

**Supplementary
Submission
No 6a**

SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW

Name: Mr Adrian Ingleby

Date Received: 6 May 2020

My second submission to the inquiry on

Sustainability of energy supply and resources in NSW

Re :- The inquiry's terms of reference having been updated to reflect new economic challenges facing NSW in light of the COVID-19 pandemic. In addition to the existing terms of reference, the Committee will also consider the capacity and economic opportunities of renewable energy for workforces, industries, and the wider economy impacted by COVID-19.

1. In my first submission [on page 3] I said, "The renewable energy revolution can't be stopped." That claim remains true, however, it can be impeded and slowed down.

Who has the power to impede the renewable energy revolution?

2. Politicians, governments, opposition parties at a state, territory and federal level.

Why impede? - when our planet is threatened by global warming and climate change?

3. The main source of energy supply to NSW and Australia over the past 100 years has been via fossil fuels in the form of coal, gas and oil. The lobby groups representing those industries support the two major political parties [LNP/Nationals & Labor] at a state, territory and federal level with massive donations. The sums of money donated are in almost equal amounts to the presiding government and its opposition. The fossil fuel energy sector have the advantage of being the larger long-serving incumbent energy supplier with established political contacts. They want to protect their business model and defend it against any opposition ie the renewable energy sector.

4. In my first submission I covered the issue of political donations and political compromise on Page 2 to Page 3 inclusive. The Federal LNP government have stated that they will not put a price on carbon and that they favour economic outcomes over environmental outcomes.

5. Further to my comments in my first report, the NSW LNP government has supported and is pushing for the approval of the Santos Narrabri Gas-field - 850 well project [fracking / unconventional gas] which stands on top of the recharge area for the Great Artesian Basin.

6. In 2019 the NSW., Independent Planning Commission rejected the Rocky Hill and Bylong Valley coal mines in NSW., The IPC took into account the long-term environmental impacts and heritage and agricultural costs which would be borne by future generations. Additionally, when coming to the decision to reject the projects, it took into account the greenhouse gas emissions that would have been produced when the coal sold was burned by overseas customers ie Scope 3 emissions.

7. In November, 2019 as a result of the IPC decision the NSW Minister for Planning of Public Spaces the Hon. Rob Stokes requested the Productivity Commissioner to conduct a review of the Independent Planning commission. The Productivity Commissioner found the IPC to be in the public interest and it will remain the determining authority for contentious state significant developments and public hearings will be maintained, but it did reduce its powers.

8 Further the NSW government prepared a bill titled the Environmental Planning and Assessment Amendment (Territorial Limits) Bill 2019. The “Overview of Bill” states:-

“The object of this Bill is to prohibit the imposition of conditions of a development consent that purport to regulate any impact of the development occurring outside Australia or any impact of development carried out outside Australia.”

9. The actions taken by the NSW LNP Government as outlined in paragraphs 4 to 8 above, were most probably taken to defend a large treasury revenue source and as an act of solidarity with their long-term coal and gas lobby donors. In December, 2019, speaking at the National Smart Energy Summit in Sydney, NSW energy minister Matt Kean said he believes it would be “negligent” to miss the economic opportunities that would be created through embracing renewable energy, telling those with vested interests in the fossil fuel sector to get ready to “enjoy their Kodak moment.” <https://reneweconomy.com.au/nsw-energy-minister-to-renewables-opponents-enjoy-your-kodak-moment-70541/> His government has nominated areas to be utilised as “renewable energy zones” in NSW with the aim to promote large renewable energy projects. <https://reneweconomy.com.au/nsw-unveils-two-new-renewable-energy-zones-in-11-billion-net-zero-strategy-13866/>

10. The actions of the NSW LNP Government as outlined in paragraphs 4 to 8 above show that they are pulling in two directions at the same time. Queensland is doing the same with its fracked gas-fields and the Adani coal mine whilst they are also embracing renewables. The Northern Territory has approved fracking gas-fields at the same time that entrepreneurs are proposing to build multi-billion dollar solar and wind projects to supply renewable energy in the NT and to also send the same renewable energy via a sub-sea cable to Singapore.

11. The Guardian, 31.01.2020, reported that Prime Minister Scott Morrison has struck a \$2bn deal with the [New South Wales](#) government to increase gas supply and reduce greenhouse gas emissions from the electricity sector. The deal includes at least \$450m of federal grants and \$510m more of federal grants or loans for “NSW-based emissions reduction initiatives”, to be matched by \$1.01bn in direct funding from Gladys Berejiklian’s government. <https://www.theguardian.com/australia-news/2020/jan/31/australian-prime-minister-scott-morrison-strikes-2bn-deal-with-gladys-berejiklian-nsw-to-boost-gas-supply>

12. So the PM offers NSW \$2 billion in funding, is ‘a deal’ requiring that they “increase **gas supply** and reduce greenhouse gas emissions from the electricity sector”. The funding is conditional on the deal! Unconventional gas extraction uses massive volumes of water, contaminates groundwater, depressurises aquifers and has the same CO2 footprint as coal and releases large volumes of fugitive methane, a greenhouse gas, into the atmosphere; just to mention a few of the negatives.

13. Actions speak louder than words and it is clear that at a federal, state and territory level, their past and present close associations with the coal and gas lobby are hindering or impeding Australia's fast transition to position itself for a grid of say 90% renewable energy.

14. Giles Parkinson the editor of Renew Economy published an article on 04.05.2020 titled, "It's time Coalition listened to experts on climate and energy and plotted a Green New Deal". <https://reneweconomy.com.au/its-time-coalition-listened-to-experts-on-climate-and-energy-and-plotted-a-green-new-deal-47424/>

The whole article is worth reading, but I will detail only some sections of his article, those which focus on the same issues that I raised above :-

"In Australia, renewables are by far the cheapest new source of bulk generation," says the Sydney-based BNEF analyst Lara Panjkov.

The Australian Energy Market Operator then delivered the news [that there is no technical reason why the grid can't have a very high level of renewables in the main grid](#). It has already outlined, in its Integrated System Plan, [a pathway to 90 per cent renewables by 2040](#), and last week it looked at what is needed to ensure [that up to 75 per cent of the grid can be powered by wind and solar at any one time, by 2025](#). "Australia already has the technical capability to safely operate a power system where three-quarters of our energy at times comes from wind and solar energy generation," says AEMO chief executive Audrey Zibelman, whose responsibility it is to keep the lights on.

Zibelman agrees that wind and solar are clearly the lowest-cost way of providing electricity, but to harness that power source to its potential requires a change in market design and regulatory requirements.

Some experts now argue that Australia can go a lot quicker. And gain even more benefits. [Ross Garnaut thinks 100 per cent renewables](#) is achievable in the early 2030s, [ClimateWorks' Anna Skarbek says a rapid uptake of renewables](#) 75 per cent annualised, not just instant by 2030) is key to also lower emissions in buildings and transport. Many major utilities think AEMO is too conservative on some of its technology costs.

But the biggest failure of Australia's energy market in the last six years has been the glacial pace of market and regulatory reform, and infrastructure investment. And you can blame that on the lack of federal government leadership.

Morrison and Co, the Australian political mob, like to boast that Australia has installed more wind and solar than any other country on a per capita basis over the last couple of years. The bitter irony is that they have spent much of the last six years trying to stop that very thing from happening, and now there is no short, medium, or long-term vision, to focus the minds of the regulatory bodies who have been so slow to move.

The situation has so enraged and frustrated state ministers that they have gone their own way. Victoria and NSW have announced they are by-passing the federal regulatory framework because it is too slow to keep pace with their renewable energy targets.

Nearly every state has emissions and renewable energy targets far more ambitious than the federal government, and the two states with the most ambition – [Tasmania \(200 per cent renewables by 2040\)](#) and [South Australia \(net 100 per cent renewables by 2030\)](#) – are both conservative governments.

Which shows that this is not simply an ideological issue, unless there is the coal lobby involved. And it is no coincidence that these two states, along with the ACT ([already at 100 per cent equivalent renewable supply in 2020](#)) are three jurisdictions that have no coal industry.

Alas, there is no indication – yet – that the Morrison government is about to change its tune. In fact, all the signs are pointing the other way. “I like to think of the other side of Covid-19 as being a gas-fired recovery,” energy minister Angus Taylor, a determined anti-wind campaigner before and after he came into parliament, told the Murdoch media’s Daily Telegraph last week.

The Morrison government appears to be convinced that the world will continue to want an expanded menu of fossil fuels – coal and gas. But the signs indicate otherwise, particularly after Covid-19. The conservative International Energy Agency notes that renewables have been the most resilient energy sector player as prices and investment in gas and coal crash. Even Shell says it could accelerate the transition to clean energy.

“Demand for fossil fuels is falling across the board for coal, oil and natural gas. At the same time, we’re seeing a major shift towards low-carbon sources of electricity including wind, solar PV, hydropower and nuclear,” the IEA said.

“Low-carbon technologies are now set to extend their lead as the largest source of global electricity generation, reaching 40% of the power mix in 2020.”

Renewable Energy

15. As stated in my first submission, a renewable energy revolution has been taking place over the past 10 years worldwide and over the next 30 years it will be grow into **a multi-trillion dollar business** as it is constructed and the old infrastructure is retrofitted.

The fact is 90% renewable energy is possible TODAY - firmed up with STORAGE

16. Some of our federal right wing conservative politicians regularly stand in front of the television cameras and spruik ‘talking points’ no doubt, relayed to them by the coal and gas lobbyists and say things like, “We need baseload power for when the sun doesn’t shine and the wind doesn’t blow.” In fact that claim is an absolute favourite of Angus Taylor the federal minister for energy and his predecessors.

17. I submit that a review of the information below on battery storage will show, beyond a reasonable doubt, that utility-scale batteries specifically, used in partnership with other forms of energy storage can and will support a 90% renewable energy grid which is secure, reliable and able to supply energy 24/7 as demand requires. Such infrastructure will also be cheaper to build than new coal-fired generation and it will reduce energy prices to the consumer. Plus it will generate jobs and growth on a long term basis.

18. My view is that the only thing standing in the way are “compromised politicians” who refuse, for the reasons stated, to drag themselves into the 21st century.

Utility-scale battery storage

The Tesla Big Battery next to the Hornsedale Wind Farm, Jamestown, South Australia

NEON [means - new energy] is a French renewable energy developer. In December, 2017 they installed a 100MW/129MWh battery which was at that time the largest battery in the world. <http://reneweconomy.com.au/tesla-big-battery-outsmarts-lumbering-coal-units-after-loy-yang-trips-70003/> On 25.08.2018 a single lightning strike took out two major circuits on the main transmission line linking NSW and Queensland. The Tesla big battery was the quickest to respond and showed a versatility un-matched by any other asset, and its efforts ensured that South Australia's was the only state grid not to suffer widespread losses or operate in an insecure state, despite its high share of renewables. **Point two** is that Australia's ageing and slow-moving legacy assets reacted poorly, and it is increasingly clear that they are going to create headaches for the market operator as it manages the energy transition, and seeks to perform the energy equivalent of the shift from analogue to digital. **Three:** new technologies such as wind farms and rooftop solar inverters are also throwing curve balls, with unexpected responses to different situations. **And four;** the market operator and the rule-maker need to act quickly and decisively to bring in rules that are useful to the latest technology, and not those of the last century.

<https://reneweconomy.com.au/how-the-tesla-big-battery-kept-the-lights-on-in-south-australia-20393>

February, 2020 - Neoen on Friday released a report by energy consultancy Aurecon on the Hornsdale Power Reserve – which at 100MW and 129MWh remains the biggest lithium-ion battery in the world – and found that the money it saved consumers in 2019 jumped to \$116 million, from \$40 million in 2018. And it has paid handsome dividends in terms of grid security, and helped rethink the role that batteries – once demonised by prime minister Scott Morrison as about as useful as a big banana – can play in Australia's transitioning grid. Almost all of the savings delivered by the Hornsdale battery came from its role in frequency and ancillary control markets, a key part of network security that had previously been the domain of fossil fuel generators, so much so that in South Australia these fossil fuel generators controlled the market like a cartel. <https://reneweconomy.com.au/hornsedale-big-battery-doubles-savings-to-consumers-and-keeps-lights-on-85139/>

March, 2020 - The 100MW/129MWh Hornsdale battery will add more strings to its bow when the 50MW/64MWh expansion is completed and commissioned within the next few months, offering new services such as “inertia” and “grid forming” inverter capacity which could play critical roles as more renewables enter the market. <https://reneweconomy.com.au/tesla-big-battery-lifts-profits-by-one-third-in-2019-expansion-on-track-24667/>

South Australia x 4

Hornsedale Wind Farm Jamestown, SA

Lake Bonney Wind Farm Millicent, SA

<https://reneweconomy.com.au/infigen-says-lake-bonney-battery-now-in-full-production-28087/>

<https://reneweconomy.com.au/south-australia-big-batteries-earn-1-million-over-two-days-21661/>

<https://reneweconomy.com.au/infigen-says-lake-bonney-battery-going-well-but-government-hindering-investment-62886/>

<https://reneweconomy.com.au/infigen-says-new-big-battery-offsets-huge-losses-from-wind-farm-shut-down-82380/>

Dalrymple North substation Yorke Peninsula, SA

<https://reneweconomy.com.au/south-australias-second-big-battery-goes-live-charges-up-62452/>

Lincoln Gap Wind Farm Port Augusta, SA

<https://reneweconomy.com.au/australias-first-unsubsidised-big-battery-installed-in-south-australia-36450/>

Small business projects

Sundrop Tomato Farm Port August, SA [completed Oct, 2016]

<https://reneweconomy.com.au/sundrop-farms-sells-solar-tower-powered-greenhouse-business-16995/>

SA water desal plant Adelaide, SA

1414 Degrees company

[Silicon storage]

Pepe's Duck Poultry Farm South Australia

Glenelg Wastewater Treatment Plant, SA.,

<http://reneweconomy.com.au/1414-plans-two-gigawatt-hour-silicon-storage-plants-s-75504/>

<https://onestepoffthegrid.com.au/australian-poultry-farmer-taps-homegrown-silicon-energy-storage-solution/>

<https://reneweconomy.com.au/1414-launches-biogas-energy-storage-system-at-wastewater-plant-73082>

<https://reneweconomy.com.au/1414-picks-up-port-augusta-solar-tower-project-plans-huge-thermal-storage-plant-22559/>

1414 Degrees company

Proposed

TESS silicon battery on the old Aurora Solar Tower project site,

Port Augusta

[bought the rights held by SolarReserve for this project site]

<http://reneweconomy.com.au/1414-plans-two-gigawatt-hour-silicon-storage-plants-s-75504/>

<https://onestepoffthegrid.com.au/australian-poultry-farmer-taps-homegrown-silicon-energy-storage-solution/>

<https://reneweconomy.com.au/1414-launches-biogas-energy-storage-system-at-wastewater-plant-73082>

<https://reneweconomy.com.au/1414-picks-up-port-augusta-solar-tower-project-plans-huge-thermal-storage-plant-22559/>

**Projects proposed by Sanjeev Gupta
and his companies
GFG Alliance & Simec Energy Australia**

May, 2019 - [1] 280 MW Cultana Solar Farm, [2] 100 MW battery [3] Pumped Hydro facility, all next to his Whyalla, SA., steelworks.

<https://reneweconomy.com.au/gupta-chooses-suntech-for-cultana-solar-farm-and-big-battery-project-86932/>

<https://reneweconomy.com.au/gupta-wins-approval-for-playford-big-battery-key-part-of-ambitious-solar-plan-93431/>

Victoria x 3

Ganawarra Solar Farm

Kerang, n/w Victoria

<https://reneweconomy.com.au/gannawarra-battery-project-shows-how-new-technologies-outpace-regulations-79467/>

Ballarat Energy Storage System

Ballarat, Victoria

<https://arena.gov.au/projects/ballarat-energy-storage-system/>

Bulgana Wind Farm - Energy Hub

Stawell, Victoria

[Nectar Farms]

<https://www.energy.vic.gov.au/renewable-energy/bulgana-green-power-hub>

<https://www.cleanenergycouncil.org.au/news/a-shining-example-of-the-revitalising-potential-of-clean-energy-for-regional-australia>

Small business projects

Priest Bros Apple Farm

Pakenham, Victoria

<https://reneweconomy.com.au/australian-vanadium-battery-plans-boosted-by-federal-grant-50937/>

<https://onestepoffthegrid.com.au/victoria-apple-farmer-taps-vanadium-flow-battery-to-better-harvest-the-sun/>

Meredith Dairy

Meredith, Victoria

<https://onestepoffthegrid.com.au/victorian-dairy-quits-grid-turns-to-solar-power-and-vanadium-flow-battery/>

RayGen Mushroom Farm [CST] Newbridge, Victoria

<https://reneweconomy.com.au/arena-backs-raygen-solar-tower-technology-with-4-8m-investment-32223/>

September, 2018 - Like other concentrated solar technologies, PV Ultra works using a field of mirrors that track the path of the sun and focus its light onto a receiving tower. But from there, the technology does things a little differently. “What we do that’s different, is that we have a PV panel, using very high efficiency PV cells, atop the tower so we convert the light directly to electricity,” says RayGen’s head of sales, Will Mosley. “And then because we have to actively cool this panel (using water), we generate heat (hot water) as a byproduct.”

The technology certainly has its fans – including the Australian Renewable Energy Agency. It has won two ARENA grants: one for \$2.9 million in 2016 to develop a pilot project in Victoria; and another \$4.8m just over a year ago, to boost manufacture and commercialisation of its PV Ultra product.

<https://onestepoffthegrid.com.au/raygen-adds-heat-pv-ultra-product-join-gas-displacement-market/>

March, 2020 - The company behind the technology, RayGen Resources, said on Thursday it had locked in \$3 million in funding from ARENA, to test the technical and commercial feasibility of its concentrated solar and thermal storage technology – or “solar hydro” – that uses mostly mirrors **and water to generate power and heat**. The flagship project will deliver 4MW of solar generation and 3MW/50MWh (17 hours) of storage that RayGen says will be able to supply the grid with “day-night renewable electricity” and support grid reliability.

The project would also be able to supply synchronous power where it is critically needed in the West Murray region, a notoriously “weak” area of the national grid that has seen the output of five solar farms cut by half and dozens more projects warned of delays to both commissioning and connection approvals. “RayGen’s flagship 4 MW/50 MWh plant is expected to offer storage at a fraction of the cost of recent battery projects,” said RayGen CEO Richard Payne in a joint statement with ARENA.

<https://reneweconomy.com.au/world-first-solar-hydro-plant-in-victoria-gets-backing-from-arena-50353/>

April, 2020 - Melbourne-based solar plus storage developer RayGen Resources says it has brought in international solar project developer Photon Energy as a minor equity partner, and has plans for a huge 100MW/1,000 MWh solar plus storage project. Photon Energy’s CEO Georg Hotar said: “Our investment in RayGen is our first step into the upstream segment of the solar industry and it comes at a crucial time,” Photon Energy CEO Georg Hotar said in the statement.

“The elimination of solar energy’s intermittency and ensuring its 24-hour availability at grid-competitive cost is the holy grail and RayGen has found it.

“Our partnership with RayGen will enable us to address a vast new universe of opportunities both on-grid as well as in off-grid remote locations including islands.” Michael Gartner, the head of Photon Energy in Australia, said RayGen’s PV Ultra solar module had proved itself as the most efficient way to convert solar energy into electricity. “Combining high efficiency concentrated PV generation with thermal absorption and storage, it achieves the highest energy density of any solar technology available today.”

RayGen CEO Richard Payne says moving toward 100 per cent renewable energy will require storage solutions **that can store power cost-effectively for hours, days or weeks** and be deployed at large scale around the world. “With the calibre of Photon Energy’s team and their breadth of experience with developing and operating solar projects worldwide, RayGen’s technology can soon be operating across a range of countries and sectors, helping to make the shift to renewable baseload power a reality,” he said.

<https://reneweconomy.com.au/raygen-signs-up-global-developer-photon-plans-huge-1000mwh-solar-storage-project-49328/>

April, 2020 - ARENA is providing \$3 million in funding for the RayGen solar energy storage technology trial in [Victoria’s north-west](#). RayGen will undertake a technical and commercial feasibility study for a 4 MW / 50 MWh ‘solar hydro’ power plant.

The Melbourne-based clean tech company plans to build the plant at Carwarp, near Mildura. AGL and GHD are partnering on the first stage of the \$6 million project, which is on track to be shovel-ready by the end of the year and operating in 2021.

<https://arena.gov.au/blog/raygen-solar-energy-storage-technology-victoria/>

Queensland x 2

Lakeland Solar & battery storage - Cooktown, North Queensland

<https://reneweconomy.com.au/why-lakeland-solar-battery-could-be-world-leader-in-battery-storage-95287/>

Kennedy Wind & Solar Park - s/w of Townsville, North Queensland
43.5 MW Wind / 15 MW Solar / 4 MW Tesla battery.

<https://reneweconomy.com.au/kennedy-solar-wind-battery-project-stuck-in-connection-doldrums-92265/>

<https://reneweconomy.com.au/windlab-told-to-wear-costs-of-kennedy-project-delays-in-key-ruling-for-renewables-industry-54041/>

3 proposed projects - [being 1 battery, 1 pumped hydro & 1 gigafactory]

Wandoan Battery, Queensland [Coopers Gap]

450 km inland and west of the Sunshine Coast.

Proposed:- 100MW / 150MWh battery plant.

Vena Energy – AGL have contracted to use the battery for their Cooper Gap Wind Farm

<https://reneweconomy.com.au/energy-insiders-podcast-australias-biggest-unsubsidised-battery-35586/>

Kidston Pumped Hydro facility, North Queensland

Genex Power already operates a 50MW Solar Farm at the old Kidston Gold Mine site

Proposed: a 250MW pumped hydro facility with eight hours of storage, and later to add up to 270MW more solar and a wind farm of up to 150MW.

<https://reneweconomy.com.au/genex-gets-loan-reprieve-for-kidston-pumped-hydro-project-63393/>

<https://reneweconomy.com.au/australias-first-pumped-hydro-project-in-40-years-gets-green-light-74509/>

Gigafactory – battery manufacturing plant, Townsville, Northern Qld

Magnis Energy / C4V LLC New York / Boston Energy & Innovation

Proposed: 18 GWh lithium-ion battery manufacturing factory

<https://www.pv-magazine-australia.com/2019/10/03/townsville-battery-gigafactory-reaches-new-milestone/>

New South Wales

[7 proposed – being 6 battery & 1 pumped hydro]

Proposed -AGL signs a deal for 4 x Large scale batteries in NSW

4 x **50MW/100MWh** batteries

Australian renewable energy company **Maoneng**

<https://reneweconomy.com.au/agl-signs-huge-battery-storage-deal-hails-dawn-of-battery-age-32169/>

Proposed - Solar Farm and battery - east of Uralla in the New England area NSW

720MW solar farm and a 400MWh battery

UPC/AC Renewables

<https://reneweconomy.com.au/massive-720mw-new-england-solar-farm-gets-final-green-light-85109/>

Proposed – Wollar Solar Farm and battery – between Denman & Mudgee NSW

290mw solar farm and a 30MW/30MWh battery

Wollar Solar Developments Pty Ltd

<https://reneweconomy.com.au/major-solar-farm-and-battery-approved-for-new-south-wales-coal-country-17428/>

Proposed – Oven Mountain - Pumped Hydro facility, bet Armidale & Kempsey, NSW.,

600mw / 7,200 MWh – with 12 hours storage - an “off-river” reservoir, 600 metre height difference, 2.5 klm apart

<https://reneweconomy.com.au/new-england-pumped-hydro-study-gets-boost-with-arena-funding-32603/>

The NSW Government legislates to allow for stand-alone Big Battery projects

April, 2020 - The New South Wales government has amended legislation to allow for stand-alone battery storage systems, a move that it expected to pave the way for multiple big batteries that no longer have to be co-located with a wind or solar farm, or other generator.

Qiao Han, vice president at Maoneng, said the change in legislation “is really going to accelerate BESS (battery energy storage systems) development in NSW, so that assets like Liddell can be properly displaced when the time comes.” [56]

<https://reneweconomy.com.au/nsw-amends-planning-laws-to-pave-way-for-stand-alone-big-battery-projects-24268/>

AGL claim that the lower cost of Big Batteries places them at a “tipping point”

February, 2020 - Australian energy utility AGL says the falling costs of battery storage puts the technology at a “**tipping point**” in the Australia market, but has warned that “only the best” large-scale renewable energy projects are likely to go ahead in coming years because of the increased costs and complexity around connections.

<https://reneweconomy.com.au/agl-says-batteries-at-tipping-point-but-renewables-choked-by-connection-woes-69591/>

WA Government paves way for Renewable Based “Stand-Alone-Power systems” and “distributed storage” microgrids

April, 2020 - The bill – the [Electricity Industry Amendment Bill 2019, which passed through parliament this week](#)– is designed to smooth the path for Western Power, the state’s main network supplier, to install stand-alone power systems for individuals, or as part of a bigger micro-grid, to lower the increasingly exorbitant cost of maintaining existing or building new power lines to remote customers.

Western Power has identified up to 15,000 customers that it could take off the grid by providing local renewable power combined with battery storage and back-up generation. And there are thousands more it believes it can serve with a “thin-wire”.

<https://reneweconomy.com.au/w-a-paves-way-for-more-stand-alone-power-systems-and-distributed-batteries-66554/>

Australian Energy Market Commission [AEMC] “Reliability Panel” raises concern about climate change and the impact of severe weather events on reliability – It states that large-scale battery systems have proven highly valuable in efforts to maintain secure supplies of power.

March, 2020 - “As the number and range of weather events such as prolonged extreme temperatures, cyclones and bushfires increase as a result of climate change, the challenge of maintaining the secure operation of the power system will grow,” the reliability panel said. “The Panel notes that climate change already casts significant uncertainty over the stability of this power system operating environment, and will continue to do so into the future.”

However, the panel was also optimistic that emerging technologies, including the growing amount of battery storage installed within the Australian energy system, provided a clear opportunity to address reliability challenges.

In recent months, large-scale battery systems have proven highly valuable in efforts to maintain secure supplies of power, including during multiple instances where [South Australia found itself “islanded” from the rest of the National Electricity Market.](#)

<https://reneweconomy.com.au/climate-change-taking-toll-on-reliable-electricity-supply-industry-panel-says-80743/>

US energy giant says “renewables and batteries” beat coal, gas and nukes

The head of NextEra Energy, the biggest and most successful utility in the United States says the energy industry is in the grip of massive change, with the cost of renewables and battery storage – without subsidies – beating gas, as well as existing coal and nuclear on costs.

“We see renewables plus battery storage without incentives being cheaper than natural gas, and cheaper than existing coal and existing nuclear,” Jim Robo, the CEO, president and chairman of NextEra, [told analysts last week at the Wolfe Utilities & Energy Conference.](#)

“And that is game changing,” Robo said. So much so, that renewables would likely replace coal generation in the US within a decade.

<https://reneweconomy.com.au/us-energy-giant-says-renewables-and-batteries-beat-coal-gas-and-nukes-78962/>

New York State announces winners of 21 large-scale solar, wind & storage projects

March, 2020 - The new slate of renewable energy projects – some of which are expected to break ground as early as late-2020, and all of which are expected to be completed by 2024 – include 17 new ground-mounted solar projects totalling 1,090MW, and 40MW of battery storage projects.

The 21 projects are expected to generate over 2.5 million megawatt-hours of renewable energy each year – enough electricity equivalent to powering over 350,000 homes and enough to reduce emissions by more than 1.3 million metric tonnes annually, itself the equivalent of taking nearly 300,000 cars off the road every year.

The new projects will spur over \$US2.5 billion in direct, private investments toward the development, construction, and operation of the projects, as well as the creation of over 2,000 short- and long-term jobs.

[said Alicia Barton, President and CEO, NYSERDA](#). “Building on our success over the past three years, these projects, once completed, will deliver a significant amount of clean, renewable energy to all New Yorkers while helping to grow the state’s green economy. With the impacts of climate change being felt in New York and around the world, moving rapidly to renewable forms of energy is imperative.”

A number of the solar projects awarded procurement contracts are set to measure in at the very precise 19.99MW, however several larger-scale projects were also awarded, including three projects totalling 120MW, 145MW, and 180MW. More impressive still were the two solar projects which will be combined with 20MW of energy storage – the 270MW South Ripley Solar and Storage project and the 200MW Garnet Energy Center.

<https://reneweconomy.com.au/new-york-state-announces-nearly-1-3gw-of-low-cost-new-renewables-storage-75310/>

Engie EPS is focused on microgrids with Giga Storage ie utility-scale storage and large-scale solar plus storage projects

March, 2020 - Its long-term strategic plan, which focuses on three product lines:

- Giga Storage, with utility-scale storage and large solar plus storage projects
- Industrial Solutions, with microgrids and storage systems
- e-Mobility, with innovative charging stations, typically vehicle to grid (and special charging devices leveraging on the Engie EPS intellectual property portfolio)

Engie EPS described several projects it has underway or has completed, among them a microgrid in Lifou, New Caledonia. The three-phase project is aimed at making the island’s energy consumption 100% renewable this year. The Lifou microgrid includes 5 MWh of energy storage, solar PV and wind power, installed in its first two phases. The island plans to add more wind and solar this year.

Microgrid control technology will help stabilize the intermittency of the renewables. When the energy demand is fully covered by the solar or wind production, the energy management system will switch off the island's diesel generators without any risk for the stability of the network, according to [Engie](#) EPS. Engie EPS sees the project as a blueprint for islands worldwide.

The company also cited its microgrid project in the African state of Somaliland, which it said made significant third-stage progress in 2019.

<https://microgridknowledge.com/engie-eps-coronavirus-microgrids/> by Elisa Wood - MicroGrid Knowledge – 20.03.2020

End of list of utility-scale and other battery projects

Economic challenges facing Australia in light of the COVID – 19 pandemic

19. An article in Renew Economy by Michael Mazengarb on 19.03.2020 titled, “Government advisory body tells Morrison to lift his game on climate” <https://reneweconomy.com.au/government-advisory-body-tells-morrison-to-lift-his-game-on-climate-77650/> reports:- The Climate Change Authority has released a [new climate policy toolkit](#), updated following a destructive summer that saw large parts of Australia impacted by bushfires, which outlines how Australia can ensure its future prosperity by embracing low-carbon technologies and economic development, which could strengthen an Australian economy recovering from a series of disasters. Key amongst its recommendations are extending funding for the Australian Renewable Energy Agency and the Clean Energy Finance Corporation, tightening the so-called Safeguard Mechanism that is designed to restrict industrial emissions, and dumping the idea of using surplus Kyoto credits to meet its Paris targets. “The case for countries to move quickly to reduce climate change and adopt measures to build our resilience has never been stronger. The good news is the global shift to low emissions presents many opportunities for Australia,” CCA chair Dr Wendy Craik says.

20. The authority has also detailed how Australia can take advantage of an opportunity to become a leading global clean energy supplier, investing in emerging technologies that will allow Australia to tap into an export market for abundant wind and solar resources, including through the growth of a zero-emissions hydrogen fuel industry. “The Authority is firmly of the view that strong measures to tackle and prepare for climate change will enhance Australia’s economic prosperity. However, the climate is changing at an increasing rate and countries around the world are responding. **Australia must act now or risk being left behind,**” Dr Craik adds in a forward to the report.

21. An article in Renew Economy by Michael Mazengarb on 13.02.2020 titled, “RBA says climate change already having profound impact on Australian economy” <https://reneweconomy.com.au/rba-says-climate-change-already-having-profound-impact-on-australian-economy-38695/> reports:- Reserve Bank of Australia governor Philip Lowe told a gathering of economic and financial leaders in Melbourne on Thursday that while monitoring climate change was not part of the regulator’s core responsibilities, it has been forced to speak

out due to the scale of the financial threat climate change posed. The RBA governor was speaking on a panel at the 7th Australia-Canada Economic Leadership Forum which was chaired by former treasury secretary and head of the department of prime minister and cabinet Martin Parkinson, and who also once served as the head of the department of climate change.

22. Lowe said that the Reserve Bank had been increasing its focus on understanding the impact climate change was having on the economy, and that it was becoming apparent that Australia was particularly exposed to new risks created by a warming planet. “The economic implications are profound. As the world is getting hotter, and the climates more variable, and we’re seeing already in Australia, perhaps more than anywhere else in the world, the effects of that, right now, we’ve got a drought that’s detracting this year a quarter of a per cent from GDP as it has for the last year.”

23. “Climate change is affecting the nature of production in Australia, the nature of investment, ultimately the nature of exports. At the moment, I think it’s affecting confidence of people, and therefore ultimately spending,” Lowe said. “It’s affecting the availability and pricing of insurance because of these extreme weather events, and it’s affecting how we generate and distribute power. So the economic effects of weather related events are really profound. So as the central bank, we’re trying to understand the full dimensionality of those effects.” As an immediate indication of the negative economic impact being caused by climate change, several of Australia’s largest insurance companies recording substantial revisions to their financial performance following a damaging Australian summer featuring fires, storms and flooding.

24. An article in Renew Economy by Sophie Vorrath on 13.03.2020 <https://reneweconomy.com.au/while-we-self-isolate-its-a-good-time-to-reflect-on-the-urgency-of-the-climate-crisis-40666/> reports:- **As Australian governments scramble to formulate the appropriate response to the pandemic proportions of the Coronavirus**, a new report from the Climate Council has reminded us of the burningly urgent need to address that other global crisis, climate change. The report, titled *Summer of Crisis*, says – unequivocally – that Australia’s devastating and unprecedented 2019-2020 bushfire season was fuelled by the climate impacts that are, in turn, being fuelled by the burning of coal, oil and gas.

25. The tourism sector alone, the report says, is set to lose at least \$4.5 billion because of the bushfires, and is estimated to have led to a 10-20 per cent drop in international visitors booking holidays to Australia. The smoke that blanketed Sydney, meanwhile, is estimated to have cost that city \$12-50 million per day, while more than 23,000 bushfire-related insurance claims lodged nation-wide have been totted up to an estimated total value of \$1.9 billion.

26. As for the carbon budget, that was blown out of the water with the fires estimated to have contributed between 650 million and 1.2 billion tonnes of CO₂ into the atmosphere – equivalent to the annual emissions from commercial aircraft worldwide and far higher than Australia’s annual emissions of around 531 million tonnes.

27. “Australia urgently needs a plan to cut our domestic greenhouse gas emissions to net zero and to phase out fossil fuel exports, because we are one of the world’s largest polluters,” the report says. “We are the 14th largest emitter of greenhouse gases globally and emit more per person than any other developed country. “We are also the third largest exporter of fossil fuels ... Clearly, what Australia does matters and the longer we delay, the harder the problem will be to solve. “We cannot call on other countries to take action if we fail to do so. We simply cannot leave this mess for our children to try to fix.” The report is particularly scathing about the federal Coalition government, which it says has ignored repeated warnings from scientists over at least a decade, and more recently from fire and emergency experts about impending bushfire disaster. “Taking action now will provide a chance to stabilise, then eventually reduce disaster risks for future generations.”

28. I submit that every state and territory government backed up by the federal government should throw every resource, including financial, into the transition to a renewable energy future. Renewable Energy infrastructure is here NOW being used and it has proven itself. It is the 21st century power source that offers carbon free energy and massive jobs and economic growth in the immediate future, continuing over the next 30 years. Our governments must paddle onto this economic wave, if not, we will get pummelled in the white-wash, as the rest of the world rides the wave of success, to reap the financial benefits and sustained employment opportunities.

29. The transition from internal combustion engine powered vehicles to electric vehicles has also arrived. Just look at the success of Elon Musk and his corporation Tesla motors. Sales of ICE vehicles have been declining each month over the past 18 months as everyone waits for the price of electric vehicles to be on parity with ICE vehicles. That will occur over the next two to three years at which time the ICE vehicle sales market **will crash overnight**. If we don’t plan for the change then we will get caught out as we did with the bushfires and the COVID-19 pandemic.

30. Electric vehicles have been designed so that they can be used to charge the home as well as the home charging the vehicle. The car batteries will also be used as virtual power plants [VPP] to charge the grid. Hold on tight it’s going to be a great ride.

In summary

31. Utility-scale battery storage has been successfully developed to the point where it is now cheap enough to buy, install and use to support large scale wind and solar projects. Batteries support the grid with firming and frequency control and ancillary services and will eventually replace the more expensive gas-peakers presently used for the same purpose. House-hold PV rooftop solar and household batteries together with electric vehicle batteries will be used in conjunction with the large batteries to support the grid and keep it reliable and stable. All of the various sources of power and storage will be monitored and controlled by smart technology, known as block-chain technology, responding in milliseconds unlike the old technology. Once all the various systems are connected via the smart technology AEMO will have a view of the whole grid in front of the meter and behind the meter in real time. As stated in my first report

the off-grid mining sector is quickly moving to 50% power from renewable energy sources supported by batteries and they will soon be at 100%.

32. As a result of the bushfires and the COVID-19 pandemic many hundreds of thousands of people will be looking for new job opportunities and many large electrical and construction businesses will be looking for projects to build. The renewable energy sector offers hope and opportunity. The only thing standing in the way is a small cohort of compromised, ignorant politicians.

33. The workforce in the coal and gas industry have to be re-skilled to allow them to move across to the renewable energy sector as the coal mines and coal-fired generators are closed down. Gas-peakers presently used on the grid will be replaced by utility-scale batteries. Those now unemployed as a result of the COVID-19 pandemic should be offered training opportunities so that those who desire to, can move into this new and growing sector also.