The Team Leader Energy Assessments Energy Assessments 12 June 2023
Development Assessment Department of Planning and Environment
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Orana Battery Energy Storage System | Planning Portal - Department of Planning and Environment (nsw.gov.au)
From: saveoursurroundings@outlook.com

Dear Ms Elisha Dunn, Contact Planner
SOS-CW NSW objects to SSD-45242780 Orana BESS Works

Project summary

Proposer	Akaysha Pty Ltd (Akaysha)
Site Location	6945 Goolma Road, Montefiores NSW 2080
Site area	14.8 hectares
Close towns	Wellington (2kms from site, population 4,581)
Main components	Battery packs, inverters, 2 x 330KV/33Kv power transformers, 300KV transmission line
BESS capacity	200MW 2 stages = 400MW on completion
BESS output	800MWh x 2 = /1600MWh on completion
BESS input	Not stated
Components Sourced from	Not yet decided
Purposes and objectives stated	• To store and discharge energy economically into the wholesale market so as to facilitate increased renewable penetration in NSW and improve NEM stability • To provide new industries to Wellington township & broader region • To minimise environmental impacts • to maximise social licence
Project justification	• Allow energy to be stored during times of low demand and released (or dispatched) at times of peak demand • The total capacity of 400MW/1600MWh would provide significant energy storage capacity to the NEM
Construction	6 - 12 months per stage, 12 - 18 months in total
Operation life	BESS 20, 35 and 40 years stated; batteries 10 years; refurbish BESS at 20 years
Decommissioning & rehabilitation	Above ground removal , 12 - 18 months required; no bond provided; resources required similar to construction phase
Jobs	Construction 100 - 150FTEs at peak; operations 6FTE; decommissioning "similar" to construction phase
Capital cost	A$879 million

We require the Proponent to respond in detail to our concerns, questions and issues and for the DPE to satisfy itself that all responses are accurate and adequately address the matters raised by SOS. Generalised responses and/or amalgamated answers are unacceptable.

Our Objections - Part 1

The Proponent's proposal of 344 pages plus attachments contains a lot of information. However, there are omissions, incorrect claims, inconsistent information, unsubstantiated claims and repetition. For instance:

1. **Size of EIS document.** The sheer size of the document for an apparently small development prevents ordinary people from even reading the document let alone appreciate the impacts that a BESS has locally and globally. SOS has made the attempt. Is this intentional to make detailed scrutiny by those affected by the project very difficult?

2. **Inconsistent information.** For example, **t**he EIS states three different lives for the project, 20, 35 and 40 years. It states 10 years life of batteries and full refurbishment after 20 years. It also states nominal capacity as "400MW, configured as either: 4 hours of 1600MWh energy storage or 8 hours of 1600MWh of energy storage, to be built in two stages." 400MW/1600MWh for both 4 and 8 hours cannot be true. It states construction phase requires 2.0ML (p47) and 2.5ML (p193) of water. Just for a few renewables projects the water usage is in the billions of litres.
   Does the Proponent agree that these inconsistencies create confusion? Does the Proponent agree that the true operational life is around 10 years as battery packs have to be replaced by then otherwise the BESS ceases functioning? Is not a difference of 25% in water requirements significant? Does the Proponent agree that the cumulative water usage of renewables projects proposed/under construction in the CWO REZ take away from farmers water that would otherwise be used to produce food?

3. **Cumulative impacts on community cannot be addressed.** The Proponent at least states that the Wellington community are neutral on the BESS project and the community have "lost heart" due to a range of factors (EIS page 231). This is a common response from the numerous communities in the SOS network, along with other issues, such as residents being deprived of their usual local services and goods (e.g. supplies of gravel and cement, availability of tradespeople and access to health services) and businesses having transport delays in receiving business inputs and distribution of their products, forcing up wage cost to retain workers, as well as impacting temporary seasonal workers because affordable accommodation is not available. Does the Proponent agree that the cumulative impact of so many concurrent and future projects cannot be mitigated against by any project and that all the impacted communities in the REZs will suffer these issues for decades as more projects come on stream and replacement renewables projects start in 15 to 20 years?

4. **Cumulative impacts on other communities not addressed at all. T**he Proponent's proposed route from Newcastle to their site (EIS page 50) is 364km. The route on page 50 and the listed roads on page 49 are inconsistent as Ulan and Cope roads (total of 61km) are ignored, Castlereagh Hwy should not be listed and heavy vehicles cannot pass through the centre of Gulgong. Gulgong is in the centre of the CWO REZ. Recently members of SOS-Gulgong were driving from the Central Coast using most of Proponent's proposed route. The travellers were stuck immediately behind two oversized trucks in convoy with safety vehicles on the Golden Highway. Travel speeds ranged from 10 to 60kms/hr in 100km zones. All on oncoming traffic had to pull completely off the road. The following traffic were considerably delayed for dozens of kilometres, which added nearly 30 minutes to the usual journey time of the Gulgong travellers. Most of this same route is increasingly in use for renewables projects. 32 potential solar, wind and stand alone BESS projects are in the pipeline just around Gulgong and nearby surrounds. Just one project has advised that 70 - 130 heavy vehicle trucks a day will use the route to Cassilis before heading towards Ulan and then

Gulgong. Does the Proponent acknowledge that they have little understanding of the huge cumulative impacts on all road users, residents and businesses along their proposed traffic route? Will tourists and other visitors to regional towns along the route avoid visiting these towns due to frustrating and unpredictable travel times?

5. **Cumulative projects impact biodiversity.** The project will remove 10.62ha of native habitat **(**pxxii, p106) out of a site area of 14.6ha. That is, 73% of native habitat is lost. While reference is made to two threatened species it totally ignores the dozens of other animals that depend on that habitat, even though this is a requirement. Biodiversity credits do not help preserve local animal populations (p107). Using Gulgong as an example, over 50 species of animals have been observed on or over just one 5.8ha area of lightly treed pasture land. In addition, a recent bird onsite survey of 500 hours found 19 endangered bird species and a further 5 believed to exist in the area, virtually none of which have been included in the proposals of several industrial wind and solar works developers. All such proposals remove local habitat and also directly kill wildlife. The cumulative impact of a never-ending rollout and frequent replacement every couple of decades of renewables works will ensure the ongoing loss of key predator species and so upset the local ecologies (e.g. more vermin, and more pests). Does the Proponent acknowledge that they claim of a minor impact on the local ecology is but a part of a much wider destruction of the local environments across the CWO REZ?

6. **The BESS cannot just supply electricity locally.** Unless on a separate grid from the NEM, how can the Proponent justify that their Proposal would provide local community and regional area with a stable and reliable energy supply, especially as most of the energy will be consumed hundreds of kms away in the large cities? Is the claim intended to mislead the local communities?

7. **Toxic smoke ignored.** The BESS would be located only 2kms from the town of Wellington. Nowhere in the EIS does the Proponent address the toxic smoke created during a Li-ion battery fire. The risk of fire and toxic smoke was raised in the objections to the Beryl solar works, located 5 kms from the historic town of Gulgong. Four fires have occurred in the Beryl location in the last 10 months, two onsite. The last started as a grass fire under some solar panels in the solar works, which resulted in 18ha of damage and reported damage bill of $7 million. The smoke travelled for several hours over many kilometres but fortunately not across the town (this time). How will the Proponent address the increased risk of toxic contamination from its BESS in the event of a battery, inverter or other fire?

8. **A Community Benefits Scheme is really for the Proponent's benefit**. If the project is so good for the residents of the region, why is a community benefits scheme necessary? Is it really just a bribe to get local support for an otherwise misplaced project that is for the primary benefit of the developer?

9. **Green House Emissions will not be reduced**. Much is made by the Proponent of green house emissions reductions, but no information is provided on the amount of CO2 and other emissions embedded and created prior the commissioning of the BESS. The source of the BESS components is not provided, which may have the affect of doubling the already high embedded emissions. These emissions can never be offset. In fact, they will be added to with each replacement of the Battery Packs and other equipment. Is not this a significant omission, as the main purposes of renewables technology is to reduce CO2e emissions and to provide low cost electricity to consumers? Will the battery components and most/all of the equipment be sourced from China, the world's biggest CO2e emitter? Why did the

Proponent claim the BESS reduces emissions? Is not the primary role of the BESS the maintenance of electricity grid frequency (50+/- 0.15Hz), which otherwise results in the out of specification frequencies caused by the frequent variable output of solar and wind works?

10. **The BESS does not generate electricity, but first absorbs it.** The Wellington and Wellington North Solar Works have a combined capacity of 470MW. This capacity may generate about 1,152,816MWh annually but range from zero supply to a peak supply under ideal weather conditions and the ideal time of year. The Proponent claims the BESS will provide 584,000MWh annually, assuming only one charge/discharge cycle a day. As at least 20% and up to 30% more electricity is needed to charge the BESS. Hence, the BESS must draw most of its electricity from the National Grid, much of which will be generated for many more years by fossil fuel generating plants. Wind and solar works, which also have substantial embedded CO2e in them, have capacity factors of under 30%, based on NEM-wide actual average capacity factors. That means over 70% of the time on average annually no renewable electricity is available across the grid. Factor in the times the wind and solar works generates little or no electricity, then the BESS causes a net increase in CO2e. Its operation can never reduce green house gas emissions, only increase them, let alone offset its own huge upfront embedded CO2e. Why did the Proponent recklessly claim the BESS will reduce emissions? Will the Proponent provide the amount of CO2e embedded in its project at time of commissioning? If not, why not?

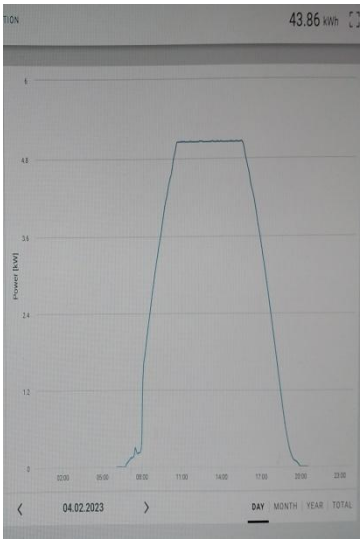
11. **Output of the BESS is insufficient to be called base-load power.** The continuously operated annual output of the BESS, which declines with the annual decline in battery efficiency, means that at least 365 charge/discharge cycles occur each year. This only provide 4 to 8 hours of delivered electricity the grid, at full rate or half rate respectively. Even on average base-load power is required at least 16.8 hours over a 24 hour day. Some days more, some days less. But to provide even this amount of energy it must first utilise up to 30% more electricity from the grid. Why did the Proponent claim that the project will make a significant contribution to the NEM?

12. **Frequent battery replacement causes increased CO2e emissions**. Replacement of the BESS batteries and other components will depend on the number of charge/discharge cycles of the BESS, the extent of discharge, and the rate of decline in efficiency of the batteries. The Proponent suggests a 10 year battery life, but it could be less. How much embedded CO2e in the initial creation of the BESS and how much will be caused by each frequent replacement of the batteries and equipment?

13. **Impact of vehicle emissions ignored.** The Proponent stated that the equipment will be transported from Newcastle Port to the BESS site, a distance of 364km by the fastest route. It also stated that 60 heavy vehicles and 6 oversize/over mass heavy vehicles a day would deliver equipment during peak construction. Over the many months of construction substantial diesel fuel will be burnt and CO2e produced by these heavy vehicles and other vehicles, including project vehicles and delayed traffic along the route. In addition, large amounts of oil would be consumed. Other vehicles and the concrete base also add CO2e to the project. The Proponent does not provide any evidence to support its statements that the BESS will reduce CO2e. Why did the Proponent claim the BESS reduces emissions, when clearly CO2e can only increase with this project?

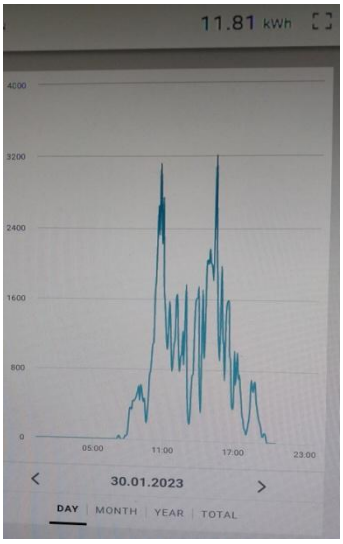
14. **Reduction in wholesale prices not reality.** The Proponent claims that the BESS may reduce wholesale electricity prices, but elsewhere suggests cheaper electricity to the consumers will

result. The BESS must recharge from the grid. It therefore places a demand on the grid, which should result in increased wholesale prices, particularly when wind and solar generation are very low or zero. Excess electricity generation is infrequent and of short duration due to the intermittency of wind and solar electricity generation. Wind droughts are common, as are consecutive cloudy days. The charts of actual solar output in summer are shown below to demonstrate the variability of PV solar generation. The best totally cloudless summer day in NSW CWO REZ is bell shaped, but this is very rare. Cloudy days are the norm. The overcast day produced under 27% of the electricity produced on the rare cloudless day. The other seasons are similar, but of course very much lower total output across all days. The phasing out of coal fired plants will exacerbate the problem of recharging the BESS. Is the Proponent suggesting that its BESS will recharge from other electricity storage facilities when insufficient generation occurs from wind and solar plants? How will the Proponent address these dark days and nights, persistent low cloud, rainy periods, periods of high/low wind or wind droughts? Is not the charging of the BESS just as weather dependent as its renewable energy source?



Cloudless day (rare) 100%

Variable cloudy day (62.8%)



Overcast day (26.9%)

15. **Energy predictions out of date**. Figures 2.4 (p22) and 2.7 (p30) actually demonstrate the need for true base-load power generation, such as High Efficiency Low Emissions (HELE) and Nuclear power plants, which are being built or approved in their hundreds in many countries. Figure 2.4 shows Snowy 2.0 operational in 2025-26. We now know it will run years late, not produce anywhere near the original output and will cost many more times its original $2 billion cost. Also, the projected renewables projects are running late. Likewise, figure 2.7 shows the impact of closing coal-powered stations early (peaks in wholesale prices) and the addition of more renewables increasing wholesale prices. Does the Proponent still maintain that its project will assist in reducing wholesale prices, which have been rising each year for several years now?

16. **The BESS increases retail electricity costs.** The capital cost of the BESS is stated as $879million dollars. Another BESS Proponent stated in its EIS that the "Disadvantages of batteries include their relatively limited life, potential hazardous material construction, and sensitivity to climatic conditions." We agree. The simultaneous replacement of the batteries and the upgrades to equipment are frequent and very costly. The initial capital cost, very high operating/replacement costs, the energy losses, the funding costs, lease costs, community benefit funds, the profit margin and the decommissioning, disposal and rehabilitation costs all have to be recovered from the difference in buying electricity and

selling electricity. The BESS does not generate electricity and only puts 70 - 80% back into the grid of what it took out to be charged. It is therefore a net consumer of electricity. If the project qualifies for subsidies this may offset some of the BESS costs, but it will increase the burden on consumers and State and Federal budgets. Obviously, all these costs increase the overall electricity system cost, which is passed onto the consumers and taxpayers. Will the Proponent's project remain viable if Lithium-ion battery prices continue to increase? Will the Proponent's project remain viable when small nuclear reactors (SMRs) enter the market? Will the Proponent's project remain viable if there is little or no excess electricity available? Will the Proponent's project remain viable if replacement batteries are in short supply due a shortage of battery materials, such as Lithium, or component supply chain disruptions? What is the Australian content of the $879m project cost?

17. **Cumulative storage projects substantially increase NEM system costs.** Pages 15 and 16 provide AEMO estimates that suggest at least 40 Orana Bess size works will be necessary to meet its 2050 targets of 16GW of BESS capacity (16000MW/400MW = 40). This many BESS works would cost $879m x 40 = $35.2 billion. However, by 2050 many more replacement BESS works will be required, at least twice but full battery replacement twice as much again. The cost balloons out to at least $70 billion. In addition, much greater numbers of wind and solar works will be required to charge all these BESS works, which in themselves have to be replaced every 15 to 25 years. Compare this with AGL's previously proposed **250MW** capacity, **90%** (1,971GWh annually) capacity factor, dual fuel combined cycle gas turbine with carbon capture plant (CCGT-CC) on only **91ha** at a cost of only **$400m** and expected life of **25 years**. That is two CCGT-CC power plants (500MW) for $800m, which would deliver 24/7 up to 3,942,000MWh annually. Does the Proponent agree that its project in fact adds to NEM system cost, which in turn results higher electricity costs to consumers? Does the Proponent accept that a CCGT-CC as described is a far superior source of electricity generation than the Proponent's BESS supplied by energy from wind and solar works?

18. **End of BESS life outcomes unknown.** According to the CSIRO: only 10% of Australia's 3,300 tonnes of lithium-ion battery waste was recycled in 2021, compared with 99% of lead acid battery waste. Lithium battery waste is growing at 20% a year. Most of Australia's battery waste is shipped overseas, with the remaining waste going to landfill, leading to potential fires and environmental contamination. On page 248 the Proponent refers to Australian recycling of Lithium batteries. In fact, the two companies mentioned are still some considerable time off being able to economically and environmentally safely fully recycle industrial size lithium-ion batteries. Refer ABC article at https://www.abc.net.au/news/2021-10-25/electric-car-solar-battery-storage-waste-recycling/100564234 . Does the Proponent they were very optimistic in claiming their estimated 9,000 tonnes of batteries will be fully recycled at the end of their 7-10 years useful life?

19. **Subsidies and benefits not stated.** Renewables projects usually qualify for subsidies or benefits. The Proponent has not included any reference to these benefits. Does the BESS Project qualify for any subsidies (e.g. RET) or any NSW government or other Government or assistance (e.g. ARENA loan)? If so, what is the estimated value of the total benefits? Will the Proponent be applying for such benefits?

Our Objections Part - 2
Save Our Surroundings (SOS) objects to this BESS project because there are still so many unresolved concerns about risks and issues involved with Battery Energy Storage Systems (BESS), for instance:

1. Lack of research
2. Resource intensive requirements
3. Involves slavery in mining and production
4. Environmentally damaging
5. Fire starting risks increased
6. Fire-fighting dangers increased
7. Local fire risks considerably increased
8. Expensive
9. Short life-span
10. Variable operation
11. Very little Australian content
12. Increased energy and sovereign risks
13. Roads and road travel are impacted
14. Electricity requirements are high
15. Classed as hazardous goods
16. No certainty at end of life of BESS
17. Increased dependency on intermittent electricity generation
18. Poor viability
19. Keep electricity prices high.

Each of these points are presented in more detail below. We require the Proponent to respond in detail to these concerns and issues and the DPE to satisfy itself that all responses are accurate and adequately address the matters raised by SOS. Generalised responses and/or amalgamated answers are unacceptable.

1. Lack of data and research

There is very little research into the life-cycle of BESS works, especially under the harsh conditions found in regional Australia, as stated by TWAICE, who provides predictive analytics software that optimizes the development and operation of lithium-ion batteries, as follows:

"Energy storage system projects are designed with an outlook into the overall lifetime of the battery, and the fact that the battery will perform at a certain level during this time.

However, unlike in the mobility sector, energy storage system designers do not have access to a lot of data from the field that indicates how the battery will behave under different conditions in the future. Additionally, energy market regulations and rules are changing, sometimes unforeseeable, and hence not all future use cases can be anticipated."

Therefore, there are valid concerns that regional people have about industrial scale BESS works, whether stand alone or as part of an industrial wind or solar electricity generating works. It is in the regions of NSW, Queensland and Victoria where Renewable Energy Zones have been declared and these massive industrial developments are proliferating. It is the residents of the regions that have their lives disrupted for decades, their amenity destroyed, their jobs lost, their roads damaged, their travel times extended, their properties put at risk, their wildlife diminished, their health at risk and their lives put at risk.

What we do know already is that the Lithium-ion batteries: are classed as hazardous materials and

require special handling and operation under temperature controlled conditions; catch/cause fires; emit extremely toxic smoke when on fire; fires are chemical reactions and so are extremely difficult to extinguish; increase the danger to fire-fighters; reportedly involve the use of slave labour in the mining of materials used in the batteries; almost exclusively made by the world's highest CO2e emitter (China); will also frequently require recharging from the grid after use, which increases demand on the grid; require up to 30% more input energy than they can deliver to the grid; are very resource intensive; are very costly to produce; increase electricity costs due to recharge requirements, subsidies and maintenance costs; are environmentally damaging to produce; have much shorter lives than the electricity generators and require frequent battery and equipment replacement; do not recycled easily; are very costly to recycle and dispose of; typically are constructed on agricultural land; only briefly supply electricity to the grid; main purpose is to stabilise grid supply frequency variations caused by inherent intermittent solar and wind generation, and; contain very little Australian content.

At this stage, the batteries are "not fit for purpose" as a backup supply of electricity to meet Australia's modern society energy needs. There are just far too many risks and issues not being considered, understood or fully addressed. BESS works are being too rushed without due diligence of the short, medium and long term consequences. The precautionary principle and intergenerational equity considerations must be applied.

Detailed research encompassing Australian conditions, source of component materials, operational deficiencies (e.g. operational life), used material disposal under safe environmental conditions, and restoration of destroyed local environments must be undertaken to fully and properly assess BESS proposals (stand alone or otherwise) before approving any more BESS works. Will the DPE impose and the Proponent accept a condition that such independent research must be undertaken and published before the proposed project can be approved?

2. Resource intensive requirements

Studies show, if the TOTAL life-cycle (e.g. mining, processing, manufacturing, transportation, land acquisition/lease, land clearing, construction, operation, maintenance, decommissioning and disposal/recycling/land rehabilitation) of wind/solar/BESS works and the associated extra supporting infrastructure needed creates a greater requirement for varied resources than any other alternate energy generation.

The Kathleen Valley WA lithium project needs to mine **139 million tonnes of ore to get 1.8 tonnes of lithium** (**1.3% yield**). The extraction and processing of lithium requires considerable heat and the by-products, such as chlorine gas, which can contaminate the soil, air and water. More extensive mining and all the habitat destruction, polluting activities and transport will grow and grow as more batteries for renewables backup/grid stabilisation and electric cars expands.

For example, a Tesla utility (industrial) scale power pack weighs **2199kg** and contains about **45kg** of Lithium, which requires mining of **3,475,000 tonnes of ore per power pack**. Lithium batteries used in a BESS weigh many tonnes. A 200MWh BESS has batteries that weigh in total over 4,800 tonnes and so contains 98,000kgs of Lithium, which involved mining a staggering 7,568 million tonnes of ore.

Open cut Lithium mines, many of which could swallow several regional towns in just the Central West NSW

Lithium-ion batteries require the mining of lithium, graphite, nickel, manganese, cobalt, copper, neodymium and dysprosium, as well as inputs of aluminium and steel. Hectares of concrete platforms support the BESS, so requiring more mined, processed and transported materials. Similarly, a great deal of mining is required for the other metals, some of it in previously untouched wilderness areas.

For example, a Tesla utility (industrial) scale power pack weighs **2199kg** and contains about **45kg** of lithium, which requires mining of **3,475,000 tonnes of ore per power pack**. The Hornsdale Power Reserve in South Australia uses over **150** Tesla Power Packs. Thus, 521,250,000 tonnes of ore had to be mined, initially processed, shipped to China for further processing and ultimately used to make batteries. Compared with a natural gas power plant, the total mining required for solar, wind and their backup is at least **10** times as many total tonnes mined, moved, and converted to deliver the same quantity of energy.

Batteries are not a good environmentally friendly backup solution for wind and solar electricity generators. Storage per se does not work. The Proposal is not technically viable nor economically and long term sustainable. Will the Proponent provide engineering and scientific proof to the contrary? If not, the BESS proposal must therefore be unilaterally rejected by the Authorities.

3. Involves slavery in mining and production

Cobalt is a required component in Lithium batteries. Cobalt and copper are mined in the Democratic Republic of the Congo. It is well established that a significant proportion of the mined cobalt comes from artisanal mining. The children and adults forcibly involved in this mining face death, abuse and poor health as they are slaves. The cobalt mined commercially and that mined by artisans is easily intermingled in the supply chain. Therefore, it should be assumed that some of the cobalt in any BESS in our country is provided by slave labour.

PV Solar Works, at least some of the time, supply the electricity to charge the BESS. Solar panels are mostly manufactured in China. It has been established that slave labour is used by major Chinese manufacturers of solar panels. Millions of Uyghur Muslims and other minority groups in China are reported to be used as slaves in the manufacture of polysilicon wafers, which are used in the manufacture of solar panels. 90% of solar panels in Australia are sourced from China. Yet we allow overseas developers to continue to import solar panels from China. Solar Works are used to recharge battery energy storage systems and so indirectly support slavery used in China .


Democratic Republic of Congo: E.g. of artisanal mining of cobalt, used in batteries, destroys many African lives

A recent planning panel condition was imposed on a proposed solar works development that required a verifiable undertaking that no solar panels would be used by the developer that had any element produced by slave labour. As a moral company, we hope that the Proponent of this BESS accepts a similar condition. Assurances that they will comply with all Federal and State Modern Slavery Act laws is not sufficient.

The DPE must require the Proponent to prove that their BESS will not contain or use materials produced through the use of slavery and accept a condition of independent verification of the source of their BESS components and materials. Does the Proponent accept these conditions? If not, why not?

4. Environmentally damaging

Lithium batteries used to backup wind and solar industrial electricity generating works contain toxic lead, cobalt and lithium and in themselves pose immediate and future risks to the environment.

Apart from the mining referred to above, the processing of lithium and of rare earths is extremely toxic. Although mostly done in China, the impact on their environments should not be ignored by Australians just for our "benefit". Neodymium, dysprosium, and other rare earth minerals are mined and processed almost exclusively in China and which has covered large tracts of China with fields and lakes of toxic waste.


Toxic "lakes" in Baotou China from processing rare earths

The extent of increased mining, the toxic processes polluting the environments of other countries, the transport by sea and land, the clearing in regions of Australia of tracts of agricultural and bushland, the reduction of wildlife or the risk of pollution to air, land and water is staggering.

This wholesale destruction of ecosystems, which is against the concept of environment protection, is of very serious concern to regional Australians. Biodiversity is not just endangered flora and fauna in

part of a region. Biodiversity refers to every living thing, including plants, bacteria, animals, and humans.

The proponent and authorities are ignoring this environmental vandalism. They must not do so any longer. All assessments of the BESS proposals must take account of the wider damage to all the environments on which the project relies. Will the DPE and the Proponent acknowledge the environmental damage the proposal will cause if it were to proceed?

5. Fire starting risks increased

In April 2021 in The Woodlands Houston USA, a Tesla Model S Electric Vehicle crashed into a tree and ignited. It was reported that the fire department took 4 hours and used 30,000 gallons (113,562 litres) of water to try to extinguish the burning lithium batteries, but eventually had to let the fire burn itself out.

In November 2022 alone the ACCC recalled LG Lithium batteries for almost 5000 households with solar systems because they were dangerous (fire risk). Two trucks, one of which was transporting lithium batteries, collided and both trucks we burnt to just ashes. An e-bike warning was issued after Fire and Rescue NSW responded to 180 Lithium-ion battery fires since January 1, 2022. Some of these fires occurred in lifts and homes. FRNSW stated, *"When Lithium-ion batteries fail, they are prone to 'thermal runaway', which sees them build up intense heat until they violently burst, causing toxic , flammable and explosive gases and flames that are extremely difficult to extinguish"*. There are numerous other examples of lithium batteries causing fires spontaneously, while charging, and in accidents.

Even worse was the fire that occurred in the 350MW/450MWh Battery Energy Storage System (BESS) during testing on 30 July 2021 in Geelong, Victoria. One of the 13 tonne battery packs caught fire. More than 30 fire trucks and support vehicles and about 150 fire-fighters from CFA and Fire Rescue Victoria responded to the incident. It burned for three days and resulted in the evacuation of several residents and others were advised to close all windows and doors, turn off heating and cooling systems, and to bring pets indoors, because of the toxic fumes generated. Fire-fighters had to let the Lithium battery pack burn out, as water and ordinary fire suppression measures cannot extinguish a Lithium chemical reaction fire. If a BESS were a consumer product they would be recalled because of the fire risks alone. They are listed as hazardous goods for a very good reason.

A BESS catches fire in Moorabool-Geelong and ties up emergency services for days. How will rural fire services possibly cope with hundreds of BESS installations scattered across a few REZs, mainly in solar and wind works?

The risk of BESS fires interrupting electricity supply for long periods, creating environmental disasters (grass fires and air pollution, risks to fire-fighters) and requiring special air-conditioned cabinets to maintain battery temperatures between 25 - 30C are unacceptable risks to local communities. Especially when BESS are being located in regions where temperatures reach well over 40C and blackouts and power supply interruptions are frequent. Multiple BESS are usually close to populated properties and regional towns. How many BESS will fail! Especially when it only takes one of the many thousands of battery cells in a battery pack to fail. Toxic fumes can cover a large area and so polluting residents' only sources of water, such as tank water and dam supplies, thus endangering the health of people and animals.

The developers may find the risks acceptable now because they will, in all likelihood, not be the owners in the future. The people who live near or work in a BESS Works do not accept the risks. Fire-fighters should not have to endure the extra risks a BESS creates. Truck drivers and other transporters are taking risk with moving the batteries over large distances. The risks are real and occur now.

Yet these risks are largely ignored by the Proponents and authorities. They must not do so any longer. Will the Proponent accept they cannot mitigate against the high likelihood that their proposed BESS will create unacceptable fire and toxic fumes risk to the local communities during the stated life-time of the BESS?

6. Fire-fighting dangers increased

Most BESS works are located near regional towns. The Rural Fire Service NSW, or its equivalent in other states, is responsible for non-town fires and therefore are the first responders to fires in the sites in which solar, wind and BESS works exist. BESS are usually co-located with wind and solar works but can also be stand alone.

In any case, RFS volunteers are not permitted to enter a solar works and have limited ability to fight a wind turbine fire. Their directive is the preservation of their safety. High voltages and toxic fumes mean that RFS personnel only try to contain the perimeter of a wind, solar or BESS works.
Some RFS units are upgrading their breathing and other equipment, at their expense, and training to even fight a wind, solar, BESS fire at the perimeter. This imposes extra costs and risks to our volunteer fire-fighters. It is only necessary because of the imposition of wind, solar, BESS works in their jurisdiction.

Water will not extinguish a BESS fire, as evidenced previously with the Geelong battery pack fire that burnt for four days. It is a chemical reaction and burns without oxygen. The FRNSW has commissioned a study into how to deal with large Lithium-ion battery fires in EVs, etc. especially when occurring in buildings and tunnels. The report is due in June 2023.

The very volatile nature of large Lithium batteries and their proliferation means the risk to fire-fighters and residents will increase dramatically in the next few years if BESS works proliferate unchecked.

Our fire-fighters and residents should not be subjected to these BESS fire-starting risks. Fire-fighters are not allowed to publicly express their concerns. Their organisations therefore suggest to proponents a mitigation requirement, which is totally inadequate. For example, a 400MW solar works with 200MW BESS near Gulgong NSW was only required to put in one 20,000 litre water tank and a fire management plan posted at the entrance to the fully fenced off 17.72 km2 site. A resident who builds on just a 6 hectare (0.06km2) property near the Gulgong town is also required by Council to reserve 20,000 litres for fire-fighters. See the absurdity?

The proponent of a BESS is putting our fire-fighters and residents at unacceptable risk and cost. BESS projects should be subject to a full enquiry as to all the risks and adverse consequences their projects cause.

Will the proponent and recommending/approving authority require such an inquiry before approving the project? Lives and property are at stake!

7. Local fire risks increased

Apart from BESS starting fires and Fire-fighters at risk of fighting them, there are local risks. Grass and bushfires are a constant risk throughout the year and particularly during dry windy periods. For example, three fires occurred in August and September 2022 in or near the Beryl solar works. The first was an equipment fire. The second was a major emergency, calling in over a dozen fire-fighting appliances and several emergency services crews from a 35km radius, as well as three water-bombing helicopters, to prevent a grass fire from entering the solar works. Conditions were relatively benign, the dams full and the ground soggy, but it took four hours to bring the blaze under control.

Photo taken from the RFS video. Part of Beryl solar works, near Gulgong NSW, is visible along the top of the photo

On 24 April 2023 a fire started under arrays of solar panels in the Beryl solar works. Conditions were benign. RFS, FRNSW and Hazmat units were called to the fire but could only patrol the perimeter. A 180 degree wind sheet extinguished the grass fires under 18ha of solar panels. The damage bill was reported to be around $7 million. Smoke from the fire travelled several kilometres and was visible

from tens of kilometres away. Four fires in Beryl in 10 months! The DPIE and then Proponent were warned of the risks of fire. Beryl solar works was approved despite 100% of residents' submissions objecting to the porposal.

In 1983/84 grass fires in the Western Division of NSW killed 5 people and 40,000 stock. An area of 3,500,000ha (35,000km2) was burnt. Today wind, solar and BESS works are being built, approved or proposed to be built on some of this same land, including land that has been classified as fire-prone.

In February 2017 the Leadville-Dunedoo fire, which is now located within the centre of the NSW CWO REZ, started with a spark and proceeded over 24 hours to destroy 35 homes, 6000 livestock, untold wildlife and 500km2 of farmland/bushland. Such can be the ferocity and extent of out of control grass fires when conditions are adverse, which is not infrequent.

In March 2023 a grass/bush fire burnt out of control for several weeks in the Tambaroora, near Hill End in the Central West NSW. At least 18,000ha (180km2) were burnt, at least six homes destroyed, fences and other property destroyed, over 200 sheep euthanased and many hundreds more perished and feedstock destroyed. Homes destroyed, hundreds of sheep euthanased as toll from Hill End fire rises - ABC News. Weather conditions were unfavouable.

With limited road access and access to water it is extremely difficult to contain a grass fire in dry hot and windy conditions. The high fencing surrounding solar works and the 250 metre plus tall wind turbines add significantly to the risks faced by the local communities. Access by road and air is much more limited. The existing, approved and in planning developments will, if all built, cover hundreds of km2 of land within a 20km radius of Gulgong. This additional risk applies to all towns with such wind/solar/BESS developments so close to their properties and towns.

February 2017 Central West NSW Leadville-Dunedoo fire front

Why we hate grass fires

Almost exclusively, the renewable energy zones include mainly agricultural land and some bushland. Therefore, wind, solar and BESS works are not only constructed on such land, but are surrounded by it. Thus, a grass fire, for example, outside of a wind/solar/BESS site threatens the works and can damage it if it passes the perimeter. Burning wind/solar/BESS works are very toxic and very difficult to extinguish. As different wind/solar/BESS works can and do adjoin each other, it is possible a huge amount of capacity will be lost during a catastrophic fire like the Leadville-Dunedoo fire.

Why should local impacted communities have to live with this additional risk of losing everything, even their towns? Electricity supply capacity is at risk too. Knowing the risks and limitations placed on fire-fighters in dealing with BESS fires does the Proponent and DPE agree that the proposal should be withdrawn?

8. Expensive

A BESS utilising Lithium-ion batteries is an expensive method of storing electricity. Anyone who wants to replace the lead acid battery in their caravan with an equivalent capacity Lithium battery will attest to that.

Using the Hornsdale Victoria BESS, the world's biggest battery in 2017 as an example, one sees the size of the issue.

The **7,500** hectare Hornsdale Windfarms in SA have a capacity of **316MW** and a claimed capacity factor of **37.9%** (1,050GWh annually, but was just 22% for 25/02/2023). When the wind turbines are becalmed, sometimes for days, then no electricity is produced. Advocates for renewables claim battery backup (they oppose coal, natural gas and nuclear electricity generation) can fill this void.

On average, wind electricity generating works in Australia do not produce electricity for 72 hours of each week. How much would the Hornsdale Power Reserve batteries (currently **150MW/193.5MWh** in size) need to be expanded to supply the backup electricity needed for, say, 72 hours before being exhausted? A staggering increase of **118** times as large (316MW x 72h /193.5MWh). The Hornsdale Power Reserve cost about **$130m** (stage 1 was $90M), required 1ha of concrete slabs and 4.3T of batteries and inverters). Scaled up 118 times comes to **$1.534 billion cost**, **118ha of concrete slab** and **504 Tonnes of battery equipment. Then how is it to be recharged during wind droughts and inclement weather conditions?**

Compare this with AGL's previously proposed **250MW** capacity, **90%** (1,971GWh annually) capacity factor, dual fuel combined cycle gas turbine with carbon capture plant (CCGT-CC) on only **91ha** at a cost of only **$400m** and expected life of **25 years**. The CCGT has longer life than the Hornsdale wind turbine plant yet produces nearly twice the electricity output annually and when required almost 24/7 at a very much lower capital cost and demand on resources.

To achieve a backup storage works for when the wind does not blow as required and the sun does not shine when needed the cost of BESS storage is enormous and will increase overall electricity system cost substantially. The short life span of batteries will require replacement relatively frequently, so adding to future system costs. Consequently the costs of electricity to consumers can only continue to increase, as has occurred everywhere else in the world. A BESS may be useful for grid stability but it is too expensive and unreliable storage method, because its increasing reliance on recharging sources of unreliable and intermittent wind and solar generators, compared to better lower cost alternatives of base-load generation.

The BESS is "not fit for purpose" as the costs are prohibitive and its operation as a significant method of back up for intermittent and unreliable wind and solar works is not feasible. Therefore, does the Proponent agree that the costs of electricity to consumers can only continue to increase, as has occurred everywhere else in the world? Does the Proponent agree that the added expense added to the electricity network by their proposal is not justified and so the BESS proposal should be withdrawn?

9. Short life-span

Unlike in the motoring sector, battery energy storage system designers do not have access to a lot of data from the field that indicates how the battery will behave under different conditions in the future. Additionally, energy market regulations and rules are changing, sometimes unforeseeably, and hence not all future use cases can be anticipated. This is particularly true for Australia.

This lack of transparency leads to increased risks for the integrator, which can be minimized with strict warranty conditions, but which become increasingly stricter the longer the term of the warranty. There are many things that affect BESS performance and longevity, such as:

- capacity usage;

- cycling degradation;
- rest time;
- state of charge (SOC);
- temperature and;
- other metrics,

  which all impact the performance and degradation of battery cells that make up each battery pack in a BESS. For example, battery cycles per day affect life (capacity retention). For example, a 70% capacity level is reached at two cycles per day, the expected life is 13 years. At 1.5 cycles/day a 15 years life and at 1.0 cycle/day a 17 years life. This is just one variable. A January 2023 BESS proposal had a discharge/recharge cycle of 2.6 times day, which would result in a battery pack life of only 5.3 years.

In addition, battery capacity declines over time, which is why manufacturers limit their warranty, with increasing stricter conditions, to still being above 70% capacity after 7 to 12 years. In any case, the batteries of a BESS, and probably other components, will need to be totally replaced at least once or possibly twice before the wind or solar works charging the batteries reach their end-of-life.

The short life-span of a BESS should be considered a major negative to achieving the claims made about being a major backup for intermittent and unreliable wind and solar works. Will the Proponent provide transparency of this fact, including life-span and replacement projections and the extensive costs involved? If not, why not?

10. Variable operation

Little detail is given on the operation of the BESS. Many operational variations affect the operation and life of batteries, including downtime for maintenance checks, which may take 3 days or more.

In addition, external temperatures can range from well below zero degrees Celsius to well above 40C, especially west of the Dividing Ranges. Thus, the BESS air-conditioning units will have to maintain the ideal battery temperature over extreme external temperature ranges for 24 hours every day. Failure of the air-conditioners to do this could lead to the batteries failing, especially during charging during the hottest part of a sunny day when a solar works is putting out its maximum output. The result may be a shutdown of the charging or a fire. Either way, output capacity would be reduced or lost.

The likely biggest impact on the capacity of a BESS to deliver electricity to the grid will that it is not fully recharged. On average, wind and solar works only produce electricity over a year under 30% of the time or about 7 hours a day. That is, their average annual capacity factors are generally less than 30%. The assertion that a BESS can, on average, provide 17 hours of electricity a day and be recharged is technically absurd.

Frequently wind and solar works produce little or no power due to the vagaries of weather and time of day. Thus, a BESS has no reliable continuous source of electricity for recharging as more base-load electricity generators are displaced by wind and solar works. For example, a fully charged 500MW/1000MWh BESS in its first year of operation (it declines after that) can only provide full power for two hours. By comparison a modern 500MW gas turbine or nuclear power plant can provide power at full capacity night and day. Storage is a unrealistic power source and can never be a substitute for any form of continuous base-load electricity generation.

Any BESS is be unable to reliably provide electricity when needed, mostly at night or on cloudy and windless days/nights. The proponent must be transparent on this. Our electricity system reliability

and availability is dependent on the Proponent's assertion that BESS works are the solution to wind and solar intermittency and unreliability. But the short lifespan, variability and decline in capacity indicates that the operation of a BESS can only provide electricity a fraction of the time when needed. Therefore, the BESS is "not 'fit for purpose" as a backup for wind and solar works.

Will the Proponent explain how their BESS proposal will actually meet the needs of electricity consumers at all times when there is no or little sunlight and no or inadequate wind? This includes when both wind and solar generation simultaneously produce no electricity at all. For instance, when adverse weather conditions cover a large geographic area, such as most of one or more States.

11. Very little Australian content

Claims by BESS Proponents that their multi-million dollars investment is good for the town/region/country lacks any significant detail. The BESS components are mined and products manufactured overseas, transported by overseas owned ships, pass through Australian ports partially owned by overseas companies, are constructed by overseas companies, employ few local workers once operational and any profits are remitted to the overseas owners and investors. The true investment value is the Australian content of the total investment. How can the financial benefit to the community and Australia of a proposal be properly assessed without knowing the Australian content?

Will the BESS Proponent declare the actual dollar and percentage Australian content of their proposed project? If not, why not?

12. Increased energy and sovereign risks

China is by far the largest manufacturer and exporter of wind, solar and BESS components in the world. Even a higher percentage (>85-90%%) is exported to Australia. It is therefore a safe assumption that all BESS works will contain Chinese made components. China also controls most of the supply and processing of materials essential for BESS batteries, such as lithium and cobalt. The reliance on China to supply the initial components and then continue to provide warranty support, spare parts and replacement components for the claimed 20 or so years life of the BESS is both an energy supply risk and a sovereign risk to Australia.

Without a reliable, low cost, high availability and diversely sourced electricity supply system Australia is vulnerable to the discretion of the Chinese government. Our ability to run our society would be seriously compromised without adequate low cost electrical power to run our industries, our businesses, our transport and our households. With no alternative to producing electricity than from wind and solar works, yet at the same time increasing our use of electricity for electric vehicles, wholly electric industries, wholly electric homes and businesses, Australians will be very vulnerable to any geo-political shocks, as is currently the case in the Northern hemisphere as a result of the Ukraine-Russian war.

Overseas developers may care little for what happens to Australia after they have built their project and left. However, it is of serious concern to Australians now and for future generations.

The Proponent must state the sources of all their BESS components, materials, backup and availability within Austrlia of all necessary spare parts, etc. as part of the EIS (or equivalent) and be held to them, so that the energy and sovereign risks can be assessed properly by the communities affected and the public in general. Does the Proponent accept this condition? If not, why not?

13. Roads and road travel are impacted

The construction of a BESS involves the movement by heavy vehicles of thousands of tonnes of components over hundreds of kilometres. Often a BESS is also part of a wind or solar project or a standalone BESS that is simultaneously using most of the same transport routes as other projects.

For example, the Central West Orana Renewable Energy Zone is over 300kms from the Newcastle Port, from where nearly all the overseas components are delivered. There are few main roads servicing the region. Many thousands of extra very heavy and very large truck movements are planned for every day, year after year to use these main roads. These roads are already in poor condition, even before the extra trucks start in large numbers. In addition, increased traffic on local roads results from cement trucks and workers' vehicles.

A rural road intersection with a primary road, used by heavy vehicles for building a solar/BESS works

Three significant outcomes will result from these extra heavy and light vehicle movements. Firstly, the damage to the main roads and local roads will be increase significantly. Secondly, road travel times for road users will increase due to the increased number of slow moving heavy vehicles and the need for increased road works. Thirdly, the financial costs will fall on the taxpayers, ratepayers and local businesses. Additional road repairs are a cost to taxpayers and rate payers with little contribution from the developers. Slower travel times will reduce the number of visitors/tourists to regional towns, especially the weekend and festival travellers, which will reduce the income of local businesses. It also impacts the time to get inputs to the farmers, businesses and manufacturers and produce and goods to market, so increasing the cost of food and goods.

Proponents dismiss these cumulative impacts. They also claim business will increase, but offer no detail of how this will be achieved and fail to take into account lost business customers and effects of loss of staff. For small towns this loss of business is very significant. The loss of agricultural land for wind, solar and BESS works also impacts jobs and businesses of regional towns. If businesses fail in a small town, especially in hard economic times like the present, then the whole town will go into decline.

Another huge cumulative impact that is being ignored by BESS Proponents is that of what happens in 20 odd years' time. The Federal Government's target by 2030 is for renewables to make up 82% of the NEM electricity generation mix. This means that most of the generating capacity from wind and solar will be built by 2030 and so be of similar age. Average economic lives of wind and solar works is 20 -25 years (much less for a BESS). Therefore, a total replacement/refurbishment of most of the electricity system will be required to start before 2050 and be completed in about a decade. The total extent of all works involved in this project has simply not been properly defined, specified and costed.

The proposal should therefore be rejected because of the damage done to roads, travel times, businesses and the sustainability of rural towns, and the inadequate detail of system installation, operation and lifetime maintenance costing. Will the Proponent detail the replacement cycle and the costs involved? If not, why not?

14. Electricity requirements are high

Charging a BESS requires about 20%-30% more electrical energy than the BESS will supply. For a standalone BESS this figure is higher, as they take alternating current (AC) from the grid and then have to convert it to direct current (DC). This involves additional losses in energy transformation. Further losses occur in converting DC to AC and when power is transmitted over huge distances to where it is required. For instance, all of the electricity produced by the Beryl solar works, located 300kms from Sydney, is contracted to Sydney organisations. A most inefficient way to distribute electrical power.

Because of the efficiency losses, especially for transmission over long distances and for charging multiple BESS works, and the infrequent generation of electricity by wind and solar works, the whole grid has to be very much larger to meet the end demand. The greater the proportion of wind and solar works in the electricity generation mix the very much bigger, and more costly, the electricity system becomes. That is, a lot more electricity has to be produced. The electricity production requirement will be ever expanding just to cope with constraints caused by the design of the grid, even before extra demand for electricity storage facilities, EVs, fully electrified households, businesses and existing and new industries become significant.

Will the Proponent of a BESS detail the expected alternating current output it will provide over its estimated economic life and the expected electricity it will consume? Only then will a better understanding of the net impact of the project and the cumulative impact on the electricity system be properly understood. Does the Proponent agree? If not, why not?

15. Classed as hazardous goods

Lithium batteries are classified as Class 9 Miscellaneous Dangerous Goods. The Australian government product safety site run by the Australian Competition and Consumer Commission (ACCC) warns that "*Lithium-ion batteries have caused fires and explosions leading to property damage, serious injury, and even death in Australia and across the globe*".

There are many reports of such events, some of which were stated earlier. A freighter carrying electric vehicles sank after a fire started in the hold. A shipping company recently decided to refuse to transport electric vehicles (EVs). Trucks carrying lithium-ion batteries have crashed and burned. Whole parked electric bus fleets have burned to the ground after one electric bus burst into flames, so fierce was the fire. EVs have caught fire while being charged. The Fire and Rescue NSW (FRNSW) recommends not charging EVs near buildings or in underground car parks. It is known however, that

EVs still catch fire even when not being charged. Similarly, there have been several reports of battery packs in BESS installations that have caught fire and have exploded in some cases.

The dangers of Lithium batteries are well known, yet are given little attention when evaluating wind/solar/BESS proposals. The inherent dangers of Lithium battery systems need to be addressed in more detail during the evaluation of BESS proposals. The accumulation of tens of thousands of tonnes of battery packs, involving hundreds of thousands of battery cells, present a very high risk that multiple BESS fires will occur over the lives of the many BESS works. It only requires one battery cell to fail and catch fire to set off a chain reaction. The accumulation of tens thousands of tonnes of battery packs applies just for one REZ. This can be multiplied dozens of times.

One the most feared events in regional Australia is out of control grass fires. Yet the concentration of lithium batteries around our towns is scandalous. In addition, they pose dangers when being transported as well as when in situ. A burning BESS releases extremely toxic smoke and will burn for days, despite the efforts of fire-fighters. When a BESS battery pack fire occurs near towns these towns will have to be totally evacuated, their water supplies will be contaminated, their roofs covered in toxic materials so that they cannot replenish their water tanks with rain water, and live with the effects of contaminated soil, water and air.

No proponent can guarantee a disastrous fire will not occur in their BESS at some time. The mitigations proposed are more relevant to a standard building catching fire, not for the toxic BESS on grazing land and surrounded by grassland. The precautionary principle must apply.

The proposed BESS should not be approved on safety reasons alone. The risks are too great. the Precautionary Principle must be applied as legislated. Does the Proponent agree that the Precautionary Principal must be applied to this proposed BESS? If not, why not?

16. No certainty at end of life of BESS

Currently, recycling Lithium-ion batteries is not widely practised. Despite the high number of lithium batteries discarded each year from small appliances and devices, only a small percentage undergo any form of recycling. The advent of growing numbers of large scale batteries in each BESS and in electric vehicles will dramatically increase battery waste during the current decade and well beyond**.**

According to the CSIRO: only 10% of Australia's 3,300 tonnes of lithium-ion battery waste was recycled in 2021, compared with 99% of lead acid battery waste. Lithium battery waste is growing at 20% a year. Most of Australia's battery waste is shipped overseas, with the remaining waste going to landfill, leading to potential fires and environmental contamination.

The difficulty and high cost of any recycling of lithium batteries is still a serious barrier to their use in BESS works. Recycling lithium batteries is inefficient, expensive and produces toxic waste. If battery prices fall, as we have seen with solar panels, then recycling of batteries will be even less likely. If battery prices continue to rise significantly due to a shortage of metals, such as lithium and cobalt, then recycling may increase as the metals in the batteries are more valuable. But this also means new BESS works are even more expensive to build. However, if battery prices rise then demand will fall and recycling may again become uneconomic. Also, if new and improved battery technology is invented then lithium batteries will become obsolete and discarded with little or no value in recycling.

What we know now is that the growing waste from Lithium batteries is not widely recycled. There is

no guarantee that the batteries in each BESS will ever be recycled, let alone to a 99% level as for lead acid batteries.

With such an uncertain future for disposing of end of life lithium batteries used in each BESS, a precautionary approach must be adopted ahead of any approval of the project. The proponent states that at the end of life of the BESS that they will decommission the BESS, dispose of the infrastructure and rehabilitate the land, which may be contaminated, to its previous condition. At this stage of the planning process they offer nothing to ensure such work will or can be undertaken, nor how in fact such works will be achieved and at what cost.

It is likely that there will be significant technological changes over the next 20 years. The technology could become obsolete, the BESS could change ownership, the developer could fail, the landholder ownership may change, the land abandoned, the BESS become uneconomic to operate, be damaged beyond repair, be unable to acquire spares and replacement components, the BESS owner or/and landholder could have to pay compensation beyond their available funds, so abandoning the BESS.

If the proposed BESS project is approved, it must be with a condition that an indexed bond be lodged to a government or Council trust fund before any work is commenced. And that the initial amount will grow annually to fully cover the independently estimated future costs of decommissioning and ecologically safe disposal of the BESS and full rehabilitation to its original state of the site. Does the Proponent accept this condition? If not, why not?

17. Increased dependency on intermittent electricity generation

It is of concern that the proposed BESS will inevitably become increasingly dependent upon intermittent solar and wind power generation facilities, as coal and gas generators are progressively de-commissioned.

All BESS installations will become increasingly reliant upon the availability of excess power from a grid that is primarily supplied by unreliable solar and wind generation.

The Capacity Factor for solar and wind power generation over a 12 month period is approximately 30 % maximum, as a rule solar is usually lower at around 25%.

It is virtually impossible therefore for a solar and wind supplied power grid to simultaneously supply the normal load and charge large (BESS) batteries. Depending upon the prevailing weather conditions there may, on occasions, be adequate power to supply both the normal load and the charge energy for a local BESS, however such excess power situations are rare in solar and wind systems and generally capacity to maintain fully charged BESS installations will be inadequate. Thus BESS installations will be of little use to support a solar and wind power grid over any extended period. It is a well-established engineering fact that energy storage facilities cannot reliably support unreliable power generation systems, energy storage systems are traditionally employed in power grids only for peak lopping (support power during morning and evening domestic cooking periods).

Will the BESS Proponent explain, **in detail**, how the charge of the BESS is adequately maintained when the grid supply is predominantly by solar and wind generators, which is expected to be by 2030, according to the projections of governments as legislated? If not, why not?

18.Poor viability

It is claimed by proponents that their project will put downward pressure on wholesale electricity prices. However, the retail electricity costs continue to rise steeply. This is a result of increased infrastructure costs (e.g. Tas-Vic underwater cable > $1b), massive government subsidies ($13B in 2019 or 39% of household electricity bills), government financial support , government paid generation fill-in support by coal and gas generators (thermal power stations running at low inefficient power levels) 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 still increasing, NSW-SA interconnector $1.35B to $3.32B before it's even started). All these cost increases 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.

In addition, add the failure in 2018 of RC Tomlinson, with a loss of 3,400 jobs and the failure of Clough Group (builders of Snowy 2.0 and the Interconnector) in November 2022 at a loss of 2500 jobs. Also, 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. Companies like Downers and New Energy have withdrawn from the market place. AGL wrote off over $2.8billion on a wind electricity generation contract in 2021. Sun Cable went into voluntary administration in January 2023. Australia's third largest energy generator-retailer, Energy Australia, reported over a one billion dollar loss for full year 2022. Ultimately the consumer pays for all these extra costs. It is expected that there will be many more cost blowouts and company failures to come, both during and when the current boom, as one developer stated in 2021, in "renewables" ends.

Given the turmoil already evident over just the last few years in the renewables industry in Australia, how can anyone have any confidence that the Australian companies or even their overseas owners will exist in a decade or two. Claims by proponents that they are in it for the long haul are not supported by the facts.

If the proposed BESS project is approved, it must be with a condition that an indexed bond be lodged to a government or Council trust fund before any work is commenced. And that the initial amount will grow annually to fully cover the independently estimated future costs of decommissioning and ecologically safe disposal of the BESS and full rehabilitation to its original state of the site. In addition, as the battery units have to be replaced frequently, there should also be a separate replacement fund to ensure the BESS will remain operational for its claimed operating life. Does the Proponent agree to this condition? If not, why not?

19. Keep electricity prices high

It is often stated by both government and renewable energy (RE) proponents that RE projects put downward pressure on wholesale prices. However, the consumers are interested in what they have to actually pay for their electricity. It is an established fact that no country or jurisdiction with over a 30% proportion of renewables has achieved lower electricity prices for consumers. For instance, the electricity prices of the UK and Germany have risen by over 300% in the last 12 months alone. This diagram from the NSW Energy website shows why:

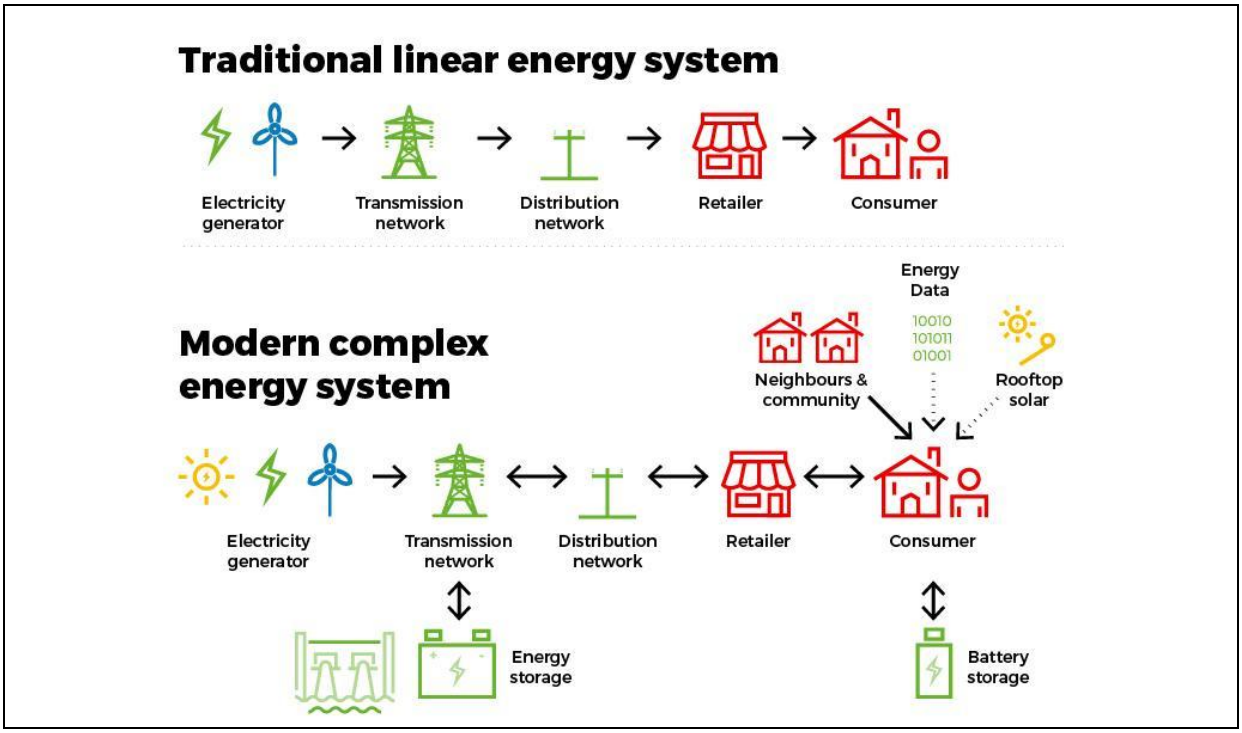


Diagram from NSW Energy 18/12/20 Renewable Energy in NSW | Energy NSW

Complexity adds cost and risk. Weather-dependent energy systems alone cannot provide the necessary electricity to run our society. Solar and wind generation systems have to augmented with: expensive pumped hydro, of which Australia has virtually none; prohibitively expensive batteries that have to be charged frequently, so requiring even more wind and solar works and 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 late 2020 there has been a continuous upward trend in electricity power prices across all countries that have installed significant amounts of solar and wind systems whilst decommissioning coal, gas and nuclear power plants. UK, Western Europe, and the USA all face a bleak 2023 winter as electricity power prices and power shortages were significantly increasing well before 2022, and continue to do so. Australia's AEMO had to suspend the spot market for wholesale electricity in June 2022 because of soaring prices and diminished supply to avoid wide-spread blackouts. The Federal government has just introduced in December 2022, price caps on coal and gas in the hope to reduce the extent of the budgeted 56% increase in electricity prices in 2023 and 2024. But, any lower retail prices are just offset by subsidies to the coal and gas industry. This is just moving costs around, and not fundamentally addressing the cause of electricity cost increases, a strategy that is not resulting in power price reductions.

Proponents must stop making obviously false statements about downward pressure on wholesale electricity prices as this misleads consumers into thinking that the proposed project must be good if it will reduce their electricity bills. It has not occurred anywhere in the world. To do otherwise is, in our opinion, outright deception.

Will the Proponent remove any reference or suggestion that their project will reduce electricity prices and in fact indicate that electricity prices are likely to rise due to increased system costs, in part as a result of their proposed BESS should it be built?

Conclusion
The BESS proposal must be withdrawn or rejected. The proposed BESS is not fit for purpose.

The claims that the project will result in clean, cheaper and reliable energy generation are unsubstantiated and are contrary to the real world facts evidenced by both domestic and overseas experiences. It increases CO2e globally and the cost of NEM electricity. It therefore fails the two fundamental justifications for approval.

This proposed project will do little to address the already compromised energy needs of the NEM grid, let alone, Australia. In fact, it will make it worse as evidenced by overseas experiences in recent years and our own experiences in 2021 and 2022, with soaring electricity prices, blackouts, energy rationing and more business closures predicted for years to come.

The costs in net jobs, environmental damage, destruction of wildlife and habitats, visual pollution of natural landscapes, immediate significant increase in global greenhouse gas emissions, increased cost to electricity consumers and tax payers, cumulative disruption to local communities and others along transport routes, health and fire risks, possible involvement of slave labour, energy and sovereign security risk, and unfunded end-of-life costs, are just a few more reasons this project should not proceed.

Finally, the other significant reason this project should not be recommended for approval is that battery storage for power grid support cannot function as proposed, These systems simply do not work, due to the impossibility of maintaining full charge under an electricity system dominated by weather dependent intermittent wind and solar electricity generation.

Reject **SSD-45242780 Orana BESS Works!**

Regards
Save Our Surroundings (SOS)
Save Our Surroundings (SOS) and SOS-CW are part of 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.