

Submission regarding Paling Yards Wind Farm. SUB-64427956 Final

I write this submission principally in support of the Paling Yards wind farm proposal. From real world experience I offer some points below I feel very pertinent to the determination mindset in face of the somewhat hysterical arguments of opposition arising from some.

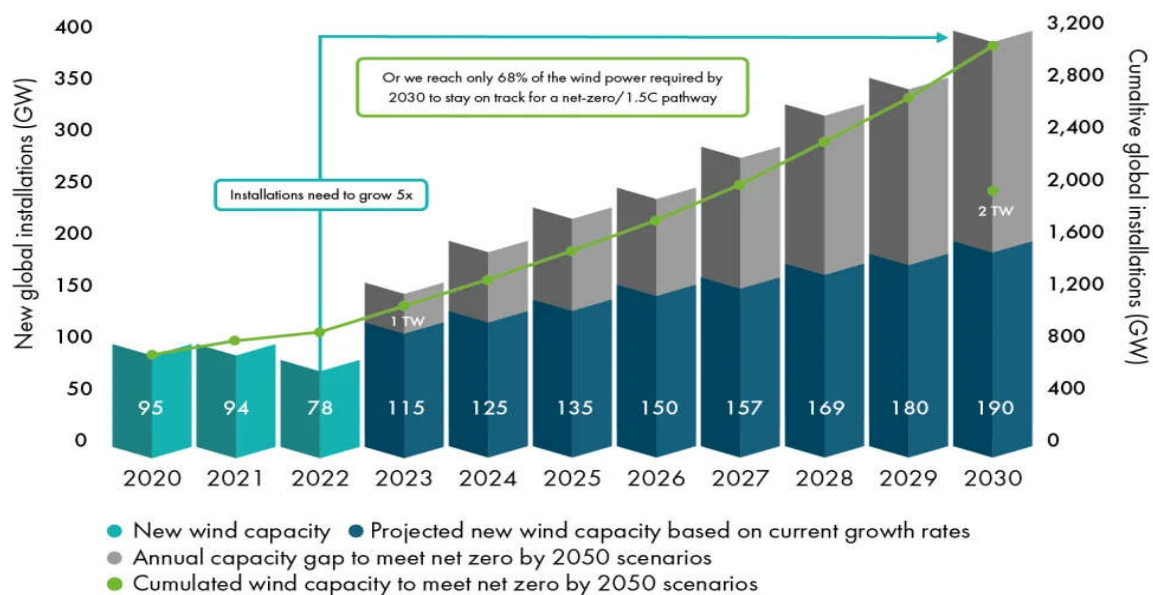
Wind energy is one of mankind's oldest forms of energy conversion and even as far back as the late 1800s also used for electricity generation. Development was slow until the 1970s global oil shock kickstarted the first wave of serious development especially in the USA and Denmark however the turbines were relatively small output and generally non-viable against cheap coal.

The second wave of wind development still continuing began in earnest in the 1990s as climate change and fossil fuel emissions came to the fore. Over the past 40 years the technology has evolved to now be extremely reliable, efficient and low cost. The modern wind turbine generator (WTG) now available is a long way removed from those of even from two decades ago other than still retaining the superior three blade design.

Wind Energy has been the fastest growing electricity source since the mid-1990s where by end of 1998 the worldwide wind generating capacity was 9.6Gw (9,600Mw), double the capacity from 1995. By 2000 that had grown to 17Gw and now at end of 2022 global capacity had grown to 900 Gw. Over 100 Gw is on track to be added by end of 2023 as growth rebounds from the effects of the pandemic. However as impressive as this growth is according to the Global Wind Energy Council current growth trends will still fall well short of the 2030 target toward the net zero 1.5-degree pathway unless massive acceleration occurs globally and certainly this includes Australia if we are to maintain worldwide expectations that we pull our weight domestically toward net zero.

Australia will have approximately 14 Gw (14000 Mw) of wind turbines installed by end of 2023 (equivalent to 10 Mt Piper Power Stations). In June 2000 Australia had just 58 Mw (.058 Gw) up from 8 Mw (.008 Gw) in 1998. It would be simply impossible for Australia to site and build ten greenfield 1400mw coal fired power stations and associated required infrastructure in the same time span.

As can be seen in this graph there is a long way to go to reign in emissions and this underlies the paramount importance that wind energy projects not be erroneously rejected due to fear mongering.



I have been involved in Australian wind energy since late 1988 principally at Hampton approx. 15 kilometres directly east of Oberon. On our family farm since 1959 in 2001 we successfully installed two Vestas V47 660kw wind generators connected to the 11kv local grid. (V47 denotes the rotor diameter). At time of order these turbines were still amongst the largest commercially proven wind

turbines available and certainly the most viable to install in NSW given the very limited mobile crane resources available back then to lift 22 tonnes to 50 metres.

The Hampton project was the first private wind installation into the electricity grid using large WTGs (for the time). These turbines still operate to design 22 years on and although new blades and refurbishment are likely to be considered around 2025-26 these turbines will likely continue well into the 2030s. Prior to this the two wind farms in NSW at Crookwell and Blayney had been built by Pacific Power which evolved from the Electricity Commission of New South Wales (ECNSW) also using Vestas V44 & V47. And the year before Crookwell Energy Australia installed a solitary Vestas V44 on Kooragang Island.

My background in electricity generation was gained within ECNSW-Pacific Power at Wallerawang Power Station operating 30-, 60- and 500-Megawatt (Mw) coal fired units. Through my training and work I have gained immense knowledge of all facets of power generation, transmission and ancillary management on a very first-hand basis.

I first became aware of possible atmospheric and climate impacts due to CO₂ and Methane emissions from fossil fuel sources whilst doing attending general power plant operator school back in early 1982. During the study of boiler flue gases CO₂ and Methane were both discussed. Our lecturer divulged that in the future fossil fuel CO₂ emissions were predicted to become a serious issue as he was aware of scientific work showing there appeared to be an upward trend of the global temperature atmosphere and changing polar ice patterns that could be attributed to higher-than-normal CO₂ concentrations since the advent of the industrial revolution. The largest emissions contribution from fossil fuelled electricity production has resulted from the electrical demands of unpredicted global population growth and industrialisation since 1900.

He felt that relatively inefficient fossil fuel use would eventually cease once technology developed better energy conversion methods from free solar energy (wind and photovoltaics) as well as continuing hydro use for grid stabilization. Given our climate hydropower alone certainly was never seen as a fix all solution but distributed small closed loop hydro was always known as a possible future energy storage solution.

The ECNSW was always exploring alternatives including wind technologies as part of their 50-year planning. The ECNSW began an experimental 150Kw wind turbine project that was installed at Malabar in 1983. Unfortunately, the breakup and privatisation of the ECNSW in the 1990s saw much of this prudent forward planning and impetus lost however by 1998 ECNSW off shoot, Pacific Power, commissioned NSWs first wind farm of 5Mw at Crookwell followed by the 8 Mw Blayney Wind Farm several years later. As of 2000 there was just 10000 Mw of installed grid connected wind energy globally.

After Hampton in Sept 2001, it would be over a decade before any further wind farms of size were built in NSW. Privatisation of the ECNSW and more widely has proven to be the major roadblock to a cohesive smooth transition away from fossil fuels as it is much more difficult to achieve with many participants than it was when only one entity drove and delivered progress.

Climate science has also evolved greatly since 2000 and now clearly shows that we have much less time to move to renewable energy sources than models indicated we had twenty years ago. Now before our eyes often long-standing weather records are broken with ever growing monotony. Copernicus Climate Change Service now warns that 2023 is “virtually certain” to be the hottest year on Earth in 125,000 years. We certainly are in uncharted waters.

The Hampton Wind Park’s longevity has proven that most issues raised by the very clear minority of anti-wind supporters are generally false and misleading. This was as expected from prior experience and comprehensive study of wind energy science and projects commencing at the end of 1998 included training with Vestas in Denmark and seeing first-hand how their wind industry had transformed much of their society especially in the more rural areas of Jutland.

Now whilst the decade long delay of more meaningful uptake in NSW missed the initial opportunities of the rapid global wind energy development since 2000 it has allowed us the opportunity of now utilising much improved economies of scale delivering lower costs per mw installed.

Harvesting wind energy following several very simple rules; 1, Power in the wind cubes with every doubling of wind speed. 2, A quadruple of energy harvest occurs with every doubling of rotor diameter. 3, Nominally wind speed increases 10% with every doubling in height. These parameters have dictated the trend to larger and taller wind turbines. This trend has transformed economies of scale to force down \$/Mw installed costs.

Scaling up wind turbine rotors and heights has always been limited by available materials and technologies of the day and since 2000 major technical advances have been made and commercialised, primarily by the Danish wind industry which Vestas leads in technology and worldwide scale. This technical threshold has been key to making current turbines now more than ever one of the very best solutions at hand to replace fossil fuels in the rapid manner now demanded. Coupled with very advanced power conversion technology that also allows some grid frequency control once impossible the technology advance has lowered operating costs.

Whilst it is true the wind does not blow all the time in any one location it is also true that the wind is most often blowing somewhere else at the same time.

Therefore, to utilise wind energy in the most productive manner generation locations need to be distributed throughout the available wind resources in Australia on the East Coast. Along with off shore opportunities the Great Dividing Range and slopes are the primary regions where wind energy production is most viable and within proximity to the major load areas along the coastal strip that contains the major demands of the East Coast Grid. And on the Central Tablelands there is generally a good wind profile correlation to higher electrical demand periods.

Considerable additional HV transmission will be required to be built the further inland wind and solar is situated. It is not necessarily viable to build huge transmission infrastructure for large distances just to transmit generated electricity unless the end user is prepared to pay more.

I have been aware of the Paling Yards project since site wind testing commenced approx. 18 years ago. For some years the site has been somewhat marginal given the need to connect to the 500kv ring main and the wind technology of the day dictating viability.

The Paling Yards proposal is well located as the 500KV Ring Main between Mt Piper Power Station switch yard and Marulan switch yards runs adjacent considerably reducing connection costs that apply at more remote wind and solar sites. This site will impact very few if any Paling Yards residents and its long lead time has bought with it a long awareness of this project's possibility. This ring main, one of the back bones of the NSW Grid also runs across some very good wind resources to the north of Paling Yards including large tracts of State Forest. However, over the past decade wind technology has developed to viable turbines on land now generally in the 4-to-7-megawatt range (7.2 Mw is the equivalent of 11 Hampton turbines in one) so the long project lead time also has been positive.

I must state I have no absolutely association with the Paling Yards wind generation proposal nor have I ever had. Neither have to my knowledge have I ever met any of the proponents or landowners.

I am also not in the habit of commenting on projects that don't directly concern me and I would place the location of Paling Yards in that basket. However, since becoming aware of "Oberon Against Wind Towers" (OAWT) opposition to Paling Yards via a flyer in my mailbox drumming up people to submit opposing submissions regarding this proposal I felt it only right that their reasons of opposition based on mistruths and inaccuracy should be countered by some facts. I first became aware of OAWT and their loud minority view regarding the State Forestry wind generation opportunities in the Oberon area. What is striking is just how wrong and out of touch their aspersions of opposition really are. One only has to look at the ridiculous out of scale photoshop images of turbines in Oberon locations post on their Facebook page that they are using to try scare others into supporting them. They have

mounted a somewhat fanatical scare campaign purely for the self interest of a select few, especially the individual driving forces behind OAWT.

I and many other locals find OAWT offers some ludicrous arguments particularly given the location of the major Oberon industry and lifeblood overshadowing the township with noise and smells. But does anyone care about that. Rarely. Nor do they care that the forests are harvested back to bare ground every 20 odd years. What many do care about is the future economy and the critical thinkers well understand that projects such as Paling Yards and later proposals can be vitally important to the longer-term growth and sustainability of Oberon. Executed properly Oberon could be a 360-degree shining light of sustainable prosperity.

The illogical nature of OAWT opposition suggests ulterior motives behind the seeds of this opposition where some of OAWT even still extol increasing fossil fuel use. Others dismiss climate science as a fairy tale. And of course, nuclear is now also a buzz word of the anti-renewable brigade without any idea of what they are calling for or the astronomical cost consumers would be lumbered with. Especially against our abundance of solar energies. One only has to look at the UK's Hinkley C nuclear white elephant to understand nuclear is not a viable option in Australia's relatively tiny electricity system for a number of reasons. Hinkley is set to cost the underwriting UK taxpayer dearly and will likely end up a stranded asset as its build costs have doubled and the project is around 8 years behind schedule. No matter what the viewpoint the simple fact is that nothing can ultimately compete with a 100% free energy source.

OAWT appears to be oblivious to fact that every unit of coal fired electricity delivered to household supply requires roughly four times that to be expended (not including mining energy) and that approximately two thirds of the energy is expended to atmospheric heat loss, both controlled or uncontrolled, and unless it was water cooled by lakes as is the case on the coastal power stations, evaporate copious amount of cooling water each day into the atmosphere. Instead, they gladly label wind energy inefficient. But they all mistake energy efficiency for site capacity factor, two entirely different things.

It must be pointed out that OAWT appears to be mostly made up of viewpoints emanating from particular generations; Baby Boomers and Gen X and of those it also appears to be the more affluent that are loudest in opposition. Opposition views of these generations must be discounted as it is not them that will be ultimately affected by opposing progress and industry working toward turning the climate problem around. It is clear these naysayers have no real facts of opposition but instead employ lies and mistruths to scaremonger the general populace to their view. No; this ultimately impacts our children, grandchildren and future generations and it is their views that must count most. Any determinations must keep this to the fore at all times as I am sure the vast majority of those generations do not support the views of the likes of OAWT. They know their global future depends on a far more truthful debate than OAWT can ever offer. My view is that if a true sentiment is to be gauged the younger generations must be those consulted first and listened to the most.

Lastly a reminder that we have seen firsthand a similar minority opposition in Oberon before regarding electrical infrastructure. Over thirty years ago when the 500kV ring main that now traverses the Oberon district was proposed by the ECNSW. A small but fanatically vocal opposition arose. It claimed the sky was going to fall in, two headed sheep and cattle would be born, dead birds would fall from the sky, crop dusters would be at risk and electromagnetic radiation would affect all. They also tried very hard to force the easement onto areas other than their own which was simply an unviable option of the ECNSW. The most fanatical even got violent to their own detriment. One lost his farm fighting this progress. And what for? Absolutely Nothing.

And did the 500kv project doomsayers' predictions arise? Never! Did most people even notice the line once built? No! Is the 500Kv Mt Piper Power Station-Marulan ring main critically important in today's NSW grid? Yes! Was considered foresight of experts more important to consider than blind fanatical minority opposition. Absolutely Yes!

The fact is OAWT represents a small percentage of the community with the ardent supporters making up around 5-7% as far as I can gauge and this is as expected in line with the long-known fact that 5 to 10% of people are generally against wind energy. Even when the Sydney Harbour Bridge was finally proposed as it now stands the project gained much greater opposition than OAWT is offering here as some felt it would ruin the harbour. Like those naysayers all those years ago OAWT is on the wrong side of history here.

This concludes my submission and I trust my observations might be of some assistance in the determinations of this project.