Sufficiency



Store the



Register As A SENEC Retailer Today!

1300 736 320 | contact@senec.com | www.senec.com/au f Osenecaustralia 🖸 Osenec_australia



FROM WHOA TO GO: if you are finding it delightfully challenging to keep up with the speed and magnitude of developments in renewables targets and pledges, join the club. There's been one awe-inspiring announcement after another the past six months, with ever more developments on the horizon in a country that is now united, not divided, on climate action.

Positivity has replaced negativity and provided optimism and galvanised action.

And what a whirlwind it's been: in less than a month of taking office the ALP had formalised Australia's updated Nationally Determined Contributions, its 2030 target under the Paris Agreement.

Fast forward three months and the *Climate Change Act* was passed, enshrining the target in legislation.

But there's still a long way to go and, as Climate and Energy Minister Bowen is fond of reminding us, there's just 86 months to achieve a 43% reduction in emissions by 2030 and the target of 82% renewables.

That, he says, demands an energy revolution. Indeed, Australia needs to install 40 (forty) 7MW wind turbines every month until 2030, and 22,000 500W solar panels every day for the next eight years, or 60 million by 2030.

Right behind Minister Bowen are the states, which too are setting a cracking pace.

It was Queensland's time to shine in late September with a series of far-reaching plans to fully dispense with coal through monumental investment in renewables from solar to hydro to hydrogen and a grid fit for purpose, as listed in the box to the right and elaborated on page 18.

"The Queensland Energy and Jobs Plan is founded on expert advice, science and evidence-based policy," Premier Annastacia Palaszczuk said, "Its aim is to shape Queensland as a serious, dedicated energy superpower; to see Queensland lead the globe."

In turn Queensland's economy is expected to grow by an additional \$25.7 billion from lower prices, green premiums and earlier access to renewables, and growth in clean energy industries including metals processing, critical minerals, green hydrogen and battery manufacturing.

The Victorian government has also unveiled its mighty vision through the country's biggest energy storage target to date: 2.6GW by 2030: and 6.3GW by 2035.

The state has set an emissions reduction target of 75-80% by 2035 and 95% renewable energy by 2035, building 4.5GW of publicly owned renewable energy generation through a revived state-owned State Electricity Commission.

There's lots more: the Commonwealth and Victorian governments signed an agreement to jointly fund Victorian offshore wind projects, to hasten Victorian's Renewable Energy Zones and the Victoria-New South Wales Interconnector, and together with Tasmania signed agreements on the Marinus Link interconnector.

Victoria's energy minister Lily D'Ambrosio commented states and federal ministers are now working as one, which "Added together make for a mighty, mighty effort, and real growth in terms of our ambition."



An understandably pleased John Grimes wholeheartedly agrees, saying "the Commonwealth and the states are now on the same page in terms of their planning around energy... the federal government wants to move, it has a plan. Together with the states they can really turbocharge things. It's exciting, daunting, also hectic!"

But he reminds the federal government that to reach its target of 82% renewables by 2030 and 43% emissions reduction we need to substantially increase energy storage capacity, both at large and small scale.

"The government should now formally lock in a Renewable Energy Storage Target as the last piece of the smart energy puzzle and the Smart Energy Council is working on a scheme having assembled a really fantastic brains trust of some of the world's best, Australia's best energy planners are in that forum," John Grimes said in reference to the REST working group which is a key plank of SEC's advocacy work. (See more on page 38.)

For its part Wood Mackenzie's latest report Global energy storage market outlook update forecasts Australia's energy storage market will



reach 18GW/41GWh of storage capacity by 2031 led by the booming demand in residential energy storage.

Power shortages and rising energy bills strengthen economic value and supply reliability of self-consumption, resulting in higher attachment rate of battery with rooftop solar, they state.

Where else does this lead?

Vision and ambition: state and federal renewables targets and projects

Federal action

- Passage of Climate Act
- Powering Australia Plan
- 43% emissions reductions by 2030
- 82% renewables by 2030
- \$20bn for Rewiring the Nation (grid upgrades to accommodate renewables)
- \$1.9bn for Powering the Regions Fund
- 85 solar banks across Australia, with \$102.2m co-investment
- \$224.3m for 400 community batteries
- \$102m for more household solar energy
- \$410m Electric Car Discount
- · Ditched: Fringe Benefits Tax and import tariffs on electric vehicles
- \$95.6m for 10,000 New Energy Apprenticeships
- \$9.6m New Energy Skills Program
- \$14m real-world vehicle testing program for fuel efficiency and emissions
- \$5.5m for First Nations Clean Energy Strategy
- \$72m for Townsville hydrogen hub
- · Preservation of funding for ARENA and CEFC
- Reinstatement of role of Climate Change Authority
- · \$1.5bn concessional finance for Victorian REZs (including for offshore wind) via CEFC
- \$750m concessional finance for the Vic-NSW interconnected 'VNI West', unlocking
- 4000MW of new renewable power generation; 2000 jobs during construction; \$1.8bn in benefits
- 20% public equity stake in Marinus (shared between Tas/Vic/Feds), creating 1400 jobs in Victoria, 1400 jobs in Tasmania; \$4.5bn in positive net market benefits; \$1.5bn in renewable investment to the Gippsland region; cutting 140 million tonnes of CO₂ to 2050
- Up to \$1bn of low-cost debt for Tasmania's Battery of the Nation projects

Thumbs up also to South Australia

Already 68% of energy generated by renewable resources by 2026: 100% renewables forecast

The Victorian Government

- 65% renewables by 2030
- 95% renewables by 2035, with NO coal
- 75-80% emissions reductions by 2035
- Net zero carbon by 2045
- 4.5GW of publicly owned renewables, and
- 2.6GW by 2030 renewable energy storage target, and
- 6.3GW by 2035
- Re-establish publicly owned State Electricity Commission
- 60,000 more jobs in energy by 2035
- Invest \$119m of \$540m REZ in 125MW big battery

Queensland's \$62 billion Energy and Jobs Plan

- Powering \$740bn resources boom
- 70% renewable energy target by 2032, and 80% by 2035
- Repowering the state-owned coal-fired power generation by 2035
- Net zero emissions by 2050; interim target 30% below 2005 levels by 2030
- 50% reduction in electricity sector emissions on 2005 levels by
- 90% reduction in electricity emissions by 2035-36
- World's biggest pumped hydro for Queensland
- \$4.5bn Queensland Renewable Energy and Hydrogen Jobs Fund
- \$35m Hydrogen Industry Development Fund
- All up 22GW new wind and solar power: 2,000 3,000 more wind turbines and 36 million solar panels

https://www.epw.qld.gov.au/energyandjobsplan

NSW Electricity Infrastructure Roadmap

- 12,000MW of renewable energy and
- 2,000MW of storage by 2030
- 50% emissions reduction target on 2005 levels by 2030
- Net zero emissions by 2050
- 10-year schedule of rolling tenders incentivising \$32bn private capital.

ROADS TO RENEWABLES

Bye bye coal

The renewables industry has welcomed AGL's decision to bring forward by 10 years the closure of 2.2GW Loy Yang A, Victoria's biggest coal-fired power generator. All three of the state's coal power plants are now destined to close early with the \$1 billion plan to ratchet up renewables.

In NSW, four out of five NSW coal plants are scheduled to retire within 11 years.

David Dixon of Rystad Energy calculates that by 2036 just 13% (3.1GW) of the NEM's operational coal capacity will remain, well down from 45% (10.4GW) at the start of 2022, on the strength of the above closures, and the Queensland's renewable energy target (80% by 2035), the update to the VRET (95% by 2035), funding for Marinus Link and the award of the VRET2 winners.

Where does this place us in the undertaking to mitigate climate change?

According to the Investor Group on Climate Change Australia needs to lift ambitions to a 75% emissions reduction target by 2035, establish a clear price on carbon, and remove all fossil fuel subsidies by 2025 to unlock the investment needed to reach net zero by 2050.

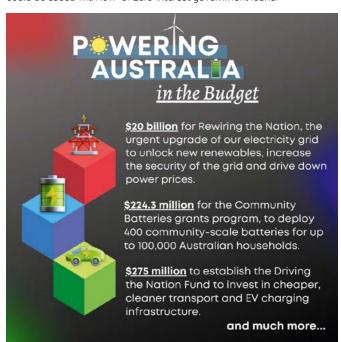
Headwinds

The broader market is encountering a few bumps in the road including spiralling electricity and gas prices, never ending climate catastrophes, supply shortages, and over-reliance on imports.

Let's unpack some of this:

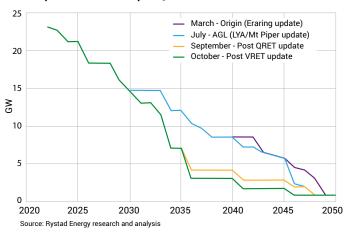
Prices: Australian homes are greedy for energy compared to overseas counterparts with their minimum housing efficiency standards. According to Climate Action Network of Australia (CANA, of which SEC is a prominent member) life in a 7-star, all-electric house in any capital city in Australia would save occupants on average \$450 per year on heating and cooling costs compared to the current building standard of 6-stars.

Further, occupants could save up to \$1,900 a year by switching from gas to electric energy sources. The upfront cost of replacing appliances could be eased with low- or zero-interest government loans.



Turbocharging the energy transformation: Chris Bowen on the place of renewables in the federal budget

NEM Operational Coal Capacity



And by accelerating investment in renewable energy, backed by storage and transmission, household disposable incomes across the national energy grid would be almost seven per cent higher by 2030.

Meantime extreme weather events over the past 12 months alone have cost every Australian household an average of \$1,532. That amount is expected to rise to \$2,500 a year by 2050. These figures don't factor in the widespread flooding across NSW and Victoria in October and November.

Imports and monopolies: The danger of putting most of your eggs in one basket was brought home following the war in Ukraine, which highlights Europe's reliance on Russian gas.

Writing for BloombergNEF Michael Liebreich spelt out that by 2021 Russia supplied 35% of Germany's oil, 45% of its coal and 55% of the country's gas. It's a similar picture across Europe.

Now Europe faces its first winter in 50 years without Russian energy supplies and is scrambling to cope by tapping in to alternatives and cleaner technologies, coupled with "urgent energy efficiency programs".

European economies will eventually return to growth, Liebreich says, and a new normal will emerge with the Great Energy Price Spike giving way to the Great Clean Energy Acceleration under RepowerEU.

The United States has taken one giant leap forward with its US\$369 billion *Inflation Reduction Act* (IRA) that will double US climate spending through 2025 from 0.6% of GDP to 1.25%, Liebreich writes, and sends a signal that the US intends to lead the world in climate-related technologies, "laying down the gauntlet to both Europe and Asia".

Speaking in the US recently Minister Bowen said The IRA – which really could be called the *Emissions Reduction Act* – is enormous in its scope, which is a great thing for the planet.

"For Australia, the passage of the Act presents both a challenge and an opportunity... the investment incentives embedded in the Act are enormous, meaning that the global race for renewable capital just got a lot sharper," he said.

He alluded to Australia's position as a critical supplier of some of the most important minerals in the production of clean energy elements such solar panels and batteries, saying "My conversations with counterparts in the Biden Administration at a very senior level were dominated by discussion on the opportunities of co-operation on supply chain management and diversification to assist this massive transformation.

Working with the $\mathsf{US}-\mathsf{as}$ only a credible climate partner can - and by turbocharging our domestic efforts, we can make the most of that opportunity.



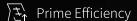


Hi-MO 6 Scientist

Being Better is Our Standard

Propelling the clean energy transformation into the Terawatt Era with ultra-high performance







てきる。 Market-leading Reliability



Upgraded Service Extended Warranty











Hluminating Possibilities

ROADS TO RENEWABLES

"Australia should be a trusted and reliable source of key materials up and down the renewable supply chain, not just of raw minerals but of manufactured compounds and of exported renewable energy itself... we need to strike while the iron is hot."

Bowen noted more than 80% of solar PV production today is concentrated in one country, and rising to over 95% soon which "meets the definition of a monopoly – and in the context of a global energy system that needs to de-carbonise, a potential risk to energy security the world over"

Hence Australia's aim to encourage a domestic manufacturing industry for at least some of those supplies.

Nicolette Boele of the Smart Energy Council maintains Australia needs something akin to the US *Inflation Reduction Act* to unleash "a flood of incentives for repurposing existing energy infrastructure and more..." Further, during her recent address to the Australian Alliance for Energy Productivity conference, Nicolette stated that as countries protect their own industries against unfair competition from dirty imports via border adjustments, and with the focus on supply chain security, there will be a push for Australian industry to decarbonise to stay internationally competitive in the global marketplace.

"If Australia aspires to be a great renewable energy exporter we can use 100% renewables in mining and refining and services we manufacture, and export them as net zero," she said.

So, way to go, but the states and federal governments are united and on the move; Australia is setting itself up to become a renewable energy superpower and exporter.

Our credentials are fast being established.

The holy grail of energy security, reliability and affordability addressed in one fell swoop.

An inconvenient tin of soup and tube of glue

George Monbiot questions whether we care more about Van Gogh's sunflowers than real ones.

The Guardian columnist stated: "The response by the media and government to the two Just Stop Oil activists who threw soup at Vincent van Gogh's Sunflowers in London's National Gallery speaks volumes.

"Decorating the glass protecting the painting with tomato soup... appears to horrify some people more than the collapse of our planet, which these campaigners are seeking to prevent.

"For locking or glueing yourself to another protester, or to the railings or any other object, you can be sentenced to 51 weeks in prison... twice the maximum sentence for common assault. Sitting in the road, or obstructing fracking machinery, pipelines and other oil and gas infrastructure, airports or printing presses can get you a year.

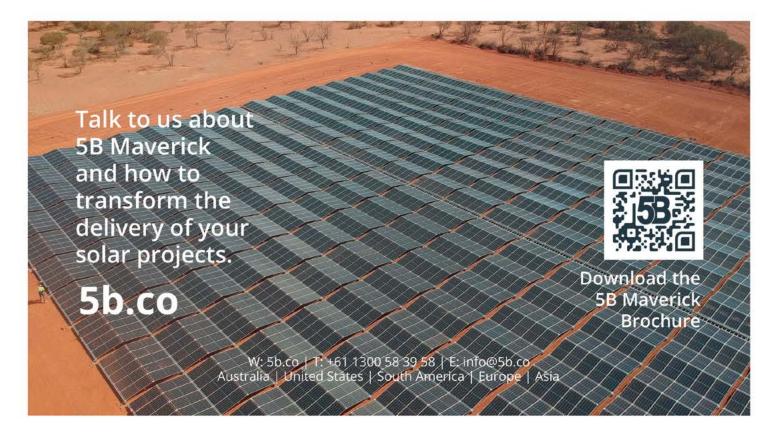
"Who are the criminals here? Those seeking to prevent the vandalism of the living planet, or those facilitating it?

"Why is life less valuable than the depiction of life?"











SOMETIMES SOCIETY NEEDS A SHAKE-UP, a wake-up call, and this was hammered home following the invasion of Ukraine which sent energy markets into a spin. Clearly dependency on oil and gas produced by a war-mongering nation is neither smart nor sustainable. Devilishly dumb in fact.

Michael Liebreich writes "Twenty years ago, sustainability was the only real driver of the transition to clean energy. Around ten years ago there was a major acceleration when it became clear that wind, solar and batteries were going to become really cheap; economics also started to drive the clean energy transition.

"I believe this hellish year is going to lead to another similar acceleration, as it becomes clear that clean energy, and not fossil fuels, holds the key to energy security."

His BloombergNEF article After Ukraine – The Great Clean Energy Acceleration, concludes "If there is to be a silver lining to this ghastly war, therefore, it will be that it draws a permanent line under Europe's long-standing over-dependence on Russian fossil fuels".

And that is the very message being amplified by **Alex Hewitt, co-founder and chairman of CWP Global** (pictured speaking below) who now resides in London. Keeping close watch on European market movements, he is now urging all in the renewables industry to think and act big.

That was the gist of his address, a call to arms if you like, at the Smart Energy Council Summit in Queensland in mid-September. Alex's message is in response to the confluence of the energy crisis in Europe,

sky rocketing gas prices, yet more alarming IPCC report findings and the all but certainty of life-threatening global temperatures, all of which scream the message we need to transition to renewables and ditch reliance on fossil fuels.

Ouick smart.

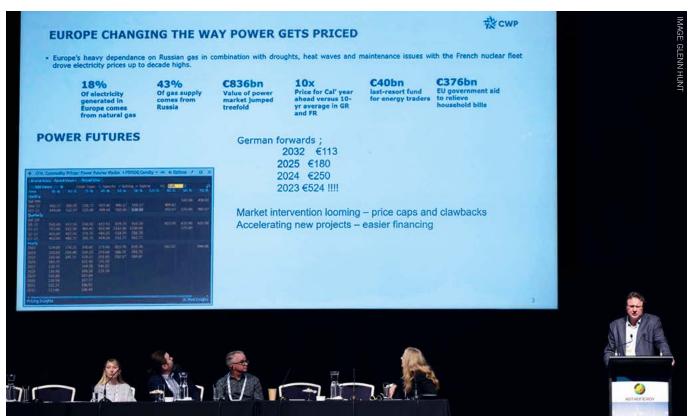
"Of course it won't happen overnight but we're just not doing anything fast enough, the energy transition is just mindboggling large, it's enormous and we are ten years behind the eight ball," Alex said. "The Russian invasion of Ukraine has only exacerbated the situation."

A slide (pictured below) illustrated the formidable forward prices of electricity in Europe that will rise to 524 euros per megawatt hour next year, ten times the price of wholesale generation which in itself is about 10 times the average price of energy in Europe over last 10 years. Crisis meetings are being held every second day.

"In the short term there's a very significant problem but [look at] the ability of renewables to arrest climate change and bring down energy prices in the long term and [facilitate] price caps and clawbacks on excessive profits."

Changes are afoot, innovative financing is coming through supported by multinational banks in the European Union in the bid to speedily develop more renewables, Alex said.

Dramatic though this is, it's a short-term challenge but nothing compared to the biggest challenge we are facing which is arresting climate change. "We are just ambling along despite the IPCC reporting; we have a carbon dioxide budget of less than 500 gigatons to get to net zero by 2050 and if we continue at our current rate the carbon budget is





Planet Ark Power is a leading clean energy solutions provider of turn-key solar, storage and microgrid solutions scalable up to 5MW.

At Planet Ark Power, we not only provide the best clean energy solutions, as a master licensee of eleXsys technology and registered market participant we also provide advanced commercial battery solutions that provide clients with a higher return on investment, we can manage FCAS and energy arbitrage so your battery can earn you income and you can keep saving over the long term.

You can rely on us to create a solution using the best technology and products.



CALL 1300 323 321 OR VISIT

PLANETARKPOWER.COM

PLANET ARK

PLANET ARK

QUEENSLAND SUMMIT AND ENERGY PLAN

blown in less than 10 years." So much for containing global warming to 1.5 degrees under the Paris agreement.

"We've got to get to net zero by 2050 and unless we go much, much faster we are going to be above 2 degrees," Alex said.

"Everything that those of you in the renewable energy industry are doing today is indeed great, to be applauded, but we need to go much, much faster," he said, noting the need to scale up green hydrogen and energy efficiencies, plant more trees, and cease felling trees in the Amazon and other rain forests to speed up decarbonisation.

"We need to pivot away from beef, start growing carbon-sucking kelp, reduce our population growth to 9 billion instead of 12."

Much of the focus needs to be on driving out fossil fuels, he reiterated, and we can't do that without adequate replacements; we have to build far more renewables and set about mass electrification.

"The predictions are roughly 80% electrons in the future; I'm talking about an energy mix out there in 2050 when around 80% of everything will be electrified and what can't be electrified will be supplied by green fuels, by green molecules, green hydrogen, green ammonia etc.

"Green hydrogen requires mindboggling levels of investment, around \$13 trillion, yet mass electrification of everything eclipses that and the grid is going to be demanding electrons to electrify everything.

"It's a mammoth task that even the IEA talks up, citing the need for annual investments of \$1.2 trillion a year by 2030 and the same every year after."

Staying on eye-watering, large-scale data Alex cited CWP's herculean project, the Asian Renewable Energy Hub in north Pilbara which is costed at \$50 billion and will generate 100 terawatt hours annually: almost half of Australia's entire generation.

Global green hydrogen demand is running at 700 million tonnes per annum and the AREH project would generate 1.8 million tonnes per annum.

Similar trillion-dollar projects are underway in Africa, Italy, Mauritania, Morocco and in windy Argentina, the mammoth costs underscoring the need to align with big partners.

Scaling up

"It will take years to complete all the projects," Alex said. "But this is my main message: if you embrace scale and embrace opportunity, you embrace the ability to create other businesses besides just a project, from big wind turbine manufacturing to cell fabrication plants.

Australia would never have this scale, being too far away from the big markets he said, unless we start to think in terms of massive scale that justifies building factories.

"And I'm reaching out here to the policy makers and project developers in Queensland – think huge, think big.

"Think big, be courageous, be audacious, you will not be able to think big enough, you cannot, I promise, you cannot go big enough on decarbonisation and electrification, there's so much to do."

The Smart Energy Council could not agree more and has for the best part of a decade batted off fossil fuel fanatics and climate deniers on the federal front bench. Until May 22, 2022. Praise be.

Such efforts have not escaped the notice of like-minded thinkers (fellow co-battlers) including **Mark Bailey, Queensland Minister for Transport and Main Roads**, who at the Queensland Summit hailed the Smart Energy Council as "a bright light during the very dark last years".

Bailey is now working with the new federal administration to "make sure that the signals we put out internationally as well as domestically are clear and powerful and that we maximise local opportunities".



The newly minted National Electric Vehicle Strategy developed in collaboration with the states and territories and fuel efficiency standards breathe new life into his portfolio. "The Queensland electric vehicle superhighway that's on the drawing board is very important because we are the most decentralised state in the country with the majority residing outside the capital city," Minister Bailey said.

Once completed the network will have 55 public charging stations across 5,000 kilometres of highways and roads.

"Earlier this year we released our 10-year zero emissions vehicle strategy and action plan with a \$45 million commitment over the next three years and \$3,000 rebates on electric vehicles priced up to \$58,000, and a \$10 million contribution fund to expand Queensland's charging network," the Minister explained.

The Queensland government fleet will be transformed which in turn will accelerate the much-needed second-hand EV market by rendering them far more affordable and widespread, at the same time driving down emissions.

"There's no time to lose in terms of making up for lost time," Bailey said, spelling out health and mental benefits of lower emissions, and talking up opportunities in domestic manufacturing and supply chains.

Queensland Minister for Energy, Renewables and Hydrogen Mick de Brenni amplified the aspirations and opportunities in local manufacturing.

"The global economy is fast changing ... we have to take real action on powering our future and we'll do this with the energy plan that I'm developing," he said of the Queensland Energy and Jobs Plan delivered two weeks after the Summit.

"The plan will seek to deliver cheaper Queensland-made electricity to power the growth of local manufacturing, and increase the use of critical minerals and building industrial components right here; we can develop energy generation industries in hydrogen, wind, solar and hydroelectricity and build export markets to help power the world's decarbonised economy."

Queenslanders will build some of the largest industrial-scale renewable energy projects in the world, a series of mega pumped hydroelectric dams and distribution networks with tens of thousands of kilometres of transmission lines, a whole new green hydrogen gas exporting industry; grid scale batteries will be delivered and world record amounts of rooftop solar will power the homes and the businesses of millions upon millions of Queenslanders, Minister de Brenni said.

"We can drive innovation, cost reductions and jobs growth in our transport sector and reduce emissions in agriculture to help primary



"Investments in renewable energy can drive the growth that we need to move our state forward... the energy transformation of our state is the biggest opportunity any of us will see in a **generation."** MICK DE BRENNI

producers remain competitive globally by taking real action on climate change and protecting their environment while delivering opportunities for local small and medium enterprises in industry, and create tens of thousands of jobs and careers in new energy generation in storage and transmission.

"Investments in renewable energy can drive the growth that we need to move our state forward... the energy transformation of our state is the biggest opportunity any of us will see in a generation... and to keep up with this we will need 25 gigawatts in extra energy generation by 2035.

"Good government policy deals with demand, it addresses storage capacity and Paris commitments and the alarming concentration of production of solar components in China.



"We signed the National Energy Transformation Partnership agreement with the federal government and we have enshrined emissions reductions in our energy objectives that will drive ever more renewables across the nation.

"We can deliver both the large-scale renewable energy projects and we can properly support the thousands upon thousands of small businesses that underpin the clean energy industry.

"Of course it's a big challenge but it's also a great opportunity," the Minister said to rousing applause from an audience in full agreement.

Spotlight on Townsville's low carbon, bright economic future

Stephanie Gray, Deputy National Director of Solar Citizens has set her sights set firmly on industry opportunities. During the Queensland Summit she chartered the path for Townsville's development into a renewable industry and hydrogen powerhouse, a hub for advanced manufacturing and processing that's powered entirely by clean energy backed by storage and renewable hydrogen. A hub that processes minerals and materials and generates energy to help power the world's transition to a low-carbon future.

Analysis by Solar Citizens reveals 24,950 jobs would be created by 2030 if Townsville became a Renewable Energy Industrial Precinct. One example is that of the 17,000 jobs at Ark Energy's proposed renewable hydrogen facility and the Lansdown Eco-Industrial Precinct.

Their analysis found that over 3,600MW of new renewable energy generation and 25MW of new storage would likely be required to power the industrial projects analysed.

"Our latest Townsville analysis looked at 10 manufacturing projects currently proposed in the local area and found they would create more than 5,350 ongoing jobs if they proceed and are powered by renewable energy backed by storage," Stephanie said.

Turning to the bigger picture, Stephanie had been urging the Queensland government to go beyond its 50 per cent by 2030 renewable energy target and was elated by the state government's subsequent "bunch of game-changing announcements in their Energy Plan, including an increased Renewable Energy Target of 70% by 2032, up from 50% by 2030 and plans to repower the state's coal-fired power stations and turn them into clean energy hubs by 2035!

"New grid infrastructure to connect regional Queensland's worldclass renewable energy resources. \$2.5 billion in extra funding for publicly-owned clean energy.



Stephanie Gray speaks at the Smart Energy Queensland Summit

"Our hard work paid off," she declared in late September. "This Energy Plan represents a major step forward for the

Queensland government," Stephanie said, crediting the strong and enduring support of the Solar Citizens community.

(Read more about the good work of Solar Citizens on page 56.)

Creating Queensland's SuperGrid

Jacqui Bridge of Powerlink Queensland (pictured at right) was on hand to present a powerful address at the Smart Energy Summit.

Here the Executive General Manager Energy Futures who says Queensland is on the cusp of a generational energy system transformation to support the decarbonisation of the state tells us more about the SuperGrid being developed to ensure timely delivery of a low emission future.

Her words were penned for *Smart Energy* in mid-October, one month after the Summit and a couple of weeks following Premier Annastacia Palaszczuk's unveiling of the state's grand plan.

IT'S ALMOST A YEAR since Australia joined the international community at the United Nations Climate Change Conference (COP26) in Glasgow and committed to net zero emissions by 2050. With that imperative in mind the Queensland Government has released the Queensland Energy and Jobs Plan (QEJP) in which the state extends the existing 50% Renewable Energy Target (RET) by 2030, to include two new targets: 70% RET by 2032 and 80% RET by 2035.

The direction is clear and the challenge for the energy sector is to develop a Renewable SuperGrid that meets customer, community and industry needs.

As the government owned corporation that owns, develops, operates and maintains the high voltage transmission network in Queensland, Powerlink's network provides the platform for renewable energy generation and storage to provide electricity to five million Queenslanders.

Powerlink will play an integral role in creating the SuperGrid to support a low emission future for Queensland.

The electricity system of the future will rely on three key elements:

- large-scale renewable energy generation, with a focus on Renewable Energy Zones
- · a portfolio of storage and firming resources, and
- an upgraded transmission network to transport huge volumes of renewable and stored energy to customers.

Each of these three components is interdependent in that development of only one element will not provide the safe, secure and reliable energy supply that customers expect.

Renewable generation capacity must account for the variable nature of the generation type. The QEJP forecasts the need for a total of 25GW of renewable generation capacity by 2035.

Currently, Queensland has approximately 3GW of large-scale renewable generation connected to the system and more than 10GW in the construction and application phase.

Clearly we have a big job ahead in both building and linking more renewable energy capacity. It's an exciting and positive prospect as we seek to deliver our targets and develop a decarbonised economy.

Large-scale energy storage will complement renewable generation development, allowing energy to be stored and used when required by customers, effectively allowing the variable, weather dependent generation to be time shifted from when it was generated, to when it is

Two large Pumped Hydro Energy Storage developments are proposed in the QEJP with a total of at least 6GW of storage capacity.

Transmission network development will need to support connection of new generation at locations with high resource quality relatively close to the transmission network, develop REZs in a scale-efficient

way and optimise use of the existing network capacity. Timing and coordination in development of generation, storage and transmission is critical to delivering these changes at an efficient cost to maintain affordability for customers, and minimise community and environmental impact.

Transmission network

The electricity transmission network will require development across three key characteristics: Location, Capacity and Capability.

Location: The location of renewable energy developments is driven by range of factors, including the quality of wind and solar resource. The future system will include many more generators across a far more distributed range of locations. The transmission network will need to provide connection to the shared network and extension of the shared network to these new locations. Renewable Energy Zones being developed in Queensland are designed to provide efficient connection for multiple generators within a defined region, minimising both cost and impact on communities and the environment.

Capacity: The capacity of the network must increase, driven by two key factors: variability of renewable generation and electrification of loads that currently use other fuels such as petroleum, gas and coal.

With the transition to variable renewable generation there is a fundamental change in how energy will flow across the transmission network. With renewable generation having lower capacity factors than the current generation fleet (wind and solar capacity factors generally range between 25% and 50%), achieving the same energy delivery requires far more installed capacity modelling reveals, approximately three times more.

At times when renewable generation is at its maximum output (sunny, windy days) we must 'make hay while the sun shines'. The transmission network must provide the network capacity to transmit and store energy while it is available. We will also see increased demand as more of the economy comes to rely on the electricity network, particularly as electric vehicles replace internal combustion engines in the transport sector.

An upgraded high-capacity transmission backbone will enable the efficient transfer of large volumes of renewable and stored energy and provide a flexible platform for future expansion as new loads emerge.

Capability: Power system security requires system services such as system strength and inertia, to ensure adequate voltage control, stability and ramp rates. The reduction of synchronous generation sources (such as coal-fired generation) changes the electrical characteristics of the energy system. Continuing to meet power system security into the future will require sufficient system services provided by a range of alternate sources.

The connection of new assets and elements to the transmission network including Pumped Hydro Energy Storage (PHES), large-scale Battery Energy Storage Systems (BESS), synchronous condensers, reactors and other new technologies will provide the system services required.

The energy system transformation is underway.

Powerlink Queensland is playing a critical role in developing the transmission network to support the location, capacity and capability of new renewable generators.

The communities we co-exist with are looking to us to undertake effective and early engagement to provide information and the



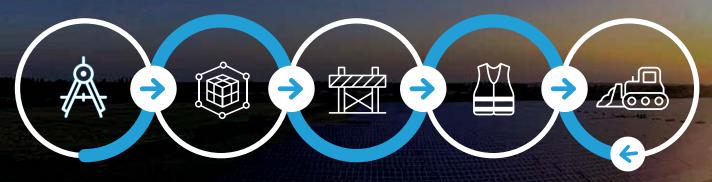


opportunity to influence how our planning and decisions impact on them in the short and longer term. The transformation to a clean, efficient and affordable energy system is only possible with the support of Oueenslanders.

The Smart Energy Council acknowledges the generous support of all sponsors and speakers participating in the Queensland Summit as well as the presence of all 250 attendees.

Renewable energy project lifetime solutions

Tailored and consolidated solutions, making every day more efficient



PRE-PLANNING

Site selection & financing needs accurate weather data

DESIGN & ENGINEERING

Asset planning needs accurate weather data to maximise potential output & returns

CONSTRUCTION

Requires weather forecasting & storm detection services to optimise project planning

OPERATION & MAINTENANCE

Needs weather/ production forecasting & storm detection services to maximise output & reduce risk

DISMANTLING & RECYCLING

Ensure safely during decommissioning operation

Weatherzone Business, a DTN company, supports the entire lifecycle of your renewables project, from pre-planning to dismantling, with accurate weather intelligence.



SMART ENERGY

CONFERENCE & EXHIBITION

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 May 2023 in Sydney to learn more about Australia's journey toward a renewable energy generation and exporting superpower

- Australia has got the potential

The world's best solar and wind resources

- We've got the means

Space for development, smart technologies, innovators, suppliers, project developers, financiers

- We've got the will

Everyday Australians are embracing the move to renewable energy. And State and Federal renewables ambitions and climate targets are helping us build a smarter, cleaner, 21st century energy system

There is an imperative

Global warming caused by carbon emissions demands a fast transition to renewable energy

- What's holding us back?

Not much!



2023 PARTNERS





















△ NELTA



Dyness

ACSolar

Smart Energy 2023 will be the 60th annual conference & exhibition for the Smart Energy Council. And this conference will be like none other, showcasing the phenomenal advances in state developments and renewables-friendly federal policies over the past year.

SHARING KNOWLEDGE

We proudly present a top line-up of expert speakers: industrial and technical specialists, project developers, financiers and key policy makers, market analysts and advisors, across three conference streams. CPD points available.

INNOVATION AND SUSTAINABILITY

The latest smart energy trends and products and emerging technologies will be on show in the Expo Hall. Be among the first to see product launches and demonstrations.

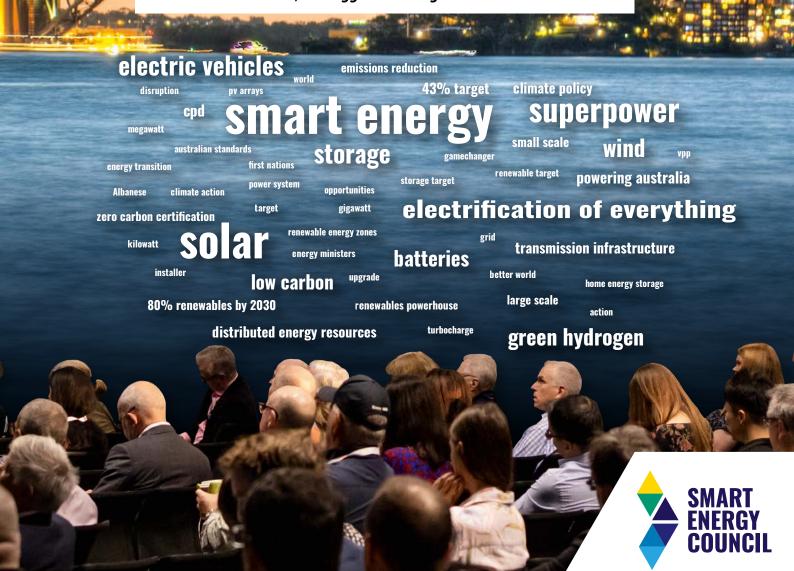
NETWORKING

Mix with new and old colleagues during and after conference sessions in a convivial setting

THE NUMBERS

150+ PA 7,500+ DELEGATES

Don't miss this event, the biggest all things renewables in Australia.





The First Nations Clean Energy Network was established in late 2021 to ensure First Nations people are key players in, and benefit from, Australia's renewable energy transition. The Smart Energy Council which was a launch partner spoke to Steering Group member Chris Croker.

NOVEMBER 2022 marks the first anniversary of the First Nations Clean Energy Network ('the Network') whose mission to address three pillars; community, industry partnerships and policy reform on behalf of Australia's Indigenous population is already scoring dividends.

Planning and communication took place over many years prior to inception, said Steering Group member Chris Croker. "First Nations communities had raised many serious concerns around energy accessibility and affordability, and inclusion in the energy transformation. We have examples of large-scale wind and solar projects being built in proximity of Aboriginal communities whose power was going out every other week due to unreliable networks," he said.

Exacerbating difficulties are the energy pre-payment plans endemic to Aboriginal households, as many as 90,000 according to ANU, that all routinely face energy insecurity issues with many losing electricity supply on a week to week basis.

"This year's significant increases in electricity and gas prices have had a big impact on household budgets and affordability, already it's a case of do you take your child to the doctor this week or keep the gas or power on?" said Chris, adding extreme temperatures are not helping.

It's now widely recognised that those who contribute least to global emissions are finding themselves on the frontline of climate change, points out Karrina Nolan who was a key initiator of the Network and is Executive Director of Original Power.

She says the ever-increasing heatwaves in central Australia are causing ever more discomfort and cites CSIRO data forecasting the number of days over 45 degrees will double by 2030 which will have a major impact on remote communities.

But relief could be in sight.

Chris Croker told *Smart Energy* "One year on and the First Nations Clean Energy Network has made significant progress. In August 2022, Australia's federal, state and territory energy ministers committed to developing a First Nations Clean Energy Strategy which brings concerns of First Nations to the foreground, and this is thanks to our efforts, no longer can we be the silent minority.

"Another key development was our July Clean Energy Symposium in Melbourne with community groups where we heard about the good work of our brothers and sisters [Indigenous/First Nations peoples] in north America and elsewhere.

"They are many years ahead of us, having made massive inroads into energy self-sufficiency and by actively participating in supplying energy solutions that also provide economic gains.

"But in Australia we now have some important alliances including industry groups and large institutional investors and a superannuation coalition adopting more heritage guidelines for investments," Chris said.

Practical plans and progress

In other developments, the Network has finalised its Information Resources Plan that focuses on the role of education and inclusion in a just transformation in the electricity sector, and addresses Best Practice Engagement Principles during new developments on traditional lands to ensure culture and heritage is protected as well as fair and favourable notification of projects in the pipeline and social benefits such as local employment.

"We are collaborating with the federal government on its Energy Transformation Roadmap and ensuring dedicated policy work around Aboriginal and Torres Straits Islander engagement, as recently announced



"Working together we can unlock investment in new energy projects and solve energy security challenges. We will advance economically and ensure a clean energy future for our people."

by Minister for Climate Change and Energy Chris Bowen. More consultation is needed but we have taken the first important steps... community engagement has been lacking to date with many developers not engaging with Indigenous communities or potential workers," Chris explained. He pointed out that for Australia to achieve its sweeping renewable energy transformation one million more workers are needed in the sector, and that means skilling up the workforce. He notes however the barrier in the limited number of TAFEs and universities in remote regions, or even those that are providing training in renewables, will slow the development of skilled workforce.

Paving the way for decarbonisation

Fortunately, Australia is now more serious about reducing its carbon impact and speeding the renewable energy transition though carbon emissions reductions targets and policies and investment in new transmission lines.

New developments and policies are being announced on a regular basis and policy makers are really engaging with us, they are serious about including a First Nations voice in the transition, Chris Croker said.

One key factor to address is the public housing or rental accommodation sector, given few First Nations families own their homes and are locked out of the benefits of rooftop PV.

There was however the celebrated test case in late 2021 of Tennant Creek elder Uncle Norman Jupurrurla Frank who was spending several hundred dollars each fortnight on electricity before becoming the first Aboriginal family in public housing to install rooftop PV.

Now he's a net exporter of electricity who gets a credit on his account, and has led a first-of-its-kind demonstration project integrating rooftop solar with pre-payment meters in town camps.

Norman Franks stated "Clean energy is the medicine that our people need. I dream of having solar on every house in town. We can get our people trained up to bring cheap energy from the sun, which unlike diesel or gas, will never run out and won't hurt our country."





Chris Croker commented "What a great example! If we can remove some of the regulatory barriers around public housing and rentals we can really move forward... if we are to have rooftop PV on every house this must include the public housing sector."

Shaping and making an impact

In his day job as Managing Director, Impact Investment Partners, Chris leverages capital from ethical investors to partner with Indigenous communities to directly address long entrenched essential service gaps including unreliable and costly electricity.

Torres Strait Islanders court win on rising temperatures and sea water levels

In August this year the UN Human Rights Committee in Geneva found that climate change was impacting Torres Strait claimants' daily lives; that Australia was breaching its human rights obligations to the people of the Torres Strait by failing to cut its greenhouse gas emissions quickly enough; and Australia's poor climate record is a violation of their right to family life and right to culture under the global human rights treaty, the International Covenant on Civil and Political Rights.

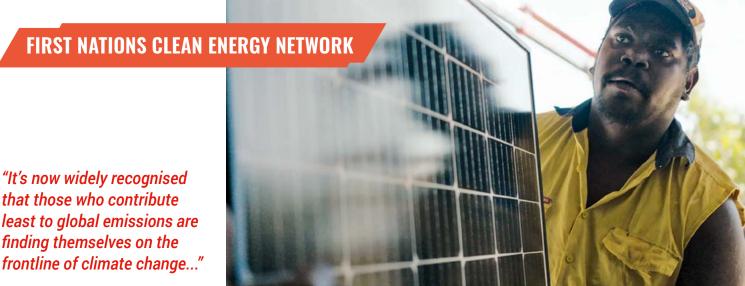
The decision marks the first time a country has been deemed to have violated human rights law through inadequate climate policy and the first time a nation state has been found responsible for their greenhouse gas emissions under international human rights law.

Momentous determinations. We had to canvass Chris's views. He told us "Over many years I have offered my support to the Torres Strait climate action group and followed this case closely and I am thrilled by the historic victory of the eight claimants from Zenadh Kes [aka #TorresStrait8] in the legal fight against the Australian Government for violating its human rights obligations to them through climate change inaction.

"This case sets a clear and vital precedent to hold governments to account, that we need to be mindful of the serious impacts of climate change on our offshore and remote communities."

He drew comparison with the Tiwi Islanders who in September won a landmark case against Santos's drilling for gas in their traditional waters after they failed to consult them about the impact of the project. "To me these are turning points. Aboriginal and Torres Strait Islander rights are being recognised and legally legislated, a huge change from the past, when we had limited or no rights to protect our lands and cultural heritage," Chris said.

"Although Australia is not a huge carbon emitter on a world scale we are one of the largest emitters per capita and also the largest exporters of carbon emissions; we actually have a very big impact."



He's developing several renewable energy projects in partnership with Aboriginal communities including Ltyentye Apurte, NT Central Australia communities and also in a solar project on Aboriginal

community land in the Pilbara.

These and other projects involve moving 12 Aboriginal communities off traditional diesel generation to renewables solutions, and directly participating in economic investments where communities are in proximity of transmission infrastructure and ripe for solar and wind projects.

Look out for the first large-scale announcement in December, says Chris. A community-led project supported by Impact's Indigenous Infrastructure Investment Fund and capital allocated from institutional investors, as well as half a dozen ethical offices or foundations.

"Additionally, we have four Indigenous foundations interested in investing in these community-led projects, where they will self-invest in

communities in partnership with socially-aligned commercial investors," he explained.

The highly qualified and very practical engineer expressed that proven renewable and energy storage technologies have been available and used at scale in Australia for many years, and that "practical, affordable, robust and reliable technologies are more attractive for our Indigenous energy projects, rather than waiting for new, cutting-edge solutions."

Smart Energy will check back in with Chris and the team at the First Nations Clean Energy Network later next year for project updates. Perhaps too we'll be able to grace the pages of this magazine with some more shining examples of renewable energy systems in action and benefitting Australia's Indigenous population.

www.firstnationscleanenergy.org.au, Twitter: @FirstNationsCEN







Only an Aussie company can design for the Australian market











GREEN HYDROGEN

Hydrogen happenings

GLOBAL ENERGY CRISIS, A TRIGGER FOR GREEN HYDROGEN

The International Energy Agency has joined the throngs declaring the global energy crisis accentuates the need for policy to align energy security needs with climate goals.

In a special report the IEA says hydrogen can contribute to energy security by decreasing dependency on fossil fuels, either by replacing fossil fuels in end-use applications or by shifting fossil-based hydrogen production to renewable hydrogen.

Further, the development of an international hydrogen market can add to the diversity of potential energy suppliers, enhancing energy security for energy importing countries.

Should governments implement ambitious policies to meet their climate pledges, hydrogen could help avoid 14 billion cubic metres a year of natural gas use, 20 million tonnes of coal equivalent a year and 360 thousand barrels a day of oil use by 2030, equivalent to more than today's fossil fuel supply of Colombia.

The International Energy Agency's *Global Hydrogen* report of September 2022 comes in at a hefty 284 pages, but fortunately the executive summary tells us much of what we need to know, even though it's a mixed bag of news.

The agency found that hydrogen demand reached 94 million tonnes (Mt) in 2021, recovering to above pre-pandemic levels (91 Mt in 2019), and containing energy equal to about 2.5% of global final energy consumption. Most of the increase came from traditional uses in refining and industry, though demand for new applications grew to about 40 thousand tonnes (up 60% from 2020, albeit from a low base).

Heavy industry, heavy duty road transport and shipping offer the largest opportunities to deliver fossil fuel and emissions savings.

Disappointingly, much of the increase in hydrogen demand in 2021 was met by hydrogen produced from unabated fossil fuels, delivering no benefit to mitigating climate change.

Production of low-emission hydrogen came in at less than 1 Mt in 2021, the majority from plants using fossil fuels with carbon capture, utilisation and storage.

However, the pipeline of projects for the production of low-emission hydrogen is growing at an impressive speed, the IEA wrote.

By 2030, if all these projects are realised, low-emission hydrogen production could reach 16-24 Mt per year: 9-14 Mt based on electrolysis and 7-10 Mt on fossil fuels with CCUS.

In the case of electrolysis, the realisation of all the projects in the pipeline could lead to an installed electrolyser capacity of 134-240GW by 2030, with costs for electrolysers falling by around 70% by 2030 compared to today.

Their analysis suggests that combined with the expected drop in the cost of renewable energy, this can bring the cost of renewable-based hydrogen down to a range of US\$1.3-4.5/kg H2 (equivalent to US\$39-135/MWh).

And with today's fossil energy prices, renewable hydrogen could already compete with hydrogen from fossil fuels in many regions, especially those with good renewable resources IEA writes.

Large volumes of hydrogen could be traded by the end of the decade if barriers are addressed soon, and the IEA trumpeted the world first shipment of liquefied hydrogen from Australia to Japan in February 2022 "a key milestone in the development of an international hydrogen market".



(Ahem: blue hydrogen it was. AGL Loy Yang produced 99.99% pure hydrogen using brown coal and biomass. The hydrogen was cooled to minus 253 degrees and liquified to less than 800 times its gaseous volume to create liquefied hydrogen.)

Moving on, based on the number of export-oriented projects under development, an estimated 12 Mt of hydrogen could be exported annually by 2030, with 2.6 Mt/yr planned to come online by 2026, the IEA report states.

Nearly all of these export-oriented hydrogen project plans have been announced in the last two years, with most projects that have identified a hydrogen carrier choosing ammonia as the preferred option.

Which brings us pretty neatly to the:

YURI RENEWABLE HYDROGEN TO AMMONIA PROJECT

The aviation industry is often singled out for its high levels of carbon dioxide emissions, however the production of ammonia is level pegging; the highly energy intensive process generating about 500 million tonnes of carbon dioxide.

That equates to around 1.8 per cent of global carbon dioxide emissions.

It's a contribution that Yara, which operates the world's largest global ammonia network, including a world-scale ammonia production facility in the Pilbara, plans to dial down.

In a bid to meet the growing market for green, zero carbon ammonia, Yara is collaborating with ENGIE to build a renewable hydrogen and ammonia plant adjacent to its existing plant which is one of the world's largest.

In mid-September the Australian Renewable Energy Agency (ARENA) conditionally approved \$47.5 million towards the \$87 million Yuri project near Karratha in Western Australia

The project includes a 10MW electrolyser to produce renewable hydrogen, 18MW solar PV system to power the electrolyser and 8MW/5MWh lithium-ion battery for firming to supply hydrogen and electricity to Yara Pilbara Fertilisers at its neighbouring liquid ammonia facility.

(Note: the biggest electrolyser currently operating in Australia is 1.25MW at Tonsley Park in Adelaide.)



On completion early in 2024, the Yuri project will be Australia's largest electrolyser, capable of producing up to 640 tonnes of renewable hydrogen per year.

The Smart Energy Council engaged Bureau Veritas, a world leader in laboratory testing, inspection and certification services to undertake a pre-certification audit of Yara's planned green ammonia plant under protocols established under SEC's Zero Carbon Certification Scheme.

Detailed engineering assessment and analysis by Bureau Veritas concluded the planned ammonia plant would produce ammonia and hydrogen with carbon footprints of 0.109 kgCO $_2$ e/kgNH $_3$ (kilogram of carbon dioxide equivalent/liquid hydrogen) and 0.26 kgCOe $_2$ /kgH $_2$, respectively.

The Smart Energy Council considers the level of embedded carbon de minimis and able to be certified as Zero Carbon Renewable Ammonia, which is a world first.

John Grimes emphasised the importance of tracking how these products are manufactured so customers can be certain that the product they select is genuinely zero emissions.

WAKEUP CALL Thirty-two independent studies have called out the folly of using hydrogen for heating on the basis of inefficiencies and exorbitant costs compared to heat pumps, solar thermal or district heating.

Separate analysis by Cornwall Insight concludes hydrogen heating could almost double the cost of home heating by 2030 compared to fossil gas, while campaigners Global Witness estimate the use of hydrogen in heating would double European energy bills by 2050.

According to studies electrolysers consume about one-fifth of the feed electricity in the conversion to hydrogen and boilers lose a further 15% converting to heat.

The scenario is exacerbated with hydrogen containing three times less energy by volume compared to natural gas, demanding higher quantities for the same amount of heat; also the trebling of energy needed to pump hydrogen into homes and businesses.

Michael Liebreich has likewise drubbed hydrogen heating, declaring "No serious analysis has hydrogen playing more than a marginal role in the future of space heating... We need to get Europe's heating systems off natural gas... the winners are district heating, heat pumps and electrification."

In late September YARRA VALLEY WATER LAUNCHED ITS GREEN HYDROGEN PILOT to test technology which would enable renewable hydrogen energy to be produced at its Aurora treatment plant.

A Victorian-made high-tech electrolyser will be tested to validate its performance before the development of a \$11.9 million larger-scale facility funded by the Victorian Government; a permanent renewable hydrogen facility at Aurora 'Hydro Gen-1'.

"Australia's goal is to be a major supplier of clean hydrogen by 2030 and the water industry has a critical role in providing a commercially viable renewable hydrogen future," Yarra Valley Water's Managing Director Pat McCafferty said.

"Recycled water and renewable energy are needed to make sustainable hydrogen and we're producing both at Aurora, which is powered by green energy from our onsite food waste-to-energy facility. And the by-product from hydrogen production — oxygen — can Magnus Ankarstand, President of Yara Clean Ammonia added "This certification will provide guarantees to Yara's customers in Asia, Australia or Europe that the quantities supplied have been produced according to set standards and will inform the customers about key attributes such as renewable origin and greenhouse gas footprint."

A further audit will be undertaken once the facility is commissioned to verify that the plant has been built according to plans and specifications to achieve these standards.



potentially be used to make our sewage treatment processes more efficient."

The project will be delivered through collaboration with Australian Gas Infrastructure Group which supplies gas to over 1.4 million homes and businesses in Victoria, with operations also across every mainland state and the Northern Territory.



IN ANOTHER LEADING AUSTRALIAN DEVELOPMENT, MOTHERSON

is looking to partner with an established electrolyser company from overseas to add value, and build the manufacturing skills and capabilities in Adelaide to supply electrolysers (or components thereof) to the Whyalla project.

Ambitious timelines have been set for building the 250MWe electrolysis plan in Whyalla by 2025.

Motherson is also in the process of establishing partnerships with local universities (including Monash Energy Institute and Hydrogen CRC, based in Adelaide) and technology companies (including BOC and Tonsley Innovation District in SA) to build, demonstrate and commercialise emerging electrolyser technology.



GREEN HYDROGEN IN TRANSPORT

Hydrogen transport in Australia: The road to 2030

Early in 2022 Australia's first hydrogen refuelling station was certified under the Smart Energy Council's Zero Carbon Certification scheme, but it is going to take a whole lot more renewable hydrogen and supporting delivery infrastructure to make a sizeable dent in Australia's transport emissions and strengthen fuel security, says Max Hewitt of Hydrogen Australia, a division of the Smart Energy Council.

HYDROGEN – when produced without excess emissions – is increasingly being considered as a fuel to help decarbonise many different sectors of the economy, including some which could not otherwise be decarbonised, for example industrial processes that can't be electrified, like fertiliser production.

In Australia, we are fortunate to have some of the best conditions in the world for large-scale production of low-cost renewable energy and hydrogen. Looking forward, it may be possible to leverage these advantages and deliver significant decarbonisation across the economy.

To advance decarbonisation, we also need hydrogen certification as a guarantee of origin for the hydrogen, detailing the emissions associated with the production process. This provides customers with an understanding of the renewable nature of the product (or an understanding of how polluting it may be).

The Zero Carbon Certification Scheme is an industry-led scheme which came about through consultation with Hydrogen Australia members and a consensus that transparency was critical to the long-term success of the industry.

The scheme only considers renewable hydrogen projects for certification, to promote the development of sustainable projects which will help deliver low-cost renewable hydrogen and decarbonise most effectively. The certification of the refuelling station in the Australian Capital Territory allows the operator, ActewAGL, to demonstrate that the hydrogen being dispensed to customers on site is renewable (according to the scheme requirements).

"The hydrogen industry has set its sights firmly on the heavy vehicle market."

Australia and the worldwide landscape

Australia is just getting started on its hydrogen journey. While there is a lot of hype, the reality is that we have been slow to leave the starting blocks. Currently there are three hydrogen refuelling stations operating in Australia, included in the total of six at various stages of development.

However hydrogen is rapidly gaining favour as a global transport opportunity. Just 10 years ago, there were around 215 refuelling stations worldwide, with numbers actually decreasing.

By 2017, things had turned around and development began to skyrocket. In 2021, a record-breaking 142 stations were installed. This took the global total to 685 by the end of 2021. Most of these refuelling stations are in Europe, Asia and North America. Germany has 100; Japan has 159; China has 105; and Korea 95.

Getting things moving

Within Australia there have been some significant recent announcements regarding hydrogen transport infrastructure.

The New South Wales, Victorian and Queensland governments have combined forces to accelerate the development of a 'hydrogen highway' along one of the country's busiest traffic corridors.

This would see the delivery of a series of hydrogen refuelling stations along the east coast,

"Australia's advantageous conditions for large-scale production of low-cost renewable energy and hydrogen could deliver significant decarbonisation across the economy – but only if we get moving now."



A Hyzon Motors fuel cell bus. Image: Hyzon Motors



"What is sorely needed at the Federal level is an uptake mechanism similar to the Renewable Energy Target scheme, or alternatively stronger commitments to the development of infrastructure and pathways for renewable hydrogen".

which could potentially decarbonise freight and transport between some of Australia's major cities and simultaneously bolster fuel security.

Additionally, the previously mentioned state governments have made it a priority to ensure that renewable hydrogen is produced for refuelling – outlining a preference for certified, or certifiable products and processes.

While there have been no specific announcements from other states and territories, each has outlined hydrogen transport as an early offtake opportunity in their respective hydrogen strategies.

The New South Wales government has also set targets of 10,000 hydrogen vehicles and 20 per cent of heavy vehicles running on hydrogen by 2030.

These targets, combined with the ambitious tri-state highway plan, could see things change pretty rapidly on the east coast.

The New South Wales government has an additional aspirational target to deliver 100 refuelling stations by 2030, alongside the state's expansion of renewable hydrogen production with clearly elucidated electrolysis capacity and production targets.

If Australia is to successfully pivot its transport sector to renewable hydrogen, other states and territories will need to adopt support for infrastructure and uptake similar to the targets set by New South Wales to stimulate development as we move towards 2030.

Timelines and standards

Even with this support, hydrogen transport will still take some time to get rolling. Despite hype and appetite, these projects have long lead times, and demand-specific equipment and expertise.

Most importantly, there are stringent safety requirements to observe. A further challenge is that – in many instances – there are very few developed national standards (safety or other) for project developers to use.

This means that each project generally needs to develop a bespoke safety and operational strategy. This extends project lead times even further, while projects concurrently deal with the growing pains of manufacturers as they scale up production of fuel-cell vehicles and work with standards organisations to enable uptake.

These factors contribute to a less-than-favourable outlook for hydrogen passenger vehicles within Australia.

The primary issue with smaller hydrogen transport is that it competes directly with electric vehicles (EVs). While there are certainly use cases for both EVs and hydrogen vehicles, they have different benefits depending on the context.

Hurdles faced by hydrogen passenger vehicles include the slow rollout of refuelling infrastructure, as well as the complex permitting process required for those keen to refuel their hydrogen car today —



A Hyzon Motors fuel cell truck in road train configuration. Image: Hyzon Motors

hydrogen fuel cell vehicle owners today must communicate closely with fuel station operators to ensure there is enough supply.

When comparing these challenges to the simplicity of plugging your EV into your charger at home (supercharger or not), it becomes a tough sell if you propose to replace the family car with a hydrogen vehicle.

Future of hydrogen transport

So where does hydrogen transport make sense? The hydrogen industry has set its sights firmly on the heavy vehicle market.

These vehicles are often too large to be powered effectively by batteries. There is also a Catch 22 in large EVs: the heavier the load being driven, the larger the battery will need to be, which will further increase the weight (and so on).

Heavy vehicles with high utilisation are a perfect fit to convert to hydrogen. Examples are: buses, freight and delivery vehicles, garbage trucks, and other back-to-base vehicles. Hydrogen excels in this particular area as vehicles can be rapidly refuelled on demand.

For large electric vehicles, this might mean that a bus or truck is out of service for several hours as it recharges, impacting services.

With a hydrogen vehicle, once it is running low it could be refuelled in a number of minutes and be back on the road very quickly.

Using renewable hydrogen to deliver the decarbonisation of Australia's major freight corridors would be a terrific outcome for 2030, and is very achievable if we develop the necessary supporting infrastructure.

Australia's new Labor Government has yet to reveal any specific plans in the hydrogen space. The Federal Department of Industry, Science and Resources is currently assessing the rollout of hydrogen refuelling infrastructure as a part of the Future Fuels program with delivery anticipated by 2025.

The previous Liberal National Party administration promoted a strategy of establishing hubs around the country and capitalising on cross-sector opportunities through concentrated industrial clusters.

Many of these initiatives are under development now.

What is sorely needed at the Federal level is an uptake mechanism similar to the Renewable Energy Target scheme, or alternatively stronger commitments to the development of infrastructure and pathways for renewable hydrogen.

A domestic uptake strategy for renewable hydrogen would be a fantastic outcome, and one that could bolster fuel security while helping Australia deliver decarbonised transport in an effective and timely manner as we move towards 2030.





Electric Vehicle Chargers for any application.

FIMER offers a comprehensive range of AC and DC electric vehicle chargers. Designed and manufactured in Italy, FIMER's chargers will meet the needs of end-users and charger operators seeking solutions for private, public and commercial use.

Learn more: fimer.com/e-mobility



FLEXA AC Wallbox

Single-phase & Three-phase solutions



- Available in 7kW (single-phase) or 22kW (three-phase)
- Choose a Type 2 socket or corded cable
- The cover is made from 100% recycled plastic
- Choose from simple plug-and-charge to advanced models with OCPP functionality



FLEXA AC Station

Charge two vehicles at the same time



- Get 2 x 22kW T2 socket
- The charger includes built-in load management when multiple chargers are used
- Choose from simple plug-and-charge to advanced models with screen and OCPP functionality



ELECTRA DC Station

Charge three vehicles at the same time



- Modular DC power ratings of 60, 90, 120 & 150kW
- 1 AC Type 2 socket + 2 DC sockets (CCS2 or CHAdeMO)
- Remote communication, dynamic load management and OCPP functionality as standard

FIMER's chargers can be integrated with charging management providers: Everty, NoodoeEV and ChargeFox in Australia.

It'll be impossible to replace fossil fuels with renewables by 2050, unless we cut our energy consumption

ENERGY CONSUMPTION – whether it's heating your home, driving, oil refining or liquefying natural gas – is responsible for around 82% of Australia's greenhouse gas emissions.

Unless Australia reduces its energy consumption, my recent study finds it'll be almost impossible for renewable energy to replace fossil fuels by 2050. This is what's required to reach our net-zero emissions target.

Yet, as the nation's economy recovers from the pandemic, Australia's energy consumption is likely to return to its pre-pandemic growth. The study identifies two principal justifications for reducing energy consumption (or 'energy descent'):

- 1. the likely slow rate of electrifying transport and heating
- 2. that renewable energy will be chasing a retreating target if energy consumption grows.

Energy descent isn't an impossible task. Indeed, in 1979, Australia's total final energy consumption was about half that in 2021. Key to success will be transitioning to an ecologically sustainable, steady-state economy, with greener technologies and industries.

What's slowing down growth in renewables?

To transition to sustainable energy, Australia must electrify transport and combustion heating, while replacing all fossil-fuelled electricity with energy efficiency and renewables, which are the cheapest energy technologies.

Renewables can be rolled out rapidly: wind and solar farms can be built in just a few years and residential rooftop solar can be installed

in a single day. But rapid growth in wind and solar is slowed by three critical infrastructural and institutional requirements of the electricity industry:

- to establish Renewable Energy Zones (a cluster of wind and solar farms and storage)
- to build new transmission lines and medium-term energy storage such as pumped hydro
- to reform electricity market rules to make them more suitable for renewable electricity.

These take longer than building solar and wind farms and much longer than installing rooftop solar and batteries. Nevertheless, they could be fully implemented within a decade.

In fact, transitioning existing fossil-fuelled electricity generation, such as coal-fired power stations, to 100% renewables could possibly be completed by the early 2030s.

But optimistic calculations based on how quickly we can build solar and wind farms and their infrastructure ignore the fact that the growth of renewable electricity is limited by electricity demand.

When existing coal-fired power stations have been replaced by renewables, electricity demand will be determined by how rapidly we can electrify transport and combustion heating. These are the principal tasks that will limit the future growth rate of renewable electricity. They will likely be implemented slowly, despite the urgency of climate change.

Households and industries have big investments in petrol/diesel vehicles and combustion heating. They may be reluctant to replace these working technologies without substantial government incentives.





So far, effective federal government policies are almost non-existent for transitioning transport and heating, which are together responsible for 38% of Australia's emissions.

This month's announcement of a future 'consultation' on fleet fuel efficiency standards is the government's tentative first step.

Chasing a retreating target

If we look at only percentage growth rates, the task of renewable electricity looks misleadingly easy. From 2015 to 2019, Australia's renewable electricity grew by 62% – an excellent achievement.

But, it was starting from a small base. This means its increase in energy production over that period was only slightly bigger than the growth of total final energy consumption – comprising electricity, transport and heating – which is still mostly fossil fuelled.

On the global scale, the situation is even worse. As a result of growth in total final energy consumption, the share of fossil fuels was the same in 2019 as in 2000: namely around 80%.

The challenge for renewable energy is like a runner trying to break a record while officials are striding away down the track with the finishing tape.

This situation is not the fault of renewable energy technologies. Nuclear energy, for example, would grow much more slowly and would take even longer to catch up with growing consumption.

In one of the scenarios I explore in my study, Australia's total final energy consumption grows linearly at the pre-pandemic rate from 2021 to 2050. Then, renewable electricity would have to grow at 7.6 times its pre-pandemic rate to catch up by 2050.

Alternatively, if renewable electricity growth is exponential, it would have to double every 6.8 years until 2050.

Considering that future growth in renewable electricity will be limited by the rate of electrifying transport and combustion heating, both the required linear and exponential growth rates appear impossible.

Possible solutions

Both the International Energy Agency and modelling done for the Intergovernmental Panel on Climate Change avoid the problem by assuming large-scale carbon dioxide capture and storage or directly capturing CO from the air will become commercially available.

But relying on these unproven technologies is speculative and risky. Therefore, we need a Plan B: reducing our energy consumption.

My study shows if we could halve 2021 energy consumption by 2050, the transition may be possible. That is, if raw materials (such as lithium and other critical minerals) are available and local manufacturing could be greatly increased.

For example, if the total final energy consumption declines linearly and renewable electricity grows linearly, the latter would only have to grow at about three times its 2015–2019 rate to replace all fossil energy by 2050. For exponential growth, the doubling time is 9.4 years.

Improvements in energy efficiency would help, such as home insulation, efficient electrical appliances, and solar and heat pump hot water systems. However, the International Energy Agency shows such improvements will be unlikely to reduce demand sufficiently.

We need behavioural changes encouraged by socioeconomic policies, as well as technical.

Implications of energy descent

To reduce our energy consumption, we would need public debate followed by policies to encourage greener technologies and industries, and to make socioeconomic changes.

This need not involve deprivation of key technologies, but rather a planned reduction to a sustainable level of prosperity.

It would be characterised by greater emphasis on improving and expanding public transport, bicycle paths, pedestrian areas, parks and national parks, public health centres, public education and public housing.

This approach of providing universal basic services reduces the need for high incomes and its associated high consumption. As research in 2020 pointed out, the world's wealthiest 40 million people are responsible for 14% of lifestyle-related greenhouse gas emissions.

And on a global scale, energy descent could be financed by the rich countries, including Australia. Most people would experience a better quality of life. Energy descent is a key part of the pathway to an ecologically sustainable, socially just society.

Mark Diesendorf is Honorary Associate Professor, UNSW Sydney.

This article first appeared in 'The Conversation' and is reproduced under Creative Commons Licence.



Energy savings schemes must drive electrification sooner

Fuel switching incentives becoming available under energy savings schemes across Australia represent a crucial opportunity to drive electrification sooner for commercial and industrial businesses and households, writes Ric Brazzale. board member of the Energy Savings Industry Association (ESIA).

IN A POSITIVE STEP the Albanese government has legislated an emissions reduction target (ERT) of 43% by 2030. However, based on the science we need more like 75% to limit global warming to 1.5°C in line with the Paris Agreement.

The 82% renewables target by 2030 and an aggressive battery storage program and Rewiring the Nation plan are all great news. But to plug a major gap, we still

urgently need a national energy savings scheme (NESS) which the Climate Change "... we still urgently need a national energy savings scheme"

Authority has recommended since 2017 and which the Business Council of Australia recommended in 2021 at least for vulnerable households.

Decarbonisation of the National Electricity Market (NEM) is set to accelerate by 2025, so policy makers at federal and state level now need to weave in policy measures that enable mass uptake of more efficient household and business appliances and equipment that switch energy consumers from gas to electric fuel sources rapidly to 2025.

It's a big call to swiftly shift the focus to largely get off gas and only reward gas-to-gas efficiency where other options are limited, so we need a nuanced suite of policies.

In early October the Albanese government delivered the welcome news of a national energy performance strategy consultation commencing in late 2022. It will take further consultation to shape and launch a NESS, hopefully based on the NSW model so most of the groundwork has been done.

The *immediate* national opportunity to rapidly accelerate efficiency upgrades across Australia is to introduce more methods under the federal Carbon Farming Initiative (CFI) energy efficiency methods. These can be adopted directly from the longestablished energy savings schemes in New South Wales and Victoria.

To date, less than 2% of the total Australian Carbon Credit Units (ACCUs) created under the CFI have been for energy efficiency projects. Given that existing methods require measurement and verification by energy efficiency expert engineers, the integrity of the savings awarded ACCUs are very high.

Victoria's gas use and emissions

In Victoria, which has just announced an ERT of 75-80% by 2035, 2.2 million households and businesses use gas, about 65% use gas for heating and cooling, and hot water. The gas sector contributes 17% of the state's emissions, and most of the gas is consumed by industry.

That state's Gas Substitution Roadmap 2022 sets a clear pathway and is relying on the Victorian Energy Upgrades (VEU) energy savings scheme as a key lever. Grant programs such as sub-metering are a crucial adjunct and first step for businesses to better inform their energy management.

The VEU, which has a greenhouse gas emissions (CO₂-e) target metric, could support the gas-to-electric switch over the long term as the emissions intensity of electricity supply reduces.

The VEU is phasing out upfront financial incentives for households upgrading from old to more efficient gas-to-gas appliances.

The Energy Savings Industry Association is urging Victoria to introduce much stronger fuel switching signals for all upgrades under the program. A way to do this is to value permanent fuel-switching. For example, in its response to consultations reviewing existing water heating and space heating and cooling activities, underlying calculations could value more than equipment lifetimes.

Once the switch has been made, getting back on gas is unlikely. Without strong signals, energy consumers will lock into gas products which will be more "Without strong signals, energy consumers will lock into gas products which will be more expensive to run and higher emitting to 2030"

expensive to run and higher emitting to 2030.

The state of NSW

The New South Wales Energy Savings Scheme (ESS), which has a MWh-based target, is addressing fuel-switching opportunities as part of its current consultation.

That state is wrapping this new direction into its overarching Energy Security Safeguard which now includes a peak demand reduction scheme (PDRS). Commencing from 1 November, the PDRS provides financial incentives called peak reduction certificates (PRCs – 'perks').

The first tranche of eligible activities includes commercial and industrial hot water heat pumps. This activity attracts energy savings certificates (ESCs) under the ESS and PRCs.

It has the scope to support significant uptake as switching to more efficient equipment that also reduces water heating load during peak times from 2.30pm to 8.30pm AEST during summer from 1 November to 31 March, significantly reducing peak energy demand.

Addressing all sectors

Other low-hanging fruit yet to come includes batteries and commercial air conditioning and refrigeration



upgrades using measurement and verification methods. For homes, upgrading and switching pool pumps to operate outside of the peak could save up to 450MW: more than the capacity of a generating unit at Liddell coal-fired power station. We are advocating that the federal government also launch a PDRS based on the NSW model.

Finally, beyond emissions reductions and efficiency gains, energy upgrades deliver significant bill savings. In a cost-benefit analysis of the NSW ESS and PDRS to 2040, households and businesses participating in both schemes are expected to save an additional \$3.6 billion on their bills from 2022-2040. The net economic benefit is predicted to be \$1.2 billion by 2040 for that state.

"Policy measures must provide targets with penalties for liable parties, financial incentives for energy consumers and workable activities and methods for industry" We mustn't kid ourselves. We have a short runway of eight years to 2030 to deliver swift change on the demand side that proactively supports electrification well before the infrastructure gets built under the federal Rewiring the Nation plan.

Policy measures must provide targets with penalties for liable parties, financial incentives for energy consumers, and workable activities and methods for industry. Only then can

commercially viable business models mobilise and change out old equipment rapidly at scale, switch to cleaner fuels sooner, and drive the transformation we so desperately need to safeguard our smart energy future across Australia.

The ESIA is the national peak body representing and self-regulating businesses that create and trade energy efficiency certificates under state and federal schemes in Australia and includes energy experts, product developers, manufacturers and installers. For more insights contact ESIA Executive Officer comns@esia.asn.au



Ric Brazzale is calling for a national energy savings scheme

Solar JinKO

SUNTANK X TIGER Neo





JKS10.24K-5HLVS

JKM475N-60HL4

SMART TRANSPORT

Revving up the electric vehicle market

IT'S NO SECRET that transport is Australia's second largest source of national emissions and that reducing vehicle emissions is critical to achieving Australia's emissions reduction target of 43% on 2005 levels by 2030, and for reaching net zero emissions by 2050. And it's widely known that Australia's lack of fuel efficiency standards means new passenger vehicles here emit a shameful 40% more emissions than those in Europe and 20% more than cars in the United States.

The transportation sector is well overdue an overhaul to bring it in line with new technologies and climate goals. Now, at long last, such a process is underway.

In late September, as promised, the Labor federal government released the *National Electric Vehicle Strategy: consultation paper*, calling for public input on methods to increase the supply and uptake of electric vehicles across a range of metrics; policy settings to encourage local manufacturing of EVs, EV chargers and related components; dealing with declining fuel excise revenue; and means of supporting deployment of charging infrastructure.

"While any standards must be designed specifically for Australia, standards that lack ambition will still leave Australians at the back of the global queue for cheaper, cleaner vehicles," Minister for Climate Change and Energy Chris Bowen said. "The scale of our climate challenge and soaring global fuel prices make it vital we bring the world's best transport technology to Australians."

The consultation paper builds on Labor's *Driving the Nation* plan released earlier this year pledging investment of \$39.3 million to deliver 117 fast charging stations on highways across Australia at an average interval of 150km on major roads, introduce an Electric Car Discount to make EVs more affordable, and exempt many EVs from import tariffs and Fringe Benefits Tax.

The government's September consultation paper coincided with the release of the Electric Vehicle Council's bi-annual report that presented a snapshot of the first three quarters of the year.

Key takeaways from the Electric Vehicle Council's latest State of Electric Vehicles Report

The bi-annual report on the electric vehicles sector is always eagerly awaited by the industry, not least of which as it tracks the evolution of the transport sector as it inches away from its combustion-powered past.

So let's dive right in...

In all, 26,356 electric vehicles were sold in Australia from January to September 2022, which is good news.

EVs increased their share of new vehicles sold to 3.39% (up from 2.05% in 2021). This represents a 65% increase in the EV market share

Unsurprisingly the Tesla Model 3 continued to dominate EV sales commanding a third of the market of new EVs. Following its August launch the Model Y shot to second place in sales accounting for one in five new EV sales.

Australia now has on sale 25 different EV models that have each sold more than 200 vehicles in 2022.

The ACT continues to lead in EV sales (as a proportion of new vehicle sales) at 9.5%, well ahead of New South Wales's 3.7%, but which represents an 84% increase in EV sales on the 2021 figure, faster than that of the 76% increase in the ACT.

Staying on EV sales: Victoria edged up 3.4%, Queensland and Tasmania 3.3% while in Western Australia it was slightly lower at 2.8%, South Australia 2.3%, and the Northern Territory 0.8%, but that 0.8% is an encouraging 75% increase on 2021 sales. (We did say 'inching'.)

But look at the otherwise beleaguered UK, where one-fifth of all new vehicles sold are EVs. Putting us to shame?

No surprise, the EVC states: "The difference between our markets is that Australia lacks an ambitious fuel efficiency standard and nationally consistent EV policy." Nevertheless public charging infrastructure is expanding with 2,147 recorded at the end of June 2022. Individual public EV chargers in service numbered 3,669, a 15% increase in charging locations compared to early 2021 according to the EVC.

Turning to commercial vehicles: 10 electric trucks, four utilities and four vans are on the Australian market, and 18 manufacturers are supplying electric buses.

"Given that many state and territory governments are now committing to electrify public transport, we can expect the bus vehicle segment to continue year on year growth," the report states.

For its part the electric motorcycle and scooter market has remained stable in the year to date, but the shared electric bikes and scooters ('micro-mobility') sector continues to expand.

www.electricvehiclecouncil.com.au



The bi-annual
Electric Vehicle
Council's report on
the EV sector tracks
trends and includes
this chart which
shows changes in
sales of EVs



Better bet on it

In early October the Climate Council released a paper calculating 'five better bets' to drive a cleaner, better future by investing in clean energy solutions rather than subsidising the fossil fuel industry to the tune of \$11.6 billion. That's an astonishing \$22,000 every single minute. Yes, Every. Single. Minute.

Topping the Climate Council list was one EV charging station for every 12 kilometres of Australia's road network, and the Council also suggests replacing the entire fossil fuel driven bus fleets of Sydney, Melbourne and Brisbane with electric buses. The Council listed solar panels for 1.5 million low-income homes or on every public housing property in Australia; 15 massive pumped hydro facilities; and 138 city-powering big batteries as important measures.

Do not miss the Smart Energy Council's **Batteries on Wheels Summit**

Wednesday 14 December 2022, 9.00AM to 5.00PM at the Hilton Hotel in Sydney

integration of Electric Vehicles into the grid.

Discussion points: Managed charging of EVs, time shifting of charging to the middle of day, opportunities for 2-way flow of EV energy, private and public EV chargers, integration of EV chargers in infrastructure and more.

Visit www.smartenergy.org.au for more details

Good idea, Good Car Company, great outcomes

According to consumer product data collector Canstar Blue, Australians spend an average of \$40,729 on new cars, while the average cost of an electric vehicle in Australia is greater than \$60,000.

That sticker price rules out EVs for the majority. Unless, that is, you check in with The Good Car Company which is importing and selling second-hand EVs priced from a much more affordable \$20,000, about half that of the cheapest new EVs currently available.

They are also turning traditional car marketing methods on their head by running a world-first community EV bulk-buy program at locations across Australia, staging a fun day out to showcase EVs, allow test drives, provide information on the merits of driving an electric vehicle while stoking interest in affordable, low-emissions driving.

The good quality, low mileage used vehicles are imported predominantly from the right-hand drive markets of Japan and the UK. Interestingly, the average age of the cars sourced which are predominantly Nissan Leafs has reduced from four to five years to just two, reflecting the increase in supplies in Japan and the UK, said Anthony Broese van Groenou who co-founded the Good Car Company three years ago with fellow Tasmanians Anton Vikstrom and Sam Whitehead.

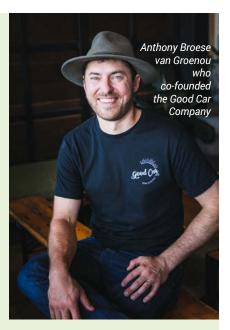
Evidently vehicle odometer readings are not the principal selling

"The key feature that buyers look to is the state of battery health." And findings are impressive: the average 2012 Nissan Leaf imported from Japan shows just 20% battery degradation," said Anthony who to date has overseen importation of about 500 EVs.

The virtues of the Good Car Company recently caught the attention of Boundless Earth which has provided a line of credit to the company



"We are proud to be doing our part to transition to a more sustainable, decarbonised future. one car at a time."



to help them expand. The injection of funds has put a rocket under the Good Car Company.

"It enables a tenfold increase in our efforts to provide more used EV stock to Australia over the next three years. We are also looking at expanding our territory by bringing in models from markets other than Japan and the UK, while carrying out due diligence to ensure the vehicles are fit for market," Anthony told Smart Energy.

"There are some great new models coming on to the market but because we are a small market compared to the UK getting prioritisation is difficult."

The team at the Good Car Company are now examining options for business expansion including establishing a fleet management operation with 50,000 vehicles operated on lease and subscription in a \$2.6 billion facility (no shortage of ambition here!), additional finance packages, battery manufacture and recycling on home shores and more. All of which leads to a myriad more questions what about premises to store and showcase the vehicles, optimum battery manufacturing locations, charging infrastructure?

It's a fascinating tale that deserves more space than we have here, and ironically the tiny AAA batteries on our digi-recorder went flat during our chat with Anthony, but stay tuned for a fuller feature on The Good Car Company in a future copy of Smart Energy.

www.goodcar.co

SMART ENERGY IN ACTION

Concentration and collaboration

THE RENEWABLES INDUSTRY is fast evolving with developments across the range of sectors. Each day, it seems, brings a new and generally welcome announcement from the federal or state governments.

Higher targets and ambitions to expand renewable energy, to develop a strong decarbonised economy and a safe climate: the very matters that get to the heart of the Smart Energy Council's mission.



Wayne Smith (pictured) who leads the Smart Energy Council's growing advocacy team is overseeing a series of energy market initiatives that deliver energy sustainability, reliability and affordability and shore up supply in the looming landscape that's free of coal power.

"One of our key ambitions is to achieve electrification of everything - households, business, transport, heavy industry, agriculture - with renewables and smart energy storage. Sectors that cannot be electrified could use renewable hydrogen and ammonia as the source of power," he said.

On the following pages Nicolette Boele of the Smart Energy Council's newly minted Electrify Everything Division outlines the nuts and bolts of critical role of electrification in a decarbonised society.

Complementing this is the SEC's push to facilitate energy storage deployment.

Renewable Energy Storage **Acceleration Scheme**

The Smart Energy Council has teamed with the Clean Energy Investor Group and Climate Action Network Australia to urge Federal and State Energy Ministers to unleash investment in large-scale renewable energy storage across Australia.

"We can't get to 82% renewables by 2030 or reach 43% emissions reduction by 2030 without substantially increasing energy storage capacity. When it comes to renewable energy storage, we need everything, everywhere, all at once," John Grimes said.

"That means batteries on wheels in electric vehicles, to household battery systems, to unlocking massive investment in large-scale energy storage projects... the coordinated buildout of energy storage capability; largescale storage appropriate to the needs of each state and territory as well as an incentive program for small-scale storage allowing more variable renewables coming online."

Everyone's a winner. Or as Simon Corbell, Chair of the Clean Energy Investor Group casts the Scheme: "It delivers fast, proven and cost-effective renewable energy storage and provides exactly the right signals to investors."

Glen Klatovsky of Climate Action Network Australia amplified the message saying it's "a genuine way to make sure energy storage is operating and ready to go as our old, polluting coal-fired power stations retire".

What's next? Brains Trust: SEC's high-level Distributed Energy Resources Working Group of about 30 companies which meets regularly is considering proposals to enhance the existing legislative framework to unlock storage capacity, and is meeting key policy makers.

Look out for media coverage as the SEC spreads the word on the merits of robust storage targets.

More details on the Renewable Energy Storage Acceleration Scheme can be viewed at www.smartenergy.org.au



Tooling up: The Australian Smart **Energy Innovation, Manufacturing Working Group**

Many Australian companies are currently creating or manufacturing smart energy products on home shores, and the SEC's Australian Smart Energy Innovation and Manufacturing Working Group is on a mission to promote these entities and to create incentives for more local manufacturers.

Local manufacturing not only provides employment opportunities but also delivers greater reliability and independence in a world fraught with uncertainties.

John Grimes told RenewEconomy's Giles Parkinson "I want to get to a point where stationary battery is competitive with electric vehicle batteries... one way to achieve that is looking at building at scale lithium ion batteries that we export to the world today, rather than simply dig up dirt, put it onto a ship and send overseas for somebody else to get all of the value of [and deliver] the final very expensive products."

Rod Scott (pictured) of innovative Australian company Selectronic is chairing the Smart Energy Innovation, Manufacturing Working Group and welcomes input from SEC members who share similar aspirations with practical, workable ideas.





Keen to keep up with the Smart Energy Council?



Tune in to Twitter at: @SmartEnergyCncl



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

Smart Energy Council's Transport Working Group

This group's remit spans all modes of electric vehicles from passenger cars to buses, bikes and scooters; recharging infrastructure and related policies; and the integration of electric vehicles in the energy grid.

These are matters of great interest to Jason Venning of high-profile energy storage maker FIMER, who has agreed to chair the SEC's newly established smart transport group.

Those with a keen interest in the development of Australian manufacturing and smart transport and who wish to be more involved are encouraged to email wayne@smartenergy.org.au



Multi-tasking

Upping the ante on 'multi-tasking' by some leaps and bounds was **John Grimes'** extended interview with RenewEconomy's **Giles Parkinson** (pictured below left) during a break in the Prime Minister's dinner of 500 people from all walks of commerce and industry. The bolt hole for the interview? The relative peace and quiet of the venue cloakrooms amid racks of coats and bags. The full and illuminating podcast can be heard at reneweconomy.com.au



What you see...

Much of the work undertaken by the Smart Energy Council can be likened to the proverbial iceberg – what you see is a fraction of the effort and time of the advocacy team and its expert advisors.

The schedule takes in regular meetings with federal and state ministers, crossbench MPs and Senators; a series of industry submissions and representations such as being strong and vocal in opposition to the proposed capacity mechanism and congestion management mechanism, lobbying in the lead up to Energy Ministers' meetings, and more.

Looking overseas, SEC is strengthening links with the Indian Government (see page 42) and pursuing greater involvement in the Pacific region, including training opportunities.

Closer to home, the SEC is pushing for a National Solar Stewardship Scheme through a Queensland pilot project and encouraging battery recycling in Australia.

Industry issues and events include smart energy roundtables and forums and input to Queensland's solar shut off scheme, also SA's dynamic export inverter requirements. There's also a range of the activities on behalf of the ACT Renewables Hub.

Other efforts involve building a strong, safe, sustainable and diverse smart energy workforce by significantly increasing female participation in the smart energy industry, also that of young people, Indigenous people and people with disabilities.

The Smart Energy Council sponsored the highly successful **Australian Women in Solar Energy (AWISE)** event 'Recharge your spark' held in late October which attracted 500 participants. Not bad for a group established just two short years ago. Shout-out to Bobbi McKibben, Sam Craft and the rest of the hard-working AWISE committee.



John Grimes caught up with Prime Minister Anthony Albanese and Kate Minter from Rewiring Australia to discuss the renewable energy revolution. Also pictured is new advocacy team member, Leigh Heaney (second left). Leigh is a public affairs and government relations specialist who brings to the Smart Energy Council his extensive experience in government and political processes.



SMART ENERGY IN ACTION

UPCOMING EVENTS

Climate Summit: Powering Wentworth to Net Zero

Sydney, November 27

9.30AM to 3PM at the newly renovated Bondi Pavilion, Bondi Beach This inaugural event is being staged by Federal member for Wentworth, Allegra Spender MP in collaboration with Sydney's Eastern suburbs councils and the Smart Energy Council. This family friendly community event will be headlined by experts and local organisations championing climate action.

The NSW State Energy Summit

Tuesday December 13, 2022, 9.00AM to 5.00PM , Hilton Sydney, 488 George St

Featuring key elements of the NSW government's plan for the renewables energy sector.

Batteries on Wheels Summit

Wednesday December 14, 2022, 9.00AM to 5.00PM Hilton Sydney, 488 George St Integrating Electric Vehicles into the grid

More details on facing page

A Big Win in South Australia

In late October, following an intervention by the Smart Energy Council, South Australia's Minister for Energy and Mining advised SA will delay the introduction date for dynamic export inverter requirements in that state.

The commencement date for dynamic export regulation in SA will now occur on 1 July 2023 (not 1 December 2022), and for battery energy systems on 1 March 2024.

This allows more time for

The Hon Tom Koutsantonis MP, SA Minister for Energy and Mining

manufacturers, distributors and installers to work with SA Power Networks to prepare for this significant change.

The SEC congratulated the SA Government for listening to its concerns and those of its members, and for working with industry to ensure the success of this initiative. The SEC also thanked the Office of Technical Regulator and SAPN for close collaboration to secure the changes.

The Energy Ministers' meeting of late October

For years the Energy Security Board sought to impose so-called Locational Marginal Pricing on large-scale renewable energy projects.

For years it's been opposed by the large-scale renewables industry. For years, the Energy Security Board has refused to listen to industry concerns (sound familiar?).

On October 28 the Energy Ministers effectively took responsibility for the issue away from the ESB and asked their senior officials to conduct detailed consultation on congestion management and to come back to Ministers at their first meeting

The Smart Energy Council was instrumental in securing this big win and credits the vision and work of **Jonathan**

in 2023 with agreed policy proposals.

Upson (right), Chair of the Large-scale

Renewables Working Group; the Working Group itself; **Stephanie Bashir** (left) of member

company Nexa Advisory; and the Clean Energy Investor Group, which the Smart Energy Council is working closely with.

A new firming mechanism, including the Smart Energy Council's Accelerating

Renewable Energy Storage proposal, will be considered by Energy Ministers at their December meeting.

"Still a way to go but we're steering the big ship in the right direction," Wayne Smith said. "We continue to push for fundamental energy market reform in distributed generation."

E-mail wayne@smartenergy.org.au if you want more information or want to get involved in this work.

Singapore Energy Summit

The 2022 Singapore International Energy Week, an annual platform for energy professionals, policymakers and commentators to share best practices and solutions, took place in late October. The Smart Energy Council was represented at the event by Wayne Smith who snapped the photos of some of the proceedings below.



GRID

ACT Minister for Water, Energy and Emission Reduction Shane Rattenbury on Channel News Asia (CNA)



Singapore International

Dr Fraser Thompson, co-founder Sun Cable, launches the **Asian Green Grid Network** at Singapore







NSW State Energy Summit Tues Dec 13, 2022 9.00AM to 5.00PM followed by networking drinks **Hilton Sydney** 488 George St, Sydney

Members: \$350 Non-Members: \$495 This important and timely event will feature all the vital elements of the NSW government's progressive plan for the renewables energy sector in the bid to accelerate decarbonisation.

The event will feature:

- · Keynote speakers: Detailed sessions with the State Energy Minister and other senior Ministers
- · Plans to escalate the uptake of household, commercial and large-scale solar
- NSW energy storage plans of all technologies and scale

- · Renewable hydrogen and ammonia projects
- Smart Energy Heavy Industry Precincts
- · Innovative financing solutions
- Electric Vehicle Roadmap and Policies
- Transmission infrastructure that will turbocharge next wave of renewable generation
- An update on the Renewable Energy Zones
- · Solar and battery program for homes and businesses
- · Interactive group panels and Q&A sessions, and more.



150+



30+ expert speakers



14 DEC 2022 | SYDNEY

Batteries on Wheels Summit Wed Dec 14, 2022 9.00AM to 5.00PM **Hilton Sydney** 488 George St, Sydney

Members: \$350 Non-Members: \$495 This event follows on from the very successful National Electric Vehicle Summit held in August and will focus on the integration of Electric Vehicles into the grid.

On the agenda:

- · Managed charging of EVs
- Time shifting of charging to the middle of the day
- The opportunities for 2-way flow of EV energy
- Private and public EV chargers
- · Integration of EV chargers in infrastructure, and

This Summit is a must attend for anyone working in EV, energy storage and networks including consultants and those with roles in grid transition.

SPECIAL OFFER FOR TWO EVENTS

Join us for the two events: sign up for the NSW State Energy Summit and Batteries on Wheels Summit at a discounted rate:

Members: \$525 | Non-Members: \$742



INTERNATIONAL RELATIONS

PASSAGE TO INDIA

IN AUGUST John Grimes and Scott Hamilton visited India at the request of Dr Anil K Garg, President of the World Renewable Energy Congress

The 8-day trip to Delhi and Chennai took in site visits, roundtables, presentations at three conference and exhibitions, and back-to-back meetings with government and business leaders in India's burgeoning renewables sector. The trip was supported and facilitated by the Australian High Commission and Austrade.

"The purpose of the trip was to build strategic relationships to help diversify smart energy and renewable hydrogen supply chains," John Grimes said.

"We had the opportunity to identify key trade and investment opportunities in all facets of renewables. We returned very pleased about India's willingness to regard Australia as a key partner in decarbonisation.

"We are now building on those connections and planning a major delegation to India in 2023," he said

The 'sleeves rolled up' itinerary included meetings with CESL and ReNew, SunSource, Tata, Reliance Industries, Larsen & Toubro, Motherson and Jakson. Some other notable meetings included Evenergi with its modelling software for electric bus depots and fleets, and ATTERO with its aspirations for building a battery recycling and manufacturing facility in Australia.

"We forged some strategic battery partnerships in terms of investment and supply agreements, battery recycling with ATTERO and the likelihood of interest spreading to Indonesia," John said.

Look out for some of these names from India at next year's Smart Energy Conference and Exhibition in Sydney.

Solar modules: "We went to India wondering if we could consider the country as a supply partner for solar components and in other strategic areas of collaboration. I think the answer is a definite yes, given India is ramping up solar module manufacturing."



No trip to India – business or leisure – is complete without a visit to the majestic Taj Mahal in Agra and luckily that tour was arranged during the one

Among the module makers are multi-billion dollar entities including Reliance, Avaada, ReNew and Tata, building between 3GW to 5GW.

"Not only are they producing wafers, cells and solar ingots but they are also considering innovations around the efficiency of solar cells and investing in battery manufacturing in Australia given the trajectory to become the largest lithium-ion battery market in the world."

Another fun fact. EVs: More than half of all the three wheelers sold in India are electric vehicles which are in high demand by small businesses - micro agricultural and commercial outfits - as utility

John likens this to a 'bottom up' movement in that it's not the likes of Tesla leading the charge in the EV market. "That got me wondering if we could attract that capacity into our states, electric vehicles present a huge opportunity, we just need to develop a plan."





MAGE: SCOTT HAMILTON **Energy And Envir**

Yet one more highlight was John's time in the limelight when he was "honoured and humbled" to receive the 2022 Global Excellence Award in Renewable Energy presented by Indian government cabinet ministers during a ceremony steeped in tradition and colour

Hvdrogen: Consistent with Prime Minister Modi's 'One Sun One Plant One Grid', India aspires to being a renewable hydrogen exporter and its government will soon finalise its renewable hydrogen plan.

There are massive opportunities for collaboration in renewable hydrogen, there's a long line of Indian companies looking for the Smart Energy Council to support their entry into the Australian market and our peak production seasons complement each other which will be of mutual benefit, John explained.

Austrade too plays a critical role as an overseas pipeline builder and will continue to forge partnerships that will facilitate industry contacts and collaborations.

All systems go!

Plans are now underway for an industry function at the Indian High Commission in Canberra and further down the track a broader trade visit to India among interested parties, with John and Scott commenting on the prospect of organising a delegation of up to 20 smart energy companies to India next year with the timing to be negotiated with the Australian government.

Australian businesses looking to find out more about the trade visit to India should contact Teni Thomas, teni@smartenergy.org.au

The Blue Pacific

A Modi initiative of 2019 involves the Coalition for Disaster Resilient Infrastructure involving 32 countries, the World Bank and meteorological organisation, with the focus on Pacific islands. This initiative is highly significant in the lead-up to COP29 in 2024 which Australia aspires to host.

Likewise the International Solar Alliance is scoping industry engagement in the Pacific and plans to engage the Smart Energy Council as the industry collaboration partner for its solar engagement in the region. The ISA also aims to establish a Pacific Smart Energy Council

Powerful Solar Inverter to Power Your Life



XG3-15kW On-grid Inverter

BD3-6kW-RL1 Hybrid Inverter

XG3-10kW On-grid Inverter

Reliable Worry free

Efficient Higher revenue

Intelligent Simple O&M

Flexible Abundant configuration

AROUT US

2002



R&D Investment/ Revenue



R&D Staff



20 Years Technical Accumulation



1300+ Patents

40+

Branches



R&D Centers

Local Contact

George Liu Tel: +61418291506 Email: georgeliu@invt.com.cn











SEC STAFF

MEET THE NEW FACES AT THE SMART ENERGY COUNCIL

The SEC is pleased to be expanding its team of industry specialists who will be assisting External Affairs Manager aka advocacy supremo Wayne Smith deliver strong representation on all facets of the renewables industry.

Nicolette Boele, Expert Adviser, Electrification of Everything (with renewables and other smart energy solutions)

Nicolette Boele (pronounced 'Buller') is a responsible investment and clean energy executive with more than 25 years' experience in capital markets, sustainability and climate change policy.

Her professional interest lies in building purpose into finance, growing just, social and equitable capitals to underpin resilient and sustainable economies.

Nicolette has held executive roles at the Responsible Investment Association Australasia, the Climate Institute, and the Clean Energy Finance Corporation. She has also worked to better climate outcomes at the Australian Conservation Foundation, Investor Group on Climate Change, and the Sustainable Energy Development Authority.



Nicolette is a Non-executive Director at The Good Car Co and is a member of the Climate Impact Advisory Committee for New Zealand's Climate Venture Capital Fund.

During the 2022 federal election Nicolette was Bradfield's community independent candidate. The seat enjoyed one of the largest swings in primary votes against a sitting member, anywhere in the country.

In her role at the Smart Energy Council, Nicolette advises the team on the electrification of everything including the rapid rollout of renewable energy, energy management technology and storage at all scales. She has a particular interest in increasing the uptake and grid integration of household solar, electric vehicles and efficient appliances and energy systems.

Leigh Heaney, Government Relations Manager

Leigh Heaney is a public affairs and government relations specialist who brings to the Smart Energy Council his extensive experience in government and political processes.

Leigh delivers advice on evolving issues and trends related to the renewables industry at a national level, bringing a strong understanding of government and parliamentary processes and procedures, as well as a strong policy background and skills in negotiation and communication. He will be leading the SEC's manufacturing working group.

Leigh joined the Smart Energy Council from Transport for New South Wales where he managed a large program of road asset transfer projects. Prior to that he spent more than a decade working as chief of staff to the Hon Matt Thistlethwaite in both the House of Representatives and the Senate working in Government in the portfolios of Pacific Island Affairs, Multicultural Affairs, Infrastructure and Transport and in opposition in the portfolios of Treasury, Financial Services, the Republic, Foreign Affairs and Immigration.

Previously Leigh held Industrial and Executive positions at the Australian Rail Tram and Bus Industry Union (RTBU) and the Australian Workers' Union (AWU).





Ria Kelleher, Event Manager

Ria Kelleher hit the ground running when she took up the role of Smart Energy Council Event Manager in May this year. In her words "I was attracted to the Smart Energy Council as it was an opportunity to work on a huge event like the annual expo in May. With over 80 exhibitors and thousands of attendees it's pretty impressive and I was excited by the challenge! I've since realised what an impact SEC has in the renewables industry and what a difference we can make with our events and our advocacy work. I'm truly fascinated seeing all the great things being achieved!

"I lead all the logistics for events, from working with exhibitors to ensure they are ready to exhibit to

organising all catering and everything in between! I'm working closely with venues to ensure all our events are as sustainable as possible.

"Successful events depend on strong relationships with suppliers, clients and speakers; thoughtful negotiations, understanding the people you're working with and being friendly and kind. Multitasking and time management is also vital in meeting deadlines!

"Behind-the-scenes dramas are inevitable, days out from an 800-attendee event, we discovered all attendees were registered without names, just email addresses! An emergency meeting fixed the issue. My worst nightmare is running out of food, or that delegate who's has had one too many drinks."



REACHING YOUR AUDIENCE THE SMART WAY...

BY ADVERTISING IN



If you want your company details to be seen by the people who matter – PV installers, retailers and wholesalers, project designers and suppliers involved in residential, commercial and industrial developments – give Alistair or Marianne a call.

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.



CONTACT

Alistair on +61 (0) 499 345 013 or alistair@smartenergy.org.au

Marianne on +64 211 824 699 or marianne@smartenergy.org.au



















ELECTRIFICATION

The Electrification of Everything with renewable energy and other smart energy systems

by Nicolette Boele

Electrification of Everything is the concerted effort to switch our lifestyles off fossil fuels and onto renewable energy. It transforms our households, our transport systems, our businesses, our industrial processes, farms and cities. The Smart Energy Council is strongly positioned to help accelerate EofE and is already making headway in the biggest opportunity of our generation: the renewables-led industrial revolution.

PICTURE THIS: a community that has replaced all its gas-fired household cooktops, water and space heating with efficient electric appliances; every available rooftop adorned with PVs; garages with affordable EVs that bi-directionally connect with the home and the grid; public housing and buildings retrofitted with clean, cheap and reliable energy systems, and battery storage packs too, benefitting residents and tenants.

It's a sublime scene in which smart technology connects homes with each other as well as businesses and the grid, where homes are net exporters of electricity and generate revenue from their rooftop solar power stations.

And no more visits to smelly petrol stations! Bill shock is replaced with bill delight, the price of the sun tomorrow is still \$0 irrespective of who's fighting who here or anywhere else in the world.

People living in these EofE homes and communities are healthier, wealthier and generally happier.

What's not to like? And more importantly, how can we accelerate this vision of a more perfect future?

Happily, the wheels are already very much in motion

Many voices, one GRAND design

Many individuals and organisations are part of the exciting efficient renewable electrification effort. This includes government agencies in the states and territories, cities and in the Commonwealth.

Examples are numerous and significant, including Victoria's recently introduced Mandatory Storage Target and Queensland's Super Grid (read more on pages 9 and 18).

The ALP's Powering the Nation plan addresses electrification as does its Rewiring the Nation; the *Climate Change Act 2022* too sets the stage, ditto the *National EV Strategy* consultation paper (fuel emissions standards please!) and even a forthcoming *National Energy Performance Strategy*. Ducks in a row!

The Commonwealth has committed the \$20 billion required to upgrade the full eastern seaboard electricity grid to enable bi-directional charge across most of the network and connect our millions of household rooftop solar power stations.

Peak bodies such as the Australian Council of Social Services (ACOSS) are calling for renters and people on low incomes to have healthy homes and affordable energy bills; unions want safe, meaningful and decent work for members; and climate activists want stronger ambition for clean energy and climate policy and programs.

Prominent engineer and inventor Saul Griffith and Independent Senator David Pocock continue to take every opportunity to present the case for electrification; both have developed models that demonstrate the indisputable and ubiquitous benefits to communities and the environment at large.

Notably, research by Griffith's Rewiring
Australia found homes could save up to \$5,000
a year in energy bills through full electrification
with renewable energy. Before long the fixed
cost to supply gas to a shrinking number of
customers may tip the economics of gas supply
for homes into oblivion.

For our part

The Smart Energy Council is building a wellresourced and coordinated program of smart and bold public policy and legal advocacy, and is ensuring that this is underpinned by strategic public communications.

Significantly, it was during the National EV Summit in August, co-hosted by the SEC, that Minister for Climate Change and Energy Chris Bowen announced he would deliver a *National EV Strategy* including the tightening of fuel emissions standards that paves the way for an electric vehicle fleet – his first major policy announcement post the May 22 election win.





"Enabling homes to generate their own electricity with efficient, renewable-powered electric appliances and vehicles locks in lower and more stable energy prices and shields households from spiralling fossil fuel costs; it is a huge opportunity to address energy stress and poverty while reducing emissions."



SEC's working groups, industry summits, conferences and exhibitions provide our advocacy team with real-world feedback required to inform meaningful policy advocacy campaigns that will benefit industry, consumers and ultimately the whole Australian economy.

SEC members too are at the frontline of driving the transition – the age of the renewables-led industrial revolution – by delivering the savvy practical solutions needed to achieve EofE.

Not hurdles but opportunities

The electrification of everything involves significant upfront costs, Everybody wins from decarbonising the economy and while it is an investment in our future we need to find, train and skill 600,000 people, to install, maintain and service all the electrical appliances, components, and vehicles prevalent in an electrified society; this means attracting many, many more women to the smart energy workforce.

The transition of social and public housing will involve everyone coming to the table: the federal and state governments, agencies including state housing departments, the National Housing Finance and Investment Corporation, the Clean Energy Finance Corporation and other investors.

From October 2023, changes to the National Construction Code take effect meaning that all new homes across Australia will be built to at least a 7-star rating. According to Renew, achieving a 7-star home with gas is tricky, and really doesn't stack up financially whereas using solar can cut bills by over \$1,000 a year. The new provisions also mandate that all apartments and some commercial buildings are built to allow EV charging capability in all car spaces and rooftops that are able to support PV retrofits.

With appropriate policy signals now at the fore, the finance sector is poised and ready to do the heavy lifting for the packages of household electrification solutions needed. Private and public financiers will be providing blended finance, structured vehicles, bonds and more – nothing is off the table as we unleash finance, an important resource that fuels our economy.

The billions of dollars that the NSW Renewable Energy Zones have attracted send a powerful signal about the confidence among key investors in the energy supplies of tomorrow. To say nothing of a turbocharged renewables market ready to power up the community.

And let's not forget the harder we drive the change now, the cheaper it will be for the economy to become electrified. Energy prices are high and energy security is a national issue as is the climate crisis, so there's never been a better reason to accelerate the transition.

Realistically we need to achieve 82% renewables in the National Energy Market to

contribute to the economy-wide challenge to deliver our national determined contribution of 43% emissions reductions by 2030.

The gas industry will likely have to exit the household sector and shareholders will need to be ready to back this rather than stall efforts to electrify.

Some fear a rapidly changing environment, but if people can envisage the new and better tomorrow we are creating together, they will likely want to get on board.

We will continue to promote the real benefits that all Australians can enjoy with EofE, and broadcast those benefits as widely as possible.

The Smart Energy Council has long touted Australia as a renewables superpower. EofE is one vital element of that vision and momentum is growing in all quarters

Let's just dial that up to warp speed! After all, Australia is a superpower in the making.

SNAPSHOT

There are three key stages to EofE – much like the reuse, reduce, recycle of waste, we have the save, switch, sequester hierarchy for reindustrialising the economy.

SAVE energy through systematic roll-out of energy savings appliances, measures and systems to where it's needed, especially public and community housing. It also involves an overhaul of codes and standards that lift the performance of all new buildings, appliances and vehicles.

While we are in people's homes, we need to SWITCH off fossil fuels such as gas for water, space heating and home cooking to all-electric homes that can be powered 100% by renewable energy from the sun for

example. Part of this involves rapidly scaling up local energy storage which includes household and community batteries as well as connecting electric vehicles into homes and the energy grid.

While not strictly a step in 'electrification' there is a third action in our toolkit for retooling our economy for a safer climate – it is SEQUESTER – it's what we have to do for hard-to-abate sectors where technological solutions aren't quite commercial including international shipping and aviation. It's also what we have to do to aggressively regenerate our landscapes to be more carbon-rich and adaptative to the physical impacts of climate change.

CARBON CHRONICLES

Overhauling the carbon market

The Labor Government intends to deliver on its promise to reduce carbon emissions by strengthening the Safeguard Mechanism which, to date, has failed to rein in emissions.

MENTION 'SAFEGUARD MECHANISM' to anyone outside the renewables industry and you draw a glazed look, but those closer to the action have spent significant time critically assessing the process designed and put in place six years ago to reduce industrial emissions from major polluting facilities.

The Safeguard Mechanism formed part of the Coalition's somewhat disingenuous 'Direct Action' plan to replace the Gillard Government's Carbon Price Mechanism designed to address climate change.

Currently 215 or so facilities that each year are producing upwards of 100,000 tonnes of greenhouse gases are subject to the Safeguard Mechanism

Time has proven the Safeguard Mechanism more spin than substance: rather than abating, emissions from heavy industry have been rising.

During 2020-2021 the 215 facilities accounted for a sizeable 28% of Australia's total emissions. Industrial emissions actually leapt 7% under the Safeguard Mechanism according to energy analyst RepuTex.

Data compiled by the Clean Energy Regulator which sets the Safeguard Mechanism's baseline emissions of Australia's largest emitters (the reference point against which net-emissions levels are assessed, including facility operations and carbon credit units for abatement activities) reveals an increase from 131 million tonnes of carbon dioxide equivalent (CO_2e) in 2016-17 to 137 Mt in 2020-21 under the Safeguard Mechanism.

The complementary Emissions Reduction Fund (ERF) established alongside the Safeguard Mechanism to purchase abatement in agriculture and land use, which we discuss in more detail in due course, likewise has a woeful scorecard.

Despite a plethora of interlinked programs and policies accompanied by authoritative sounding acronyms that might otherwise convey positive action, determination and discipline to rein in

emissions – Australia's efforts have so far been about as effective as the *Titanic's* radar system.

The Labor government is keenly aware of the mess it has inherited and needs to address if it is to meet its pledge to reduce emissions by 43 per cent by 2030 and reach net zero by 2050.

The ALP put the wheels in motion in August with the release of the 'Consultation on Safeguard Mechanism reform options' to help industry reduce emissions in line with Australia's climate targets. One of the elements of the reform is the introduction of 'below the baseline crediting'.

The consultation paper attracted 240 submissions (181 of which were published) by the due date of Sept 20.

This was followed by the release in early October of the draft *Safeguard Mechanism* (*Crediting*) *Amendment Bill 2022* which presents a new financial incentive "for the big polluters to make the changes they need to reach net zero emissions by 2050".

The draft legislation discusses the [limited] prospect of international credits, greater transparency in and accounting in emissions, and consistent frameworks for information.

Consultation on the draft Safeguard Mechanism (Crediting) Amendment Bill 2022 closed in late October

Australian Carbon Credit Units

The success and environmental effectiveness of the Safeguard reforms depends largely on the integrity of domestic ACCUs for greenhouse gas abatement activities undertaken as part of the Emissions Reduction Fund, and which represent one tonne of carbon dioxide equivalent (tCO₂-e) stored or avoided by a project.

The veracity of ACCUs is likewise under the microscope in a review headed by Ian Chubb, former chief scientist and former vice-chancellor of ANU.



Can the ALP's review of the Safeguard Mechanism reduce emissions covered by the Safeguard Mechanism by between 3.5% and 6% annually. Maybe



It is widely recognised that Australia's existing carbon credits are failing to deliver the vowed carbon abatement, with the use of carbon offsets enabling big emitters to keep polluting while conducting 'business as usual'.

The terms of reference of the Chubb review are expressed as: *The Government supports reductions in Australia's greenhouse gas emissions by crediting Australian carbon credit units (ACCUs) issued under the Carbon Credits (Carbon Farming Initiative) Act 2011, and purchasing ACCUs through the Emissions Reduction Fund (ERF).*

For its part the Emissions Reduction Fund which was designed to provide carbon credits to projects that reduce greenhouse gas emissions with the credits sold to the federal government or to private entities required to, or voluntarily, offsetting emissions has been derided as riddled with defects.

Earlier this year professor Andrew Macintosh, former chair of the Emissions Reduction Assurance Committee, declared the Coalition's Emissions Reduction Fund constituted "environmental and taxpayer fraud" with its flawed methodologies, and cast serious doubt over the integrity of all emissions reductions methods.

In an article published mid-year he declared the policy pays people to grow trees that already existed and stated that taxpayers and the environment "deserve better".

Macintosh explained that human-induced regeneration of a permanent even-aged native forest accounted for almost 30% of the carbon credits issued, and on inception of the ERF it was assumed projects would be located in areas where vegetation had previously been cleared, and where grazing and repeated clearing were suppressing regrowth.

No to International carbon credits

The government's desire for the biggest polluters – which takes in the oil and gas sector – to reduce emissions by 3.5% to 6% each year prompted a call from the Australian Petroleum Production and Exploration Association for an ability to purchase international carbon offsets in lieu of reducing emissions.

"We know there is a lot of interest in the use of international carbon credits, but equally there is a need to ensure that any such units, if they are included in the future, are of the highest integrity," Minister Bowen responded.

"Even strong advocates of the use of international credits recognise that we are several years off being able to assert that these requirements can be met.

"My position, and the government's position, remains as I have previously indicated: any move to provide access to international credits for this purpose would need to be accompanied by strict requirements to ensure real abatement that can be counted in Australia's 43% emissions reduction target."

However most projects were located in arid and semi-arid rangelands where native vegetation has never been cleared, therefore credits were being issued for growing trees already in place or would have occurred anyway, he wrote.

The Chubb review will report its findings in late December 2022, well after the conclusion of consultation over the Safeguard Mechanism.





'Safeguarding fossil fuels': the Australia Institute

In its submission to the Consultation on Safeguard Mechanism reform options to address carbon emissions and climate targets the Australia Institute expresses concern the proposed changes will drive further demand for low integrity carbon credits while keeping the door wide open for new entrants to the Safeguard Mechanism (aka new gas and coal mining projects).

"The Consultation Paper proposes for safeguard facilities emissions to reduce by 28% from 137 Mt $\rm CO_2e$ in 2020-21 to 99 Mt $\rm CO_2e$ by 2030, maintaining the same proportional share of national emissions from now to 2030 under a business-as-usual scenario.

"This is a modest level of ambition for Australia's highest polluting facilities," TAI wrote, noting the paper fails to spell out how emissions from expected large new projects will be accommodated, and declaring the mining, industrial and waste facilities covered by the Safeguard Mechanism will soon overtake electricity to become the largest segment of Australia's national emissions.

"The government's ambition is modest. The Consultation Paper identifies a national carbon budget for Australia of 4,381 Mt of $\rm CO_2e$ between 2021 and 2030. Of this carbon budget, safeguard facilities are expected to have a 28% share of the carbon budget, 1,227 Mt $\rm CO_2e$," TAI wrote.

TAI's views are echoed by RenewEconomy science and business journalist Rachel Williamson who says the government's consideration of limits for polluting facilities based on their emissions intensity rather than absolute emissions is flawed and that the draft bill sets the scene for 'grey credits' to be issued to big emitters that produce fewer emissions than the average, and that the tightening of the rules has led to big emitters buying up credits in the existing carbon market over the past quarter.

The Australia Institute recommends the government delay any further developments until the Independent Review of ACCUs 'The Chubb review' is complete and actioned.

What's next?

Minister Bowen plans to introduce the *Safeguard Mechanism Credits Bill* into Parliament in November and beyond that for the baseline crediting Bill – which requires separate legislation – to pass in federal parliament's 2023 Autumn sittings, with the final Rule amendments made by the end of March 2023 to allow the reforms to start on 1 July 2023.

Recommended reading on related material: Ketan Joshi's 'Hello and welcome to the Offsets Hall of Shame' Offsets EXPOSÉ!

Here's a teaser to the well-researched, comprehensive, illuminating, amusing and downright disquieting piece packed with examples collected from across the globe:

"Honestly, I'm pretty late to the whole offsets thing. People in the climate movement have been writing about it for a while now. But I have only really recently delved into it, and holy hell, has my mind been blown.

It is a fundamentally absurd system that has settled and calcified into being accepted as normality. It isn't just absurd, though. I think it's clear now that it is actively destructive.

What follows is a list of examples of companies or people deciding to buy their way out of strong, immediate climate action.

They purchase 'carbon offsets', services that claim to either physically (by removing carbon) or morally (by paying someone else to be less bad) neutralise the act of emitting greenhouse gases and causing climate change.

Carbon offsets have often been touted as limited to 'hard to abate' things, like cement production, but in reality they're used to justify continued or worsened emissions from essentially any activity, no matter how wasteful, avoidable or egregious.

Often, the defence is "It's a start!" and/or "something is better than nothing!". The thing is, the unstoppable and growing availability of offsets means companies are avoiding taking real actions in favour of cheap permission-slips. That is to say; it's often worse than nothing.

Ketan runs us though Offsets for car loans, Offsets for literal fossil fuels, Offsets for jpegs of tennis balls, Offsets for killing people, for Bitcoin, Offsets for NFTs of pictures of planes, Offsets for supersonic jets, Offsets for luxury travel disguised as remote work, Offsets for your breath.

"You're starting to get an idea of the shape of this problem, right? This isn't an okay-ish system with a few flaws. This is a system that is broken at every single resolution," he writes.

Two of our favourites: Offsets for fossil fuel expansion

"It's been more than one year since the International Energy Agency found that no new fossil fuel extraction projects are required if we're to limit the planet's warming to 1.5 degrees. These projects are definitely not 'hard to abate' – in fact, they're actively contributing to the problem. But that doesn't stop extraction companies pasting offsets all over these projects, to create a false image of climate friendliness, such as the project from Australia's Santos."

Unavoided emissions

"... offsets have often been presented as only being needed for 'hard to abate' sectors, such as concrete manufacturing or agriculture. But in reality, they're often used for easy to abate sectors, like electricity and transport. That is to say: it doesn't matter what the mitigation hierarchy is.

...Consider this stunningly frustrating fossil fuel power station in Australia I wrote about, which describes 85% of its total operational emissions as 'residual'. No: this power plant isn't hard to abate. It doesn't need to exist at all – its function can be performed by non-emitting technologies reliably and cheaply. But nope: it gets presented as a 'net zero' gas power plant!

...If carbon traders feel comfortable advocating for a huge explosion in offsetting, then yeah, something is going wrong.

Keep reading at ketanjoshi.co

And to learn more about the writer himself turn to page 62.





Delta has supplied over

■ 1,500,000
■

EV Chargers worldwide!

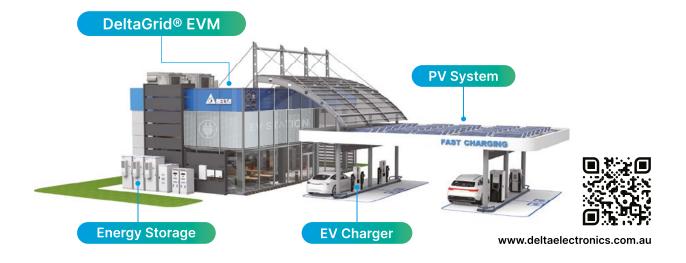


Smart EV Charging Infrastructure Solution

Relieving grid peak demand while lowering operational costs

As we plug into an electrified future, Climate Change is an unstoppable global megatrend that must be tackled by everyone. Delta's promise to help you go "Smarter. Greener. Together." drives development of our EV Charging Solutions applied in a wide range of residential, commercial and fleet charging sites.

Take EV charging to the next level with Delta's Smart EV Charging Infrastructure Solution! Convert your charge point into a solar-powered system for better efficiency and availability than grid-powered systems. Improve your charging service, optimize energy cost and tackle power peak with an onsite energy storage system that's perfect for rural areas.



ONE SMART, CREATIVE CARBON CUTTING MODEL

HOW GOOD WOULD IT BE to be given \$4,000 with no strings attached other than to spend it on something to reduce your carbon footprint?

Such was the idea of John Body, Founding Partner of ThinkPlace, the international strategic design consultancy which designs enhancements in health, nutrition, regulation, social services and responses to climate change.

"We wanted to apply our values in our offices but we are not high energy and don't generate significant emissions so it was a struggle considering what we could do to make a material difference," John told *Smart Energy*.

"We have staff of around 160 around the world and wondered if we could adapt their behaviour in positive ways that would have more impact."

What followed was the introduction of the ThinkPlace Carbon Reduction Fund which offers every employee \$4,000 to spend on a carbon-cutting investment of their choice.

"Our people are purpose driven with high values, they support causes for environmental sustainability and a better society and this program really resonated with them," he said.

"I didn't want to put lots of rules and procedures in place so I asked staff to use a carbon calculator and left it in their hands... staff are ethical and we trust them."

Staff initiatives

Since the April 2022 launch, many of the staff at ThinkPlace studios in Brisbane, Sydney, Canberra and Melbourne have installed rooftop PV, split systems or insulation while others have opted for a scooter or e-bike, even an urban farm.



No EVs yet, but that is only a matter of time, John said, mindful of the ACT government's generous \$15,000 interest-free loan through the *Sustainable Household Scheme* which combined with the company fund can be put toward an electric vehicle.

"Through this fund, we're having a bigger impact than we could have had by just putting the money towards something sustainable in the office," he explained.

The seed of the idea took hold several years ago when John attended an overseas conference that featured the UN's 17 Sustainable Development Goals (SDGs); the call for action by all countries to end poverty and other deprivations through strategies that improve health and education, reduce inequality, and spur economic growth, while tackling climate change and working to preserve oceans and forests.

"We have since used the SDGs as a filter for all our work, all of our work should be attributed to one of the 17 goals," said John who co-designs policy and strategy for government departments and organisations that directly inform and influence ministerial decisions, including the ATO.

A-Lab

ThinkPlace was a driving force in establishing ARENA's A-Lab which supported starts-ups including Reposit Power that drive systemic change in the electricity sector in the transition to renewable energy.

Globally, John is a key contributor to programs tackling global health and nutrition including the Bill & Melinda Gates Foundation's fight against global malnutrition, and was a co-design partner for the world's largest public health initiative, Breakthrough ACTION by USAID and Johns Hopkins University which encourages people to adopt healthier behaviours including modern contraceptive methods, the use of bed nets and testing for HIV.

"Am I a trailblazer? Well I'm hoping our Carbon Reduction Fund will generate a ripple effect. I'm also hoping the government will take note," John said.

"Due to taxation laws we effectively pay around \$7,000 to give staff \$4,000 in the hand; if this scheme took off among 50 or so companies then it would probably be worth lobbying government or Treasury about the incentive being regarded as a business expense.

"We would love to see scaled impact with many more companies implementing the same scheme. Meantime we are in active discussions about how to roll out across our five other global locations and devising appropriate strategies for context."

www.thinkplace.com.au



Tracking the PV market

"DOWN BUT NOT OUT" So says PV market 'Woracle' Warwick Johnston of SunWiz, who reckons despite the lower uptake of the sub-100kW PV market in recent months things bode well for next year.

Before we get to that, a look at this year's downturn, or market correction caused in part by post-COVID dynamics.

"During the restrictions caused by the pandemic, homeowners were investing far more on home improvements including rooftop solar systems so the PV industry did quite well during that period," Warwick said.

"After that the community went from being stuck in their homes to getting out and about and spending money on travel and restaurants, so the rooftop PV sector started sliding backwards."

Tasmania is the exception to the slide, whereas Victoria is well behind previous PV uptake rates, as is WA. Generally, no state is doing particularly well, all are typically down 15 to 20% on the previous year, Warwick explained. "That's a bit of a grim statement but unfortunately that's how it is."

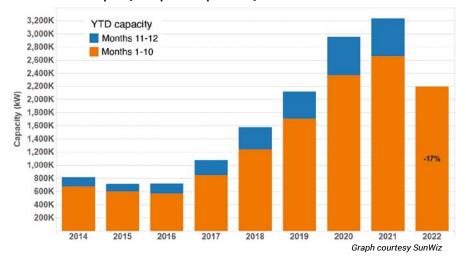
However steep rises in electricity bills making front-page news, and concerns over energy security led to a spike in inquiries in solar power systems and storage this year.

"More homeowners were getting quotes, however that has not yet resulted in 'conversion'; that is the expressed level of interest is not commensurate with actual take up," Warwick told *Smart Energy*.

Meanwhile the commercial and industrial PV market has registered a recent uptick, following the sector's disproportionate impact during COVID.

Warwick's observations are echoed by Green Energy Markets whose recent Solar

Year to date capacity compared to previous years



Snapshot reveals commercial system registrations in September were 29% up on the year-to-date average. Commercial installed capacity was 49MW, the highest level since December 2021 and 39% above the prior year-to-date average.

Queensland fared particularly well, registering 90 large commercial systems (+95kW) representing over 20MW in September; more than triple its 3-year monthly average (26) and the highest monthly number by any state. (The previous highest being 54 in NSW, July 2022.)

Overview

According to Warwick the PV market in Australia is somewhat different compared to overseas. We present as a low-price market sporting cheaper brands and more competitive prices for systems which poses some difficulties for overseas manufacturers.

"It will be harder for manufacturers to justify sending products here than to places such as the US whose Inflation Reduction Act seeks to promote sustainability and will stimulate the market and in turn receive more attention from manufacturers," Warwick said.

"And Europe is facing far greater electricity price rises than here which likewise will result in more action in the PV sector, so much of what happens in the product market in 2023 will be affected by international factors."

Looking ahead

Locally, higher electricity bills are coming through the letterbox, and coupled with the backlog of interest indicated by quotes, the market could be in for a surge.

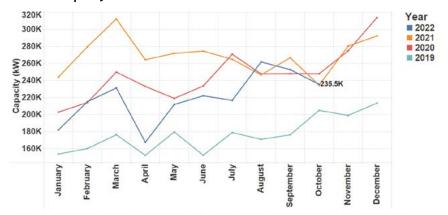
The end-of-year reduction in STC quantities [small scale technology certificates] usually galvanises action too, Warwick said, the year will likely end strongly just as it does every year.

"My take is that we will start next year on a much stronger footing than we did this year, but this will be tempered by system price rises and longer paybacks, so we may essentially flat line; much depends on electricity price rises.

"Further down the track with more electric vehicles coming onto our roads – as is the plan under the federal government's Driving the Nation strategy – there will be increased interest in home energy and storage systems."

Other positive factors include the stronger emissions reductions targets and renewables policies being set by the ALP and states, all of which lends confidence in the community as it reinforces the need to decarbonise the economy with all playing a part. And right now, as we reach the end of the year, it's a good time for PV installers and retailers to start planning for 2023, Warwick says.

National capacity installed



The 236MW recorded in October 2022 is above the volumes seen for the same month in 2019 & 2021 while below those observed in 2020 Graph courtesy SunWiz

PV PERFORMANCE

"By taking a retrospective look at the market as well as current dynamics and the future that is unfolding dealers can adjust their business strategies to set themselves up for the year ahead."

It goes without saying that the marketsavvy team at SunWiz is poised to help with their sophisticated range of PV market analysis tools and projections and other intel clarifying the what, where, when and why.

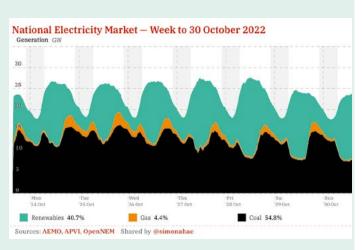
www.sunwiz.com.au

A quick message from the Smart Energy Team: Looking forward to seeing SunWiz and its fearless leader the lightsaber wielder at Smart Energy 2023 in Sydney on May the 4th next year. Indeed, "May the Force be with us all."



In other wraps

- According to APVI, as of 30 September 2022 there were more than 3.27 million PV installations in Australia, with a combined capacity greater than 28.2 gigawatts.
- The Green
 Energy Markets
 Deemed Report
 - which took in the first three quarters of the year reveals 26.3 million STCs had been created year-to-date; 24.7% below the 34.99 million of the same time last year. Ouch.
- A snapshot of September shows PV STC monthly creation of 3.1 million was 14% below September 2021; while PV small scale generation units (SGU) represented 91.3% of total monthly creation; down on the prior 12-month average of 91.5%.



- Greenbank Environmental increased its market share to 4.2% in September, its highest monthly market share since January 2019 (4.8%). Greenbank's 2022 year-to-date market share at end September was 3.5%, up from 3% in 2021 and 2.9% in 2020. Congratulations Ria O'Hehir and team!
- Energy market mix: the AEMO chart above is a positive illustration of the extent of renewables penetration in the NEM.



Proud to be part of planet earth.

Achieving Carbon Net Zero is significantly dependent on renewable energy and Motherson is committed to maximising its use together with smart energy management solutions as part of our ambition to be Carbon Net Zero across our current global operations by 2040.





Motherson Sustainability.

SPREADING SUNSHINE

Solar Citizens harnesses the group's thousands of supporters to take action to protect the rights of Australia's three million solar homes and businesses, and pursue the largest opportunities for a fast and fair transition to clean, renewable energy. Here, National Director Heidi Lee **Douglas** looks at some of the wins achieved with the help of like-minded citizens.

"We're more powerful when more of us stand together." RIGHT NOW AUSTRALIAN COMMUNITIES are facing a triple threat: a cost of living crisis, an energy crisis and the climate crisis. We see this as an important moment for state and federal governments to address all three challenges by immediately increasing investment in household electrification and electric transport.

We're excited to address these by campaigning nationally for government incentives for the rollout of household solar and storage, electric appliances to replace gas, and energy efficiency upgrades, including for rental and social housing properties.

Alongside this work, we're campaigning for critical Fuel Efficiency Standards reforms that will help Australian consumers by bringing more electric vehicles to our shores, and we were instrumental in locking in electric vehicle incentives in states like Victoria and Queensland.

A campaign that we've run three times now is to stop the 'sun tax': a rule change that allows solar owners to be charged by network service providers for exporting electricity to the grid.

The first two times we stopped the rule change, but last year unfortunately it was passed by the Australian Energy Market Commission. However, the strong community campaign we ran meant that important consumer protections were included in the rule change, and we will continue to monitor that network service providers are not unfairly penalising solar households.

Celebrating success

Our most recent campaign success, however, has been locking in more clean energy ambition from the Queensland government.

Back in 2015, Queensland solar citizens worked hard to put clean energy on the agenda and lock in the state government's 50% Renewable Energy Target.

Over the past few years we've been campaigning for them to increase that goal by demonstrating how renewable energy backed by storage can power regional economic activity and jobs, and generate bill savings for all.



This work paid off when the state government launched its Queensland Energy and Jobs Plan, which backs in a 70% Renewable Energy Target by 2032.

Turning the clock back a few years, our clean energy-loving community fought to protect the Australian Renewable Energy Agency, the Clean Energy Finance Corporation, the Renewable Energy Target and the Small-scale Renewable Energy Scheme from repeated attacks and won!

Strength in numbers

We could not achieve such success without our supporter base. It is currently skewed towards older homeowners, but we're very excited to expand our audience base to include more renters as we kick-start work in earnest campaigning for schemes to support solar on rentals and social housing.

Perhaps not surprisingly, when there are attacks on clean energy – for example, when governments are considering new handouts to big coal and gas companies or when there are proposals on the table for solar owners to get unfairly slugged – we see an observable increase in new supporters.

There's also been a noticeable shift in the public narrative in recent years. In regional Queensland, where we do a fair amount of work, we're now seeing key local stakeholders calling out for more local investment in renewable energy and green hydrogen projects where they previously were supportive of building new coal assets.

Nationally, we've also seen a large and positive shift. In 2017 when power bills were high, renewable energy received a lot of the blame in the media. Happily, we've seen that story mostly turn around now.

We regard these fundamental developments as evidence that our hard work is paying off, people are listening, learning and taking action, and the renewables industry is going from strength to strength

Long may it continue! www.solarcitizens.org.au



UN-leashing carbon free energy

IN RESPONSE TO THE URGENT NEED to drive decarbonisation of the world's electricity systems, the Sustainable Energy for ALL and UN-Energy launched the 24/7 Carbon-free Energy Compact.

The 24/7 Carbon-free Energy Compact is a set of principles and actions that stakeholders across the energy ecosystem can commit to in order to drive systemic change.

Due to the remarkable ongoing progress in clean energy and enabling technologies, the transition to a fully decarbonised electricity sector is possible. Achieving it will require a concerted and targeted effort by all stakeholders to develop and scale the energy policies, technologies, procurement practices and solutions to transform the broader energy ecosystem to enable rapid and cost-effective achievement of 24/7 CFE for all

Both Circular Energy Group, which is the parent company of Maximum Energy, and Bowhill Engineering are signatories of the 24/7 CFE.

Circular Energy Group are proud owners of the Sustainable Energy Commitment, a leading-edge certification which follows a science-based criteria that is measurable and certifies an organisation's commitment to sustainable energy targets.

Importantly, the Sustainable Energy Commitment criteria is connected to an Environmental, social, and governance (ESG) framework, so progress can be tracked and communicated to the key stakeholders.

Bowhill Engineering is now a certified user of the Sustainable Energy Commitment and is completely supported by the Sustainable Energy ecosystem.

This ecosystem provides organisations such as Bowhill Engineering with a host of digital tools to control their sustainable energy transition and build a competitive advantage.

Typically, Sustainable Energy Commitment organisations are expected to pay up to 20% less for energy by 2030, compared with traditionally sourced energy options

Jodie Hawkes, CFO of Bowhill Engineering says "We as a business, have always been environmentally conscious and recognise the importance of sustainability moving forward.

"Being involved with a UN-Energy backed initiative such as 24/7 CFE at a local level is a great example to other like-minded businesses as





to how we can all make a difference." She added "We need to look after and protect the environment and are always actively looking for best practice in this area.

"We are committed to ESG, we want to run a sustainable business, but this must be balanced with being viable, profitability shouldn't come at the cost to the environment, just as environmentally sustainable actions shouldn't come at the cost of peoples' jobs or business viability.

"Once we understood what our footprint was, we had a clear understanding of what ground zero was.

"With Maximum Energy's help, we were able to create a plan and go forward with a clear understanding of what implementing the Sustainable Energy Commitment would have on our business, as well as jobs and the local community."

Jodie explained that Maximum Energy was helping them to drive the process and their digital platform provides instant information, including where they are sitting in real time, what they are doing, when they are doing it and how they are tracking against our project plan.

"We have a clear understanding that it is a process, that it won't happen overnight but we have a plan and we are on track with our goals of meeting our Sustainable Energy Commitment by 2028," she said.

Positive outcomes

"As a result, we have a customer-centric, sustainable energy platform, designed to be a better economic pathway. We have been able to expand the initiative to other areas of the business and local community."

David Lynch of Sustainable Energy for All said "This relationship between two 24/7 carbon free energy signatories is a great working example of what our movement is all about.

"It demonstrates that it isn't just about large corporates' ability to do something in this space, but that all businesses, large or small, have the opportunity to make a difference."

Circular Energy Group is the parent company of Maximum Energy, an Approved Partner of the Sustainable Energy Commitment and one of the initiative's Foundation Partners. For more information contact Maximum Energy on: info@maximumenergy.com.au



SMART ENERGY INNOVATION

SOLAR WHOLESALE SPECIALISTS SG Wholesale is a wholly

Australian-owned and operated supplier of solar components, including solar PV modules, inverters, battery storage, balance of system, mounting and EV chargers.

Our focus is on supplying high quality products at the best value possible. Our team has a combined 60+ years of industry experience which empowers us to deliver exceptional service with technical support and product know-how.

We have an extensive supply network with warehouses in Victoria, NSW. Oueensland. WA. SA and the ACT.

We pride ourselves on efficiency of supply and have aligned with key logistics partners to deliver to you as quickly as possible.

SG Wholesale's service does not end at point of sale, we offer technical advice and unrivalled customer service and we are more than

happy to go the extra mile to help our clients achieve their goals.

For any product or service enquiries contact sales@sgwholesale.com.au or call 1300 076 938



The iStore's dynamic efficiency can reduce hot water heating costs by up to 70%, using intelligent technology which converts air into hot water via the transfer of thermal energy.

Heating hot water for the home accounts for up to a quarter of electricity costs for the average Australian household.

The iStore reduces hot water heating consumption by two-thirds from conventional electric or gas storage systems, while reducing carbon emissions by four tonnes.



Conversion of 400% green energy

Convert green energy using thermodynamic from the surrounding air to heat the water tank. The iStore uses the surrounding outside air and compresses it to heat up the water tank.

The iStore uses advanced technology to store 4kW of heat energy for every 1kW of power consumed. That's a remarkable 400% transformation of green energy that can be used to power a home's hot water needs, while lowering greenhouse gas emissions.

Call 1300 515 640 for sales or distribution opportunities. Visit the website at www.istore.net.au

OCELLS AUSTRALIA HAS PARTNERED WITH FINANCE PROVIDER

PLENTI to offer innovative and affordable finance solutions for residential solar, energy storage and virtual power plant solar in the bid to accelerate the uptake of renewable energy solutions.

The partnership will enable homeowners to purchase Qcells' battery system Q.HOME CORE either as stand-alone or bundled with Qcells' solar panels and allows customers to pay back the cost of their solar battery system over the course of up to 10 years with Plenti.

Plenti's Head of Renewable Energy Louis Edwards said "Accelerating Australia's renewable energy transition requires industry stakeholders to work together to make customer propositions simple and easy to understand and this partnership with Qcells does just that.

"These solutions were created to simplify the customer's path to purchase as they look to reduce their use of fossil fuels, provide back-up power in blackouts, allow them to become more energy independent

"This massive simplification of acquiring and managing renewable energy is key to enabling more Australians to reduce their reliance on fossil fuels and insulate against a turbulent energy market." and mitigate against continuing electricity bill increases and grid energy price rises."

Mick Fell, General Manager, and the business leader for Qcells' Arcstream VPP added "The energy crisis is resulting in bill shock for many consumers, and the global demand for solar power means that the price of solar panel and battery systems are unlikely to fall. With all of this in mind, the sooner that consumers are able to make the switch to solar with storage, the better — for their wallet and for the planet.

"Consumers who combine their finance repayments with an energy plan connected to a VPP can consolidate their monthly energy outlays with one single payment and strike 100% green energy for less than their existing electricity bill." Fell added, "This massive simplification of acquiring and managing renewable energy is key to enabling more Australians to reduce their reliance on fossil fuels and insulate against a turbulent energy market." www.qcells.com/au, www.plenti.com.au



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



EXPLORATION AND MINING COMPANY IGO'S NOVA SITE IN WESTERN AUSTRALIA'S FRASER RANGE WILL BE THE LOCATION FOR THE FIRST INSTALLATION OF THE NAS® BATTERIES IN AUSTRALIA

NAS® batteries are a containerised solution with each container able to provide 250kW of power and an energy capacity of 1,450kWh.

The IGO Nova nickel-copper-cobalt operation is powered by a 26MW PV/diesel hybrid microgrid power station operated by Zenith Energy and is currently adding another 10MW of solar in keeping with IGO's mission

National Business Manager for Energy Storage at BASF Australia Ross Sang told *Smart Energy* "The 250kW BESS will demonstrate the ability of the NAS® batteries to operate without air-conditioning in the extreme temperatures often seen in remote areas like this mine site."

to discover, develop and deliver products critical to clean energy.

The IGO Nova Operation, which in FY22 produced 26,675 tonnes of nickel, 11,483 tonnes of copper, and 982 tonnes of cobalt is projected to be capable of 100% renewable operation during daylight hours this summer

The new battery will be connected into this local grid to demonstrate the capabilities of the technology to the Australian market and will be delivered by the EPC Allset Energy for the Future Battery Industries Cooperative Research Centre, as part of the QUT operated National Battery Testing Centre.

"The design of the NAS® battery suits large scale long duration (≥ 6 hour) applications and allows easy scale up from single container 250kW/1,450kWh systems up to GWh size systems. BASF Australia is



in discussion with a number of developers, end users, gen-tailers and utilities to provide batteries to support decarbonisation, electrification, grid stability and large-scale renewable energy integration," Sang explained.

NAS® batteries are manufactured by NGK INSULATORS, LTD in Japan and distributed globally by BASF.

IGO Nova's BESS will add to the 200 existing installed and operational NAS® battery sites across the world, with total power exceeding 680MW and a storage capacity of approximately 5.0GWh.

The containerised format allows a reduced installation time compared with conventional format systems and in 2016 NGK demonstrated this when constructing the then-world's largest storage battery facility in about six months, the 50MW/300MWh NAS® battery facility at the Buzen substation in Japan.

More tech specs: NAS® batteries have a fully commercialised track record of 20 years and a 20-year operational lifetime (equivalent to 7,300 cycles). They also boast 100% depth of discharge and a low degradation based on energy throughput making it easier to assess the NAS® battery performance over its lifetime. www.nasbatteries.basf.com

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



NAS® batteries are high-energy, long-duration sodium-sulfur batteries that operate across a broad temperature range and arduous environments without active cooling. NAS® batteries are well-suited to various operational applications, including renewable energy integration, grid support, and microgrid power supply.

Contact us to learn more

BASF Australia Ltd ABN 62 008 437 867 Level 12, 28 Freshwater Place Southbank VIC 3006 Australia

nasbatteries@basf.com www.nasbatteries.basf.com



Produced by NGK INSULATORS, LTD. Distributed by BASF

NSULATORS, LTD., registered in the U.S.

SMART ENERGY INNOVATION

LONGI HAS ANNOUNCED A NEW WORLD RECORD

conversion efficiency of 26.12% for its p-type silicon heterojunction (HJT) cells, 0.65% higher than that of 25.47% released earlier this year.



This was achieved on full-size (M6, 274.3cm²) gallium-doped p-type monocrystalline wafers and is reputedly the highest record for p-type cell efficiency to date.

The record was validated in testing carried out by the Institute for Solar Energy Research (ISFH) in Germany.

During the 8th World Conference on PV Energy Conversion held in late September in Milan, founder and president of LONGi Green Energy Technology Li Zhenguo (pictured), said "At the crossroads of the global energy transition, every decision we make now has a bearing on the future of a liveable planet."

www.longi.com

THE TASMANIAN GOVERNMENT HAS SELECTED BRIGHTE as

the official finance and administration partner of the state's Energy Saver Loan Scheme.

And it's proving popular, with close to 1,000 Tasmanians registering for the October launch of the energy efficiency scheme enabling access to zero-interest loans of up to \$10,000 to residential households, landlords, small businesses and not-for-profit organisations to assist in accessing a range of energy efficient products, from solar panels, hot water and heat pumps, to insulation and other energy efficient appliances.

Founder and chief executive of Brighte Katherine McConnell said "Accelerating the transition is a progressive and positive step... across Australia, people are looking for ways to bring their bills down and their power bill is the one they have the most control over.

"Installing energy efficient products powered by solar can make a real difference to household budgets in a short time."

Brighte has to date helped over 110,000 households get solar sooner, partnering with over 2,000 solar retailers nationally and processing more than \$1.3 billion in finance applications. www.brighte.com.au

INNOVATIVE ENERGY COMPANY SOUTH STREET ENERGY was

recognised at the 2022 National iAwards in the Sustainability and Environmental Solution for the Year category for its pioneering Distributed Generation Network which enables the owners of small scale solar, wind and biogas generation systems to sell renewable electricity to the wholesale electricity market.

"South Street Energy has fundamentally changed the National Electricity Market by enabling the owners of small-scale renewable generation systems to directly participate in the wholesale market for the first time," said Managing Director Marco Bogaers. "This benefits everyone. It helps the owners of individual systems by providing a new and additional form of revenue, it helps the community by providing further financial incentives for the take-up of renewables and it helps the National Electricity Market (NEM) by providing a demonstrable mechanism for participation by small scale, renewable generators."

The iAwards are presented by the Australian Information Industry Association (AIIA), Australia's peak industry representative body for innovative technology.



South Street Energy team: Peter Sertic, Marco Bogaers, Melita Vellucci, Cathy McDonald, Chris Boek and Andrew Randall

TAKE COVER!

The Bureau of Meteorology has issued a severe weather outlook with increased risk of widespread flooding in eastern and northern Australia.

There's likely to be 'prolonged heatwaves' in southern parts of Australia, and higher humidity, in particular with high overnight temperatures.

There's also increased risk of above average numbers of tropical cyclones. Although the warming climate results in fewer tropical cyclones, those that do form are more severe and they push further courts.

There will be a 'normal' risk of severe thunderstorms, but possibly more thunderstorm asthma occurrences should late spring and early summer be dry.

And a message to climate deniers out there who claim wet weather is evidence that climate change is a load of codswallop. Simply, climate change is characterised by more extreme weather.

That's hotter, drier and wetter.

The rain gets dumped. Big time.

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



Signing up

Every fortnight over the past two years Ria O'Hehir, who is Chief Executive Officer at Greenbank Environmental and Board Member of the Smart Energy Council, has broadcast a series of thought-provoking pro-renewable messages on large pieces of cardboard.

She wields the smart signs standing in random places - on a suburban street, in the city centre, at a shopping centre, even knee deep in sea water - she's committed!

Right on message

"I keep the messages original but they all relate to renewable energy in terms of political or climate related statements or questions," Ria told Smart Energy.

"We take a photo and post it on various social platforms including LinkedIn, where I have close to 5.000 followers, for all to read.

"The short but succinct messages appearing on the cardboard signs are great way to start conversations, engage and reach many people, allowing many to share them

and get involved. One of my signs reached 65,000 views, gained hundreds of 'likes' and was forwarded hundreds of times so we know we are getting the word out!"

Cutting to the chase

Samples of the meaningful messages and posers include those seen in pictures on this page, as well as:





- "Make voluntary carbon markets great again."
- "Australia is better placed than any other country to lead the world into the global push for clean energy," and
- "Spain and Portugal 80% Renewable Energy Target, why not Australia?"

Keep up the great work Ria! You lend new meaning to the title 'board member'. Maybe we should change that to 'board messenger'.



ALL IN ONE REPOWER EVERYTHING

50FAR PowerÁll)

- Modular and integrated DC-coupled energy storage
- Built-in 3 6kW inverter with EPS functionality
- 5 30kWh battery storage capacity
- >10 ms switchover time to critical loads
- 10 years warranty with local support



The truth is out there, but so are lies

... and that is what drives
Australian-born Oslo
resident **Ketan Joshi**who is an avid researcher
and communicator on
all things good, bad,
bizarre or misrepresented
in energy and
climate change.

"I hope every climate denier I've encountered has left alienated and confused. They're small in number... today many millions of people want to be part of climate action, but aren't really sure how they can do it. Those are the people I want to talk to!"

Smart Energy: How does an Australian neuroscience/psychology graduate end up immersed in all things energy transition and living in Oslo?

I fumbled around after university, wanted a 'sciency' job and found one advertised for a wind farm company based in Sydney. Fumbled my way through an interview and somehow got it. It was terrifying, but once I understood the work, exhilarating.

We moved to Norway for my partner's work, but like with many in my generation, we just go wherever work takes us. We'd probably prefer to be in one place!

SE: What rattles you most about the energy transition trajectory and the influence of the fossil fuel industry?

A big and structural slow-down in solar, wind or both due to community or political factors. We're already seeing it in places like Germany and the UK for wind, and to a lesser extent solar in Australia (perhaps temporary, hopefully). Even if the building of the generators goes well, transmission lines, storage, funding, policy etc can all trip up. It really rattles me a lot. The people spearheading the transition must have resilience to extreme conditions for this to work.

SE: To what extent has the invasion of Ukraine triggered a wake-up call over European energy supplies?

I remain unconvinced that bloody conflict or disease will accelerate the clean energy transition. The power of incumbency, the greedy corruption of fossil fuel interests, the irrationality of those who want to rely MORE on the fuels that are causing this crisis (in both economic and political terms) are all stunningly powerful hurdles to overcome. Clean energy is powerful, but to clear those roadblocks and then some seems pretty unlikely. However, what we see, with wind and solar weathering this storm and still managing to keep up historical growth is nothing to sneeze at. I'm impressed!

"I am bullish not about a positive destiny, but about our unrealised power to change our destiny.
No fate."

@Ketanj0

SE: We note 'Norway has taken the lead from Russia in supplying natural gas to Europe and its gas production is set to rise 8% this year, on track for a record.'

Norway's fossil fuels cause climate change, and they cause air pollution when they're used in products in customer countries. They also lock in reliance on a fuel we know is wielded by a bloodthirsty warmonger as a tool to hold countries hostage. Gas, more so than oil these days, is nothing less than a deadly weapon mixed with a toxic hazard.

SE: Norway leads the world in electric vehicle uptake, do you drive one?

Only sometimes, I barely ever drive as Oslo is very walkable; we use public transport or bikes when we need to go longer distances, or car share as a last resort.

Norway's high EV sales figures are often touted as positives, but that bleeds through only very slowly in actual emissions reductions in transport, which sit at only a few percent below 2005 baselines. Norway's state ownership of its fossil fuel machine is also touted as a positive in Australia; of course that just means we as residents and citizens feel compelled to ignore the consequences of the money that feeds our welfare and government systems. Norway should be urgently exiting the fossil fuel age, but it's clinging on, and the small, slow change to its transport emissions is expanded and over-sold as greenwashing.

SE: Reading your recent lengthy expose 'Hello and welcome to the Offsets Hall of Shame' I wonder about its reach and impact.

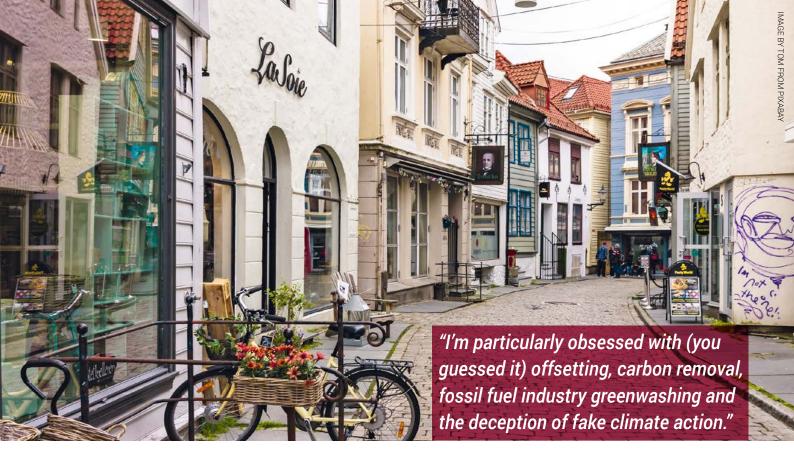
I wrote the Offsets article during my parental leave period of three months (thank you Norwegian fossilfunded welfare state) but these days I've cooled down a bit on writing as I was on overload. Now, I do communications strategic consulting for European climate groups and organisations, though I do miss writing a bit.

My sphere of influence is limited, but I have sometimes had an actual impact. Mostly it comes down to just pushing as hard as possible where I know I can contribute, and not worrying about quantifying my impact in a direct way. It's fuzzy, but I've learned not to stress about it.

SE: Do you think you are in some way helping facilitate the shift to renewables, have you swayed many climate deniers?

I think in my earlier career I did help facilitate the shift to renewables in Australia, in a very small way, by effortfully debunking misinformation about energy transformations. Today, I hope I focus more on enablement. It's more about building good wind, and good solar, and good policies, and a focus on justice and equity. The tech has momentum now, but we still need to shape it so it's fair and effective, and fast





enough. I hope every climate denier I've encountered has left alienated and confused. They're small in number and I will never spend time on them when I could be talking to the open-minded but unsure. There are today many millions of people who want to be part of climate action, but aren't really sure how they can do it. Those are the people I want to talk to!

SE: What work are you most proud of?

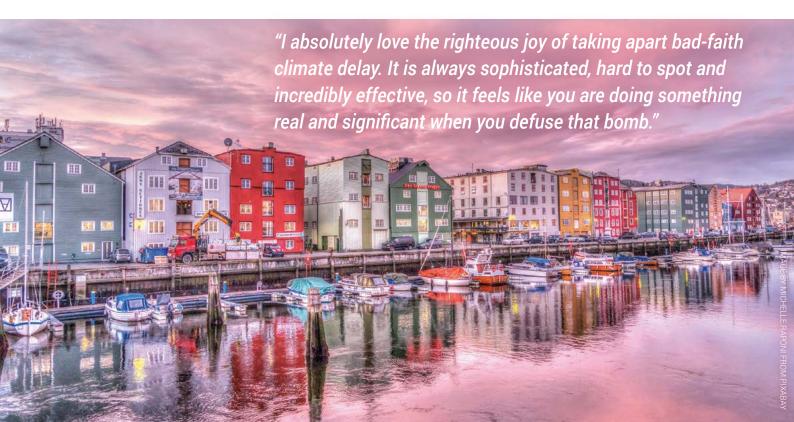
Definitely this is one of the ones: https://ketanjoshi.co/2021/04/10/within-the-drumbeat-of-bad-decisions-impossible-is-toxic/ — arguing that defining anything as "impossible" is premature and somewhat ludicrous. The entire effort we're in is a fight to change probability — to change the straight-line trajectory of our current destiny and make the impossible into the improbable, then the unlikely, then the middle-case, then likely, and finally, the unavoidable. We did that for renewables — now to do it for every single other sector, and to do it fast enough to

limit total cumulative emissions to a narrow budget. I am bullish, not about a positive destiny, but about our unrealised power to change our destiny. No fate.

SE: What's on your radar now?

My focus, both on work and in my non-work interests, is in climate commitments, targets and the various gaps, roadblocks and setbacks in translating ambition into action. I'm particularly obsessed with (you guessed it) offsetting, carbon removal, fossil fuel industry greenwashing and the deception of fake climate action. I absolutely love the righteous joy of taking apart bad-faith climate delay. It is always sophisticated, hard to spot and incredibly effective, so it feels like you are doing something real and significant when you defuse that bomb.

Look out for Greta Thunberg's 'The Climate Book', in which Ketan Joshi contributed an essay on carbon capture and storage.



ENGINEERING AN ENERGY REVOLUTION



To achieve Australia's emissions reduction target of 43% by 2030, it's estimated that we will need to install about 40 (forty) 7-megawatt wind turbines every month until 2030. For solar, we still need to install more than 22,000 five hundred-watt panels every day — and 60,000,000 by 2030... we need to act so rapidly. Achieving our climate change targets will require an energy revolution... an energy revolution that we are engineering.

CHRIS BOWEN, Minister for Climate Change and Energy

We're bringing forward our net zero target to 2045 and slashing our emissions by 75-80% by 2035 – one of the most ambitious targets in the world. We'll have 95% renewable electricity in Victoria by 2035 – bringing an end to polluting, coal-fired electricity. This will slash emissions and our power bills while supporting 59,000 jobs. This is what ambition looks like. Because we don't just talk about climate change, we deliver real climate action.

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

The Queensland Energy and Jobs Plan is founded on expert advice, science and evidence-based policy. Its aim is to shape Queensland as a serious, dedicated energy superpower... [we have] the renewable resources above the ground [and] critical minerals below the ground to be a renewable energy superpower and support nearly 100,000 more jobs [and] deliver average wholesale electricity prices of \$56 a megawatt hour over the next decade. As Queensland expands additional renewable power and storage, existing coal-fired power stations will progressively become clean energy hubs from 2027. In total Queensland's economy is expected to grow by an additional \$25.7 billion. Queensland, it's our time to shine

ANNASTACIA PALASZCZUK, Queensland Premier and Minister for the Olympics

Saul Griffith has laid out the plan for the people and households of Australia to achieve real zero emissions within a decade. Now our governments – local, state and federal – need to earnestly coordinate to support the will of the people.

NICOLETTE BOELE, Expert Adviser, Electrification of Everything, Smart Energy Council

We [global leaders] have a credibility problem all of us: We're talking and we're starting to act, but we're not doing enough. We must see the so-called 'dash for gas' for what it really is: a dash down a bridge to nowhere, leaving the countries of the world facing climate chaos and billions in stranded assets. We have to move beyond the era of fossil fuel colonialism.

FORMER US VICE PRESIDENT AL GORE speaking at the COP27 climate conference in Egypt

The community independents – the teals – were the biggest story of the 2022 federal election. They represent arguably the biggest change in Australian politics over the past generation, and they mark a new era in our politics... Climate200 was an important piece of a wonderfully complex, amorphous and dynamic movement that upended traditional polarised politics in a range of previously safe seats in 2022.

Extract from The Big Teal by SIMON HOLMES À COURT

READ THIS...

The Big Teal | Simon Holmes à Court

Simon Holmes à Court has been criss-crossing Australia promoting his book *The Big Teal* which, for good reason, we label a must read.

It charts the background to the crowd-funded Climate 200 campaign that saw a bunch of smart, talented people elected community independent MPs in the May 2022 election. An outcome that "marked the great re-engagement of those ignored and patronised for too long on climate, integrity and gender equity".

Some of our favourite extracts from *The Big Teal*: "It's been very exciting to see the crossbench become an attractive pathway for successful non-politicians to serve their communities and the country... the calibre

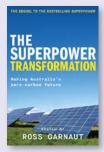
of politicians we've always wanted. The ineptitude, corruption, and deep unpopularity of the previous government had proven too much... we caught a wave," Simon writes.

Heralding a new direction in federal parliament. Disruption!

Simon makes it clear in the book and during his book tours that he does not discuss policy issues with the Independents who each determine their own approach based on climate science and today's societal needs.

Energy analyst and clean-tech investor Simon Holmes à Court is a director of the Smart Energy Council.





The Superpower Transformation: Making Australia's Zero Carbon Future Edited by Ross Garnaut

Renowned economist Ross Garnaut and contributions including Mike Sandiford, Frank Jotzo, and Dylan McConnell spell out how Australia can develop a zero-carbon future and meet the objectives set at the Paris and Glasgow climate conferences (as well as the growing costs of not doing so). Australia has the potential to make a cut to

global emissions of 8 per cent and make Australia a richer country than it has ever imagined by tapping into renewable electricity, hydrogen, steel, exports and carbon capture. The book concludes "The new [economic] opportunities are much larger than the old."

"Our nation's most prophetic economist" - Ross Gittins



Windfall: Unlocking a fossil free future | Ketan Joshi

Renewable energy expert Ketan Joshi examines how wind power inspired the creation of a weird, fabricated disease, and why the speed with which emissions could have been reduced — like putting a price on carbon — was hampered by a flurry of policy disasters. He then plots a way forward to a future where communities champion equitable new clean tech projects, where Australia grows past a reliance on toxic fuels, and where the power of people is used to rattle fossil fuel advocates from their complacency.

"Brilliant! Ketan artfully contrasts the past and present of Australia's climate challenges against our inevitably optimistic future – harnessing our boundless renewable resources to become an energy superpower."

- Mike Cannon-Brookes

"This is a book from the heart: clear, eloquent, candid and rational. It is at once an intensely personal narrative and a searing indictment of policy failure. Windfall' provides abundant reasons to be angry, but also plenty to be hopeful."

— Lesley Hughes

The Climate Book | Greta Thunberg

It seems like an impossible task: secure a safe future for life on Earth, acting at a scale and speed that the world has never seen, in the face of vast and powerful forces — not just oil tycoons and governments, but the changing climate system itself. The odds are against us, and we are running out of time. But it doesn't have to be this way. *The Climate*

Book shows that we all have the responsibility of being alive at the most decisive time in the history of humanity, and that, together, we can do the seemingly impossible. But it has to be us, and it has to be now.

Look out for the chapter on carbon capture and storage authored by Ketan Joshi.



The Future of Electricity Distribution Network |

Look out for Chapter 2 in Part One: How technological innovations are changing customers' service needs in which Bruce Mountain, Victoria Energy Policy Centre, University of Victoria in Melbourne discusses Commercial rooftop solar in Australia: State of play, innovations and future

Various authors from across the globe, with a foreword by Jean-Michel Glachant, Florence School of Regulation, Italy

prospects. Heads-up: Tune in for mention of award-winning South Street Energy developed by Marco Bogaers and the team at Metropolis Metering.

The book is due to be published by Academic Press in early 2023.

SMART ENERGY COUNCIL CORPORATE MEMBERS

TITANIUM MEMBERS

FOR FULL LISTING OF SMART ENERGY COUNCIL MEMBERS SEE WWW.SMARTENERGY.ORG.AU





PLATINUM MEMBERS



































































































GOLD MEMBERS

















Panasonic













Solplanet

























































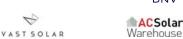






SILVER MEMBERS









Power**Smart**













Ingeteam





Scimita





BRONZE MEMBERS

Clean Technology Partners Coral Reef Developments Crystal Solar Energy CWP Renewables Earthconnect

eleXsys Energy **Emerging Energy Solutions Energy Ease** Freshwater Group **Gardel Electrical & Solar**

Global-Roam Master Instruments Mondiaux Nexa Advisory Off-Grid Energy Australia

One Global Logistics Powow **Red Earth Energy Storage** RETA (WA) SATEC (Australia)

Solar Energy Australia Solar Wholesalers SolarHub/Smart Renewables Volt Solar Tile **WINAICO** Australia

X-Elio Australia Zeromow **ZNSHINE Solar Australia**

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

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.

industry.

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

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



SUPPORT THE DRIVING **FORCE OF SMART ENERGY**

The **SMART ENERGY COUNCIL**:

- Fights hard for smart energy policy
- Provides actionable market intelligence
- · Creates valuable networking and introductions
- · Delivers high quality training and professional development
- Promotes your business and brand We represent companies across the Smart Energy spectrum including: solar, solar hot water, storage, energy management, electric vehicles, hydro, wind energy, bioenergy, ocean energy, geothermal, hydrogen, co- and trigeneration, and hybrid and enabling technologies.

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

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



BECOME A MEMBER TODAY

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

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



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.



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



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

SUMMER 2022 ADVERTISING CONTENT

ADVERTISER	PAGE	WEB ADDRESS
5B	13	http://5b.co
BASF	59	www.nasbatteries.basf.com
CanadianSolar	45	https://www.canadiansolar.com
Delta	51	www.deltaelectronics.com.au
FIMER	30-31	http://fimer.com/e-mobility
GoodWe	3	www.gesolarinverter.com.au
Huawei	54	https://www.huawei.com/au
INVT	43	www.invt.com.cn
Jinko	35	https://www.jinkosolar.com
LEDA	24	https://leda.inc
LG Chem	12	www.lghomebattery.com.au
LONGi	11	https://www.longi.com
Motherson	55	www.motherson.com
Planet Ark Power	15	https://planetarkpower.com
Pylontech	5	https://en.pylontech.com.cn
Redback	25	http://redbacktech.com
Risen	49	https://risenenergy.com
S-5	Inside back cover	www.S-5.com
SENEC	7	www.senec.com/au
Sofar Solar	61	www.sofarsolar.com.au
SolaX Power	Inside front cover	www.solaxpower.com.au
Sungrow	Outside back cover	www.sungrowpower.com
Weatherzone Business	19	http://business.weatherzone.com.au
		A





Choose PVKIT® to reduce the weight and volume of your solar system...

& save 30-50% in installation time.

