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Climate 200 for integrity and independent candidates
Big thinking around renewable hydrogen
Ramahyuck Indigenous solar farm

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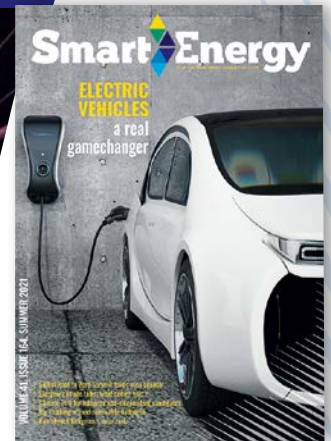
Mitzi Mann

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 the sun rather than fossil fuels.

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FRONT COVER Australia is in the slow lane with electric vehicle uptake, but once they take off EVs will be vital in the energy network

SMART ENERGY COUNCIL

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WELCOME

John Grimes, Chief Executive
Smart Energy Council



Enough is Enough – At the next federal election put the Liberal and National Parties last

SINCE 2013 the federal Coalition government has done everything it can to protect coal, massively expand fossil gas, and to roll back and stop the expansion of smart energy.

Eight years of constant attacks on our industry, almost daily venom, with no end in sight.

Net zero? Their heart is not in it. Their 'plan' has no legislation, no mandate and no policy to make it real. It is simply a talking point to hoodwink the public and get the Coalition government three more years in power.

For the past eight years the federal Liberal and National parties have put our industry last.

Enough is enough. At this election it is now up to us to act. For our industry, for the future of the Australian economy and for the future of our planet.

Australia can and should be a global renewable energy superpower. We need to electrify everything, in our homes and businesses, on the road and in heavy industry, and then power it all with cheap zero-carbon renewable energy.

We should be harnessing our fantastic Aussie sunshine and wind to export to the world, attracting global investment and growing Australian industry and jobs.

Instead we are holding the world back, Australia is an outlier, a global climate pariah.

That is why at the federal election I am calling on you to vote strategically. It is time for this fossil fuel obsessed Coalition to go.

How so?

Find and support a moderate independent candidate who will act on climate, or a Labor or Greens candidate. Whoever you choose to vote for this election, make sure you put the Liberal and National parties last on your ballot paper.

It is high time we took our industry off the table as a political football. When we show we are a potent political force prepared to turn the political dial, all future governments will have to be serious about the smart energy transition and take the actions the planet desperately needs.

Regardless which side of politics they come from.

IN MY VIEW

Anika Molesworth is a farmer, scientist and the author of 'Our Sunburnt Country', www.AnikaMolesworth.com
@AnikaMolesworth

FOR FARMERS climate change is not an abstract concept. It is not something to worry about at a later date. It is not an issue for someone else on the other side of the world.

For Aussie farmers, climate change is impacting them right now, right here.

I love nothing more than walking through the paddocks of my family's farm in far western NSW, seeing kangaroos bound with gymnastic elegance while wedge-tailed eagles glide effortlessly overhead.

I love not only living closely alongside nature, but also working with her, and growing food that nourishes people. However, my ability to do this is being severely compromised by delayed and insufficient climate action.

Year after year, season after season, records are smashed in high temperatures, low rainfall and more severe weather events. Droughts, floods and bushfires wreak havoc for food and fibre producers.

As a society we are pumping dangerous, climate-destabilising greenhouse gases into the atmosphere with an ignorant 'she'll be right' attitude. But one thing is certain, and the science is clear on this, our unrestrained consuming and polluting behaviour guarantees we will not be alright.

The way we are interacting with our planet cannot continue.

And the good news is, we can change. We can improve the way we live and work alongside the natural world. Farmers are already making great strides in doing this.

They are working out ways to reduce on-farm emissions, such as by reducing livestock methane with selective breeding and feed supplements.

Trees are being planted in biodiversity and carbon sequestration efforts. Farmers are placing solar panels on homestead roofs and among vineyards, while cattle and sheep quietly graze beneath wind turbines.

Clean energy projects are an exciting prospect for both farmers and rural communities, as they inject new, skilled jobs into the regions, bringing with them

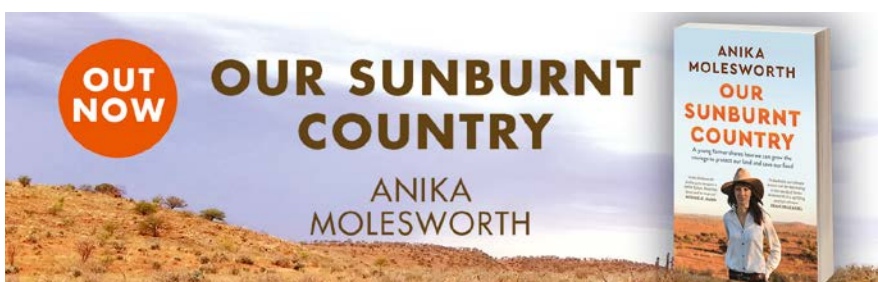


economic opportunities and a way to get off the harmful fossil fuels that are harming the land that farmers care so deeply about.

But farmers can't do this alone. We need climate leadership on all fronts, from all sectors of society. And most importantly, we need ambitious, science-backed climate policy.

This would ensure there is investment and research where it's needed. This gives direction to where we are going, and confidence in the strategies to get us there.

We can protect our land, our food and our future, and it is within our grasp.



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INDUSTRY DEVELOPMENTS

THE INTERNATIONAL ENERGY AGENCY'S 2021 WORLD ENERGY OUTLOOK

reveals that despite the COVID lockdowns of 2020, renewable sources of energy wind and solar PV continued to grow rapidly, and electric vehicles set new sales records. Clean energy technology is becoming a major new area for investment and employment, however 2021 is seeing a large rebound in coal and oil use and led to the second-largest annual increase in CO₂ emissions in history. Data puts in doubt the IEA's landmark Net Zero Emissions by 2050 Scenario which charts a narrow but achievable roadmap to a 1.5°C stabilisation of global temperatures. www.iea.org

Flagship report

World Energy Outlook 2021

CLIMATEWORKS AUSTRALIA says Australia must strike emissions reductions of 48 to 74 per cent by 2030 (well up on the Coalition's 28 per cent) to provide a realistic chance of reaching zero net emissions by 2050 and to contain global warming to 1.5 degrees.

Climate Council data likewise shows Australia should be cutting emissions 21 times faster and aiming for a 75 per cent cut in greenhouse gas emissions below 2005 levels by 2030 "to avoid the catastrophic consequences", declaring we're on track to cut emissions by just one-third of one per cent (0.28 per cent) annually over the next decade.



GLOBAL RACE TO ZERO SUMMIT Electrify everything: During the two-day event staged in mid-October by the Smart Energy Council, Australian-born scientist and inventor Saul Griffith of Rewiring Australia said if all Australian residents switched to home electric appliances and EVs, households would save \$5,000 and Australia up to \$40 billion a year by 2030 and help decarbonise the nation.

High level Summit speakers from across the globe, including the French Ambassador, urged fossil fuel obsessed Australia to change its path. *Read more on page 12.*



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THE AUSTRALIA INSTITUTE'S CLIMATE OF THE NATION 2021

report reveals Australians want leadership on climate change. Two-thirds of the 2,626 surveyed agree that Australia should be a world leader in finding solutions to climate change and more than two-thirds want Australia to commit to net zero emissions and set targets to limit global warming to 1.5-2°C. At the very least, that requires halving Australia's emissions this decade (approximately doubling the current 2030 emissions reduction target) and not approving new gas, coal or oil projects. Australians support changes at a policy level and are willing to make changes to electrify their homes and their vehicles, and power them using sun, wind, water and batteries.

"Current policy settings and ambition in Australia remain stagnant and largely out of touch with the prevailing public opinion on climate action," TAI's Richie Merzian said. "The majority of Australians think our leaders should be doing more to plan the orderly closure of coal power stations, increase electric vehicle uptake, and prepare for and adapt to the impacts of climate change... [they don't support] a gas-fired recovery and current levels of fossil fuel industry subsidisation.

Key findings on the views of everyday Australians:

- 82% are concerned climate change will result in more bushfires, more droughts and flooding, and animal and plant species extinction
- 74% support state governments putting in place incentives for more renewable energy
- 67% think Australia should be a world leader in finding solutions to climate change
- 60% support Australia following the IEA pathway rather than approving new gas, coal or oil projects
- 82% support a phase-out of coal fired power stations
- 71% support government subsidies to reduce the cost of purchasing an electric vehicle
- 66% think the Australian Government should stop new coal mines, and
- 79% rank solar in their top three preferred energy sources, compared to 15% for coal and 19% for gas.

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VICTORIA'S latest Greenhouse Gas Emissions report reveals the state's emissions continued to fall to 24.8 per cent below 2005 levels by 2019, exceeding the state's ambitious 2020 target to reduce emissions by 15 to 20 per cent below 2005 levels and demonstrating the state's transition to a net zero emissions economy by 2050 is on track. Analysis reveals Queensland contributed 31.1 per cent of Australia's total net emissions; NSW 25.8 per cent, and WA 17.4 per cent. Victoria came in at 17.3 per cent.

Victoria is decarbonising at the most rapid rate of any major jurisdiction in Australia while its population and economy continues to grow, said Energy Minister Lily D'Ambrosio.

"As we outlined in our ambitious Climate Change Strategy released earlier this year, we will halve our emissions by 2030 and transition to a zero net emissions economy by 2050."

AEMO data revealed an average price of daytime wholesale power in Victoria in August and September of just one cent a megawatt hour, with abundant renewable energy generation on the NEM coupled with rooftop PV sending average spot electricity prices to around zero for six hours each day.

SOUTH AUSTRALIA recently excelled in solar and wind generation, powering the grid for several consecutive days.

NEW SOUTH WALES has received widespread acclaim for its Electric Vehicle Strategy and its far-reaching Hydrogen Strategy
Read more on pages 22 and 32.

AUSTRALIA'S main electricity grid is forecast to exceed 50 per cent renewables by 2025, and surge to 69 per cent renewables by 2030, according to the Department of Industry, Science, Energy and Resources whose projections illustrate wind and solar will become Australia's dominant sources of electricity within a decade.

New South Wales is forecast to rapidly transition from coal to reach 84 per cent renewables by 2030, Victoria to rise to 61 per cent, Queensland 43 per cent and South Australia 96 per cent. Tasmania leads the pack, powered by 100 per cent renewables. Western Australia's separate grid should reach 45 per cent renewables by 2030.

POINT OF LEGAL FACT The Federal Government's push to invest public money in fossil fuels and non-renewable technologies by funding carbon capture and fossil fuel hydrogen technologies could be illegal and is at odds with the purpose of ARENA according to a leading barrister and former head of the Law Council of Australia. Regulations are well open to serious legal challenge on multiple fronts.

Smart Energy Council's John Grimes said "The Morrison Government's attempts to gut ARENA are outrageous and illegal and must not stand. These changes must be disallowed by Parliament" while Environmental Justice Australia Hollie Kerwin said ARENA has a critical role to play in ensuring a safe climate for all Australians and that "we can take our place as a renewable energy superpower."

Upbeat news in from **QUEENSLAND'S WESTERN DOWNS** with the successful connection of Neoen Australia's 400MW solar farm to the electricity grid. The solar plant forms part of the Green Power Hub which is destined to include a 200MW/400MWh battery and produce in excess of 1,080GWh per year.

Queensland-owned CleanCo is purchasing 320MW of the Hub's output and is "further proof of Queensland's credentials as a renewables superpower" says Queensland Energy Minister Mick de Brenni.



Across now to the Pilbara in **WESTERN AUSTRALIA** where mining titan Rio Tinto is investing heavily in wind and solar: up to 5GW for smelters and 1GW for the iron ore mines.

The mega projects are integral to Rio Tinto's plan to outlay \$10 billion slashing in half scope 1 and scope 2 emissions by 2030.

On the drawing board are investments in green steel and green aluminium, replacing gas power, electrification of Rio's Pilbara grid and all trucks, mobile equipment and rail operations, which will require at least another gigawatt-scale renewable deployment, taking the total to more than 7GW.

'FIRESTORM: BATTLING SUPER-CHARGED NATURAL DISASTERS'

is the aptly titled book by Greg Mullins, Former Commissioner of Fire & Rescue NSW who says "In my nearly 50 years of fighting fires, I've never seen anything like Black Summer. Climate change is supercharging extreme weather events... we have to fight harder than ever for action to rapidly reduce emissions this decade... Emergencies don't get any bigger than our climate crisis."



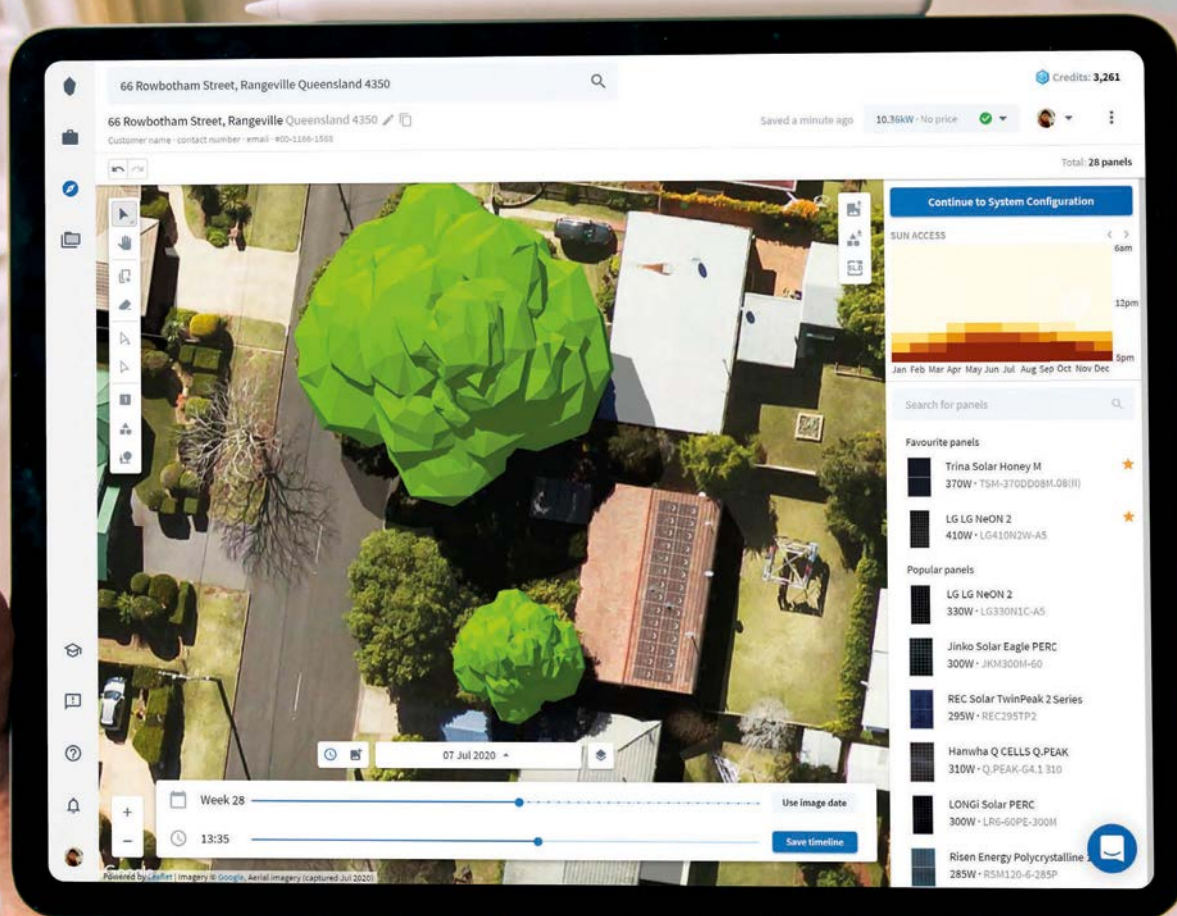
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ACTING THE ROLE IN CLIMATE TALKS

Months of anticipation followed by a two-day meeting of global leaders pledging varying degrees of support for climate action. Whether this will generate the scale of change needed to combat further global warming remains to be seen. We do know, however, that Australia remains enamoured by fossil fuels despite the just-in-time rhetoric around net zero.

MANY WILL RECALL the elation of climate activist Tim Flannery at the 2015 talks in Paris that set an ambition to limit global warming to 1.5 degrees. But six years on from the Paris Agreement the world has endured six of the warmest years in modern history, producing more extreme weather events. Worse, the world is on a path to a 16 per cent boost in emissions rather than the necessary 45 per cent reduction by 2030.



Australia will miss the net zero emissions target by 250 years if it stays on the current path, according to science reporter Ketan Joshi. Comedian Dan Ilic successfully satirised the situation on billboards seen around the country and as pictured above in New York's Times Square

The question then is whether COP26 can trigger tangible and enduring change among the 130 participating nations, of which Australia stood out like a sore thumb blackened by coal dust.

What the...?

So let's begin by observing that Australia, with its unwavering support for dozens of new fossil fuel coal mines and gas basins, and gleeful abandonment of billions of taxpayer dollars into failed carbon capture projects and a determination to pursue fossil fuel hydrogen, unashamedly exposed its true colours at COP26 in Glasgow. On show was a shiny blue exhibit by oil and gas giant Santos of its mega fossil fuel carbon capture and storage project earmarked for Moomba, South Australia. Promoted as the biggest in the world at that!

A reminder here that Australia is the third largest global exporter of fossil fuels: the largest exporter of liquefied natural gas and the second largest exporter of coal. And it looks to stay that way. Climate action be damned! Net zero *commitment*, many chide.

National shame

John Grimes expressed his extreme disappointment with the Australian government's position.

"As shown at COP26 there is a strong movement globally to really push for more ambition and more action as the urgency of the situation is becoming abundantly clear," he said. "Australia is a really important yet negative player because what we're doing is giving cover to other countries that really don't want to move, like Brazil, Saudi Arabia and Russia.

"We are stopping a genuine global consensus emerging, the fewer countries that are holding out on action the more intense the pressure is on those countries.

"It is a huge national shame."

As to the PM's comment that technology will lead to a decarbonised economy via progress in carbon reductions charting the path to net zero and "progress will be met by those who are largely not in this room: scientists, technologists, engineers, entrepreneurs, industrialists and financiers", that is one lengthy euphemism for carbon capture and storage accommodating continued burning of fossil fuels.

"The PM has been talking about how technology will save Australia and now it is clear what he means by technology, he means carbon capture and storage. This is an unproven technology that has already received billions of taxpayer dollars in funding both here and overseas over the last decade or so, and is yet to be proven."

Further, when oil and 'natural gas' are extracted from the ground, significant levels of methane and carbon dioxide leak out. Let's not forget methane is around 80 times more potent than carbon dioxide as a greenhouse gas, he said.

Australia was a notable exception to the pledge by more than 100 countries including the US, EU, Brazil, Indonesia and Saudi Arabia to reduce methane emissions – which currently contribute up to a quarter of all global emissions – by 30 per cent by 2030.

Leading economist John Quiggin says "This probably should have been talked about before. Methane is in a sense the low hanging fruit and something we have not been focussed on, all improvements in getting methane out of the air would be impressive and we need to do what we can."

John Grimes stated the Coalition's flawed version of 'clean' hydrogen made from burning fossil gas and using carbon capture and storage is also a complete charade.

"It is a fantasy to think that you can just keep burning coal and gas and somehow capture emissions and put them under eighty metres of rock and keep them there forever without leaking into the atmosphere."

CCS is costly, idle nonsense and an excuse to keep burning fossil fuels. At scale at maturity it would come in at \$185 per MWh, but solar and wind energy are now produced at just \$40 per MWh, he said.

Energy advisor Cleantechica modelling concludes "If we actually did start using carbon capture at anything approaching the scale of the problem, where would we put the resultant CO₂? We are multiplying the mass of the extracted oil, gas, and coal by two to three times as we combine oxygen from the atmosphere with carbon from the fossil fuels. It's really hard to pretend that we are going to put two to three times the mass of CO₂ underground as the mass of fossil fuels we extracted without intentionally ignoring physics."

But who in the Coalition is concerned with such physical, economic and environmental rationale? The party has long eschewed climate

friendly policies and agencies and “basically stopped every initiative in renewable energy”.

So much for the PM’s posturing over Net Zero by 2050.

John Quiggin agrees, stating to the extent Morrison might have thought the commitment to Net Zero by 2050 would keep Australia out of the fray as an obstacle has not worked, even Brazil which is seen as recalcitrant gained some credibility over its pledge to end deforestation in nine years.

COP commitments

The long-term advocate of renewable energy commented the near universal commitments by countries at COP26 indicate very few support coal or carbon-based fuels into the future.

Quiggin observed some “quite unexpected and positive results” from the gathering, notably India coming on board with a Net Zero commitment by 2070 which he says is important especially in the Australian context with its dominant role in mining and exporting coal, he told *Smart Energy*.

“And while technology is obviously important, things are not going to happen without a carbon price and so yes, we will move forward with technology, but we need policies to lead the technology uptake.”

Australia at present has no desire to adopt a carbon price but others might impose one on us, he said. Tariffs will be imposed on our exports and in that sense, we should take things on.

Most of the discussion at COP26 is around setting targets and it is up to countries how they reach them and, while the IPCC and other reports go into more detail, the conference is more about commitments to numbers rather than prescriptive technologies, the UQ economics professor said.

“The actions and targets that are being discussed now are more ambitious than in the past. For example we now have the 1.5 degree global warming limit based on scientific knowledge gained in terms of what we need to aim for.”

At the Glasgow climate summit, close to 500 financial services firms signed up to an initiative to align US\$130 trillion with the Paris climate goals, and 190 nations and organisations vowed to end all investment in new coal power generation which is the single biggest contributor to climate change.

India, China and the US failed to sign the pledge as did Australia, the world’s second largest exporter of coal.

Would a Coalition-led Australian government ever see the light, or indeed recognise the ramifications of runaway climate inaction, many are wondering.

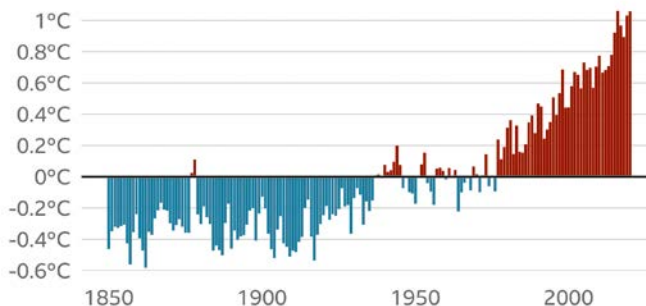
A rational pathway

In an ideal world Australia would take positive action by accelerating the closure of coal plants, mobilising investment in the renewable energy future well before to 2030, as well as upgrading grid transmission infrastructure and facilitating more decentralised energy (rooftop PV and batteries), while speeding up the transition from combustion engine driven to electric cars and all the necessary supportive infrastructure on roads and in the community.

John Grimes said “My message is this: things can change quickly. The US went from being the climate laggard to being a global climate leader in the space of 12 months and Australia has the opportunity to do the same thing by electing a different government.”

The world is getting warmer

Annual mean land and ocean temperature above or below average, 1850 to 2020



Note: Average calculated from 1951 to 1980 data

Source: University of California Berkeley

And how things would change. Federal Labor leader Anthony Albanese foresees a future with “cheap and abundant energy powering Australian homes and industry, with tens of thousands of job opportunities in renewable energy”.

“The ALP will take an ambitious agenda to the election including \$20 billion to rewire the nation, community batteries and 10,000 apprentices,” he says.

Speaking at the Smart Energy Council’s Global Race to Zero Summit, Shadow Climate Change & Energy Minister Chris Bowen declared: “Good climate action is in our interest. It’s 2,996 days since the Coalition government was elected yet it still has no climate policy, instead there is ongoing denial and delay, years of climate wrecking when we could have reaped the advantages from being a first mover.”

He later added “The PM’s net zero speech was devoid of substance, it’s simply more slogans, more spin. A vacuous policy. They have not released the modelling for it. There’s more detail in a fortune cookie.”

Greta Thunberg might well dismiss it as blah blah blah.

Independent MP Zali Steggall who recently reintroduced the Climate Change Bill that she believes would ensure Australia gets a share of the estimated \$1.7 trillion per annum invested globally in the net zero transition said “Climate change is the single biggest threat to Australia’s prosperity and largest opportunity for economic development.”

With its abundant solar and wind resources Australia could potentially power the world five times over.

Simon Holmes à Court of Climate 200 believes that the election of independent candidates at the next federal election hold the key to climate action, integrity and accountability. (*Read more on page 20.*)

His opinion is reinforced by comedian turned billboard designer Dan Ilic who says “We need to elect so-called ‘climate independents’ to the cross bench at the federal election who could push the next government to eventually abandon fossil fuels.

“The next federal election is the most critical election for the health of the world.”

Seriously sage words from a serially amusing man. Let’s take action to prevent the serious matter of emissions-driven climate catastrophes as a point-scoring game heavily weighted in favour of a time-worn losing fossil fuel side, as is the custom of the sitting Prime Minister.

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THE WORLD TURNS TO GREENER PASTURES

The Smart Energy Council's two-day Global Race to Zero Summit heard from a host of high-profile local and international presenters calling for pragmatic policies and accountable actions to address climate change.

THE SMART ENERGY COUNCIL'S Global Race to Zero Summit delivered a smorgasbord of passion, pleas and emotion from 80 diverse presenters including UN/COP26 Climate Champions, Ambassadors, business and industry, government ministers, scientists, environment reporters as well as sport stars and comedians.

Here we unpack some of the key messages that followed **former Prime Minister Malcolm Turnbull's** powerful opening statement: "The stakes have never been higher".

Why so? Under existing trajectories, the globe is on a 'woeful' path to 2.7 degrees warming and can only be reined in if we cut emissions by 45 per cent by 2030, he said. It's a more realistic figure that is well up on the Coalition's current 28 per cent.

Even then, 45 per cent may not be enough. According to climate scientists, emissions reduction targets of 50 to 70 per cent by 2030 are necessary to help contain global warming to two degrees.

Once warming hits two

degrees, they say, Sydney and Melbourne temperatures would commonly reach 50 degrees and the mercury would routinely rise upwards of 40 degrees, grain crops would struggle under prolonged droughts and, tragically, the frequency of bushfires would prevent regeneration. Harsh, very harsh.

This data highlights the magnitude of what is a very bleak outlook, yet not fully grasped by many in power.

Australia, says Turnbull, is ideally placed to cease coal production by 2040 due to the rapid and continued fall in the cost of renewable energy but we must find the will to grasp the opportunity.

"We are short of the scarcest resource – federal leadership. But as Prince Charles said, this is our last chance saloon. Glasgow must be the galvanising inflection point.

"But let's not lose hope. Most Australians want faster cuts and higher ambitions and business, which is driven by economics, is overwhelmingly committed as are Australian states each with a target of Net Zero by 2050."



**GLOBAL RACE
TO ZERO**
VIRTUAL SUMMIT

Former Olympian turned **Independent MP Zali Steggall** agreed, stating “We are on the eve of major disruptions and rapid change, and Australia is uniquely blessed by abundant natural resources.” The climate activist who has reintroduced the *Climate Change Bill* that received 6,500 submissions of support from business, industry and the community cast the timing as “The eve of Olympics of international diplomacy and international relations,” and has called on Australia to double its target and achieve a high penetration of renewable energy by 2030. “Yet we are being held to ransom by a small number of climate deniers. We need a vote of conscience – consumers need to make that decision.”

And we certainly don’t need to be ‘Meeting by cheating’, says **The Australia Institute’s Richie Merzian**, who spelt out Australia’s use of 430 million tonnes of carbon credits to meet the majority of its efforts over 10 years, despite the lack of legal basis for so doing.

“Australia has no plan to transition the energy sector or transport sector but does have plans to ramp up fossil fuel production for local use and mostly for exports and this will blow out the carbon budget,” he said.

“We need a plan based on integrity, not by meeting by cheating,” Merzian said, singling out NSW’s emissions reductions target of 50 per cent by 2030 which should be a minimum, and drawing attention to TAI’s recent *Climate of the Nation* report showing two-thirds of Australians reject the notion of any new coal plants.

Meantime, Australia is facing mounting pressure from developed nations with stronger ideals and targets.

Ambassadors have their say

French Ambassador Jean-Pierre Thébault

all but stole the show and captured media attention for his strong tribute to all the Australian states for “heading in the right direction with targets of net zero by 2050”. A subtle yet powerful rebuke to federal laggards and antipodean betrayal in general.

“As a citizen of the world I particularly commend the example set by NSW with its firm commitment to 2050 and strong emissions reductions target, with a pledge to halve emissions by the end of this decade,” he told the Summit.

Thébault also commended the Business Council of Australia and the National Farmers Federation for their position on climate action.

“But all these initiatives must be supported by an overriding goal,” he said, calling on the Australian government to step up, set short-term and long-term targets and enact the right set of policies to tackle climate change. As well as reap the economic benefits.

“There is no room for procrastination or complacency. Without a plan you cannot have a clear path. A failure to act on climate will be a moral failure and disastrously short-sighted for mankind.”

US Ambassador Michael Goldman

reminded Australia it was one of the top carbon emitters in the world on a per capita basis and declared net zero by 2050 a necessity yet perhaps not sufficient as “You won’t magically in 2049 decide OK we are going to shut everything off and reach net zero within a year.”

His over-riding message was a rally cry for worldwide increased ambition – now. “There needs to be preliminary steps and they are better undertaken in the early years in this decade, rather than in the 2040s.”

The Ambassador however concluded on a bright note stating the future holds hope with a green economy triggering a \$4 billion investment boom.

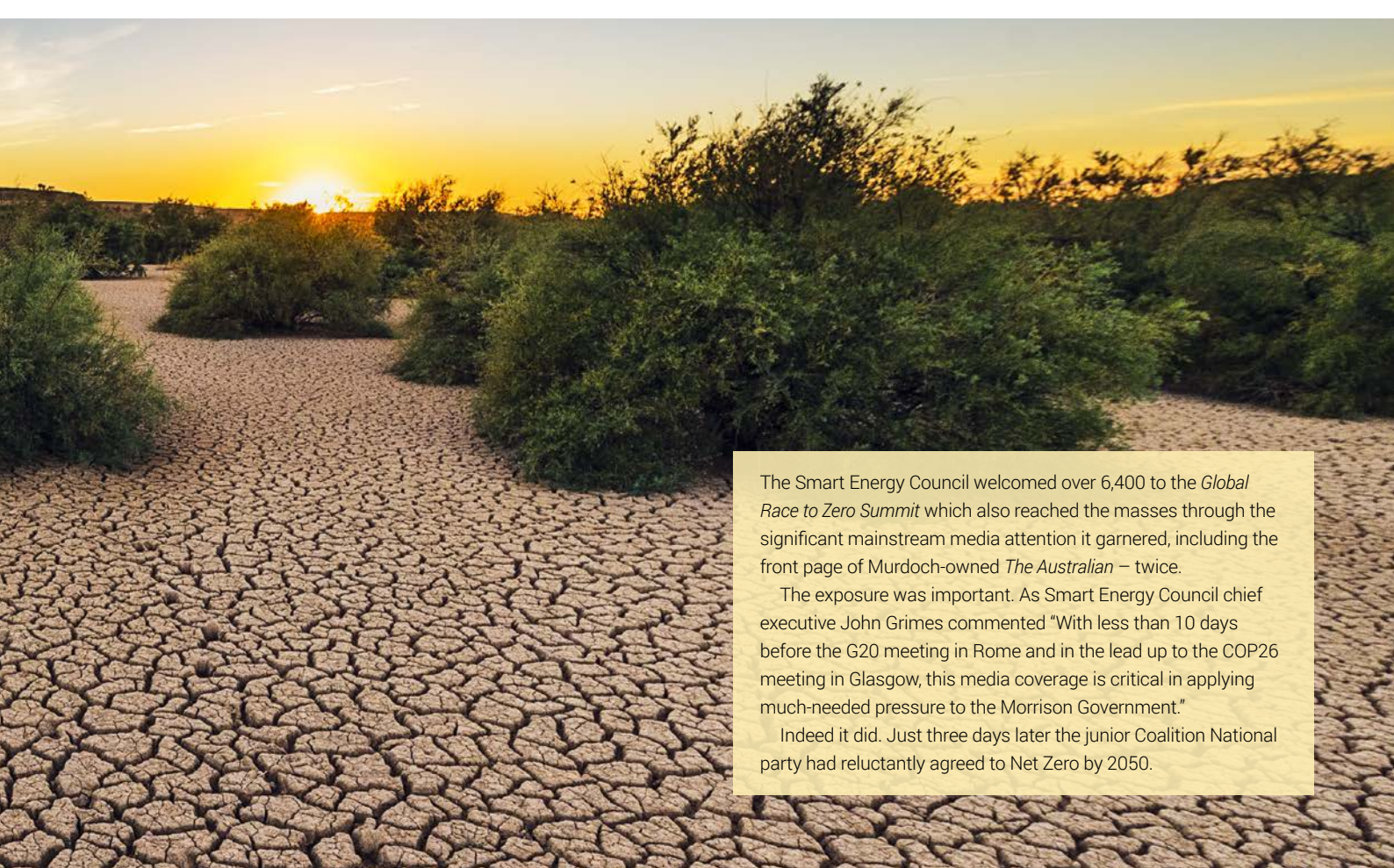
British High Commissioner Vicki Treadell

concurred, stating “This should be seen as an opportunity to build a new renewable greener future, with a lower reliance on fossil fuels. Investment follows clarity and already manufacturers have responded.” She noted the fate that awaits a million species facing extinction and the imperative to “take the intervention to put the world back into balance”.

Italian ambassador Francesca Tardioli

likewise hopes G20 nations including Australia take “bold decisions to save the planet” and called for far greater investment in renewables, declaring Glasgow “the last chance”.

The Danes are clearly the frontrunners with their 70 per cent emissions reductions target



The Smart Energy Council welcomed over 6,400 to the *Global Race to Zero Summit* which also reached the masses through the significant mainstream media attention it garnered, including the front page of Murdoch-owned *The Australian* – twice.

The exposure was important. As Smart Energy Council chief executive John Grimes commented “With less than 10 days before the G20 meeting in Rome and in the lead up to the COP26 meeting in Glasgow, this media coverage is critical in applying much-needed pressure to the Morrison Government.”

Indeed it did. Just three days later the junior Coalition National party had reluctantly agreed to Net Zero by 2050.

by 2030, as **Danish Ambassador to Australia Ernille Dahler Kardel** told the Summit.

UN Climate Champions

Addressing the gathering from Chile was an impassioned **Gonzalo Muñoz** whose message was simply: It's time to change the course.

"Humanity has to get to grips with the enormity of Climate Change, we need to halve emissions by 2030, yes that is a big ask but we don't have options. And leaders in Canberra must do the same.

"Is Australia on the train or stuck in the station?" the Climate Champion asked, pulling no punches.

He declared the world needs to reach 25GW renewables hydrogen by 2026 and Australia will play a relevant role in supplying that 25GW.

"We are pushing for more ambition and joining the Race to Zero is aligned with science," he said.

"Australian businesses were third on the list globally to sign up for Race to Zero but this needs to be backed up by conviction at federal level."

Fellow COP26 Climate Champion Nigel Topping

is likewise impressed by the reception of Race to Zero among Australian businesses.

"Australia is in a great place to be in the race and this is a very serious race, it's an industrial competitiveness issue and an exciting journey that involves investing in new technologies.

"The key is to take action on R&D spend and capex; setting a target is great but you also need plans and countries will win big – or lose big if they don't catch on," he said.

"We need ever more ambitious national plans and need to keep building confidence and to mobilise global finance of \$90 trillion in assets.

"And business leaders are listening, thinking of the company they want to lead.

"Are you ahead of the pack and proud of the transition? Join the Race to Zero if you have not already done so. And don't underestimate your voice, call on your political leaders and get rid of the dichotomy of targets and technology – we need both."

Expert advice based on robust data

Scientist Saul Griffith of Otherlab, Rewiring America and Rewiring Australia

was in his trademark fine form and on message with his 'Electrify everything' mantra: cars, houses (ditch gas heating) and reduce emissions, and better still save each household \$5,000 a year in bills.

Don't underestimate the power of households to turn things around in the race

JOIN THE RACE Race to Zero the UN-backed global campaign rallying non-state actors – including companies, cities, regions, financial and educational institutions – to take rigorous and immediate action to halve global emissions by 2030 and deliver a healthier, fairer zero carbon world in time. All members are committed to the same overarching goal: reducing emissions across all scopes swiftly and fairly in line with the Paris Agreement, with transparent action plans and robust near-term targets. <https://racetozero.unfccc.int/join-the-race/>

to address climate change, he told the Summit from his base in San Francisco.

"Australia can cut its emissions by 80 per cent by 2035 by electrifying everything and benefit from the best economic win in the shortest amount of time," said the Biden administration adviser. "This is why we must make households the centre of climate policy," he declared. <https://www.rewiringaustralia.org/>

The Summit was as rich in content as it was variety, with *The New Climate War* author and renowned climate scientist **Professor Michael Mann** presenting the scientific perspective on atmospheric conditions. He outlined the chilling backstory to decades of inaction on

climate and decarbonisation due to Exxon's undermining of public faith in climate change.

It's no small irony that the American citizen's sabbatical in Australia took place during the black summer, and Prof Mann cited this to highlight the extremes at both ends of the scale: from searing heat and fires to rains and flooding to mud slides.

"Nowhere is safe," he said. "We need to reach 50 per cent emissions reductions in a decade or face the severity of consequences."

And that of course hinges largely on the race to renewables.

Michael Liebreich of Liebreich and Associates

who was on hand to deliver a wealth of analysis on the exponential pace of change toward a decarbonised energy sector observed that investment in fossil fuels has halved since 2015. Signs are indeed positive.

Drawing on his extensive research into industry trends over the decades, Liebreich covered all sectors: the world record economics-driven shift to solar and wind energy, the decline in investment in fossil fuels, the rise in sales of EVs, the ascent of renewable hydrogen, and more, too much fascinating (and indeed uplifting) material to cover on these pages, however the key takeaway was the speed of the transition underway, from global emissions output to COP26 pledges.

Unsubsidised clean energy world records 2015

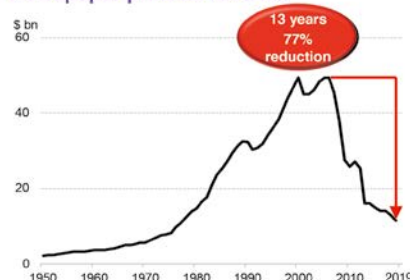
Liebreich Associates



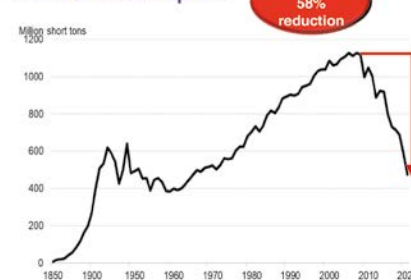
Speed of transitions

Liebreich Associates

Newspaper print ad revenue



US coal consumption

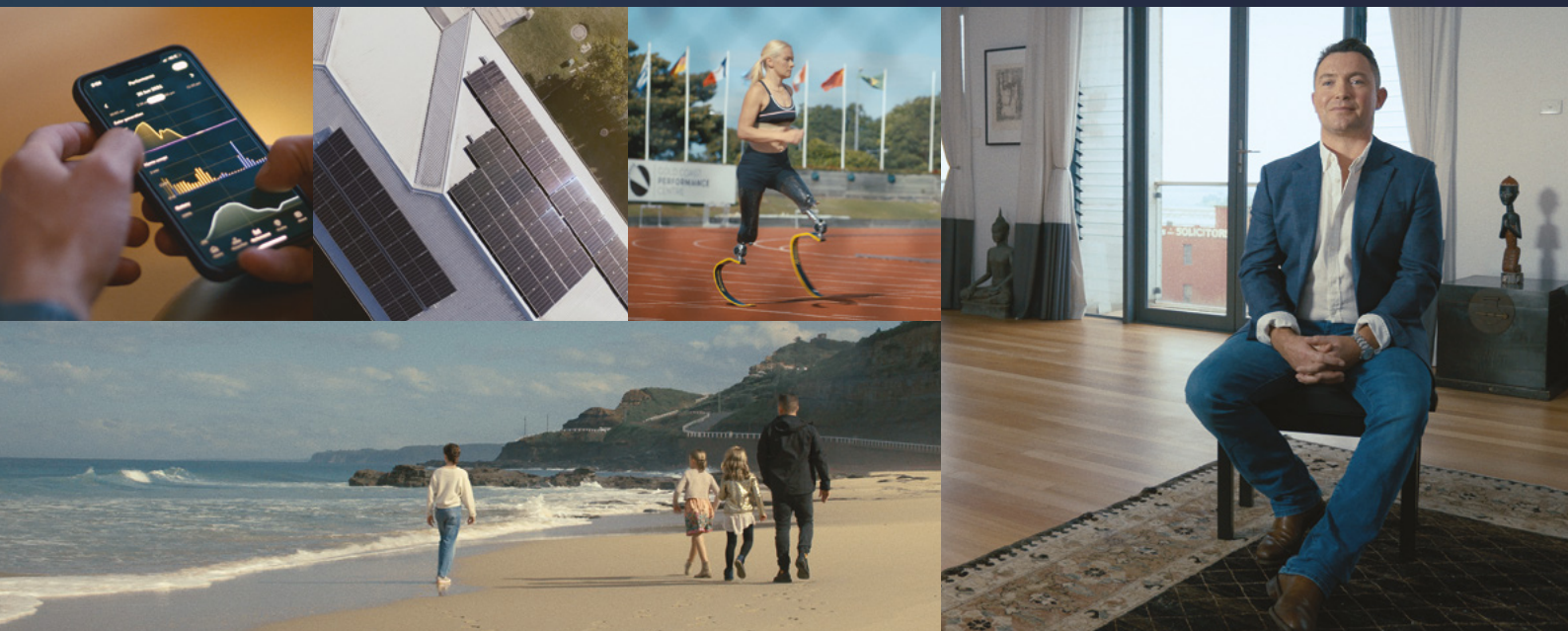


Source: US Census, PEW Research, EIA, Liebreich Associates



“This generation needs to be the one that turns around climate change. Preservation for future generations is not optional, it’s a human crisis, not a local crisis”.

BEN HUTT
CEO



Presented by the World Energy Council and produced by BBC StoryWorks, Evergen are honoured to be featured in the **#HumanisingEnergy** series.



WATCH VIDEO

or visit evergen.energy



Global CEO, BloombergNEF Jon Moore “what would a BloombergNEF presentation be without the tables and charts?” followed up later by illustrating the results of strategic research leading to a decarbonised future that includes corporate commitments to net zero emissions and the encouragingly high number of net zero pathways as illustrated in BloombergNEF’s recently launched *Tracker* report.

Analysis of the companies aligning their emissions targets with the science-based targets of the 2015 Paris Agreement reveals the soaring scale seen in 2021.

At this stage we are buoyed by the power of households, corporations and state governments to make a difference. And each day it seems more are joining the multitude of climate activists: farmers, sports stars (checkout cooldown.org) and comedians included.

Before we get to that, one big nod to corporate sector pledges.

Business and investment

Dale Connor of Lendlease has launched Mission Zero strategy and joined Race to Zero with firm commitments stepped out to 2025 and 2040 as “it’s what we stand for... and our advice is start now, start early, get on board, don’t wait for governments to set mandates. Set your own targets, you know where the products are that create the most embodied carbon.”

Jillian Broadbent, inaugural Chair of the Clean Energy Finance Corporation told the Summit: “The federal government is riding on the success of individuals and companies [reducing emissions], this has nothing to do with their policies” and “The pain is around the corner, trade issues will hit us.”

Hesta’s Debby Blakey hit a chord stating: “Our country’s more than \$3 trillion superannuation industry represents an incredible national advantage in positioning Australia for a low-carbon future.

“We want to invest more in Australian renewables, but the current policy framework means for every \$1 we commit to Australian renewable infrastructure assets, we have \$3 invested overseas. Investment capital goes where there is certainty and stability, and Australia’s ad hoc policy approach is not helping to encourage investment or foster innovation.”

The Smart Energy Council urges everyone to spread the word of the Race to Zero pledge and encourages as many organisations and companies as possible to sign up.
<https://racetozero.unfccc.int/>

John McMurdo of Australian Ethical astutely observes: “There is too much ‘Target washing’ and ‘Pledge washing’.”

The parched land

Transporting us to the frontline of climate change was climate communicator **Dr Anika Molesworth**, Young Farmer of the Year 2015 and author of *Our Sunburnt Country*.

Speaking from her farm (and indeed her heart) in far western NSW with its “ruby red sands that stretch forever on the horizon” she said “I feel a great sense of responsibility to look after the land... but the sand monster comes and the world becomes dark.

“Climate change is not an abstract concept, the climate crisis is here and it is real, temperature records being smashed yet we continue to pump destabilising gases into atmosphere. Our interaction like this cannot continue.” It was a heartfelt and somewhat emotional delivery.

But some comic relief to jog us along, from self-described JokeKeeper and Billboards Campaigner and generally enormously popular funny guy **Dan Ilic**: “Our government does not necessarily represent us... we are rich in sunshine, wind and climate denial... we meet and beat because we cheat.” His billboards lampooning Australia’s net zero by 2300 (not 2050) were seen by tens of thousands attending the Glasgow Climate talks and caused many to stop and think in New York’s Times Square.

TV celebrity Julia Zemiro was another firm favourite and a celebrity who not just recognises climate change for what it is but is using her wildly popular status to spread the message, and recommends everyone “Use the power they have to do something meaningful”.

So many wise words from so many wise people who are doing what they can where they can (be it as far away as New York and Glasgow) to position Australia on a smarter, cleaner pathway. Spreading messages of hope and amplifying calls for action to stave off the ever-looming and very real threat of two degrees warming.

All that is needed is for wise words to be translated into prudent policies, acts and deeds by those in power.

Links to videos of key recordings were circulated to Summit registrants following the event.

The Smart Energy Council would like to thank the Lord Mayor’s Charitable Foundation, eleXys, LONGi and Mott MacDonald for their generous support for the Global Summit.
See page 48 for more details.

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LOSE \$3.4 TRILLION worth of GDP and 880,000 jobs (mining, construction, tourism) through climate inaction

ALTERNATIVELY ...

REAP \$680 BILLION in economic activity and generate more than 250,000 jobs by 2070

Source: Deloitte Access Economists

Government emissions data revelation

- **0.28% EMISSIONS CUT** over the next decade based on current movement. *Less than one-third of one per cent.*
- **CLIMATE COUNCIL:** 'Aim for 75% cut in greenhouse gas emissions below 2005 levels by 2030, that is 21 times faster: ramp up emissions cuts to avoid the catastrophic consequences of worsening climate change.'

Beyond Zero Emissions: Export Powerhouse

- **\$333 BILLION BY 2050:** potential revenue growth for Australian new green exports

RECOMMENDATIONS

- **\$100 BILLION BY 2035:** national export target for renewable hydrogen, green steel, green aluminium, and critical minerals
- **\$20 BILLION LENDING FACILITY:** Supergrid Deployment Authority for large scale investments in grid infrastructure to supercharge growth in the zero-emissions commodity exports.
- **14 PRIORITY REGIONAL LOCATIONS:** Launch a five-year national rollout of Renewable Energy Industrial Precincts to power Australia's clean zero-emissions export market.

www.bze.org.au

Uptick in large scale solar and wind investment

- **2.7GW OR POSSIBLY >3GW:** estimated total capacity renewables in 2021 achieving FID, based on:
 - 744MW of large-scale solar and wind projects reaching FID (Financial Investment Decision) year to date, plus
 - 1.6GW expected in the second half of 2021, and
 - Potentially part of 2022's 1.6GW realised ahead of schedule

Source: Clean Energy Regulator's Carbon Market Report for June Quarter

A land of contrasts

- On a per capita basis every Australian emits approximately **FOUR TIMES THE GLOBAL AVERAGE** in carbon emissions,

YET...

- Australia boasts the **LARGEST SHARE PER CAPITA** of rooftop PV.

KPMG Australia report 30 Voices on 2030: The Future of Energy

- **69%** agreed that most businesses/households will have shifted to solar and battery storage in 2030
- **59%** agreed that specific ESG targets will be law in 2030
- **65%** agreed that by 2030, the challenge of meeting net zero will mean all forms of carbon capture technology are considered.
- **74%** agreed most households will be actively using smart energy monitoring by 2030

The 30 leaders in the Australian energy sector included Tim Buckley, IEEFA; Jemma Green, Powerledger; Chris McGrath, 5B Australia; Alan Yu, LAVO; Victorian Energy Minister Lily D'Ambrosio; Audrey Zibelman, X, the Moonshot Factory; Innes Willox, Ai Group; UNSW; and CSIRO.

Glut of global carbon emissions

- **3,000 BILLION TONNES** of CO₂ in the world's atmosphere
- **>1,000 BILLION TONNES** added by human activity to date
- **35-41 BILLION TONNES PA** added
- Currently using **230* MILLION TONNES** pa or 0.006% of scale of problem (minuscule)

*of which around 90 million tonnes CO₂ pa used for enhanced oil recovery.

www.Cleantechnica.com





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SAM CRAFT, DIRECTOR NRG SOLAR

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CLIMATE 200: VOTING FOR SCIENCE-BASED CLIMATE POLICY

Climate 200 is spearheading a movement to support the election of more independent candidates at the next federal election in a bid to raise integrity and deliver climate action. Momentum is growing and Climate 200 now wants the renewables industry to get on board to help secure its future.

Climate 200 convenor Simon Holmes à Court states "with the right political leadership and support from progressive independents we can create millions of new jobs in low-emissions industries, improve national security and public health, and pass on a safe and clean environment to future generations."

THE ALARM BELLS ARE RINGING yet we are sleepwalking through a critical decade, one in which the world is on track to push up the average temperature by 3°C by the end of this century.

Action group Climate 200 alerts us to the fact the 3-degree scenario would be catastrophic for the dry continent of Australia, with rainfall across the Murray-Darling Basin dropping by as much as a fifth and crop yields slashed by up to 50 per cent. The coral reef? Ninety-nine per cent dead.

The outlook is bleak. Political procrastination and obfuscation cannot continue. Unless integrity and accountability are brought to bear, we are barrelling toward hothouse earth and pretty much unliveable, at best unbearable, atmospheric conditions.

Dramatic words but there is no gilding the lily of the perilous situation the world is facing, one in which Australia is contributing mightily with its excessive output of carbon emissions as well as plans to develop more coal and gas plants that will pump ever more carbon emissions into the atmosphere.

It's time for a reality check, and that reality is that Australia needs to reduce emissions by 75 per cent by 2030 (below 2005 levels) to contribute its fair share to limiting global temperature rise to 1.5°C.

However the Coalition's target is a wholly insufficient 26-28 per cent by 2030, notes Climate 200, which states Australia's political system is too broken to tackle climate change and observes big polluters are determined to keep it that way.

Setting a new path is Oxford educated Byron Fay, executive director of Climate 200. The climate strategist, former Paris Agreement negotiator and participant in a Biden-aligned Political Action Committee during the 2020 US presidential election, is on a mission to support local communities who "want to ditch stale politicians and elect fresh independent voices instead".

A very successful funding appeal has resulted in more than \$2 million being tipped into the Climate

200 coffers to support up to a dozen community-chosen independent candidates who "stand for cleaning up politics and following the science on climate change".

Championing the cause

Climate 200 cites the success of Zali Steggall who toppled the former climate-denying prime minister from his otherwise 'safe' political seat. The independent federal member has gone on to lead debate in parliament and challenge the Coalitions' support for fossil fuel technologies.

The tireless independent continues to champion the cause for climate action and integrity based on scientific principles.

We need more Zali's, says Simon Holmes à Court, the high-profile convenor, name and face of Climate 200, cleantech investor, climate philanthropist and director of the Smart Energy Council. He is optimistic the pendulum can swing at the next federal election, provided the community gets on board, that is, by backing independent candidates. The Coalition currently teeters on a margin of just one seat in Parliament.

Despite the razor-thin leadership position "It means they can dodge scrutiny, and block climate action. But if just a few more fresh Independents succeed at the next federal election, together they could have enough votes to finally force meaningful climate action and clean up politics," Simon says.

Climate 200 is supporting those independent candidates with the best chance of success, and will offer assistance with strategy and fundraising to help them get elected.

"We learnt a lot at the 2019 election: how to spot communities that can take on political Goliaths and win. But we need to aim higher this election, because some campaigns were so badly outspent by their major party opponents," Simon said.

He has also put on public record his support for progressive liberals, stating if a candidate with the values of NSW Energy Minister Matt Kean was running federally or had "the courage to vote with their values", Climate 200 would consider supporting them.

Strong action on climate means a faster transition to non-polluting renewable energy, and an unparalleled economic opportunity.

"Australia is home to some of the best solar and wind resources in the world. We have a once-in-a-lifetime opportunity to enhance our prosperity by becoming a renewable energy superpower," the Climate 200 website states. The message is clear: it's time to vote for Climate Action.

Where to from here? Visit www.climate200.com.au, info@climate200.com.au



AUSTRALIA A RENEWABLES SUPERPOWER

\$131 billion
in additional
investment this
decade

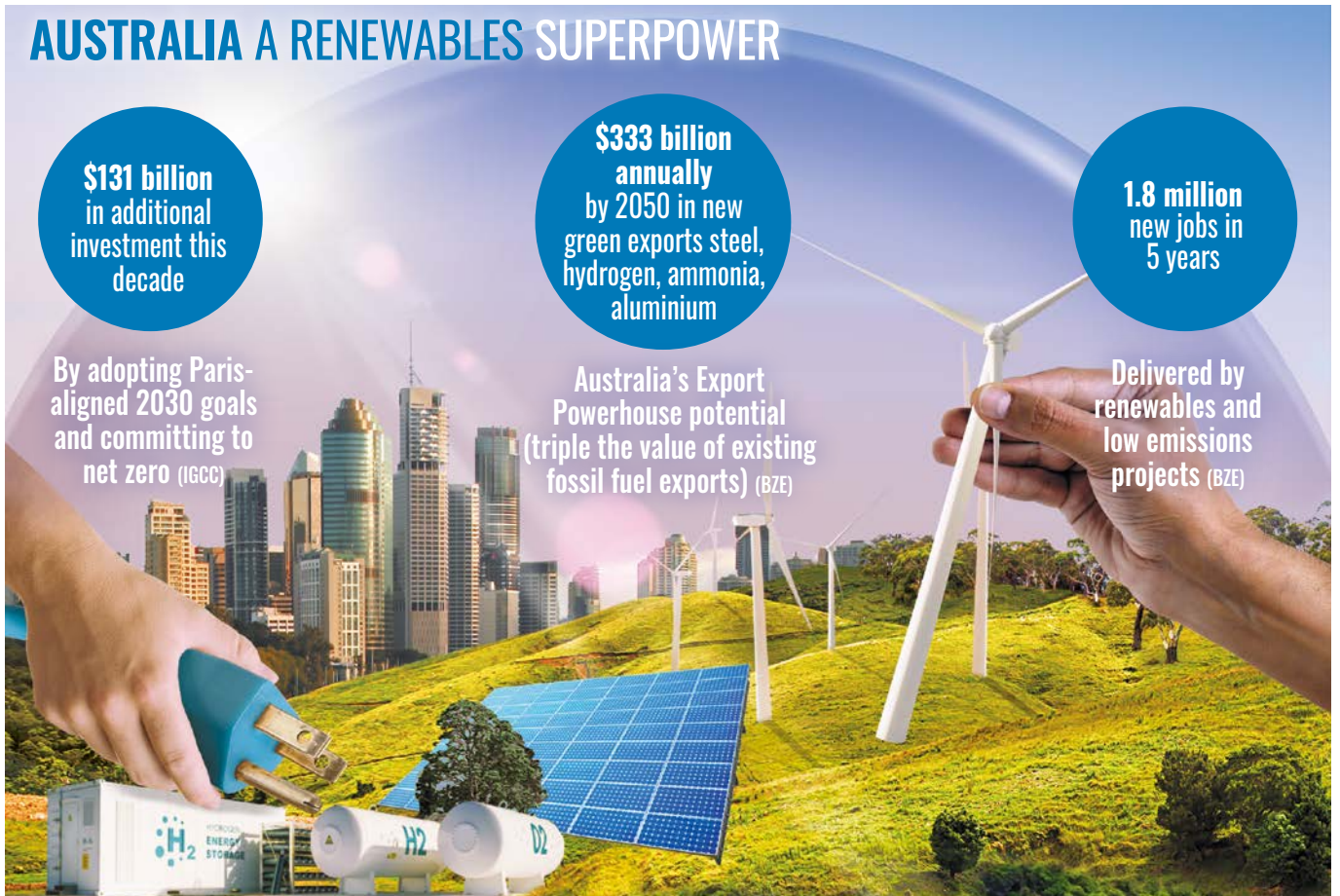
By adopting Paris-aligned 2030 goals and committing to net zero (IGCC)

\$333 billion
annually
by 2050 in new
green exports steel,
hydrogen, ammonia,
aluminium

Australia's Export
Powerhouse potential
(triple the value of existing
fossil fuel exports) (BZE)

1.8 million
new jobs in
5 years

Delivered by
renewables and
low emissions
projects (BZE)



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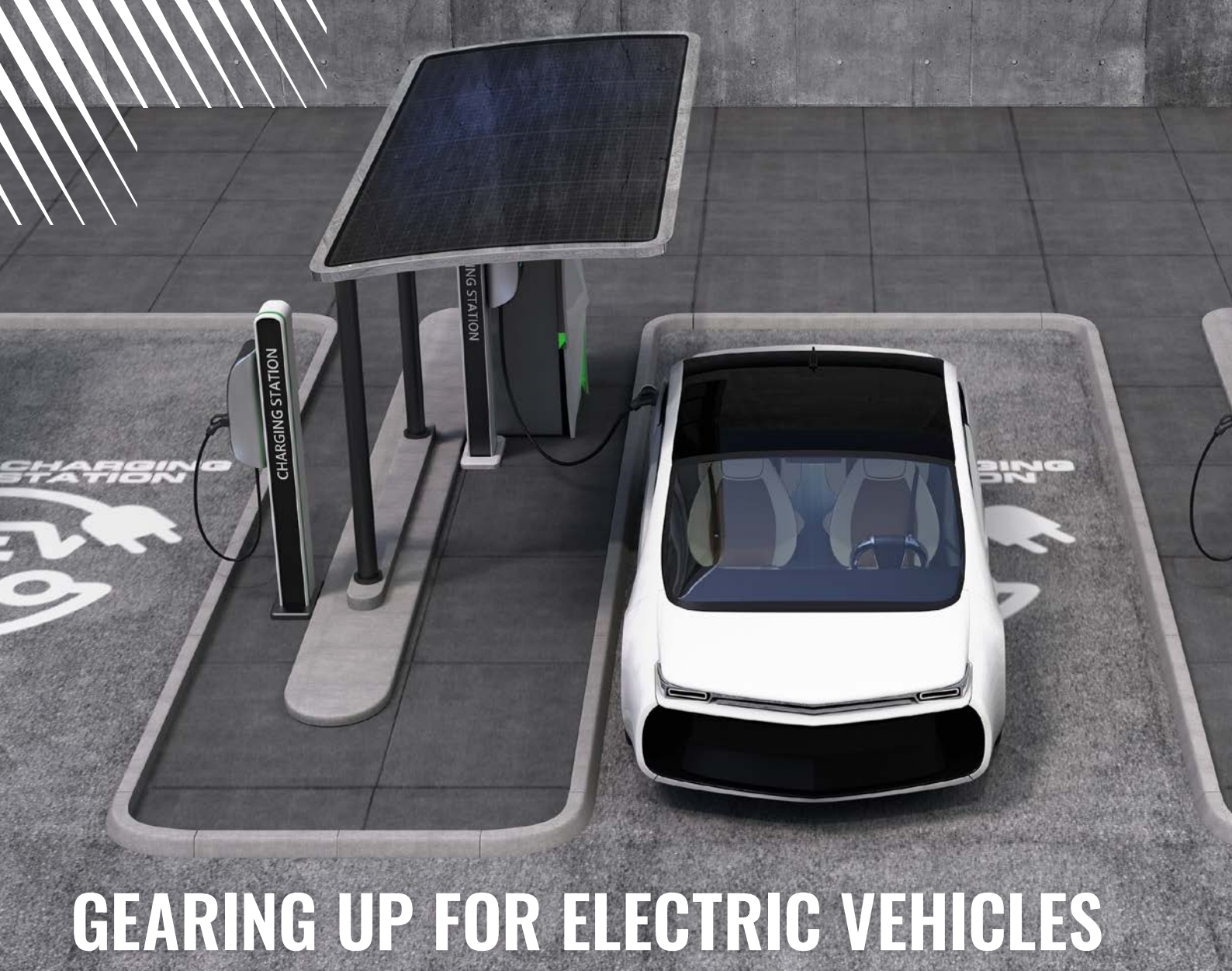


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GEARING UP FOR ELECTRIC VEHICLES

Australia is nudging toward a more electrified future with more 'batteries on wheels' taking to the roads and home infrastructure potentially taking on a vital new role in grid stabilisation.

A LOOK AT THE MOST RECENT DATA on Australian car sales reveals that in the six months to June this year, 8,688 electric vehicles were sold. This represents just 1.57 per cent of total sales and brings EVs to 0.12 per cent of Australia's light vehicle market.

These numbers may not sound encouraging but coming off a low basis they are an improvement. During 2020 the 6,900 electric vehicles sold represented just 0.78 per cent of all new light vehicle sales and numbers were only marginally up from the 6,718 electric vehicles sold in 2019, according to the Electric Vehicle Council.

Under this prism, sales during 2021 have been positive and momentum will continue given more consumers are weighing up the benefits of EV ownership.

The recent Consumer Attitudes survey conducted by the Electric Vehicle Council and Carsales found Australians are "well and truly ready to go electric": more than half (54 per cent) of the 3,000 surveyed would consider purchasing an electric vehicle as their next car and almost half (49 per cent) of the respondents see themselves driving an electric vehicle in 2030.

Importantly, 40 per cent would be encouraged to purchase an electric vehicle if government subsidies were available for the initial purchase cost. In other key

findings: 92 per cent say public charging infrastructure is an important factor in their decision and 55 per cent indicated they would power their electric vehicle via solar panels.

"What this survey demonstrates is Australians are well out ahead of their government when it comes to electric vehicle attitudes," said Electric Vehicle Council chief executive Behyad Jafari who scores the federal government's support for EVs just three out of ten.

He refers to the somewhat lame *Future Fuels Strategy* which allows for \$24.55 million in co-investment for charging infrastructure, on top of ARENA's \$21 million investment which is widely regarded as a drop in the ocean in the scheme of things, and is in sharp contrast to NSW's nation-leading \$500 million *Electric Vehicle Strategy* that addresses consumer hesitancy around vehicle cost and availability.

Pole position: NSW Electric Vehicle Strategy

Led by NSW Energy Minister Matt Kean and then NSW Transport Minister Andrew Constance the progressive Strategy includes rebates of \$3,000 for the first 25,000 EVs sold for under \$68,750; phased removal of stamp duty for EVs under \$78,000 purchased from 1 September 2021, and other EVs and plug-in hybrids



"Four in ten Australians would be encouraged to purchase an electric vehicle if government subsidies were available for the initial purchase cost"

from 1 July 2027 or when EVs make up at least 30 per cent of new car sales, at which time a road user charge will be introduced.

The plan also includes fleet incentives to help local councils and businesses buy electric vehicles and leasing companies and car share companies to purchase battery or hydrogen fuel cell EVs; and investment of \$171 million over the next four years in a world-class electric vehicle charging network with ultra-fast chargers at minimum 100km intervals across all major NSW highways, creating 'EV Super-Highways' across the State.

NSW is also committed to transitioning its 8,000 buses to zero emissions technology.

Clearly the state is in the fast lane, however there is a dark back-story to former Minister's Constance's objectives, as recently revealed to the Smart Energy Council: his electorate suffered mightily during the black summer bushfires and the burnt-out apocalyptic appearance is a vision he cannot shake off. It is one that is guiding his actions.

The Strategy developed by the Minister is projected to boost state EV sales to 52 per cent by 2030-31, while leading to most new car sales being electric by 2035 which in turn assists NSW in achieving its goal of net-zero emissions by 2050 to mitigate climate catastrophes.

The progressive EV policies of NSW are widely lauded within the renewables sector. John Grimes of the Smart Energy Council has commended the NSW government for its strong position, saying the policy is leading the way and that other states would do well to follow suit. Tim Washington agrees, adding the presence of a government strategy lends market confidence.

Policy certainty to drive confidence

"I always say that where government acts, the industry responds threefold," the Jet Charge founder told *Smart Energy*. "Market confidence drives change and has a real impact, and we hope that Victoria and Queensland will follow the lead set by NSW and turn things around."

"The EV industry is looking for certainty for investment and in our case we want to quadruple our staff levels within three years, with offices in three states, and will always look to the states with the most progressive EV policies."

Established back in 2014 Jet Charge is the name behind early mover Chargefox which now boasts more than 1,400 'plugs under management', commanding approximately half the nation's EV charging infrastructure.

"Local governments too are demonstrating leadership and paving the way to transport electrification by upgrading their fleets and providing much-needed infrastructure to constituents," Tim said. "These initiatives are well received in the community and help drive momentum."

Ross De Rango of the Electric Vehicle Council concurs, saying the uptake and availability of vehicles is highly correlated with state and local government policies.

"Vehicle availability is also interrelated as the more comfortable car makers are, the more likely they are to invest locally in bringing EVs to market."

"The fact we have fewer EV models here in Australia is largely a function of government policy, momentum would flow from measures such as subsidies or upfront incentives such as rebates and price reductions," the newly appointed Head of Energy and Infrastructure said.

The EVC's wish-list to spur sales includes tax exemptions (stamp duty, registration, GST, Fringe Benefits Tax), targeted incentives (fleet, bus, commercial vehicles, logistics) on top of regulatory changes, fuel efficiency standards, and sales and procurement targets for government fleet purchasing, as well as access by EVs to high occupancy lanes and exemptions from tolls.

Should the ALP gain power at the next election the party will introduce an EV Discount which includes FBT exemptions, and De Rango says this is the sort of policy that the community is calling for. And benefits would follow.

"FBT exemptions would be very beneficial and create significant economic opportunity to shift to EVs so it's very useful," De Rango said. "Importantly too this would help create a second-hand market in EVs. Three times the amount of cars changing hands are in the second hand market than are bought new and this brings more EVs at affordable prices to the masses. It's a catalyst for change."

"Many drivers' first EV will be a second-hand model and this in turn creates robust data around resale values. It will provide a bigger commercial signal and a benchmark for resale data."

What about government coffers taking a hit through loss of fuel excise which currently sits close to a not insignificant \$20 billion annually?

Taxing times

Motorists currently pay 42.3¢ in tax on every litre of petrol and diesel and for y/e 2021, gross revenue from the fuel excise tax stood at \$19.2 billion, with net revenue of \$11.6 billion.

Each year up to \$50 billion is spent on roads of which 40 per cent is raised from fuel excise, and that pothole will need to be filled. But moves to do so are not popular, with the roll-out of road user charges in Victoria and South Australia proving controversial.



IMAGE: SHUTTERSTOCK

Tim Washington commented “We certainly don’t want to kill EVs before they have started, we need a whole redesign. All other governments across the globe have tackled the same issue, it’s not unique to Australia, it’s even been on the Productivity Commission’s agenda for 25 years. There are many sophisticated arguments on issues of fuel efficiencies and hybrids.”

He believes the government will find the means to make up for the two per cent shortfall in revenue and commented the reality is we must transition to a different way of taxing vehicles and paying for infrastructure.

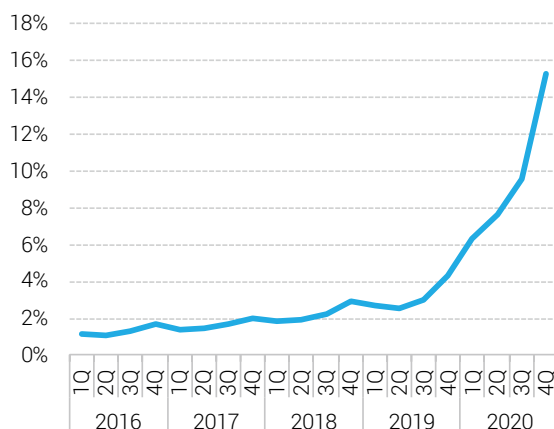
Smart Energy Council board member Simon Holmes à Court regards Victoria’s EV tax a big mistake. “Not the concept, but the timing,” he said. “It’s a blemish on an otherwise strong record; other parts of the policy are good and if improved will help undo the damage of the premature and poorly designed EV tax.”

For its part the Electric Vehicle Council does not object to road user charges per se, but states rather than being introduced immediately they must be phased in, emphasising the need to avoid all disincentives.

“There is a lot of work to do in this space, and we need to take into consideration broader benefits from EVs such as improved air quality. And if we fail to do an effective job in the transition to a decarbonised economy it will affect our international trade opportunities,” De Rango said.

EV sales in Europe

Europe EV share of passenger vehicle sales



“Importantly too the existing transport fleet relies heavily on imported liquid fuels and to the extent we shift away from that we shore up far greater reliability and national security.”

Good point, important point. Effectively Australian solar energy which is abundant can power the entire electric vehicle fleet. No more reliance on imports or need to stockpile and transport polluting diesel from Texas. Low-cost fossil fuel free non-polluting motoring independence lies ahead.

Tapping into resources

Australia boasts many more inherent advantages in building an EV fleet, among them the large deposits of key battery-making materials including lithium, cobalt, manganese, bauxite and nickel, says De Rango.

“We also have all the base materials necessary to build the electrical infrastructure to service EVs such as steel, copper and aluminium.

“And as the world shifts to EVs Australia will do very well supplying those materials.

“More locally, a key advantage is the easy pathway to decarbonisation of the electricity grid due to our plentiful solar and wind resources, with pumped hydro power to fill the gaps.

“The same cannot be said for many other first world countries where the decarbonisation process will be harder.”

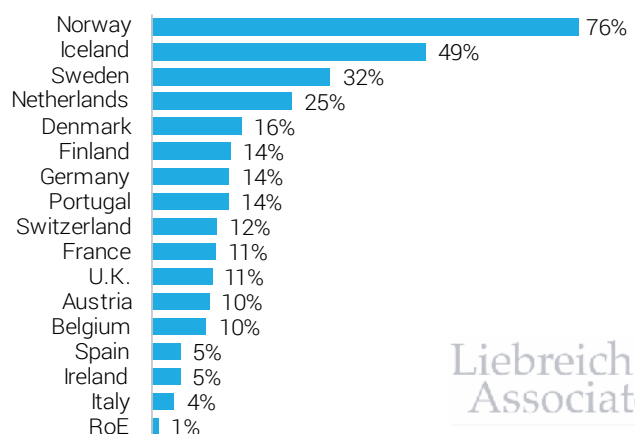
He also notes most Australian homes have a driveway which can accommodate a charger, however it can be difficult for those in apartments to arrange for a charger in their car space as some buildings were designed without power points in the communal car park.

Buildings and building codes

With a degree of prescience, the EVC is addressing this issue with the Building Codes Board and the National Construction Code is being updated to provide EV readiness in the form of electrical infrastructure provisions in new residential as well as commercial and business apartment blocks, offices, schools, warehouses and more, so it is easy to install car chargers later.

“And if we waved the magic wand and all cars were electric, we would need about 40 per cent more electricity all told. We will need to build more generation assets to provide that energy and that will require more wind and solar power.”

EVs share of passenger vehicle sales 2020



Liebreich
Associates

Source: BloombergNEF EVO2021

@mliebreich

"The existing transport fleet relies heavily on imported liquid fuels and to the extent we shift away from that we shore up far greater reliability and national security."

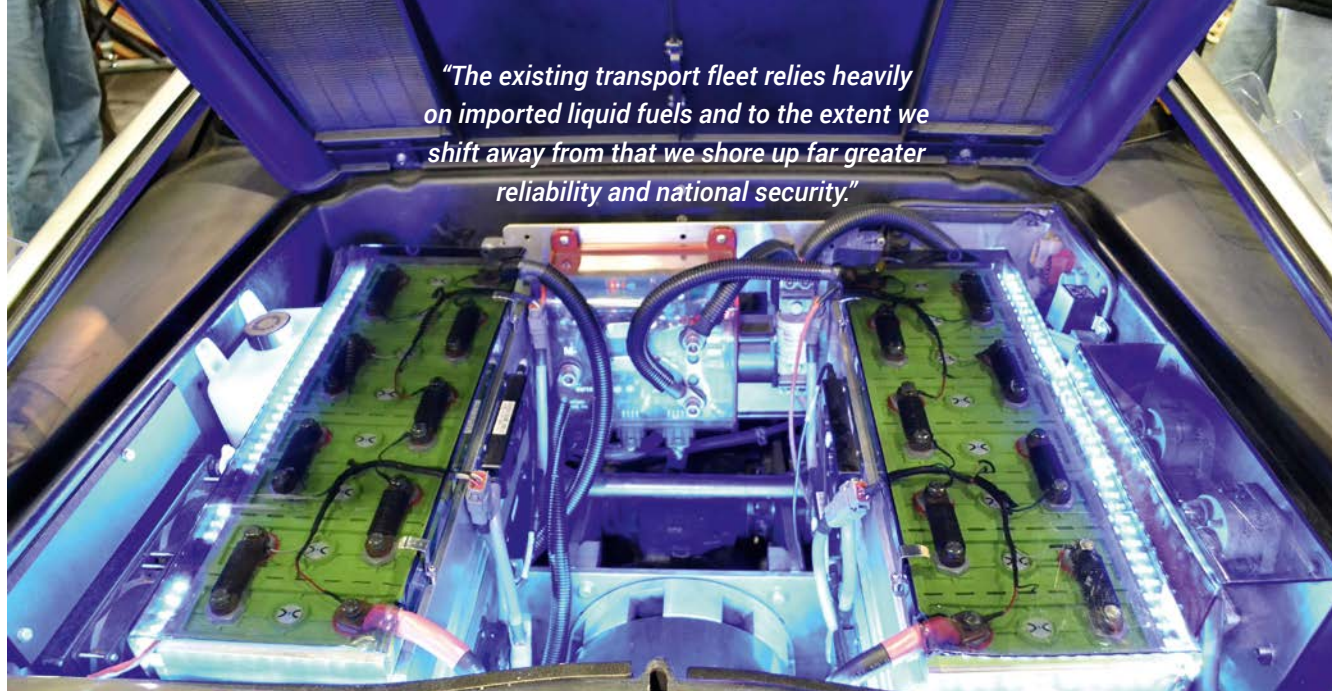


IMAGE BY F. MUHAMMAD FROM PIXABAY

When electricity is delivered through a network it is vital to ensure we can deliver that energy at a time that drivers need it, but also so that it does not place undue strain on the network, he says.

"The future we are looking at is one in which people charge their electric cars at home with solar power during the day, or off-peak overnight from the grid, delivering more efficient network use and lower prices for everyone."

The picture is extended by Tim Washington who acknowledges most of the vehicle charging will take place at home, however people's concept of 'fuels' and what a fuel provider is will change, for example it's natural to consider service stations now but in future public charging facilities will spring up at supermarkets, shopping centres, council buildings and more. There will be a lot of choice.

"Most of the funding is going into public chargers because the driving public anticipates availability beyond their home, but where they see them will change dramatically – their gym, their pool, their library. It is important to have that choice and around town there is lots of scope for networks.

"But don't be surprised either about the number of home chargers as you charge where you park – where you are – at home or at work."

Those home chargers are set to take on an even more important role.

Gamechanger: Vehicle to Grid

The future has arrived with V2G – vehicle-to-grid – technology, which enables EV batteries to supply the home or be paid to export to the grid during a blackout.

(Blackouts tend to average 15 minutes so EV batteries would lose just 5 per cent charge.)

V2G, vehicle-to-home and bi-directional charging will fundamentally change the world's view of energy and transform how we view vehicles and transport, says Tim Washington.

First the case for home power, as he explains: EV owners pay the full retail price yet use just 5 per cent of the asset; 95 per cent of the time the car is parked. By using the battery in bi-directional form owners are unlocking that 95 per cent, and it soon becomes a more useful asset.

Contrast that with a home battery (linked to solar PV) which is used every day.

"EVs have some of the largest batteries in use today at around 28kWh and in future will be sized at around 40-60kWh compared to the 15kWh of the home battery and will therefore be able to store a lot more solar energy. Few would purchase a home battery that size but in a car, you get that bigger battery.

"Within a decade car battery will be used far more as home batteries," said the man who has a knack of pre-empting the next big thing.

And once the EV market takes off the ramifications as backup to the NEM would be enormous. V2G is the key to zero cost mobility, he says.

Jet Charge announced in early September it was pioneering the world's first bi-directional DC charger to Australian homes and businesses: the Wallbox Quasar which will cost less than a standard Tesla Powerwall 2, and ChargeFox has certified the first ever V2G charging station in Australia.

Some are getting in early: participants in Discover Energy's Vehicle2Grid program will in future be able to take advantage of Discover Energy's energy trading platform as an EV VPP (Virtual Power Plant) member by trading excess EV battery electricity during times of high demand, and trading energy for profit while helping to stabilise the electricity grid. www.discoverenergy.com.au/electric_vehicles

But V2G is primarily in trial form, the only EV currently on the market that will accept V2G without voiding battery warranty is the 2019 Nissan LEAF. The only fully operational V2G chargers are housed in the ANU test laboratories and need to be certified as meeting the relevant Australian Standards and other technical specifications being sold in the public domain.

The ACT however is gearing up for the future with its REVS project – Realising Electric Vehicle-to-grid Services – deploying 50 vehicle-to-grid-enabled electric vehicles into the ACT government fleet. While they are currently locked in single directional charging mode, a flick of the switch would enable bi-directional functions.

Industry insiders believe the first commercialised V2G charger could be around by 2023, followed by full V2G by 2025. For its part VW Motors forecasts all cars will have bi-directional charging by 2022, however some, such as Tesla, may choose not to 'turn on' for commercial reasons that centre on encroaching their Powerwall business.

The future is unfolding and innovators and industry bodies are proving key to driving that smarter, brighter future. We just need the federal and more state governments to put the wheels in motion with policies that accelerate sales of electric vehicles. Perhaps the federal government's verbal support for Net Zero Emissions by 2050 and need to rein in the significant levels of transport emissions will provide some impetus.

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IEEFA: *Perceived Road Revenue and Excise Tax Gap Not a Barrier to EVs*
Carsales and EVC consumer survey
EVC report *State of Electric Vehicles* dated August 2021

ELECTRIC VEHICLE MEDLEY

WHAT YOU MAY OR MAY NOT KNOW

Many
fascinating
facts and
some
alarming
comparisons.

Australia: One million cars sold each year, of these:

- Battery and plug-in hybrid EVs = **0.39 per cent*** of total new light vehicle sales (2020)
- By **end 2020**, EVs accounted for **0.12 per cent** of the fleet.

* Mid 2021: about 1.6 per cent of sales = 8,688 EVs sold

- **20,000** EVs on our roads, led by **NSW** ~6,400, **Vic** 5,800, **Qld** 3,400, **SA** 2,300 and **WA** 1,800
- **ACT** leads EV penetration per vehicle at **0.31 per cent**; **South Australia** follows at **0.16 per cent**

Australian consumers can select from 31 EV models, just 14 of which are priced under \$65,000. Availability by end 2022 predicted to double to 58 models.

- The average ICE (internal combustion engine) vehicle consumes **\$2,160** worth of petrol each year travelling 15,000km
- EV drivers pay about **\$600** for the same distance
- Australians comprise 0.3 of 1 per cent of the global population, yet **1.3 per cent** of global new vehicle consumption.
- The average car travels **40km a day** or 15,000km a year (pre-COVID) on tarmac roads and does not 'tow a boat'
- Most Australians have a driveway or garage at home = **convenient home charging**
- **70 per cent** of EV drivers have rooftop PV at home
- There are **7.21 EVs** for every public charger.
- Across Australia there are **3,000 public chargers**
- The majority are 'destination chargers', **capacity 7kW-25kW** allowing recharge between 40km to 140km an hour *best suited for commuter carparks, motels and multi-residential dwellings.*
- The **3,000 chargers** include **470 DC fast chargers** with a capacity of 350kW enabling **15-minute recharge between 200 and 400 kilometres.**

Hypotheticals: If there were **one million 7.7kW home chargers** in Australia (one in 10 properties) and all charged at once, they would add **25 per cent** to the national electricity load.

Battery capacity of **19 million EVs would be >1,800GWh** (ie more than 10,000 Tesla big batteries).

EV sales

Norway (top at) 74 per cent, **Iceland** 45 per cent, **Sweden** 32.2 per cent, **Germany** 13.5 per cent, **France** 11.3 per cent, **UK** 10.7 per cent, **EU average** 10.2 per cent, **California** 8.3 per cent, **China** 6.2 per cent, **global average** 4.2 per cent, **US** 2.3 per cent, **Australia** 0.78 per cent.
Emissions intensity of new vehicles in Australia is higher than OECD average.

International EV policies and aims

US: spend **US\$174 billion** to hasten EV uptake; upgrade 640,000 government fleet to EVs

Norway: end sales of new petrol and diesel vehicles by **2025**

Germany: **10 million EVs** on the road by 2030, install one million charging stations

UK: ban sale of new petrol/diesel vehicles by **2030**

Sweden: **grant for 25 per cent** of the purchase price of low emissions vehicles and 50 per cent of the cost of home charging points

Canada: **CAD\$600 million** on EV incentives, develop coast-to-coast fast charging network

Singapore: ensure all vehicles are low- or zero-emissions by **2040**

Japan: end sale of petrol and diesel cars by **mid-2030s**

France: spend **€1.3 billion** to accelerate EV uptake and prohibit petrol and diesel vehicle sales by **2040**

New Zealand: invest **NZ\$300 million** in EVs and upgrade government fleet to emission-free by **2025-26**

Car makers EV commitments

- **Toyota:** produce **15 BEV models** by **2025**
- **Volvo:** **fully electric** car company by **2030**
- **Ford:** **phase out** internal combustion engines in Europe by **2030**
- **General Motors:** **phase out** ICE in light vehicles by **2035**
- **Hyundai:** **phase out** ICE by **2040**
- **BMW:** EVs across **90 per cent** of its range by 2023; **50 per cent** of global deliveries EV by **2030**
- **Honda:** sell only EVs in Europe by **12/2022**
- **Jaguar Land Rover:** sell only EVs from **2025** (Jaguar) and **2036** (Land Rover)
- **Stellantis:** EVs across **100 per cent** of its range by **2030**
- **Volkswagen:** spend **<US\$30 billion** to develop EVs by **2023**, EVs to comprise **40 per cent** fleet by **2030**.

Electric buses on the market: BCI Bus, BusTech Group, Custom Denning, Nexport BYD Gemilang, Nexport BYD Volgren, and Yutong.

Also a selection of electric commercial and mining vehicles and motorcycles.

Terminology

Battery EVs: powered by electricity; no tailpipe emissions

Plug-in hybrid EVs: Small battery and petrol or diesel engine

Hydrogen fuel cell EVs: Fuel cell rather than battery

References: *State of EVs report August 2021 by Electric Vehicle Council, TAI Emissions audit Sept 2021 quarter; EVC and CarSales consumer survey, EVC staff, JetCharge, The Conversation.*

Compact and Smart Liven up Business and Home Charging

AC MAX, 22kW EV Charger



- 22kW AC charger improves parking turnover
- RFID and ISO 15118 authentication for user management
- Low standby power consumption for energy-saving
- Remote management by built-in network connectivity
- OCPP compliance enables backend system integration
- IP55 and wallmount/stand installation provides high adaptability



Commercial



Parking



Fleet



Residential



CHECK YOUR MIRRORS

THREE THINGS ROOFTOP SOLAR CAN TEACH US ABOUT AUSTRALIA'S ELECTRIC CAR ROLLOUT

GOVERNMENTS AND CAR MANUFACTURERS

are investing hundreds of billions of dollars on electric vehicles. But while the electric transport revolution is inevitable, the final destination remains unknown.

The electric vehicle transition is about more than just doing away with vehicles powered by fossil fuels. We must also ensure quality technology and infrastructure, anticipate the future and avoid unwanted outcomes, such as entrenching disadvantage.

In Australia, the electric vehicle rollout has been slow, and federal action limited. But some state governments are working to electrify bus fleets, roll out public charging networks and trial smart vehicle charging in homes.

Australia's world-leading rollout of rooftop solar power systems offers a guide to help navigate the transition. We've identified three key lessons on what's gone well, and in hindsight, what could have been done differently.

Price isn't everything

Solar systems and electric vehicles are both substantial financial investments. But research into rooftop solar has shown financial considerations are just one factor that guides purchasing decisions. Novelty, concerns about climate change and a desire for self-sufficiency are also significant – and electric vehicle research is producing similar findings.

When considering the electric vehicle rollout, understanding these deeper motivators may help avoid a race to the bottom on price.

About one in four Australian homes has rooftop solar, with almost three million systems installed. Solar companies have often sought to highlight the low price of rooftop systems over other considerations. This has created consumer demand for low-priced, lower-quality products – and led to potentially hundreds of thousands of substandard installations across Australia.

So what are the lessons here for the electric vehicle rollout? First, when planning public infrastructure where electric vehicles can be charged, construction costs should not be the only consideration. Factors such as night-time safety and disability access should be prioritised. Shortcuts today will reinforce barriers for women and people with disabilities and create complex problems down the track.

Like rooftop solar, the point of sale of electric vehicles offers a unique opportunity to teach customers about the technology. Companies, however, can only afford to invest in customer education if they aren't too stressed about margins.

'Smart' charging is one measure being explored to ensure the electricity network can handle future growth in electric vehicle uptake. Smart chargers can be remotely monitored and controlled to minimise their impact on the grid.

The point of sale is a pivotal moment to tell new owners of electric vehicles that their charging may at times be managed in this way.





IMAGE SHUTTERSTOCK

Plan ahead

The uptake of rooftop solar in Australia has been a raging success. In fact, rooftop solar is now the largest generator in the national power system.

This raises issues, such as how rooftop solar systems will respond to a major disturbance, such as the failure of a transmission line. A large amount of solar power feeding into the grid can also challenge electricity network infrastructure.

In response, electricity networks have implemented changes such as limiting solar exports and therefore, returns to solar system owners, and charging fees for exporting solar.

Such retrospective changes have been unpopular with solar owners. So to maintain reliable electricity supplies, and avoid angering consumers, it's vital to plan where and when electric vehicles are charged.

If every vehicle in Australia was electric, this would add about a quarter to national power demand. The rise in demand would be greatest near bus and logistics depots and ultra-fast highway chargers.

Timing is key to maximising the use of a network connection without overloading it. For example, if everyone charged their vehicle in the evening after they get home from work, this would put further pressure on electricity supplies at this peak time.

Governments and electricity providers should encourage electric vehicle charging during the day, when demand is lower. This might mean, for example, providing vehicle charging facilities at workplaces and in public areas.

Until Australia's power grid transitions to 100 per cent renewables, the use of solar energy should be strongly encouraged. This would ensure the vehicles were charged from a clean, cheap energy source and would help manage the challenges of abundant solar.

The question of road user charges for electric vehicles drivers is another example where it's best to avoid retrospective changes. Such charges are necessary in the long run and best introduced from the outset.

Coordination is key

Electric vehicle policy spans many government portfolios: transport, infrastructure, energy, planning, environment and climate change. Nationally, and from state to state, different ministers are in charge. This makes coordination difficult, and creates the risk of policies

undermining each other. For example, one policy might encourage the charging of electric vehicles from rooftop solar, to reduce carbon emissions. But because solar energy is so cheap, this might encourage more private vehicle use, which worsens road congestion.

So policies to encourage electric vehicle uptake should not come at the cost of creating more attractive and efficient public transport networks.

And new technologies can entrench societal disadvantage. For example, the rooftop solar rollout often excluded people who could not afford to buy the systems. Without policies to address this, the electric vehicle transition could lead to similar outcomes.

Lessons in the rear-view mirror

As Australia's experience with rooftop solar has shown, successful technology transitions must be carefully planned and attentively steered.

In the case of electric vehicles, this will ensure the benefits to owners, society and the environment are fully realised. It will also ensure a smooth-as-possible transition, the gains from which all Australians can share.

Authors

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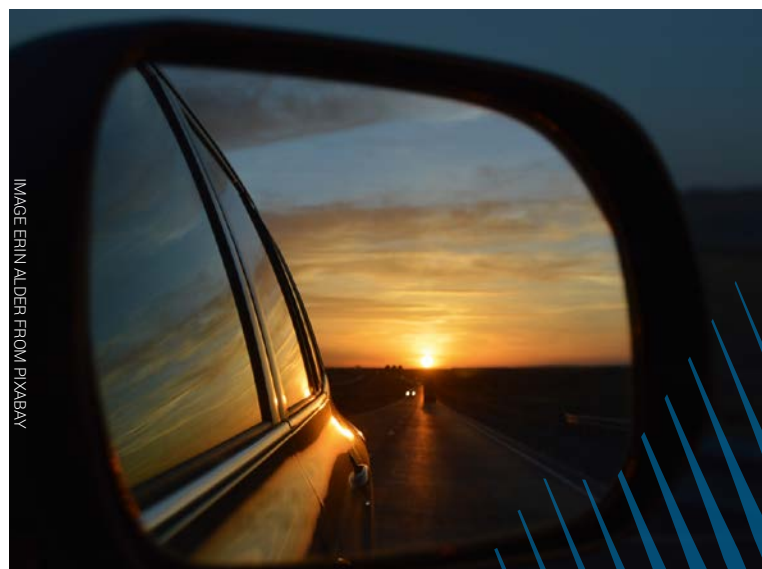


IMAGE ERIN ALDER FROM PIXABAY

QUANTUM LEAPS FOR RENEWABLE HYDROGEN

Here we check in on some of the many recent and major advances in what's been described as 'the fuel of the future, the energy source that could bring the world to net zero emissions'.

FIRST TO GLADSTONE in central Queensland where a major partnership between Fortescue Future Industries with manufacturing company Incitec Pivot with backing from the Queensland government to produce green ammonia on an industrial scale will establish central Queensland as home to the world's largest hydrogen manufacturing facility.

The first stage of the six-step \$1 billion project is to build the hydrogen electrolysis facility costing about \$115 million. The generation of renewable hydrogen (from electrolysis powered by solar or wind yet to be announced) will then be turned into green ammonia, with "zero-pollution" says FFI's Andrew Forrest, and generate thousands of jobs into the future.

The Gladstone plant is forecast to double renewable hydrogen production capacity across the globe, earning the state the status of a renewable energy superpower.

Andrew Forrest commented on his pride in pioneering a Green Energy Manufacturing Centre, highlighting that "manufacturing will come roaring back to regional Australia, creating many thousands of jobs.

"This initiative is a critical step in Fortescue's transition from a highly successful pure play iron ore producer to an even more successful green renewables and resources powerhouse."

FFI and Incitec Pivot have also committed to a joint feasibility study into a renewable hydrogen and green ammonia production and export facility at Gibson Island in Brisbane to assess whether industrial-scale manufacturing of green ammonia at the facility (which currently produces more than 300,000 tonnes of ammonia annually) is technically and commercially feasible.

Back to Gladstone and publicly owned renewable energy generator CleanCo has signed an agreement to join Sumitomo Corporation and its partners in the development of a hydrogen industry.

Consortium partners include Gladstone Ports Corporation, Gladstone Regional Council, CQUniversity Australia and Australian Gas Infrastructure Group.

Meanwhile ARENA is pumping \$2.17 million into the \$10.5 million study of a large-scale hydrogen electrolyser and liquefaction facility in Gladstone.

Energy infrastructure business APA Group will join Stanwell and Japanese companies Iwatani Corporation, Kawasaki Heavy Industries, Kansai Electric Power Company and Marubeni to commence a detailed feasibility study into the development of the large-scale renewable hydrogen project.



Artist's impression of FFI's green energy hydrogen manufacturing facility at Gladstone in Central Queensland

The project would initially aim to produce up to 36,500 t/y of clean hydrogen for large industrial customers in Central Queensland thus reducing emissions, and destined for export to Japan from 2026 before scaling up almost tenfold to 328,500 t/y in 2031 to meet forecast Japanese demand.

Importantly, the project will create more than 5,000 new jobs and \$4.2 billion in hydrogen exports.

Kogan Creek project

Within 24 months renewable hydrogen will be produced at the proposed state government demonstration facility near Chinchilla slated to produce 50,000kg of renewable hydrogen annually.

The plant will sit adjacent to the Kogan Creek Power Station and include the co-location of a solar farm, battery, hydrogen electrolyser and hydrogen fuel cell. Construction is expected to commence in 2022 with commissioning in early 2023, from when hydrogen will be sold into the domestic market and the plant's battery used to provide grid stability services.


All falling into place

Queensland Minister for Energy, Renewables and Hydrogen Mick de Brenni said "Agreements with Fortescue Future Industries to manufacture electrolysis in Gladstone combined with projects underway in on the Western Downs, a feasibility study into manufacturing renewable ammonia in Brisbane and our continued support for hydrogen in Townsville and other regional centres, is further proof of Queensland's hydrogen superiority.

"This is the start of the green industrial revolution and these announcements prove that Queensland has what it takes to be a global leader in renewable energy and hydrogen."

In mid-October the Queensland government signed an MOI that could result in hydrogen exports to Europe's largest port, Rotterdam,



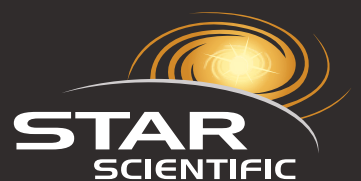


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which seeks to import up to 20 million tonnes of hydrogen by 2050, starting with ammonia imports in 2025.

Let's take a close look at the promising future for green ammonia.

Ammonia

Speaking at the Smart Energy Council's Global Race to Zero Summit Andrew Dickson said "Ammonia is already a big part of the hydrogen landscape, and it is likely to get much bigger as it adapts from existing uses to new uses as a zero-carbon fuel.

"We talk about getting to scale quickly. In terms of the size of the projects and size of the demand and offtake contracts."

The ammonia energy industry regards a large part of the hydrogen future an ammonia future, said Dickson who wears many hats: Chair of the Australia Committee for the Ammonia Energy Association, CWP Project Manager and Smart Energy Council board member.

Ammonia is the second most produced chemical in the world at 180 million tonnes per annum of which 20 mtpa is globally traded, he explained, and production of ammonia currently consumes about half of the world's hydrogen; three quarters of Australia's hydrogen.

"Conventional ammonia is almost exclusively generated using fossil hydrogen: steam methane reforming, coal gasification (especially in China), and just one tonne of ammonia can result in 2-3 tonnes of CO₂ emissions.

"Its production accounts for approximately two per cent of worldwide fossil energy use and generates over 420 million tons of CO₂ annually."

Ammonia is best known as a key ingredient of all-important fertilisers and thus "Arguably it is one of the inventions which has had the most impact on humanity by dramatically increasing the amount of food which can be produced to feed a growing world population," Dickson said.

It's also used in refrigerants and as a feedstock for production of explosives. "Ammonia can, however, be used for much more than just the current uses, it can also become a carbon free fuel and it can be produced from renewable energy, and this is where things really get interesting.

"It is much easier to store and transport liquid ammonia than liquid hydrogen, and in

"These projects are renewables on steroids and they can harness the renewable energy potential of remote, uninhabited, vast desert sites"

Andrew Dickson, Chair of the Australia Committee for the Ammonia Energy Association, CWP Project Manager and Smart Energy Council board member



fact in a given volume such as a tanker ship, you can store a lot more hydrogen as liquid ammonia than as liquid hydrogen."

Ammonia has been safely produced, stored and transported for decades therefore the technology and processes are mature, and about 200 port terminals worldwide can handle ammonia.

Today several large new markets are emerging for ammonia energy as a carbon free fuel including in Japan (displacing coal) and Korea.

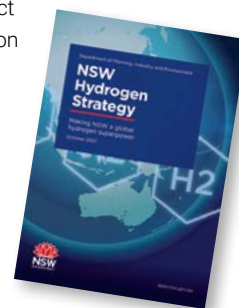
"There are many ammonia energy production projects proliferating to support this future, seeking to turn wind and sunshine into renewable electrons, then using these electrons to split hydrogen from water, to distil nitrogen from the air, and to combine hydrogen and nitrogen to form ammonia," Dickson told the Summit.

"CWP Global is developing several such projects, including the Asian Renewable Energy Hub in northwestern Australia, but now also another large project in southwestern Australia, several in northern and southern Africa and in South America.

"These projects are renewables on steroids and they can harness the renewable energy potential of remote, uninhabited, vast desert sites," he said.

NSW Hydrogen Strategy: pledging \$3 billion of incentives in renewable hydrogen

NSW is set to attract more than \$80 billion of investment, drive deep decarbonisation and establish itself as an energy and economic superpower with a robust Hydrogen Strategy.



Energy Minister Matt Kean said the strategy which comes with \$3 billion in incentives will set up NSW as a global hydrogen leader and boost the NSW economy by more than \$600 million by 2030.

In addition to delivering the \$70 million to develop the State's hydrogen hubs in the Illawarra and the Hunter, the strategy includes: exemptions for renewable hydrogen production from government charges; a 90 per cent exemption from electricity network charges for renewable hydrogen producers who connect to parts of

NSW 2030 stretch targets









	Green hydrogen produced 110,000 tonnes per annum		Renewable energy capacity 12 GW
	Electrolyser capacity 700 MW		Hydrogen price Under \$AU2.80 per kg
	Hydrogen vehicles 10,000		Refuelling stations 100
	Gas network blending 10% (by volume)		NSW Government heavy vehicle fleet 20% hydrogen vehicles

IMAGE NSW DEPT OF PLANNING, INDUSTRY AND ENVIRONMENT



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financed

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development

Hydrogen

3
continents

6
projects

140+ GW in
development

Impact

18 mt CO2
already
avoided

1.5 bt CO2
potential
abatement

the network with spare capacity; incentives for renewable hydrogen production; and a state hydrogen refuelling station network.

The actions are anticipated to reduce the cost of renewable hydrogen by \$5.80 per kg in the next decade and deliver a 2030 stretch target of 110,000 tonnes of annual renewable hydrogen production while driving decarbonisation in the transport, industrial and energy sectors to help reach net zero emissions by 2050.

"Hydrogen will not only help the State halve our emissions by 2030 and get to net zero by 2050, it will also create new opportunities for our heavy industry, and an economic bonanza of investment and jobs... this strategy is forecast to more than halve the cost of renewable hydrogen production in NSW and will make NSW the best place to invest in hydrogen in the world," Minister Kean stated.

Blue ain't green!

In late September the White House issued a joint statement on the commitment by Quad nations the US, India, Australia and Japan to establish a clean hydrogen partnership that focuses on scaling up clean hydrogen. Sounds good but the small print reads "which includes that produced from fossil fuels with carbon capture and sequestration".

Just days later FFI's Andrew Forrest panned blue hydrogen a "highway to climate disaster" referring to the government's \$250 million in funding for research and development of large-scale carbon capture and storage to "support the production of clean hydrogen from existing [fossil fuel] energy resources like coal and gas".

"Blue hydrogen is not 'clean' and, tragically, most governments – without a scintilla of science – are throwing tens of billions of dollars in subsidies at it," Forrest said at the Reuters Impact climate conference.

Stump up

The International Energy Agency is urging governments to step up investment in low-carbon hydrogen to unlock potential and help the world achieve net zero emissions, citing the need for US\$1.2 trillion by 2030 "if the world is to have a chance of reaching net zero emissions by 2050".

To date governments with hydrogen strategies have committed US\$37 billion and the private sector \$300 billion.

"We are seeing exciting progress in making hydrogen cleaner, more affordable and more available for use across different sectors of the economy," said IEA executive director Fatih Birol, mindful of today's predominantly fossil fuel generated hydrogen that releases 900 million tonnes of CO₂ emissions.

The federal government has pledged an additional \$150 million in funding to the \$1.2 billion hydrogen investment and added two locations under the Clean Hydrogen Industrial Hubs programme in a bid to boost roll-out of regional hydrogen hubs in seven priority sites: Bell Bay in Tasmania, Darwin, Eyre Peninsula, Gladstone, Latrobe Valley, Hunter Valley and the Pilbara.

UN Climate Champions launch 'Guiding Principles for Climate-Aligned Hydrogen Deployment'

October 22 marked the launch of the 'Guiding Principles for Climate-Aligned Hydrogen Deployment' by UN Climate Champions Gonzalo Muñoz and Nigel Topping and partners of the UN Marrakech Partnership for Global Climate Action.

Seven principles have been designed to strengthen decarbonisation efforts and help streamline the emerging production and use of low- to zero-carbon hydrogen where other solutions like efficiency and direct, renewable electrification are unavailable.

The plan also involves redoubling efforts in pursuit of renewable hydrogen, as the only resource strictly and reliably compatible with climate goals.

"It's high time for a principled approach to the energy transition. Efficiency, reliability, equity, and speed in the deployment of clean energy to meet the climate challenge are imperative," UN Climate Champion Nigel Topping said.

Climate Champions Energy & Industry Lead Kieran Coleman thanked Wayne Smith of the Smart Energy Council for the opportunity for discuss these matters during the Global Race to Zero Summit.

Meanwhile scientists from the European Technology and Innovation Platform for Photovoltaics forecast a reduction in PV-generated hydrogen costs to €0.7 (\$1.08) and €1.8/kg (\$2.77) by 2030 and €0.9/kg (\$1.38) by 2050. They also believe the levelised cost of hydrogen could drop from today's €0.031-0.081/kWh to €0.02-0.05 by 2030 and €0.01-0.027 by 2050.

"Blue hydrogen is not 'clean' and, tragically, most governments – without a scintilla of science – are throwing tens of billions of dollars in subsidies at it."

ANDREW FORREST

IMAGE: SHUTTERSTOCK



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FIRST NATIONS SOLAR FARM: THE FIRST OF MANY?

Aboriginal-owned land in the Gippsland region of eastern Victoria is to be developed into a 5MW grid-connected solar farm that will power local businesses and deliver gains to the local indigenous community.

A 16-HECTARE FARM that has sat idle for many years is to be put to good use as a solar farm which will take on a level of local importance as well as national significance. On completion the 4.9MW development led by the Ramahyuck District Aboriginal Corporation will notch up many firsts: it will be the first grid-connected solar farm on Aboriginal-owned land in Victoria, and the first wholly owned and operated by First Nations people.

Another key point of difference is the project is not being driven by profit, instead the income generated is earmarked to fund social and emotional well-being needs of the local Aboriginal community, with health, education and employment top priorities.

Discussions over the proposal have taken place over several years and, as Ramahyuck's Andrew Dimarco has found, the physical construction of the solar plant itself will take far less time than the planning.

"Ironically, perhaps, construction is the quickest once all due diligence and governance is taken care of," the General Manager, Economic Development told *Smart Energy*. "All being well, the solar farm could be up and running late in 2022, pending an anticipated mid-year commencement of the build."

The date is significant, coming 30 years after the Ramahyuck property was established back in 1992 with the intention of one day reducing reliance on the government by providing for the local community.

And the benefits will flow from get-go, with 40 jobs created during construction providing opportunities for Aboriginal employment and training in the fast-growing renewable energy sector and many ongoing roles, Andrew said, emphasising the development of a skilled local workforce. Electricity sales from the solar farm will ensure a

sustainable income stream for two or more decades and provide key outcomes for the Aboriginal community, including funds for school and tertiary student scholarships; employee training; a health practitioner operating from a fully serviced clinical room and/or resources to provide culturally safe health services in a patient's home; a dental chair to provide free dental treatment for Aboriginal patients; and for two mental health clinicians, together with the required operational funds for domestic violence prevention and alcohol and other drug dependency management services.

"The aim is to have sufficient funds to recruit extra staff for health practitioners for clinics as well as sufficient income for refurbishment of buildings and sites we own that are in need of upgrades so they are fit for purpose," said Andrew whose background is in funding management in health, agriculture and other industries and found his foray into renewables "a steep learning curve". It is an industry that he now recognises as delivering widespread benefits.

Spreading the good word

"We believe others will flock to Ramahyuck income stream... the solar farm has the potential to be a template for other Indigenous organisations around the nation.

"They are watching us with great interest as a test case – there are vast tracks of Aboriginal owned land across Australia which are not being put to use and the owners could learn a lot from the success of the Ramahyuck solar farm."

Given the journey to date, Andrew's skills in driving the process from inception could be put to good use with him taking on a mentoring role for those with similar aspirations. Advice would include information on avenues leading to grant providers, the lengthy list of agencies and their programs at both state and federal levels, Aboriginal Community infrastructure and other funding sources and models including debt finance.

It's a long and complex road to navigate.

The journey

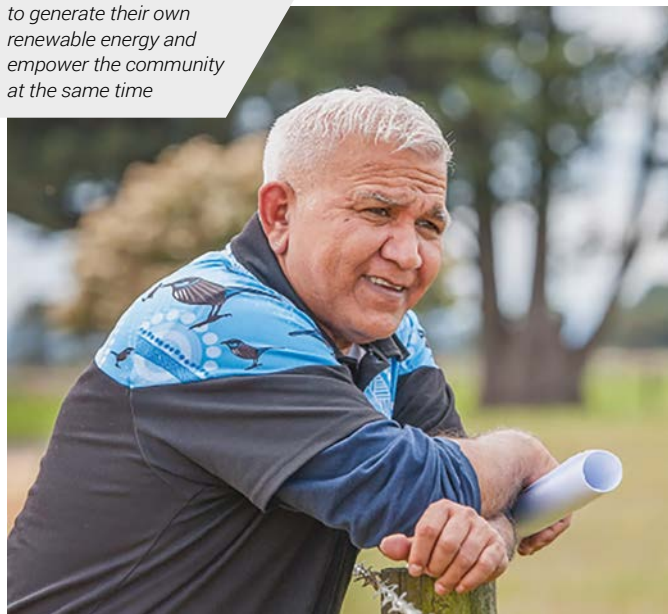
In the case of Ramahyuck, momentum kicked off three years ago when the land's potential as a solar farm was recognised, and from there followed a series of discussions and feasibility studies that concluded a five to six megawatt solar farm was appropriate, Andrew explained.

A federal government agency was contacted which resulted in some funds for the

Mark Munnich, General Manager Community Services (right) pictured with Andrew Dimarco. The Ramahyuck District Aboriginal Corporation (Ramahyuck) is a financially secure, well-run Corporation possessing strong governance and a stable and experienced management team. Ramahyuck was established to improve social, health and economic outcomes for Aboriginal people in the Gippsland region of Victoria.



The Ramahyuck solar farm will enable the local Aboriginal community to generate their own renewable energy and empower the community at the same time



commissioning of renewable energy consultants Point Advisory and Energy Forms to develop a detailed and highly structured program plan along with indicative costs.

There followed a successful application for a \$1 million grant from DELWP (Department of Environment, Land, Water and Planning) which kick started the 4.9MW solar project. Investment in storage batteries were considered as part of the plan but the team decided to hold off for the time being and review in a few years.

The project has been advancing rapidly with another \$3 million in funding for the \$9 million solar farm secured, and discussions for additional funding are underway with various state and federal bodies, the balance to come from a Ramahyuck contribution topped up with debt finance.

Strong relationships have also been built across a range of stakeholders from the private sector, local government, community groups and others, with letters of support received from AusNet and other parties.

"This level of certainty has enabled us to develop a timetable and brought forward key tasks such as ZAPD Energy working with AusNet around connection details and the prospect of upgrades to power lines," Andrew explained. "The processes of obtaining Development Consent and Grid Connection Approval are well advanced."

Anwar Mohammed of ZAPD Energy is also leading the EOI (Expressions of Interest) procedures and has drawn up a shortlist for EPC (Engineering, Procurement and Construction) partners.

Discussions with retailers and potential PPA (Power Purchase Agreement) customers are also well underway.

"These PPA customers are mostly large corporations and governments which have indigenous procurement targets and corporate responsibility objectives to satisfy, so their involvement with the solar farm is beneficial to them as well as to us," said Andrew.

Ramahyuck is now anticipating that the pre-planning processes should be completed by early 2022 and looking toward commencement of construction in mid-2022.

Although the project is still in the planning stages, it has already generated a great deal of interest not just in the local community but also in the media, which has helped accelerate plans.

"It's very heartening to be getting so much airtime, on local and national radio and on ABC TV," Andrew says. "This is one of the reasons for Ramahyuck receiving so many approaches from stakeholders who can benefit from the project."

Momentum continues to grow as does the shape of the project which clearly delivers many benefits both locally and further afield, but are there any dark clouds – hurdles or challenges – on the horizon?

The series of consultations around the planning approval process are ongoing so that is not quite yet a given, Andrew conceded. "This takes into account key stakeholders including the seven or so neighbouring property owners so consultation is happening now and there are no guarantees.

"Surrounding properties are a combination of small farmlets, some of which overlook the farmland on which the solar array will take up much of the property. We are conscious of the visual impact and will take on board any concerns that may arise and mitigate these with, for example, screening and tree lines."

We did mention the numerous benefits of the solar farm and can add a couple more to the lengthy list: plans for the planting of bush tucker from the run-off from arrays as a side project. A healthy 'fringe' benefit you could say. The solar plant will also reduce grid electricity greenhouse gas emissions by around 12,000 tonnes a year. It's a sensible and timely step in the right direction that mitigates sky high levels of carbon emissions generated since white man arrived in a land whose habitants had managed for more than 40,000 years to live in total harmony with nature.

This feature was written, designed and printed on Wurundjeri land. All involved in its production pay respect to Elders past, present and emerging.

A Renewable First for First Peoples in Victoria

The Latrobe Valley Energy and Growth Program will play an important role in helping Victoria halve its carbon emissions by 2030.

More than \$1 million in grants is being shared by five community-led renewable energy generation groups under the Latrobe Valley Energy and Growth Program, which empowers communities to take control of energy costs, support local jobs and reduce emissions.

Stage two of the program which will provide \$1.98 million for new renewable energy projects in the region. Funding will be provided for innovative projects that capitalise on the renewable energy potential of the valley such as rooftop PV on community and sports facility buildings and provide long-term benefits to the community.

Victorian Minister for Energy, Environment and Climate Change Lily D'Ambrosio said "Helping industry and community groups achieve affordable reliable power now and into the future is more important than ever – this funding helps to deliver that – creating jobs and stimulating the economy."

Round two applications close on 30 November 2021.
<https://www.energy.vic.gov.au/new-energy-technologies>

MY LIFE MY WORK

Smart Energy talks to key identities about their achievements and impressions. Here we start with the highly sought-after speaker and thought leader, and very affable Maria Atkinson AM.

Maria, reflecting on your many significant roles, among them: Co-Founder of Green Building Council of Australia, UN Environment Programme Sustainable Buildings & Climate Initiative, Co-Chair, World Economic Forum Global Agenda Council on Sustainable Construction, what springs to mind?

I was so much younger when I was the Environment Manager for Sydney's Olympic Village and wish someone had told me that it would be the most impressionable time of my career! The Village was the largest solar-powered suburb in the world and the Green Games became a catalyst for lots of innovation such as dual pipe systems for drinking water and recycled water; low emission paints – Greenpeace 'eco-warriors' inspected our site office bins to ensure we were recycling! Third party independent review and reporting was key to unlocking innovation and uniting the industry to identify and share sustainable construction and infrastructure solutions.

Twenty years on, I am honoured to be the first independent and female Chairperson of the Holcim Foundation for Sustainable Construction which recognises and rewards sustainable construction solutions. Using Target Issues as its roadmap, the Foundation conducts Awards competitions for projects and concepts, hosts academic symposiums, and promotes sustainable construction via its global network, publications, internet presence and social media.

You are well known for your participation in Powerledger's blockchain technology; what future lies ahead for energy trading?

Decentralisation of energy grids enables new local marketplaces for energy sharing to develop that require tracking, tracing, and recording. Readers of Smart Energy will know that blockchain makes it easier to reliably trace, verify and choose energy sources. It provides enhanced auditing functionality for an immutable record of transactions and event participation and reliable granular reporting on energy use and transactions. I can see a day when blockchain will be used for everyday commercial decisions – like assessing whether the fish you want to buy for dinner is sustainable and fresh! I am a big fan for supply chain transparency and informed decision making.

Are you optimistic about the future of renewable energy and emissions reductions?

I believe there is a smarter, fairer, cheaper and more efficient energy transition for Australia using Distributed Energy Sources, including small and mid-scale renewable generation, storage (grid-connected, behind-the-meter batteries and electric vehicles) and controllable smart loads (demand management).

Local solar generation and storage and even demand management AI can defer or avoid utility scale distribution network investment, resulting in lower energy bills and protecting future generations from paying for infrastructure that is not needed. In one of the most urbanised societies in the world with vast distances between proposed new generation and major load centres, a utility-scale only transition is a costly pathway for Australia. With the NEM rules for the first time recognising the potential role of DER, and Australia having some of the highest DER uptake in the world, an alternative energy transition that maximises the role of DER requires consideration.

What other changes would you welcome?

I would love the property industry to be the leading sector that helps Australia reach the decarbonisation targets of 2030 to contain global warming to 1.5 degrees Celsius. Where the majority of buildings are renewable generators with batteries and with smart load management.

Is there anything else noteworthy about your background?

I deferred university and studied at TAFE to become a laboratory technician and spent my first years in microbiology testing the water quality of Newcastle's beaches! I went on to do a Bachelor of Applied Science in Environmental Biology at UTS when it was first offered. Six years later when I graduated not one person in my year had a job. What a contrast to today's high demand for people with sustainability skills!



"In one of the most urbanised societies in the world with vast distances between proposed new generation and major load centres, a utility-scale only transition is a costly pathway for Australia."



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OFFICEWORKS SOLAR WORKS

It's a little over a year since Officeworks MD Sarah Hunter launched the People and Planet Positive 2025 commitments, but as you would expect from an entity that helps people organise their business and home office environments, it's already producing dividends.

BACK IN 2015 leading retailer Officeworks foresaw the need to establish a long-term sustainability strategy that took into account its carbon footprint and other environmental impacts.

Six years on and the bottom line is already evident, with an impressive 32 per cent reduction in emissions. It's a standing start for a mission which has since been boosted by a series of ambitious commitments to achieve yet more cuts on the road to ever greater sustainability.

Those commitments are outlined in the *People and Planet Positive Plan* launched just over a year ago and which has enabled Officeworks to cut emissions a further 7.2 per cent.

Underpinning the plan is Officeworks' aspirations to use 100 per cent renewable electricity by 2025 and beyond that, Net

Zero emissions by 2030 through a more circular economy and meaningful climate action in which solar energy is playing a key role.

Ryan Swenson, General Manager Corporate Affairs, says "Our approach to achieving our goal of 100 per cent renewable energy by 2025 includes installation of onsite solar systems and batteries where feasible, with 90 of the 167 stores, the majority of which are stand alone, earmarked for rooftop PV.

"Our broader plan takes in continued investment in energy efficiency initiatives, and reviewing purchase options for renewable energy in front of the meter.

"As a last resort, or to support our transition in the short term, we are also looking at the role of LGCs (large-scale generation certificates). These initiatives are happening concurrently, and we are currently exploring opportunities for large scale PPAs (power purchase agreements)."

Shining the light on rooftop PV

The selection of the initial 10 pilot sites for PV was informed by various factors, he said, "including where we can abate the most carbon through the installation of solar panels, the lease tenure remaining of our sites, and obviously financial considerations.

"Decisions were also based on expected system performance, and we agreed on at least one site per state. Property strategies relating to the future of the store location were additional factors."

The management team is more than confident they have established a blueprint for success, with each of the 10 installed 100kW solar PV systems built using "high quality technology products" outperforming modelled expectations on generation.

"The PV systems are providing about a third to half of site energy consumption and in the process reducing energy bills by up to 15 per cent," Swenson explained.

Officeworks anticipates the capital outlay to break even within four years, and is gleaning data from the experience.

"The objectives of the first phase were really about understanding processes and financing models (for example site-based PPAs) to inform our second phase solar PV rollout in which we are targeting 50 stores to be completed over the next 18 months, and will then review the third phase.

"Any new stores that we open now include solar panels. This is also the case



for our online warehouses – we have recently opened our latest site in Victoria, which included the installation of a solar system. This will be followed with an on-site battery that will be used to charge the onsite robotics in our state-of-the-art facility.”

All round efficiency

Swenson explained Officeworks also converted to LED lighting across all store floors a few years ago and the energy savings have contributed to the 7.2 per cent reduction in emissions of the past year. “Lighting technology has improved and we are now embarking on an upgrade

Escalating actions to reduce emissions

The Officeworks FY21 People & Planet highlights to-date include planting 794,000 trees and restoring 1,500 hectares across Australia. Up to 97 per cent of the 6,000 private label products are now recyclable and 6.7 million pieces of plastic have been avoided in the transition to sustainable packaging.

As much as 91 per cent of all waste recycled as Officeworks nudges toward a zero-waste business; 1,474 tonnes of unwanted products have been collected to be repaired, repurposed or recycled – an increase of 39 per cent on the prior year despite multiple lockdowns. And the launch of the Greener Choices product range has led to 2,000 sustainable products.

<http://officeworks.com.au>

program, initially in Victoria and NSW, with second generation LED lighting, and ensuring that all exterior and remaining back of house lighting is energy efficient.

“Underpinning our approach is robust data and analytics which helps us continually monitor and respond to energy reduction opportunities.

“Another key role in reducing our emissions and electricity spend is attributed to our BEMS (building energy management system) across the majority of our network. We recently launched a new facilities management software that will now enable us to centrally control, optimise and regulate all of our sites, building in climate resilience in the process by enabling us to better respond to extreme heat events,” he explained.

“These initiatives will help Officeworks in its quest to reduce emissions even further this year.”

The range of new materials being trialled includes heat reflective paint and thicker installation, and an appraisal of the efficacy will inform deployment in other stores. All bases covered!

But what else is shaping the future? Officeworks is also committed to reducing emissions throughout its supply chain, associated with the raw materials, production, transportation and use of the products sold, and recently celebrated the milestone of planting one million trees through the company’s 2-for-1 tree planting initiative. This is part of the Officeworks commitment to plant two million trees by 2025. Better still, batteries will be hooked up to the building PV systems. It’s a shrewd development that lends new meaning to a smart, circular economy.

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THE SOUND OF SOLAR

Residents across Australia have been doing it tough during the extended lockdowns over the past two years, unable to venture much further than the local supermarket. So we here at Smart Energy were delighted to be contacted by our colleagues at Advantage Austria, of the Austrian Consulate General, who are keen to showcase some of their nation's leading renewables technologies and projects, along with some stunning images. Sit back and soak up the atmosphere...

SWIMSOL: WORKING HARD AT HOLIDAY RESORTS

Most readers have probably never heard of Austria's Swimsol, a key player in offshore/marine PV and island micro-grids and heavy-duty tropical solar PV systems.

In 2014, Swimsol launched the world's first floating solar solution for the sea, SolarSea, which overcomes space limitations for solar panels on small tropical islands, and is designed to withstand the harsh conditions of waves, storms and saltwater.



Pictured here is SolarSea, the World's first floating PV system, gracing the LUX Resort, South Ari Atoll in the Maldives which has pledged to minimise carbon dioxide emissions.

The 678kWp SolarSea + RoofSolar system was completed in 2019.

The solar PV system uses all available roof space and is coupled with offshore SolarSea® platforms. It works in hybrid mode with the diesel powerhouse of the island.

"We wanted to bring solar energy to places where there is no space on land for the panels. So we put them on the seawater" said Martin Putschek, Managing Director.

According to Swimsol the ocean also benefits as the platforms provide shelter for juvenile fish and invertebrates, acting like fish-aggregating devices.



SOLAR, REINVENTED: Smartflower is touted as the world's only solar solution to an all-in-one, sculptural design and intelligent solution to produce clean, sustainable energy for homes, cars, or businesses. It's photosynthesis at its best, perhaps, as the floral shaped SmartFlower uses advanced robotics and automation to intelligently track the sun's trajectory and generate up to 40 per cent more energy than traditional stationary solar panels.

Come sunset Smartflower automatically folds up its 'petals' and cleans itself to maintain peak solar use. "Sunflowers open, close and follow the sun for optimal energy conversion, we figured solar panels should too," says Smartflower.

Smartflower is seen in action in the photo below. This writer would be very happy to 'plant' such a Smartflower in the front garden!

Earlier this year **ANDRITZ**, the technology company founded in Austria back in 1852, received an order from EPC contractors McConnell Dowell and John Holland to supply the electro-mechanical equipment for Genex Power's 250MW Kidston pumped hydro storage plant in North Queensland.

Andritz's scope of supply comprises design, manufacturing, supply, transportation, erection, and commissioning of two 125MW reversible pump turbine units as well as full operation and maintenance services for more than 10 years. Commissioning of the plant is expected in 2024.

Kidston will be Australia's first pumped storage plant in four decades and one of the world's first to be co-located with a solar plant.

'SOLARIS URBINO 12 HYDROGEN': No virtual trip to Austria would be complete without a reference to the tech pioneer Fronius. And true to form the company which also remains family run has been at the forefront of advances, among them a two-week trial of a hydrogen-powered bus in Upper Austria which was fueled by Fronius Solhub using renewable hydrogen generated locally from solar energy.

The bus will be fuelled daily with approximately 13 kg of hydrogen produced from solar energy. Fuelling takes around 15 minutes, with the bus travelling at least 160kms.

Separately, in May, Fronius launched Wattpilot which is aimed at all electric vehicle drivers. It is described as one of the few products on the market which can switch between single-phase and three-phase surplus charging.

There's more: with its Selectiva battery charging systems, Fronius boasts advanced

technology for charging traction batteries in the world. The innovative Ri charging process, which adapts to the effective inner resistance of the connected battery, allows for gentle and efficient charging depending on the age, temperature and state of charge

OTHER AUSTRIAN COMPANIES are leading the way in high efficiency biodiesel procedures using raw materials including vegetable oils, used cooking oils and animal fats; others are planning, building and operating large solar plants for water heating, space heating, process heat and solar cooling.

Ochsner is an outstanding example. The heat pump, one of the most efficient and progressive cooling and heating methods, was invented in Austria 150 years ago by the Ochsner family and the company is today run by the fifth generation of descendants.

There is more but we'll finish with Kioto Solar, with its roots in 1991 in the garages of two innovators who collaborated on the production of the first solar collectors. In 2005, Kioto Solar commenced production of photovoltaic modules and now manufactures more than 1,600 modules daily.

ADVANTAGE AUSTRIA is the trade promotion organisation of the Austrian Federal Economic Chamber.

Contact sydney@advantageaustria.org,
<http://www.advantageaustria.org/au>



FUN FACTS: Most people know Austria for its scenic Salzburg ('Salt Castle') with its medieval and baroque architecture and stupendous backdrop for *The Sound of Music*, as well as its top brands Red Bull and Swarovski, and Viennese residents Mozart, Beethoven and Sigmund Freud. Also the sublime River Danube and the waltzes of Johann Strauss, most famously the Blue Danube which led us into *2001: A Space Odyssey*. Fast forward to the 2021 Global Quality of Life rankings and Austria comes in at number 16, pipping Australia by one point. (The top three being Finland, Denmark and Norway. Sunshine and sandy beaches evidently don't feature in the judges' deliberations!) And yet Austria is a leader in innovation in the renewable energy field.

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The Smart Energy Council cordially invites anyone with a stake in the renewable energy industry to join us in early May 2022 in Sydney to learn more about Australia's journey toward a renewable energy generation and exporting superpower

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WAY TO GO

"A million dollars doesn't buy you much these days. It buys you about a day in court if you're a defamation lawyer, or it buys you about a third of a car park in Kooyong, or it buys you approval of a \$60 billion mine [in the Galilee Basin]... This election coming up is the most critical election for the health of the world. We're not mucking around here."

Climate campaigner and comedian Dan Illic who garnered significant financial support for billboards to grace Glasgow during the COP26 summit, and who is on a mission to stir up interest in 'climate independents' in federal electorates to accelerate the closure of fossil fuel plants

"Richie Merzian and I saw the UK COP Presidency and other countries saying we need to consign coal to history, launching initiatives that stop new coal power stations, stop financing them and actually bring out plans to phase coal out in 2030 (for developed countries) and 2040 (for developing countries)." Australia's absence from the anti-coal day was noticeable. Australia's role at COP26 as a promoter of fossil fuels over climate solutions has been on full display.

Ben Oquist of The Australia Institute, reporting live from COP26

"Based on current information, investment in large-scale renewables seems to have settled at an average of approximately 2.5GW per annum reaching FID and may be trending up... With a joint probable pipeline of 7.1GW in committed projects, the outlook for the renewable energy industry over the coming few years is positive [however] at some point, investment in renewables may stall if delivery of transmission and interconnector upgrades are not sped up."

The Clean Energy Regulator

"Australia's clean energy transition is tipped to accelerate to the point that most homes will have solar panels paired with batteries by 2030 and the nation could have the highest penetration of renewable energy per capita of anywhere in the world."

The Age (newspaper) reporters Nick Toscano and Mike Foley

"While Australia is benefiting from its highest share of renewables in the energy market ever, the Audit shows that emissions reductions from Australia's electricity generation is still worse than in countries like the US, UK and Japan, and emissions from our other energy combustion activities are rising. Reductions in electricity emissions achieved through renewables are also being cancelled out thanks to the commissioning of new Liquefied Natural Gas plants, estimated to have increased Australia's annual emissions by around 15 Mt CO₂e."

The Australia Institute's Climate & Energy Program latest National Energy Emissions Audit

"The latest emissions data release proves the federal government's climate response is woefully inadequate. They say we're 'on track' to cut emissions by one-third of one per cent (0.28%) per year over the next decade. That is a snail's pace – not the rapid and deep reductions we need to be making this decade."

The Climate Council's Tim Baxter

CoalKeeper and the Energy Security Board

"The ESB's capacity mechanism involves paying generators not for producing electricity, but for being able to prove they are available in certain periods of the year when there is a risk of an energy supply shortage. It's like getting paid not for working every day, but for being able to prove you would be able to be at work on some of the busiest days of the year."

Johanna Bowyer, IEEFA

AND

"Analysis that takes into account variability of wind and solar power suggests that the vast bulk of the gap left by exiting coal can be filled with batteries capable of supplying power for around six hours or less."

Tristan Edis, Green Energy Markets

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GLOBAL RACE TO ZERO SUMMIT'S KEY SUPPORTERS

The Smart Energy Council's Global Race to Zero Summit which attracted more than 6,400 registrants was supported by prominent organisations Mott MacDonald, eleXsys and LONGi.

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Earlier this year eleXsys successfully raised A\$9 million to support the global expansion of its solar and storage microgrid platform technology. The capital raise attracted investment from the UK, and eleXsys Energy is now incorporated in the UK. www.elexsys.com



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DO YOU HAVE PHOTOS OF YOUR GREAT ACHIEVEMENTS? *Smart Energy* aspires to source the best illustrations possible for stories and would like to invite members who are proud of their work – residential or commercial solar and/or battery installations, large scale projects, EV chargers and more – to share images. We will of course credit all who provide images used in this magazine. *Please email editor@smartenergy.org.au*

ALL DUE CREDIT The Smart Energy Council recently welcomed National Credit Management Limited (NCML) as a Gold Member.

For those who haven't already heard, NCML is a nationwide provider of innovative debt collection solutions that has assisted its clients to improve their cash flow for over 30 years.

NCML is a wholly owned subsidiary of Credit Corp Group, one of Australia's largest receivables management organisation and an ASX 200 listed company.

Head of Collection Services Daniel Todd explained, "The debt collection industry has gone through a holistic transformation over the past decade, with the financial outcomes achieved no longer being the only measure of success.

"Our clients are not only focused on how much money is collected, but also in ensuring that customer experience is paramount. This is particularly important for our small to medium sized clients who rely on return customer business into the future.

"To achieve this outcome NCML assesses each customer's unique personal and financial situation to tailor a solution that is sustainable for both the customer and our clients."

He added the organisation's team was "passionate in our belief that successful debt collection outcomes can be achieved through treating our mutual customers with

respect and maintaining an ethical approach to customer engagement" and believes they can achieve this while providing "exceptional value for money for clients".

For more information on NCML's services to improve cash flow, visit www.ncml.com.au or call 1300 784 999.



TRINA RECENTLY RELEASED an update on its activities downunder, including the imminent launch of its 670W module in Australia, which when listed will be the highest power, highest efficiency module available in this country.

The higher power output has been achieved by incorporating some new technologies into the modules, in particular the 210mm diameter solar cells/wafers that are larger in size.

Todd Li, Trina Solar President Asia Pacific commented on the number of enquiries about

the Vertex 670W module which he says will be a real game changer for the utility segment.

Trina Solar is also promoting its extensive range of Vertex modules available in Australia starting with the 400W Vertex S which is proving popular with residential customers, and the 500W, 550W and 600W Vertex modules for the commercial, industrial and utility-scale segments.

In related news, TrinaTracker now boasts two types of systems available in Australia: the Vanguard 2P single row tracker and the Agile 1P dual row tracker.

According to Andrew Gilhooly, Head of TrinaTracker and Utility Solution Sales for Trina Solar in Asia Pacific, trackers in Australia are now ubiquitous, with the increase in yield they provide driving project levelised cost of energy (LCOE) ever lower.

The 670W Vertex modules, like others in the range, have options of mono-facial and bifacial, and the bifacial modules coupled with trackers are very popular among those developing utility-scale projects, he said.

"Trina Solar is unique because it is the only solar module manufacturer in the industry that also provides a truly compatible module and tracker solution.

TrinaTracker is internationally certified and Australian steel will be incorporated into the Australian market.

Trina Solar claims to be one of few tracker suppliers to have deployed at large scale in cyclonic regions of Australia.

Trina Solar has just launched a training centre in Sydney to help industry professionals learn how to install its trackers and become certified. It's believed to be the first such centre in Asia Pacific outside of China.

<https://www.trinasolar.com/au/contact-us>





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A FITTING RETIREMENT A retirement village on the NSW Mid North coast is receiving a 1.2MW rooftop PV system and it is estimated site owners will recover the \$1.2 million cost of deploying an Enphase-based renewable energy microgrid within five years.

A key attraction for the carbon-neutral community is an embedded electricity network in which most houses have a PV array of 16 x 370W panels. Each panel is equipped with an Enphase IQ 7™ microinverter to harvest and share solar energy throughout the village, including common use facilities such as swimming pools, the bowling club and streetlights.

The initial phase of the microgrid involves PV solar generation and reticulation, however the system's design allows for the deployment of a large battery storage system once it's commercially viable. Each home in the village is prewired with heat

pump hot water systems and electric vehicle charging circuits from day one.

Enphase Energy Australia General Manager Wilf Johnston describes the development as a leading example

of how to deploy renewable energy and full home electrification to create energy independent and carbon-neutral communities.

<https://enphase.com/>



FIMER HAS LAUNCHED ITS NEW POWER PLATFORM a new 100 per cent Italian manufactured residential range of single-phase, three-phase and energy storage solution: the Fimer PowerUNO, PowerTRIO and PowerX.

Visitors to Intersolar in Europe in early October were able to see the range which the company anticipates will arrive in Australia and New Zealand in mid-2022.

The PowerUNO and PowerTRIO inverters offer power options from 2 to 8.5kW and feature single and three-phase options, a small and light-weight footprint with several easy-to-use plug-and-play connections allowing for simple installation.

It also has built-in high-end connectivity with Wi-Fi and ethernet, and Linux OS which allows local integration with smart home appliances and EV charging, as well as seamless interaction with Fimer's Aurora Vision cloud, and a dedicated blockchain processor which allows utilities and aggregators to build specific-use cases on top of the inverter, avoiding the need for external devices.

PowerX provides a flexible option for capacity requirements of all sizes, with a maximum of 48 kWh, with installation of the one module weighing 33kg.

Fimer's 'Power' platform allows homeowners the flexibility to add more capacity at any time, as well as being able to easily integrate with electric vehicle and home automation technologies.

In related news, Fimer is now inviting Australian and New Zealand solar and energy storage installers to register for its installer program that aims to provide better support and incentivise and reward its loyal installers.

Certified Fimer Installers can access enhanced service and warranty benefits, including an extra two-year warranty (total 12 years) on its UNO-DM-PLUS-Q inverter range, priority call centre support, online support booking requests and more.

The program also offers an integrated online portal with access to online training, Fimer marketing collateral with the opportunity for co-branding, lead generation, the ability to earn Fimer dollars to use toward Fimer merchandise, and exclusive promotions and events.

To qualify for the free program installers must have a minimum number of installs registered quarterly, with training and branding activities completed to achieve and maintain certified installer status. Visit Fimer's partner portal at www.partners.fimer.com, www.fimer.com





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INDUSTRY EVENTS REACHING THE MASSES

DURING THE PAST YEAR the Smart Energy Council has run a series of events on a regular basis to keep its members and the broader industry well informed and updated on key issues.

Experts and specialists have presented on topics including, but not limited to, professional development, industry regulations, Australian Standards updates, CoalKeeper, PV market updates and renewable hydrogen.

And thanks to the powers of technology SEC also staged product launches and a virtual plant tour of a manufacturer.

Records indicate that during the 12 months to early October 2021, more than 22,000 people tuned in to SEC webinars, training sessions, summits and physical events.

Among the most popular:

- September 2020 **Global Summit** (total of 6,630 registrants over two days)
- September 2020 **3D Virtual Exhibition and Conference** with 6,200 registrants, plus 22,000 booth visits to the 35 exhibitors ('proving a pandemic will not slow us down')
- August 2021 **NSW Energy Summit** – 1,200 registrants
- July 2021 **Queensland Energy Summit** – 900 registrants
- February 2021 **UK/Australia Road to Net Zero** - 650 registrants
- April 2021 – **Shading performance and safety standards** – 600
- **Controlling household appliances** – 580
- **Big batteries strengthening the grid** – 500, and
- **Installer roadshow** – 500

In all 26 events over the year. That's one every two weeks.

The majority of other events attracted an average of 300 registrants.

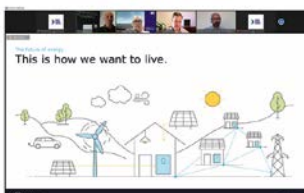
The biggest physical event of the year is the annual Smart Energy Conference and Exhibition which attracted more than 5,000 registrations, and SEC was lucky with the timing prior to the NSW lockdown. More than 70 speakers, 120 exhibitors.

SEC will continue to deliver top events and fine tune the agenda according to members' needs.

The Smart Energy Council would like to thank all those who participated and all its members for supporting the peak body for renewable energy, and most importantly for driving the transition to a net zero carbon energy industry.

Collectively we can make a big difference.

LIVE EVENT



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8 SEPTEMBER 2021

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INTERNATIONAL PARTNERSHIPS

- Helping trading partners reduce their emissions through our low emissions energy exports.
- in traditional markets - Japan, South Korea and China
- increasingly in prospective markets, eg Singapore, Vietnam and Indonesia
- recent announcement with Germany on hydrogen trade feasibility study.



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PUTTING ENERGY INTO ACTION



SUPPORT THE DRIVING FORCE OF SMART ENERGY

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

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

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

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

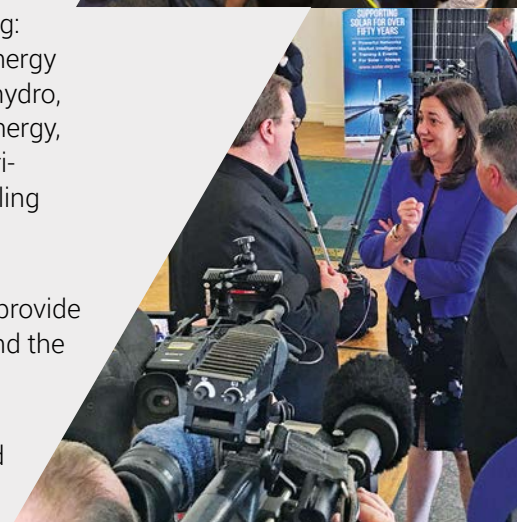
The **SMART ENERGY COUNCIL**:

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

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

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

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



BECOME A MEMBER TODAY

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

For further information please contact:
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Connecting
industry, sharing
knowledge, and
building business
opportunities
through
collaboration.

NEWH2 SKILLS AND REGULATIONS In early November the ACT Government and Hydrogen Australia in partnership with the Smart Energy Council presented a webinar on the ACT Hydrogen Refuelling Station, which dispenses hydrogen generated from 100 per cent renewable electricity.

Opened in March 2021, the site that is unique to Australia is operated by ActewAGL which joined forces with Neoen, Hyundai and SG Fleet to make the project a success.

The 90-minute webinar heard from a range of speakers including Clare Sykes of NewH2 and

James Dunlop of ActewAGL who presented an overview of the project.

Scott Nargar addressed Hyundai's First Hydrogen Car Fleet and Hyundai Nexo SUVs, and rounding off the program was Scott Hamilton on the Smart Energy Council's Zero Carbon Certification Scheme.

The ACT Government will use the station to service Australia's first government fleet of hydrogen vehicles, 20 Hyundai NEXOs, as the government continues to transition 100 per cent of its passenger fleet to zero emissions vehicles.

ACT HUB MANAGER ALETHIA BARCEINAS advises the Hub community about two important programs:

The ACT Government's Sustainable Household Scheme and its brand new website, which Canberrans can visit for all the latest information to help them make Everyday Climate Choices.

Visit www.climatechoices.act.gov.au

The Export Market Development Grant (EMDG) is recognised as an excellent way for businesses and organisations marketing overseas to obtain a cashflow boost.

EMDG is available for businesses exporting products or services overseas, and for promoting inbound tourism or events held in Australia.

Businesses can claim eligible marketing expenses for trade shows and marketing events cancelled due to the COVID-19 pandemic.

EMDG provides for a maximum 50 per cent of export promotion expenses.

But be quick! The deadline for claims for the years ended 30 June 2021 and 2022 is 30 November 2021. Both claims must be lodged at once due to a change in the EMDG process moving from a retrospective claim to claiming in advance to provide greater business certainty.

For more information contact Accounting and Tax Consultants Nexia Australia at the Canberra Office on +61 2 6279 5400 or email mail@nexicanberra.com.au Alternatively visit www.Austrade.gov.au

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

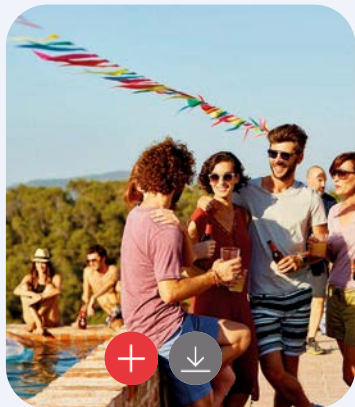
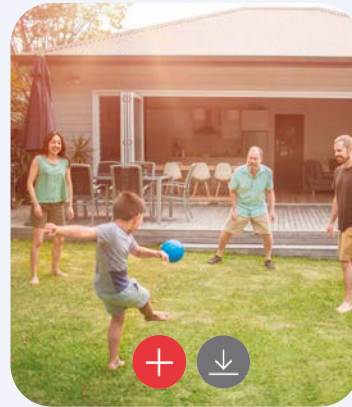
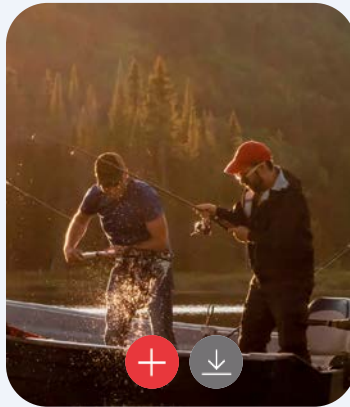
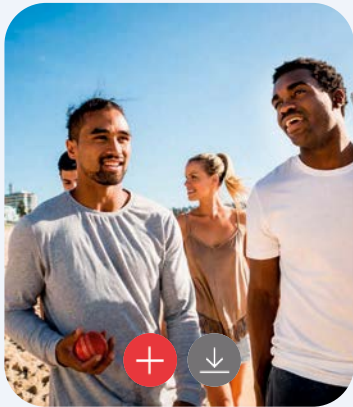
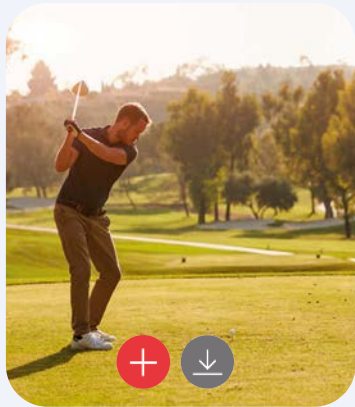


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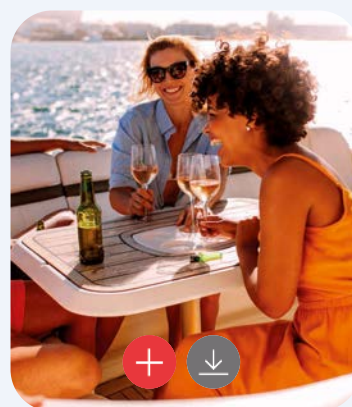
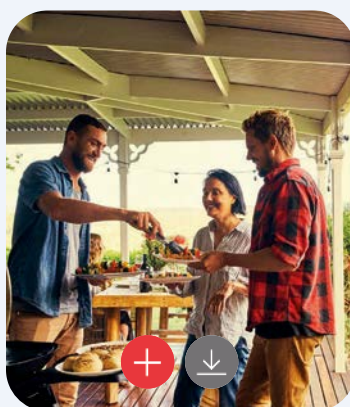
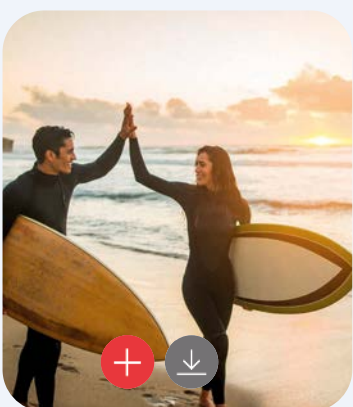
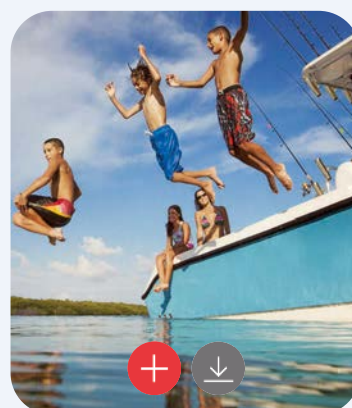
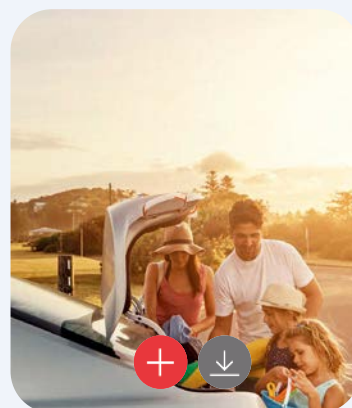
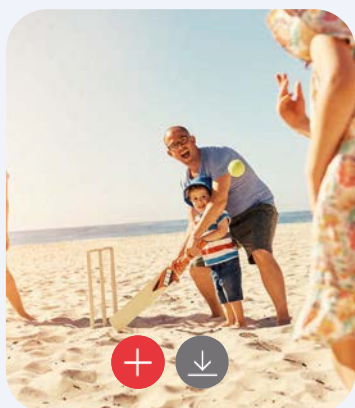
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RIISING FROM THE ASHES A reader of *Smart Energy* has shared his experience of suffering through two successive years of severe bush fires. Tragically, the extensive fires of January 1 2020 burnt his house to the ground, as seen in the image on this page.

The remote dweller has lived off grid for more than three decades, and designs and constructs his own solar and battery systems.

The system on the original dwelling was updated in 2011 and ran a small 2-bedroom home with 500Ah at 24V AGM battery bank

and a smaller system at 12V for LED lights at a total cost of under \$10,000.

Since the house was razed to the ground, the PV pioneer's home has been two caravans wired to AC and DC power via a 24V system and inverter.

"I am still using a 40-year-old Solarex 40W panel to charge batteries for power tools etc and it still puts out 19V!," he told *Smart Energy*. "A quality solar panel, kept clean and undamaged, will last a long time."

Two other solar and battery systems power the workshop and a large shed, as well as a

few small electric vehicles and an electric ride on mower running off these systems.

He paints a sombre first-hand picture of life on the land.

"The country is dying – the insect life is a tiny fraction of what it was when I first came here in the late 1970s. Deer have taken over from emus and feral dogs from dingos – they seem to have disappeared altogether. Most of the koalas have gone. I saw the last one crossing the road out of a burned reserve last year. It had nowhere to go."

The pensioner is a disillusioned activist who has taken his concerns to Canberra on several occasions and concludes "These days life is just a branch of marketing".



The burnt out home



The bike ridden to Canberra in 2014, equipped with 2x10Ah batteries

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

Despite the pandemic, 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
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Aztech International	Energy Ease	IQ Energy Australia	RETA (WA)	SolarHub /Smart Renewables	Zeromow
B&R Enclosures	Freshwater Group	Master Instruments	Royal Automobile Association of SA	Solastor	ZNSHINE Solar Australia
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Crystal Solar Energy	Global-Roam	Mondiaux		WINAICO Australia	

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SOLAR INDUSTRY Positive Quality™



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

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

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

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

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

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

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

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



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Continuous Quality Assurance

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

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Sungrow	Outside back cover	www.sungrowpower.com
Western Union Business Solutions	51	www.wu.com
William Buck	53	www.williambuck.com/renewable-energy-and-recycling

WESCOR

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Save time on-site with a dedicated, safe enclosure for solar system installations with these rugged aluminium solar battery & equipment cabinets. The cabinets are adaptable and sized to enable housing of all the battery and power conversion equipment required. A secure design that provides protection from the weather and pests, ultimately extending the system's service life.



Features

- 1 Double front doors, 3-point locking system and segregation between battery section and equipment section.
- 2 House up to 8 or 12 19" rack mount battery modules on slide-in shelves in an aluminium cabinet with IP protection rating.
- 3 Stainless steel lifting eyelets on each top corner to help lift and guide the cabinet into place. Rain and insect protected vents on either side and on top to facilitate passive ventilation.
- 4 Internal circuit breaker section for individual battery module isolation, with circuit breaker cut-outs in the escutcheon.
- 5 Optional 600mm tinned copper busbars with pre-drilled holes for battery cable connections.

Model	Battery Modules	External Dimensions (mm)			Weight (kg)
		H	W	D	
ALS8	8	1427	1500	550	67
ALM12	12	2027	1500	550	89
ALL12+	12	2027	1900	550	106

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Master Instruments is proud to be a master distributor of the Wescor Solar Battery & Equipment Cabinet range. Talk to our battery engineering team about how the Wescor range can support your system installation.

Our brands: Through years of experience and research, we only stock and supply the brands we support and trust.

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Years in the
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