The Team Leader Energy Assessments Energy Assessments 20 January 2023
Development Assessment
Department of Planning and Environment
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Winterbourne Wind Farm | Planning Portal - Department of Planning and Environment (nsw.gov.au)
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Dear Contact Planner, Iwan Davies
SOS Objects to SSD-10471 Winterbourne Wind Project

Save Our Surroundings (SOS) is a network of community groups across multiple states that share their experiences about, and research into, industrial wind, solar, BESS and pumped hydro proposed and developed projects and their impacts on affected individuals and regional communities.

Australia's two largest currently operating wind electricity generating works are 420MW (WW1) and 453MW (WW2) capacity. The Winterbourne wind works is rated at 700MW, a considerable capacity increase over existing wind works. It is therefore useful to highlight some of the claims made by WW1 and WW2 before construction and their actual performance to date. These should be compared with those being made by the Proponent for Winterbourne Wind Works. This will be done under the points made below.

SOS strongly objects to this project as a simple analysis shows it is not "fit for purpose" and is environmentally damaging. Our review of the EIS has raised many specific questions. The DPE must require the Proponent to properly answer each specific question and not generalise by amalgamating topics or providing general responses rather than complete and supported answers.

Project summary by SOS:

- **EIS:** The Environmental Impact Statement (EIS) consists of 25 separate documents totalling 3,624 pages; the EIS summary is 378 pages; a huge drain on time of rural people
- **Changes in ownership:** Project owner WinterbourneWind P/L, was owned by Mirus Wind P/L, then Danish Vestas Wind Systems A/S, who sold to Copenhagen Infrastructure IV. 3 owners in 30 months!;
- **Capacity/Capacity Factor:** Up to 119, 6MW, 230m high by 160m wide, wind turbines with stated total nameplate capacity of 700MW will occupy the site along with substantial other infrastructure. Tallest in Southern Hemisphere!; no electricity most of the time!;
- **Site location:** The site includes covering unstated dozens of kilometres of hilltops and ridges with turbines; impact on wildlife and visual amenity!;
- **Site location:** The site is 6.5km north east of Walcha (population 3100) and 23km from Uralla (pop 6100); impact on amenity, resources, roads, life-style for many, many years!;
- **Site location:** The 22,285ha (222.9km2) site covers 315 agricultural land holdings plus crown & other lands; this equates to nearly 7% of the Uralla Shire area!;
- **Site location:** The site is next to Oxley Wild Rivers National Park; impact on wildlife!;
- **Site location:** Site has 23km of new transmission infrastructure, 60 metre wide easement, 40m high towers and 113km of new internal gravel roads; lowers food production & impacts wildlife!;
- **BESS:** Battery Energy Storage System (BESS) of 100MW capacity and 200MWh of output; lots of issues for community, RFS & future generations!;

- **Jobs:** 400 construction jobs during 10 (or 11?) months peak of 30 months construction period; where will the workers come from!
- **Jobs:** 39 operational jobs with 16 full-time onsite expected from surrounding towns; more jobs lost than created!
- **Project life:** Project operational in 2026 (or by 2030) with a claimed a 30 year operating life; no experience that turbines economically last that long; batteries much shorter life;
- **Information:** EIS is littered with "get out" terms e.g. "where practical", "if economical", "be expected to', 'be unlikely', 'may be', 'are generally', 'subject to', 'approximately', 'up to', etc, etc, being typical of all such proposals; will promises be met?;
- **Project value:** Project value not stated; Australian content!;
- **Sourcing:** Component sourcing not disclosed, but will be imported; energy security at risk;
- **Subsidies:** Value of subsidies not stated; do subsidies outweigh benefit payments?;
- **Benefits:** Benefit payments of about $850,000pa via a Community Benefit Fund, plus undisclosed payments to host land holders and Neighbour Benefit Fund (withdrawn); who pays?;
- Infrasound: Infrasound produced by wind turbines not considered despite known dangers to humans and animals; audible sound is detrimental humans and animals too;
- **Vehicle movements:** Vehicle movements grossly understated as no estimates for trucking water, gravel, waste;
- **Supply electricity to 375,000 homes:** Claims it will generate enough electricity for 375,000 average NSW homes; for how many hours a day?;
- **Sustainable, clean, reliable and low-cost renewable energy:** Claims project will deliver sustainable, clean, reliable and low-cost renewable energy; unrealistic!;
- **Reduce carbon emissions and human induced climate change:** Claims up to 2,100GWhpa of electricity generation (an unstated capacity factor of 34.3%) and this "will contribute significantly to reducing carbon emissions and human induced climate change ...'; unrealistic!;
- **Embedded CO2e emissions:** Claims it will reduce CO2e emissions by 1.8 million tonnes a year and offset the project's embedded CO2e emissions in under a year; how much was excluded?;
- **Decommissioning:** Claims 18 months to decommission, but no upfront funds to be set aside;
- **Water use:** Claims water use as 113 mega litres (ML) for construction phase (6ML for concrete, 26ML for road and earth works, 81ML for dust suppression); appears understated;
- **Bat and bird strikes:** Claims bat and bird strikes will be negligible; unrealistic!
- **Pollution:** Claims no pollution created during operation; unrealistic!
- **Cumulative impacts:** Claims 'the Project would not contribute to any material cumulative impacts'; unrealistic!
- **Resources required:** Ignores the full extent of global resources required for the project; huge requirements compared with alternatives
- **Industry viability is of concern:** failures, delays and cost blowouts continue to mount;
- **Comparison with alternatives:** No comparison done with alternative forms of electricity generation; why not?;
- **Offsets closure of Liddell:** Claims the project output is needed to offset the closure of the 1,680MW Liddell (April 2023) and the 2,880MW Eraring power stations (in 2025); no comparison provided.

Based just on the project summary above the concerns of each point are:

- **EIS:** is a massive document of 3,624 pages in total. Even the EIS summary is 378 pages. Reading the EIS is equivalent to reading one of the longest books written, Tolstoy's "War and Peace" novel, three times. This makes it almost impossible for a rural person to access, read

absorb, summarise, discuss and make a response. For many regional people, poor internet and phone access hampers their ability to evaluate and communicate what is being proposed. Time is the biggest factor with many people on the land, who not only manage their food production and property maintenance, but also do paid and volunteer work off the property.
Does the Proponent agree that the EIS poses an unreasonable time burden of the very people who have to live with the adverse consequences should the project proceed? Is the size, complexity, inconsistencies, repetition, understatements, etc. of the EIS deliberately intended by the Proponent to control the narrative solely in its favour?

- **Changes in ownership:** several changes in project ownership have already occurred. WW1 and WW2 have also had several changes of ownership.
How many more ownership changes will occur over the project's life? How will all the commitments made now be met and policed in the future and with each new owner? Why do so many industrial wind and solar projects change hands so often?

- **Capacity:** up to 700MW capacity is compared with the capacities of Liddell and Eraring. A 700MW wind works is nowhere near equivalent to a new 700MW base-load coal fired, gas fired or nuclear plant . In fact, a 700MW wind works will only produce electricity intermittently on average over a full year about 30% of the time. Even the 50 years old Liddell power station can currently generate electricity on demand 24/7 over 54% of the time (refer table 2). Modern alternatives can operate above 90%.
Is it misleading the readers of the EIS to have not made this point? Would not readers assume that the project's stated 700MW capacity would replace 700MW (42%) of Liddell's 1680MW (1260MW available) capacity or any other base-load electricity generation plant?

- **Capacity factor:** capacity factor (CF) is the ratio of an estimated/actual electrical energy output over a given period of time to the maximum possible electrical energy output over that period for a given capacity. The derived CF for this project is 34.3% over a full year. Capacity factors reduce with aging of the generator and other factors, such as weather patterns changing year to year. Records over the last 10 years indicate the average CF for all wind turbines in Australia is 30.1%. WW1 claimed a CF 35%, but after 10 years of operation has an average CF of just 26.3% and a maximum of only 28.63%. Therefore, electricity produced is so far 25% less than stated in their EIS. Many other constructed wind and solar projects have not achieved their claimed output and in some cases are still not providing electricity to the National Grid after one or two years.
Is the CF for the Winterbourne project for the first year or an estimated average over the life of the project? What is the estimated life-cycle profile of the capacity factor by year? How can Australians have any faith that project would achieve the claims made for it when several other projects have not?

- **Site location:** the site is adjacent to Oxley Wild Rivers NP and only 6.5kms from the rural town of Walcha. The NP is an attraction to the lovers of nature and country life-style. This provides tourist dollars to Walcha and surrounding areas. The project would cover 223km2 with some of the tallest, widest and readily visible massive structures in Australia, especially as they will be located on hilltops and ridges. The site will become an industrial complex of massive size, largely obliterating the rural and country amenity and attraction to locals and visitors alike. It will reduce future food production capability for current and future generations. Proximity to transmission lines, gullible land owners, some potential labour and inclusion in an area marked on a map by people in Sydney as an REZ does not justify the location of this project.

Will the proponent revaluate the choice of this site? Will the Proponent find another site that does not trample the wildlife, future food production and people's enjoyment of a country life-style, whether a resident or visitor?

- **Site location:** in addition to scarring dozens of kms of bushland hilltops and mountain ridges with massive 230m high x 160m wide wind turbines, it further scars the landscape with 23km of new transmission lines, 113kms of new internal roads and large associated infrastructure, so further transforming the rural and natural landscape into part of an industrial complex of unprecedented size.
  Will the proponent revaluate its choice of this site and the size of the project?

- **BESS:** not much is said about the 100MW/200MWh battery energy storage system (BESS). Given the relatively small size of the BESS, if the turbines were becalmed, which is a frequent occurrence, then the BESS could only supply 14.3% to the grid of the wind works 700MW capacity full output for less than two hours before becoming flat. The wind turbines and BESS poses additional risks to our volunteer Rural Fire Services personnel. Recent separate fires at a BESS, a wind turbine and a solar works demonstrated how difficult it is to fight fires of these types. They all took extensive resources and time to contain.
  What is the real purpose of the BESS? How long will it take to recharge the BESS once flat? Where will the remaining 86% of electricity come from? What is the life expectancy of the batteries in the BESS? Where will the electricity come from to run the air-conditioners and safety equipment when the turbines are idle? Will the project use sulphur hexafluoride (SF6) as a fire suppression gas? How will the extremely hazardous and dangerous lithium-ion batteries be disposed of when they fail or reach their end-of-life? How big would the BESS have to be to ensure continuous supply of electricity from the wind works if, say, a wind drought lasted 72 hours? Why should our RFS volunteers have to face additional risks to their lives that will be created by your project?

- **Jobs:** 16 onsite local operating jobs for a possible few decades is a poor return for the communities around this project, especially as it is very unlikely all the jobs will be drawn from them. Likewise, 400 construction jobs for a few months is unlikely to come from the towns, as shortages of trades already exist and will be in demand by other projects too. The cumulative impacts of this project, other NE REZ potential projects, the Liverpool Ranges, Liverpool Plains and numerous CWO REZ projects that will result in years of disruption to their lives, and others, damage to roads, loss of tourism, traffic delays, increased food transport costs, etc. The estimated ongoing jobs created by this project is minuscule compared to the jobs already lost in other projects since 2018 (e.g. 3800 Tomlinson Engineering, 2400 Clough) and likely loss of jobs in agriculture activities and services.
  Does the proponent agree that the jobs provided by this project is a small return to the communities for a two billion dollars (SOS estimate) project expenditure with little Australian content and at least 2.5 billion dollars in subsidies over 30 years from Australians?

- **Project life:** claimed life of the wind works is 30 years. Overseas studies of actual wind turbine lives to date show less than 20 years economic life for operational wind turbines. Wind works proposals in 2021/22 were saying 20-25 year lives. A December 2022 wind works EIS stated 25 years.
  What dramatic technology breakthrough has extended wind turbine lives to 30 years in the last 12 months, especially as no 6MW turbines exist in Australia to provide factual support for life-time operation in our harsh climate?

- **Information:** inconsistency, no or poor substantiations, omissions and deferral of information on the proponent's web-site and within its documentation, a typical issue with most proposals. Actual experience with operating wind and solar works highlights failures to achieve outputs, meet vegetation screening requirements, maintain vegetation maintenance, achieve deadlines, handle noise complaints, etc. How can the people most affected for decades by this proposed project be confident of what is proposed versus what will be delivered, when so many points are couched in "get out terms", basic information obscured, omitted or misleading, or significant matters deferred until after approval?

- **Project value:** a project value is unstated but around $2 billion by completion is likely, based on similar projects. It is claimed that billions of dollars of investment from wind and solar will go into the regions, especially the renewable energy zones. However, all such projects are made up of largely imported components. The true investment value for the rural regions is only the Australian content. Using NREL modelling and other studies, indicates that about 75% ($1.5b) is for imported equipment; 12.5% capital cost ($250m) and 12.5% ($250m) for construction. Not much Australian content in this project!
  Will the proponent provide the value of the project and details of the expected Australian content by type and value?

- **Sourcing:** The source of the wind turbine components, BESS, switchgear, etc., is not stated. It is stated that it will be imported through Newcastle Port, about 300km away by road. The high majority of wind and solar works components and batteries are imported from China, the world's largest green house gas emitter and user of slave labour. Vestas manufactures wind turbines in several countries, including China. The source is important for many reasons, including energy and sovereign security.
  From where will the proponent import all of its components for the project? Does the Proponent source any components from overseas that include materials created from slave labour, such as cobalt and copper used in BESS batteries from artisan mines in the DRC?

- **Subsidies:** The proponent refers to the Federal Government's Large Scale Renewable Energy Target scheme under which the Proponent would be eligible for one free Large-scale Generation Certificate (LGC) for each megawatt hour (MWh) of electricity exported to the National Electricity System. The LGC can be surrendered for a guaranteed minimum amount or sold on the secondary market. No value for this substantial benefit was provided. Based on the Proponent's claim of 2,100,000MWh of electricity produced annually and the minimum surrender price of $40/MWh the project would be subsidised by at least $84m each year or even more. Recent price on the secondary market was $60 a LGC. This subsidy alone represents $706,000 - $1,058,800 a year per wind turbine.
  Does the Proponent agree that they would be subsidised by at least $84million a year? Would the project be unviable if this subsidy was withdrawn?

  A Parliamentary enquiry concluded that over 50% of a wind works' profit comes from subsidies. In addition, the NSW government guarantees a wholesale floor price for wind and solar works generated electricity. Also, coal and gas plants are penalised by government caps, the AEMO's bias towards wind and solar supply, favourable ARENA funding, exemption from Council Development Application fees (typically 1% of project value) and a largely poorly regulated alternate energy industry. Subsidies and favourable pricing/cost benefit mechanisms for wind and solar works and their massive necessary backup requirements are paid for by taxpayers, energy consumers and current and future generations through the repayment of government debt and interest.
  What would be the total likely value of subsidies and value of other benefits that the

proposed project will receive? Does the Proponent agree that Inter-generational equity is not supported by passing onto future generations huge debts and higher electricity prices as a result of these subsidies? Would the project be unviable if these subsidies and favourable treatment were withdrawn?

- **Benefits**: the intended Community Benefit Fund is $1m upfront and $750,000 to $850,000pa. No details of the Neighbours Benefit Fund or payments to host land holders were detailed. The Neighbours Benefit Fund was withdrawn post issue of the EIS. If a Council Development Application fee of 1%, which otherwise applies to local residents and businesses, was not exempted for this project then the Walcha and Uralla communities would have received about $20 million upfront.
  Does the Proponent agree that their proposed benefit payments are actually a return of just a small fraction of the money that comes from Australians via the subsidies and other benefits referred to earlier i.e. $84m plus?

- **Infrasound:** A substantial body of work has shown the serious harmful effects of infrasound (i.e. inaudible low frequency sound) to humans and animals generated by wind turbines under varying conditions. Audible noise can travel long distances. However infrasound can travel, according to some studies, a lot further, up to 13km, well within the range of the residents of Walcha. Wind turbine audible noise and infrasound effects increase with turbine size. Some existing wind works, with turbines much smaller than the Proponent's 230m high turbines, are already the subject of noise complaint and legal action.
  Why did the Proponent not address this health risk, especially given the massive size and number of wind turbines it proposes for this project? Will the Proponent fund an in-depth independent study into this risk issue?

- **Vehicle movements:** vehicle movements are stated as 288 heavy vehicles and 270 light vehicle moments a day during 11 months of peak construction. However, this does not include movements of gravel, water, waste and end of construction decommissioning. One estimate for just gravel is 38,650 truck loads (800 truck movements per day). Water tanker movements at 12,000 litres per tanker would exceed 56,000 tanker loads. Regardless of the source of the gravel or water or location of waste disposal it is obvious a lot more truck movements will be on local roads and possibly main roads.
  Does the Proponent agree that the number of vehicle movements it stated for the project is significantly understated?

- **Supply electricity to 375,000 homes:** The Proponent stated that its project generates enough electricity to power 375,000 average NSW homes. However, no homeowner only wants electricity available on average 8.2 hours a day (i.e. 34.3% of the time) with none on some days and nights when in a wind drought or too little or too much wind blows.
  Does the Proponent agree that its statement is either false or designed to mislead the communities?

- **Sustainable, clean, reliable and low-cost renewable energy:** The claim for this project has proven to be false by real world experience. Every country or jurisdiction in the world that has substantially increased electricity prices for consumers by increasing wind and solar electricity capacity beyond 30% of its generation mix.
  In Australia, electricity prices had already doubled by 2021, rose sharply in 2022 and are expected to rise by another 50% or more in 2023/24, even though in the last seven years 95% of all electricity system expenditure has been for renewables. Ever increasing electricity cost to consumers is unsustainable.

The rare earths, copper, lithium, cobalt, etc. required for the project all have economically finite extraction lives, are extremely energy intensive and toxic to mine, transport, process and convert into usable materials for the project's components. They also are environmentally very damaging as the volume of mining for these extra required metals and minerals is now extensive. Globally, 82% of mining areas, including wilderness areas, are now targeted to extract raw materials for "renewables".
As the project is weather dependent it cannot generate electricity when required and so it can never be a reliable source of electricity generation. Repeating unsubstantiated claims of other organisations over and over in the EIS does not change reality.
Does the Proponent still insist on making these false claims?

- **Reduce carbon emissions and human induced climate change:** 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. 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.
  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. The whole of Australia is responsible for about 0.036% (i.e. 1.2% of the 3%) of human induced global emissions of carbon dioxide equivalents.
  Will the Proponent amend its submission to remove its claim that the project will reduce Australia's carbon emissions and reduce our impact on climate change?

- **Embedded CO2e emissions:** All proponents claim that their proposed wind project in Australia will reduce annual CO2 emissions by 'x' tonnes/annum. Such claims cannot be true. Electricity generated from fossil fuels has been decreasing for many years as more non-fossil fuel generation plants have become operational. Therefore, each new wind or solar works proposed project must have a lesser CO2 saving in its first year than each operating project. A point will be reached when each new wind or solar project actually increases CO2e as its embedded CO2e cannot be offset by its future electricity production.
  The Proponent claims that the embedded CO2e in its project will be offset in the first year of electricity output. Yet it does not know which turbines it will use, from where the turbines and other components will be sourced, the overseas transport involved, the total vehicle movements, the embedded CO2e in its share of all the backup and other support required, such as building specialised ships, cranes, vehicles, new transmission lines, BESS hubs, pumped hydro storage, etc. In addition, the stated annual CO2 saving is for the first full year of operation and therefore is not sustainable over the project's life as coal-fired plants are shut down, more wind and solar works are built and the wind works itself imports spares, lubricating oil, replacement batteries and components from overseas, most likely from China, the world's largest emissions country and largest exporter of wind, solar and batteries in the world. Also, all wind, solar and BESS facilities become less efficient each year, and must be taken into account in assessing claimed output.
  Will the Proponent provide the evidence for its one year claim? Has the temporary and long-term loss of CO2 absorbing vegetation removed by the project been included? Has all the embedded CO2e from mining and transporting the materials included in the supply chain

been included? Will the Proponent provide an annual lifetime profile of actual CO2 savings expected from the project?

- **Decommissioning:** The Proponent claims it will take 18 months to decommission and require similar resources as it took to construct the works. No reference is made as to the time to rehabilitate the land or extent of waste disposal. Currently, turbine blades are cut up and buried because it is uneconomic to recycle them. The weight of 357 blades is about 10,000 tonnes. A lot to remove, cut up, transport, dig a hole for and then cover with soil. The BESS batteries are similarly uneconomic to recycle, but will need replacement 2 to 3 times over 30 years. No costs were provided, but it will be huge, especially in future dollars.
  Will the Proponent provide a suitable upfront bond or similar, indexed to annual cost rises, to cover the decommissioning, rehabilitation and disposal costs? If not, why not?

- **Water use:** The Proponent claims water use as 113 mega litres (ML), twice the capacity of the Walcha storage dam, for construction phase and that it may come from the possible sources of harvestable rights, on-site bores or farm dams or from council supply. One community group estimates the water requirement is closer to 675ML (12 times Walcha storage dam's capacity). Either way, this is staggering amount of water, much of which is not available during droughts, such as during 2017-2020. Dams are very low or empty, bores may be dry, councils ration water. Crops fail and livestock die. And demands by other projects in the region will exacerbate the water scarcity. Water is an essential valuable resource for Walcha and its surrounding properties and communities.
  Will the Proponent accept its demands for water, especially when added to the demands of other projects, pose a serious problem for the communities and the projects, especially if construction coincides with a severe drought? Will the Proponent agree defer or stop all construction if an emerging water crises becomes apparent?

- **Bat and bird strikes:** The Proponent claims bat and bird strikes will be negligible. It is not only the number of bats and birds injured or killed that matters but the fact that the top predators, such as the protected Wedge-tail Eagle, kites and kestrels are most likely the victims. Bats consume enormous numbers of insects, including mosquitoes. Fewer bats, then more crop and health damage by insects. Significantly reducing these numbers of birds will result in increased numbers of mice, rats, rabbits, hares and snakes, all of which can adversely affect fields, crops, farm buildings, equipment and households. A bird and avifauna study at the WW1 wind works in 2014 concluded that over 1400 birds were killed in just 12 months by 140 turbines blades with only a 136 metre diameter.
  Will the Proponent remove from its plans all wind turbines within a suitable distance from all gorges inhabited by raptors and their surrounding hunting grounds? Will the Proponent accept a condition that it fund frequent independent counts of bat and bird deaths and that these be reported to a local community body and Walcha Council?

- **Pollution:** The Proponent claims its project, once operational, produces no pollution. This claim appears to be false for several reasons. The turbine blades contain fibreglass, carbon fibre and plastics, which are shed as micro particles due to wear and tear. These micro particles will spread across the lands and into water ways so entering the food chain. The lithium-ion batteries have relatively short lives and contain several polluting hazardous materials that either require polluting processes to partly recycle or otherwise disposed of. Wind turbines require huge volumes of specialised lubricating oil that requires replacement annually. The spent oil must be disposed of and therefore adds to pollution. Wind turbines and lithium-ion batteries emit very toxic smoke into the air during a fire that can travel long distances, endangering the health of humans and animals in its path, including polluting

water sources, especially tank water and dams used for human and animal consumption. During the many times that the turbines are not generating electricity the BESS will require electricity for recharging and to continuously run the air-conditioning units and safety control equipment. If this electricity comes from either the grid, which fossil fuels will still supply for many years, or local diesel generators, then emissions will result. The turbines themselves are visual pollution of the landscape.
Will the Proponent amend its claim that it is pollution free? Will the Proponent explain how these pollution risks will be mitigated?

- **Cumulative impacts:** The Proponent claims 'the Project would not contribute to any material cumulative impacts'. An astounding claim! Tell that to the people in the suburbs surrounding the Port of Newcastle and all the road users between the Port and all the sites west of the Great Dividing Range in NSW. The number of projects already being proposed in the NSW REZs and beyond for construction before 2030 is huge, let alone including those in the early planning stage. Adverse cumulative impacts include labour shortages, material shortages, water shortages, road works delays, longer travel times, accommodation shortages, increased road wear and tear, increased road kill, increased visual pollution of rural landscapes, disruption to social fabric of affected towns and regions, influx of external workers who don't understand rural life, increased drain on already inadequate medical and other support services, and increased crime.
  Will the Proponent now admit that it has grossly under estimated the cumulative impacts of all projects that will compete for the same limited resources, etc. and that will have a combined damaging impact on many communities?

- **Resources required:** The Proponent appears to have under estimated, not explained or ignored the extent of resources it requires or consumes for its project. The water requirements alone are just but one example (113ML v possibly 675ML). The 119 concrete and steel wind turbine bases alone will require up to 255,000 tonnes of concrete, 3,225 tonnes of structural steel reinforcing and about 127 mega litres of water (not 6ML as stated by the Proponent). By comparison the Sydney Metro Central Station box upgrade used 67,200T of concrete and 850T of steel. The underestimate of the number of vehicle movements was covered earlier, appearing to be many hundreds of vehicle a day short. The BESS weighs about 1100T. The processing of lithium ore is extremely toxic and mining intensive (a Western Australian mine's yield is only 1.3% lithium per tonne of ore dug up). 223km2 appears an enormous waste of resources and destruction of bushland and agricultural land for such an intermittent, unreliable, weather impacted and weather dependent source of electricity generation, especially when much more electricity can be produced 24/7 from generators requiring very little land and materials by comparison e.g. HELE, CCGT or SMRs and with much longer lives (refer Table 1).
  Will the Proponent provide a more comprehensive analysis of the total resources the project requires? Will the Proponent justify the relatively much greater requirement for resources for its project construction than for other forms of electricity generators?

- **Industry viability is of concern:** Since 2017 there have been $ billions of losses incurred by Australian businesses involved in renewables related projects. 3,400 jobs were lost with just the failure of RCR Tomlinson Ltd. Solar works have been sold at a third of their construction cost after just three years of operation. AGL wrote off $2.8b on wind contracts. Overseas and Australian companies have withdrawn from the renewables industry. Costs have blown out by billions and years of delay for major projects like Snowy 2.0 pumped hydro. On 6/12/22 Clough Group, involved in constructing Snowy 2.0 and the EnergyConnect power cable, entered into voluntary administration, so impacting 2500 employees. In January 2023

Sun Cable went into voluntary administration. Alternate energy projects are still not providing electricity to the grid after up to two years after completion. Other projects have failed to generate the electricity output originally claimed. Electricity prices continue to increase rapidly.

Will you please explain how Australians generally and regional Australians particularly, who carry the unfair burden of having their environment converted into massive industrial zones, can be confident of the renewables industry viability, given the history so far?

- **Comparison with alternatives:** The Proponent restricted its comparison with alternatives largely to site selection. However, it is enlightening to consider other forms of electricity generation for a 400MW capacity generator and over an 80 years time period, which takes into account the replacement life-cycle of each form of generation. Table 1 below compares the approved Stubbo (near Gulgong NSW) 400MW solar and small battery storage (BESS) plant with the output and resource requirements of alternatives over an 80 years period. Clearly, such resource requirements and poor energy payback for intermittent, short life, solar, wind and batteries is not sustainable over the medium to longer term.

Table 1. Comparison of 400MW capacity Generation Types

Generator Type	Land Req't Hectares *	Capacity Factor %	Output MWh/year	Availability	Tonnes Material Requirement	Expected Life yrs	Energy out/in Payback %	Materials Over 80 years Tonnes
Stubbo Solar	1772	25.2	883,008	Daylight Hrs #	74,200##	30	60	218,666###
Industrial Solar (ave)	1280	25.5	893,520	Daylight Hrs	67,745	25	60	216,784
Rooftop Solar	0	24.5	858,480	Daylight Hrs	13,550	25	>60	43,360
Wind (no BESS) ave	10,160	30.1	1,054,704	Wind dependent	164,212	20	290	656,848
HELE	30	82.3	2,915,328	24hrs/7days	< 108,550	60	3,000	<144,733
CCGT-CCS	146	90	3,153,600	24hrs/7days	< 108,550	25	3,000	NA
Nuclear	169	91.3	3,199,152	24hrs/7days	108,550	80	7,400	108,550

* Ratios used to bring to all types to 400MW capacity level, except nuclear, used 50% for 1000MW plant
# plus up to one hour from BESS
Stubbo estimated by SOS: 4,800T batteries, 16,000T (20kg x 800,000) solar panels, 53,400T steel (40kg/m x 5m lengths X 133,500 piles plus 133,500 cross members) but no allowance for concrete, inverters, wiring, etc.
Batteries replaced 7 times, rest of system 2.67 times (80yrs/30 yrs)
[ref: Average hectares based on developers' published figures for Beryl, Gulgong, Stubbo and Wellington solar works; materials from sciencedirect.com "global environmental change Vol 60 Article 102028 table 1"]

Scaled up for the Proponent's 700MW wind works project and using the unsubstantiated 30 year life, the estimates, with the Project's provided value in brackets if available, become: Land 17,780ha (22,285ha); Capacity Factor 30.1% (34.3%); Output 1,845,732 MWhpa (2,100,000 MWhpa); Materials initial project 287,371T (NA, but just the concrete bases and wind turbines estimated to be 614,000 Tonnes); Life 20 years (30 years); Materials for an 80 years period 1,149,484T (NA, but in excess of 1,637,333T even using the 30 years life). The enormous materials required for this wind project, compared with the averages from built projects using very much smaller turbines, is likely due to the massive size of the proposed 230 metre tall turbines.

Does the Proponent agree that its wind turbine works project consumes an enormous amount of the Earth's resources for very little electricity generation, especially in comparison with other available sources of electricity generation? Can the Proponent justify this huge consumption of resources? Is

this level of resource consumption and environmental damage sustainable?

- **Offsets closure of Liddell:** The Proponent claims that the project output is needed to offset the closure of the 1,680MW Liddell (April 2023) and the 2,880MW Eraring power stations (in 2025). Several other wind and solar proposals make similar claims. AGL states (4/12/22) that Liddell is currently a 1260MW available capacity power station, has an output of 6000GWh annually, supplies 750,000 average family households and employs about 200 people. Table 2 compares this proposed wind project with the current 50 years old Liddell power station.

Table 2 - Proposed Wind Project comparison with Current Liddell Operation

Parameter	Winterbourne Wind	Liddell	How wind compares
Capacity	700MW	1260MW available	55.6% of the capacity
Annual output	2100GWh	6000GWh	35% of the output pa
Capacity factor	34.3%	54.4%	47% less reliable
Households supplied	375,000 intermittently	750,0000 on demand	50% fewer houses supplied
Operating workers	39	200 approx.	80% fewer jobs
Operational life	30 years claimed	50 years actual	60% the life
Land utilised	223km2	~22km2 excl Lake	Ten times more land
Number of equivalent wind projects to match Liddell's output	2,000MW, 111 operations workers, 637km2 of land and a $5.7 billion est cost (over $4.3b imported equipment)		**2.86** times more wind projects needed, plus new transmission lines and up to 100% additional source of electricity provision from gas/coal or storage

From Table 2 it is evident that:

1. the capacity of the wind works is not equivalent to a similar capacity base-load power plant e.g. the 700MW for the wind project equates to only about a modern 240MW base-load power station

2. it is even more evident that the intermittent output of the wind works (2,100GWh) is much less than an equivalent 24/7 base-load power plant (3,333GWh based on Liddell's constrained output and inefficient 50 years old technology)

3. the wind works capacity factor (34.3%) is vastly inferior to even a 50 years old based-load power station (54.4%); modern base-load power stations have capacity factors above 90%. [capacity factor is the ratio of actual or estimated output to the potential 24/7 output over a year based on the stated maximum capacity of the power plant]

4. the wind works operating staff of 39 (only 16 onsite) is much lower than a base-load power station, which also provides such jobs for at least twice as long (> 50 years)

5. to even get close to the same output as Liddell, a wind works would need to be nearly 2.9 times larger, so requiring nearly 10 times more land and $5.7billion (SOS estimate) in expenditure plus other costs specifically needed to be incurred for the wind works to be constructed and operate (e.g. new/upgraded roads, new transmission infrastructure, compensation payments, higher subsidies).

The non-equivalence of capacity values results in misleading the general public and others, as does the omission of capacity factors. The SEARS requires proponents to include a comparison with alternatives to their project but they do not do so. By omitting comparisons with rooftop solar, offshore wind turbines, HELE, CCGT and nuclear power plants they avoid a proper understanding of the options, particularly those that can produce electricity at least 90% of the time compared to the wind works estimated 30% a year.
Does the Proponent agree?

This proposed project will do little to address the already compromised energy needs of NSW, let alone Australia. In fact, it will make it worse as evidenced by overseas experiences in recent years and our own experiences in 2022 with soaring electricity prices, blackouts, energy rationing and business closures predicted for years to come.
Does the Proponent agree?

Conclusion

Our governments state repeatedly that the only substantial reasons for replacing our existing coal/gas/hydro based electricity system with a non-fossil fuel (wind/solar/ BESS/Pumped Hydro) based system is to reduce Australia's CO2e emissions and to lower household and business electricity prices. Therefore, all non-fossil fuel based electricity supply proposals must prove beyond doubt that they satisfy these two fundamental requirements. Comparisons should be against the lifetimes of current replacement technologies, such as an equivalent output from a new HELE, CCGT, nuclear plant or SMR plant. Proof of both CO2e emissions and all-in system costs analysis must be supplied. **The DPE must insist on this verifiable evidence, otherwise the proposals are fundamentally flawed and should be rejected outright.**

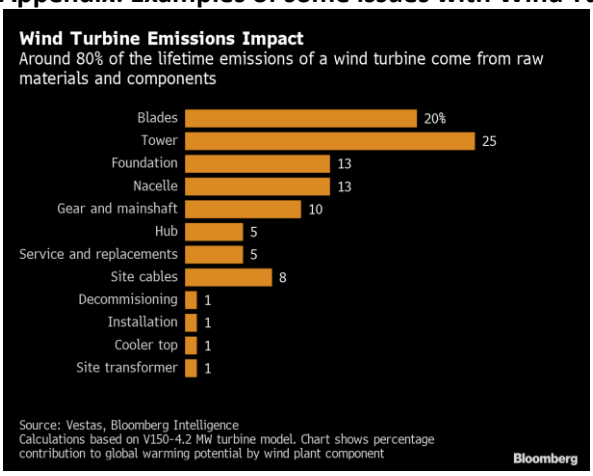
Clearly, the proponent's claims of emissions reductions and lowering of electricity prices is not supported with facts. Lowering CO2 emissions and electricity prices has not been achieved by any country or jurisdiction in the world. This proposed project should not be recommended for approval on these two facts alone.

In addition, there are the issues of potentially facilitating the use of slave labour, the mass slaughter of wildlife and habitat destruction, the significantly increased fire risks, the unavoidable noise created, the contamination of the environment, the reduction in available agricultural land, the energy independence risk and the sovereign security risk of relying on virtually a single source of supply and the cumulative impacts of existing and future wind, solar, BESS and pumped hydro projects (refer Appendix for some examples of issues).

Taking just the foregoing into account the proposed project is "not fit for purpose" and must not be approved. Other countries now recognise these shortcomings and are now turning to better alternatives such as safe, long-life, 24/7 output electricity generation options, such as nuclear reactors and in the near future small modular reactors. China alone added 20GW of coal powered capacity in 2021 and is constructing or announced adding 250GW of coal powered capacity. China is also adding 61GW of nuclear plants capacity.

Yours Faithfully
Save Our Surroundings (SOS)

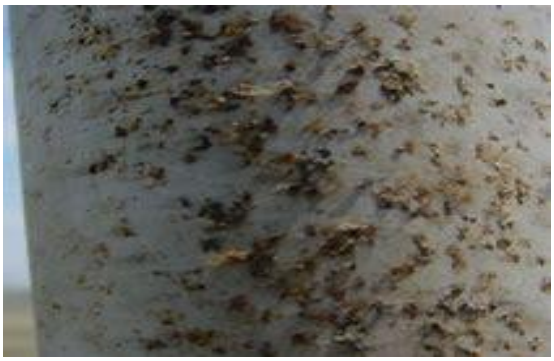
Appendix: Examples of some issues with Wind Turbine Works



Wind turbines emissions impact

Lithium mining could swallow many regional towns

Child slave labour used in DRC



Insect encrusted turbine blade attracts bats & birds

Bird and bats at risk when in flight

Burning turbines create toxic smoke

55,000ha Leadville fire 2/17#

Traffic disruption (e.g. blade movement)

Accidents may occur

Turbines can fail catastrophically

Is this the fate of all discarded turbine blades?

A big hole filled with lots and lots of concrete and steel

Sure can, they just have to start

An alternate site perhaps. Regional people are sure the City people would support this option, just as City folk want wind turbines on OUR regional beauty spots

The February 2017 Leadville-Dunedoo fire moved very fast and destroyed 35 homes, killed 6000 livestock & burnt 500km2 of bush and grassland in one day. Grass fires are frequent occurrences in the regions, especially during periods of drought. While this fire was not started by a non-fossil fuel electricity plant, such plants may start grass/bush fires or be vulnerable to such fires in the future. Fighting wind, solar, and BESS related fires is much more difficult than other types of fires.