

Submission  
No 256

**INQUIRY INTO FEASIBILITY OF UNDERGROUNDING  
THE TRANSMISSION INFRASTRUCTURE FOR  
RENEWABLE ENERGY PROJECTS**

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The Hon Emily Suvaal, Committee Chair,  
Inquiry - Feasibility of undergrounding the transmission infrastructure for renewable energy projects  
Standing Committee on State Development  
Parliament House  
6 Macquarie Street  
SYDNEY NSW 2000

14th July 2023

Dear The Hon Emily Suvaal MLC,

Re: Feasibility of undergrounding the transmission infrastructure for renewable energy projects

Thank you for the opportunity to make a submission to this important inquiry into the feasibility of undergrounding transmission infrastructure for renewable infrastructure projects.

I write this submission to urge you to consider that although in the short term the dollar cost maybe initially be higher for underground transmission. However, the longer term benefits of underground transmission to our environment, tourism industry, agricultural production, communities, reduction in bushfires, grid resilience and energy costs will ultimately far outweigh any reticence in that initial spending for a brighter renewables future for the state and nation as a whole.

When you compare the pluses and minus of overhead transmission lines vs underground, you will note in all submissions the negatives of overhead far outweigh underground. Why? Impacts! In the case of overhead transmission lines the detrimental impacts are considerable in regard to the environment, communities, agricultural production, increased bushfire risk.

Overhead transmission

- HumeLink has an action area of 5,714 hectares including clear-felling areas of native forests and bushland with serious impacts on habitat, greenhouse gases and global warming (Transgrid's per the referral to EPBC Act).

In its current form, the HumeLink Tower proposal will devastate habitats for more than 80 threatened or endangered species of flora and fauna

HumeLink will impact approximately 5,714 hectares of land, including clear-felling areas of native forests and bushland with severe impacts on habitat, greenhouse gases and global warming (per Transgrid's referral to the EPBC Act).

Impact of wildlife

The proposed path for the HumeLink towers is home to a range of endangered, threatened and vulnerable animals, including the Koala, Booroolong Frog, Superb Parrot, Dusky Woodswallow, Gang-gang Cockatoo, Yellow-bellied Glider, Eastern Pygmy Possum, Squirrel Glider, Greater Glider, Scarlet Robin, Flame Robin, Powerful Owl, Masked Owl and Booroolong and the near threatened Spotted Quoll.

Climbing and flying threatened and protected species, such as Wedge-Tailed Eagles, are particularly vulnerable to powerlines.

Also at risk are critically endangered flora such as the Leek Orchid, Blue Tongued Greenhood, Pimelea Bracteata, a tract of the endangered ecological community, the White Box, Yellow Box woodland, remnant native vegetation areas, a nationally important wetland, and land that has been rehabilitated through government-funded Landcare projects.

The fragmentation of wildlife corridors that will occur from the current proposal, including vegetation clearance in established bio-links, will reduce the biodiversity of flora and fauna.

## Bushfires

Power lines regularly cause fires

Faults in electrical distribution networks are one of the primary sources of significant bushfires. Power faults cause two to four per cent of all rural fires in Australia. However, when weather conditions elevate fire risk, up to 50 per cent of primary fires are ignited by faults in distribution networks.

A study by Wollongong University found that powerline-caused ignitions were the most over-represented cause of bushfires, with the most houses destroyed. We have also seen AusNet Services Group report to Energy Safe Victoria and the Australian Energy Regulator that there were 79 'fire-start' incidents in the six months between January and June 2016. Of these, 59 were attributed to lightning strikes; contacts with birds, animals, or objects, HV fuse failures; and other infrastructure failures. It is noted that the arc distance for a 500kV overhead power line that is hit by lightning is up to 50 meters from the tower's base.

But the problem with overhead powerlines isn't restricted to the increased threat of starting fires, but the impediment they present in fighting them too.

High voltage powerlines effectively stop the management of bushfires in the vicinity because the space over and under them are no-go zones for firefighters, and many of the dams used to refill aerial firefighting fleet in southern NSW will become no longer accessible to these key emergency services. With aerial response to bushfire management a commonly used fire control method, if Humelink's current proposal is actioned, it will not be an option for many fire-prone areas.

Some landowners who have high voltage transmission lines on their properties already, lost significant parts of their property during the Black Summer bushfires of 2020, as a result of not being able to fight the fires.

In neighbouring Victoria, the threat of electricity assets and towers to bushfire-prone communities and wildlife is well recognised, with the 2009 Victorian Bushfires Royal Commission highlighting that the "State has a history of electricity assets causing bushfires. In 1969 and 1977 the failure of electricity assets—including the clashing of conductors, conductors contacting trees, and inefficient fuses—caused major bushfires. This history was repeated on 7 February 2009, when five of the 11 major fires that began that day were caused by failed electricity assets; among the fires was that at Kilmore East, as a result of which 119 people died."

The economic cost of bushfires

Deloitte Access Economics put the tangible and intangible costs of the Victoria 'Black Saturday' bushfires at \$7.6 billion. By extrapolation, the cost of the 2019-20 Australian bush fire season, 'Black Summer', has been estimated at \$230 billion.

The Fire on the Farm report by the World Wide Fund for Nature-Australia and the University of Sydney estimates that the 2019-20 bushfires cost agriculture \$4 to 5 billion.

In the US in 2019, to escape the billions of dollars from claims of fire victims, energy company PG&E filed for bankruptcy. After a preliminary report by the state regulators said that its equipment was responsible for several fires that destroyed the town of Paradise and killed 85 people in 2018. Since then, the company has started undergrounding and has implemented a plan to bury 10,000 miles of power lines and equipment in areas with high fire risk.

PG&E's modelling shows that burying lines reduces their risk of igniting wildfires by approximately 99 per cent.

In addition to considering the likely loss of human life and native animals, the Committee must look at the economic cost of bushfires that projects like HumeLink will potentially and unnecessarily cause.

These costs could run into billions of dollars, well over the cost of undergrounding.

Recent costings provided by independent consultants and real-world experience overseas show that the differential cost between undergrounding and overhead transmission lines is much smaller than Transgrid's inflated estimates, which have proved wildly inaccurate.

## Underground transmission

### a) the costs and benefits of undergrounding

- Internationally, governments are choosing undergrounding based on analysis of all costs, including environmental and social costs and conclude that undergrounding transmission is the cheapest long-term solution.
- HVDC underground transmission, proposed for undergrounding HumeLink, has less transmission losses than AC overhead lines, and so has offsetting energy efficiency benefits over the life of the project.
- Undergrounding is also chosen due to its benefits including:
  - o no risk of underground cables causing a fire;
  - o no restriction or hazard on safe firefighting;
  - o protection of the infrastructure from severe weather and fire events;
  - o will not impede agricultural operations;
  - o no impact on the landscape and amenity; and
  - o significantly reduced impact on biodiversity as a much smaller easement is required
- Our governments are telling us that renewable energy, like solar and wind, will reduce the cost of electricity. Given this, it's critical that a better environmental option for transmitting electricity, like undergrounding, isn't rejected on the basis of cost.

The benefits to the environment and communities of undergrounding will last for generations.

### b) existing case studies and current projects domestic and international

- In Australia, private companies are putting transmission underground.
  - o Existing projects
    - Murraylink, 180km
    - Directlink
    - Powering Sydney's Future Project - Transgrid 330kv underground 20km (Potts Hill to Alexandria)
  - o Current Australian projects
    - Mariner Link, 90km
    - Star of the South, 60-80km
- International Projects
  - SuedLink, 750km 525kV – renewables Germany
  - SuedOstLink, 500km 525kV
  - California burying 10,000 miles of powerlines to reduce wildfire risk
  - Champlain Hudson Power Express (CHPE), renewables Canada - New York

### c) any impact on delivery timeframes

- Undergrounding will grant Transgrid 'social licence'. There will no longer be community opposition as concerns will be resolved with an underground solution. The community will work with the government and Transgrid to assist in any way possible to ensure delivery timetable is met. Farmers at Tumut have said: 'If HumeLink goes underground, Transgrid can start tomorrow, and we'll even dig the trench for them'.

- The planning for HumeLink was done assuming Snowy 2.0 would be available in July 2025. Snowy Hydro has now announced that Snowy 2.0 won't be complete until December 2029. This four and a half year delay means HumeLink can be delivered when needed as an underground solution.

- AEMO's own modelling, even before significant delays to the completion of Snowy 2.0 were announced, said the optimal timing of HumeLink was 2028-29 in the Step Change scenario; and 2033-34 in Progressive Change scenario.

- If undergrounding HumeLink is rejected, because it will take longer to build, Transgrid will be solely to blame, and must be held to account. Transgrid has been continually working against the community on Undergrounding HumeLink – stalling and misleading government for the last 3 years.

d) environmental impacts of undergrounding

- Greatly reduced environmental impacts in comparison to Overhead infrastructure.

- o Undergrounding will result in at an estimate 15m easement in comparison to a 70m easement with overhead lines;

- o Much reduced removal of trees and plant flora;

- o Reduction in endangered species types being killed. 82 threatened species are impacted by HumeLink;

- o Land above underground cable infrastructure can be rejuvenated after construction;

- o No towers and wires interfering with flight of birds or movement of climbing animals. No bird or climbing animal deaths will result. Thus eliminating concern for protected birds e.g. Wedge tailed eagles.

- o Eliminates the risk of overhead lines causing bushfire. The black summer cost the nation \$230 billion and killed almost 3 billion koala, kangaroos and other animals.

- o Eliminates air and ground fire control hazards;

- o Eliminates the risk of interruption to power transmission in severe weather events and/or bushfires and therefore improves transmission security and resilience as required under the SLACIP Act;

- o Minimal impact to private or public land after construction is complete;

- o No overhead lines impeding agricultural operations, machinery use, irrigation, drones, or aircraft operation;

- o No visual impact from the transmission lines and so no loss of visual and rural landscape character of regions;

- o Little to no electromagnetic field impacts. Therefore, less risk of serious health impacts, plus no interruption to new technologies like precision agriculture that improve the productive efficiency of agriculture.

In view of the above, I urge the Standing Committee to recommend that undergrounding is the best way forward for renewable energy transmission in NSW. As we transition to net zero emissions we need environmentally responsible transmission as well as generation.

Yours sincerely,  
Rebecca Piper