

Save Our Surroundings (SOS) GENCOST SUBMISSION
To draft consultation documents
2023 Inputs Assumptions and Scenarios Report

Dear AEMO/CSIRO,

Comments on the CSIRO Gencost 2022-23 Consultation Report

It appears to us that the CSIRO report started with the answer and then developed the justification. The conclusion that wind and PV solar works are the cheapest method of electricity generation ignores the real world experiences of every country and jurisdiction that has wind and solar capacities in their energy mix of 30% or more. The LOCE method is a flawed approach.

The following is our support for our comments in the previous paragraph.

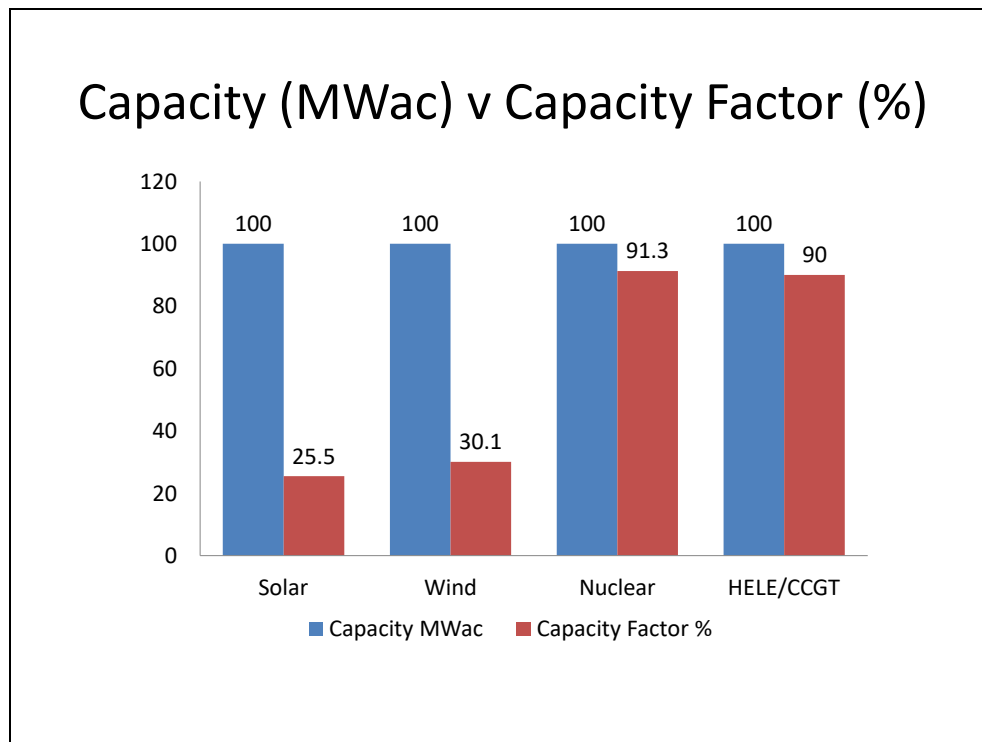
The significant conclusions drawn from nearly four years of ongoing research and input from dozens of affected communities into weather-dependent wind and solar electricity generation, including the required supporting infrastructure for the 70% of time on average annually that wind and solar does not generate any electricity, using new transmission infrastructure, batteries, pumped hydro, biomass, and "green" hydrogen are that:

- Australian governments cannot achieve their stated objectives of reducing global temperatures, significantly reducing electricity prices and creating substantial numbers of jobs. No state or country with a large proportion of wind and solar plants in their electricity generation mix has achieved these objectives.
- The risks to the safety of people and the damages to many domestic and overseas environments are substantial and are being ignored. The risks include life-cycle toxicity, causing serious bush and grass fires, loss of productive farmland, pollution of the environments and abuses of people in developing countries, including children. Globally, 82% of mining areas, including wilderness areas, are now targeted to extract raw materials for "renewables".
- Resources are being misallocated: up to ten times more resources (land and materials) are needed for intermittent and unreliable weather-dependent and weather impacted renewables than for alternatives, such as reliable 24/7 base-load modern coal, gas or nuclear generators. Subsidies, favourable policies and favourable purchase power agreements for renewables distort the market place for other types of energy generation.
- The public are not being told about the many negative aspects of weather-dependent electricity generation or are being misled about the benefits, the costs and the viability of proposed solutions, such as green hydrogen.

Firstly some definitions:

It is important that the reader understand the terms and acronyms used when discussing electrical energy. For example, the net **Capacity Factor** is the **ratio of an actual electrical energy output over a given period of time to the maximum possible electrical energy output over that period e.g. a 1MW wind turbine may produce 2,637MWh in a year out of a possible 8,760 MWh, therefore its capacity factor is $2,637/8760 = 30.1\%$, which is a typical value for modern wind turbines in Australia.** A photovoltaic (PV) solar Industrial Electricity Generating Plant (IEGP) with a rated nameplate capacity of 400 megawatts alternating current (MWac) produces little more than a quarter of the electricity over a year than does a modern HELE coal fired plant or combined cycle gas turbine (CCGT) power plant or a nuclear reactor. The electricity output of a power plant is described

as megawatt hours (MWh). The chart below shows the relative Capacity (MWac) vs Capacity Factor (%) of the main electricity generating technologies.



Estimated or actual annual output in MWh = Capacity factor % x (capacity MWac x 24hrs x 365 days)

Secondly, some basic facts:

- It is estimated from IPCC data that carbon dioxide (CO2) from all human-induced sources, not just electricity generation, is **3%** of the 0.04% of CO2 in the atmosphere. 97% of greenhouse gases (GHG) are naturally occurring, with water vapour being the major greenhouse gas. Australia is responsible for about **0.036%** (i.e. 1.2% of the 3%) of human-induced amount of total global emissions of carbon dioxide equivalents (generally stated as the main driver of global warming) and by signing the Paris Climate Agreement has undertaken to reduce its human related carbon dioxide emissions over time.

However, Australia’s Chief Scientist of Australia, Dr Finkel, told a Senate inquiry in June 2017 that if Australia reduced its **total** carbon emissions to **zero**, that it would do **virtually nothing to reduce global temperatures**. Likewise the CSIRO could not produce to a senate enquiry any scientific evidence that CO2 drives climate change. None of the over 100 climate models based on this "theory" have proven to be accurate and all have estimated higher global temperature increases than actually recorded over recent decades. When SOS, one of 32 witnesses called, pointed out at the House of Representatives hearing into MP Zali Steggall's Climate Change Bills that CO2 is not proven to be a dial for climate change, Ms Steggall disagreed. SOS offered to apologise if she could provide scientific proof that CO2 causes climate change. SOS is still waiting.

Thus, Australia's policies on emissions reductions should be based on logic and practicality. For Australia, electricity consumption is about **33%** of our total energy consumption, i.e. a third of our total CO2 emissions. Restructuring our electricity system can have no affect on our climate, but is significantly negatively impacting our environments and electricity costs.

There is no justification for spending many multi-billions of dollars every year in direct and indirect subsidies for no climate benefit, yet causing higher electricity bills, increasing hardship to Australians, damaging our economy and causing wide-scale damage to our environments, both in Australia and overseas.

[ref: <https://www.facebook.com/SenatorIanMacdonald/videos/1343186319100574/>; IPCC AR4 2007]

- Every country, such as Australia, Germany and Denmark or state, such as California, Texas and South Australia, that have significantly introduced solar and wind technologies into their electricity generation mix have not only significantly increased their electricity prices but also destabilised their electricity grids, which leads to more expenditure on 100% backup, extension of transmission infrastructure, more difficult electricity grid management and more ad hoc unproven "solutions" being pursued, such as the failed geothermal, wave generation and carbon capture experiments already tried.

Doing more of the same thing (i.e. increasing the percentage of weather-dependent renewables) and expecting a different result is totally illogical.

[ref: afr.com/5/8/17/MarkIntell,USEnergyInformationAdministration"]

- The NSW Government in November 2020 declared the Central-West Orana a Renewable Energy Zone (CWO REZ), which was to be an initial **3,000MW** (now increased to 12,000MW) installed capacity "pilot" for several already now declared NSW Renewable Energy Zones. The NSW Electricity Strategy states it aims are to provide low cost electricity to consumers and provide a stable and reliable energy system, while achieving a net-zero emissions target by 2050. *"For households, the Strategy will lead to estimated bill savings of \$40 per year "* by **2040**.

The 2020 average residential bills were: **18-29yo \$1906; 60syo \$1458**. We need to reduce electricity bills by **half or more not a miniscule \$40pa or even AEMO's estimate of \$55pa in 20 years' time**. No country, state or jurisdiction has been able to have a high percentage of renewables in their electricity system mix and still provide cheaper electricity or even a stable or reliable supply. Australians already support renewables through direct and indirect subsidies and other means to the tune of at least **\$1300pa** per household, amounting to over **\$13 billion** nationally, and still growing, each year (in October 2022 it was reported to now be \$22 billion a year by 2030). As of the October 2022 Australian Federal Budget projected that electricity prices are to rise by 20% in 2022 and 30% in 2023. This is on top of a tripling of prices (net of FIT credits) from March 2019 to April 2022 for some NSW residents.

If the renewables subsidies were used to build two or three modern long-life HELE coal-fired (China, India, Japan and others are building hundreds of these right now) or a few combined-cycle gas turbine and/or a nuclear plant (53 nuclear reactors are globally under construction right now) or several of the USA approved Small Nuclear Reactor (SMR) then the average electricity bills should drop by meaningful amounts within in a few years.

[ref: <https://energy.nsw.gov.au/media/1921/> " NSW Electricity Strategy"; afr.com/5/8/17/MarkIntell,USEnergyInformationAdministration"; afr.com/5/8/17/MarkIntell,USEnergyInformationAdministration"; [23/08/20 Report by Dr Moran "The Hidden Cost of Renewables on Electricity Prices"](http://23/08/20ReportbyDrMoranTheHiddenCostofRenewablesonElectricityPrices); ddears.com/2020/07/14/dont-ignore-coal/; world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx Daily Telegraph p2 9/11/20 "Road to cheaper and cleaner power in NSW"]

- Germany and Denmark are regarded as world leaders in transitioning to renewable energy electricity generation, yet in 2020 Germany had the highest household electricity prices in the world at **US\$0.366/KWh** with Denmark at **US\$0.337/KWh**, despite their massive shift to renewables at **46.5%** and **63%** respectively; the world average electricity price in 2019 was

US\$0.14/kWh, Australia was **US\$0.23**. China and India, who generate most of their electricity from burning coal, were each **US\$0.08/kWh**. In 2022 Western Europe, the UK and the USA are in an energy crisis with 400% increases in electricity costs, company failures, energy rationing, fertiliser shortages and food shortages, all expected to worsen during the 2022-23 Northern winter. Australia's electricity cost is expected to increase by 56% by 2024.

The evidence is clear: the more weather-dependent renewables there are the greater the increase the overall cost of electricity supply. How can Australia be competitive when our electricity costs were already three times more than our competition and near trading partners in 2020?

[ref: globalpetrolprices.com "Electricity prices for households, December 2020".]

- For energy generation, wind is an ancient technology and solar cells (invented in 1883 by C Fritz) and the first viable solar panel developed by Bell Laboratories in 1954, are both dilute inefficient and inconsistent forms of energy conversion. The energy density (the amount of energy in mega-joules [Mj] released per kg) of different fuels in increasing order is wood (16Mj/kg), coal (24), oil (45), natural gas(55) and nuclear (3,900,000). The higher the energy density the lower the total demand on all resources and the higher the efficiency in producing electricity. A mega-joule is equivalent to 0.278KWh of energy.

Logically, natural gas and zero emissions nuclear are the preferred fuels at this time.

- A study of Germany's electricity generation found that over their operating life solar and wind have very low energy output compared to the energy used to make and install them. The energy generated by nuclear, hydro, wind and solar was, respectively, **75, 35, 3.9 and 1.6** times greater than the energy required to make them. Wind and solar provide a poor return on an energy in/energy out basis compared with other methods. More energy in means the more emissions created and embedded in the product, especially those sourced from China, which generates the most emissions globally. About 90% of Australia's wind, solar and batteries are made in China.

Logically, nuclear energy should be preferred for electricity generation as it gives the best energy in/out result, causes fewer emissions in its creation and generates zero emissions during its operation. Also, the imbedded GHG in renewables must be taken into account.

[ref: 30/6/20 M Shellenberger "Apocalypse Never" p192]

- Australia is the only country of the top 20 developed countries and the top 'developing' countries (China and India) that do not depend on zero-emissions nuclear power for part of their electricity generation. There are currently about **53** nuclear power reactors under construction, mainly in China, India, Russia and UAE.

Australia is being left behind due to its illogical and damaging ban on nuclear energy.

[ref: [World Nuclear Association](https://www.world-nuclear.org) "Plans for New Reactors Worldwide" September 2020]

- California at the end of 2019 had 13 in-state sources of electricity (excludes over 30% imported from interstate). Its installed capacity (MW) was PV solar **14.1%**, wind **7.5%**, natural gas **50.6%**, nuclear **3%**, hydro **17.6%**, others **7.2%**. California, America's most populous state, is among the most expensive states for electricity and its electricity prices have increased at five times the average rate of the rest of the USA as they move each year to higher percentages of "renewables" and elimination of fossil fuels and nuclear power sources.

Again, gas and nuclear should be the preferred power sources for Australia, especially as they do not involve major changes to the electricity grid or place huge demands on scarce resources as do weather-dependent renewables.

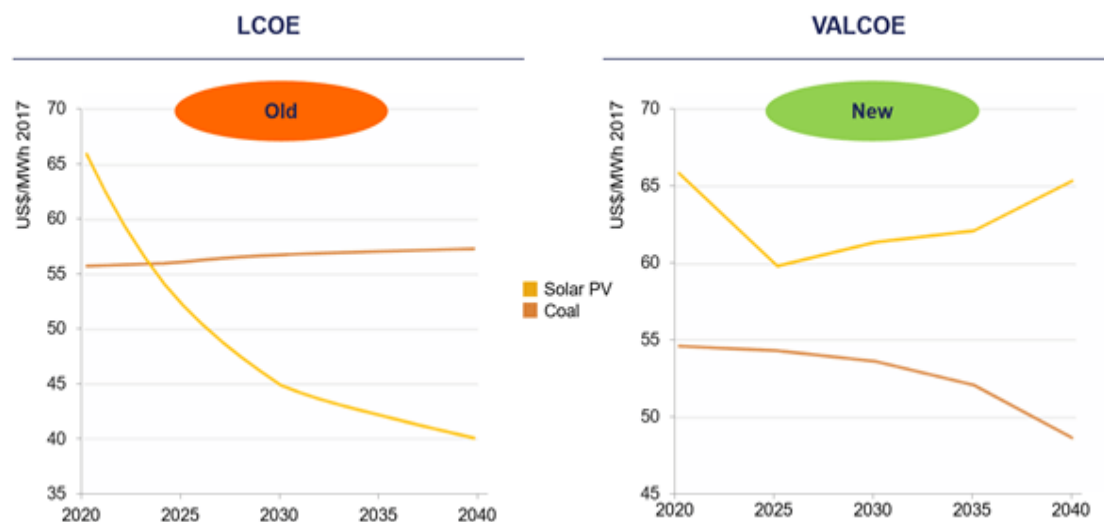
[ref : 2001-2019 www.energy.ca.gov "Electric Generation Capacity and Energy"]

Provide the cheapest sources of electricity generation?

The claim that wind and solar electricity generation is the cheapest method to supply Australia with electrical energy is not supported by the facts, and actually the opposite is true based on real world experiences, such as:

- The **Levelised Cost of Electricity (LCOE)** measure used in the popular press and by most governments is misleading. The still incomplete, but better, **Value-Adjusted LCOE (VALCOE)** from the **IEA** was first published in 2019. In January 2020 the prestigious Institute of Energy Economics Japan (IEEJ) published its 280-page 'IEEJ Energy Outlook 2020' and raised concerns about renewables' rising unaccounted-for integration costs, concluding that LCOE is not capable of capturing the true cost of wind and solar. Comparisons of alternate costs using VALCOE helps explain why electricity systems that have significant weather-dependent renewables in their mix always result in higher electricity prices than those that don't.

[ref: Oct 2020 Dr Lars Schernikau "The truth behind renewable energy"; www.iea.org/data-and-statistics/charts/levelised-cost-of-value-adjusted-lcoe-valcoe-for-solar-pv-and-coal-fired-power-plants-in-india-in-the-new-policies-scenario-2020-2040]



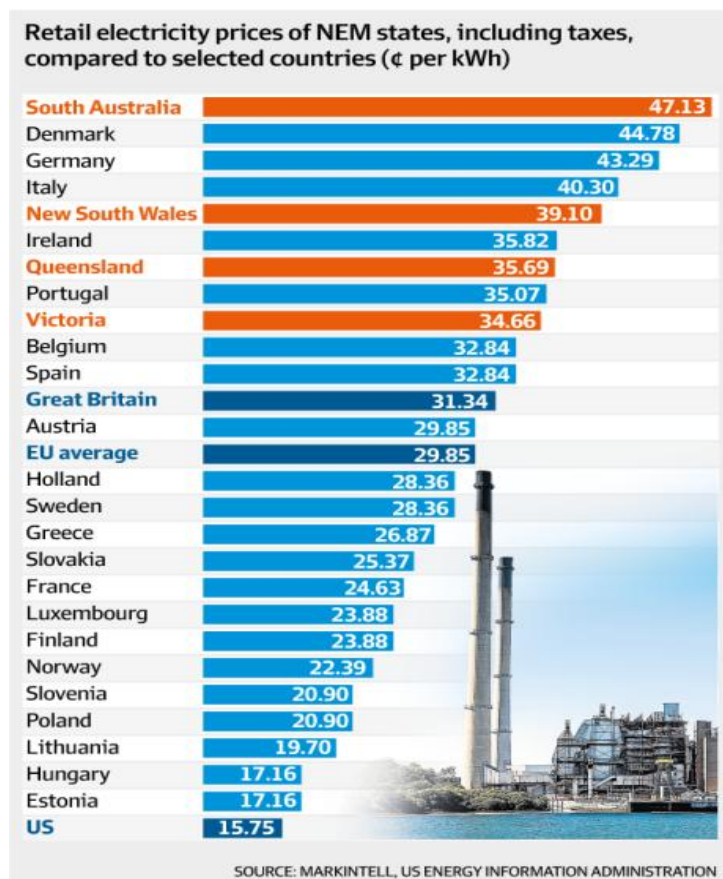
IEA chart

- In South Australia, Wholesale Electricity prices increased from an average of **\$52.60 to \$109.80/MWh** when the Northern power plant was closed in 2015 and, in Victoria, on the closure of Hazlewood power plant in 2017 from **\$51.50 to \$97.90/MWh**. After the coal-fired Liddell Power station in NSW closed just one of its four turbines in 2022, wholesale electricity prices rose sharply. Liddell is scheduled to close operation completely during April 2023. If coal-fired power stations are claimed to be more expensive than solar and wind, why do average wholesale prices rise when they are closed down or policies applied that reduce their efficiency?

[ref: "Life-cycle energy densities and land-take requirements of various power generators: A UK perspective: 18/02/2016]

- A comparison of retail electricity prices emphasises the disadvantage Australia has already created for itself with its high penetration of weather-dependent renewables. The more weather-dependent renewables the higher the electricity costs. A study of retail electricity prices in cents/KWh shows that in 2017 Australia's four NEM states ranked in the top nine highest electricity prices in the world, namely: **South Australia 47.13**, Denmark 44.78, Germany 43.29, Italy 40.30, **NSW 39.10**, Ireland 35.82, **Queensland 35.69**, Portugal 35.07, **Victoria 34.66**. In 1990s Australia had the lowest electricity prices in the world. Closing coal-fired power stations and substituting them with renewables has contributed to the increased rise.

[ref: afr.com 5/8/17 "MarkIntell, US Energy Information Administration"; Oct 2020 Dr Lars Schernikau "The truth behind renewable energy"; www.statista.com/statistics/263492/electricity-prices-in-selectedcountries/ 2018]



- In 2019 Germany's electricity production mix was **24.6% wind, 9.0% solar**, 8.6% biomass, 3.8% hydro, 29.1% coal, 10.5% gas, 13.8% nuclear, resulting in the highest household electricity price of any country in the world at **US\$0.381/KWh**, despite 46.0% (**33.6% wind and solar**) generated from renewable sources. This pattern of substantial increases in electricity prices appears to occur in all countries and states that have significantly increased their reliance on weather-dependent renewables.

[ref: www.ise.fraunhofer.de/news January 15 2020, p2; globalpetrolprices.com "Electricity prices for households, December 2019"; Oct 2020 Dr Lars Schernikau "The truth behind renewable energy"]

- In 2019 Denmark's electricity production mix was **57% wind, 3% solar**, 20% biomass, 20% fossil fuels, resulting in the second highest domestic electricity price in the world at **US\$0.361/KWh**, despite **60%** generated from weather-dependent renewable sources. This pattern of substantial increases in electricity prices appears to occur in all countries and states that significantly increase their reliance on weather-dependent renewables.

[ref: globalpetrolprices.com "Electricity prices for households, December 2019";

https://en.wikipedia.org/wiki/electricity_sector_in_denmark]

- In 2019 Australia's electricity production mix included **21%** of renewables, mainly from roof-top solar systems, and its average domestic electricity price was **US\$0.246/KWh**. This already puts Australia in the high end of world prices. In 2019 the global average electricity price was only **US\$0.14**. China and India, who both predominately use coal-fired electricity generation, were only **US\$0.08/KWh**. This pattern of substantial increases in electricity prices appears to occur in all countries and states that significantly increase their reliance on weather-dependent renewables. What should Australia's target price be for, say, 2025? [ref: globalpetrolprices.com "Electricity prices for households, December 2019"; 26/05/20 energy.gov.au/publications " Australian statistics table O electricity generation by fuel type 2018-19 and 2019]
- It is often stated that renewables put downward pressure on wholesale prices. However, what the consumers are interested in is what they have to actually pay for their electricity. The previous analysis shows that no country or state with a high proportion of renewables has achieved lower electricity prices. This diagram from the NSW Energy website shows why:

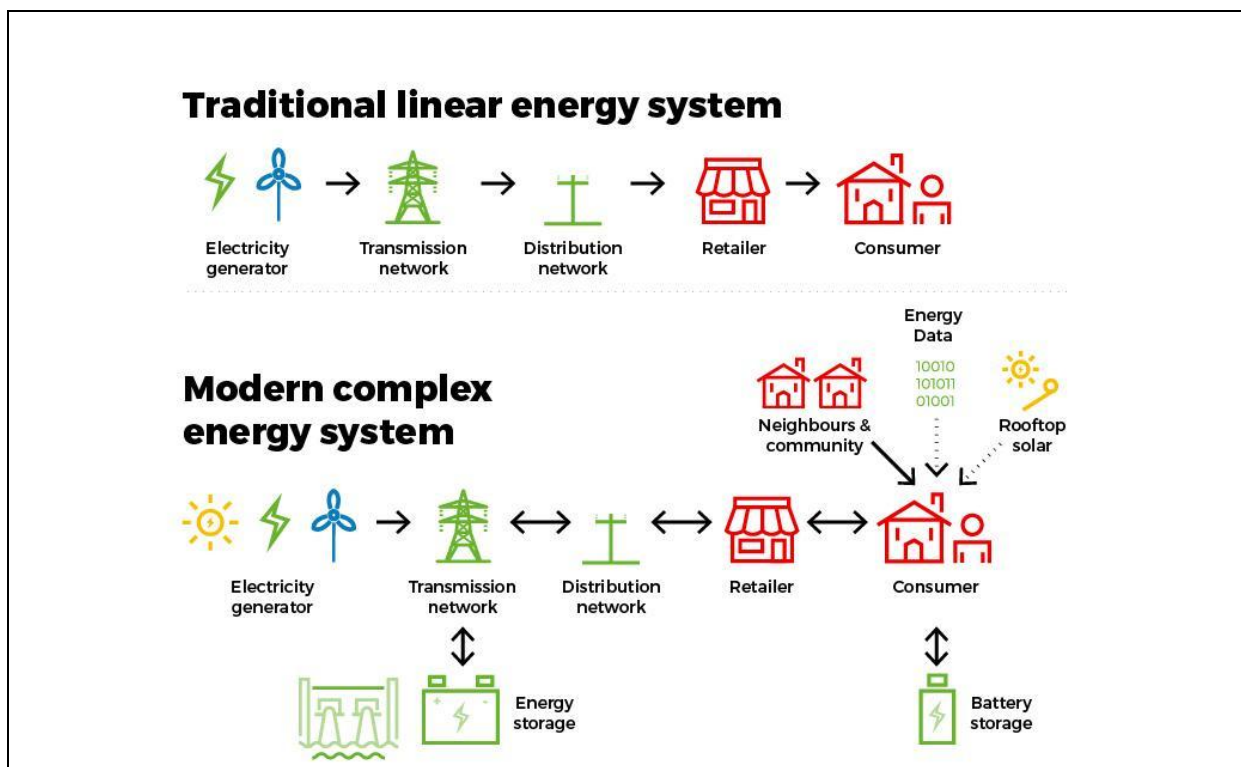


Diagram from NSW Energy 18/12/20 [Renewable Energy in NSW | Energy NSW](#)

- Complexity adds cost and risk. Weather-dependent renewables cannot provide the electricity to run our society. They have to be augmented with: expensive pumped hydro, of which Australia has virtually none; prohibitively expensive batteries that have to be charged daily, so requiring even more wind and solar plants and unrealistically continuous favourable weather; upgraded or new transmission lines and infrastructure, specifically to accommodate wind and solar generation; very much more difficult management of an unstable and complex system, something in which Australia has little experience. Since issuing the first SOS Research Paper in November 2020 a lot more has occurred that shows electricity prices must continue to increase, not decrease. UK, Western Europe, USA all face a bleak 2022-23 winter as electricity prices and power shortages were rising well before 2022, but rose many-fold in 2022. Australia's AEMO had to suspend the spot market for

wholesale electricity in June 2022 because of soaring prices and to avoid wide-spread blackouts.

[Ref: [AEMO suspends NEM Wholesale Market | energy.gov.au](#); [Renewables subsidies: \\$22 billion by 2030 | The Spectator Australia](#)]

- Wholesale prices are claimed to be reducing, but the retail costs are rising because of increased infrastructure costs (e.g. Tas-Vic underwater cable > \$1b), massive subsidies (\$13B in 2019 or 39% of household electricity bills), financial support and favourable regulations (\$22 billion yearly by 2030), massive losses and write-downs and enormous cost blow outs (e.g. Snowy 2.0 \$2B to \$10B and growing, NSW-SA interconnector \$1.35B to \$3.32B before its even started) have to be recovered from the consumer or taxpayers. In NSW, each landholder, over which new transmission lines will cross their land, will get paid and indexed \$200,000/km over 20 years. In addition, each landholder will get a one off compensation payment for compulsory purchase of easements. Over 28,000km of new high voltage electricity transmission lines is now anticipated at a 2022 Federal Budget cost of \$80 billion. Add to this the failure in 2018 of RC Tomlinson, with a loss of 3,400 jobs. In addition, shareholders in Origin Energy and AGL, both ASX listed companies, have seen nearly 50% falls in the value of their shareholdings in less than 12 months. Both Origin and AGL had losses due to write-downs against profits. AGL wrote off over \$2.8 billion on a wind electricity generation contract. Ultimately the consumer pays for all these extra costs. [Ref: [the HIDDEN COST OF CLIMATE POLICIES AND RENEWABLES \(regulationeconomics.com\)](#) ; [Renewables subsidies: \\$22 billion by 2030 | The Spectator Australia](#); [Snowy 2.0 emerges as \\$10 billion white elephant \(smh.com.au\)](#); Daily Telegraph "Powerful Incentive for Pylons" p16 25 Oct 2022; <https://www.sgst.com.au/news/is-it-time-for-an-adult-conversation-about-nuclear-power> 28 Oct 2022]
- A NSW resident was advised by EnergyAustralia in January 2020 to justify their 11.9% increase in the usage and supply rates were because "...supply costs have increased significantly" and in January 2021 the Feed-in Tariff rate was again reduced because "...there's more solar-generated energy going back into the grid. This has reduced the wholesale price of energy going back into the grid during the day when the sun is out.". More wind and solar IEGPs may well reduce wholesale prices during some parts of a day and on some days but it is the consumer and taxpayer who ultimately gets slugged. This has been the case throughout the world.
- The NSW Electricity Infrastructure Investment Act 2020 became law in November 2020. The Act provides very favourable conditions for NSW weather-dependent renewable developers and operator. Rooftop solar already produces 9% of NSW electricity, at a much lower cost per kilowatt hour than solar IEGPs, compared to only 5% by industrial solar. However, the legislation gives no equivalent guarantees for rooftop solar producers. One typical NSW resident on the outskirts of a rural town paid \$30,000 for a transformer and pole, which the distributor now owns, just to connect to the pole directly on the other side of the road. Several thousand dollars more was spent to get power onto the other side of the fence. More still was spent to connect to the building. Meanwhile, the feed-in tariff was reduced by 24% from March 2019 to January 2021 and by a further 20% in April 2022. Yet for industrial solar operators they get a government guaranteed minimum wholesale price and other favourable payments. The higher production costs and the costly guarantees will add to electricity costs overall and disadvantage the cheaper alternatives, such as rooftop solar, HELE, CCGT and nuclear.
- Energy Australia in 2019/21 increased its household electricity rates by **11.9%** and reduced its rooftop solar feed-in tariff by **24%** for some rural NSW consumers, despite the a nearby PV industrial electricity generating plant becoming operational in May 2019. The reason

given for the increase was "supply costs have increased significantly" despite several solar and wind industrial electricity generating plants (IEGPs) already operating in the Central West NSW region, and which is now declared a NSW Renewable Energy Zone.

[ref: a resident's EA notification of changes to their base rates]

- Energy Australia, which is Australia's third largest retail electricity distributor, did not pay any company taxes for years as they did not generate profits on their **\$30 billion** in revenue during 2013-2017. They also own power stations, mines and wind IEGPs. Electricity prices will have to rise further if profits are to be made. Higher energy costs to their consumers.
[ref: michaelwest.com.au/energy_australia_four_years_30_billion_zero_tax]
- Renewables in Australia have direct and indirect subsidies and loans by various levels of state and federal governments amounting to **\$13 billion a year or \$1300 per household (forecast to be \$22b by 2030)**, yet electricity prices continue to rise and will continue to do so unless base-load power is put in place urgently. To put this expenditure in perspective, the JobKeeper scheme as part of the then Government's response to the COVID-19 pandemic cost \$13 billion to support 3.3 million jobs to the end of June 2020. Just one year's subsidies of **\$13 billion** would pay for three **250MW** dual fuel combined cycle gas-fired power plants to be built every year for the next decade. Such plants are very efficient, flexible, provide base-load power, are quick to build and have low resource demands and CO2 emissions compared with wind and solar IEGPs.
[ref: 23/08/20 Dr Moran "The Hidden Cost of Renewables on Electricity Prices"; smh.com.au 14/06/20 Infrastructure to get \$1.5 billion boost and priority list"; finance.nine.com.au/business-news/agl-to-build-400m-gas-fired-power-plant/0ea6303e-65df-4c8d-b501-0cb52aa0d197]
- Germany faced the prospect of replacing/decommissioning **5,700** (4,500MW of capacity) of its over **29,000** wind turbines in 2021 alone. Decommissioning just one wind turbine, without removing most of the enormous concrete footing, costs about **US\$532,000**, while replacing with a new wind 3MW turbine costs about **US\$3.9 million** plus transport and installation costs. Such frequent decommissioning and replacement costs are not reflected in the kWh price comparisons of renewables electricity against the alternatives using the Levelised Cost of Electricity (LCOE) method. Costing changes in the total electricity system costs is the best way to measure the impact of mixes of renewables and other solutions.
[ref: weatherguardwind.com 24/3/20 "Wind turbine cost: How much? Are they worth it in 2020"; insituteforenergyresearch.org 2/11/19 "The cost of decommissioning wind turbines is huge"; stopthesethings.com 14/11/17 "Kaput!: German Wind Farms set for dismantling as subsidies dry up"; Oct 2020 Dr Lars Schernikau "The truth behind renewable energy"]
- Although electricity is available in a road in a rural NSW town in the centre of the NSW CWO REZ, a new owner had to spend over **\$30,000** to have electricity connected to their small rural property. The extra pole and transformer, which they had to buy, became the property of the NSW government owned electricity infrastructure provider. So the land owner paid for the additional infrastructure, while the renewables local and overseas developers, who get various types of government subsidies, do not contribute to the grid upgrades/construction that are only needed because the installation of weather-dependent renewables create the need for it. These costs of extra infrastructure, which can be for each additional MW of generating capacity, cost **\$275,000/km to \$660,000/km** just for the high voltage transmission lines. Such extra costs are passed onto the consumer, which helps explain why electricity prices rise as more weather-dependent renewables are installed.
[ref: www.transgrid.com.au/news-views/publications/ "Transmission annual planning 2018" p28 Table 14]
- On 4/11/20 it was reported that the estimated cost of the proposed **900km** electricity interconnector between Robertson SA and Wagga Wagga NSW had gone from **\$1.53 billion to**

\$2.43 billion (by September 2021 the cost estimate was \$3.3 billion), most of which will get passed onto mainly NSW consumers.

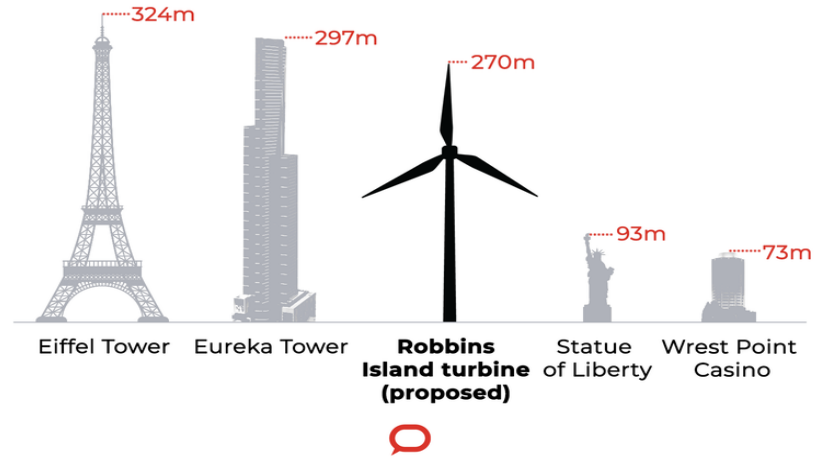
How did Transgrid and ElectraNet get their initial estimate so wrong? Such extra costs are passed onto the consumer, which helps explain why electricity prices continually rise as more weather-dependent renewables are installed.

[ref: <https://www.transgrid.com.au/news-views/publications/> "Transmission annual planning 2018" p28 Table 14; The Daily Telegraph 4/11/20 page 4]

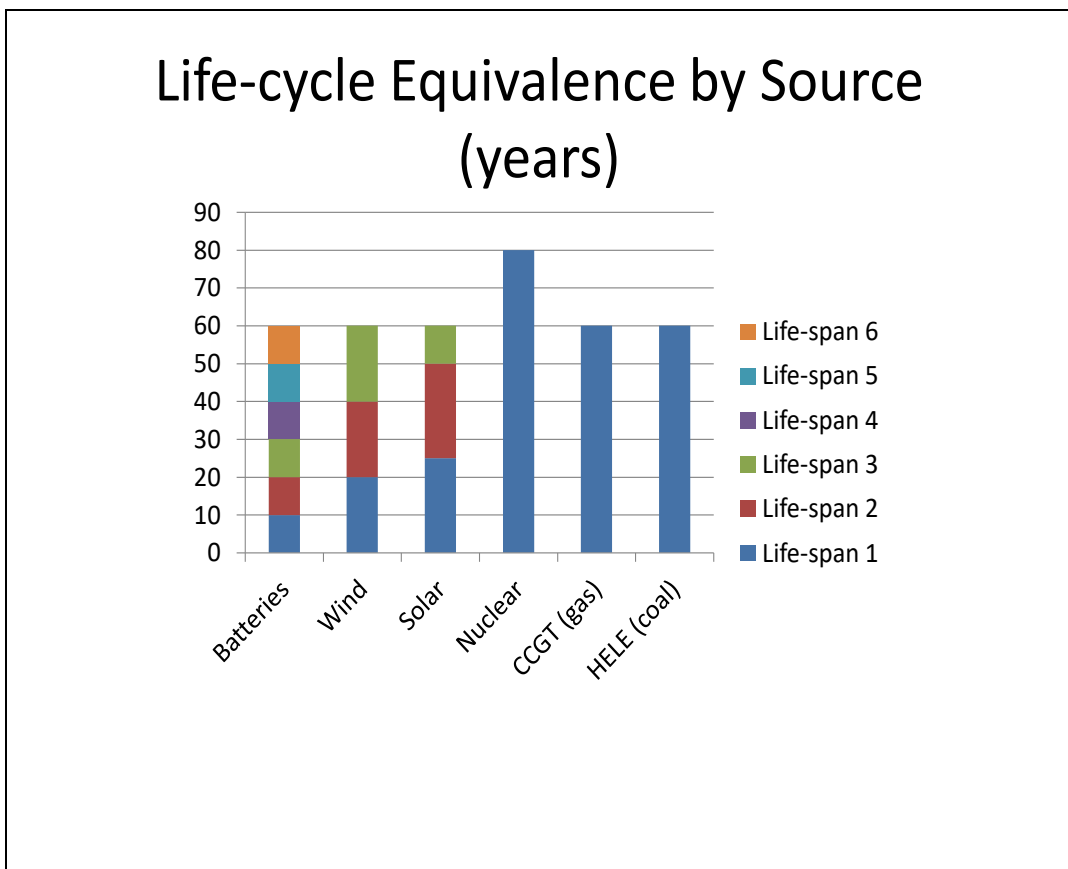
- The relatively short life-cycle of PV solar systems (20 to 30 years) and wind turbines (15 to 20 years) compared to the alternatives of coal, gas and nuclear plants (60 to 80 years) means that a PV solar plant or a wind turbine plant need to be replaced/upgraded 2 to 3 and 4 to 5 times (plus Battery Storage 5 - 6 times) respectively during the lifetime of the alternatives, which generates more costs into the electricity network each time. Over a 60 years period this frequent replacement of solar and wind plants will continue driving up electricity prices for decades to come. One study shows that wind and solar over **60** years is **SIX** times more costly per 1,000MWh than natural gas combined cycle turbine technology.
[ref: 17/08/20 "The excess cost of weather dependent renewable power generation in the USA" from EDMHDOTME]
- While wind turbines are getting bigger and solar panels cheaper to make, as well as more energy conversion efficient, the cost of electricity to consumers is not falling. The reasons for this appear obvious: land acquisition or lease payments, transport and construction costs are increasing, Community Benefit Funds contributions, neighbour compensation payments, frequent repairs due to failures and weather damage, vegetation maintenance, biodiversity offset payments, etc.; 100% duplication by alternate backup generation; inefficient use of base-load coal and gas-fired power plants to backup the grid supply when the renewables outputs are low or zero; rising costs of extending and modifying the electricity grid to connect renewables; increased complexity of managing the grid due to instability caused by renewables' variable output; high level of subsidies even though renewables are a mature industry with over 25 years of field operation; the introduction of high cost, short-life batteries for short-term stabilisation of renewables plant output; frequent replacement of end of life renewable installations and battery backup; high increasing maintenance costs of wind turbines; very high costs of decommissioning renewables plants and disposing of their waste, some of which is toxic.
- For example. The proposed **\$1.5 billion** wind IEGP for Robbins Island and Jim's Plain Tasmania will involve **163** turbines up to 270m tall for a nameplate capacity of up to **900MW**. For the project to go ahead the developer requires to be built: a bridge between the island and the Tasmanian mainland; a **500** metre wharf at the island; **115km** of new 220kV transmission lines; a new substation; the Marius Link Interconnector undersea cable to Victoria at about \$1billion plus. A direct link to Victoria at \$1.5billion to \$2billion would have made the project unviable and so was abandoned by the developer. Yet the Federal Government has included funding for the Marius Link in the October 2022 Budget. The amount of government (taxpayers) subsidies is unknown, however, for another project it was stated as **\$660,000 per turbine per year**. Therefore, the subsidy could total \$1.1 billion over just 10 years. So in reality, the project's viability depends on \$billions being spent by others (i.e. taxpayers and other consumers). No wonder Australia's electricity prices are near the highest in the world and can't come down anytime soon with years' of committed subsidies, which are still growing annually.

[ref: robbinsislandwindfarm.com/projects/; 3/7/20 skynews.com.au/details/_6169082592001 "Taxpayers 'taken for a ride' with subsidised windfarm"; Bing search - pics of wind turbines from theconversation]

The proposed Robbins Island turbine height in comparison



- The following chart graphically displays the relative life-spans of various sources of electricity generation. Each life cycle requires more resources to replace their output and results in more waste each time.



Created by SOS

- C Millis, a USA Carolina state representative was the lead sponsor of [House Bill 745](#), which required proper decommissioning of utility-scale solar plants after they close, reclamation of the land to its original condition within two years, and posting financial guarantees to ensure the work gets done. For example, he said, a 3 megawatt project in Sacramento County, California, cost the owners US\$220,000 to clean up even after they got US\$375,000 for recycled materials. A 20MW solar project in Maryland cost US\$2.1 million to remove *after* off-setting the recycling revenue.
In Central West NSW alone there are several solar plants in place or proposed with capacities ranging from 87MW to 600MW or more where the cleanup cost will be astronomical. No bonds are required or guarantees that restoration will occur. This is another cost that will be borne by the electricity consumer or local rate payers if the company or land holder fails to properly clean up the site.
[\[ref: carolinajournal.com/news-article/environmental-hazard/ "Moore County residents worry about solar's long-term environmental impacts - Carolina Journal"\]](#)
- The Lancet study, as with many other studies over the years, found that **6.5%** of deaths in Australia are due to cold weather while only **0.5%** of deaths are due to hot weather. In 2010-11 over **200 people a day died** during winter because they could not afford to heat their homes. Another study in 2020 by University of Illinois found that 94% of temperature-related deaths were from cold temperatures. High electricity prices cause many people to forego heating, resulting in premature death. In 2018 one charity provided **55,000** winter garments to Australian "families who can't afford to run their heating". Australia must get back to electricity prices near the cheapest in the world, as in the 1990s. Weather-dependent renewables cannot achieve this life-saving goal.
[\[ref: theconversation.com/cold-weather-is-a-bigger-killer-than-extreme-heat-heres-why-42252; theguardian.com/society/2011/oct/22/older-people-cold-energy-bills; Daily Telegraph 9/11/20 editorial p40; Cold-weather accounts for almost all temperature-related deaths -- ScienceDaily \]](#)
- The House Standing Committee on the Environment and Energy launched an enquiry in May 2021 entitled *Federal House Committee on Energy - a new inquiry into dispatchable energy generation and storage capability in Australia*. Save Our Surroundings (SOS) made a submission (sub050) in which it draws attention to many of the issues in the design of a national electricity grid based on projects in NSW near the communities of Gulgong, Wellington, the Riverina, etc, etc., especially increased instability and increased short and long term electricity prices. So far our concerns continue to be validated by actual events.
[\[ref: Submissions – Parliament of Australia \(aph.gov.au\) no. 50\]](#)
- The ACT stated in 2020 that it uses 100% renewable energy. Yet in June 2021 it announced that regulated electricity prices will rise by 12% from July 2021. *"The main reason for the increase in retail prices is the 36.91 per cent increase in network costs..."* The ACT therefore joined the rest of the world in demonstrating that the more renewables the higher the electricity cost. The facts are against the claims that wind and solar electricity generation will reduce electricity prices. It just does not happen.
[\[ref: Electricity shock: ACT prices surge 12 per cent | Canberra CityNews\]](#)
- AMEC proposed in 2021, which is now been regulated, that rooftop solar systems pay to export their excess electricity to the grid from 2025. The AEMC argued a change was necessary because the current system is unsustainable as the huge uptake in household solar has overloaded the grid, and the alternative would mean more solar users being blocked from exporting their energy. Rooftop solar was promoted since 2010 and is installed

on 30% of households in 2022 and growing rapidly due to the ever increasing cost of electricity. It took more than 10 years for our electricity designers to see a problem with rooftop solar producing too much electricity on the sunniest days. Will it take another 10 years for them to see the folly of near 82% intermittent and unreliable wind and solar electricity generation by 2030? The need for more the industrial solar plants is not justified, given that rooftop solar installations are still significantly increasing in number and already produce more electricity on some sunny days at a much lower cost than current industrial solar plants.

[ref: 12/08/21 [Electricity companies get green light to charge rooftop solar owners for exporting power to grid - ABC News](#); 6/6/22 [Labor needs to double the pace of its renewable energy rollout to meet 2030 emissions target. Can it be done? | Energy | The Guardian](#)]

Conclusion

The CSIRO Gencost 2022-23 Report needs a substantial rewrite based on factual assumptions and unbiased analysis.

Prepared by Save Our Surroundings

13 February 2023