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August 29, 2025

Dear Sir/Madam,

SUBMISSION IN RESPONSE TO THE ENVIRONMENTAL IMPACT STATEMENT OF THE VNI WEST PROJECT – APPLICATION NO SSI-72887208

We welcome the opportunity to make a submission to the Victoria to NSW Interconnector West (VNI West) Environmental Impact Statement (EIS).

Introduction

This submission details major failings of the VNI West EIS and therefore urges that planning approval be denied.

The VNI West EIS fails to establish that the project has a benefit to the State as a whole and fails to establish that there is no feasible alternative with less impact on the environment. These two critical failures are discussed in turn below.

1. Failure to establish the VNI West has a benefit to the State as a whole

The 'economic' key issue in the Planning Secretary's Environmental Assessment Requirements (SEARs)[1] is to assess the benefit of the project to the State as a whole:

[1] https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-72887208%2120250526T034831.018%20GMT

'Economic:
• an assessment of the economic benefits of the project for the region and the State as a whole' VNI West SEARs, p5.

Transgrid has once again incorrectly used input-output (I-O) analysis to assess the State benefit of a major project.

'12.2.2. Methodology

*The **economic impacts were assessed using input-output (IO) analysis**. IO analysis is used to assess the direct and indirect impacts of the construction and operation of the project on the regional and NSW economy',* VNI West EIS, p410.

Transgrid also used fundamentally flawed I-O analysis to assess the State benefit of the HumeLink project.

The fact that NSW Planning is allowing this assessment methodology is a major failure of the planning process and is inconsistent with NSW government cost-benefit guidelines.

NSW Treasury's *Economic Appraisal Principles and Procedures Simplified* states:

> *'International research on major infrastructure projects has found evidence of **systemic bias in project appraisals**, ….*
>
> *The research suggests a tendency for the **costs of major projects to be underestimated and for demand forecasts to be inflated**. These conclusions are based on case studies of several hundred major infrastructure projects in over 20 nations and 5 continents…..'*

Allowing the proponent, Transgird, to use I-O analysis to assess the economic benefit of projects is facilitating systemic bias is transmission project appraisal, as it allows the proponent to omit quantifying the social and environmental costs of projects[2] and erroneously count second-round impacts, resulting in the underestimation of the costs and overestimation of benefits of major projects.

[2] Transgrid has stated:

> *'there are currently no applicable mechanisms to quantify non-market benefits [of project options]',* (Transgrid, Letter to the HumeLink Undergrounding Steering Committee (CCGSC), February 2023, p6).

This is demonstrably not the case. Methods to quantify environmental and community impacts are discussed in Appendix 3A: Valuation principles and methods of the NSW Government Guide to CBA. Appendix 3A discusses Non-market valuation methods such as "stated preference methods" including "contingent valuation" which is described as '***widely used mainly to value environmental programs'***. These methods should be used to quantify the visual amenity and other non-market costs of the VNI West project, as an overhead line.

Quantifying non-market costs of projects, is well established in environmental economics.

The TPP17-03 NSW Government Guide to Cost-Benefit Analysis (NSW Government Guide CBA)[3], states I-O analysis is *'**not a tool to measure welfare in the appraisal of projects or programs',*** p71**.**

NSW Planning appears to be ignoring this clearly stated fact.

One of the significant limitations of I-O analysis is the lack of supply-side constraints. This is particularly relevant in the current macroeconomic environment. The Australian Energy Market Operator's (AEMO's) 2025 Electricity Network Options Report states:

> *'After **accounting for inflation**, transmission cost estimates are markedly increased from equivalent estimates considered as inputs to the 2024 ISP, **ranging up to around 100% higher** in some cases. Key cost increase drivers are **sustained supply chain pressures on materials, equipment and workforce**, scope revision, market competition driven by a high number of concurrent projects under development as well as project complexity, social licence and additional contracting costs.'*[4]

It has also been reported:

> *'There's been a huge blowout in the estimated cost of the VNI West transmission line. Its price tag is expected to double to $7.6 billion, but could almost triple to $11.4 billion….*
>
> *the cost blowout was due to "inflationary pressures that are affecting major infrastructure projects across Australia…" '*[5]

In the context of material, equipment and worker supply-side constraints in the national electricity market (NEM) and Australian economy more generally, I-O is wholly the wrong method for assessing the benefits of the VNI West project for the region and the State as a whole.

(See Appendix A for further comment on the failures of I-O to assess the State benefit of the VNI West project. Also see attached a supplementary submission to the HumeLink EIS that discusses in more detail the importance of using NSW government CBA analysis and the failures with using I-O analysis to assess State benefit of a project).

The *NSW Government Guide to Cost-Benefit Analysis* states:

*'The purpose of this Treasury policy and guidelines paper is to provide guidance and promote a consistent approach to **appraisal and evaluation of public projects,** programs and policies across the NSW Government. Agencies should use **this NSW Government Guide to Cost-Benefit Analysis (Guide) when assessing all significant government projects,** programs, policies and regulations.'*

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[3] https://arp.nsw.gov.au/tpp17-03-nsw-government-guide-cost-benefit-analysis

[4] https://www.aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2025/2025-electricity-network-options-report/final/2025-electricity-network-options-report.pdf?rev=c5bad52793224b77a49c9912204f29cd&sc_lang=en , p8.

[5] https://www.abc.net.au/news/2025-08-01/transmission-line-vni-west-cost-blow-out-victoria-farmers-fight/105599880

NSW government requires CBA analysis to be undertaken for projects costing more than $10 million dollars. As a $7.6 billion project ($3.7 billion NSW section), with significant, widespread and enduring negative environmental impacts, it is critical that the benefit of VNI West for the State as a whole is determined with NSW Government Guide CBA.

Further, the NSW Government Guide CBA states:

> *'A CBA is **an essential part** of both a preliminary business case and a final business case'* (p6).

Transgrid has failed to undertake this ***essential* part** of the preliminary and final business case for the VNI West project.

The assessment of the economic benefit of the project for the region and the State as a whole, as required by the SEARs, therefore must be redone using the NSW government CBA method.

1.1. Failure of the regulatory investment test for transmission (RIT-T) to assess State benefit

The need to assess all the first round direct and indirect costs and benefits of the VNI West project, to assess '*the benefits of the [VNI West] project for the region and the State as a whole*', is especially critical because of the RIT-T explicitly excludes environmental and community costs when assessing the project.

Despite the objective of the NEM being efficient outcomes[6], the net benefit of VNI West and other projects in AEMO's 2024 Integrated System Plan (ISP), exclude large costs of transmission projects – environmental externalities. Environmental externalities are market failures and must be taken into account to ensure efficient outcomes.

The Australian Energy Regulator's (AER's) cost-benefit guidelines states:

- Exclude from its analysis, the costs (or negative benefits) of an ISP project's harm to the environment or to any party that is not prohibited under a law, regulation or other legal instrument.

AER, *Cost benefit analysis guidelines - Guidelines to make the Integrated System Plan actionable*, August 2020, p91.

This practice is inconsistent with government cost-benefit analysis and is leading to inefficient outcomes in the NEM.

Because the cost-benefit analysis of actionable ISP projects excludes environmental and community costs, the net benefit of additional transmission is significantly exaggerated. AEMO advises government and the public of the net benefit of rewiring the nation, without acknowledging the

[6] The objective of the national electricity market (NEM) is: '*to promote efficient investment in, and efficient operation and use of, electricity services*' https://www.aemc.gov.au/regulation/neo

benefits are before taking into account significant enduring environmental and community costs of projects.

If environmental and social cost were taken into account, different energy market investments would be made. Instead of:

- tens of thousands of kilometres of overhead transmission lines;
- large water batteries remote from load centres, like Snowy 2.0; and
- renewable energy zones dispersed geographically, long distances from load centres;

there would be:

- underground transmission;
- more battery storage close to the urban load centres;
- a concentration of renewables in regions where transmission infrastructure already exists, such as where coal fired power stations are shutting down;
- off-shore windfarms close to coastal urbanisation; and
- more rooftop solar.

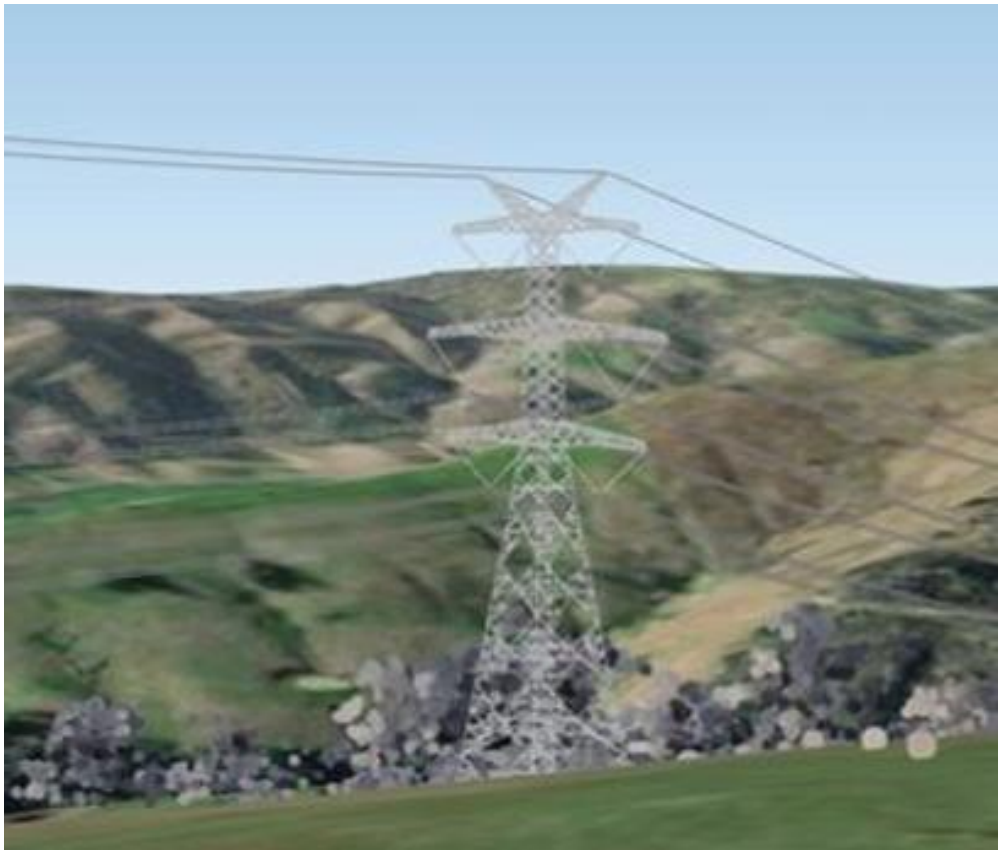
As a consequence of omitting environmental and social costs from the NEM Rules, the environment is left severely damaged by excessive amounts of transmission infrastructure.

1.1.1. Visual amenity costs

Perhaps the most egregious failure of the VNI West EIS is the misleading image on the front cover of the Main Report of the EIS, where small shrubs are shown screening the up to 80m tall 500kV towers of the VNI West transmission line, see Figure 1a.

Figure 1a: VNI West – EIS Main Report Front Cover

Figure 1b: Image of 500kV tower provide by Transgrid to the HumeLink Community Consultative Group



An accurate impression of the visual and landscape character impacts of the VNI West 500kV towers is shown in Figure 1b.

The negative visual and landscape character impacts of overhead transmission lines are well documented.[7]

The following excerpt from the RIT-T cost-benefit analysis guidelines illustrates the problem with omitted externalities for transmission lines.

Example 20: Externalities

Negative externality

Assume a credible option is a local gas-fired peaking generator, planned for development in close proximity to an existing hotel. The RIT–T proponent expects the development of the generator will reduce the nearby hotel's annual earnings (due to a loss of visual amenity). The present value of this loss is $15 million.

In this example, the $15 million cost borne by the hotel's proprietor is a negative externality. While the development of the gas-fired peaking generator drives this cost, the generator's developer will not incur the cost. It is therefore not part of the credible option's costs.

Source: AER, Application guidelines Regulatory investment test for transmission December 2018.

A power station is at one point, spatially. Transmission lines, like VNI West and HumeLink, are impacting communities and the environment all along the 600 km route (235 km VNI West + 365 km HumeLink = 600 km). If there is a $15m present value cost every kilometre, for the 600 km length, the cost would be $9 billion ($15m/km x 600km = $9 billion).

In the case of the Humelink project, the area impacted visually and by noise has been calculated as follows:

a. the noise from HumeLink, under certain weather conditions, will exceed the EPA noise limit up to 470m either side of the line. That is 34,310 ha impacted by noise (365km x 2 x 0.470km * 100 = 34,310 ha); and
b. the visual impacts have been assessed up to 2km either side of the line. That is around 146,000 ha potentially impacted visually (365km x 2 x 2km x 100 = 146,000 ha).

Applying the same assumptions to 235km VNI West, the area impacted visually and by noise is calculated as follows:

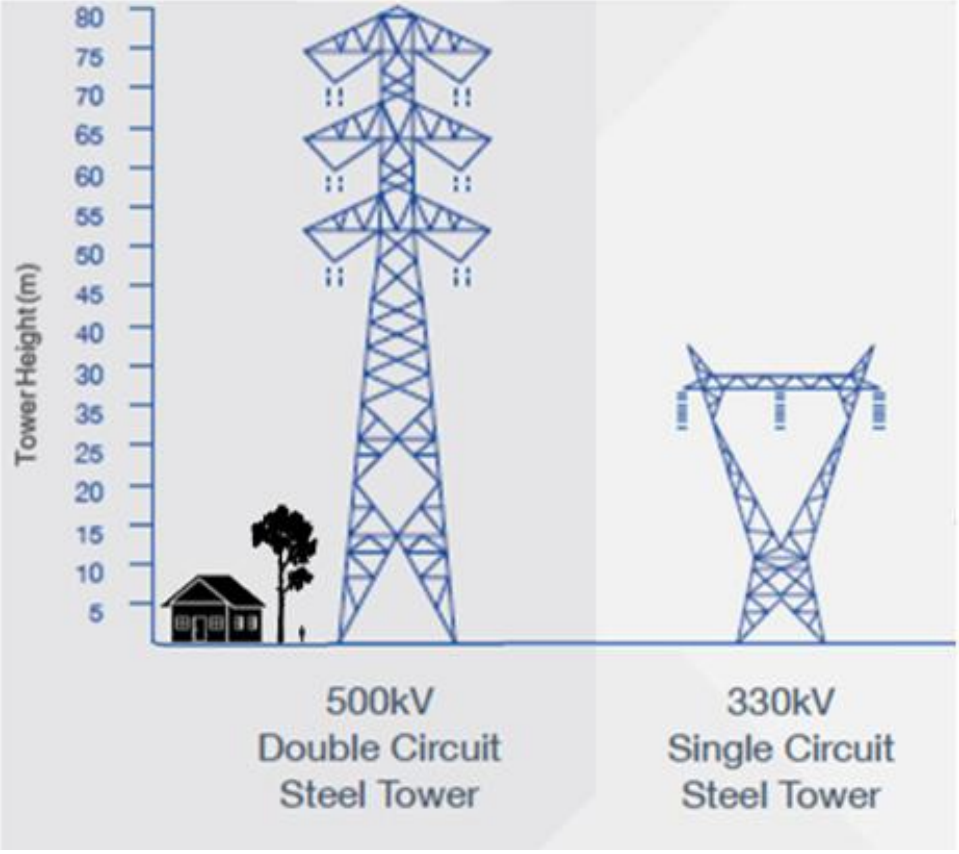
[7] Overseas studies have found that transmission lines have a major negative impact on the aesthetic quality of the landscape, and have established a link between the quality of landscapes and the wellbeing of the population (Berto, 2005; Hartig, Evans, Jamner, Davis & Garling, 2003; Mu˜noz, 2009; Ulrich, 1984; Ulrich et al., 1991; Velarde, Fry, & Tveit, 2007; Wells, 2000, Arriaza, Ca˜nas-Ortega, Ca˜nas-Madue˜no, & Ruiz-Aviles, 2004; Devine-Wright, 2012; Kaplan, TaskIn, & Önenc, 2006; Soini, Pouta, Salmiovirta, Uusitalo, & Kivinen, 2011; Tempesta, 2006; Tempesta & Thiene, 2007).

a. if, like HumeLink, the noise from VNI West, under certain weather conditions, will exceed the EPA noise limit up to 470m either side of the line. That is 22,090 ha impacted by noise (235km x 2 x 0.470km * 100 = 22,090 ha); and
b. if visual impacts can be expected up to 2km either side of the line. That is around 94,000 ha potentially impacted visually (235km x 2 x 2km x 100 = 94,000 ha).

For the combined HumeLink/VNI West project 56,400 ha can be expected to be impacted by noise, and 240,000 ha can be expected to be visually impacted. These are enormous, enduring impacts for 600km of regional NSW.

An indication of the visual and landscape character impacts of 500kV overhead transmission lines, is provided in Figure 1 below, that shows the height of the towers relative to a 6'6" person, an 8m dwelling, a tree and existing 330kV transmission lines in the landscape.

Figure:1: Comparison of 500kV and existing 330kV transmission lines



Other environmental costs like increased risk of bushfires[8], increased risk in severe weather and reduced productive efficiency of agriculture, as a result of overhead transmission lines, also need to be taken into account when assessing projects.

[8] Particularly projects like VNI West and HumeLink. Figure 18.2: Bushfire Prone Land in the VNI West EIS indicates almost all of the VNI West route is Category 1 - high bushfire risk. The HumeLink project has over a third of the route in bushfire prone land.

The costs associated with bushfires, as well as blackouts in severe weather with overhead transmission lines can be extreme, and are discussed below.

1.1.2. Bushfire risk

The construction of overhead transmission lines in bushfire prone land decreases electricity transmission system resilience.[9] It also increases bushfire risk, and is a work health and safety issue for farmers. An effective way to manage bushfire risk is to underground transmission.

While overhead transmission lines rarely start fires, on days of extreme fire danger the percentage of fires linked to electrical infrastructure assets rises dramatically. Transmission lines also seriously hinder aerial and ground bushfire control.

Firefighters on the ground at the Dunns Road 2019-20 Black Summer bushfire say overhead transmission lines prevented the control of that fire. When the fire was only 400ha, firefighters requested that the transmission lines that were stopping access to fight the fire, be turned off, but were unable to get the lines turned off. The Dunns Road fire went on to burn for two weeks with 147 homes lost and 386,000 ha burnt, including 50,000 ha of pine plantation and 20,000 ha of hardwood forest, with a value for the timber alone estimated at more than $5 billion.

Reducing the risk of bushfires is a compelling cost-benefit argument for undergrounding transmission. If underground transmission enabled the control of one major fire, then it is likely the least cost transmission option for the nation.

In July 2021 California announced it will bury 10,000 miles of overhead power lines to reduce the risk of wildfires, at a cost of between $15 to $30 billion. When asked about the cost the CEO said "It's too expensive not to do it. Lives are on the line,"[10]

1.1.3. Cost of blackouts with severe weather

Overhead transmission lines are also vulnerable in severe weather that is increasingly frequent with global warming.

In October 2024 severe weather brought down 220 kV transmission lines at Broken Hill. The damage was extensive with seven towers crumpled and Transgrid stating that repairs could take weeks.

[9] AEMO has a system resilience criterion of 'do no harm'. Building new overhead transmission lines in bushfire prone land is defined by AEMO as a deterioration in system resilience.

[10] https://www.npr.org/2021/07/21/1019058925/utility-bury-power-lines-wildfires-california

Source: https://www.abc.net.au/news/2024-10-17/far-south-west-new-south-wales-broken-hill-power-outage-storm/104482994

Consistent with severe weather increasing in frequency, early last year a major power outage occurred in Victoria because of wild weather, with reports stating that:

> *'..[a] destructive storm took Victoria by surprise. As winds of up to 150 kilometres an hour raced through the state, transmission towers near Geelong toppled and the grid went into chaos.*
>
> *At its worst, almost one in five Victorian homes were left without electricity while the main transmission system came close to collapse.'*[11]

The downed powerlines resulted in some 620,000 Victorian homes and businesses blacked out.

Further in 2016 again as a result of severe weather transmission lines were brought down in South Australia causing blackouts that lasted from a number of hours in some areas, to several days in other regions including the Eyre Peninsula. The cost of this blackout to businesses has been estimated at $367 million ($467 million, 2024$).[12]

Undergrounding transmission eliminates the risk of interruption to power transmission in severe weather events and therefore improves transmission security and resilience as required under the

[11] https://theconversation.com/victorias-power-outage-could-have-been-far-worse-can-we-harden-the-grid-against-extreme-weather-224142#:~:text=At%202.08pm%2C%20six%20of,south%20western%20Victoria%20to%20Melbourne.
[12] https://www.abc.net.au/news/2016-12-09/sa-blackout-costs-could-have-been-worse-business-sa-says/8106600 .

Security Legislation Amendment (Critical Infrastructure Protection) Act 2022.[13] These system security benefits of undergrounding transmission need to be factored into the cost-benefit analysis when assessing transmission options.

1.2. Acknowledgement that the regulatory process is "not fit for purpose"

1.2.1. Minister Bowen – RIT-T *"Not fit for purpose"*

Prior to the 2022 federal election, Minister Bowen acknowledged that the transmission regulatory process was "not fit for purpose" as it excludes costs to communities and the environment.

He committed to fixing the problem if elected, as reported by Renew Economy in an article titled: *"Not fit for purpose": Labor vows to overhaul regulatory process for transmission projects,* March 2022.

The article reports:

> '*Chris Bowen said he did not think the existing RIT-T process that regulates major network investments was 'fit for purpose', and was failing to serve community interests.'*
>
> and also:
>
> *'Labor would seek to reform the RIT-T process …. increasing the consideration of social and economic factors when making network investment determinations.'*[14]

The former Australian Energy Infrastructure Commissioner, Andrew Dyer, also maintained that the current Rules of the NEM are 'not fit for purpose'.

The people of Australia, and in particular rural communities impacted by overhead transmission lines, have been let down by governments that have failed to correct this obvious problem – for distributional equity and social licence, but also efficiency in the NEM.

1.2.2. Recommendation from the 2nd NSW parliamentary inquiry into the feasibility of undergrounding transmission

The 2nd NSW parliamentary inquiry into the feasibility of undergrounding transmission recommended:

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[13] SLACIP Act

[14] https://reneweconomy.com.au/not-fit-for-purpose-labor-vows-to-overhaul-regulatory-process-for-transmission-projects/

Recommendation 1

That the NSW Government consult with the Australian Energy Regulator (AER) to explore ways to incorporate broader environmental elements into RIT-T test, with the aim of shaping further changes to the National Energy Rules and associated regulatory tests.[15]

The government supported this recommendation.[16] Despite the recommendation from the inquiry and the government's support of the recommendation, the national electricity rules (NERs) still exclude environmental externalities from the RIT-T.

This government supported recommendation, demands the application of NSW government CBA to the VNI West project, as part of the EIS.

2. Failure to establish that there is no feasible alternative with less impact on the environment

The VNI West EIS fails to establish that there is no feasible alternative option for the project with less impact on the environment.

2.1. Plan, policy or strategy – international context

The EIS states that the VNI West project, as proposed, aligns with key strategic planning policies and strategies as outlined in Table 2.1, p16.

Table 2.1 Alignment with key strategic planning policies and strategies

Plan, policy or strategy	Description	Alignment with strategic framework
International context		
The Paris Agreement 	On 10 November 2016, Australia ratified the UN Paris Agreement and the Doha Amendment to the Kyoto Protocol, representing the Australian Government's commitment to provide action on climate change. These commitments included setting interim emission reduction targets, primarily a commitment to reduce emissions by 26 to 28 per cent below 2005 levels by 2030. Additionally, COP26 was the 26th annual climate change Convention on Climate Change Conference of Parties held in Glasgow 2021. At this meeting, the Australian Government continued its commitment to achieving net zero emissions by 2050.	The project is consistent with climate change initiatives and would be an enabler for the continued expansion of renewable energy generation by facilitating the longer-term transition of the energy sector to low-emission energy sources.

However, the EIS fails to acknowledge the UN Kunming-Montreal Global Biodiversity Agreement in the 'Plan, policy or strategy - international context'. The UN Kunming - Montreal Global Biodiversity

[15] https://www.parliament.nsw.gov.au/lcdocs/inquiries/3002/Report%20No.%201%20-%20Select%20Committee%20on%20the%20Feasibility%20of%20Undergrounding%20the%20Transmission%20Infrastructure%20for%20Renewable%20Energy%20Projects%20-%20Tabled%2028%20March%202024.pdf

[16] https://www.parliament.nsw.gov.au/lcdocs/inquiries/3002/Report%20No.%201%20-%20Select%20Committee%20on%20the%20Feasibility%20of%20Undergrounding%20the%20Transmission%20Infrastructure%20for%20Renewable%20Energy%20Projects%20-%20Tabled%2028%20March%202024.pdf

Agreement, to which Australia is a signatory, gives a clear directive that biodiversity loss must be tackled jointly with the climate crisis.

As discussed below, undergrounding the VNI West project can be expected to reduce habitat and biodiversity loss by 70%. Therefore, failing to undertake an underground option for the VNI West project, that would deliver a material reduction in loss of biodiversity, is inconsistent with Australia's international environmental obligations.

In a recent address to the National Press Club about failures with Australia's environmental laws Dr Ken Henry is reported as saying:

> *"The stakes are high,"...*
>
> *"**We have whole industries with business models built on the destruction of the natural world.***
>
> *"I am angry at our failures. But we should all be angry at our collective failure to design economic structures, including environmental regulations, that underpin confidence in a better future for our children and grandchildren.*
>
> *"We have turned nature against us. Our destruction of the natural environment now poses an existential threat to everything we value."*[17]

As seen by the exclusion of environmental externalities from the RIT-T, the electricity transmission industry is an industry with a business model '***built on the destruction of the natural world'.*** Also Transgrid's business model assumes biodiversity loss can be simply offset. This is inconsistent with EPBC Act Environmental Offsets Policy which states:

> *'Offsets will not be considered until all reasonable avoidance and mitigation measures are considered…'*[18]

Meeting the requirements of environmental legislation, is specified as a "key issue" in the SEARs for the VNI West EIS.

> ***'Biodiversity:***
> *• an assessment of the biodiversity impacts of the project, in accordance with the NSW Biodiversity Conservation Act 2016, the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must:*
> *- be prepared using the approved BDAR template;*

[17] https://www.abc.net.au/news/2025-07-16/fmr-treasury-secretary-ken-henry-urgent-environmental-reform/105536744

[18] The Environmental Offsets Policy makes clear that only unavoidable impact can be offset. The HumeLink undergrounding studies find biodiversity impacts can be significantly avoided by undergrounding, *(Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy, October 2012,* p7).

*- document the **application of the avoid, minimise and offset framework** including assessing all direct, indirect and prescribed impacts in accordance with the BAM;'*

Delivering the project underground means policy and legal requirements under the Environment Protection and Biodiversity Conservation Act (EPBC Act) and NSW Environmental Planning and Assessment Act 1979, to construct the project option with a lesser impact on the environment, can be met.[19]

Transgrid not identifying the significant benefits to the environment, and more specifically biodiversity, of an underground option, is a major failure of the VNI West EIS. Our second supplementary submission to the HumeLink EIS (attached) notes that Transgrid, in the Transgrid/GHD HumeLink undergrounding study, estimates the relative biodiversity offset costs of overhead and undergrounding options as follows:

- **Transgrid/GHD option: biodiversity offset costs of overhead lines - $711 million;**
- **Transgrid/GHD option: biodiversity offset costs of underground cables - $363 million**.

Amplitude Consultants, using Transgrid's $/km biodiversity cost, prorated for a narrower underground easement option, estimated the biodiversity offset costs as follows:

- **Amplitude Consultants option: biodiversity offset costs of underground cables - $200 million.**

The reduction in biodiversity offset cost from $711 million with an overhead option, to $200 million with an underground option, is a 72% reduction, and therefore a principal means of avoiding and/or mitigating impacts, as required under the EPBC Act Environmental Offsets Policy. These biodiversity benefits of an underground option are being ignored.

The 2021 Australia State of the Environment report said 'Overall, the state and trend of the environment of Australia are poor and deteriorating.'

The State of the Environment report found that Australia is failing the environment on almost every measure. An important measure is loss of habitat. VNI West as an overhead line will have a significant and enduring impact on this measure, with a required easement of 70 m to 100 m, for the 235 km length of the project.

An obvious means of avoiding and mitigating environmental impacts of the VNI West project is to underground the transmission, as indicated by the Transgrid/GHD HumeLink underground study and the Amplitude Review. By undergrounding transmission, a much smaller easement (around 15 m) is needed with commensurate reductions in loss of habitat and biodiversity. Also, with undergrounding some sections can be horizontal directional drilled, up to 1 km, eliminating impacts on habitat altogether.

[19] Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
Environmental Planning and Assessment Act 1979 No 203

While it is easy to dismiss the costs to biodiversity of the VNI West project – as just another project clearing habitat, this project is part of the nation's loss of biodiversity by a thousand cuts.

It is important to note that the value of biodiversity globally has been put at USD 125-140 trillion per year, more than one and a half times the size of global GDP, and has been describes as fundamental to life on earth.

> '*Biodiversity loss is among the top global risks to society. The planet is now facing its sixth mass extinction, with consequences that will affect all life on Earth, both now and for millions of years to come. Humans have destroyed or degraded vast areas of the world's terrestrial, marine and other aquatic ecosystems. Natural forests declined by 6.5 million hectares per year between 2010 and 2015…*
>
> *Human pressures are undermining the biodiversity that underpins all life on land and below water. Ecosystem services delivered by biodiversity, such as crop pollination, water purification, flood protection and carbon sequestration, are vital to human well-being. Globally, these services are worth an estimated* ***USD 125-140 trillion (US dollars) per year, i.e. more than one and a half times the size of global GDP'*****,** OECD, Biodiversity: Finance and the Economic and Business Case for Action**.**

Figure 4: Clearing in Kosciuszko National Park, Maragle State Forest and Bago State Forest for the Snowy 2.0 Transmission Connection Project easement

Source: Facebook - https://www.facebook.com/geoff.wise.3114

As shown in Figure 4 above, transmission line easements not only remove critical habitat, they also impact biodiversity by destroying connectivity between remnant stands of vegetation.

Many projects cannot be put underground to reduce impacts on biodiversity, for example solar farms and wind farms. But transmission lines can be. As stated above, while the biodiversity impacts of VNI West are being addressed with biodiversity offsets, this is contrary to the EPBC Act Environmental Offsets Policy.

2.2. Transgrid's biased assessment of undergrounding VNI West

In dismissing the option of undergrounding VNI West the EIS states:

> *The limitations and challenges of undergrounding can typically include:*
> *....*
> *• differences in reliability and fault restoration (including increased repair timeframes)*
> *• limited supply of underground high voltage expertise*
> *• shorter asset life expectancy of underground cables*
> *• construction and operational differences between overhead and underground installations, including restrictions on potential land uses within transmission line easements*
> *• significant ground disturbance during construction (resulting in significant environmental impacts) and greater potential biosecurity risks*
> *• the required width of easements and impact of undergrounding to agricultural land.*

Although Transgrid implies there are problems for landowners with underground cables, an international study indicates there are important benefits, see Figure 2 below.

Figure 2: Impacts of concern from overhead transmission lines and underground cables

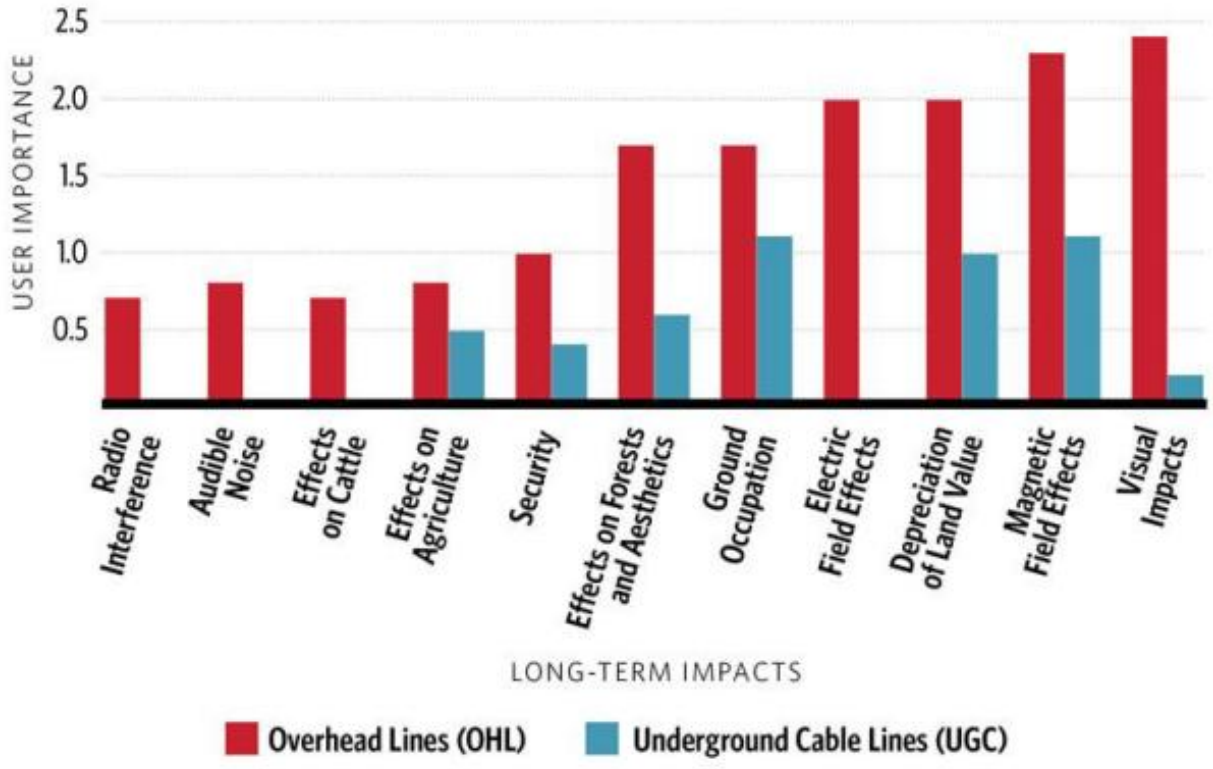

Figure 2: Source - CIGRÉ as referenced by HDR https://www.hdrinc.com/insights/top-5-reasons-use-underground-transmission-lines

Transgird fails to mention significant benefits of HVDC underground transmission as follows:

1. **Options for expandable capacity**. The ability to build underground transmission expandable by installing additional conduits, so additional cables with additional transfer capacity can be easily installed when more capacity is needed. This strategy, for future proofing transmission, was proposed for the Marinus Link project.
2. **A significant reduction in biodiversity offset costs.** The 180 km HVDC underground Murraylink project is renowned for only removing 2 trees its entire length, while the HumeLink undergrounding study found biodiversity offsets could be reduced by 70% with an underground option;
3. **Less transmission losses.** HVDC is a more efficient way to transmit electricity over long distances as it is associated with less transmission losses;
4. **Significantly less Opex**. Estimates for HumeLink indicate that annual opex for an HVDC underground option would be $15m/year, versus $45m/year to $153m/year with an overhead option;
5. **Stability and inertia services provided by HVDC converter stations**. HVDC converter stations, with an HVDC option, can provide stability and inertia services that otherwise require investment in synchronous condensers, at an approximate cost of $150m per condenser. Estimates indicate that HumeLink HVDC underground would reduce the need for 10 synchronous condensers, with a cost saving of $1.5 billion;
6. **Ability to go in a straight line rather than avoiding constraints.** Estimates indicate that a HVDC underground backbone to the grid would reduce the length of transmission by 500 km, with a saving of $4 billion.[20]
7. **Significant economies of scale with HVDC.** If both HumeLink and VNI West were HVDC underground, a pair of converter stations could be eliminated, reducing the combined cost of the projects by $1 billion.

Transgrid also misrepresents disadvantages of an HVDC underground option as follows:

1. **Underground lines are substantially more expensive than overhead lines.** The recently announced Syncline Community Cable project is a 256 km, 2000 MW, underground transmission line, in Victoria, with an estimated cost of $3.2 billion.[21] The 235km overhead option for the NSW section of VNI West is costing $3.7 billion. The higher $3.7 billion cost for VNI West AC overhead, is before the additional synchronous condensers that will be needed with the AC overhead option, that will not be needed with an HVDC underground option. Also, the comment that *Underground lines are substantially more expensive than overhead lines* ignores the significant costs associated with overhead lines due to loss of visual amenity, loss of noise amenity, interruption to agriculture, increased risk with bushfires and increased risk with severe weather.

[20] https://www.parliament.nsw.gov.au/lcdocs/submissions/80012/0029%20Prof%20Simon%20Bartlett.pdf

[21] Amplitude Consultants in a HumeLink undergrounding study estimated the cost of undergrounding 365 km, 2570 MW, HumeLink at $7.3 billion, with a point-to-point underground option for HumeLink possible at $5.46 billion. Transgrid strongly disputed the $7.3 billion cost to underground HumeLink as a substantial underestimation of the undergrounding cost. The $3.2 billion cost of the Syncline project, confirms the $7.3 billion HumeLink undergrounding cost as a conservative estimate.

2. **More ground disturbance**. The underground option for HumeLink proposed by Amplitude Consultants, involved 2 x 1.5m trenches. For the VNI West project with a length of 235km this would mean ground disturbance of 705,000 m2, (2 x 1.5m x 235km x 1000 = 705,000 m2). Each of the 500kV towers of the overhead option requires a 50m x 50m crane pad to be constructed – levelled and cleared. Assuming a tower every 400m, this is ground disturbance of 1,468,750 m2, (50m x 50m x 235km x 1000/400 = 1,468,750 m2). Contrary to claims in the EIS, the ground disturbance of the overhead option is more than double the ground disturbance of the underground option.
3. **Impact of undergrounding to agriculture**. Transgrid implies there is more interruption to agriculture with underground cables. However overhead transmission lines impede farm aerial operations, restrict the use of machinery to a height limit of 4.3m, prevent spray irrigation, and prevent the use of Precision Agriculture - such as fenceless technologies and remote animal welfare monitoring. When announcing the 256km underground Syncline project, it was stated that an important advantage of the underground option was there would be *'almost no impact on farmers, their operations or land values.'*.
4. **Differences in reliability and fault restoration (increased repair timeframes**). Underground transmission is in fact more reliable transmission. Studies estimate the forced outage rate for overhead lines is 2.25 incident per annum, versus 0.75 incident per annum with an underground option.[22] The VNI West EIS fails to mention that underground cables are built with redundancy, so if one cable fails, the other cables can take the load, while the repair is being undertaken. If an overhead tower comes down in severe weather or a bushfire, all circuits are lost, and a blackout will occur.
5. **Does also not meet the identified need of VNI West as determined during the RIT-T process.** We assume this refers to the tap-in/tee-off constraint with an HVDC option. Both a 500kV AC overhead option and a 2000MW HVDC option present a tap-in/tee-off constraint, with the cost of a 500kV substation and a 2000MW converter station at $300m to $400m, respectively.

After for correcting for biases in the EIS assessment, it is clear that undergrounding VNI West is a feasible alternative for the project.

While Transgrid is dismissing HVDC underground transmission the rest of the world is embracing it as the best option for '*technical, environmental and social license reasons'*.

After the 2023 International Council on Large Electric Systems (CIGRE)[23] HVDC (B4) conference in Vienna, engineers stated:

> *'Germany and UK are really pushing forward, with TSOs [transmission system operators] now going against the (RIT-T) type approach and choosing the higher cost options for technical, environmental and social license reasons. Previously "immovable" government owned utilities now see the light – and are filling up the order books of the HDVC and cable vendors in Europe (TenneT is ordering 20GW of HVDC, with signed contracts!).'*

[22] Moorabool Shire Council Comparison of 500 kV Overhead Lines with 500 kV Underground Cables September 2020.
[23] https://www.cigre.org/

20GW of HVDC underground transmission is equivalent in transfer capacity to 10 x VNI West transmission lines underground, currently planned in Europe.

Conclusion

Major failures with the current electricity planning and regulatory system relating to transmission, mean wrong decisions are being made about projects. Projects are being planned and constructed in environmentally destructive ways. The current system is neither efficient or equitable, and the nation is being seriously damaged by NEM and State Planning failures.

The current NEM Rules don't mean we, as a nation, have low-cost electricity. Rather we have 'high-cost electricity' that is destroying the liveability, workability and beauty of large areas of rural Australia, plus increasing risk in severe weather and bushfires, and unnecessarily reducing biodiversity.

A recent poll by the Guardian said that 70 per cent of people believed the transition to net zero should not be at the expense of communities and the environment. Also 65 per cent of people were against overhead transmission lines. It is important to take the opinions of the people of Australia into account, when making project decisions.

Transgrid has used I-O analysis to assess the State benefit of the VNI West project. This is described by NSW Treasury as **not a tool to assess State benefit of projects**. Therefore, Transgrid has failed the SEARs 'economic' key issue - to assess 'the economic benefits of the [VNI West] project for the region and the State as a whole.

The assessment of an underground option is biased - exaggerating disadvantages, and failing to identify important advantages. Undergrounding VNI West is clearly a feasible option for the project, when the biases are omitted.

The important stability and inertia benefits of an HVDC underground option have not been disclosed.

The economies of scale with HVDC transmission is not discussed.

In a major failure of the assessment, the biodiversity benefits of an underground option are not mentioned. Failing to deliver the VNI West project with the feasible option of undergrounding, that significantly reduces the loss of biodiversity, means Australia is not complying with its international environmental obligations under the UN Kunming - Montreal Agreement.

The rejection of undergrounding as the preferred option for the VNI West project, is not consistent with recent overseas transmission planning decisions which are increasingly preferencing underground options for projects.

In 2021 the US announced the burying of 10,000 miles of overhead power lines because of the risk with bushfires. Almost the entire VNI West route is classified as high bushfire risk.

In 2023 TenneT reported 20GW of signed contracts for HVDC underground cables, with transmission system operators choosing the higher cost option for '*technical, environmental and social license reasons'.*

It was recently reported that:

> *'Australian researcher Professor Mark Howden, vice chair of the Intergovernmental Panel on Climate Change working group II, said while undergrounding transmission lines could involve expense in the short term, it would reduce the lines exposure to climatic pressures, fire threats and reduce the visual impact of the energy transition',* The Weekly Times, August 6, 2025.

Considerable unnecessary harm will be done to the nation and the State if VNI West is delivered as an overhead option.

Image: Johannes Leak

We need environmentally responsible transmission as well as generation in the transition to net zero.

We urge you to deny approval for VNI West as an overhead line, and require that the project be delivered underground.

Yours sincerely,

Andrea Strong,

President, HumeLink Alliance Incorporated

Appendix A - Flawed economic assessment of the State benefit of VNI West

The key economic issue in the Planning Secretary's Environmental Assessment Requirements (SEARs) is to assess 'the economic benefits of the [VNI West] project for the region and the State as a whole.'

The method used to assess the economic benefit of the HumeLink project is entirely unsound, as it uses a method described by NSW Treasury as **not a tool to assess State benefit of projects**.

NSW Government Guide CBA says in relation to I-O modelling:

> I-O analysis is *'of limited usefulness in assessing the net social benefit of proposals.'*
>
> And
>
> *'I-O analysis is subject to **significant limitations**, and **extreme care should be taken in its interpretation**. I-O analysis is concerned with simply measuring economic activity. **It is not a tool to measure welfare in the appraisal of projects or programs, nor does it take account of the alternative uses (opportunity costs) of resources. I-O analysis does not necessarily measure net benefits**.*
>
> *Multipliers are often inappropriate for assessing impacts associated with additional (marginal) investment. Published multipliers measure the overall linkages between an industry and the remainder of the economy, and therefore represent average rather than marginal impacts.*
>
> *Other limitations include:*
> *♣ Often poor quality of the data on which regional input-output models are based.*
> *♣ Potential double counting of impacts – Value added, income and employment impacts are alternative measures of the level of activity, and should not be added together.*
> *♣ Lack of supply-side constraints – Multipliers assume that extra output can be produced in one area of activity without reducing resources for other activities. This would not apply, for instance, where resources are fully employed.*
> *♣ The assumption that prices are fixed and that relative price changes have no impact on the allocation of scarce resources between activities, which may not always be true.*
> *♣ The assumption of fixed production technology, which can lead to erroneous conclusions, particularly when technology is changing rapidly.*
> *♣ Absence of budget constraints – As a result changes in consumption occur without reducing demand elsewhere. When in reality most consumption expenditure by households and government are budget constrained. p*
> *♣ Multiplier impacts are based on a theoretical relationship. They cannot be considered as literal or precise, and any flow-on impacts (i.e. impacts beyond the first round effects) cannot be directly observed, measured or verified after the fact'* (some emphasis added), p65-66.