Submission on AEMO Draft ISP 2026

The Author

Richard Willoughby is a retired electrical engineer having spent the majority of his working career in the Australian mining industry. In the early-mid 1990s he represented large customers on the first Systems Working Group for the national grid operating system. That involvement followed his contributions to the development of the national grid during Treasurer Keating's Productivity Commission enquiries into the mining and energy sectors in Australia. Willoughby spent the last decade of his working career employed as an engineering risk consultant by the largest global industrial insurance underwriter where he assessed engineering risk at large industrial and construction sites across the globe. During that time he gained deep insight into natural perils including weather extremes and climate.

Summary

South Australia is leading the world in the transition from carbon based fuels to weather dependent generation and has continually offered insights into the hurdles that need to be surmounted to eliminate use of carbon based fuels. South Australia has made steady progress and the future for the region and the national grid is becoming clearer.

Although the draft ISP 2026 recognises the growing significance of distributed PV and distributed batteries, it fails to examine the drivers of this evolution and what it means for grid scale weather dependent generators. It also assumes the wholesale market will grow, which requires reversal of now established trend also for obvious reasons.

This submission makes recommendations on changes to the market system that would immediately lower the wholesale cost of electricity as well as improving the system reliability.

Introduction

Australia is making rapid progress in the application of weather dependent generation (WDG) of electricity. This is most evident in South Australia where local coal has not been the dominant fuel for electricity generation for decades. In essence, South Australia is the test case for the entire world and has already provided many important lessons. Some of those lessons have resulted in changes in system design and operating practice. However there are significant issues emerging that are not reflected in the draft ISP 2026.

The South Australian Example – Latest Quarterly Update

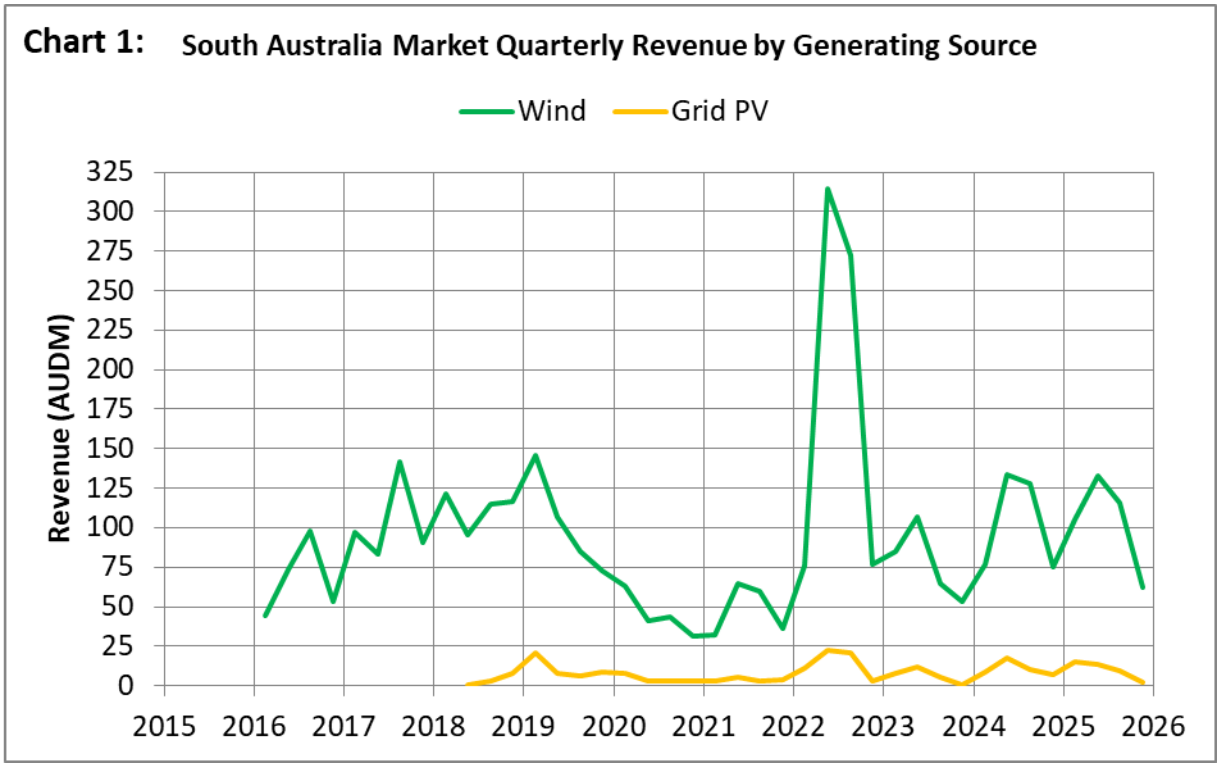
In Q4 2025, wind generators supplied 1817GWh, distributed PV 1135GWh and grid PV 171GWh. Curtailment of wind totalled 435GWh and grid PV curtailed 249GWh. The average wholesale price for wind was $34.39/MWh and grid PV was $14.47/MWh.

The corresponding figures for Q4 2024 were output - wind 1619GWh, distributed PV 1086GWh, grid PV 265GWh; curtailment - wind 239GWh, grid PV 169GWh; prices - wind $49.02, grid PV $28.55. This data is available from OpenNem

There are two key points to be made using this data:

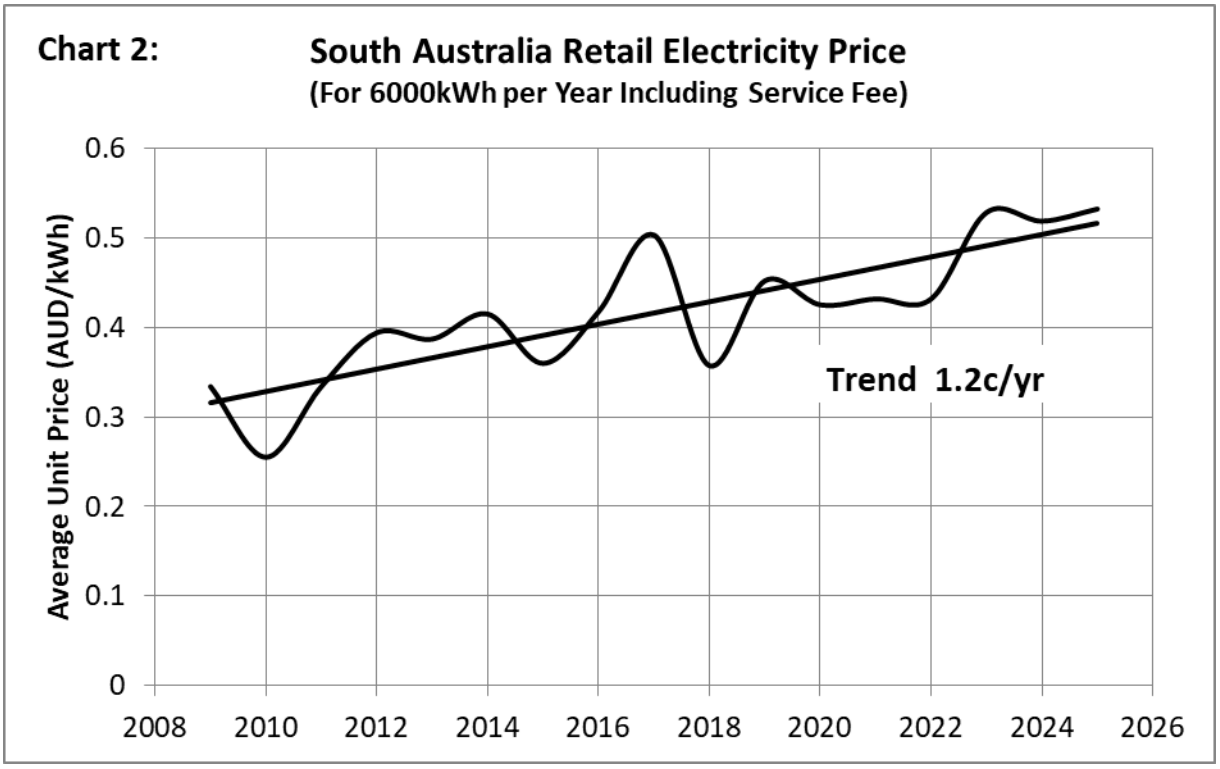
- The wholesale market income for wind dropped from $79.4M in 2024 to $62.4M in 2025. Income for grid PV dropped from $7.6M in 2024 down to $2.5M in 2025.
- The curtailment of wind increased by 82% from 2024 to 2025 and distributed PV 47%.

It is becoming apparent in South Australia that distributed PV is eliminating wholesale demand thereby reducing the opportunity for grid scale WDGs to earn an income. This is not an aberration. The wholesale market income for South Australian grid scale WDGs peaked in Q2 2022 at $314.5M for wind and $22.1M for grid PV per Chart 1 when South Australia lost the interconnector to Victoria and had to be firmed by high cost gas rather than low cost lignite fuelled electricity from Victoria. That enabled the WDGs to force prices higher when the capacity of distributed PVs was much lower than now.



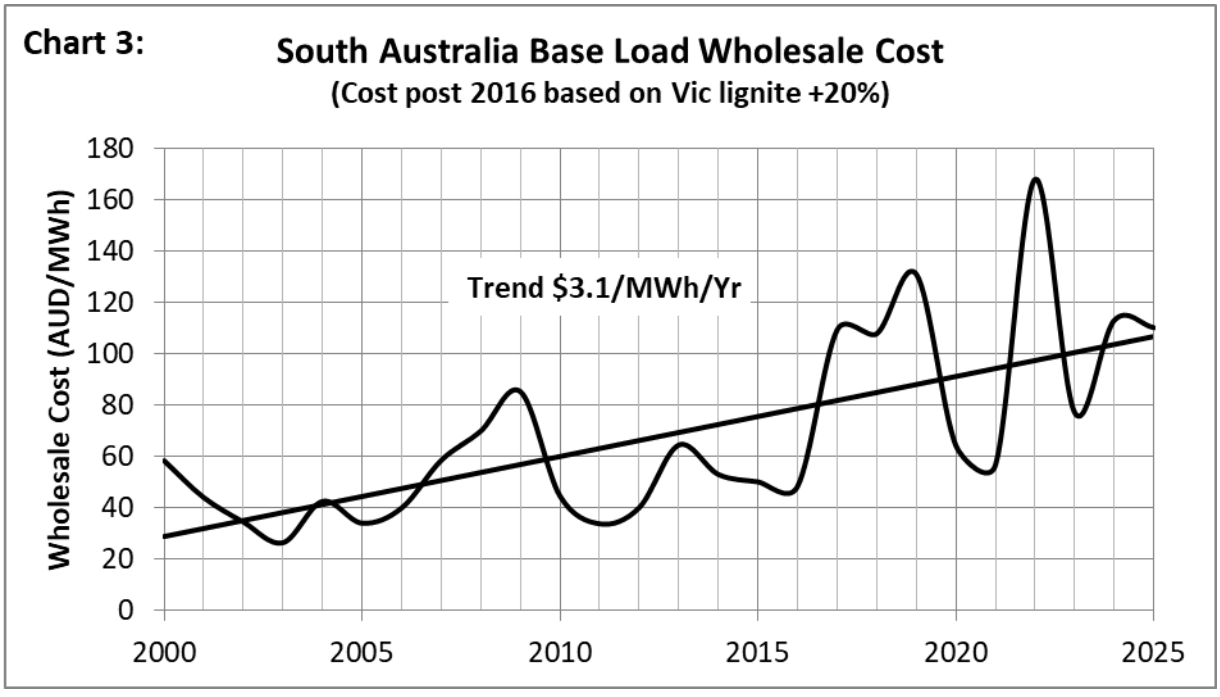
It is clear that the opportunity to generate revenue for both wind and grid PV is now declining. Trying to push more into the system will be increasingly hampered by the rapid uptake of distributed PV and distributed batteries. Distributed PV/battery enjoys numerous economic advantages over grid scale WDGs but the overwhelming advantage is that they have ***captive demand to serve***.

The reason for distributed PVs and batteries displacing the grid scale WDGs is obvious when the economics of both are considered. Chart 2 shows the retail price trend in South Australia based on Vinnies annual survey of electricity prices.



The average retail cost of 52c/kWh in June 2025 continues the upward trend in retail prices and continues to cause small consumers to consider better value options. For example, under the Solar Sharer scheme that will come into force in July 2026, households need only purchase a battery and can get energy at an average cost of 7c/kWh over a likely 20 year life of the battery. The cost of the battery is recovered within three years based on 47c/kWh saving after allowing for the daily service charge so the risk of the Solar Sharer program ending after a few years still favours buying the battery. In fact, given the ever inflating retail price of electricity and current low risk-free return on savings, the value of a battery could be even greater than these numbers indicate.

The two largest industrial users in South Australia are no longer economically viable. Both the Port Pirie smelter and the Whyalla steel works only survive through taxpayer contributions. The reason for this becomes apparent when the trend in wholesale price is considered per Chart 3.

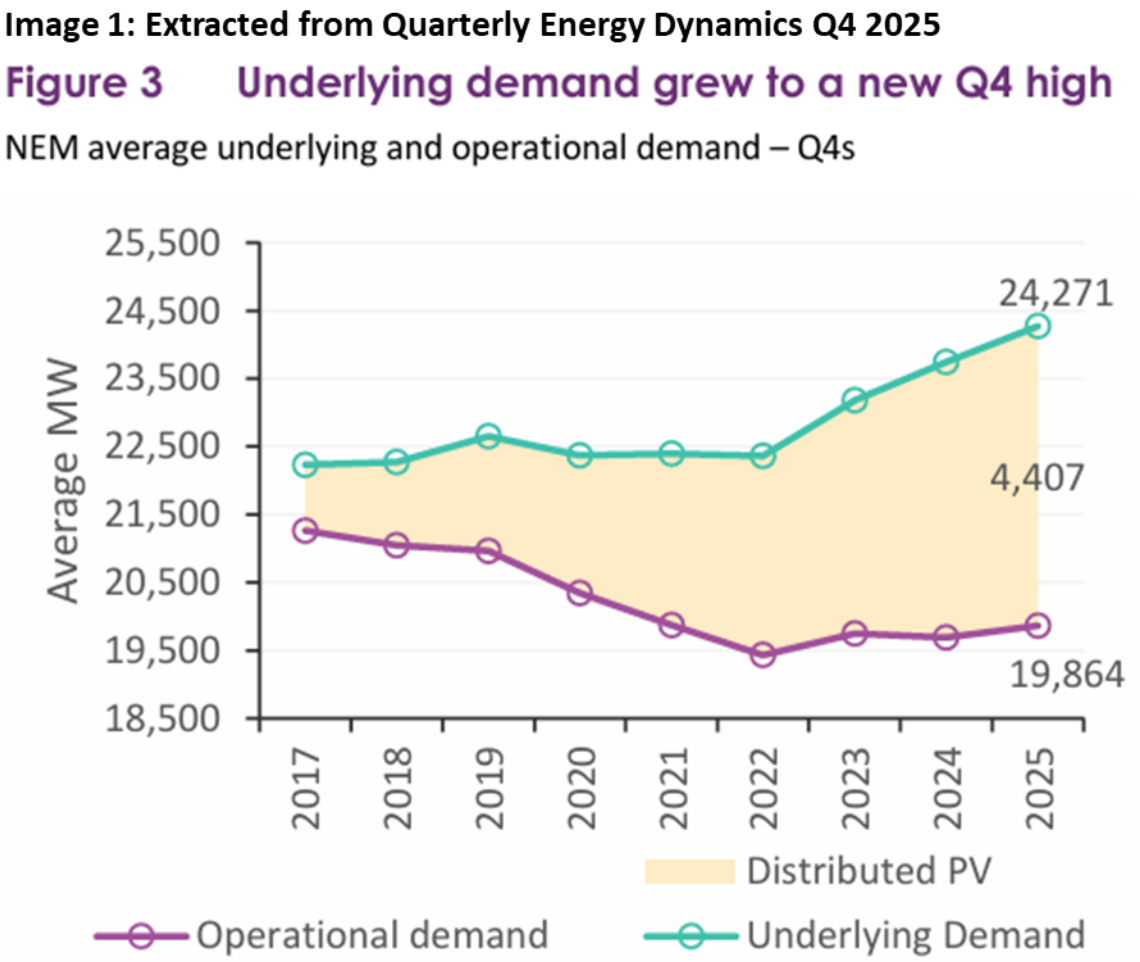


No globally exposed electricity intensive consumer can accommodate such rapid cost increase for a key input. Mitsubishi stopped building road vehicles in South Australia in March 2008 and Holden closed its South Australian road vehicle production in October 2017.

The East Coast Grid (NEM)

The South Australian region of the National Electricity Market (NEM) is leading WDG uptake but other regions are showing similar trends. The following chart, labelled Image 1, was extracted directly from AEMO Q4 2025 Report.

Image 1: Extracted from Quarterly Energy Dynamics Q4 2025

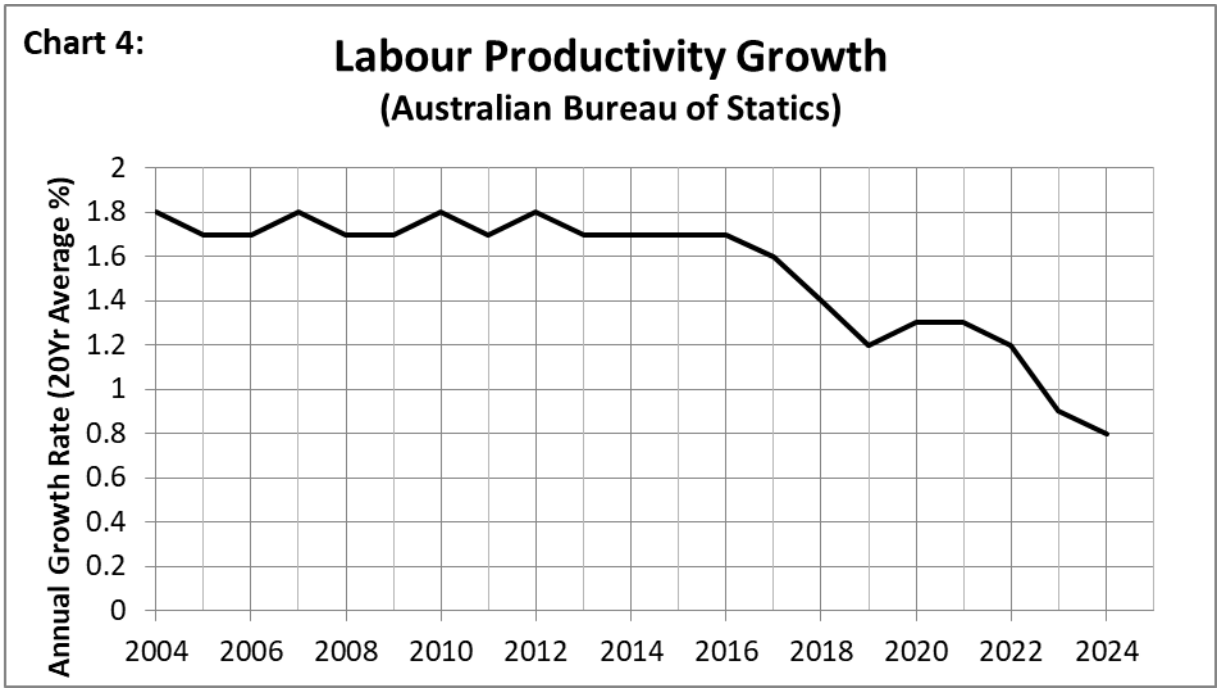


The portion of the demand being served by distributed PV continues to rise strongly. The quarterly wholesale demand appears to have flatlined after trending down since its peak in Q3 2008 of 24,931MW.

The NEM is in an economic trap with rising complexity, rising costs and falling demand. The current flatlining in demand rather than the continuing downward trend is due to electricity intensive industry such as aluminium smelters being socialised using taxpayer funds. That creates a Soviet era style spiral into economic oblivion so is unsustainable.

Discussion

Australia's Productivity - Electricity has been a vital input to Australian industry that achieved its lowest wholesale price in 2003 and underpinned strong growth in labour productivity that was maintained till 2012 as indicated in Chart 4. The benefits of Keating's Productivity Commission enquiry into the Australian energy industries and subsequent removal of bloated State monopolies achieved its maximum return in 2003.



Since 2012, labour productivity has been in decline as electricity prices have increased in response to the vain efforts tasking Australia's electricity grid to control the global weather.

Benefits of Scale - In an historical context, the Australian grid was a textbook example of ever increasing benefit of scale. It evolved from local town and city based generators fuelled by coal being shipped, railed and trucked from coal fields to ever larger generators being located at the coal fields and transmitting power to the load centres. Eventually the Australian States built interconnectors that enabled limited sharing of power across the State borders but the full benefits of those interconnectors was not available to consumers until the State monopoly powers over transmission and distribution were removed. The ability to wheel low cost lignite fuelled generation from Victoria into New South Wales and South Australia benefitted Australian industry along with other benefits from industrial co-generation having a competitive market to sell into.

Transitioning the grid from dense, low footprint power generation to low intensity, high footprint generation using truly ubiquitous energy sources offers no benefit of scale or value. In fact, it is now clear that the effort is destroying Australian industry and labour productivity improvements are in rapid descent.

WDGs offer no benefit of scale, the solar panels used in solar farms are the same as the solar panels placed on the roofs of Australian homes. The cells used in grid scale batteries are the same used in household batteries. Any siting benefits that give better access to solar sources in remote parts of Australia are soon eroded by the time and cost to get environmental approval, first nation approval, land acquisition or lease and cost of transmission. While those disadvantages are significant they are dwarfed by grid scale WDGs being thoroughly knobbled by distributed PV simply because distributed PV serves captive demand thereby removing the available demand for the grid WDGs to serve.

Grid scale bird mincers have so many negative environmental factors that they should have never been considered. The past and present mincers are not being or will not be replaced. But the main issue for mincers in Australia is that wind takes annual leave around June, which coincides with lower output from distributed PV. Having batteries and pumped hydro to firm wind generation for two weeks or so makes them uneconomic against battery and pumped hydro firmed solar.

Relying on Ancient Assets - Many of Australia's base load generators could be reasonably described as clapped out, fifty year old machines running on a song and prayer. These massive, high temperature

machines with immense thermal inertia are being required to load cycle far more than they were designed to do. That pushes up maintenance and operating costs and dramatically increases risk of failure. These massive units are forced to operate in unstable firing regimes responding to the tune set by WDGs. The wholesale market system 5-minute settlement interval is best described as a craps shoot where the bidder with the best weather forecasting wins. The only essential generators for keeping lights on are unloved and abused by the market rules with no prospect of the needed capital injection consistent with their vital economic importance to Australia. The current natural gas shortage in Australia and its high cost makes substituting coal fired generation with gas fired risky and expensive.

The Rise of Distributed PV & Batteries - Of global countries, Australia is unequalled in a number of resources. Possibly the most abundant is sunshine which is readily converted to electricity to supply a household with modern technology. Most suburban homes in Australia can install an array of solar panels on the roof and batteries on the garage wall to be self-sufficient for electricity. Sunlight is ubiquitous and most of the country is exposed to more sunlight than nearly all other countries over the globe. Australia's predominantly coastal cities experience a moderate climate with modest needs for heating and cooling most of the time. Few people in Australia die from extreme cold or extreme heat. Sunlight is a reliable resource over Australia. It is rare to get less than two hours of full sunshine equivalent over any 48 hour period anywhere on the mainland. Accordingly, Australian households are able to buy an unsubsidised solar/battery system that will provide electricity over its life at lower cost than the retail price of electricity in South Australia. A grid dependent on grid scale WDGs firmed with batteries and pumped hydro will always be more expensive than distributed solar/battery systems supplying a captive load.

New Industries - Nvidia is currently the largest company in the world by market capitalisation. Ten years ago, Nvidea CEO, Jensen Huang, recognised that artificial intelligence (AI) presented a great opportunity for his company and he redirected their hardware and software expertise in that direction. The decision resulted in history making returns. Late last year, Huang stated that Nvidea builds the second and third tier of the five tiers for AI to serve a useful purpose. The base tier was the power grid.

Conclusions

In the simplest terms, Australia's electricity grid is in transition. The trends are now becoming obvious to most.

- Distributed PV firmed with batteries offer high value alternative for households and other low intensity electricity users when faced with ever rising retail prices. Their uptake is booming and will continue to do so while being supported by taxpayers and remaining consumers.
- Ever rising wholesale price of electricity makes globally exposed industry in Australia uneconomic. Many industrial sites have already closed down and those remaining need Soviet era style support to keep operating. That is a waste of taxpayer money because there is no justification to spend capital to update technology so the skill set also becomes dated and of diminishing value.
- The wholesale electricity market is in an economic trap with falling or static volume; ever increasing complexity; rising risk of outage and rapidly rising costs. Prices are therefore stuck on an upward trend.
- Grid scale WDGs are rapidly becoming stranded assets. Those now being installed or in the pipeline require capital guarantees that taxpayers are underwriting without any disclosure of the inevitable waste of money.
- It is extremely remote that distributed PV firmed with batteries will supply the energy needed for Australia to build a significant industry around AI as USA, China and India are doing.

Recommendations

1. Stop incentivising grid scale WDGs. That is the only sane response faced with what is now obvious. They offer negative economic value; are already stranded assets and there is absolutely no prospect of them stopping climate change because that is the nature of our Earth in this solar system.
2. Remove the semi-scheduled classification of generators and require all bidders to offer firm generation. That will show the essential generators the much needed love they deserve for keeping the lights on. They need lots of TLC through the hard times ahead to restore grid value.
3. Increase the bidding interval gradually to 24 hours so the grid gets something closer to true merit order scheduling without favourites.
4. Penalise generators failing to meet their scheduled generation.
5. Continue to incentivise distributed batteries but the highly regressive aspect that favours property owners needs to be rectified. This is the most direct and lowest cost means to reduce the strain on the unloved essential generators.
6. Provide capital guarantees for new coal fired power stations. This will enable gradual renewal of the existing fleet and expansion if the demand can grow.

Final Observations

POTUS Trump is making great strides in convincing the entire world that the United Nations inspired Climate Change™ scam is indeed a scam. Even those who doubt that POTUS Trump is getting good advice on the belief, it is fact that there was 97.4GW of new coal generators commissioned last year and only 23.3GW retired. So the equivalent of Australia's coal generating fleet is being added globally ever few months. Australia's entire effort to transition the electricity grid to WDGs is negated in a few months by the addition of coal generators elsewhere. The time to negate the entire effort is only a few weeks if the carbon used to mine iron ore, bauxite and coal in Australia then ship the mined minerals to China; manufacture the WDGs in China, ship to Australia and install the WDGs was accounted for.

The ISP 2026 is not a credible plan. It does not even recognise the now obvious fundamental drivers shaping Australia's electricity supply. It is time to change course in recognition of the fundamentals. WDGs offer no benefit of scale. If they were economically viable, every property owner would simply install solar panels and batteries on their property and make their own electricity untethered from the grid. More Australians are now doing that faced with high retail prices but there are not many leaving the grid entirely because the existing essential base load generators generally keep the lights on at night if the battery goes flat. Households are currently prepared to pay the connection service fee as an insurance policy.

Australia's electricity grid is not treated as an essential service for the benefit of customers. The grid has become a political weapon in a misguided belief that it can somehow fix the global weather by de-industrialising Australia. No one can articulate what the weather will be like when it is eventually fixed and Australia is one of the few remaining countries that is still willing to sacrifice its industrial base in that vain effort.