



# As the crow flies

(Straight to the point)

March, 2020

Some thoughts from Dennis Lambert from Junee Community Power inc.

## 1. How can I make myself carbon negative by 2030?

Build or make our homes energy neutral - the UK requires this of new homes now and all home in 2050

Install solar PV- a no brainer

Energy efficiency- replace items with highly energy efficient ones

Buy green electricity

Buy an electric car charged with green electricity or green hydrogen

Buy carbon offsets for travel

Plant trees

Reduce carbon miles grow some of your own vegies

Reduce plastics, Reduce waste, Compost not landfill

Buy items made from green metals - Apple bought its first load of green aluminium just before

Christmas, Gupta will be making green steel using hydrogen not coal to reduce the iron

## 2. How can remove our historical carbon by 2050 or before I die?

All of the above would be a good start.

The legacy we leave might really start to have an impact. But the later we start the harder it gets both for the individual, the company the nation.

## 3. Invest in some ethical funds and innovative green energy companies.

## POLITICS and POLICY

### [Cristina Figueres is in Australia – always good value. Read more here](#)

Cristina Figueres led the UN Paris Agreement and is still a powerful voice on climate change. This is from a guest article in the SMH.

**‘Be honest Australia, you’re not meeting and beating your climate targets.’**

Optimistic. Prosperous. A country of rare beauty, blessed with abundant natural resources. Australia has all the “golden eggs” needed to position itself as a global leader, to help its Asia-Pacific region leapfrog to a new energy future, and to guarantee Australian prosperity in the process.

Watching this summer’s unprecedented firestorms, I was heartbroken by the sheer scale of the human and ecological tragedy. “This must be the tipping point on climate politics in Australia,” I said to myself. “Surely now the politicians will join hands and forge a bipartisan plan for a better future.”

Instead, the climate wars have returned, driven by a handful of deniers afraid to let go of longstanding vested interests, and given air by powerful media sympathisers and a Prime Minister unwilling to fully embrace the science and stare them down.

### [From Ross Garnaut – CROW has invited him to Wagga later this year](#)

- Professor Ross Garnaut has backed Scott Morrison's plan to protect the economy
- He outlined how Australia could still profit from minerals in a zero-emissions world
- Professor Garnaut says carbon pricing is a "cheaper, faster" way to reduce emissions

The economist said he "strongly endorsed" Prime Minister Scott Morrison's focus on reducing emissions without damaging the economy, and believed Australian industries could still reap the benefits of the country's mineral resources in a zero-emissions world.

As this bushfire season has claimed lives and thousands of homes, [Professor Garnaut has become a focus on the debate around climate change and the Government's response](#).

That is because in 2008 he conducted a widescale review into the impact of climate change on Australia and its economy, and came to a conclusion: the nation would face a more frequent and intense fire season by 2020.

## **We have two Technology Road Maps – [the Government's](#) and [the CSIRO's](#)**

We now have two Technology Emissions Reduction plans. The first developed by the CSIRO in 2017 and a second sketched out by Angus Taylor for the LNP Government last month.

One is targeted, costed and backed up by research. It relies on existing, tested technology along with its likely future development and falling costs. The other gambles on untested, expensive, fossil fuel based technologies that have already wasted billions of dollars producing no results.

Here is the CSIRO roadmap:

"A secure and reliable electricity system based on low emissions wind and solar PV could be possible and cost effective, but technical challenges must be addressed. Maintaining reliability in a system with high wind and solar PV share requires technologies that provide flexibility in matching supply and demand, such as energy storage (e.g. batteries and pumped hydro) and demand response (enabled by smart grid technologies), as well as other approaches such as building excess VRE generation capacity and geographic and technology diversity. Modelling carried out for this roadmap finds that with a mix of battery storage, excess VRE capacity and gas generation, a reliable electricity system delivering 95% abatement in 2050 compared with 2005 levels and VRE share of ~90% is possible at moderate cost (as compared to the no abatement scenario in the figure below)."

And here is the Government's

The Morrison government signalled plans to shift investment from wind and solar to hydrogen, carbon capture and storage, lithium and advanced livestock feed supplements, as part of a "bottom up" strategy to reduce emissions by 2050.

Taylor's speech focused mostly on the sort of technologies that will support fossil fuels. This is exactly what the fossil fuel industry and the right wing vandals in the government and conservative media want to hear.

Absurdly, Taylor is now proposing that the country ignore the cheap emissions abatement options and throw more money at things like carbon capture and storage, that has had more than half a billion thrown at it by the Australian government for no discernible outcome.

The other big focus was on hydrogen, and particularly fossil fuel hydrogen. Taylor was particularly enthusiastic about the Latrobe Valley brown coal hydrogen project, a pilot scheme that [will spend \\$500 million to produce just three, yes, three tonnes of hydrogen](#).

"Whether it's a migration from gas and coal to hydrogen or widespread use of low-cost geological and biological sequestration – it is crucial that we take that approach," Taylor said. There was no mention of "green" or renewable hydrogen.

Which should we go for?

## **SCIENCE**

### **Project Drawdown**

The World's Leading Resource for Climate Solutions

Our mission is to help the world reach "Drawdown" — the point in the future when levels of greenhouse gases in the atmosphere stop climbing and start to steadily decline, thereby stopping catastrophic climate change — as quickly, safely, and equitably as possible.

[LEARN MORE ABOUT DRAWDOWN](#)

## Longer, hotter, drier summers – get used to it.

Australia's summers have lengthened by as much as a month or more in the past half century, exposing people to greater fire and heat extremes and placing ecosystems and farm crops at risk.

Researchers from The Australia Institute analysed data from 70 of the Bureau of Meteorology's weather stations across southern and sub-tropical Australia, where the bulk of the population lives. They found in the past five years, summers were 50 per cent longer than they were in the mid-20th century.

The institute's study compares 1950-69 against 1999-2018 to assess trends. Using historic averages for the calendar starts of each season, such as June 1 for winter and December 1 for summer, the researchers then identify when those temperatures were reached and how long they lingered in the more recent two decades.

They found temperatures that used to mark summer are typically being reached two weeks earlier than December 1 and the warmth associated with the end of February is lasting two weeks longer.

Winter is the season that is shrinking the most, typically starting 12 days later and finishing 11 days earlier. With the background warming from climate change, average temperatures are warmer for every day of the year.

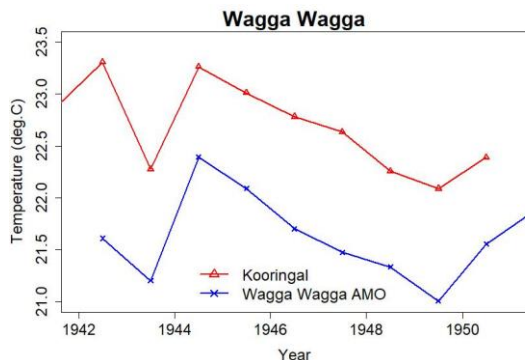
## Remember the name – Jennifer Marohasy on Wagga's weather

I stumbled across this in an American blog written by a distinguished statistician who blogs at Open Mind under the name Tamino.

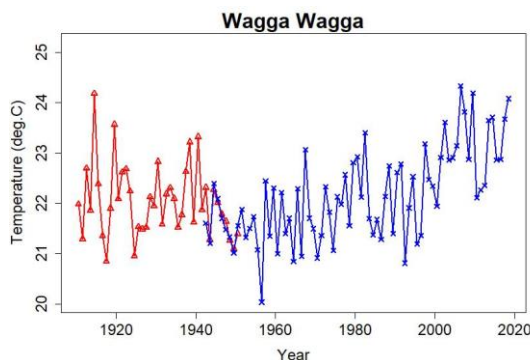
Jennifer Marohasy often falsely attacks the Bureau of Meteorology for sensibly and accurately adjusting temperature records. Apparently she wants them to use the raw figures.

To see how brainless this is read the whole article [here](#).

But the gist of it is that the BoM has had to combine two sets of records, Koorinal from 1910 to 1951 and Wagga AOM from 1942 to the present to get a continuous record of Wagga temperatures. During the 1942 to 1951 overlap the Koorinal station gave readings 1°C hotter than the AOM station. But both stations followed exactly the same pattern:



What BoM does is the obvious and correct thing. It recognises that the two stations, separated by 8 km, consistently differ by a one degree temperature So it extends the AOM backwards by subtracting 1°C from the 1910 to 1942 Koorinal readings to get a continuous series. What Marohasy wrongly insists on is that the consistent difference should be ignored and that the record should show a sudden and unexplained drop in the 1940's temperatures for Wagga.



This second graph is what the BoM gets. The red section is the adjusted Koorinal records. The blue is the AOM record. Marohasy's pointless graph just has two unconnected lines.

Jennifer Marohasy, a biologist rather than a meteorologist, is behind the Alan Jones, Craig Kelly, Malcolm Roberts, IPA etc attacks on the BoM.

As Tamino says: "Jennifer Marohasy is doing everything she can to prevent Australia from dealing with the climate crisis and preparing for the consequences — too many of which have

*already hit. She is one of the sources of misinformation for those who have crippled any attempt to save Australia from the coming (and present) conflagration.”*

## MONEY

### Not sure where to put this but hope it cheers you up

Have a listen to this if you are feeling down about the way things are. Good things are happening (including, in Australia, abandoning the exploration for oil in the Bight, the judgement against more uranium mining in Kakadu and threats to Adani’s coal exports to India.

Click the links to hear good news

What do Amazon, Microsoft, Finnair, Teck Frontier, Lloyds Bank, Equinor and Singapore have in common? Buried in the news so far in 2020, there's been a deluge of good climate change developments around the world, signifying a clear uptick in momentum in the fight against global heating. [In Episode 32, The Angry Clean Energy Guy](#), less angry for once, goes through these positive developments and continues to build on the case for climate optimism made in [Episode 27](#).

### Is a 20:1 dollar benefit from a strong CC policy good enough for our politicians?

In the face of extreme weather events, modelling shows the economic benefits of emissions reduction far outweigh the costs. ... Projects supported by [Climate Council](#) and [MSSI](#) have started to better map out damages in large-dimensional global trade and climate models, giving more finely calibrated measures of the costs of climate change. All up, that gives us total cumulative losses of nearly \$2.7 trillion from climate change. That’s a number that is hard to comprehend (noting that current GDP is roughly \$1.9 trillion and total wealth \$10.9 trillion in Australia), but someone will need to pay for these damages.

We can think of the cost of meeting a Paris Accord Target for Australia for 2050 (roughly 1.8C warming or slightly less, and more aggressive than a [45% reduction](#) in emissions by 2030 compared to 2005), assuming the rest of the world also complies.

That cost is \$122 billion, accounting for the loss in net exports., land-use change, deadweight (welfare) losses and limited negative emissions technology.

**That’s more than a 20 to 1 ratio of the damages from climate change to the costs of emissions reduction!** Even a 10 to 1 ratio would be outstanding. The low cost and the big return stems largely from the [rapidly falling](#) prices of renewables. The switch to renewables lowers electricity prices and labour and capital in fossil fuel industries is largely absorbed into other sectors.

### Australian politics – brought to you by fossil fuels



Every year, Australian governments and their departments spend billions of dollars of your money so that more coal, gas and oil can be extracted and burned. Favourable decisions include:

- [tax-based subsidies](#)
- [direct contributions](#)
- [concessional loans](#) from public financial institutions
- [lax environmental](#) laws and [approvals for disastrous projects](#).

So how has the fossil fuel industry come to enjoy such a cosy relationship with our politicians? A trawl of the latest political donations [data](#), released on 3 February, offers some clues.

#### **Fossil fuel donations up 48%**

In 2018-19, fossil fuel companies donated **\$1,897,379** to the ALP, Liberal and National parties. This was up 48% from \$1,277,933 in 2017-18 (\$968,343 in 2016-17, \$1.03 million in 2015-16). Yet given Australia’s reputation for [woefully inadequate](#) political disclosure and ‘dark money’ donations, the true figure could be 5-10 times higher. Like last year, we found big discrepancies

between what the major political parties disclosed, and how much the fossil fuel companies claimed to have gifted.

## [Rio Tinto to try for carbon neutrality by 2050](#)

Mining giant Rio Tinto says it will invest \$1.5 billion over five years in initiatives to drastically reduce greenhouse gas emissions from its global operations and become carbon-neutral by 2050.

Matching recent pledges by federal Labor leader Anthony Albanese and national carrier [Qantas](#), the Anglo-Australian miner on Wednesday night became the latest global company to set an ambition for "net zero" emissions by 2050, and unveiled the industry's largest carbon-reduction investment to date.

## TECHNOLOGY

### [Goulburn community solar farm adds batteries](#)

Goulburn community solar farm wins grant to add battery storage

By [Sophie Vorrath](#) March 10, 2020

Plans to add battery storage to a 1.8MW community solar farm planned for the NSW Southern Tablelands town of Goulburn will now go ahead after the project secured a \$2.1 million grant from the state government.

Not-for-profit group Community Energy 4 Goulburn (CE4G) said on Tuesday that the grant, part of the NSW government's Regional Community Energy program, would also give certainty to locals who wanted to invest.

The project has come a long way since CE4G was set up four years ago, with the aim of building a 1MW(AC) solar farm that could be co-owned by Goulburn residents for as little as \$400 a share.

In August last year, the group [secured a contract with local outfit Komo Energy](#) for development services of the now-bigger solar farm.

Komo Energy – which was co-founded by occasional RenewEconomy contributor Jonathan Prendergast – said at the time that the deal would see it finalise property, planning and procurement of EPC services for the solar farm, and ready it for community investment.

"Since we started this project, the technology has improved so rapidly that we are now able to build a 1.8MW(DC)/1.2MW(AC) farm instead of 1MW(AC) at less than the original cost," said CE4G president Ed Suttle.

"And because batteries are now an important part in stabilising the grid, the NSW government has seen the advantage of batteries and are supporting the project with this substantial grant."

"We simply would not have been able to include a battery component without the assistance of the (grant)," Suttle said.

### [Solar cell efficiency heading for 30%? – Australian research](#)

Researchers at the Australian National University set a new efficiency world record for 'tandem solar cells', which stack two different types of solar modules on top of each other to achieve dramatic increases in performance.

The researchers believe that the layering of multiple types of solar cells to achieve higher efficiencies could be on the cusp of becoming commercially viable, and commonplace within the next few years.

The research led by a team at the ANU in Canberra started with a conventional silicon solar cell, which is commonly used in most solar panels currently available on the market. On top of the silicon wafer, the researchers successfully layered a perovskite solar cell, which is produced using organic and inorganic materials, rather than silicon wafers, to convert sunlight into electricity.

The two layers are then able to absorb different parts of the light spectrum, maximising the amount of sunlight which is converted into electricity. Working together, the two layers are able to use more of the solar energy reaching the cells, as each work best with lights of different wavelengths.

Many commercially available silicon solar cells achieve a conversion efficiency of above 20 per cent. In setting a new record for 'mechanically-stacked perovskite-silicon tandem cells', the ANU research team were able to use the combined outputs of the two different layers to achieve a conversion efficiency of 27.7 per cent, and are aiming to go above 30 per cent for their next goal.

### Storage technology research hub

The University of New South Wales will host a new research hub that will seek to accelerate the development of new energy storage technologies, and coordinate the efforts of leading Australian researchers in battery, fuel-cell and power-to-gas technologies.

The research hub is being supported by \$3 million in funding provided under the Australian Research Council (ARC) Research Hub for Integrated Energy Storage Solutions. An additional \$8.7 million has been provided through a partnership across 14 organisations involved in the hub, including UNSW, the University of Technology Sydney and Deakin University as well as industry partners including Goldwind.

The research partners will co-operate on the development of new energy storage technologies, identifying both the immediate and long-term needs for energy storage in a global energy system transitioning to renewable energy sources.

### WA gold mine turns to renewables – goes off grid

Hat tip to Grant Adams for finding this report. It is well worth following the link to the report for the amazing photos of the construction process of the wind turbines.

The Agnew gold mine in Western Australia is moving to wind and solar energy.

Key points:

- Once completed, Agnew will be home to Australia's largest hybrid renewable energy microgrid and the first mine site to use wind generation
- The microgrid will have a total power generation capacity of 54 megawatts, including 19MW of gas and diesel, 18MW of wind, 4MW of solar and 13MW of battery storage
- Three of five wind turbines have been installed to date and they are on track to be commissioned by the middle of the year

While the bush landscape surrounding the remote Agnew gold mine, 640 kilometres north-east of Perth, might seem an unlikely setting, wind is not in short supply.

Before construction of five new wind turbines began in January, sophisticated equipment — which shoots sonic waves into the air to measure wind speeds — collected data for 12 months. EDL Energy's Andy Devene, who is overseeing construction of the wind farm, said the turbines are designed to operate in regions like Agnew where the average wind speed is 7.5 metres per second.

Smaller turbines typically start generating power when the wind speed is around 12 metres per second.

Commissioning of the first wind turbines is due to start in the next couple of weeks.

The owners of the Agnew mine, which has been running since the 1980s and was prone to blackouts, expect the decision to take the mine off the grid will likely save millions of dollars a year in lost production.