

I write to object to the proposed Hume Link EIS Application Number SSI-36656827.

I believe that the assumptions upon which the entire project is based upon should be re-evaluated. I believe that net present value calculations for generators have not been based over 100 years, and subsequently locations for high voltage transmission have also been poorly assessed. Comparisons of costings for generators with wildly ranging life and recycling costs must be compared over the time period of the longest lasting equipment, and that would be nuclear powered generation. The baseline over which the service is meant to be providing for has led to a lack of clarity in scope. And it has resulted in the specification of: over-head transmission lines, when they should have been underground; and, incorrectly located substations, based more on ease and for Transgrid's benefit, than for the nation as a whole.

I also believe that the project has been poorly scoped to provide for a replacement of the existing transmission grid, as it has not allowed for the removal of wires that should no longer be required to reduce existing impacts and costs. And importantly, it has not used the learnings from Europe where long distance high voltage transmission lines are direct current and are installed underground.

And finally, I believe that the community through which the project is to be installed has been treated with contempt. The engagement process, if it could be called that, has been one of deception. Based on the conversations that I have had, and the answers to the questions that I have asked - I don't trust Transgrid to run our power transmission, let alone build more. I further believe that the Commonwealth Government should have a Senate Hearing to investigate how it can pressure Transgrid to change the board make-up to more closely follow that of a service provider, than a fund management entity. Further the shareholder base should be examined with a view to get a closer alignment to that of an Australian utility service provider.

The following matters on which I object to the Proposed Gugaa Substation and Conductors are specifically in relation to the following parts of the EIS:

3.3.1.2 Proposed Gugaa 500kV substation to Wondalga OH Transmission Line.

3.4.1. Proposed Gugaa 500 kV substation.

6.4.1 Government Agency Feedback – NSW Rural Fire Service

14.4.3 Night-time visual impact assessment of the proposed Gugaa substation.

19.3.2 Bushfire Risk

19.3.3. Aircraft operations and aviation facilities

25.5.1 Issue -Specific cumulative impact assessment – Biodiversity

3.3.1.2 Proposed Gugaa 500kV substation to Wondalga OH Transmission Line.

It is my belief that the local community along and beyond the corridor would be better served if the conductors were buried underground.

1. The existing 330kV OHTL from Wagga Wagga to Wondalga (a region halfway between Tumut and Batlow in NSW) is not going to be replaced by a 500kV transmission line. The new 500kV Line and the 330kV are going to be placed side by

- side. This has the effect of creating wider damage to riparian areas and additionally, leaving the taxpayer with the maintenance costs for both the older OHTL and the new towers and wires. This could be mitigated by a substation at Wondalga and Uranquinty and installing one new 500kV line. And better still if it were underground.
2. Each overhead powerline is a hazard in terms of fire ignition and lightning strike. Wires are prone to flash over in wind conditions associated with rain as low as 10km/hr (Chao Zhou et al. 2018). Flashover is a significant fire hazard. The fire hazard is proportional to the number of individual strings of power lines and the probability of a weather event causing conductor swings leading to flashover.
    - Risk of fire = hazard x frequency (Increasing strings of conductors increases risk.)
    - Frequency of flashover in severe wind and light wind with rain is significant.
    - This risk of fire ignition is heightened and quantifiable. The Victorian bush fire cost from OHTL (in 2009) was \$4 billion and 173 lives. I believe that production losses and costs across the region would be affected, and that this may be best evaluated by insurance premiums. This cost needs to be added to the cost of overhead transmission lines when comparing with underground DC transmission lines. Increased fire risk leads to increased insurance premiums – all landholders are paying for the use of overhead conductors which increases costs of production. The greater the number of conductors strung in the air, the greater the fire risk.
  3. Undergrounding conductors works out cheaper in the long term, I believe, when all costs are considered. That includes increased costs of production, due to fire and insurance, and health and amenity costs.
  4. European interconnectors are more normally Direct Current underground, and the further the distance, the greater the reasoning for burying underground.
  5. Undergrounded conductors are quicker to construct when they are installed in road corridors – not needing lengthy approval and engagement processes to be strung over landholders' property.
  6. Undergrounded conductors when fitted with quick connectors, in conduits, pit to pit, are quick to replace if insulation is somehow ruptured.
  7. Undergrounded conductors can be installed with Australian labour and equipment.
  8. Undergrounded conductors do not add to production costs of farms and business in the surrounding 100km radius.
  9. Direct Current [DC] has reduced electromagnetic radiation (E) effect, and I have noted that some scientific writers are measuring a correlation between close proximity (less than one kilometre) E from high voltage alternating current and a form of cancer (Leukemia).
  10. Undergrounded conductors require a vastly reduced corridor of impact, with reduced impact on riparian zones, which are important wildlife corridors. It should be noted that underground conductors would have followed more closely 26.1 Approach to Environmental Management: "minimising impacts throughout all stages of the project."

#### 3.4.1. Proposed Gugaa 500 kV substation.

This substation at 22.5ha in size will be possibly the largest substation in the Southern hemisphere. And there is no AEMO plan for connection of renewable generators or nearby high load to connect to it.

11. I explored the Australian Electricity Market Operator webpage to determine if there were any proposed plans for an interconnector, or generators, East of Wagga. There are neither.
12. As coal and gas fired generators are retired the best location for a new substation is either:
  - At the load, locally at the existing Wagga Wagga substation (as set out in the EIS for Energy Connect Project 3.4.2), located at the corner of Ashfords Road and Boiling Down Road, Gregadoo; or
  - At the generator, adjacent the gas fired power station at Uranquinty, which coincidentally is on the Energy Connect Project conductor alignment.
13. Based upon the Australian Electricity Market Operator [AEMO] planning documents for renewable generators, placement of the proposed Gugaa substation to the East of Wagga represents an economic waste, as an additional substation to the West of Wagga will still be required – most likely at Uranquinty.
14. Local landholders near to the proposed Gugaa substation were not informed or engaged in relation to the proposed Gugaa until after the EIS was released. A delegation met with landholders at 10am on 20 September 2023.
15. Transgrid staff gave the reason for construction of the Gugaa substation to allow “staged construction” of the 500kV interconnector from Wondalga to Dinawan. I note that a substation for “staging” works could be placed anywhere along the alignment that the 500kV and 330kV lines are strung, and that such a substation should be placed where it will be required after construction is completed – it is most likely that a 300kV/500kV substation will be required at Uranquinty.
16. The engagement that I have had with Transgrid specifically in relation to the placement of a substation at Livingstone Gully Road (now the proposed Gugaa substation) has, at best, been misleading.
  - i. “It is no longer required” (two years ago), and then
  - ii. “It maybe needed for future work” (August 2023).
  - iii. “It has been planned for twelve months” (September 2023)
17. Existing background noise levels in the rural area proposed for Gugaa substation are of the order of 35dBA. Transformer fan noise levels, and perhaps - later expansion to incorporate large heavy industrial machines, such as synchronous condensers, will likely affect the local environment for several kilometre. A noise report has not been released with the EIS. There are several annoying tones associated with OHTLs and fan noise. This would need to be addressed before the project is commenced.

#### 6.4.1 Government Agency Feedback – NSW Rural Fire Service

18. Local RFS – Big Springs Fire Brigade were not engaged – the Proponent choosing a high-level approach which focused on ignition sources rather than specific firefighting methodology.

14.4.4.2. Views to substations should be reduced as much as is feasibly possible.

19. Siting of the proposed Gugaa substation (22.5ha) has been shown in the EIS to maximise a buffer to Big Springs and Livingstone Gully Roads. This would allow the use of strategically placed tree lines along roads and hill sides to reduce the visual impact further. I believe that tree lines would improve the project from aesthetic and ecological perspectives.
20. Transgrid employees have suggested (onsite meeting at proposed Gugaa substation site 20 September 2023) that moving the substation towards Livingstone Gully Road would be preferable for noise consideration for affected landholders. I believe that such a move would move it away from hills and rises that provide a natural noise barrier. It would be most beneficial to the local landholders that substation be hidden from view, and shielded by the hills, to reduce noise impacts.
21. Maximising buffers (to say minimum 200m) to nearby Livingstone Gully Road would allow sufficient room to re-install tree lines, removed in the project, without impacting Asset Protection Zones.

14.4.3 Night-time visual impact assessment of the proposed Gugaa substation.

22. The EIS sets out that the Gugaa substation will not be manned 24 hours per day, but that lighting will be: "Substation lighting would operate from dusk until dawn, seven days a week and would aim to maintain 2.5 lux as a minimum level. There may be areas that exceed 2.5 lux (in some cases up to 30 lux)".  
A mitigation to the visual impact of the Gugaa substation being lit by artificial lighting at night, would be to turn off the lights, when not in use.
23. CCTV and security systems frequently use infrared switches and infrared switching cameras to monitor premises. CCTV does not need visual lighting to be effective.

19.3.2 Bushfire Risk

24. Whilst the EIS points out that SOI and IOD give rise to wetter and drier periods. It does not point out that these wet and dry periods occur in regular cycles in line with the Lunar Maxima and Minima over an 18.6-year cycle. And whilst it accepts that natural growth occurs in concert with cycles of wet and dry events, it does not allow for the fighting of fires – particularly using aerial fire-bombing aircraft.  
Figure 19.1 Bush Fire Prone Land shows that there is Vegetation Category 1 (Mount Flakney) within 2km to the South West of the proposed Gugaa substation. This vegetation increases over years (usually about every twenty years) until the local weather events lead to a large-scale fire on Mount Flakney. The current method of controlling the fire from breaking out towards the proposed Gugaa site is to use water bombing with tanker crews mopping up and keeping the fire within control lines. And the path of the water bombers will be directly over the OHTL and the proposed Gugaa substation. Typically, water bomber takeoff from Forest Hill Air Base and fly at low altitude (say 50-100m) before dropping fire retardant on the Northern and Eastern slopes in a steep climb. With higher wires they will have to climb over the wires – then descend and then climb again – adding aviation hazard. Mitigation may be to add more aircraft loaded with less retardant, or water-bomb from a higher altitude – both requiring a higher frequency of flights – therefore based upon Risk = Frequency x Outcome, risk is increased. This risk becomes a production cost to all local landholders due to increased insurance premiums.

25. The OHTL towers have earth lines strung between towers upper most in the several wires strung between towers. These earth wires are designed to reduce damage to the structure and conductors due to lightning. However, the towers themselves attract more lightning - Increasing the frequency to ignite nearby combustible organic material. Based upon existing lightning hazards, an increased frequency due to proximity of OHTL, leads to greater bushfire risk. Increased risk leads to increased production costs for all in the region.
26. The proposed Gugaa substation will be equipped with seven 500kV/330kV transformers. The oil load in transformers is a hazard. Explosion of transformers can and does occur. That's why one (of the seven) is an installed spare. An explosion would probably lead to a breakout fire, depending on the time of the year that it occurs. As this is would be a newly introduced ignition risk, then bushfire risk is increased – and so again are production costs.

#### 19.3.3. Aircraft operations and aviation facilities

27. The EIS says that “Aerial [rural] application operations are conducted from various [aircraft landing areas] surrounding the project footprint... usually between two metres (2m) and 30.5 metres [altitude above ground level] AGL” and that “Aerial firefighting and medical emergency evacuations may also occur throughout the area surrounding the project footprint”. This is indeed the case. The EIS then goes on to state that “Aerial firefighting operations are only conducted after extensive planning and review by local emergency services to ensure risks such as existing obstacles and hazards are appropriately considered”.  
The EIS does not consider that there is a cost attached to the inefficient or non-use of emergency or rural application aviation services because OHTLs are installed. This opportunity cost is borne by local landholders. This cost would be entirely mitigated by use of one set of 500kV underground conductors and the removal of route 51 OHTL.

#### 25.5.1 Issue -Specific cumulative impact assessment – Biodiversity

28. The Night Parrot *peporus occidentalis* is a not often seen ground-based parrot that has been seen twice in the riparian area along the Obrien's Creek. The parrot has not been included in the table in section 25.5.1 The impact of two sets of OHTL beside one another is profound. It means that the riparian zone is completely disjointed, subjecting the parrot species, and other birds and small mammals, to being preyed upon in the open riparian area by the various species of eagles and hawks that currently frequent the OHTL alignment. Discontinuance of the riparian treed zone means that all smaller birds and animals are limited in the locality over which they can mate and expand, and this often leads to localised depletion of the species. In the case of the Night Parrot there are very few localities in Australia where this species still exists.
29. Microbats are also present in the Obrien's Creek riparian zone. There are various species within this grouping of small mammals that are endangered. These bats have not been listed in the Table in section 25.5.1 and are likewise affected by the destruction of riparian zones.