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To
NSW Department of Planning and Environment

Submission opposing the Hills of Gold Wind Farm (SSD-9679) project

The number of wind turbines is rapidly increasing globally as the demand for renewable energy grows. While wind power plays a vital role in reducing carbon emissions, the 'Hills of Gold Windfarm' (HoGWF) as proposed by Wind Energy Partners Pty Ltd (ENGIE), is the wrong development in the wrong place.

The HoGWF would see 47 turbines, constructed along the ridgelines in the middle of four karst areas (Timor, Crawney Pass, Glenrock and Barry). These areas contain significant caves that are the rousting sites for micro-bats. At night they forage amongst the trees and vegetation of the slopes and ridgelines where it is proposed to construct the HoGWF. The ridgeline is the divide between the Hunter Valley to the south, Manning River to the east and the Peel River to the north in NSW. The project site borders with the Crawney Pass NP and the Ben Halls Gap Nature Reserve.

This proposed wind-farm has many detrimental consequences for the environment as a whole, including direct collision risk for birds and bats. I draw your attention to several studies which relate to micro-bats.

- A presentation of a study by Simbolix (Stark and Muir 2020) of post construction windfarm strikes of bats and birds across 10 Western Victorian wind-farm sites containing 764 turbines, found that each turbine on average killed between 7 and 10.8 bats per year. This may sound like a small number of bats, but if one multiplies an average of 10 bats x 764 turbines = 7640 bats per year. This can devastate bat populations. In addition to the bats, each turbine killed on average between 5 and 6.7 birds per year. However these figures only consider the carcasses found during periodic searches and could not determine how many carcasses were removed by scavengers. The study averages the strikes over all turbines including those in areas with fewer bat populations, so it would be expected that specific turbines located near large bat populations would have a much larger mortality rate.
- Studies have also shown that bats do not have to have a direct impact with a wind turbine blade to be killed. The bat is often killed by barotrauma which is roughly equivalent to a scuba diver suffering the bends due to not decompressing. For bats, the rapid change in air-pressure as it flies past a spinning wind turbine blade is a significant cause of bat fatalities due to extensive multifocal pulmonary hemorrhage, congestion and bullae. The study by Baerwald et al. (2008) shows that as significant number of bats don't actually need to strike the turbine blades to be killed. This raises the question of how far from the turbines can the bats with barotrauma actually fly before they eventually die? And how many of these dead bats have escaped the count of bats killed by wind turbines.
- Horn et al. (2008) study showed large numbers of migratory tree-roosting bats were being killed at utility-scale wind power facilities observed bats actively foraging near operating turbines, rather than simply passing through turbine sites. Their results indicate that bats 1) approached both rotating and nonrotating blades, 2) followed or were trapped in blade-tip vortices, 3) investigated the various parts of the turbine with repeated fly-bys, and 4) were struck directly by rotating blades. Blade rotational speed was a significant negative predictor of collisions with turbine blades, suggesting that bats may be at higher risk of fatality on

nights with low wind speeds.

At the proposed ENGAL, HoGWF there is a large population of bats within the nightly foraging range of micro-bats that roost within caves, mine audits as well as forest dwelling bats. The acoustic bat study undertaken for the HoGWF, is grossly inadequate. It was undertaken over too short a period in just a few selected locations on the ridgeline, and also did not consider that bats do hunt just on dusk and do not necessarily use their sonar at this time as they have excellent eyesight in addition to echolocation. In previous submissions I have indicated that I have personally observed many thousands of bats roosting in the nearby caves.

Bird and Bat Adaptive Management Plan (BBAMP)

ENGIE have suggested implementing measures (called curtailment) that it can be put in place to reduce the number of bat deaths. However this is not an industry enforceable measure and if implemented, does not stop bat and bird strikes. Curtailment, is when wind turbines stop spinning (or slow down) during limited periods of low wind and high bat activity. This practice does not appear to be legally enforceable or regulated in NSW (Stock 2022). The implementation of curtailment only reduces the number of bats killed, it does NOT eliminates them. However bird strike numbers remain high as they continue to fly in higher wind speeds.

Other bat and Wind-farm studies

A recent UK study found that wind-farms negatively affected over 30 bat species and have potential consequences for bat population viability, particularly species which already have low numbers (Richardson *et al*. 2021). Insufficient studies matching pre and post construction data have been undertaken in Australia to measure the impact of wind-farms on bat and bird populations, particularly in areas within close proximity to wooded and vegetation areas where bats reside and forage.

Despite over a decade of research on bat fatalities at wind farms around the world, relatively little is known about why wind turbines kill bats (Richardson et al. 2021). Lintott et al. (2016) surveyed 46 wind-farms across the UK and found that pre-construction acoustic surveys, which form part of Environmental Impact Assessments, are poor predictors of bat casualties at wind-farms. Their study determined that "bat activity recording during pre-construction surveys may not accurately reflect activity levels post construction". The study also mentioned that bats may be changing their behavior around turbines and even attracted to wind-farm sites because of ultrasound emission from turbines and increased prey availability. There may also be other yet to be identified reasons for the increased bat activity around wind-farms.

The study by Richardson et al. (2021), determined that even if bats were foraging closer to the ground, they would still be at risk of collision with the blade tips as they neared the ground. The turbine blade minimum sweep height above the ground at many sites where bat kills occurred, was 30m above the ground and the bats were also being killed with blades with a clearance of 40 m above the ground. Their study looked at bat activity and bat kills across locations at 23 British windfarms and included a broader UK survey of bat activity around wind turbines.

It would be logical to assume that the Hills of Gold Windfarm EIS bat survey is considerably lacking as it only determined there were 8 bat species in the area, however a survey at nearby Timor Caves undertaken by Hoye (2008) identified an additional 4 micro bat species. The EIS bat survey using acoustic bat recognition, was undertaken at just a few selected locations around the project site and over a relatively short period of time. It is inconceivable that this short survey could be considered as adequate. As determined by extensive studies overseas, a pre-windfarm assessment is not a predictor of likely bat fatalities, if the windfarm is constructed.

The above comments have only given cursory consideration of potential bat impact with wind turbines. The potential turbine blade impact with flying foxes and birds, would no doubt be significant if turbines are constructed in the proposed locations.

EIS inadequate bat study

The Environmental Impact Statement (EIS) identifies thirteen threatened terrestrial fauna species that were directly observed within the development footprint. In addition there were a number of species of microbats and at least two species of raptor most at risk of collision.

There are only 8 species of microbat recorded in the project EIS study, however at least 12 species of microbat have been recorded in the Timor area (Hoye 2008; Rutledge et al. 2008), just kilometres from the project site. This indicates that the EIS study was not conducted over a sufficient time period nor covered a sufficient area to be credible. NHVSS members have observed and reported in the Newcaves Chronicles, very large populations of cave dwelling bats (numbering in the thousands) in caves at Timor, Crawney Pass, Glenrock Station, Ellerston, Barrington and Barry (Figs 1 & 2). The proposed windfarm is within the nightly feeding range of both the Eastern Bent-wing Bat (*Miniopterus schreibersii oceanensis*) and the Eastern Horseshoe Bat (*Rhinolophus megaphyllus*), cave dwelling bats which reside in the above mentioned caves. However both cave dwelling and forest bat species will be impacted by the proposed windfarm.

The EIS mentions nothing about the large regional population of Bent-wing Bat and their flight paths between the significant roost sites at Barrington Cave (Tomalla), Main Cave (Timor), Barry Cave (Barry Station), Bats and Bandicoot Cave (Glenrock Station) and Crawney Pass Caves. Barrington Cave has in the past been observed to have hundreds to thousands of Bent-wing Bats (Rutledge 2003; Helman 2002; Scott 2001). Numbers are seasonal as they migrate between sites. Caves in the other above mentioned areas have been recorded with similar numbers exceeding a thousand individuals.

Very little has been mentioned about the Crawney Pass limestone caves, which are roosting sites for microbats less than 1.5 kilometers from the turbines. It is well documented that both micro and mega bats fly considerable distances in search of food each night. The proposed windfarm is well within the nightly foraging range of cave dwelling bats as well as the forest bats. Also the EIS does not consider the countless disused mines, adits and rock shelters where colonies of microbats may be resident close to the windfarm site.

The impact on threatened forest dwelling bat species identified in the EIS, such as the Eastern False Pipistrelle, Eastern Coastal Free-tailed Bat and Yellow-bellied Sheathtail Bat would be substantial. The Yellow-bellied Sheathtail Bat and Eastern False Pipistrelle rely on mature hollow-bearing trees offered by the native forest woodlands along the ridges proposed for construction of wind turbines. Likewise, the Eastern Coastal Free-tailed Bat relies on mature trees with hollows or loose bark to roost under. Loss of suitable habitat is unacceptable to these vulnerable species.

There are far too many issues to cover in this article, so I will briefly cover a couple of NHVSS's concerns with examples of relevant studies from abroad.

Other environmental issues

Other detrimental aspects include noise and visual pollution, habitat fragmentation, wildlife displacement. These last two issues habitat fragmentation and wildlife displacement will greatly impact on quite a few vulnerable and threatened species. Then there is also the issue of disposal of the turbine blades when they reach the end of their useful life.

NHVSS has made a number of submissions against the installation of this huge windfarm comprising 74 wind turbines. The windfarm, if constructed, will involve the bulldozing (total destruction) of 2.067 sq km of native vegetation (including old growth forest) plus 2.8 sq km of other vegetation. A total of 4.87 square km of vegetation is to be cleared, to build the proposed windfarm. This would result in loss of animal habitat (particularly threatened and vulnerable species habitat), soil erosion which may affect downstream karst areas and river systems, and the impact of spinning turbine blades on airborne creatures.

Vegetation and vulnerable species.

The proposed wind farm would have a significant impact on the threatened ecological communities of the White Box - Yellow Box - Blakely's Red Gum Grassy Woodland. The Hills of Gold

Windfarm EIS states that there are also endangered and vulnerable fauna species found on the study site. *"Thirteen threatened terrestrial fauna species were directly observed within the Development Footprint, including Koala, Greater Glider, Spotted-tailed Quoll, Southern Myolis, Large-eared Pied Bat. Little-Pied Bat, Eastern False Pipistrelle, Eastern Coastal Free-tailed Bat, Little Bent-wing Bat, Large Bent-winged Bat, Greater broad-nosed Bat, Eastern Cave Bat and Gley-headed flying-fox.*

In addition to the threatened fauna species directly observed within the Development Footprint, the detailed habitat assessments identified a high likelihood of occurrence for an additional four fauna species; Booroolong Frog, Border Tick-tailed Gecko, Eastern Pygmy Possum and Squirrel Glider. The field surveys identified two species of raptor most at risk of collision, Nankeen Kestrel and Wedge- tailed Eagle."

The clearing of 4.86 sq km of established vegetation (including a substantial amount of old growth forest) will enable soil erosion to occur, which could affect the downstream karst areas that contain caves and specialized eco systems. Building a windfarm is not justification for clearing habitat of these threatened and endangered species and others not listed above. There are plenty of other localities around NSW where hills have been denuded of vegetation in the past due to early agricultural practices.

It is worth having a look at the two short videos at the following link, which show the permanent destruction of native vegetation and loss of wildlife habitat which occurs during the construction of a wind farm. https://www.rainforestreserves.org.au/kaban

Worn-out turbine blades a recycling nightmare

An issue rarely raised is, what happens to the wind turbine components such as the blades when they reach their use by date and have to be replaced? Turbine blades are constructed of a composite of fibreglass and resin to withstand hurricane-force winds. They have a life span of 20 to 25 years in which time they become fatigued and their strength is compromised. The problem of disposal becomes an issue at the end of their useful life. At present there is no feasible way of recycling the material, nor disposing of them. As Tom Leonard (2022) reveals, there is a graveyard where 4000 worn-out giant turbine blades cover a 25 acre field in Sweetwater Texas, USA. Each blade can be 300ft (100m) long and weigh 8 tons. The scale of the immense mountain of discarded turbine blades is hard to visualise. Have a look at the article and photos at https://www.dailymail.co.uk/news/article-10558375/TOM-LEONARD-Graveyard-green-giants.html and another article with graphic images of 870 turbine blades being buried by bulldozers at the municipal landfill in Casper, Wyoming. https://www.bloomberg.com/news/features/2020-02-05/wind-turbine-blades-can-t-be-recycled-so-they-re-piling-up-in-landfills?leadSource=uverify%20wall

Researchers are looking for ways to separate the resin from the fibres or possibly grind the blades into small pellets to use in other products, however to date no viable large scale process has been identified (Leonard 2022).

Given the situation in the USA and no doubt other countries around the world, it is reasonable to expect that Australia is heading down the same path of what to do with damaged or worn out turbine blades in the future.

The 'Hills of Gold Windfarm' EIS, states there are currently 114 operating wind farms in Australia, another 26 in construction and 70 in the pipeline. So unless a way of recycling or an environmentally friendly method of disposal is found, there will be huge mountains of waste turbine blades in the future. The Hills of Gold Windfarm will be using turbine blades of 83.5 metres in length and when installed the overall tip height will be 230 metres AGL.

Conclusion

While the concept of renewable energy from windfarms makes sense at first glance, there are many long term hurdles that still need to be overcome to make this technology truly renewable eg. recycling of worn out turbine blades. Even if one sets aside these long-term issues, the proposed

'Hills of Gold Windfarm' is one that has far too many detrimental aspects which environmentally outweigh the possible benefits. The proposed windfarm if constructed will mean the total destruction of huge areas of native vegetation including habitat of endangered and vulnerable fauna. There is very high likelihood of many airborne bat and bird deaths due to impact strikes. It makes far more sense to construct such windfarms on land that has historically been stripped of vegetation to create grazing land and it should be well away from known bat roosting sites.

Clearing large areas of old growth forest along ridge tops creates erosion issues, destroys more vegetation that produces oxygen for life on earth, and destroys fauna habitat. The overwhelming detrimental aspects of this proposed windfarm, falls far short of being environmentally sound.

References

Baerwald E.F, D'Amours G.H., Klug B.J., and Barclay R.M.R. (2008). Barotrauma is a significant cause of bat fatalities at wind turbines. *Current Biology* Vol. 18, No. 16:R695-6

Helman M. 2002, Gloucester and Barrington Caves, *Newcaves Chronicles*, No. 18, Newcastle and Hunter Valley Speleological Society.

Horn J.W., Arnett E.B., and Kunz T.H., (2008). Behavioral Responses of Bats to Operating Wind Turbines. *The Journal of Wildlife Management*. 72(1) p.123–132

Hoye G. (2008) Bats at Timor, *Timor Caves Hunter Valley, New South Wales*, Newcastle & Hunter Valley Speleological Society Inc. (Ed's) Rutledge J., Smith G.K., Brainwood M., Baker A.C., p.73-74.

Leonard T. (2022), Graveyard of the green giants: It's the hidden cost of our dash for windpower - thousands of decommissioned blades that are so difficult to recycle, they are just dumped as landfill, writes Tom Leonard. *Daily Mail Australia*, 28th Feb 2022

Lintott P.R., Richardson S.M., Hosken D.J., Fensome S.A. and Mathews F. (2016) Ecological impact assessments fail tobat casualties at wind farms. *Curr. Biol.* **26**, R1135–R1136

Richardson S.M., Lintott P.R., Hosken D.J. *et al.* (2021). Peaks in bat activity at turbines and the implications for mitigating the impact of wind energy developments on bats. *Scientific Reports*. 11, 3636 www.nature.com/scientificreports/

Rutledge J. 2003, Barrington Cave on the Pigna Barney Karst, *Newcaves Chronicles*, No. 20, Newcastle & Hunter Valley Speleological Society.

Rutledge J., Smith G.K., Brainwood M., Baker A.C., (2008). *Timor Caves Hunter Valley, New South Wales*, Newcastle & Hunter Valley Speleological Society Inc.

Scott, D. (2001), Barry Cave (BA1) Barry, NSW, *Newcaves Chronicles*, No. 17, Newcastle & Hunter Valley Speleological Society.

Stark E. and Muir S., (2020), A decade of post-construction bird and bat monitoring at south-eastern Australian wind farms. Presentation for Wind & wildlife research meeting, Nov-Dec 2020. Accessed 9-1-24 at https://static1.squarespace.com/static/521edeb1e4b01d29835d1d62/t/5f936fd43ef9bd77e98f82bf/1603497962750/Symbolix_PostContructionWF_WWRM_Slides.pdf

Stock P., (2022), Wind energy in Australia is killing thousands of bats, but there is a solution, *The Citizen*, Nov/ Dec 18 2022. A publication of the centre for advancing journalism, University of Melbourne. Accessed 3-2-23 at https://www.thecitizen.org.au/articles/wind-energy-in-australia-is-killing-thousands-of-bats-but-there-is-a-solution

Signed